Southern Nuclear

B. H. Whitley
Director
Regulatory Affairs

Southern Nuclear
Operating Company, Inc.
42 Inverness Center Parkway
Birmingham, AL 35242
Tel 205.992.7079
Fax 205.992.5296

May 11, 2018

Docket Nos.: 52-025
52-026

ND-18-0608
10 CFR 50.90
10 CFR 52.7

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

**Southern Nuclear Operating Company**
**Vogtle Electric Generating Plant Units 3 and 4**
**Supplement to Request for License Amendment and Exemption:**
**Changes to Tier 2* Departure Evaluation Process (LAR-17-037S2)**

Ladies and Gentlemen:

Pursuant to 10 CFR 52.98(c) and in accordance with 10 CFR 50.90, Southern Nuclear Operating Company (SNC) requested an amendment to the combined licenses (COLs) for Vogtle Electric Generating Plant (VEGP) Units 3 and 4 (License Numbers NPF-91 and NPF-92, respectively) by SNC letter ND-17-1726, dated December 21, 2017 [ADAMS Accession Number ML17355A416], and supplemented (LAR-17-037S1) by SNC letter ND-18-0417, dated April 6, 2018 [ADAMS Accession Number ML18096B328], to apply the existing departure evaluation process for Tier 2 departures to the evaluation of certain Tier 2* departures. In this same license amendment request (LAR) SNC also requested an exemption from certain change requirements in 10 CFR Part 52, Appendix D.

This supplement provides information in response to Requests for Additional Information (RAIs), LAR 17-037-3 and LAR 17-037-4 from the NRC Staff, which were transmitted by electronic mail (email) on April 12, 2018 [ADAMS Accession Number ML18102B683] and April 23, 2018 [ADAMS Accession Number ML18113A780], respectively, to support review of LAR-17-037. The response to RAI LAR-037-3 also considers feedback provided by the NRC staff during a public meeting held May 3, 2018 [ADAMS Accession Number ML18110A120].

Additionally, this supplement provides a revised response to RAI LAR-17-037-1 (original response provided in SNC letter ND-18-0417) to address feedback provided by the NRC staff during a teleconference on April 12, 2018 and email from the NRC staff to SNC dated April 17, 2018 [ADAMS Accession Number ML18107A587].

Enclosures 1 through 8 were provided with the original LAR-17-037, SNC letter ND-17-1726. Enclosure 9 was provided with the first supplement to LAR-17-037, SNC Letter ND-18-0417.

Enclosure 10 to this letter provides the revised SNC responses to RAI LAR-17-037-1. Enclosure 11 to this letter provides the SNC response to RAI LAR-17-037-3, and Enclosure 12 to this letter provides the SNC responses to RAI LAR-17-037-4.

The information provided in this LAR supplement does not impact the scope, technical content, or conclusions of the Significant Hazards Consideration Determination, or the Environmental Considerations of the original LAR-17-037 provided in Enclosure 1 of SNC letter ND-17-1726.

This letter has been reviewed and confirmed to not contain security-related information. This letter contains no regulatory commitments.

SNC now requests NRC Staff review and approval of the license amendment and exemption by July 16, 2018 and would implement the amendment within 45 days of issuance. This license amendment and exemption is not tied to any particular construction activity; however, any delay in the issuance would also delay the benefits.

In accordance with 10 CFR 50.91, SNC is notifying the State of Georgia of this LAR supplement by transmitting a copy of this letter and its enclosure to the designated State Official.

Should you have any questions, please contact Wesley Sparkman at (205) 992-5061.

I declare under penalty of perjury that the foregoing is true and correct. Executed on the 11th of May 2018.

Respectfully submitted,

Brian H. Whitley
Director, Regulatory Affairs
Southern Nuclear Operating Company

Enclosures 1-8) (Previously submitted with the original LAR, LAR-17-037, in letter ND-17-1726)

9) (Previously submitted with the first supplement to LAR-17-037, in letter ND-18-0417)

10) Vogtle Electric Generating Plant (VEGP) Units 3 and 4 – Revised Response to Request for Information (RAI) LAR 17-037-1 Regarding the LAR-17-037 Review (LAR-17-037S2)

11) Vogtle Electric Generating Plant (VEGP) Units 3 and 4 – Response to NRC Request for Additional Information (RAI) LAR 17-037-3 Regarding the LAR-17-037 Review (LAR-17-037S2)

12) Vogtle Electric Generating Plant (VEGP) Units 3 and 4 – Response to NRC Request for Additional Information (RAI) LAR 17-037-4 Regarding the LAR-17-037 Review (LAR-17-037S2)

cc:

Southern Nuclear Operating Company / Georgia Power Company
Mr. S. E. Kuczynski (w/o enclosures)
Mr. D. G. Bost (w/o enclosures)
Mr. M. D. Meier (w/o enclosures)
Mr. D. H. Jones (w/o enclosures)
Mr. J. B. Klecha
Mr. G. Chick
Mr. D. L. McKinney (w/o enclosures)
Mr. T. W. Yelverton (w/o enclosures)
Mr. B. H. Whitley
Ms. C. A. Gayheart
Mr. C. R. Pierce
Ms. A. G. Aughtman
Mr. D. L. Fulton
Mr. M. J. Yox
Mr. J. Tupik
Mr. W. A. Sparkman
Ms. A. C. Chamberlain
Ms. A. L. Pugh
Mr. F. J. Redwanz
Document Services RTYPE: VND.LI.L00
File AR.01.02.06

