



January 22, 2018

Docket No. 52-048

U.S. Nuclear Regulatory Commission  
ATTN: Document Control Desk  
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11555 Rockville Pike  
Rockville, MD 20852-2738

**SUBJECT:** NuScale Power, LLC Response to NRC Request for Additional Information No. 316 (eRAI No. 9222) on the NuScale Design Certification Application

**REFERENCE:** U.S. Nuclear Regulatory Commission, "Request for Additional Information No. 316 (eRAI No. 9222)," dated January 02, 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. 9222:

- 09.01.01-19

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 Carrie Fosaaen at 541-452-7126 or at [cfosaaen@nuscalepower.com](mailto:cfosaaen@nuscalepower.com).

Sincerely,

A handwritten signature in black ink, appearing to read 'Zackary W. Rad', written over a horizontal line.

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

Distribution: Gregory Cranston, NRC, OWFN-8G9A  
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Enclosure 1: NuScale Response to NRC Request for Additional Information eRAI No. 9222



RAIO-0118-58286

**Enclosure 1:**

NuScale Response to NRC Request for Additional Information eRAI No. 9222

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

**eRAI No.:** 9222

**Date of RAI Issue:** 01/02/2018

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**NRC Question No.:** 09.01.01-19

Title 10 of the *Code of Federal Regulations* (10 CFR), Section 50.68, “Criticality accident requirements,” provides the regulatory requirements for maintaining subcriticality in the spent fuel pool. General Design Criterion (GDC) 61, “Fuel storage and handling and radioactivity control,” in Appendix A to 10 CFR Part 50, requires, in part, that the fuel storage and handling systems shall be designed to assure adequate safety under normal and postulated accident conditions, including a capability to permit appropriate periodic inspection and testing of components important to safety. The applicant has chosen to incorporate neutron absorbing material into the design of the spent fuel racks to maintain subcriticality and to assure adequate safety. To meet GDC 61, Standard Review Plan (SRP) Section 9.1.2, “New and Spent Fuel Storage,” specifies that provisions for inspection and testing are necessary to verify that there is no degradation of any strong fixed neutron absorbers. Furthermore, 10 CFR 50.36, “Technical specifications,” requires an applicant or licensee to establish administrative controls in the technical specifications (TS) that will assure operation of the facility in a safe manner.

TS 5.5.12, part (a) states that the spent fuel storage rack neutron absorber monitoring program shall include periodic physical examination or neutron attenuation testing; however, the coupon monitoring program description in technical report TR-0816-49833-P, “Fuel Storage Rack Analysis,” Revision 0, specifies that at least one coupon shall be removed at specified intervals to be measured, visually examined, and to undergo boron-10 ( $^{10}\text{B}$ ) areal density measurement. Therefore, TS 5.5.12, part (a) must include periodic physical examination and neutron attenuation testing.

Furthermore, the phrase “provide the credited criticality control” in parts (a) and (c) of TS 5.5.12 is too vague to constitute an acceptance criterion to ensure the safety function of the neutron absorbing material is maintained, which leaves questions as to how compliance with 10 CFR 50.68 will be ensured. The staff requests more specific acceptance criteria that will ensure the acceptability of the measured  $^{10}\text{B}$  areal density, as it is a key assumption in the criticality analysis. The applicant’s technical report TR-0816-49833-P, Section 3.4.1.3.4 already defines the acceptance criteria for  $^{10}\text{B}$  areal density coupon measurements.

Finally, part (b) of TS 5.5.12 calls for establishment of performance-based frequencies for examination or testing based on observed trends or calculated projections of neutron absorber degradation, not to exceed 10 years. However, the applicant has not specified the neutron

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absorbing material to be used, and as such, there is uncertainty in how the material will behave while in service. In technical report TR- 0816-49833-P, Section 3.4.1.3.4 already defines the sampling schedule for the neutron coupon monitoring program. A 10-year inspection interval is not consistent with the sampling schedule. TS 5.5.12 part (b) should be revised to reflect the licensing basis described in TR-0816-49833-P.

Therefore, please revise TS 5.5.12 as follows:

- a. Update TS 5.5.12 part (a) to include periodic physical examination and neutron attenuation testing.
- b. Provide specific acceptance criteria for the neutron absorber measured  $^{10}\text{B}$  areal density.
- c. Update the sampling intervals in accordance with TR-0816-49833-P.

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#### **NuScale Response:**

NuScale has revised TS 5.5.12 to require a Spent Fuel Rack Neutron Absorber Monitoring Program that conforms with NEI 16-03-A, Revision 0, "Guidance for Monitoring of Fixed Neutron Absorbers in Spent Fuel Pools", dated May 2016. The NRC staff found that NEI 16-03-A, Revision 0 was acceptable for referencing in licensing applications for nuclear power plants to the extent specified in the final SE as described in ADAMS Accession No. ML16354A486.

COL holders will be required to implement the programs described in TS 5.5 consistent with the facility operating license requirements and the licensing basis. The contents of TR-0816-49833-P form part of the licensing basis and will be addressed in the program prepared by the COL applicants, consistent with the program description specified in the TS.

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

The Technical Specifications have been revised as described in the response above and as shown in the markup provided in this response.

## 5.5 Programs and Manuals

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### 5.5.11 Surveillance Frequency Control Program (continued)

- b. Changes to the Frequencies listed in the Surveillance Frequency Control Program shall be made in accordance with NEI 04-10, "Risk-Informed Method for Control of Surveillance Frequencies," Revision 1.
- c. The provisions of Surveillance Requirements 3.0.2 and 3.0.3 are applicable to the Frequencies established in the Surveillance Frequency Control Program.

### 5.5.12 Spent Fuel Storage Rack Neutron Absorber Monitoring Program

This Program provides controls for monitoring the condition of the neutron absorber used in the spent fuel pool storage racks to verify the neutron absorber density is consistent with the assumptions in the spent fuel pool criticality analysis. The program shall be in accordance with NEI 16-03-A, "Guidance for Monitoring of Fixed Neutron Absorbers in Spent Fuel Pools," Revision 0, May 2017. ~~This program provides controls for monitoring spent fuel storage racks that utilize neutron absorbing materials that are credited in the spent fuel storage rack criticality safety analysis to ensure the neutron absorbing material continues to provide the credited criticality control. The program shall include the following:~~

- ~~a. Periodic physical examination or neutron attenuation testing of representative coupons or in situ storage racks to ensure the spent fuel rack neutron absorber materials provide the credited criticality control;~~
  - ~~b. Establishment of performance-based frequencies for examination or testing based on observed trends or calculated projections of neutron absorber degradation, not to exceed 10 years; and~~
  - ~~c. Corrective actions to be taken if the neutron absorbing materials do not provide the credited criticality control.~~
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