



March 15, 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. 207 (eRAI No. 9059) on the NuScale Design Certification Application

**REFERENCES:** 1. U.S. Nuclear Regulatory Commission, "Request for Additional Information No. 207 (eRAI No. 9059)," dated September 01, 2017  
2. NuScale Power, LLC Response to NRC "Request for Additional Information No. 207 (eRAI No.9059)," dated October 24, 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. 9059:

- 06.02.04-9

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 Marty Bryan at 541-452-7172 or at [mbryan@nuscalepower.com](mailto:mbryan@nuscalepower.com).

Sincerely,

A handwritten signature in black ink, appearing to read "Zackary W. Rad".

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

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Enclosure 1: NuScale Supplemental Response to NRC Request for Additional Information eRAI No. 9059



**Enclosure 1:**

NuScale Supplemental Response to NRC Request for Additional Information eRAI No. 9059

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

**eRAI No.:** 9059

**Date of RAI Issue:** 09/01/2017

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**NRC Question No.:** 06.02.04-9

The 10 CFR 50.34(f)(3)(iv) requirement states in part “Provide one or more dedicated containment penetrations...in order not to preclude future installation of systems to prevent containment failure, such as a filtered vented containment system. (II.B.8)” In FSAR Tier 2, Table 1.9-5, “Conformance with TMI Requirements (10 CFR 50.34(f))...,” the applicant states “...should any future development identify a need for a new penetration, adding such a penetration to the NuScale vessel is a substantially different process versus the typical containment.” The staff would like the applicant to describe the “substantially different process versus the typical containment” and how this process if applied to the NuScale design would not preclude later installation of containment venting systems, if required.

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**NuScale Response:**

During a January 30, 2018 follow-up call concerning the response to RAI 9059, the staff expressed concern that the departure discussion in Table 1.9-5 for TMI Requirement 10 CFR 50.34(f)(3)(iv) is focused in hydrogen combustion since other severe accident progressions besides hydrogen combustion could challenge hydrogen combustion. Accordingly, Table 1.9-5 is revised to align the departure discussion in the comment column for 10 CFR 50.34(f)(3)(iv) with the language in FSAR Section 6.2.1.1.1, which references Section 19.2.3.

**Impact on DCA:**

Table 1.9-5 has been revised as described in the response above and as shown in the markup provided in this response.

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RAI 06.02.04-7S1, RAI 06.02.04-9, RAI 06.02.04-9S1, RAI 08.01-1, RAI 08.02-4, RAI 08.02-6, RAI 08.03.02-1, RAI 09.02.06-1

**Table 1.9-5: Conformance with TMI Requirements (10 CFR 50.34(f)) and Generic Issues (NUREG-0933)**

| Item             | Regulation Description / Title  | Conformance Status | Comments   | Section              |
|------------------|---|--------------------|--|----------------------|
| 50.34(f)(1)(i)   | Perform a plant/site-specific probabilistic risk assessment, the aim of which is to seek such improvements in the reliability of core and containment heat removal systems as are significant and practical and do not impact excessively on the plant (II.B.8) | Partially Conforms | Design certification will address reliability of core and containment heat removal systems, with an update required by COL applicant to reflect site-specific conditions.  | 19.0<br>19.1<br>19.2 |
| 50.34(f)(1)(ii)  | Perform an evaluation of the proposed auxiliary feedwater system (II.E.1.1)   | Not Applicable     | This rule requires an evaluation of proposed PWR auxiliary feedwater (AFW) systems. The NuScale plant design does have an AFW system like a typical LWR. Neither the literal language nor the intent of this rule applies to the NuScale design.                     | Not Applicable       |
| 50.34(f)(1)(iii) | Perform an evaluation of the potential for and impact of reactor coolant pump seal damage following small-break LOCA (II.K.2.16 and II.K.3.25)  | Not Applicable     | The NuScale reactor design differs from large PWRs because the NuScale design does not require or include reactor coolant pumps. Rather, the NuScale design uses passive natural circulation of the primary coolant, eliminating the need for reactor coolant pumps. | Not Applicable       |
| 50.34(f)(1)(iv)  | Perform an analysis of the probability of a small-break LOCA caused by a stuck-open power-operated relief valve (PORV) (II.K.3.2)   | Not Applicable     | This guidance is applicable only to PWRs that are designed with power-operated pressurizer relief valves. The NuScale design does not use power-operated relief valves.  | Not Applicable       |
| 50.34(f)(1)(v)   | Perform an evaluation of the safety effectiveness of providing for separation of high pressure coolant injection and reactor core isolation cooling system initiation levels (II.K.3.13)  | Not Applicable     | This requirement applies only to BWRs.   | Not Applicable       |
| 50.34(f)(1)(vi)  | Perform a study to identify practicable system modifications that would reduce challenges and failures of relief valves (II.K.3.16)   | Not Applicable     | This requirement applies only to BWRs. Regardless, the issue contemplated by this requirement was related to power-operated relief valves. The NuScale design does not use power-operated relief valves.   | Not Applicable       |

**Table 1.9-5: Conformance with TMI Requirements (10 CFR 50.34(f)) and Generic Issues (NUREG-0933) (Continued)**

| Item             | Regulation Description / Title  | Conformance Status | Comments   | Section                     |
|------------------|---|--------------------|--|-----------------------------|
| 50.34(f)(3)(iv)  | Provide one or more dedicated containment penetrations, equivalent in size to a single 3-foot-diameter opening (II.B.8) | Departure          | This requirement is not technically relevant to the NuScale design. This TMI requirement is based on traditional large LWR containment designs and the potential, as of the time of the requirement, need for future containment venting systems to accommodate severe accidents. The NuScale containment vessel design differs from a typical LWR containment structure because of its high-pressure capability. A 3-foot opening relative to the NuScale containment is unnecessary. <del>Containment structural integrity and availability of equipment necessary for safe shutdown are assured for hydrogen combustion scenarios occurring 72 hours following an event initiation, with have no adverse effect on containment integrity or plant safety functions. The NuScale design includes provisions to allow venting the containment atmosphere, including connections for portable equipment, if necessary beyond 72 hours. As discussed in Section 6.2.1.1.1, the calculated peak containment for design basis events remains less than the CNV internal design pressure. As discussed in Section 19.2.3, peak containment pressures do not challenge containment integrity for any analyzed severe accident progression.</del> (Refer to TR-0716-50424, Section 2.8). | 6.2<br><a href="#">19.2</a> |
| 50.34(f)(3)(v)   | Preliminary Design Information - Containment Integrity (II.B.8)   | Not Applicable     | Pursuant to 10 CFR 52.47(a)(8) and 10 CFR 50.34(f), paragraph (f)(3)(v) is excluded from the information required to be included in an application for a design certification.   | Not Applicable              |
| 50.34(f)(3)(vi)  | For plant designs with external hydrogen recombiners, provide redundant dedicated containment penetrations (II.E.4.1)   | Not Applicable     | The NuScale design does not have external hydrogen recombiners.  | Not Applicable              |
| 50.34(f)(3)(vii) | Provide a description of the management plan for design and construction activities (II.J.3.1)                          | Not Applicable     | This requirement is applicable only to applicants and holders of reactor facility licenses.  | Not Applicable              |