



March 08, 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. 200 (eRAI No. 9021) on the NuScale Design Certification Application

**REFERENCES:** 1. U.S. Nuclear Regulatory Commission, "Request for Additional Information No. 200 (eRAI No. 9021)," dated August 25, 2017  
2. NuScale Power, LLC Response to NRC "Request for Additional Information No. 200 (eRAI No.9021)," dated October 23, 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. 9021:

- 03.09.03-5

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 that reads "Jennie Wike".

Jennie Wike  
Manager, Licensing  
NuScale Power, LLC

Distribution: Omid Tabatabai, NRC, OWFN-8G9A  
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Enclosure 1: NuScale Supplemental Response to NRC Request for Additional Information eRAI No. 9021



**Enclosure 1:**

NuScale Supplemental Response to NRC Request for Additional Information eRAI No. 9021

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

**eRAI No.:** 9021

**Date of RAI Issue:** 08/25/2017

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**NRC Question No.:** 03.09.03-5

As part of the staff's evaluation of the applicant's compliance with the requirements of GDCs 1, 2, 4, 14, and 15; 10 CFR 50.55a; and 10 CFR Part 50, Appendix S, this section evaluates component supports the ASME Code Class 1, 2, and 3 component and core support structures.

In DCD Tier 2 Section 3.9.3.1.2, the applicant states that piping supports are designed in accordance with ASME BPVC Section III, Subsection NF. The core support structures are design to ASME BPVC Section III Subsection NG. The applicant also stated that the SG tubes supports are internal supports and, therefore, are also designed using Subsection NG. The applicant is requested to discuss the effects of the friction and wearing between the tubes and tag supports when the tubes are subject to the fluid induced vibration from the vertical cross flow for 60 years of plant life.

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**NuScale Response:**

The initial response to this RAI 9021, Question 03.09.03-5 was provided by NuScale letter RAIO-1017-56765, dated October 23, 2017. The following supplements that response with additional discussion of the methodology used to calculate steam generator (SG) tube fretting wear.

The predicted SG tube wear value and acceptance criterion are provided in FSAR Section 5.4.1.3.

The Connor's method for fretting wear is used to determine this value, as the geometry of the SG tube within the support can be approximated by a tube in a circular support hole. A zero-to-peak root mean square (RMS) vibration for sinusoidal whirling of the tube is used (per pages 343 and 361 of Au-Yang, M.K., *Flow-Induced Vibration of Power and Process Plant Components*, ASME Press, New York, NY, 2001). This approximation is equal to square root of two times the calculated RMS vibration value.

While design analysis is performed to estimate wear, these estimates are predictive in nature

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and actual wear performance is monitored over the life of the SG design in accordance with NEI 97-06, Revision 3, "Steam Generator Program Guidelines." NuScale SG inspection requirements are provided in Section 5.5.4 of the Technical Specifications, "Steam Generator (SG) Program." Additional information related to periodic SG tube inspections is provided in FSAR Section 5.4.1.4.

**Impact on DCA:**

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