Nuclear Regulatory Commission
Mr. W. Jones (w/o enclosures)
Ms. J. Dixon-Herrity
Mr. C. Patel
Ms. J. M. Heisserer
Mr. B. Kemker
Mr. G. Khouri
Ms. S. Temple
Mr. F. Brown
Mr. T.E. Chandler
Ms. P. Braxton
Mr. T. Brimfield
Mr. C. J. Even
Mr. A. Lerch

State of Georgia
Mr. R. Dunn

Oglethorpe Power Corporation
Mr. M. W. Price
Mr. K. T. Haynes
Ms. A. Whaley

Municipal Electric Authority of Georgia
Mr. J. E. Fuller
Mr. S. M. Jackson

Dalton Utilities
Mr. T. Bundros

Westinghouse Electric Company, LLC
Mr. L. Oriani (w/o enclosures)
Mr. G. Koucheravy (w/o enclosures)
Mr. M. Corletti
Mr. M. L. Clyde
Ms. L. Iller
Mr. D. Hawkins
Mr. J. Coward

Other
Mr. S. W. Kline, Bechtel Power Corporation
Ms. L. A. Matis, Tetra Tech NUS, Inc.
Dr. W. R. Jacobs, Jr., Ph.D., GDS Associates, Inc.
Mr. S. Roetger, Georgia Public Service Commission
Ms. S. W. Kernizan, Georgia Public Service Commission
Mr. K. C. Greene, Troutman Sanders
Mr. S. Blanton, Balch Bingham
Mr. R. Grumbir, APOG
NDDocumentinBox@duke-energy.com, Duke Energy
Mr. S. Franzone, Florida Power & Light

**Southern Nuclear Operating Company**

**ND-18-0608**

**Enclosure 10**

**Vogtle Electric Generating Plant (VEGP) Units 3 and 4**

# Revised Response to NRC Request for Additional Information (RAI) LAR 17-037-1

# Regarding the LAR-17-037 Review

# (LAR-17-037S2)

Supplement 1 changes to the original LAR-17-037, ND-17-1726, Enclosure 1, that are unchanged in Supplement 2 are shown as **bold-underlined** text.

Supplement 2 changes that are added to the Supplement 1 submittal are shown as blue-underlined text; deletions of Supplement 1 text are shown as ~~red strikethrough~~ text.

(This Enclosure consists of six pages, including this cover page.)

The following questions were provided by the NRC Staff [Request for Additional Information (RAI) [LAR 17-037-1] regarding the review of Southern Nuclear Operating Company (SNC) License Amendment Request (LAR) 17-037, which was submitted by SNC letter ND-17-1726 on December 21, 2017. The original responses to these questions were provided by SNC in letter ND-18-0417 which was submitted on April 6, 2018. The revised responses below reflect feedback regarding the original responses provided by the NRC staff during a public phone call on April 12, 2018, and in an email from the NRC staff to SNC dated April 17, 2018 [ML18107A587].

**Question 1**

Section VIII.B.6.a of 10 CFR Part 52, Appendix D, states that an applicant who references this appendix may not depart from Tier 2* information, which is designated with italicized text or brackets and an asterisk in the generic DCD, without NRC approval. Additionally, General Design Criterion 1 of 10 CFR Part 50, Appendix A, "Quality standards and records" requires, in part, that structures, systems, and components important to safety be designed, fabricated, erected, and tested to quality standards commensurate with the importance of the safety functions to be performed.

In the technical evaluation, the licensee states that "SNC performed an analysis of the Tier 2* matters listed in 10 CFR Part 52, Appendix D, Section VIII paragraphs B.6.b and B.6.c." The Reviewer's Aid included as Enclosure 5 also addresses matters based on Section VIII.B.6.b and VIII.B.6.c. The DCD contains additional text designated as Tier 2* that may not clearly fall under the matters listed in Section VIII.B.6.b and VIII.B.6.c, but is still subject to the requirements of Section VIII.B.6.a. Specifically, the CVS piping inside containment is non-ASME Code piping subject to additional requirements for design, fabrication, examination, inspection, and testing. These additional requirements are designated Tier 2* and support the basis for satisfying GDC 1. The licensee should describe how a potential change to the treatment of this non-ASME Code piping would be handled by the proposed process. Additionally, the licensee should consider if there are any other topics designated as Tier 2* information in the DCD that may not be adequately covered by the specified criteria.

**SNC Response to RAI Question 1**

As a point of clarification, Section VIII.B.6.a of 10 CFR Part 52, Appendix D, referenced in Question 1 is only applicable to "applicants" who reference Appendix D, not COL holders that reference Appendix D. Instead, Paragraph VIII.B.6.b, which contains similar requirements, is applicable to licensees.

The UFSAR text regarding the CVS piping in the UFSAR referred to in the question (Subsection 5.2.1.1) is designated in the AP1000 DCD *Introduction* [ADAMS Accession Number ML11171A303], Table 1-1, *Index of AP1000 Tier 2 Information Requiring NRC Approval for Change*, as "ASME Code Piping Design Restrictions." SNC utilized this DCD Introduction table to ensure that all Tier 2* text was properly identified and evaluated. This Tier 2* category is listed in the 10 CFR Part 52, Appendix D, paragraph VIII.B.6.c.(2) as "American Society of Mechanical Engineers Boiler & Pressure Vessel Code (ASME Code) piping design and welding restrictions, and ASME Code Cases." (Note that although the UFSAR Tier 2* text refers to ASME B31.1 Code and the 10 CFR Part 52, Appendix D, paragraph VIII.B.6.c.(2) refers to ASME Boiler and Pressure Vessel Code, SNC considers paragraph VIII.B.6.c.(2) as the applicable reference.) Furthermore, SNC interprets the term "code" in the new evaluation Criteria to include ASME B31.1.

