

NuScaleDCRaisPEm Resource

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Sent: Tuesday, January 02, 2018 4:03 PM
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Subject: Request for Additional Information No. 316 RAI No. 9222 (9.1.1)
Attachments: Request for Additional Information No. 316 (eRAI No. 9222).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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301-415-0546

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Request for Additional Information No. 316 (eRAI No. 9222)

Issue Date: 01/02/2018

Application Title: NuScale Standard Design Certification - 52-048

Operating Company: NuScale Power, LLC

Docket No. 52-048

Review Section: 09.01.01 - Criticality Safety of Fresh and Spent Fuel Storage and Handling

Application Section: 9.1.1

QUESTIONS

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}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}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}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 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}B areal density.
- c. Update the sampling intervals in accordance with TR-0816-49833-P.

