

## NuScaleDCRaisPEm Resource

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**Sent:** Friday, May 26, 2017 4:30 PM  
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**Cc:** NuScaleDCRaisPEm Resource; Lee, Samuel; Chowdhury, Prosanta; Samaddar, Sujit; Roche-Rivera, Robert  
**Subject:** RE: Request for Additional Information No. 38, RAI 8838  
**Attachments:** Request for Additional Information No. 38 (eRAI No. 8838).pdf

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

Please submit your 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.

Gregory Cranston, Senior Project Manager  
Licensing Branch 1 (NuScale)  
Division of New Reactor Licensing  
Office of New Reactors  
U.S. Nuclear Regulatory Commission  
301-415-0546

**Hearing Identifier:** NuScale\_SMR\_DC\_RAI\_Public  
**Email Number:** 50

**Mail Envelope Properties** (16b7e14d88e34d83933109b6457fdda2)

**Subject:** RE: Request for Additional Information No. 38, RAI 8838  
**Sent Date:** 5/26/2017 4:29:33 PM  
**Received Date:** 5/26/2017 4:29:34 PM  
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<b>Files</b>	<b>Size</b>	<b>Date &amp; Time</b>
MESSAGE	522	5/26/2017 4:29:34 PM
Request for Additional Information No. 38 (eRAI No. 8838).pdf		30142

**Options**

**Priority:** Standard  
**Return Notification:** No  
**Reply Requested:** No  
**Sensitivity:** Normal  
**Expiration Date:**  
**Recipients Received:**

## Request for Additional Information No. 38 (eRAI No. 8838)

Issue Date: 05/26/2017

Application Title: NuScale Standard Design Certification - 52-048

Operating Company: NuScale Power, LLC

Docket No. 52-048

Review Section: 03.08.04 - Other Seismic Category I Structures

Application Section: 3.8.4

### QUESTIONS

#### 03.08.04-1

Title 10 of the Code of Federal Regulations, Part 50, Appendix A, Criterion 2 requires, in part, that SSCs important to safety are designed to withstand the effects of earthquakes without the loss of capability to perform their safety functions. The design bases for these SSCs shall reflect: (1) the severity of the historical reports, with sufficient margin to cover the limited accuracy, quantity, and time period for the accumulated data, (2) appropriate combinations of the effects of normal and accident conditions with the effects of the natural phenomena, and (3) the importance of the safety functions to be performed. DSRS Sections 3.7.2 and 3.8.4 provide review guidance pertaining to the seismic analysis, including interaction of the non-seismic Category I structures with seismic Category I SSCs, and structural design, including consideration of seismic loads, respectively.

FSAR Section 9.1.5.2.3 describes refueling operations including, in part: (1) the placement and restraining of a bioshield on an adjacent bioshield; (2) the use of a containment vessel (CNV) flange tool (CFT) and reactor vessel (RPV) flange tool (RFT) for de-tensioning flange closure bolts and as structural supports during refueling operations; and (3) the placement of the upper CNV with the upper RPV still attached on the module inspection rack in the flooded dry dock.

To assist the staff in evaluating the compliance of the aforementioned components with the above regulatory requirements the staff request the applicant to provide the following information and include these information in the FSAR (Sections 3.7 and 3.8, as applicable).

- (1) Describe the method/mechanism for restraining a bioshield mounted on an adjacent bioshield and restraining the upper CNV on the module inspection rack during the refueling operations. Further, provide analysis and design criteria (consistent with DSRS Section 3.7.2.II.8) to ensure no adverse interactions occur between the seismic Category II bioshields and inspection racks with adjacent seismic Category I SSCs, during refueling operations (and during the transport of new modules, as applicable).
- (2) For the seismic Category II CFT, a description of the CFT geometry, weight (with and without the lower CNV), structural materials, separation distance between the CFT and the RFT and surrounding walls, connection to the basemat, and analysis and design criteria (consistent with DSRS Section 3.7.2.II.8) to ensure no adverse interactions occur between the CFT and adjacent seismic Category I SSCs during refueling operations.
- (3) For the seismic Category I RFT, design information including geometry, weight (with and without the RPV lower head), separation distance between RFT and surrounding walls, connection to the basemat, applicable design codes, standards, and specifications, design and analysis procedures, structural acceptance criteria, materials, quality control, special construction techniques (as applicable) and quality assurance requirements, testing and in-service surveillance programs, and ITAAC (as applicable). Further, provide the seismic input (ISRS and acceleration time histories) at the base of the RFT, and at lower and upper core plate (if any) elevations while mounted on the RFT. Additionally, provide a description of how the seismic input motion is transferred from the RFT base elevation to the lower and upper core plate (if any) elevations.