

August 18, 2017

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. 8873 (eRAI No. 8873) 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. 8873 (eRAI No. 8873)," dated June 30, 2017
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).

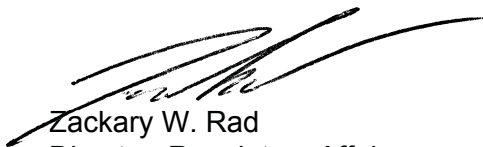
The Enclosure to this letter contains NuScale's response to the following RAI Question from NRC eRAI No. 8873:

- 01-17

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.

Sincerely,



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



RAIO-0817-55515

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

Enclosure 1: NuScale Response to NRC Request for Additional Information eRAI No. 8873



Enclosure 1:

NuScale Response to NRC Request for Additional Information eRAI No. 8873

Response to Request for Additional Information Docket: PROJ0769

eRAI No.: 8873

Date of RAI Issue: 06/30/2017

NRC Question No.: 01-17

In accordance with 10 CFR 50 Appendix A GDC 10, "Reactor design," the reactor core and associated coolant, control, and protection systems shall be designed with appropriate margin to assure that specified acceptable fuel design limits are not exceeded during any condition of normal operation, including the effects of anticipated operational occurrences. The Standard Review Plan (SRP) 15.0.2 acceptance criteria with respect to evaluation models includes the requirement that the chosen mathematical models and the numerical solution of those models must be able to predict the important physical phenomena reasonably well from both qualitative and quantitative points of view.

Section 5.6.2, "Decay Heat" of the topical report (TR), TR-0516-49417-P, states that the decay heat is treated as a static power level in the calculations. Section 8.2.2.2, "Event at 32 MW Conditions with 35 Percent Initial Decay Heat," of the TR refers to sensitivity calculations performed at various levels of decay heat. It is not clear how the user determines an appropriate input, percentage of the initial thermal power, for licensing calculations using PIM.

In order to make an affirmative finding associated with the above regulatory requirement important to safety, NRC staff requests NuScale to describe the method for determining an appropriate decay heat level input for licensing calculations.

NuScale Response:

The examination of NuScale power module stability includes evaluating the effect of reactivity feedback variations. For this reason, calculations were performed at the beginning and end of cycle conditions where the moderator temperature coefficient change is maximized. However, the fuel temperature reactivity feedback, due to Doppler Effect, is negative for both beginning and end of cycle. The only physically possible situation for forcing a reduction in Doppler feedback is including the largest possible fraction of decay heat which is not affected by any reactivity feedback mechanism. This situation was achieved by assuming operation at rated power for a long time to equilibrate the fraction of decay heat and reach a maximum absolute value, and run the code at low power to maximize the decay-to-total fraction. The results reported in the topical report demonstrate highly stable behavior, therefore performing decay



heat sensitivity for licensing calculations is not necessary.

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.