

## NuScaleDCRaisPEm Resource

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**Sent:** Friday, August 04, 2017 4:28 PM  
**To:** RAI@nuscalepower.com  
**Cc:** NuScaleDCRaisPEm Resource; Lee, Samuel; Chowdhury, Prosanta; Vera Amadiz, Marieliz; Wang, George; Samaddar, Sujit  
**Subject:** RE: Request for Additional Information No. 124, RAI 8981 (3.4.2)  
**Attachments:** Request for Additional Information No. 124 (eRAI No. 8981).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.

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  
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## **Request for Additional Information No. 124 (eRAI No. 8981)**

Issue Date: 08/04/2017

Application Title: NuScale Standard Design Certification - 52-048

Operating Company: NuScale Power, LLC

Docket No. 52-048

Review Section: 03.04.02 - Analysis Procedures

Application Section:

### QUESTIONS

#### 03.04.02-1

10 CFR 50, Appendix, GDC 2 requires, in part, that SSCs important to safety shall be designed to withstand the effects of natural phenomena such as floods, tsunamis, and seiches without loss of capability to perform their safety functions.

a. The staff requests the applicant to provide the analysis procedures utilized to transform the static and dynamic effects of the highest flood and groundwater levels into effective loads applied to seismic Category I structures.

b. In DCD Section 3.4.2 "Protection of Structures against Flood from External Sources," the applicant describes that the lateral hydrostatic pressures on the structures from the design flood, in conjunction with ground water and soil pressure, are factored into the structural design as discussed in Sections 3.7.1 and 3.8.4 of the DCD. The staff did not find the lateral hydrostatic pressures due to the design flood level in the DCD Section 3.7.1. Therefore, the staff requests the applicant to describe where this information is located in the DCD or supplement the DCD to include the lateral hydrostatic pressures due to the design flood level.

#### 03.04.02-2

10 CFR 50, Appendix, GDC 2 requires, in part, that SSCs important to safety shall be designed to withstand the effects of natural phenomena such as floods, tsunamis, and seiches without loss of capability to perform their safety functions.

In DCD Section 3.4.2 "Protection of Structures against Flood from External Sources," the applicant describes that the below grade portions of the Seismic Category I structures provide protection for the safety-related and risk-significant SSCs from groundwater intrusion by utilizing waterstops, waterproofing, damp proofing, and watertight seals.

The staff requests the applicant to provide the specified design life for waterstops, waterproofing, damp proofing, and watertight seals. If the design life is less than the operating life of the plant, the applicant should describe how continued protection will be ensured.

#### 03.04.02-3

10 CFR 50, Appendix, GDC 2 requires, in part, that SSCs important to safety shall be designed to withstand the effects of natural phenomena such as floods, tsunamis, and seiches without loss of capability to perform their safety functions.

In DCD Section 3.8.4.1.1 "Reactor Building," the applicant describes that there is a tunnel provided between the RXB and the CRB, this tunnel is part of the CRB. In DCD Section 3.8.4.1.2 "Control Building," the applicant describes a 6" expansion gap between the end of the tunnel and the corresponding connecting walls on the RXB.

The staff requests the applicant to provide a discussion of how this expansion gap between the end of the tunnel and the corresponding connecting walls on the RXB is prevented from the groundwater intrusion. In addition, the staff requests the applicant to identify whether there are other Seismic Category I buried tunnels, pipes, conduits or duct banks within the scope of the NuScale design certification, and located below the PMF or ground water elevations. The applicant should list these items and describe any measures taken to protect them from the effects of PMF or groundwater.

#### 03.04.02-4

10 CFR 50, Appendix, GDC 2 requires, in part, that SSCs important to safety shall be designed to withstand the effects of natural phenomena such as floods, tsunamis, and seiches without loss of capability to perform their safety functions.

SRP 3.4.2 Acceptance criteria 3 states the dynamic loads of wave action should be considered where the flood level is above the proposed plant grade, and its acceptable procedures for determining such dynamic loads.

In DCD Section 3.4.2.1 "Probable Maximum Flood," the applicant did not provide the finished grade elevation at a truck ramp on the west side of the Radwaste Building and CRB tunnel. Because it is possible that the finished grade elevation in this area might be below the flood level, and because CRB tunnel is a seismic Category I structure, the staff requests the applicant to provide finished grade elevation of CRB tunnel and evaluate whether the dynamic loads due to wave action should be considered at this location if the flood level is above the proposed plant grade elevation.