



April 15, 2019

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. 478 (eRAI No. 9470) on the NuScale Design Certification Application

**REFERENCES:** 1. U.S. Nuclear Regulatory Commission, "Request for Additional Information No. 478 (eRAI No. 9470)," dated May 14, 2018  
2. NuScale Power, LLC Response to NRC "Request for Additional Information No. 478 (eRAI No.9470)," dated December 21, 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 Enclosures to this letter contain NuScale's supplemental response to the following RAI Question from NRC eRAI No. 9470:

- 15.06.05-10

Enclosure 1 is the proprietary version of the NuScale Supplemental Response to NRC RAI No. 478 (eRAI No. 9470). NuScale requests that the proprietary version be withheld from public disclosure in accordance with the requirements of 10 CFR § 2.390. The enclosed affidavit (Enclosure 3) supports this request. Enclosure 2 is the nonproprietary version of the NuScale response.

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

If you have any questions on this response, please contact Matthew Presson at 541-452-7531 or at [mpresson@nuscalepower.com](mailto:mpresson@nuscalepower.com).

Sincerely,

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. 9470, proprietary

Enclosure 2: NuScale Supplemental Response to NRC Request for Additional Information eRAI No. 9470, nonproprietary

Enclosure 3: Affidavit of Zackary W. Rad, AF-0419-65196



**Enclosure 1:**

NuScale Supplemental Response to NRC Request for Additional Information eRAI No. 9470,  
proprietary



**Enclosure 2:**

NuScale Supplemental Response to NRC Request for Additional Information eRAI No. 9470,  
nonproprietary

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

**eRAI No.:** 9470

**Date of RAI Issue:** 05/14/2018

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**NRC Question No.:** 15.06.05-10

Title 10 of the Code of Federal Regulations, Part 50, Appendix A, General Design Criterion (GDC) 35, "Emergency Core Cooling," requires that a system to provide abundant emergency core cooling shall be provided. The system safety function shall be to transfer heat from the reactor core following any loss of reactor coolant at a rate such that (1) fuel and clad damage that could interfere with continued effective core cooling is prevented and (2) clad metal-water reaction is limited to negligible amounts. DSRS Section 15.6.5 provides guidance for complying with GDC 35. It requires that evaluation models meet the requirements of 10 CFR 50.46, which states that the evaluation model must include sufficient supporting justification to show that the analytical technique realistically describes the behavior of the reactor system during a loss-of-coolant accident.

Section 4.1 of the Long-Term Cooling Methodology technical report, TR-0916-51299-P, Rev. 0, a technical report supporting the DCD Chapter 15 analyses, describes a process where the {{

}}<sup>2(a),(c)</sup> It is unclear why this methodology is used and the impact of this approach on the long-term cooling analysis cannot be determined based on the information provided in this report.

Please provide the justification and basis for using {{

}}<sup>2(a),(c)</sup> listed in the LOCA Topical Report, TR-0516-49422-P, Rev. 0.

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**NuScale Response:**

The original NuScale response as submitted in NuScale correspondence RAIO-1218-63933 and dated December 21, 2018, is augmented with the following information.

The reactor vent valve (RVV) discharge flow model in the LOCA model (TR-0516-49422-P) incorporates no penalty to the design valve capacity to account for the compressibility effects that may be present in long term cooling scenarios. Therefore, in the LOCA model, {{

}}<sup>2(a),(c)</sup> in the long term cooling transient calculations. The figure below compares the calculated riser collapsed liquid level above the top of active fuel for {{ }}<sup>2(a),(c)</sup> for the RRV event minimum level scenario. The results demonstrate the conservatism of applying an {{ }}<sup>2(a),(c)</sup> throughout the entire transient calculation.

{{

}}<sup>2(a),(c)</sup>

Figure 1 Riser collapsed liquid level above the top of active fuel

The table below compares the results for the use of the differing expansion factors for the RVVs. The comparisons show that the use of a {{ }}<sup>2(a),(c)</sup> results in conservative predictions of minimum collapsed riser level above the top of active fuel and minimum boron precipitation margin.

Table 1 Expansion factor sensitivity results for the RRV event minimum level scenario

{{

}}<sup>2(a),(c)</sup>

**Impact on DCA:**

There are no impacts to the DCA as a result of this response.