SNC evaluated the Tier 2* text regarding the CVS piping in UFSAR Subsection 5.2.1.1. This Tier 2* text involves two types of information. One set of text involves Tier 1 information. SNC's evaluation of this text concluded that the Design Commitments in Tier 1 (specifically for CVS Section 2.3.2, item 14) adequately capture the necessary safety significant requirements. This item requires that the nonsafety-related piping located inside containment and designated as reactor coolant pressure boundary, as identified in Tier 1, Table 2.3.2-2 (pipe lines with "No" in the ASME Code column), is designed to withstand a seismic design basis event and maintain structural integrity. Hence, any departures from these Tier 1 Design Commitments would require prior NRC approval. Furthermore, changes that would relax the manner in which Code requirements are met, such as adverse ~~non-conservative~~ changes to the loading combinations and stress limits described in UFSAR Subsection 5.2.1.1 Tier 2* text would require prior NRC review and approval per the requirements of 10 CFR Part 52, Appendix D, paragraph VIII.B.5.b.(2) because adverse changes in design requirements tied to code requirements are treated as adverse effects on design function potentially affecting the frequency of occurrence of an accident. As described in NEI guidance 96-07, *Guidelines for 10 CFR 50.59 Implementation*, Revision 1, while a minimal increase in the likelihood of occurrence of a malfunction of an SSC important to safety is permitted, licensees must still meet applicable regulatory requirements and other acceptance criteria to which they are committed (such as contained in regulatory guides and nationally recognized industry consensus standards, e.g., the ASME B&PV Code). Thus, an adverse ~~non-conservative~~ change to loading combinations and stress limits would be incompatible with the "more than minimal" standard. This same requirement would apply to departures from other UFSAR Tier 2* text that similarly involve regulatory requirements and other acceptance criteria to which SNC is committed.

The second set of Tier 2* text in UFSAR Subsection 5.2.1.1 related to CVS piping inside containment involves requirements that were not included in Tier 1. This text requires that dimensional fabrication, assembly, erection, inspection, examination, and testing requirements as defined in Chapters IV, V, and VI of the ASME B31.1 Code are applicable and used for the B31.1 (Piping Class D) CVS piping systems, valves, and equipment inside containment. SNC's evaluation of this text determined that it did not require any new evaluation Criterion. The basis for this conclusion is that any departure that reduces commitments to B31.1 Code in this text would require prior NRC review and approval based on the departure evaluation criteria in 10 CFR Part 52, Appendix D, paragraph VIII.B.5.b.(2), because adverse ~~non-conservative~~ changes in fabrication, assembly, erection, inspection, examination, and testing requirements tied to code requirements are treated as potentially affecting the likelihood of malfunction (see similar basis discussion in above paragraph).

After initial full power operation, this Tier 2* text reverts to Tier 2 text in accordance with 10 CFR Part 52, Appendix D, paragraph VIII.B.6.c.

**Question 2**

Section VIII.B.6.b of 10 CFR Part 52, Appendix D, states that an applicant who references this appendix may not depart from the following Tier 2* matters without prior NRC approval, of which one of these matters is titled "piping design acceptance criteria." The licensee states that "SNC performed an analysis of the Tier 2* matters listed in 10 CFR Part 52, Appendix D, Section VIII paragraphs B.6.b and B.6.c."

In the LAR 17-037 submittal, Page 9 of Enclosure 1 indicates that Criterion 2 was developed as a screening criterion as a result of the analysis performed of these Tier 2* matters, which

included, among other things, piping design acceptance criteria. The bases for Criterion 2 provides a list of three design processes:

a. Diverse Actuation System
b. Protection and Safety Monitoring System
c. Human Factors Engineering

Notably missing from this list is piping design acceptance criteria, one of the topics identified on Page 9 of Enclosure 1. Please elaborate on how piping design acceptance criteria will be treated by the proposed process.

**SNC Response to RAI Question 2**

Piping design acceptance criteria (DAC) are called out in various locations within the UFSAR (e.g., Subsections 3.6.2 and 3.9.3) as Tier 2* text. This Tier 2* text describes a design process that is used to implement an industry standard (e.g., ASME Code) or endorsed regulatory guidance. Hence, any departures that result in a material change to this piping DAC would meet Criterion 2 and require prior NRC approval. LAR-17-037 submittal, Page 9 of Enclosure 1 properly includes piping design acceptance criteria under Criterion 2. However, as noted in the question, the bases discussion regarding Criterion 2 does not list piping design acceptance criteria. Enclosure 1 of the original LAR-17-037 is revised as follows to correct this inconsistency (revised text is shown in blue underlined font):

1. Under Section 3, Technical Evaluation, on Pages 10 and 11 of 19, under "Criterion 2 (Design Processes) Bases" add the following new bullet as the third ~~second~~ bullet:

   - **Piping design acceptance criteria (multiple system sections in the plant-specific Tier 1; plant-specific Tier 2 DCD, Subsections 3.6.2 and 3.9.3);**

2. Under Section 3, Technical Evaluation, on Pages 10 and 11 of 19, under "Criterion 2 (Design Processes) Bases" after the paragraph entitled "Protection and Safety Monitoring System (PMS)" add the following:

