RAIO-0918-61659

September 05, 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. 330 (eRAI No. 9271) on the NuScale Design Certification Application

REFERENCES:
1. U.S. Nuclear Regulatory Commission, "Request for Additional Information No. 330 (eRAI No. 9271)," dated January 08, 2018
2. NuScale Power, LLC Response to NRC "Request for Additional Information No. 330 (eRAI No.9271)," dated February 15, 2018

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. 9271:

- 12.02-21

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 Carrie Fosaaen at 541-452-7126 or at cfosaaen@nuscalepower.com.

Sincerely,

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

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Enclosure 1: NuScale Supplemental Response to NRC Request for Additional Information eRAI No. 9271

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NuScale Supplemental Response to NRC Request for Additional Information eRAI No. 9271

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

eRAI No.: 9271
Date of RAI Issue: 01/08/2018

NRC Question No.: 12.02-21

Regulatory Basis

10 CFR 52.47(a)(5) requires applicants to identify the kinds and quantities of radioactive materials expected to be produced in the operation and the means for controlling and limiting radiation exposures within the limits set forth in 10 CFR Part 20.
10 CFR 20.1101(b) and 10 CFR 20.1003, require the use of engineering controls to maintain exposures to radiation as far below the dose limits in 10 CFR Part 20 as is practical. The DSRS Acceptance Criteria section of NuScale DSRS section 12.2, “Radiation Sources,’ states that the applications should contain the methods, models and assumptions used as the bases for all sources described in DCD Section 12.2. The DSRS Acceptance Criteria 12.3-12.4, “Radiation Protection Design Features,” states that the areas inside the plant structures, as well as in the general plant yard, should be subdivided into radiation zones, with maximum design dose rate zones and the criteria used in selecting maximum dose rates identified.
Background
NuScale DCD Tier 2, Revision 0 DCD Section 11.4.2.5.1 “Tanks,” regarding the Phase Separator Tanks (PSTs), states that there are two permanently installed PSTs that are provided to receive spent resins from the liquid radioactive waste (LRW) demineralizers and the chemical and volume control system (CVCS) deborating demineralizers.
DCD Tier 2, Revision 0 subsection 12.2.1.7, “Solid Radioactive Waste System,” states that the assumed values used to develop the solid radioactive waste system (SRWS) source terms are listed in Table 12.2-18. NuScale DCD Tier 2, Revision 0 Table 12.2-18: “Solid Radioactive Waste System Component Source Term Inputs,” list the dimensions of the Phase Separator Tanks (PST), including the height of 16.46’. DCD Table 12.2-19, “Solid Radioactive Waste System Component Source Terms – Radionuclide Content,” lists the radionuclide inventory of the PST. DCD Table 12.2-20: “Solid Radioactive Waste System Component Source Terms – Source Strengths,” provides the Phase Separator Tank (PST) gamma emission rate in photon/s. DCD Section 12.2 does not appear to contain any other information about the amount of radioactive material that can be present in the PST, and the sources of that material.
Based on information made available to the staff during the RPAC Chapter 12 Audit, the volume of radioactive material in the PST occupies less than 1/10th of the height of the tank, as stated in

the DCD. In addition, the model of the PST contained in the analytical package reviewed by the staff appears to be significantly different that the model described in DCD Table 12.2-18.
Key Issue 1:
The radionuclide concentrations listed in DCD subsection 12.2 are the basis of the information used to establish plant source terms. NuScale DSRS 12.2 Acceptance Criteria, states that all of the sources of radiation exposure to workers and members of the public (from contained sources) are to be identified, characterized, and considered in the design and operation of the facility. This section of the DSRS also states that unless described within other sections of the FSAR, source descriptions should include the methods, models, and assumptions used as the bases for all values provided in FSAR Section 12.2.
Question 1:
To facilitate staff understanding of the application information sufficient to make appropriate regulatory conclusions, with respect to the descriptions of the sources of radiation present in the facility, the staff requests that the applicant:

- Describe the sources of radioactive material contained in the PST, including the addition rate, source component and specific activity,
- Explain/justify the sources of material in the PST, as it relates to the volume and photon emission rates used in the analytical package,,
- Provide the methods, models and assumptions, used to develop the assumed radionuclide concentrations, and associated basis,
- As necessary, revise DCD Section 12.2 to include the information needed to describe the source contained in the tank,

OR

Provide the specific alternative approaches used and the associated justification.

NuScale Response:
The updated source term and source strength values for the phase separator tank (FSAR Tables 12.2-19 and 12.2-20) are provided as part of the NuScale response to RAI 9264.

Impact on DCA:

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