

Attachment A

U.S. NUCLEAR REGULATORY COMMISSION STAFF FEEDBACK ON NUSCALE'S RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION NO. 9179

Design Certification Application, Final Safety Analysis Report Tier 2, Section 2.3.1, "Regional Climatology"

Question 02.03.01-1

- (1) Although the applicant clarified the phrase "at most potential plant site locations in the United States" in its response to the U.S. Nuclear Regulatory Commission (NRC) staff's Request for Additional Information (RAI) 9179, clarification should also be provided in the Final Safety Analysis Report (FSAR) Tier 2, Section 2.0, "Site Characteristics and Site Parameters" and Section 2.3, "Meteorology."

NuScale Response:

NuScale will take this feedback under advisement.

- (2) Terminology related to this RAI is used inconsistently or incorrectly. For example,
- a. Paragraph 1 of Section 2.3.1, "Regional Climatology," which states, with respect to HMR-52, that the design maximum precipitation rate values "address the majority of locations in the United States" (HMR-52 only applies east of the 105th Meridian – essentially east of the Rocky Mountains in the contiguous U.S.)
 - b. Paragraph 4 of Section 2.3.1 which refers to the "continental United States" (should be corrected to read "contiguous United States" consistent with the basis for the design-basis tornado (DBT) parameters in regulatory guide (RG) 1.76, "Design-Basis Tornado and Tornado Missiles for Nuclear Power Plants")
 - c. Paragraph 2 (Sentence 3) of Section 2.3.4, "Short-Term Atmospheric Dispersion Estimates for Accident Releases," which ends with the phrase "all regions of the United States" (should be clarified if Hawaii was not among the Met stations used)
 - d. Paragraph 2 and Paragraph 3 of Subsection 3.3.2.1 both of which use the phrase "for the continental United States" (should be corrected to read "for the contiguous United States" consistent with the basis for the DBT parameters in RG 1.76 and the design-basis hurricane parameters in RG 1.221, "Design-Basis Hurricane and Hurricane Missiles for Nuclear Power Plants")

NuScale Response:

NuScale will take this feedback under advisement.

- (3) There are potential implications associated with the possible deployment of the NuScale Small Modular Reactor (SMR) plant design in locations with extreme climatological conditions, including (1) design, operational, and environmental issues, (2) offsite meteorological data availability issues, (3) onsite meteorological monitoring, data

processing, and atmospheric stability classification issues, and (4) atmospheric dispersion and modeling approaches.

NuScale Response:

NuScale will take this feedback under advisement.

Question 02.03.01-2

(1) The list of cross-references to FSAR sections that references the site parameters appears to be incomplete. These include:

1. Maximum Precipitation Rate

- a. FSAR Chapter 3, "Design of Structures, Systems, Components and Equipment," Subsection 3.8.4.3.10, which addresses the relationship between the rain load and snow load for the Reactor and/or Control Building (CRB) roofs for extreme liquid winter precipitation loads.

2. Normal Roof Snow Load

- a. Subsection 3.8.4.3.10, which addresses the relationship between the rain load and snow load, and
- b. Subsections 3.8.4.3.16, 3.8.4.4.1, 3.8.4.4.2, and 3.8.5.5.5 because snow load appears to be considered in various other design analyses.

3. Extreme Roof Snow Load

- a. Subsections 3.8.4.3.10, 3.8.4.3.16, 3.8.4.4.1, 3.8.4.4.2, and 3.8.5.5.5 for the reasons indicated above under Normal Roof Snow Load.

4. 100-year Return Period 3-Second Gust Wind Speed

- a. Section 3.3.3 because it relates to evaluating the interaction of failures of Non-Seismic Category 1 structures with Seismic Category I structures.

5. Design Basis Tornado

- a. Subsections 3.3.2.2 and 3.3.2.3 because these are subsections in which the effects of extreme winds due to tornadoes are considered.

6. Tornado Missile Spectra

- a. Subsections 3.3.2.3, 3.5.2, 3.5.3.1, and 3.5.3.2 because these are subsections in which the effects of tornado missiles are considered.

7. Maximum Wind Speed Design Basis Hurricane

- a. Subsection 3.1.1.2 for consistency with Design Basis Tornado; and

- b. Subsections 3.3.2.2 and 3.3.2.3 because these are subsections in which the effects of extreme winds due to hurricanes are considered.
- 8. Hurricane Missile Spectra
 - a. Subsections 3.3.2.3, 3.5.2, 3.5.3.1, and 3.5.3.2 because these are subsections in which the effects of hurricane missiles are considered.
- 9. Summer Outdoor Design Dry Bulb Temperature
 - a. Subsection 9.4.1.1 because this subsection describes the design bases for the Control Room Ventilation System.
- 10. Winter Outdoor Design Dry Bulb Temperature
 - a. FSAR Chapter 9, "Auxiliary Systems," Subsection 9.4.1.1 because this subsection describes the design bases for the Control Room Ventilation System.
- 11. Summer Outdoor Wet Bulb Temperature (Coincident, Non-Coincident)
 - a. Subsection 9.4.1.1 because this subsection describes the design bases for the Control Room Ventilation System.