**Enclosure 3:**

Affidavit of Zackary W. Rad, AF-0419-65196



**NuScale Power, LLC**  
AFFIDAVIT of Zackary W. Rad

I, Zackary W. Rad, state as follows:

1. I am the Director, Regulatory Affairs of NuScale Power, LLC (NuScale), and as such, I have been specifically delegated the function of reviewing the information described in this Affidavit that NuScale seeks to have withheld from public disclosure, and am authorized to apply for its withholding on behalf of NuScale.
2. I am knowledgeable of the criteria and procedures used by NuScale in designating information as a trade secret, privileged, or as confidential commercial or financial information. This request to withhold information from public disclosure is driven by one or more of the following:
  - a. The information requested to be withheld reveals distinguishing aspects of a process (or component, structure, tool, method, etc.) whose use by NuScale competitors, without a license from NuScale, would constitute a competitive economic disadvantage to NuScale.
  - b. The information requested to be withheld consists of supporting data, including test data, relative to a process (or component, structure, tool, method, etc.), and the application of the data secures a competitive economic advantage, as described more fully in paragraph 3 of this Affidavit.
  - c. Use by a competitor of the information requested to be withheld would reduce the competitor's expenditure of resources, or improve its competitive position, in the design, manufacture, shipment, installation, assurance of quality, or licensing of a similar product.
  - d. The information requested to be withheld reveals cost or price information, production capabilities, budget levels, or commercial strategies of NuScale.
  - e. The information requested to be withheld consists of patentable ideas.
3. Public disclosure of the information sought to be withheld is likely to cause substantial harm to NuScale's competitive position and foreclose or reduce the availability of profit-making opportunities. The accompanying Request for Additional Information response reveals distinguishing aspects about the method by which NuScale develops its long term cooling analysis.

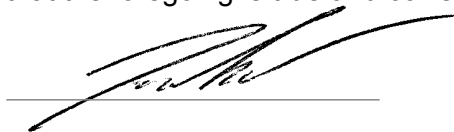
NuScale has performed significant research and evaluation to develop a basis for this method and has invested significant resources, including the expenditure of a considerable sum of money.

The precise financial value of the information is difficult to quantify, but it is a key element of the design basis for a NuScale plant and, therefore, has substantial value to NuScale.

If the information were disclosed to the public, NuScale's competitors would have access to the information without purchasing the right to use it or having been required to undertake a similar expenditure of resources. Such disclosure would constitute a misappropriation of NuScale's intellectual property, and would deprive NuScale of the opportunity to exercise its competitive advantage to seek an adequate return on its investment.

4. The information sought to be withheld is in the enclosed response to NRC Request for Additional Information No. 478, eRAI No. 9470. The enclosure contains the designation "Proprietary" at the top of each page containing proprietary information. The information considered by NuScale to be proprietary is identified within double braces, "{{ }}" in the document.
5. The basis for proposing that the information be withheld is that NuScale treats the information as a trade secret, privileged, or as confidential commercial or financial information. NuScale relies upon the exemption from disclosure set forth in the Freedom of Information Act ("FOIA"), 5 USC § 552(b)(4), as well as exemptions applicable to the NRC under 10 CFR §§ 2.390(a)(4) and 9.17(a)(4).
6. Pursuant to the provisions set forth in 10 CFR § 2.390(b)(4), the following is provided for consideration by the Commission in determining whether the information sought to be withheld from public disclosure should be withheld:
  - a. The information sought to be withheld is owned and has been held in confidence by NuScale.
  - b. The information is of a sort customarily held in confidence by NuScale and, to the best of my knowledge and belief, consistently has been held in confidence by NuScale. The procedure for approval of external release of such information typically requires review by the staff manager, project manager, chief technology officer or other equivalent authority, or the manager of the cognizant marketing function (or his delegate), for technical content, competitive effect, and determination of the accuracy of the proprietary designation. Disclosures outside NuScale are limited to regulatory bodies, customers and potential customers and their agents, suppliers, licensees, and others with a legitimate need for the information, and then only in accordance with appropriate regulatory provisions or contractual agreements to maintain confidentiality.
  - c. The information is being transmitted to and received by the NRC in confidence.
  - d. No public disclosure of the information has been made, and it is not available in public sources. All disclosures to third parties, including any required transmittals to NRC, have been made, or must be made, pursuant to regulatory provisions or contractual agreements that provide for maintenance of the information in confidence.
  - e. Public disclosure of the information is likely to cause substantial harm to the competitive position of NuScale, taking into account the value of the information to NuScale, the amount of effort and money expended by NuScale in developing the information, and the difficulty others would have in acquiring or duplicating the information. The information sought to be withheld is part of NuScale's technology that provides NuScale with a competitive advantage over other firms in the industry. NuScale has invested significant human and financial capital in developing this technology and NuScale believes it would be difficult for others to duplicate the technology without access to the information sought to be withheld.

I declare under penalty of perjury that the foregoing is true and correct. Executed on April 15, 2019.



Zackary W. Rad