   **Piping Design Acceptance Criteria (DAC)**

   **This UFSAR Tier 2* text describes a design process for piping design that is used to implement an industry standard (e.g., ASME Code) or endorsed regulatory guidance. For example, as explained in UFSAR Section 3.6.2.1.1, this text defines the process for determining pipe break locations in piping designed and constructed to the requirements for Class 1 piping in the ASME Code, Section III, Division 1. Departures related to this design process may not be easily evaluated against the eight criteria of paragraph B.5.b; therefore, some departures may not receive prior NRC approval as required. The application of proposed Criterion 2 assures that any material departure related to piping DAC receives prior NRC approval.**

3. Under Section 3, Technical Evaluation, on Page 13 of 19, in the second full paragraph, revise the last sentence to read as follows:

"…are related to the Diverse Actuation System (DAS), Protection and Safety Monitoring System (PMS), **piping design acceptance criteria,** and Human Factors Engineering (HFE)."

4. Under Section 3, Technical Evaluation, on Page 14 of 19, after the second full paragraph (i.e., before the paragraph starting "Tier 1 DCD, Section 3.2….") add the following text:

**Various system ITAAC in the plant-specific Tier 1 DCD address piping design ~~in accordance with ASME Code~~. For example, plant-specific Tier 1 Section 2.1.2, Reactor Coolant System, item 6~~2.b~~ reads as follows:**

Each of the as-built lines identified in Table 2.1.2-2 as designed for leak before break (LBB) meets the LBB criteria, or an evaluation is performed of the protection from the dynamic effects of a rupture of the line. ~~The piping identified in Table 2.1.2-2 as ASME Code Section III is designed and constructed in accordance with ASME Code Section III requirements.~~

**The Tier 2* text in plant-specific Tier 2 DCD Subsections 3.6.2 and 3.9.3 define the processes (i.e., piping design acceptance criteria) necessary to implement the Tier 1 requirement. These processes define, for example, how to determine pipe break locations for ASME Code Class 1, 2 and 3 piping systems.**

The design reports used to close out the ITAAC are referenced in ITAAC close-out documentation and available for NRC review. After initial full-power operation, the "piping design acceptance criteria" reverts to Tier 2 text in accordance with 10 CFR Part 52, Appendix D, paragraph VIII.B.6.c.

**Question 3**

Section VIII.B.6.b of 10 CFR Part 52, Appendix D, states that an applicant who references this appendix may not depart from the following Tier 2* matters without prior NRC approval, of which one of these matters is titled "Motor-operated and power operated valves." 10 CFR Part 50 Appendix A, General Design Criteria 1, 2, 4, 14, and 15 provide requirements related to the design of these valves. 10 CFR Part 50 Appendix B additionally provides requirements related to quality assurance in the design, fabrication, construction, and testing of safety-related valves.

The screening criteria provided in LAR 17-037 use the phrase "used to implement an industry standard or endorsed regulatory guidance" or "construction materials that deviate from a code or standard credited…" to determine whether the Tier 2* change process may be departed from. In the case of the design and qualification provisions for motor-operated valves (MOVs) and power-operated valves (POVs), the Tier 2* information contained in the AP1000 DCD was not considered part of a code, standard, or endorsed regulatory guidance at the time, but subsequent to the certification of the AP1000 design, became classified as such. Furthermore, the applicant states in Enclosure 5 of LAR 17 037 that the topic of MOVs and POVs is adequately addressed in Tier 1 and by paragraph VIII.B.5. Please provide additional basis for supporting this conclusion, including the means by which the qualification of MOVs and POVs will be accomplished. The licensee should elaborate on how they would evaluate changes to the provisions for MOVs and POVs– specifically if changes would be made pursuant to 10 CFR Part 52, Appendix D, Section VIII paragraph B.5.

**SNC Response to RAI Question 3**

The basis for excluding MOV/POV design and qualification provisions from the new evaluation criteria is based on the following. Plant-specific Tier 1 DCD requires that safety-related MOVs/POVs (identified in Tier 1 tables) must be able to perform their active safety-related function to change position as indicated in the Tier 1 table. These Tier 1 requirements specify that tests or type tests of motor-operated valves will be performed that demonstrate the capability of the valve to operate under its design conditions. The design and qualification conditions that need to be tested are described in Tier 2* text in UFSAR Subsection 5.4.8. These design and qualification requirements are tied to ASME QME-1-2007 Edition, "Qualification of Active Mechanical Equipment Used in Nuclear Power Plants" (Reference 8 in the UFSAR Subsection 5.4.16) by text in UFSAR Subsection 5.4.8.3 that states "Requirements for qualification testing of power-operated active valves are based on QME-1 (Reference 8)."

If a change were proposed to reduce or adversely alter the design and qualification provisions outlined in UFSAR Subsection 5.4.8 that are based on QME-1, such as removing the requirement for the design conditions applicable to MOVs to include differential pressure, the change would require prior NRC review and approval under 10 CFR Part 52, Appendix D, paragraph VIII.B.5.b.(2) because adverse ~~non-conservative~~ changes in design requirements tied to code requirements are treated as potentially affecting the likelihood of malfunction. As described in NEI guidance 96-07, *Guidelines for 10 CFR 50.59 Implementation*, Revision 1, while a minimal increase in the likelihood of occurrence of a malfunction of an SSC important to safety is permitted, licensees must still meet applicable regulatory requirements and other acceptance criteria to which they are committed (such as contained in regulatory guides and nationally recognized industry consensus standards). Because the Tier 2* text in UFSAR Subsection 5.4.8 contains design and qualification acceptance criteria, tied to code requirements any ~~non-conservative~~ change to reduce or adversely alter the design and qualification provisions outlined in the Tier 2* text would trigger the paragraph VIII.B.5.b.(2) criterion. Hence, SNC concluded that no new evaluation Criterion was necessary to address changes to this text.

