RAIO-0818-61438

August 16, 2018

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 Supplemental Response to NRC Request for Additional Information No. 416 (eRAI No. 9460) on the NuScale Design Certification Application

REFERENCES:
1. U.S. Nuclear Regulatory Commission, "Request for Additional Information No. 416 (eRAI No. 9460)," dated April 11, 2018
2. NuScale Power, LLC Response to NRC "Request for Additional Information No. 416 (eRAI No.9460)," dated June 07, 2018

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. 9460:

- 14.03.03-11

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 Carrie Fosaaen at 541-452-7126 or at cfosaaen@nuscalepower.com.

Sincerely,

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

Distribution: Gregory Cranston, NRC, OWFN-8G9A
Omid Tabatabai, NRC, OWFN-8G9A
Samuel Lee, NRC, OWFN-8G9A

Enclosure 1: NuScale Supplemental Response to NRC Request for Additional Information eRAI No. 9460

Enclosure 1:

NuScale Supplemental Response to NRC Request for Additional Information eRAI No. 9460

NuScale Power, LLC
1100 NE Circle Blvd., Suite 200 Corvalis, Oregon 97330, Office: 541.360.0500, Fax: 541.207.3928
www.nuscalepower.com

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

eRAI No.: 9460
Date of RAI Issue: 04/11/2018

NRC Question No.: 14.03.03-11

10 CFR 52.47(b)(1) requires “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.” In supporting this requirement, staff identified that clarifications are necessary for the inspections, tests, and analyses (ITA) associated with ITAAC 02.01.04 and 03.11.08 in order to clearly demonstrate that the acceptance criteria are met. Specifically, the ITA should mention an "inspection and analysis" instead of only "an inspection," as in order to meet the acceptance criteria, the analysis associated with the as-built Pipe Break Hazard Analysis Report must be fully completed. This completed analysis guides the inspection and is necessary to demonstrate the acceptance criteria has been met.

NuScale Response:

This response supplements NuScale's eRAI No. 9460, Question 14.03.03-11 response (ML18158A507). During a July 23, 2018 telephone conference call, NRC staff requested that ITAAC 02.01.04 and 03.11.08 identify an "inspection and analysis" instead of only "an inspection" in their respective inspections, tests, and analyses (ITA) columns. Staff concluded that citing only "an inspection" in the ITA column does not meet the acceptance criteria for these ITAAC. The analysis that is associated with the as-built Pipe Break Hazard Analysis Report must be completed in order to meet the acceptance criteria of these ITAAC.

Revisions have been made to Tier 1, Table 2.1-4, ITAAC No. 4 and Table 3.11-2, ITAAC No. 8 to add "and analysis" after "An inspection" in their ITA columns.

Impact on DCA:

Tier 1, Tables 2.1-4 and 3.11-2 have been revised as described in the response above and as shown in the markup provided in this response.

RAI 06.02.06-22, RAI 06.02.06-23, RAI 08.01-1, RAI 08.01-1S1, RAI 08.01-2, RAI 14.03.03-3S1, RAI 14.03.03-4S1, RAI 14.03.03-6S1, RAI 14.03.03-7S1, RAI 14.03.03-8, RAI 14.03.03-11S1

Table 2.1-4: NuScale Power Module Inspections, Tests, Analyses, and Acceptance Criteria

No.	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
1.	The NuScale Power Module ASME Code Class 1, 2 and 3 piping systems listed in Table 2.1-1 comply with ASME Code Section III requirements.	An inspection will be performed of the NuScale Power Module ASME Code Class 1, 2 and 3 as-built piping system Design Reports required by ASME Code Section III.	The ASME Code Section III Design Reports (NCA-3550) exist and conclude that the ~~for the~~ NuScale Power Module ASME Code Class 1, 2 and 3 as-built piping systems listed in Table 2.1-1 meet the requirements of ASME Code Section III~~, NCA-3550~~.
2.	The NuScale Power Module ASME Code Class 1 and 2 components conform to the rules of construction of ASME Code Section III.	An inspection will be performed of the NuScale Power Module ASME Code Class 1 and 2 as-built component Data Reports required by ASME Code Section III.	ASME Code Section III Data Reports for the NuScale Power Module ASME Code Class 1 and 2 components listed in Table 2.1-2 and interconnecting piping exist and conclude that the requirements of ASME Code Section III are met.
3.	The NuScale Power Module ASME Code Class CS components conform to the rules of construction of ASME Code Section III.	An inspection will be performed of the NuScale Power Module ASME Code Class CS as-built component Data Reports required by ASME Code Section III.	ASME Code Section III Data Reports for the NuScale Power Module ASME Code Class CS components listed in Table 2.1-2 exist and conclude that the requirements of ASME Code Section III are met.
4.	Safety-related SSC are protected against the dynamic and environmental effects associated with postulated failures in high- and moderate-energy piping systems.	An inspection and analysis will be performed of the as-built high- and moderate-energy piping systems and protective features for the safety-related SSC.	Protective features are installed in accordance with the as-built Pipe Break Hazard Analysis Report and safety-related SSC are protected against or qualified to withstand the dynamic and environmental effects associated with postulated failures in high- and moderate-energy piping systems.
5.	The NuScale Power Module ASME Code Class 2 piping systems and interconnected equipment nozzles are evaluated for LBB.	An analysis will be performed of the ASME Code Class 2 as-built piping systems and interconnected equipment nozzles.	The as-built LBB analysis for the ASME Code Class 2 piping systems listed in Table 2.1-1 and interconnected equipment nozzles is bounded by the as-designed LBB analysis.
6.	The RPV beltline material has a Charpy upper-shelf energy of ~~greater than~~ 75 ft-lb minimum.	A vendor test will be performed of the Charpy V-Notch specimen of the RPV beltline material.	An ASME Code Certified Material Test Report exists and concludes that the initial RPV beltline material Charpy upper-shelf energy is ~~greater than~~ 75 ft-lb minimum.

