

NuScaleDCRaisPEm Resource

From: Cranston, Gregory
Sent: Friday, August 04, 2017 6:32 PM
To: RAI@nuscalepower.com
Cc: NuScaleDCRaisPEm Resource; Lee, Samuel; Chowdhury, Prosanta; Samaddar, Sujit; Roche-Rivera, Robert; Vera Amadiz, Marieliz
Subject: RE: Request for Additional Information No. 129, RAI 8967 (3.8.4)
Attachments: Request for Additional Information No. 129 (eRAI No. 8967).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. The NRC Staff recognizes that NuScale has preliminarily identified that the response to one or more questions in this RAI is likely to require greater than 60 days. NuScale is expected to provide a schedule for the RAI response by email within 20 days.

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: 151

Mail Envelope Properties (060dbe9f04de4315ae01d0c2177040b2)

Subject: RE: Request for Additional Information No. 129, RAI 8967 (3.8.4)
Sent Date: 8/4/2017 6:32:11 PM
Received Date: 8/4/2017 6:32:15 PM
From: Cranston, Gregory

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Post Office: HQPWMSMRS08.nrc.gov

Files	Size	Date & Time
MESSAGE	812	8/4/2017 6:32:15 PM
Request for Additional Information No. 129 (eRAI No. 8967).pdf		93150

Options

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

Request for Additional Information No. 129 (eRAI No. 8967)

Issue Date: 08/04/2017

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:

QUESTIONS

03.08.04-4

10 CFR 50, Appendix A, GDC 1, 2, and 4, provide requirements to be met by SSC important to safety. In accordance with these requirements, DSRS Section 3.8.4 provides review guidance pertaining to the design of seismic Category I structures, other than the containment. Consistent with DSRS Section 3.8.4, the staff reviews description of the structures, loads and loading combinations, and design and analysis procedures.

FSAR Section 3B.2.3.3 states "Pilasters are added to the exterior walls of the RXB structure to increase the capacity at the corners and stiffness of the walls between the corners. The phrase "to increase the capacity at the corners" is unclear to the staff as to what kind of capacity. Clarify the failure mode and structural demand for which the corner pilasters provide additional capacity. Also, clarify whether the phrase, "to increasestiffness of the walls between the corners," refers to additional wall strength provided by the pilasters. Describe the failure mode and structural demand for which the pilasters provide additional wall strength, as applicable.

03.08.04-5

10 CFR 50, Appendix A, GDC 1, 2, and 4, provide requirements to be met by SSC important to safety. In accordance with these requirements, DSRS Section 3.8.4 provides review guidance pertaining to the design of seismic Category I structures, other than the containment. Consistent with DSRS Section 3.8.4, the staff reviews description of the structures, loads and loading combinations, and design and analysis procedures.

FSAR Section 3B.2.3.3 states "In the finite element model, the pilasters are modeled with frame elements with stiffness properties that represent the combined action of the walls (modeled with shell elements) and the pilasters." Describe the process to establish the frame stiffness properties that represent the combined action of the walls and the pilasters. Describe what portion of the wall contributes to the frame element stiffness properties.

03.08.04-6

10 CFR 50, Appendix A, GDC 1, 2, and 4, provide requirements to be met by SSC important to safety. In accordance with these requirements, DSRS Section 3.8.4 provides review guidance pertaining to the design of seismic Category I structures, other than the containment. Consistent with DSRS Section 3.8.4, the staff reviews description of the structures, loads and loading combinations, and design and analysis procedures.

FSAR Section 3B.2.3.3 states "Bending about the weak axis does not need to be evaluated because the pilaster is an integral part of the wall and bending in that direction is not local behavior. It is part of the in-plane behavior of the wall and the shell elements in this area have adequate reinforcing." Further this section states "If the 5 feet by 10 feet pilaster can resist the resulting loads on its own, the pilaster is considered qualified." Provide the magnitude of loadings (bending moments in both strong and weak

axes, and axial and horizontal forces) at the top of each of the 5' by 10' pilasters and the 4 corner pilasters.

03.08.04-7

10 CFR 50, Appendix A, GDC 1, 2, and 4, provide requirements to be met by SSC important to safety. In accordance with these requirements, DSRS Section 3.8.4 provides review guidance pertaining to the design of seismic Category I structures, other than the containment. Consistent with DSRS Section 3.8.4, the staff reviews description of the structures, loads and loading combinations, and design and analysis procedures.

FSAR Section 3B.2.3.3 states "The shear in the weak axis direction, parallel to the wall, does not need to be evaluated because the in-plane capacity of the wall is capable of accommodating the minor increase." The phrase "the minor increase" in the above sentence is unclear to the staff. Clarify what the source of the "minor increase" is and explain why the shear in the pilaster does not need to be evaluated.