October 11, 2018   Docket: PROJ0769

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. 9576 (eRAI No. 9576) on the NuScale Topical Report, "Evaluation Methodology for Stability Analysis of the NuScale Power Module," TR-0516-49417, Revision 0

REFERENCES: 1. U.S. Nuclear Regulatory Commission, "Request for Additional Information No. 9576 (eRAI No. 9576)," dated August 14, 2018

                2. NuScale Topical Report, "Evaluation Methodology for Stability Analysis of the NuScale Power Module," TR-0516-49417, Revision 0, dated July 2016

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

The Enclosures to this letter contain NuScale's response to the following RAI Question from NRC eRAI No. 9576:

- 15.09-10

Enclosure 1 is the proprietary version of the NuScale Response to NRC RAI No. 9576 (eRAI No. 9576). 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 Paul Infanger at 541-452-7351 or at pinfanger@nuscalepower.com.

Sincerely,

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

Distribution: Gregory Cranston, NRC, OWFN-8G9A
                  Samuel Lee, NRC, OWFN-8G9A
                  Bruce Bavol, NRC, OWFN-8G9A

Enclosure 1: NuScale Response to NRC Request for Additional Information eRAI No. 9576, proprietary

Enclosure 2: NuScale Response to NRC Request for Additional Information eRAI No. 9576, nonproprietary

Enclosure 3: Affidavit of Zackary W. Rad, AF-1018-62106

Enclosure 1:

NuScale Response to NRC Request for Additional Information eRAI No. 9576, proprietary

Enclosure 2:

NuScale Response to NRC Request for Additional Information eRAI No. 9576, nonproprietary

Response to Request for Additional Information
Docket: PROJ0769

eRAI No.: 9576
Date of RAI Issue: 08/14/2018

NRC Question No.: 15.09-10

Title 10 of the Code of Federal Regulations (CFR), Part 50.34 "Contents of Application; technical information," requires licensees to submit safety analyses that demonstrate how a given reactor complies with associated safety criteria. NuScale has submitted the PIM stability analysis methodology for NRC review and approval such that it may be used to demonstrate that the NuScale power module complies with the requirements of General Design Criteria (GDC) 12 of Title 10 CFR 50 Appendix A. SRP 15.0.2, "Review of Transient and Accident Analysis Methods," which provides guidance for the review of transient and accident analysis methods, directs the reviewer to review the quality assurance program, and in particular the software configuration control and testing procedures to ensure compliance with the requirements of Title 10 CFR 50 Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Reprocessing Plants".

During the NRC staff audit of the software test plan and associated procedures for PIM, the staff found that the regression testing requirements leave PIM susceptible to a condition the staff refers to as "code drift." Code drift refers to a process whereby multiple, subsequent changes to an evaluation model or code result in a significant change in the results. Code drift can occur if each change results in only a small difference in the results from version to version in each change, but the difference continues to accumulate in a consistent direction. Without tracking of the integrated effect of changes, it would be possible for changes to accumulate such that each change from an approved version results in code drift and a significant difference goes undetected. In summary, software testing is conducted to approve changes and relies only on comparing an updated code version to the previous version – and does not include any static benchmark – the change process could result in code drift.

In order to make an affirmative finding with regard to the above regulatory requirement important to safety, the NRC staff requested that NuScale describe how code drift is avoided through the regression testing process of PIM in RAI 9333 Question 01-67.

In the response to RAI 9333 Question 01-67, the applicant states that "no code drift has occurred through Version 1.2 of PIM, and any future code drift will be captured as part of the testing and verification process." However, the response does not provide any discussion as to how this conclusion was reached and does not describe any aspects of the testing and verification process in a specific sense that would preclude future code drift.

Therefore, in order to make an affirmative finding with regard to the above regulatory requirement important to safety, the NRC staff requests that NuScale describe those specific tests that are performed as part of the routine testing and verification process that ensure code drift has not occurred and further, that would capture future code drift if it were to occur, and that the quality assurance plan ensures the aforementioned specific test are effective in diagnosing any possible code drift.

NuScale Response:

The NuScale software configuration management procedures include a requirement for regression testing consistent with NQA-1a-2009 wherein unintended adverse effects introduced during any software changes are detected and it is verified that modified system(s) or system component(s) still meet specified software design requirements.

This regression (code drift) testing serves to validate that only justifiably low levels of code drift occur {{ }}$^{2(a),(c)}$ between the current version of PIM and the initial version (version 1.0) of PIM. These values {{

}}$^{2(a),(c)}$

As this specifically applies to the software testing and verification of PIM, five test cases are examined. The most current evaluation of code drift was done for the current version of PIM (version 1.3) and involved an assessment between the initial version of PIM (version 1.0) and version 1.3 of PIM (the versions of PIM used to develop the stability analyses presented in Revision 0 and Revision 2 of the NuScale FSAR, respectively). The outputs produced from each version of PIM, whose differences are compared to the {{

}}$^{2(a),(c)}$

{{

}}$^{2(a),(c)}$ is considered sufficient to determine the potential for code drift
and will be performed for any new PIM version in the future.

Impact on Topical Report:

There are no impacts to the Topical Report TR-0516-49417, Evaluation Methodology for
Stability Analysis of the NuScale Power Module, as a result of this response.

Enclosure 3:

Affidavit of Zackary W. Rad, AF-1018-62106

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 stability analysis of the NuScale power module.

   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.

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4. The information sought to be withheld is in the enclosed response to NRC Request for Additional Information No. 9576, eRAI 9576. 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 October 11, 2018.

Zackary W. Rad