RAIO-0918-61888

September 20, 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 Response to NRC Request for Additional Information No. 410 (eRAI No. 9310) on the NuScale Design Certification Application

REFERENCES:
1. U.S. Nuclear Regulatory Commission, "Request for Additional Information No. 410 (eRAI No. 9310)," dated April 09, 2018
2. NuScale Power, LLC Supplemental Response to "NRC Request for Additional Information No. 410 (eRAI No. 9310)" dated June 8, 2018

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. 9310:

- 03.09.02-71

A majority of the responses to RAI No. 410, eRAI No. 9310, questions were previously provided in Reference 2. The response to question 03.09.02-70 will be provided by October 12, 2018.

Enclosure 1 is the proprietary version of the NuScale Response to NRC RAI No. 410 (eRAI No. 9310). 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 Marty Bryan at 541-452-7172 or at mbryan@nuscalepower.com.

Sincerely,

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

Distribution: Gregory Cranston, NRC, OWFN-8G9A
Samuel Lee, NRC, OWFN-8G9A
Marieliz Vera, NRC, OWFN-8G9A

Enclosure 1: NuScale Response to NRC Request for Additional Information eRAI No. 9310, proprietary

Enclosure 2: NuScale Response to NRC Request for Additional Information eRAI No. 9310, nonproprietary

Enclosure 3: Affidavit of Zackary W. Rad, AF-0918-61889

Enclosure 1:

NuScale Response to NRC Request for Additional Information eRAI No. 9310, proprietary

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

Enclosure 2:

NuScale Response to NRC Request for Additional Information eRAI No. 9310, nonproprietary

NuScale Power, LLC
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Response to Request for Additional Information
Docket No. 52-048

eRAI No.: 9310
Date of RAI Issue: 04/09/2018

NRC Question No.: 03.09.02-71

10 CFR 50, Appendix A, GDC 2 requires systems, structures, and components important to safety be designed to withstand appropriate combinations of the effects of normal and accident conditions with the effects of natural phenomena including earthquake. During the audit for the NuScale power module seismic analysis, the NRC staff noticed that the blowdown loads of main steam pipe break (MSPB) and feedwater pipe break (FWPB) are not included in the load combination of reactor primary vessel (RPV) primary stress calculation documented in EC-A011-2278-00 Rev. 0, “Reactor Pressure Vessel Primary Stress Calculation.” The applicant stated during the audit that blowdown analysis of MSPB and FWPB will be performed in the second quarter of 2018 and a confirmatory analysis will be conducted to demonstrate that the blowdown loads of MSPB and FWPB are bounded by the design basis pipe break (DBPB) load. If not bounded, reevaluation of RPV primary stress will be performed. The staff requests the applicant to provide the comparison of the loads between DBPB, MBPB, and FWPB at various locations of the RPV and reactor vessel internals when the blowdown loads of MSPB and FWPB are available. Also provide the updated RPV primary stress calculation if reevaluation is necessary.

NuScale Response:

The main steam and feedwater lines inside of containment meet the criteria for Leak Before Break (see FSAR Section 3.6.3). Therefore, circumferential breaks are not postulated for dynamic effects of the MSS and FWS lines inside containment.

Because main steam pipe break (MSPB) and feedwater pipe break (FWPB) occur outside of containment, loads due to asymmetric cavity pressurization are not applicable to the reactor pressure vessel (RPV) and a direct comparison of the loads due to design basis pipe break

(DBPB) loads at various locations on the RPV cannot be made. MSPB and FWPB however, do impact the main steam (MS) and feedwater (FW) nozzles and plena. The maximum pressure load due to MSPB or FWPB is generated at the feed plenum and is {{ }}2(a),(c).The maximum loads generated at the FW and MS nozzles due to either a MSPB or a FWPB are provided in Table 1.

Table 1. Maximum MSPB and FWPB Loads at RPV3-10

Nozzle	P (lb)	VC (lb)	VL (lb)	MT (in-lb)	ML (in-lb)	MC (in-lb)
RPV3-6 FW nozzle	{{					
RPV7-10 MS nozzle						}}2(a),(c)

The RPV Primary Stress Analysis has been updated to include the above mentioned loads. The calculation demonstrates that the conclusions of the analysis are not affected by the inclusion of MSPB and FWPB loads.

Additionally, per the discussion held during the monthly closed NRC status call regarding FSAR Section 3.9.2 seismic issues on 07/02/2018, NuScale agreed to address the following questions related to the response provided for RAI Question 03.09.02-72 in the response to this RAI:

1. In DCD Table 3.9-2, “Pressure, Mechanical, and Thermal Loads,” EXT is defined as “Mechanical loads other than piping such as RPV and CNV support reactions, RVI and CNV interface loads, scram loads, fuel assembly weights, and nozzle loads.” SCRAM event could exert forces on the RPV. Can the NPM scram loads be neglected in the Level D load combination for the RPV primary stress evaluation?
2. Does elimination of Belleville washers affect the results of RPV Primary Stress Analysis presented in EC-A011-2278 “RPV Primary Stress Evaluation,” Rev. 0? If yes, what is the timeline for updating the results?

Supplemental Question Responses:

1. SCRAM loads can be neglected in the Level D combination in the analysis for the RPV Primary Stress Analysis. The pressure loading and temperature conditions experienced during a SCRAM event are bounded by the pressures and temperature conditions used

in the analysis. Mechanical loads generated during a SCRAM event are not considered in the analysis as they do not impact the results. SCRAM loads at the core support blocks are less than {{ }}[2(a),(c)] of the Level D loads used in the RPV Primary Stress Analysis at this location. There is a {{ }}[2(a),(c)] margin for stress in the RPV at the core support blocks. Therefore the calculation results are not affected by inclusion of SCRAM loads. This assessment has been documented in the RPV Primary Stress Analysis.

2. Elimination of the Belleville washers causes the Level D load at the core support blocks to increase by less than {{ }}[2(a),(c)]. There is a {{ }}[2(a),(c)] margin for stress in the RPV at this location. Therefore the RPV Primary Stress Analysis is not affected by elimination of the Belleville washers. This assessment been documented in the RPV Primary Stress Analysis.

Impact on DCA:

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

Enclosure 3:

Affidavit of Zackary W. Rad, AF-0918-61889

NuScale Power, LLC
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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 power module seismic analysis.

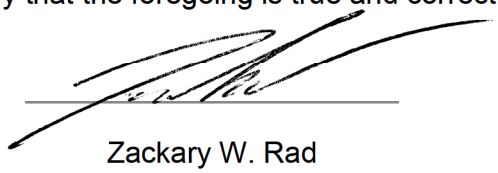
    NuScale has performed significant research and evaluation to develop a basis for this method and has invested significant resources, including the expenditure of a considerable sum of money.

    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. 410, eRAI 9310. 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 September 20, 2018.



Zackary W. Rad