



May 24, 2018

Docket No. 52-048

U.S. Nuclear Regulatory Commission  
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Rockville, MD 20852-2738

**SUBJECT:** NuScale Power, LLC Supplemental Response to NRC Request for Additional Information No. 279 (eRAI No. 9131) on the NuScale Design Certification Application

**REFERENCES:** 1. U.S. Nuclear Regulatory Commission, "Request for Additional Information No. 279 (eRAI No. 9131)," dated November 03, 2017  
2. NuScale Power, LLC Response to NRC "Request for Additional Information No. 279 (eRAI No.9131)," dated December 27, 2017

The purpose of this letter is to provide the NuScale Power, LLC (NuScale) supplemental response to the referenced NRC Request for Additional Information (RAI).

The Enclosure to this letter contains NuScale's supplemental response to the following RAI Question from NRC eRAI No. 9131:

- 14.03.03-6

This letter and the enclosed response make no new regulatory commitments and no revisions to any existing regulatory commitments.

If you have any questions on this response, please contact Steven Mirsky at 240-833-3001 or at [smirsky@nuscalepower.com](mailto:smirsky@nuscalepower.com).

Sincerely,

A handwritten signature in black ink, appearing to read "Zackary W. Rad". The signature is fluid and cursive, with a long horizontal stroke extending to the right.

Zackary W. Rad  
Director, Regulatory Affairs  
NuScale Power, LLC

Distribution: Gregory Cranston, NRC, OWFN-8G9A  
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Enclosure 1: NuScale Supplemental Response to NRC Request for Additional Information eRAI No. 9131



**Enclosure 1:**

NuScale Supplemental Response to NRC Request for Additional Information eRAI No. 9131

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## **Response to Request for Additional Information Docket No. 52-048**

**eRAI No.:** 9131

**Date of RAI Issue:** 11/03/2017

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**NRC Question No.:** 14.03.03-6

The NRC regulations in 10 CFR 52.47(b)(1) require that the “proposed inspections, tests, analyses, and acceptance criteria that are necessary and sufficient to provide reasonable assurance that, if the inspections, tests, and analyses are performed and the acceptance criteria met, a facility that incorporates the design certification has been constructed and will be operated in conformity with the design certification, the provisions of the [Atomic Energy] Act, and the Commission’s rules and regulations.” NuScale FSAR Tier 2, Section 3.9.6.1, “Functional Design and Qualification of Pumps, Valves, and Dynamic Restraints,” specifies that the functional design and qualification of safety-related valves is performed in accordance with ASME Standard QME-1-2007, “Qualification of Active Mechanical Equipment Used in Nuclear Power Plants,” as endorsed in NRC Regulatory Guide (RG) 1.100, Revision 3, “Seismic Qualification of Electrical and Active Mechanical Equipment and Functional Qualification of Active Mechanical Equipment for Nuclear Power Plants,” with clarifications as described in Section 3.10.2, “Methods and Procedures for Qualifying Mechanical and Electrical Equipment and Instrumentation.” NuScale FSAR Tier 2, Section 3.10.2 states that ASME QME-1-2007 is used with the exceptions noted in RG 1.100 (Revision 3) for the qualification of active mechanical equipment. Based on experience with the qualification of power-operated valves used in current nuclear power plants, the NRC staff has determined that the qualification process for safety-related valves in new reactors needs to be implemented as specified in the design certification with any modifications to that process reviewed by the NRC staff prior to implementation. This lesson learned from current nuclear power plants is even more significant for the various first-of-a-kind designs planned for the safety-related valves in the NuScale Power Plant. However, the proposed ITAAC related to the qualification of safety-related valves in the NuScale FSAR Tier 1 do not contain specific references to the qualification process for safety-related valves. The NRC staff requests that the NuScale design certification applicant discuss its plans to specify the qualification process for safety-related valves as part of Tier 1 of the NuScale FSAR.

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**NuScale Response:**

This supplements NuScale's RAI 9131 December 27, 2017 response to the NRC as a

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consequence of a question asked during a teleconference call with NRC staff on February 6, 2018.

Conforming changes were made to FSAR Table 14.3-1, ITAAC No. 02.08.06 to remove the word "Functional" from the Discussion.