After initial full-power operation, this Tier 2* text reverts to Tier 2 text in accordance with 10 CFR Part 52, Appendix D, paragraph VIII.B.6.c.

**Southern Nuclear Operating Company**

**ND-18-0608**

**Enclosure 11**

**Vogtle Electric Generating Plant (VEGP) Units 3 and 4**

# Response to NRC Request for Additional Information (RAI) LAR 17-037-3

# Regarding the LAR-17-037 Review

# (LAR-17-037S2)

Supplement 2 changes that are added to the original LAR submittal are shown as blue-underlined text; deletions of original LAR text are shown as ~~red strikethrough~~ text.

(This Enclosure consists of four pages, including this cover page.)

The following is the question provided by the NRC Staff [Request for Additional Information (RAI) LAR 17-037-3] regarding the review of Southern Nuclear Operating Company (SNC) License Amendment Request (LAR)-17-037, which was submitted by SNC letter ND-17-1726 on December 21, 2017.

**Question:**

By letter dated December 21, 2017, Southern Nuclear Operating Company, Inc. (SNC), submitted License Amendment Request (LAR) No. 17-037 to the U. S. Nuclear Regulatory Commission (NRC) for Vogtle Electric Generating Plant Units 3 and 4, Combined License Nos. NPF-91 and NPF-92 (ADAMS Accession No. ML17355A416). The LAR requests NRC approval of a proposed license condition that would allow departures from Tier 2* information without a license amendment by allowing the licensee to evaluate a prospective departure against criteria stated in the proposed license condition.

Enclosure (5) of the referenced LAR provides a summary of an analysis of Tier 2* matters using the proposed license condition (screening criteria) presented in enclosure (3) of your letter dated December 21, 2017. For “Section VIII.B.6.b (Tier 2* Matters that Do Not Expire at Full Power),” Item 5, the enclosure states that the reactor coolant pump type is adequately addressed in Tier 1, and therefore no additional screening criteria is required. Also, note that since the enclosure only states that it is adequately addressed by Tier 1, paragraph VIII.B.5 would not be needed since a change in Tier 1 information requires NRC approval. Therefore, per the enclosure, no additional screening criteria is needed since the information is in Tier 1. The NRC staff notes that the analysis provided in Enclosure (5) of the SNC submittal is not correct, since Tier 1 does not specify the type of RCP; but only specifies "sealless reactor coolant pumps." "Sealless reactor coolant pumps" is a generic term that only states that the pump does not have seals, which makes seal failure not a concern. Using the proposed license condition, a different sealless pump type could be used because the pump still meets the “sealless” (shaft seal failure) requirement that is specified as Tier 1. The Tier 2* information is “canned motor type RCP,” which is not addressed in Tier 1. Therefore, Enclosure (5) is not correct since Tier 1 does not adequately address all the essential attributes of the type of pump (i.e., canned motor, wet winding, etc.). However, the essential attributes of the type of pump are included as Tier 2* information which states "centrifugal sealless pump of canned motor design".

Therefore, since all of the essential attributes of the RCP (i.e., that it be of a canned motor design) are not addressed in Tier 1, the staff requests that the licensee revise the proposed License Condition 2.d (13)(a) in Enclosure (3) to address this essential attribute by adding the following, or explain why it is not necessary:

"5. Results in a change to the RCP type (canned motor design)."

**SNC Response to RAI Question LAR 17-037-3**

SNC agrees to add a fifth non-qualifying criterion that reads:

5. Result in a change to the RCP type (canned motor design).

**Changes to Original LAR-17-037:**

**Changes to Enclosure 1:**

Add a fifth screening criterion described on page 6 of 19 to read:

5. Result in a change to the RCP type (canned motor design)

Replace the last paragraph and supporting bullets on page 8 of 19 with:

Based on the results of the analysis, 12 of the 24 Tier 2* matters listed in 10 CFR Part 52, Appendix D, Section VIII paragraphs B.6.b and B.6.c were determined to be adequately covered by existing Tier 1 information, covered by another regulation or the combined license, or did not rise to the level of Tier 1 safety significance. The remaining 12 of the 24 Tier 2* matters listed in 10 CFR Part 52, Appendix D, Section VIII paragraphs B.6.b and B.6.c were selected for development of additional screening criteria that would determine whether an associated Tier 2* departure qualifies for the departure evaluation process outlined in 10 CFR Part 52, Appendix D, Section VIII.B.5. A summary of the analysis is provided in Enclosure 5. The selected matters are:

- Maximum fuel rod average burn-up
- Fuel principal design requirements
- Fuel criteria evaluation process
- Reactor coolant pump type.
- Screen design criteria
- Design Summary of Critical Sections
- American Concrete Institute (ACI) 318, ACI 349, American National Standards Institute/American Institute of Steel Construction (ANSI/AISC)–690, and American Iron and Steel Institute (AISI), “Specification for the Design of Cold Formed Steel Structural Members, Part 1 and 2,” 1996 Edition and 2000 Supplement
- Nuclear design of fuel and reactivity control system, except burn-up limit
- Instrumentation and control system design processes, methods, and standards
- Piping design acceptance criteria
- Human factors engineering
- Steel composite structural module details

Add a fifth screening criterion described on page 9 of 19 to read:

5. Result in a change to the RCP type (canned motor design)

Add the following detailed description and bases for Criterion 5 following the Criterion 4 bases on page 13 of 19:

Criterion 5 (Reactor Coolant Pump Type) detailed guidance:

Tier 2* information regarding RCP type is contained in UFSAR Subsection 5.4.1.2.2, Design Description. Any departure from the design of the RCP that would not utilize the canned motor design would meet Criterion 5 and the departure would not qualify for evaluation under paragraph B.5.b.

