RAIO-0419-65217

April 17, 2019

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. 06 (eRAI No. 8775) on the NuScale Design Certification Application

REFERENCES:
1. U.S. Nuclear Regulatory Commission, "Request for Additional Information No. 06 (eRAI No. 8775)," dated April 25, 2017
2. NuScale Power, LLC Response to NRC "Request for Additional Information No. 06 (eRAI No.8775)," dated June 26, 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. 8775:

- 12.03-1

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. 8775

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NuScale Supplemental Response to NRC Request for Additional Information eRAI No. 8775

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

eRAI No.: 8775
Date of RAI Issue: 04/25/2017

NRC Question No.: 12.03-1

10 CFR 52.47(a)(8) requires that the final safety analysis report provide the information necessary to demonstrate compliance with any technically relevant portions of the Three Mile Island requirements set forth in 10 CFR 50.34(f), except paragraphs (f)(1)(xii), (f)(2)(ix), and (f)(3)(v).

10 CFR 50.34(f)(2)(vii) requires that applicants perform radiation and shielding design reviews of spaces around systems that may, as a result of an accident, contain accident source term radioactive materials, and design as necessary to permit adequate access to important areas and to protect safety equipment from the radiation environment.

10 CFR 50.34(f)(2)(viii) requires that applicants provide a capability to promptly obtain and analyze samples from the reactor coolant system and containment that may contain accident source term radioactive materials without radiation exposures to any individual exceeding 5 rems to the whole body or 50 rems to the extremities. Materials to be analyzed and quantified include certain radionuclides that are indicators of the degree of core damage (e.g., noble gases, radioiodines and cesiums, and nonvolatile isotopes), hydrogen in the containment atmosphere, dissolved gases, chloride, and boron concentrations.

NUREG-0737 and DSRS section 12.3-12.4 provide additional guidance on acceptable methods of meeting these requirements. These documents indicates that post accident radiation zones should be provided based on the guidance of RGs 1.7 and 1.183 and that the analysis for access to vital areas should consider access to, stay time in, and egress from these vital areas. NUREG-0737 specifies that any area which will or may require occupancy to permit an operator to aid in the mitigation of or recovery from an accident is to be designated as a vital area and in addition to the control room and technical support center, the sample station and sample analysis area must be included among those areas where access is considered vital

after an accident (This question is focused on the sample station, sample analysis, and other areas requiring infrequent access. Any questions related to the MCR and TSC will be addressed separately). Finally, NUREG-0737 provides a list of other areas that should be considered in determining the vital areas. NUREG-0737 specifies that if these areas are not considered vital areas, justification should be provided for not including them. The areas specified are the post-LOCA hydrogen control system, containment isolation reset control area, manual ECCS alignment area (if applicable), motor control centers, instrument panels, emergency power supplies, security center, and radwaste control panels. In addition, any other areas that may need to be accessed during an accident are to be identified. As specified, the plant should be designed so that the dose to an individual should not exceed the occupational dose criteria to perform the vital missions, including accessing and egressing from the areas.

DCD Section 12.4.1.8, "Post-Accident Actions," provides a discussion of post-accident sampling and analysis for both primary liquid sampling and containment gas sampling. It indicates that access may be required to the CVCS gallery, counting room, and hot lab in the Reactor Building, and Annex building counting room may be required to sample and analyze liquid samples and that access to the utilities area and steam gallery on the 100' elevation of the reactor building may be required for containment gaseous grab sampling. The discussion to perform these activities indicates that doses will be under the 5 rem occupational dose limit, including ingress and egress. However, it indicates that 0.25" lead equivalent temporary shielding is assumed in the analysis for calculating the post-accident doses (in addition to the permanent shielding specified in the application) and there is no discussion of the dose rates received in installing the temporary shielding to the various different areas. In addition, no post-accident radiation zone maps or ingress/egress routes are provided; no information is provided on the time assumed to be spent at each location or the speed of travel assumed; and no information is provided on the assumptions made regarding submersion and inhalation dose. Finally, staff did not find any information regarding any other vital areas in the DCA.

Based on the above, staff requests the following:

1. Provide more information regarding where temporary lead equivalent shielding is assumed to be installed as it relates to taking and analyzing liquid and gaseous samples, including access and egress, and the dose rates that will be received in installing this temporary shielding during accident conditions.

2. Provide post-accident radiation zone maps and ingress and egress routes for all areas associated with performing the vital missions and update the DCD to include this

information.

3. Provide information on the time spent at each location and the speed of travel assumed and update the DCD to include this information.

4. Provide information on the assumed post-accident airborne activity concentrations and how these source terms were developed. In addition, provide information regarding what assumptions are made regarding submersion and inhalation dose. Update the DCD accordingly.

5. Identify any other areas that would require or may require access following an accident to permit an operator to aid in the mitigation of or recovery from an accident. For each of these areas, identify the work that may need to be performed in these areas, provide the dose to perform the work and to access and egress from the area. Also, for each of these areas, provide the information requested in items 1 through 4, as applicable. Update the DCD with this information, as appropriate.

6. If any of the areas that NUREG-0737 specifies should be included for consideration as a vital area (i.e. hydrogen control system, containment isolation reset control area, manual ECCS alignment area, motor control centers, instrument panels, emergency power supplies, security center, and radwaste control panels), are not considered as a vital area in the NuScale design, please provide justification for not including them. The justification should include an explanation for why it will not be necessary to access each of the areas following an accident.

NuScale Response:

On January 31, 2019, NuScale submitted a request to be exempted from the dose analysis aspect of 10 CFR 50.34(f)(2)(viii), as described in DCA Part 7, Section 16. Therefore, based on this exemption request, this supplemental RAI response replaces the previous RAI response.

This RAI requested that additional details be provided regarding the NuScale analyses related to operator dose during post-accident sampling activities, and other areas that may need to be accessed following an accident. Given the NuScale exemption request in DCA Part 7, Section 16, such requested information is not required. Also, as described in the original response to

this RAI, there are no areas outside of the main control room that require operator access post-accident in the NuScale design.

For the associated DCA changes, please see NuScale letter LO-0319-65027, dated March 29, 2019.

Impact on DCA:

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