



December 27, 2017

Docket No. 52-048

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
One White Flint North
11555 Rockville Pike
Rockville, MD 20852-2738

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

REFERENCE: U.S. Nuclear Regulatory Commission, "Request for Additional Information No. 279 (eRAI No. 9131)," dated November 03, 2017

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

The Enclosure to this letter contains NuScale's 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.

Sincerely,

A handwritten signature in black ink that reads "Jennie Wike".

Jennie Wike
Manager, Licensing
NuScale Power, LLC

Distribution: Gregory Cranston, NRC, OWFN-8G9A
Samuel Lee, NRC, OWFN-8G9A
Demetrius Murray, NRC, OWFN-8G9A

Enclosure 1: NuScale Response to NRC Request for Additional Information eRAI No. 9131



Enclosure 1:

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

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

eRAI No.: 9131

Date of RAI Issue: 11/03/2017

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.

NuScale Response:

NuScale’s commitment to the qualification process for safety-related valves is described in the



application as follows:

- In Tier 1 Table 2.8-2, ITAAC No. 6, Acceptance Criteria, identifies a Functional Qualification Report that "concludes that the safety-related valves listed in Table 2.8-1 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."
- In Tier 2 Table 14.3-1, the discussion for ITAAC No. 02.08.06 states 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 "Functional Qualification Report" in Tier 1 Table 2.8-2, ITAAC No. 6, Acceptance Criteria has been revised to "Qualification Report" to agree with the definitions provided in ASME QME-1-2007 Section QR-4000 Definitions. The revision to Tier 1 Table 2.8-2, ITAAC No. 6 is attached.

Impact on DCA:

Tier 1, Table 2.8-2 has been revised as described in the response above and as shown in the markup provided in this response.

Table 2.8-2: Equipment Qualification Inspections, Tests, Analyses, and Acceptance Criteria (Continued)

No.	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
6.	The safety-related valves are functionally designed and qualified to perform their safety-related function under the full range of fluid flow, differential pressure, electrical conditions, and temperature conditions, <u>and fluid conditions</u> up to and including DBA conditions.	A type test or a combination of type test and analysis will be performed of the safety-related valves.	A Functional Qualification Report exists and concludes that the safety-related valves listed in Table 2.8-1 are capable of performing their safety-related function under the full range of fluid flow, differential pressure, electrical conditions, and temperature conditions, <u>and fluid conditions</u> up to and including DBA conditions.
7.	The safety-related relief valves provide overpressure protection.	<ul style="list-style-type: none"> i. A vendor test will be performed of each safety-related relief valves. ii. An inspection will be performed of each safety-related as-built relief valves. 	<ul style="list-style-type: none"> i. An American Society of Mechanical Engineers Code Section III Data Report exists and concludes that the relief valves listed in Table 2.8-1 meet the valve’s required set pressure, capacity, and overpressure design requirements. ii. Each relief valve listed in Table 2.8-1 is provided with an American Society of Mechanical Engineers Code Certification Mark that identifies the sump-recirculation valve’s set pressure, capacity, and overpressure.
8.	The safety-related DHRS passive condensers have the capacity to transfer their design heat load.	A type test or a combination of type test and analysis will be performed of the safety-related DHRS passive condensers.	A report exists and concludes that the safety-related DHRS passive condensers listed in Table 2.8-1 have a heat removal capacity sufficient to transfer their design heat load.
9.	<u>The CNTS containment electrical penetration assemblies located in a harsh environment, including associated connection assemblies, withstand the design basis harsh environmental conditions experienced during normal operations, AOOs, DBAs, and postaccident conditions and performs its function for the period of time required to complete the function.</u>	<ul style="list-style-type: none"> <u>i. A type test or a combination of type test and analysis will be performed of the CNTS containment electrical penetration assemblies equipment including associated connection assemblies.</u> <u>ii. An inspection will be performed of the containment CNTS electrical penetration assemblies, including associated connection assemblies.</u> 	<ul style="list-style-type: none"> <u>i. An EQ record form exists and concludes that the CNTS electrical penetration assemblies listed in Table 2.8-1, including associated connection assemblies, performs their function under the environmental conditions specified in the EQ record form for the period of time required to complete the function.</u> <u>ii. The CNTS electrical penetration assemblies listed in Table 2.8-1, including associated connection assemblies, are installed in their design location in a configuration bounded by the EQ record form.</u>