Criterion 5 (Reactor Coolant Pump Type) Bases

The VEGP 3 and 4 Plant-specific Tier 1 DCD does not contain information related to the canned motor design attributes of the RCP. Proposed Criterion 5 would provide assurance that departures from Tier 2* information related to RCP type would receive prior NRC approval.

**Changes to Enclosure 3:**

Add a fifth screening criterion and revise formatting for proposed License Condition 2.D(13) to read:

* * *

5. Result in a change to the RCP type (canned motor design).

**Changes to Enclosure 4:**

Add a decision box after the decision box for Criterion 4 on page 2 of 3 with adjacent text to read:

5. Result in a change to the RCP type (canned motor design).

**Changes to Enclosure 5**

Change the table entry for reactor coolant pump type on Page 2 of 6 to read:

| | | | | |
|---|---|---|---|---|
| 5 | Reactor coolant pump type. | ~~No~~Yes | ~~Adequately~~Not addressed in Tier 1 | 1. ~~N/A~~Result in a change to the RCP type (canned motor design). |

**Southern Nuclear Operating Company**

**ND-18-0608**

**Enclosure 12**

**Vogtle Electric Generating Plant (VEGP) Units 3 and 4**

# Response to NRC Request for Additional Information (RAI) LAR 17-037-4

# Regarding the LAR-17-037 Review

# (LAR-17-037S2)

Supplement 2 changes that are added to the original LAR submittal LAR submittal are shown as blue-underlined text

(This Enclosure consists of eight pages, including this cover page.)

The following are the questions provided by the NRC Staff [Request for Additional Information (RAI) LAR 17-037-4] regarding the review of Southern Nuclear Operating Company (SNC) License Amendment Request (LAR) 17-037, which was submitted by SNC letter ND-17-1726 on December 21, 2017.

Question

The process for changes and departures from Tier 2* information is provided, in part, in 10 CFR Part 52 Appendix D Section VIII.B.6.b (i.e., Tier 2* matters that do not expire at full power) and states that departures from Tier 2* will be treated as a license amendment request and require prior staff review and approval.

SECY-17-0075 (ML16196A321) provides regulatory insights regarding Tier 2* content. Per SECY-17-0075, the purpose of the Tier 2* designation is to control certain information which the staff has determined to have safety significance commensurate with Tier 1 information. Any modification to the Tier 2* change process must still ensure that information with safety significance commensurate with that of Tier 1 information is controlled in a similar manner (e.g. changes to such information require prior staff review and approval).

Part 52 Appendix D, Section VIII.B.6.b Item (7), "Screen design criteria," (for containment sump screens) is one of the items designated as Tier 2* information for the AP1000 design. LAR 17-037 proposes to evaluate departures from item (7) in part by applying a screening criterion identified as Qualifying Criterion 4, "[a]dversely affects the debris screen design criteria."

LAR 17-037 Enclosure 1 provides screening guidance used to assess if a proposed change is adverse with respect to Qualifying Criterion 4. Specifically, "[a]n adverse change is any change that would be considered a non-conservative change of a debris value established in the UFSAR" and "[a]n adverse change would be any change that changes any element of the evaluations used to determine the design of the debris screens."

The staff requests that the applicant provide the following information in the LAR:

**Question 1:** Identify the DCD/UFSAR Section(s) which contain(s) information subject to LAR 17-037 Qualifying Criterion 4 and associated guidance.

**SNC Response to Question 1**

The Vogtle Electric Generating Plant (VEGP) 3 and 4 Updated Final Safety Analysis Report (UFSAR), which contains the Tier 2 plant-specific design control document (DCD), Subsection 6.3.2.2.7.1, *General Screen Design Criteria*, contains information which would be subject to Qualifying Criterion 4. Specifically, Criterion 4 would apply to Tier 2* information contained in Subsection 6.3.2.2.7.1, item 3, which describes limits of types of insulation which may be used inside containment; item 10, which places limits on where sources of fibrous material may be located; and item 12, which lists limits for containment resident debris and resident debris which may be fibrous. It should be noted that each of the items discussed above also contain Tier 2 information which would not be subject to Qualifying Criterion 4, but which would be subject to the departure requirements of 10 CFR Part 52, Appendix D, Paragraph VIII.B.5.

**Changes to Original LAR-17-037:**

None

**Question 2:** Identify the debris value(s) that are subject to Qualifying Criterion 4.

**SNC Response to Question 2**

The debris values listed in UFSAR Subsection 6.3.2.2.7.1, item 12, would be subject to Qualifying Criterion 4. The values listed are:

- ≤ 130 pounds for the total amount of resident debris inside containment
- ≤ 6.6 pounds of fibrous debris

**Changes to Original LAR-17-037:**

**Changes to Enclosure 1:**

To Criterion 4 (Debris Screen) detailed guidance on Page 12 of 19, add the following sub-bullets under the first bullet which defines adverse change to a debris value.

