



April 11, 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 Response to NRC Request for Additional Information No. 381 (eRAI No. 9397) on the NuScale Design Certification Application

**REFERENCE:** U.S. Nuclear Regulatory Commission, "Request for Additional Information No. 381 (eRAI No. 9397)," dated March 12, 2018

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. 9397:

- 18-19

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 Steven Mirsky at 240-833-3001 or at [smirsky@nuscalepower.com](mailto:smirsky@nuscalepower.com).

Sincerely,

A handwritten signature in black ink, appearing to read "Zackary W. Rad".

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

Distribution: Samuel Lee, NRC, OWFN-8G9A  
Prosanta Chowdhury NRC, OWFN-8G9A  
Demetrius Murray, NRC, OWFN-8G9A

Enclosure 1: NuScale Response to NRC Request for Additional Information eRAI No. 9397



**Enclosure 1:**

NuScale Response to NRC Request for Additional Information eRAI No. 9397

---

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

**eRAI No.:** 9397

**Date of RAI Issue:** 03/12/2018

---

### **NRC Question No.:** 18-19

Title 10 of the *Code of Federal Regulations* (10 CFR) Section 52.47(a)(8) requires an applicant for a design certification to provide a final safety analysis report (FSAR) that must include 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). Section 10 CFR 50.34(f)(2)(iii) requires an applicant to "Provide, for Commission review, a control room design that reflects state-of-the-art human factor principles prior to committing to fabrication or revision of fabricated control room panels and layouts." Chapter 18, "Human Factors Engineering," of NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR Edition," and NUREG-0711, "Human Factors Engineering Program Review Model," identify criteria the staff uses to evaluate whether an applicant meets the regulation. The applicant stated in the FSAR, Tier 2, Section 18.0, "Human Factors Engineering - Overview," that its human factors engineering (HFE) program incorporates accepted HFE standards and guidelines including the applicable guidance provided in NUREG-0711, Revision 3.

NUREG-0711, Section 11.4.3.6.4, criterion 2 says, "To assure that the participants' performance is representative of plant personnel, the applicant's training of participants should result in near asymptotic performance (i.e., stable, not significantly changing from trial to trial) and should be tested for such before conducting the validation."

In Section 4.6.4 of the V&V IP the applicant states, "To assure near-asymptotic performance and a consistent level of proficiency between individuals making up the operating crews, only participants who have successfully completed the training program and have reached an acceptable level of proficiency are considered to be qualified for operating crew assignment." Please clarify how participants' proficiency levels will be assessed prior to conducting validation testing.

---

### **NuScale Response:**

The Integrated System Validation (ISV) participants (i.e. ISV plant personnel) are given approximately 9 weeks of classroom training consisting of approximately 56 classroom lectures

---



to provide an in-depth level of knowledge of the NuScale design. The areas of instruction during this time include generic fundamentals, introductions to NuScale design, NuScale Power Module, primary systems, balance of plant systems, electrical systems, instrumentation and control systems, plant administration including Technical Specifications, integrated operation, and emergency operation. Throughout this phase, the ISV participants are assessed through periodic written examinations to ensure a consistent baseline knowledge level within the ISV participant group. Remediation is provided to address knowledge deficiencies.

The ISV plant personnel training also includes approximately 10 weeks of simulator training on the NuScale conduct of operations and plant operations. The areas of instruction during this simulator training phase are conduct of operations, normal operations, plant startup, plant shutdown, reactor trip, reactor trip with abnormalities, module casualties, plant casualties, site casualties, and safety function failures. Throughout this phase, the ISV participants are assessed through periodic monitored dynamic simulator scenarios including a final audit examination that is administered similar to an ISV examination scenario.

The monitored scenarios evaluate plant personnel performance to assure near-asymptotic performance. The monitored scenario scoring assesses both individual and crew performance. Participants will be assessed in the areas of task performance, system knowledge, and Conduct of Operations implementation such as communication standards and use of human performance tools. Crews will be assessed in the areas of crew communication, and group task performance. Remediation is provided commensurate with the issues identified.

The ISV Test Team and NuScale management review the exam scores and monitored scenario performance. This group will determine if the participant has successfully completed the training program and is considered to be qualified for operating crew assignment.

#### **Impact on DCA:**

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