



April 24, 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. 379 (eRAI No. 9381) on the NuScale Design Certification Application

**REFERENCE:** U.S. Nuclear Regulatory Commission, "Request for Additional Information No. 379 (eRAI No. 9381)," dated March 09, 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. 9381:

- 18-15

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. 9381



**Enclosure 1:**

NuScale Response to NRC Request for Additional Information eRAI No. 9381

---

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

**eRAI No.:** 9381

**Date of RAI Issue:** 03/09/2018

---

**NRC Question No.:** 18-15

Title 10 of the *Code of Federal Regulations* (10 CFR) Section 52.47(a)(8) requires an applicant for a design certification to provide an FSAR [Final Safety Analysis Report] which includes 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), with certain exceptions. Section 10 CFR 50.34(f)(2)(ii) requires an applicant to "Establish a program, to begin during construction and follow into operation, for integrating and expanding current efforts to improve plant procedures. The scope of the program shall include.....human factors engineering..." The current NRC guidance for developing a human factors engineering (HFE) program is NUREG-0711, Rev 3, "Human Factors Engineering Program Review Model."

Section 4.3 of NUREG-0711 indicates that an RSR [results summary report] should include "the set of safety functions for the facility."

Table 3-1 of the functional requirements analysis (FRA)/ function allocation (FA) RSR provides a list of "NuScale plant functions." It is not clear which are the safety functions (as defined in the glossary to NUREG-0711) identified by this analysis, as opposed to functions supporting other high-level goals (such as power generation or physical security). Similarly, it is not clear if those items shown on the Table 3-1 constitute the complete set of safety functions (much of the RSR uses sampling of results rather than inclusive lists).

1. Please clarify which of the NuScale Plant functions on Table 3-1 of the FRA/FA RSR are considered safety functions. If there are any safety functions that are not included on Table 3-1, please identify them or indicate that there are no additional safety functions that are not already included on the table.
2. Please clarify the relationship of the safety functions identified in the FRA/FA process to the "critical safety functions" identified in other human factors RSRs and elsewhere in the design certification application, such as Chapter 7 and Chapter 13.

**NuScale Response:**Item 1 response:

RP-0316-17615, Human Factors Engineering Functional Requirements Analysis and Function Allocation Results Summary Report (HFE FRA/FA RSR), Table 3-1, identifies all NuScale plant functions and design features. Of these functions, the following are considered "safety functions" or "critical safety functions":

- maintain containment integrity
- reactivity control
- remove fuel assembly heat

Item 2 response:

RP-0316-17615, HFE FRA/FA RSR, uses the term "safety function" in Appendices B and C for the safety functions of "reactivity control" and "fuel assembly heat removal," respectively. In TR-1117-57216, Generic Technical Guidelines, Table 1-2, the definition of safety function is: "A function defined by the plant design that maintains the unit in a safe shutdown condition and provides mitigating actions for accidents that cause core damage or release of radioactivity. The NuScale design has three safety functions defined: (1) maintain containment integrity, (2) reactivity control, and (3) remove fuel assembly heat." In FSAR Section 7.1.1.2.2, the following three critical safety functions are identified as:

- reactivity control
- remove fuel assembly heat
- containment integrity

The term "safety function(s)," which is identified in the FRA/FA process and the NuScale Generic Technical Guidelines, is equivalent to "critical safety functions" identified elsewhere in the design certification application.

**Impact on DCA:**

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