- Containment resident debris limit is defined in UFSAR Subsection 6.3.2.2.7.1 (item 12)
- Fibrous debris limit is defined in UFSAR Subsection 6.3.2.2.7.1 (item 12)

**Question 3:** State how you would evaluate (e.g., in the Qualifying Criterion 4 bases section) any relaxation of the debris values identified in response to item (2) above and state whether each relaxation adversely affects the debris screen design criteria, including in-vessel debris effects on long-term core cooling. Explain the basis for your conclusion regarding each relaxation, whether adverse or not adverse.

**SNC Response to Question 3**

This question can best be answered by providing a set of examples regarding how proposed changes to the debris values would be evaluated using the overall proposed Tier 2* departure evaluation process.

UFSAR Subsection 6.3.2.2.7, *IRWST and Containment Recirculation Screens*, describes the IRWST and Containment Recirculation Screens. UFSAR Subsection 6.3.2.2.7.1 lists the general screen design criteria consisting of 12 specific elements or criteria. Item 12 contains Tier 2* information including limits on debris. Specifically, the total amount of resident debris inside containment is limited to ≤ 130 pounds, and the total amount that might be fiber is limited to ≤ 6.6 pounds. The following examples illustrate how proposed Qualifying Criterion 4 would be applied to proposed changes to the limits.

Example 1

Following a refueling outage, a review of the containment closeout inspection results reveals that the calculated total amount of resident containment debris is 135 pounds. An engineering analysis determines that the screens would still be able to meet their safety function. Consequently, a change is proposed to raise the limit in the UFSAR to 135 pounds.

The proposed departure would be evaluated against all four proposed Qualifying Criteria, and when evaluated against Qualifying Criterion 4, the evaluation would determine that the proposed departure is considered an adverse effect on containment debris limits and would require prior NRC approval before implementation. The condition would be considered adverse because any relaxation of the limit (increase in value) would be considered adverse.

Example 2

A design change is proposed that improves the effectiveness of the screens. The engineering evaluation, using the methodology described in the UFSAR, demonstrates that the fibrous debris limit could be raised to 10 pounds. As a result, it is proposed to raise the limit in the UFSAR to 10 pounds.

The proposed departure would be evaluated against all four proposed Qualifying Criteria, and when evaluated against Qualifying Criterion 4, the evaluation would determine that the proposed departure is considered an adverse effect on the containment debris limits and require prior NRC approval before implementation. The condition would be considered adverse because any relaxation of the limit (increase in value) would be considered adverse.

Example 3

A design change to the containment screens is proposed which would alter the size of the screens slightly. An engineering evaluation determines that the screens would continue to meet their design function if the fibrous debris limit were set at ≤ 6.0 pounds. Consequently, it is proposed to revise the UFSAR to change the limit from ≤ 6.6 pounds to ≤ 6.0 pounds.

The proposed departure would be evaluated against all four proposed Qualifying Criteria, and when evaluated against Qualifying Criterion 4, the evaluation would determine that the proposed debris limit departure is not considered an adverse effect on the containment debris limits and would not require prior NRC approval before implementation. The condition would not be considered adverse because the revised limit is more restrictive and continues to ensure the screens meet their design function. However, the proposed departure and associated screen design change would also be evaluated against the criteria of 10 CFR Part 52, Appendix D, paragraph VIII.B.5 and it may be determined that prior NRC approval is required.

**Changes to Original LAR-17-037:**

**Changes to Enclosure 1:**

To Criterion 4 (Debris Screen) detailed guidance on Page 12 of 19, add the following after the bullets describing adverse change.

Application of the criteria related to debris values is demonstrated by the following examples:

[Insert Examples 1-3 described above]

**Question 4:** Identify a) the elements of the evaluations, other than debris values, used to determine the design of the debris screens that are subject to Qualifying Criterion 4 and b) the debris screens that are subject to Qualifying Criterion 4.

**SNC Response to Question 4**

a) The elements of the evaluations used to determine the design of the debris screens that are subject to Qualifying Criterion 4 are located in the VEGP 3 and 4 UFSAR, Subsection 6.3.2.2.7.1, *General Screen Design Criteria*. Specifically, Criterion 4 would apply to Tier 2* information contained in Subsection 6.3.2.2.7.1 item 3, which describes limits of types of insulation which may be used inside containment and item 10, which places limits on where sources of fibrous material may be located. It should be noted that each of the criteria discussed above also contain Tier 2 information which would not be subject to Qualifying Criterion 4, but which would be subject to the departure requirements of 10 CFR Part 52, Appendix D, Paragraph VIII.B.5.

b) The debris screens that are subject to Qualifying Criterion 4 are described in VEGP 3 and 4 UFSAR, Subsection 6.3.2.2.7, IRWST and Containment Recirculation Screens. The screens are:

- In-Containment Refueling Water Storage Tank (IRWST) Screens
- Containment Recirculation Screens

**Changes to Original LAR-17-037:**

**Changes to Enclosure 1:**

To Criterion 4 (Debris Screen) detailed guidance on page 12 of 19, add the following bullet after the bullets defining adverse change.