NuScale Response:

NuScale will take this feedback under advisement.

- (2) Applicant modified Design Basis Tornado site parameter descriptions in FSAR Tier 2, Table 2.0-1, "Site Design Parameters," to be consistent with RG 1.76. Similar revisions should be made to the corresponding descriptions in FSAR Tier 1, Table 5.0-1, "Site Design Parameters."

NuScale Response:

NuScale will consider making these changes in the FSAR and submit to the NRC via a self-initiated letter (as opposed to an RAI response letter).

- (3) Consistent terminology should be used throughout the FSAR when referring to same plant feature or boundary for dispersion modeling and dose calculation purposes (i.e., EAB, site owner controlled area boundary, site owner controlled area fence, site boundary, site owner controlled area boundary, owner controlled area).

NuScale Response:

NuScale will take this feedback under advisement.

Question 02.03.01-3

- (1) There are inconsistencies in the proposed revisions to FSAR Tier 2, Subsections 3.8.4.3.10 and 3.8.4.3.11 between the responses to Questions 02.03.01-2 and 02.03.01-3.

NuScale Response:

NuScale will take this feedback under advisement.

- (2) The proposed site parameter values in FSAR Tier 1, Table 5.0-1 and FSAR Tier 2, Table 2.0-1 were not changed from roof snow loads to ground snow loads as requested in 02.03.01-3(c).

NuScale Response:

NuScale will take this feedback under advisement.

- (3) The proposed roof and/or ground snow load site parameters values are likely to be exceeded in many of the northern tier states of the contiguous U.S., at locations in higher elevations in the western U.S. and some eastern U.S. States, and many locations in the State of Alaska.

NuScale Response:

NuScale will take this feedback under advisement.

- (4) FSAR Tier 2, Subsection 3.4.2.2 states the Reactor Building (RXB) has a gabled roof with no parapets on the top, flat section, implying that the RXB will not have undesirable buildup of standing water. The staff is concerned that there may be parapets on the north and south sloping portions of the roof and, if so, what the maximum depth of standing water would be.

NuScale Response:

NuScale noted there are no parapets in the RXB design.

- (5) FSAR Tier 2, Table 3.2-1 indicates that various valve systems in the Turbine Generator Building (TGB) are designated as Seismic Category I Structures, Systems, Components (SSCs). The staff would like to know whether this designation applies to the valve systems only and/or the TGB itself. No clear indication is given in FSAR Tier 2, Chapter 1, "Introduction and General Description of the Plant," Subsection 1.2.2.5.1. If the TGB is designated as a Seismic Category I structure, the staff would like to know:
- a. Whether an Importance Factor of 1.2 or 1.0 applies in determining roof snow loads.
 - b. Whether parapets, roof scuppers, and/or other liquid precipitation drainage systems that could become clogged or blocked are present; if yes, what would be the resulting maximum depth of standing water on the TGB roof.

NuScale Response:

NuScale explained that there were no Seismic I SSC in the Seismic III turbine building.

- (6) FSAR Tier 2, Subsection 3.4.2.2 (as revised) states that the CRB roof is a sloped steel structure with scuppers in the parapet and an additional drainage pipe that limits the average water depth on the CRB roof to a maximum of 4 inches (21 pounds per square foot

(psf)). The staff is concerned whether this drainage pipe is susceptible to potential blockage from an antecedent snowpack; if yes, what would be the maximum depth of standing water (as opposed to the average) on the CRB roof.

NuScale Response:

NuScale confirmed during the phone call that on the CRB roof the average water depth would be a maximum of 4 inches, and stated that the maximum depth will not exceed 8 inches.

Question 02.03.01-4

- (1) The current designation “Conforms” for Issue II.F (Tornado Design Basis) under the column heading “Conformance Status” in FSAR Tier 2, Table 1.9-8 (Conformance with SECY-93-087) should be changed to “Partially Conforms.” Language in SECY-93-007 is not accurate in this case but for the Advisory Committee on Reactor Safeguards’ (ACRS’) agreement with that SECY and Applicant’s use of the best available data in the form of the current DBT parameters in RG 1.76.

NuScale Response:

NuScale will consider making these changes in the FSAR and submit to the NRC via a self-initiated letter (as opposed to an RAI response letter).