

## NuScaleDCRaisPEm Resource

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**Sent:** Tuesday, July 25, 2017 9:02 AM  
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**Subject:** Request for Additional Information No. 102, RAI 8925 (13.03)  
**Attachments:** Request for Additional Information No. 102 (eRAI No. 8925).pdf

Attached please find NRC staff's request for additional information concerning review of the NuScale Design Certification Application.

Please submit your technically correct and complete response within 60 days of the date of this RAI to the NRC Document Control Desk.

If you have any questions, please contact me.

Thank you.

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U.S. Nuclear Regulatory Commission  
301-415-0546

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## Request for Additional Information No. 102 (eRAI No. 8925)

Issue Date: 07/25/2017

Application Title: NuScale Standard Design Certification - 52-048

Operating Company: NuScale Power, LLC

Docket No. 52-048

Review Section: 13.03 - Emergency Planning

Application Section: FSAR, 13.3 - Emergency Planning

### QUESTIONS

#### 13.03-1

In accordance with 10 CFR 50.47(b)(8) and paragraph IV.E.8 to Appendix E of 10 CFR Part 50, respectively, adequate emergency facilities and equipment to support the emergency response shall be provided and maintained, and adequate provisions shall be made and described for emergency facilities and equipment. In the Design Certification Application (DCA), Final Safety Analysis Report (FSAR) Tier 2, Chapter 13, "Conduct of Operations," Section 13.3, "Emergency Planning," the applicant stated that the NuScale design includes, "design features, facilities, and equipment that are usable for multiple NuScale Power Modules to support emergency response functions."

The staff requests that NuScale explain what is implied by the term "multiple", and if the design features are only usable for a certain number of modules or pertain to an entire site.

#### 13.03-2

The regulatory requirements for a Technical Support Center (TSC) are found in 10 CFR 50.47(b)(8), Subsection IV.E.8 in Appendix E to 10 CFR Part 50, and 10 CFR 50.34(f)(2)(xxv). Associated guidance is described in NUREG-0696, "Functional Criteria for Emergency Response Facilities," Section 2, and in Supplement 1 to NUREG-0737, "Clarification of TMI Action Plan Requirements," Section 8.2.

##### i. Structure

Section 2.5 of NUREG-0696 states that the TSC should be able to withstand the most adverse conditions (100-year-recurrence frequency wind and flood) and well-engineered to withstand earthquakes. Supplement 1 to NUREG-0737, Section 8.2.1.d, notes that it should be structurally built in accordance with the Uniform Building Code. However, FSAR Tier 2, Section 13.3 appears to be silent on the structural features of the TSC.

The staff requests that NuScale describe the structural features of the TSC as they relate to Section 2.5 of NUREG-0696 and Supplement 1 to NUREG-0737, Section 8.2.

##### ii. Habitability and Comparability to MCR

Section 2.6 of NUREG-0696 states that the TSC shall have the same radiological habitability as the main control room (MCR) under accident conditions. In addition, NUREG-0737 states, in part, that the TSC shall meet the requirements of General Design Criteria 19 (5 rem whole body) for the duration of the accident and have radiation monitoring equipment available to measure those radiation levels. However, FSAR Tier 2, Section 13.3, does not specifically state whether the TSC can protect personnel from direct, airborne, in-plant radiological hazards under accident conditions in a manner that is equivalent to the MCR.

The staff requests that NuScale clarify if the TSC will be able to protect personnel from direct, airborne, in-plant radiological hazards under accident conditions in a manner that is equivalent to the MCR, as specified in Section 2.6 of NUREG-0696. If yes, then NuScale is to explain how those design features are met for the TSC facility and either reference the pertinent discussion in the FSAR, or provide revisions to FSAR text, to clearly document the basis for TSC radiological habitability. If no, then NuScale is to explain why those design features do not need to be met for the TSC facility.

iii.. Relocating function if TSC is evacuated

FSAR Tier 2, Section 13.3 states, in part: "In the event of a loss of ventilation, or if the TSC becomes otherwise uninhabitable, personnel are evacuated and the TSC function is transferred to an alternate location."

The staff requests that NuScale describe where the TSC function will be transferred to if the TSC is evacuated, and the capabilities of this alternate location to perform TSC functions.

iv. Diagram of location

FSAR Tier 2, Section 13.3 states, in part, that the TSC is located on the 100-ft elevation of the control building. The FSAR also states that the walking time between the entrance of the MCR and the entrance of the TSC does not exceed 2 minutes.