- The criteria apply to departures affecting the In-Containment Refueling Water Storage Tank (IRWST) Screens and the Containment Recirculation Screens

**Question 5:** State how you would evaluate (e.g., in the Qualifying Criterion 4 bases section) any relaxation to any element of the evaluations used to determine the design of the debris screens associated with item 4) above (other than debris values) and state whether each relaxation adversely affects any element of the evaluations used to determine the design of the debris screens. Explain the basis for your conclusion regarding each relaxation, whether adverse or not adverse.

**SNC Response to Question 5**

This question can best be answered by providing a set of examples regarding how proposed relaxation of elements of the evaluations used to determine the design of the debris screens would be evaluated using the overall proposed Tier 2* departure evaluation process.

UFSAR Subsection 6.3.2.2.7, IRWST and Containment Recirculation Screens, describes the IRWST and Containment Recirculation Screens. UFSAR Subsection 6.3.2.2.7.1 lists the general screen design criteria consisting of 12 specific elements or criteria. Of the 12 criteria, three contain Tier 2* information. Subsection 6.3.2.2.7.1, item 3 contains Tier 2* information which specifies the type of insulation material to be used throughout containment and specifies how the associated zone of influence (ZOI) is to be calculated. Item 10 specifies that potential sources of fibrous material are not located in jet impingement damage zones or below the maximum post-DBA loss of coolant (LOCA) floodup water level. Item 12 contains Tier 2* information that specifies limits on debris inside containment. The examples provided below address potential changes to items 3 and 10. Potential changes to item 12 were addressed in response to Question 3 above.

Example 1

A design change is proposed to relocate a stairwell inside containment. An evaluation of the potential impacts of the design change reveals that the stairwell is credited as an intervening structure in the LOCA pipe break analysis, and a ventilation filter (which contains fibrous material) is located 40 inside diameters from the break along an axis that is a continuation of the pipe axis. Per UFSAR Subsection 6.3.2.2.7.1, the ZOI in the absence of intervening components, supports, structures, or other objects includes insulation in a cylindrical area extending out a distance equal to 45 inside diameters from the break along an axis that is a continuation of the pipe axis and up to 5 inside diameters in the radial direction from the axis. The 5 inside diameter limit in the radial direction from the pipe axis continues to be met. An engineering evaluation and testing demonstrate that the non-qualifying insulation material will not be adversely affected by the assumed pipe break. As a result, a change is proposed to revise the UFSAR ZOI limit from 45 inside diameters to 40 inside diameters in this area.

The proposed departure would be evaluated against all four proposed Qualifying Criteria, and when evaluated against Qualifying Criterion 4, the evaluation would determine that the proposed departure is considered an adverse effect on the debris screen design criteria and require prior NRC approval before implementation. The condition would be considered adverse because any relaxation of the ZOI distance (decrease in value) would be considered adverse.

Example 2

A design change is proposed that would add a structure in the lower regions of the containment. The impact of the change would be that the maximum post-design basis accident (DBA) LOCA floodup water level would be raised to plant elevation 111.0 feet. Per UFSAR Subsection 6.3.2.2.7.1, the maximum post-DBA LOCA floodup water level is plant elevation 110.2 feet. Additional analysis reveals that no non-qualifying insulation is located below 111.0 feet. As a result, a change is proposed to revise the UFSAR maximum post-DBA LOCA floodup value to 111.0 feet.

The proposed departure would be evaluated against all four proposed Qualifying Criteria, and when evaluated against Qualifying Criterion 4, the evaluation would determine that the proposed departure is not considered an adverse effect on the containment debris screen design criteria and would not require prior NRC approval before implementation. The condition would not be considered adverse because the revised post-DBA LOCA floodup water level is more restrictive and continues to ensure fibrous insulation material will not be introduced following a DBA LOCA. However, the proposed departure and associated design change would also be evaluated against the criteria of 10 CFR Part 52, Appendix D, paragraph VIII.B.5, and this evaluation may determine that prior NRC approval is required.

**Changes to Original LAR-17-037:**

**Changes to Enclosure 1:**

To Criterion 4 (Debris Screen) detailed guidance on Page 12 of 19, add the following after the examples used for the fibrous debris limit.

> Application of the criteria related to debris screens is demonstrated by the following examples:
>
> [Insert Examples 1 and 2 described above.]

**Question 6:** Revise license condition 2.D.(13)(a)4 (i.e., Qualifying Criterion 4) to include containment debris limits in addition to debris screen design criteria.

**SNC Response to Question 6**

License condition 2.D.(13)(a)4 will be revised to read:

> Adversely affect the containment debris limits and debris screen design criteria.

**Changes to Original LAR-17-037:**

**Changes to Enclosure 1:**

Revise the fourth screening criteria described on Page 6 of 19 to read:

4. Adversely affect the containment debris limits and debris screen design criteria.

Revise the fourth screening criteria described on Page 9 of 19 to read:

4. Adversely affect~~s~~ the containment debris limits and debris screen design criteria.

**Changes to Enclosure 3:**

Revise the fourth screening criteria for proposed License Condition 2.D(13) to read:

4. Adversely affect the containment debris limits and debris screen design criteria.

**Changes to Enclosure 4:**

Revise the text adjacent to the Qualifying Criterion 4 decision box on Page 2 of 3 to read:

4. Adversely affect the containment debris limits and debris screen design criteria.

**Changes to Enclosure 5:**

Change the table entry for screen design criteria on Page 3 of 6 to read:

| | | | | |
|---|---|---|---|---|
| 7 | Screen design criteria. | Yes | Paragraph VIII.B.5 may not work well in all cases; safety significance | Adversely affect the containment debris limits and debris screen design criteria. |