**Impact on DCA:**

FSAR Table 14.3-1 has been revised as described in the response above and as shown in the markup provided in this response.

RAI 08.01-1S1, RAI 08.01-2, RAI 14.03.03-3S1, RAI 14.03.03-4S1, RAI 14.03.03-6, RAI 14.03.03-6S1, RAI 14.03.03-7, RAI 14.03.03-7S1, RAI 14.03.03-8, RAI 14.03.03-9

**Table 14.3-1: Module-Specific Structures, Systems, and Components Based Design Features and Inspections, Tests, Analyses, and Acceptance Criteria Cross Reference<sup>(1)</sup>**

ITAAC No.	System	Discussion	DBA	Internal/External Hazard	Radiological	PRA & Severe Accident	FP
02.01.01	NPM	<p>As required by ASME Code Section III NCA-1210, each ASME Code Class 1, 2 and 3 component (including piping systems) of a nuclear power plant requires a Design Report in accordance with NCA-3550. NCA-3551.1 requires that the drawings used for construction be in agreement with the Design Report before it is certified and be identified and described in the Design Report. It is the responsibility of the N Certificate Holder to furnish a Design Report for each component and support, except as provided in NCA-3551.2 and NCA-3551.3. NCA-3551.1 also requires that the Design Report be certified by a registered professional engineer when it is for Class 1 components and supports, Class CS core support structures, Class MC vessels and supports, Class 2 vessels designed to NC-3200 (NC-3131.1), or Class 2 or Class 3 components designed to Service Loadings greater than Design Loadings. A Class 2 Design Report shall be prepared for Class 1 piping NPS 1 or smaller that is designed in accordance with the rules of Subsection NC. NCA-3554 requires that any modification of any document used for construction, from the corresponding document used for design analysis, shall be reconciled with the Design Report.</p> <p>An ITAAC inspection is performed of the NuScale Power Module ASME Code Class 1, 2 and 3 as-built piping system Design Report to verify that the requirements of ASME Code Section III are met.</p>	X				

**Table 14.3-1: Module-Specific Structures, Systems, and Components Based Design Features and Inspections, Tests, Analyses, and Acceptance Criteria Cross Reference<sup>(1)</sup> (Continued)**

ITAAC No.	System	Discussion	DBA	Internal/External Hazard	Radiological	PRA & Severe Accident	FP
02.08.05	EQ	<p>Section 3.11, Environmental Qualification of Mechanical and Electrical Equipment, presents information to demonstrate that the Class 1E digital equipment is qualified using a type test, analysis, or a combination of type test and analysis to perform its safety-related function when subjected to electromagnetic interference, radio frequency interference, and electrical surges that would exist before, during, and following a DBA. The qualification method employed for Class 1E digital equipment is the same as the qualification method described for that type of equipment in Section 3.11.</p> <p>The ITAAC verifies that: (1) an equipment qualification record form exists for the Class 1E digital equipment listed in Tier 1 Table 2.8-1, and (2) the equipment qualification record form concludes that the Class 1E digital equipment withstands the design basis electromagnetic interference, radio frequency interference, and electrical surges that would exist before, during, and following a DBA without loss of safety-related function.</p>	X				
02.08.06	EQ	<p>Section 3.9.6.1, Functional Design and Qualification of Pumps, Valves, and Dynamic Restraints, and Section 3.10.2, Methods and Procedures for Qualifying Mechanical and Electrical Equipment and Instrumentation, discuss that the functional qualification of safety-related valves is performed in accordance with ASME QME-1-2007 (or later edition), as accepted in RG 1.100 Revision 3 (or later revision), with specific revision years and numbers as presented in Section 3.9.6.1. The qualification method employed for the valves agrees with the qualification method described in Section 3.10.2.</p> <p>The ITAAC verifies that: (1) A <del>Functional</del>-Qualification Report exists for the safety-related valves listed in Tier 1 Table 2.8-1, and (2) the <del>Functional</del>-Qualification Report concludes that safety-related valves are capable of performing their safety-related function under the full range of fluid flow, differential pressure, electrical conditions, and temperature conditions up to and including DBA conditions.</p>	X				