

NuScaleDCRaisPEm Resource

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Sent: Friday, December 15, 2017 9:11 AM
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Subject: Request for Additional Information No. 298 RAI No. 9228 ()3.7.4
Attachments: Request for Additional Information No. 298 (eRAI No. 9228).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 this question in this RAI is likely to require greater than 60 days.

If you have any questions, please contact me.

Thank you.

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U.S. Nuclear Regulatory Commission
301-415-0546

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Request for Additional Information No. 298 (eRAI No. 9228)

Issue Date: 12/15/2017

Application Title: NuScale Standard Design Certification - 52-048

Operating Company: NuScale Power, LLC

Docket No. 52-048

Review Section: 03.07.04 - Seismic Instrumentation

Application Section: 03.07.04

QUESTIONS

03.07.04-2

Appendix S to 10 CFR Part 50 requires that suitable instrumentation be provided for the evaluation of the seismic response of nuclear plant features important to safety after an earthquake. On the public meeting conducted October 10, 2017, to discuss NuScale's response to DCA RAI 8927, Question 03.07.04-1, NRC staff mention the importance regarding the use of the updated Regulatory Guide (RG) 1.12, Revision 3, "Nuclear Power Plant Instrumentation for Earthquakes" and/or the American National Standard (ANS)-2.2-2016, "Earthquake Instrumentation for Nuclear Power Plants." Both of these documents specify the current acceptable means for the placement of seismic instrumentation at a site and in structures (in lieu of RG 1.12, Revision 2, which was published in 1997).

The updated RG 1.12 was first released by the NRC for public comment as a draft DG-1332 in September 2016 (ML16104A220), and the final version became publically available on November 8, 2017 (ML17094A831). The revision to the RG 1.12 incorporates ANS-2.2-2016 and addresses the current state-of-practice for seismic instrumentation that allows for a more reliable evaluation for seismic response of the reactor building (RXB) after an earthquake. Specifically, this would include the following:

A. downhole seismic instrument. NuScale's proposed basemat is located at the depth of 86 ft. below the plant grade. According to RG 1.12, Rev. 3, if the depth of the site specific Ground Motion Response Spectra (GMRS) or Foundation Input Response Spectra (FIRS) exceeds 40 ft. below the plant grade, two free-field seismic instruments are recommended: (a) one located at the ground surface and (b) the second one in the borehole to record ground motion at the elevation corresponding to the GMRS or FIRS.

B. Additional seismic instrumentation on the basemat. Considering the length (approximately 350 ft.) and the irregularity of the weight distribution in the RXB, RG 1.12, Rev. 3, recommends more than one seismic instrument on the basemat for such structures. The instruments should be appropriately placed to record the rocking or torsional responses predicted by the engineering analyses.

In order for the NRC staff to determine if the site, RXB, and CRB are adequately instrumented with seismic monitors in accordance with Appendix S to 10 CFR Part 50, please update Section 3.7.4 consistent with the RG 1.12, Rev. 3, and/or ANS-2.2-2016 recommendations stated above; or provide an equivalent methodology and justification that would meet their intent for the placement of instrumentation that would allow for a reliable evaluation of the RXB's seismic response after an earthquake.

