

NuScaleDCRaisPEm Resource

From: Cranston, Gregory
Sent: Saturday, August 12, 2017 2:19 PM
To: RAI@nuscalepower.com
Cc: NuScaleDCRaisPEm Resource; Lee, Samuel; Chowdhury, Prosanta; Samaddar, Sujit; Neuhausen, Alissa; Markley, Anthony
Subject: RE: Request for Additional Information No. 180, RAI 9010 (9.1.2)
Attachments: Request for Additional Information No. 180 (eRAI No. 9010).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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Licensing Branch 1 (NuScale)
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301-415-0546

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Request for Additional Information No. 180 (eRAI No. 9010)

Issue Date: 08/12/2017

Application Title: NuScale Standard Design Certification - 52-048

Operating Company: NuScale Power, LLC

Docket No. 52-048

Review Section: 09.01.02 - New and Spent Fuel Storage

Application Section: 9.1.2

QUESTIONS

09.01.02-1

10 CFR Part 50, Appendix A, General Design Criteria (GDC) 1, 2, 4, 5, 63, and 10 CFR 52.80(a) provide the regulatory requirements for the design of the new and spent fuel storage facilities. SRP Section 9.1.2 and DSRS Section 3.8.4 Appendix D describe the specific SRP acceptance criteria for the review of the fuel racks to meet the requirements of the Commission's regulations identified above. DSRS 3.8.4 specifically states that dynamic input data such as floor response spectra or ground response spectra are developed using the criteria described in DSRS Section 3.7.1, 3.7.2, 3.7.3, and SRP Section 3.7.4. It also states that the seismic input motion to the racks should consider the spectra at the rack base and the wall of the spent fuel pool. It is acceptable to envelope the seismic motion at these two locations for the input loading to the racks.

The staff reviewed the description of the time history development in TR-0816-49833-P, Section 3.1.2. The staff requests the applicant clarify the steps taken in the development of the time histories for the fuel storage rack analysis. Specifically, the applicant should clarify the purpose of developing a target low frequency (LF) and high frequency (HF) response spectra and describe the enveloping methodology that yields the frequency targeted spectra. The applicant should also describe the basis for selecting one set of time histories to envelop RS (TH1), four sets of time histories for the LF target RS, and two sets of time histories for the HF target RS.

With respect to the identification of the selected wall nodes, in the 1st paragraph of Section 3.1.2.4, the applicant describes the eight nodes selected for time history generation. The paragraph states that nodes represent locations in the SFP walls, up to an elevation of +50 ft-0 in, which is consistent with the Figures 3-3 and 3-4 which show node locations at multiple elevations above the basemat. Also in the same paragraph, the applicant states that the nodal ISRS are enveloped at two elevations, 24 ft. and 50 ft. consistent with Figures 3-6 through 3-14. The applicant should clarify whether nodes are enveloped up to +50 ft-0 in. or at +50 ft-0 in.

Additionally, the nodes located on the basemat (5237 and 5981) appear to be located at the corner and edge of the basemat. Because Figures 3-8, 3-11, and 3-14 show that at some frequencies the ISRS in the Z direction, the acceleration at 24 ft-0 in. exceeds the acceleration at 50 ft-0 in., the applicant should explain why there is no node selected at the center of the SFP at the basemat elevation. The applicant should address the possible amplification in the ISRS due to flexibility of the basemat at this location.

09.01.02-2

10 CFR Part 50, Appendix A, General Design Criteria (GDC) 1, 2, 4, 5, 63, and 10 CFR 52.80(a) provide the regulatory requirements for the design of the new and spent fuel storage facilities. SRP Sections 9.1.2 and DSRS Sections 3.8.4 Appendix D describe the specific SRP acceptance criteria for the review of the fuel racks to meet the requirements of the Commission's regulations identified above.

The applicant should confirm whether the methodology to develop the synthetic time histories, including the spectral matching process, is the same approach used in developing the seismic time histories for the seismic SSI analyses described in FSAR Section 3.7, and if not, identify any differences.

Also, on page 17, in Section 3.1.2.1 of TR-0816-49833-P, the applicant describes the methodology for developing the acceleration time histories. The staff requests the applicant clarify the statement that “damping is not used in the development of the time history.”

Additionally, on page 18, in Section 3.1.2.1, the last paragraph references “DSRS 3.7.1 Subsection II.1.B.II-Approach 2 (ii)”. The staff requests the applicant clarify why “(ii)” is specified after “Approach 2.”