

## NuScaleDCRaisPEm Resource

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**Subject:** Request for Additional Information No. 280 RAI No. 9134 (14.3.3)  
**Attachments:** Request for Additional Information No. 280 (eRAI No. 9134).pdf

Attached please find NRC staff's request for additional information concerning review of the NuScale Design Certification Application.

Please submit your technically correct and complete response within 60 days of the date of this RAI to the NRC Document Control Desk.

If you have any questions, please contact me.

Thank you.

Gregory Cranston, Senior Project Manager  
Licensing Branch 1 (NuScale)  
Division of New Reactor Licensing  
Office of New Reactors  
U.S. Nuclear Regulatory Commission  
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## Request for Additional Information No. 280 (eRAI No. 9134)

Issue Date: 11/03/2017

Application Title: NuScale Standard Design Certification - 52-048

Operating Company: NuScale Power, LLC

Docket No. 52-048

Review Section: 14.03.03 - Piping Systems and Components - Inspections, Tests, Analyses, and Acceptance Criteria

Application Section: 14.3.3

### QUESTIONS

#### 14.03.03-7

The NRC regulations in 10 CFR 52.47(b)(1) require that a design certification application contain the inspections, tests, analyses, and acceptance criteria (ITAAC) that are necessary and sufficient to provide reasonable assurance that, if the inspections, tests, and analyses are performed and the acceptance criteria met, a plant that incorporates the design certification is built and will operate in accordance with the design certification, the provisions of the Atomic Energy Act, and the NRC's regulations. General Design Criterion 2 of 10 CFR 50 Appendix A requires that structures, systems, and components important to safety withstand the effects of natural phenomena without loss of capability to perform their safety functions. Additionally, General Design Criterion 4 of 10 CFR 50 Appendix A requires that structures, systems, and components important to safety accommodate the effects of and be compatible with the environmental conditions associated with normal operation, maintenance, testing, and postulated accidents, including loss-of-coolant accidents. The ITAAC proposed in the NuScale FSAR Tier 1, Section 2.8, "Equipment Qualification," for safety-related electrical and mechanical equipment located in harsh environments and digital instrumentation and controls equipment in mild environments are not sufficient to verify the capability of safety-related valves in the NuScale Power Plant to perform their safety functions in accordance with 10 CFR 52.47(b)(1). The NRC staff understands that the ITAAC for the qualification of all safety-related valves in the NuScale Power Plant are intended to be provided in NuScale FSAR Tier 1, Section 2.8. In light of this understanding, the NRC staff requests that the NuScale design certification applicant address the following aspects of the proposed ITAAC for the qualification of safety-related valves in NuScale FSAR Tier 1, Section 2.8:

- a. NuScale FSAR Tier 1, Section 2.8, Table 2.8-1, "Module Specific Mechanical and Electrical/I&C Equipment," does not appear to include reactor coolant system (RCS) check valves RCS-CKV-0323, 0332, 0333, and 0400. Describe the basis for excluding these check valves from Table 2.8-1.
- b. NuScale FSAR Tier 1, Section 2.8, Table 2.8-2, "Equipment Qualification Inspections, Tests, Analyses, and Acceptance Criteria," provides equipment qualification ITAAC for safety-related valves. However, the scope of Section 2.8 only applies to safety-related valves in harsh environments. The NRC regulations in 10 CFR 50.49(c) define a mild environment as an environment that would at no time be significantly more severe than the environment that would occur during normal plant operation, including anticipated operational occurrences. Therefore, a mild environment as defined in 10 CFR 50.49(c) can be severe at all times, but not vary significantly from normal operation to design-basis conditions. The NRC staff requests that the NuScale design certification applicant revise the System Description in Section 2.8 to remove the limitation of its scope to specific environments (either harsh or mild) to ensure that all applicable equipment are addressed by the specific ITAAC.
- c. NuScale FSAR Tier 1, Section 2.8, Table 2.8-2 proposes ITAAC #6 to verify the functional design and qualification of safety-related valves. The requested change in paragraph (b) of this RAI will ensure that this ITAAC will verify the functional design and qualification of all safety-related valves. The Design Commitment and Acceptance Criteria in proposed ITAAC #6 should include the evaluation of functional design and qualification to address the design-basis fluid conditions. The NRC staff requests that the NuScale design certification applicant revise the Design Commitment and Acceptance Criteria for ITAAC #6 to include "and fluid conditions" after "temperature conditions" with removal of "and" before "temperature" to ensure that the applicable fluid conditions are addressed in the qualification process.
- d. NuScale FSAR Tier 1, Section 2.8, Table 2.8-2 proposes ITAAC #7 to verify overpressure protection by safety-related relief valves. The NRC staff understands that the NuScale design certification applicant will correct the editorial error in Acceptance Criteria in ITAAC #7 that refers to the sump recirculation valve. The requested change in paragraph (b) of this RAI will ensure that this ITAAC will verify overpressure protection by all safety-related relief valves.