RAI 14.03.03-1, RAI 14.03.03-11S1

Table 3.11-2: Reactor Building Inspections, Tests, Analyses, and Acceptance Criteria

No.	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
1	Fire and smoke barriers provide confinement so that the impact from internal fires, smoke, hot gases,or fire suppressants is contained within the RXB fire area of origin.	An inspection will be performed of the RXB as-built fire and smoke barriers.	The following RXB fire and smoke barriers exist in accordance with the fire hazards analysis, and have been qualified for the fire rating specified in the fire hazards analysis: • fire-rated doors • fire-rated penetration seals • fire-rated dampers • fire-rated walls, floors, and ceilings • smoke barriers
2	Internal flooding barriers provide confinement so that the impact from internal flooding is contained within the RXB flooding area of origin.	An inspection will be performed of the RXB as-built internal flooding barriers.	The following RXB internal flooding barriers exist in accordance with the internal flooding analysis report and have been qualified as specified in the internal flooding analysis report: • flood resistant doors • curbs and sills • walls • water tight penetration seals • National Electrical Manufacturer's Association enclosures
3	The Seismic Category I RXB is protected against external flooding in order to prevent flooding of safety-related SSC within the structure.	An inspection will be performed of the RXB as-built floor elevation at ground entrances.	The RXB floor elevation at ground entrances is higher than the maximum external flood elevation.
4	The RXB includes radiation shielding barriers for normal operation and post-accident radiation shielding.	An inspection will be performed of the as-built RXB radiation shielding barriers.	The thickness of RXB radiation shielding barriers is greater than or equal to the required thickness specified in Table 3.11-1.
5	The RXB includes radiation attenuating doors for normal operation and for post-accident radiation shielding. These doors have a radiation attenuation capability that meets or exceeds that of the wall within which they are installed.	An inspection will be performed of the as-built RXB radiation attenuating doors.	The RXB radiation attenuating doors are installed in their design location and have a radiation attenuation capability that meets or exceeds that of the wall within which they are installed in accordance with the approved door schedule design.
6	The RXB is Seismic Category I and maintains its structural integrity under the design basis loads.	i. An inspection and analysis will be performed of the as-built RXB. ii. An inspection will be performed of the as- built RXB.	i. A design report exists and concludes that the deviations between the drawings used for construction and the as-built RXB have been reconciled, and the RXB maintains its structural integrity under the design basis loads. ii. The dimensions of the RXB critical sections conform to the approved design.

Table 3.11-2: Reactor Building Inspections, Tests, Analyses, and Acceptance Criteria (Continued)

No.	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
7	Non-Seismic Category I SSC located where a potential for adverse interaction with a Seismic Category I SSC exists in the RXB will not impair the ability of Seismic Category I SSC to perform their safety functions during or following a SSE.	An inspection and analysis will be performed of the as-built non-Seismic Category I SSC in the RXB.	A report exists and concludes that the Non-Seismic Category I SSC located where a potential for adverse interaction with a Seismic Category I SSC exists in the RXB will not impair the ability of Seismic Category I SSC to perform their safety functions during or following an SSE as demonstrated by one or more of the following criteria: • Seismic Category I SSC are isolated from non-Seismic Category I SSC, so that interaction does not occur. • Seismic Category I SSC are analyzed to confirm that the ability to perform their safety functions is not impaired as a result of impact from non-Seismic Category I SSC. • A non-Seismic Category I restraint system designed to Seismic Category I requirements is used to assure that no interaction occurs between Seismic Category I SSC and non-Seismic Category I SSC.
8	Safety-related SSC are protected against the dynamic and environmental effects associated with postulated failures in high- and moderate-energy piping systems.	An inspection and analysis will be performed of the as-built high- and moderate-energy piping systems and protective features for the safety-related SSC located in the RXB outside the Reactor Pool Bay.	Protective features are installed in accordance with the as-built Pipe Break Hazard Analysis Report and safety-related SSC are protected against or qualified to withstand the dynamic and environmental effects associated with postulated failures in high- and moderate-energy piping systems.