

NuScaleDCRaisPEm Resource

From: Cranston, Gregory
Sent: Saturday, August 05, 2017 11:41 AM
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. 137, RAI 8973 (3.8.4)
Attachments: Request for Additional Information No. 137 (eRAI No. 8973).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

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Request for Additional Information No. 137 (eRAI No. 8973)

Issue Date: 08/05/2017

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

03.08.04-15

10 CFR 50, Appendix A, GDC 1, 2, and 4 provides 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 the descriptive information, including plans and sections of each structure, to establish that there is sufficient information to define the primary structural aspects and elements relied upon for the structure to perform the intended safety function.

Staff review finds that the descriptive information, including plans and sections provided in the FSAR for the RXB and CRB need additional details to assist the staff's evaluation of these structures. Further, the enhancements to the FSAR descriptive information requested below are important for the verification that the as-built RXB and CRB conform to the approved design as per ITAAC in FSAR, Tier 1, Chapter 3.

Therefore, for the plan and section views provided in FSAR, Tier 2, Chapter 1, the staff requests the applicant to enhance the level of details provided in those plan and section views to include overall structure dimensions, and local dimensions such as slab and wall thickness, complete identification of major elevations (e.g. for the RXB, roof elevation, elevation at the intersection of the exterior wall and the roof, and reactor building crane support elevation), and identification of section cuts in the plan views (e.g. identification of the section cuts for the section views shown in FSAR Figure 1.2-19). Also, provide drawings that show how the stiffener walls are supporting the sloping portion of the roof (rigid or hinge or sliding connections between them) and how the stiffener walls are connected with other structural members to transfer loads to the basemat.

Additionally, the staff request the applicant to provide a table identifying wall and floor thicknesses for the CRB in FSAR, Tier 1, Chapter 3. Further, the staff request enhancements to the section views and reinforcement drawings provided in FSAR, Tier 2, Appendix 3B to include missing section cut IDs (e.g. see Figures 3B-8, 3B-11, 3B-15, 3B-19, amongst other); provide missing section cuts that are currently identified in plan or section views [e.g. weir wall reinforcement layout (8 – 1697 – S51; see Figure 3B-11)]; correct inconsistent section cut IDs between the section cut identified in a section view and the respective detail drawing (e.g. section cut in Figure 3B-19 and reinforcement layout in Figure 3B-21; also between 3B-23 and 3B-24; and others); provide development length and concrete clear cover distances in the current reinforcement drawings in FSAR, Tier 2, Appendix 3B. Further, clarify whether the drawing in Figure 3B-47 applies to the section cut identified in Figure 3B-46. If not, provide the applicable drawing.

03.08.04-16

10 CFR 50, Appendix A, GDC 1, 2, and 4 provides 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 the descriptive information, including plans and sections of each structure, to establish

that there is sufficient information to define the primary structural aspects and elements relied upon for the structure to perform the intended safety function.

Figures 1.2-18, 3.8.4-5, 3B-11, 3B-13, 3B-15 (same as 3B-43), 3B-17, 3B-19, 3B-20, show stiffener walls (as described in Appendix 3B) immediately below the sloping portion of the roof and coinciding with the pilaster locations in the east-west direction. Describe the load path from the stiffener walls to the basemat of the reactor building. Augment the details of reinforcement layout figures provided in Appendix B to clearly show the connection between the structural members upon which these stiffener walls are supported and their connection to the roof (e.g. section views also showing the roof reinforcement). Describe how the horizontal components of the inclined seismic forces from the sloping roof plates, are resisted.

03.08.04-17

10 CFR 50, Appendix A, GDC 1, 2, and 4 provides 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 the descriptive information, including plans and sections of each structure, to establish that there is sufficient information to define the primary structural aspects and elements relied upon for the structure to perform the intended safety function.

Figure 3B-30 shows a reinforcement section view (North-South view) for the RXB roof slab. Augment the details provided in this figure to explicitly identify the rebar for the sloping portion of the roof and the rebar for the supporting walls shown in this section view, rebar development length, and concrete clear cover information. Provide an east-west section view with reinforcement details for the roof.

03.08.04-18

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.

Appendix 3B.2.1 for the RXB, indicates the use of W shapes and Tube Steel in the RXB. Describe in the FSAR the locations where these W shapes and Tube Steel are used.

03.08.04-19

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.

The section views in Figures 3B-14 and 3B-42 show wall portions that do not appear to be included in the SAP model section views in Figures 3B-15 and 3B-43, respectively. Clarify and/or correct the inconsistencies between these figures, as applicable.