The staff requests that NuScale identify where, if any, a diagram exists that displays this plant layout for the technical staff's review to ensure consistency with Section 2.2 of NUREG-0696.

### 13.03-3

Relevant regulations pertaining to emergency preparedness instrumentation, data system equipment, and power supplies include 10 CFR 50.47(b)(8), Subsection IV.E.9 in Appendix E to 10 CFR Part 50, and Subsection VI in Appendix E to 10 CFR Part 50. Instrumentation, data system equipment, and power supplies must be in place to provide data retrieval capabilities of safety parameters during accident conditions and the communication of emergency response data system (ERDS) parameters to the NRC as identified in Sections 2.8 and 2.9 of NUREG-0696 and Supplement 1 to NUREG 0737, Section 8.2.1.h.

- i.. FSAR Tier 2, Section 13.3 states, in part: "The TSC includes a safety display and indication system as discussed in Section 7.2.14." However, neither Section 13.3 nor 7.2.14 provides a clear indication or description regarding how the safety display indication system (SDIS) relates to applicable EP functions and how these functions are achieved.

The staff requests that NuScale describe the data retrieval capabilities of the SDIS for the NuScale design, as compared to the traditional Safety Parameter Display System (SPDS) and Emergency Response Data System (ERDS) for traditional light water reactors. The staff also requests that NuScale explain the design features and characteristics of those system(s) as related to ensuring that appropriate displays and instrumentation are in place to display and receive parameters during accident conditions (e.g. meteorological data, radiation monitors-stationary and/or designated portable monitoring) within the TSC.

- ii. Section 2.8 of NUREG-0696 states that the TSC must contain primary and backup power in order to maintain continuity of TSC functions and to immediately resume data acquisition, storage, and display of TSC data in the event of a loss of power and/or if the TSC becomes uninhabitable.

The staff requests that NuScale describe the backup power capabilities of the NuScale design as they pertain to instrumentation and data system equipment associated with the TSC.

- iii. FSAR Tier 2, Section 13.3 states, in part: "An emergency response data system compliant with section VI of 10 CFR 50 Appendix E, provides a direct near-real time electronic data link of selected parameters between the onsite computer system and the NRC Operations Center in the event of an emergency."

Table 7.1-7, "Summary of Type A, B, C, D, and E Variables," in FSAR Tier 2, Section 7.2.15 appears to contain the variables monitored by the Module Protection System (MPS) and the Plant Protection System (PPS). However, neither FSAR Section 13.3 nor 7.2.15 provides a clear discussion on ERDS data variables.

The staff requests that NuScale provide discussions to confirm that the capability exists for the data variables identified in FSAR Table 7.1-7 to be communicated to the NRC as specified in Sections 2.8 and 2.9 of NUREG-0696 and Supplement 1 to NUREG-0737, Section 8.2.1.

### 13.03-4

In accordance with 10 CFR 50.47(b)(8) and subsection IV.E.8 in Appendix E to 10 CFR Part 50, respectively, adequate emergency facilities and equipment to support the emergency response shall be provided and maintained, and adequate

provisions shall be made and described for emergency facilities and equipment, including a licensee emergency operations facility (EOF) from which effective direction can be given and effective control can be exercised during an emergency.

COL Item 13.3-2 in FSAR Tier 2, Section 13.3 states: "A COL applicant that references the NuScale Power Plant design certification will provide a description of a near-site emergency operations facility for management of overall licensee emergency response and which complies with the guidance in NUREG-0696, "Functional Criteria for Emergency Response Facilities." However, this COL Item does not include a provision for conformance to the updated performance-based EOF guidance in NSIR/DPR/ISG-01, Section VI.I, which supplemented NUREG-0696, or Supplement 1 to NUREG-0737, Section 8.4.

The staff requests that NuScale consider revision of COL Item 13.2-2 to include a provision for conforming to the guidance in NSIR/DPR/ISG-01, in addition to NUREG-0696 and Supplement 1 to NUREG-0737, or explain why this conformance is not necessary.

It should also be noted that the 2011 final rule, "Enhancements to Emergency Preparedness Regulations" (76 FR 72598; November 23, 2011), removed the reference to the EOF as a "near site" facility and provided, instead, performance-based criteria for EOFs.