

## Vogle PEmails

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**From:** Hoellman, Jordan  
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Please see the attached draft RAI responses regarding LAR 17-037, Changes to Tier 2\* Departure Evaluation Process, for discussion at a future public meeting with SNC.

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The following are questions 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.

### **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 (Section 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.c.(2) refers to ASME Boiler and Pressure Vessel Code, SNC considers paragraph VIII.B.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 non-conservative changes to the loading combinations and stress limits described in UFSAR Section 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, a 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 non-conservative changes in design 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., 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). 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, tenth paragraph, under “detailed guidance” for “Criterion 2 (Design Processes) Bases” add the following new bullet as the 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, tenth paragraph under “detailed guidance” 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 that is used to implement an industry standard (ASME Code). For example, 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, 15th 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, after the 20<sup>th</sup> paragraph, 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 2.b reads as follows:

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 conditions that need to be tested are described in Tier 2\* text in UFSAR Subsection 5.4.8.

If a change were proposed to reduce or adversely alter the design and qualification provisions outlined in UFSAR Subsection 5.4.8, 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 non-conservative changes in design 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. Because the Tier 2\* text in UFSAR Subsection 5.4.8 contains design and qualification acceptance criteria, any non-conservative change to 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.