RAIO-0917-56225

September 26, 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. 42 (eRAI No. 8836) on the NuScale Design Certification Application

REFERENCE: U.S. Nuclear Regulatory Commission, "Request for Additional Information No. 42 (eRAI No. 8836)," dated June 02, 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. 8836:

- 03.06.02-9

The response schedule for the remaining questions of RAI No. 42, eRAI 8836 were provided in an email to NRC (Greg Cranston) dated September 12, 2017.

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

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Enclosure 1: NuScale Response to NRC Request for Additional Information eRAI No.8836

Enclosure 1:

NuScale Response to NRC Request for Additional Information eRAI No. 8836

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

eRAI No.: 8836
Date of RAI Issue: 06/02/2017

NRC Question No.: 03.06.02-9

BTP 3-4, Part B, Item A(iii)(4) states that if a structure separates a high-energy line from an essential component, the separating structure should be designed to withstand the consequences of the pipe break in the high-energy line that produces the greatest effect at the structure, irrespective of the fact that the criteria identified in BTP 3-4, Part B, Item A(iii)(1), (2), and (3) might not lead to postulating a break at this location. The staff found that no information (or pointer) related to the design criteria of the separating structure are currently included in the FSAR Tier 2, Section 3.6. The applicant is requested to clarify whether the NuScale design criteria for structures that separate high-energy from essential components, if applicable are consistent with the NRC staff guideline described in BTP 3-4, Part B, Item A(iii)(4).

NuScale Response:

NuScale design criteria for structures that separate high-energy lines from essential components are consistent with the guidance described in BTP 3-4, Part B, Item A(iii)(4). FSAR Section 3.6.4.1 has been revised to include the following supplemental information.

In accordance with BTP 3-4, Part B, Item A(iii)(4), if a structure is credited with separating a high-energy line from an essential SSC, that separating structure is designed to withstand the consequences of the pipe break in the high-energy line that produces the greatest effect on the structure, irrespective of the fact that the criteria in BTP 3-4, Part B, Items A(iii)(1) through (3) might not require the postulation of a break at that location.

Impact on DCA:

FSAR Tier 2 Section 3.6.4.1 has been revised as described in the response above and as shown in the markup provided in this response.

ii) ~~At each location where stresses are calculated by the sum of Eqs. (9) and (10) in NC/ND-3653 of ASME Code, Section III, to exceed 0.8 times the sum of the stress limits given in NC/ND-3653.~~

~~As a result of piping reanalysis, due to differences between the design configuration and the as-built configuration, the highest stress locations may be shifted; however, the initially determined intermediate break locations may be used unless redesign of the piping resulting in a change in pipe parameters (diameter, wall thickness, routing) is necessary, or the dynamic effects from the new (as-built) intermediate break locations are not mitigated by the original pipe-whip restraints and jet shields.~~

RAI 03.06.02-9

Where break locations are selected without the benefit of stress calculations, breaks are postulated at the piping welds to each fitting, valve, or welded attachment. Breaks in seismically analyzed non-ASME Class piping are addressed in Section 3.6.2.1.3. Additionally, in accordance with BTP 3-4, Part B, Item A(iii)(4), if a structure is credited with separating a high-energy line from an essential SSC, that separating structure is designed to withstand the consequences of the pipe break in the high-energy line which produces the greatest effect on the structure, irrespective of the fact that the criteria described in BTP 3-4, Part B, Items A(iii)(1) through (3) might not require the postulation of a break at that location.

3.6.4.2 Reactor Module Piping System Parameters

Table 3.6-4 lists the NuScale NPM piping along with the respective design and operating conditions. High-energy piping systems (i.e., CVCS, MSS, FWS, and DHRS) are evaluated for HELB both inside and outside the CNV. Although the DHRS condenser is manufactured from piping products, and analyzed to ASME Code, Class 2 piping rules, it is nonetheless considered a major component and not a piping system, thus breaks are not postulated.

Moderate-energy piping systems (i.e., RCCWS, CFDS and CES) are exempt from HELB and are not addressed further herein.

3.6.4.3 Reactor Module Piping Material

The high-energy piping systems are manufactured using ASME SA-312, dual-certified TP304/TP304L stainless steel, with the properties shown in Table 3.6-5, which are taken from ASME Section II, Materials. Dual-certified TP304/TP304L SS maintains the low-carbon content of the TP304L SS grade and exhibits the higher strength associated with the straight grade of TP304 SS. Thus, Table 3.6-5 uses the strength properties from the straight TP304 SS grade at design temperature of 650 degrees F shown in Table 3.6-4. Note that S_A in Table 3.6-5 is calculated with a 1.0 stress range reduction factor, f.

The bases for break exclusion zones in areas away from containment penetrations and areas within containment penetrations are described in Section 3.6.2.1.2. The guidance relates to both Class 1 and Class 2 piping systems, where the allowable stresses