June 22, 2017

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. 12 (eRAI No. 8773) on the NuScale Design Certification Application

REFERENCE: U.S. Nuclear Regulatory Commission, "Request for Additional Information No. 12 (eRAI No. 8773)," dated April 25, 2017

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. 8773:

- 04.04-2

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 Darrell Gardner at 980-349-4829 or at dgardner@nuscalepower.com.

Sincerely,
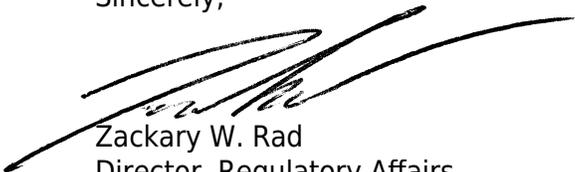
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Enclosure 1: NuScale Response to NRC Request for Additional Information eRAI No. 8773

Enclosure 1:

NuScale Response to NRC Request for Additional Information eRAI No. 8773

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

eRAI No.: 8773
Date of RAI Issue: 04/25/2017

NRC Question No.: 04.04-2

10 CFR 50.36(c)(2)(ii)(B) requires that a technical specification limiting condition for operation (LCO) be established for a "process variable, design feature, or operating restriction that is an initial condition of a design basis accident or transient analysis that either assumes the failure of or presents a challenge to the integrity of a fission product barrier." The initial condition ranges assumed in the evaluation of design basis events is provided in Table 15.0-6 of the Final Safety Analysis Report (FSAR). This table includes the range of reactor coolant system (RCS) flowrates assumed to bound the minimum and maximum RCS flowrates. However, the NRC staff has not identified an LCO that would limit operation within the bounds of the RCS flowrates assumed in the transient and accident analyses. The NRC staff relies upon such an LCO to establish a finding that each NuScale Power MODULE will be operated within the bounds of the safety analyses. Accordingly, the NRC staff requests that NuScale provide sufficient justification that the RCS flowrate during normal operation will be maintained within the bounds of the transient and accident analyses.

NuScale Response:

The NuScale Power Module (NPM) operates with natural circulation. The primary system flow rate is a function of the core power level. This power level determines the reactor coolant system (RCS) density gradient via the temperature difference between the core and steam generator. This density gradient creates the hydraulic head which drives the RCS flowrate. The uncertainty of primary flow for the NPM is primarily a function of hydraulic loss uncertainty, which establishes the analytical minimum and maximum flowrates analyzed in the safety analyses.

Relevant parameters to RCS flow are controlled and monitored within the NPM.

- Core power level
- RCS temperatures
- Pressurizer pressure

Pressurizer pressure and RCS cold temperature have initial condition limitations that are controlled in limiting condition for operation (LCO) 3.4.1 in the Generic Technical Specifications (GTS). The RCS flow rate is dependent upon the controlled and measurable limits specified in LCO 3.4.1 in conjunction with core power level. The safety analyses have been analyzed from the combination of initial conditions within the allowable spectrum which maximize the severity of each safety analysis transient for the particular acceptance criterion being evaluated. In addition, it is also noted that FSAR Section 15.3 states that decrease in flow events do not apply to the NuScale design.

In summary, NPM operates in natural circulation and does not control RCS flowrate. However, the RCS flowrate correlates directly with core power level, pressurizer pressure, and RCS temperatures. The existing LCO 3.4.1 in conjunction with the licensed power level assures the NPM operates within the flowrates analyzed in the transient and accident analyses.

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