NuScaleDCRaisPEm Resource

From:	Cranston, Gregory
Sent:	Saturday, August 19, 2017 7:47 AM
To:	RAI@nuscalepower.com
Cc:	NuScaleDCRaisPEm Resource; Lee, Samuel; Chowdhury, Prosanta; Samaddar, Sujit; Park, Sunwoo; Vera Amadiz, Marieliz
Subject:	RE: Request for Additional Information No. 191, RAI 9036 (3.7.2)
Attachments:	Request for Additional Information No. 191 (eRAI No. 9036).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
Email Number: 214

Mail Envelope Properties (4b84d88e357343ba88537c60a4658320)

Subject: RE: Request for Additional Information No. 191, RAI 9036 (3.7.2)
Sent Date: 8/19/2017 7:46:46 AM
Received Date: 8/19/2017 7:46:51 AM
From: Cranston, Gregory

Created By: Gregory.Cranston@nrc.gov

Recipients:
"NuScaleDCRaisPEm Resource" <NuScaleDCRaisPEm.Resource@nrc.gov>
Tracking Status: None
"Lee, Samuel" <Samuel.Lee@nrc.gov>
Tracking Status: None
"Chowdhury, Prosanta" <Prosanta.Chowdhury@nrc.gov>
Tracking Status: None
"Samaddar, Sujit" <Sujit.Samaddar@nrc.gov>
Tracking Status: None
"Park, Sunwoo" <Sunwoo.Park@nrc.gov>
Tracking Status: None
"Vera Amadiz, Marieliz" <Marieliz.VeraAmadiz@nrc.gov>
Tracking Status: None
"RAI@nuscalepower.com" <RAI@nuscalepower.com>
Tracking Status: None

Post Office: HQPWMSMRS07.nrc.gov

Files	**Size**	**Date & Time**
MESSAGE	560	8/19/2017 7:46:51 AM
Request for Additional Information No. 191 (eRAI No. 9036).pdf	95969	

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

Request for Additional Information No. 191 (eRAI No. 9036)

Issue Date: 08/19/2017
Application Title: NuScale Standard Design Certification - 52-048
Operating Company: NuScale Power, LLC
Docket No. 52-048
Review Section: 03.07.02 - Seismic System Analysis
Application Section: 3.7.2

QUESTIONS

03.07.02-27

10 CFR 50 Appendix S requires that the safety functions of structures, systems, and components (SSCs) must be assured during and after the vibratory ground motion associated with the Safe Shutdown Earthquake (SSE) through design, testing, or qualification methods.

DSRS Section 3.7.2.II.1 provides guidance that the seismic analysis of all seismic Category I SSCs should use either a suitable dynamic analysis method (e.g., time history analysis method, response spectrum analysis method) or an equivalent static load method. However, the DCD Section 3.7.2 does not contain information with respect to analysis methods applied to the SSCs. Therefore, the applicant is requested to provide information on what seismic analysis methods are used for respective NuScale site-independent seismic Category I SSCs.

03.07.02-28

10 CFR 50 Appendix S requires that the safety functions of structures, systems, and components (SSCs) must be assured during and after the vibratory ground motion associated with the Safe Shutdown Earthquake (SSE) through design, testing, or qualification methods.

DCD Section 3.7.2.8 provides information on interaction of non-seismic Category I structures with seismic Category I structures. The applicant listed Turbine Generator Buildings, Central Utilities Building, and Annex Buildings, which are classified as seismic Category III in DCD Section 3.2.1, as structures adjacent to seismic Category I structures. However, the applicant did not provide information about potential seismic interaction of these buildings with adjacent seismic Category I structures, the RXB and CRB. Therefore, the applicant is requested to provide analysis or information that ensures that the failure of these non-seismic Category I structures will not impair the integrity of an adjacent seismic Category I structure during the design basis seismic event.

03.07.02-29

10 CFR 50 Appendix S requires that the safety functions of structures, systems, and components (SSCs) must be assured during and after the vibratory ground motion associated with the Safe Shutdown Earthquake (SSE) through design, testing, or qualification methods.

COL Item 3.7-6 in DCD Section 3.7.2.16 states, “A COL applicant that references the NuScale Power Plant design certification will perform a SSSI analysis that includes the RXB, CRB, RWB and both Turbine

Generator Buildings." However, in the DCD, no SSSI analysis involving the Turbine Generator Buildings (TGBs) is included. The applicant is requested to provide the following information: (a) justification for not including in the DCD the SSSI analysis involving TGBs; (b) whether NuScale intends to provide in the DCD any guidelines on SSSI analysis involving TGBs for a COL applicant to follow; and (c) whether the distance between the RXB and TGBs is considered a NuScale standard design parameter.

03.07.02-30

10 CFR 50 Appendix S requires that the safety functions of structures, systems, and components (SSCs) must be assured during and after the vibratory ground motion associated with the Safe Shutdown Earthquake (SSE) through design, testing, or qualification methods.

In DCD Section 3.7.2.4.6, the last paragraph, the applicant states, "The results for the selected cases are compared to the existing design envelop at: The reactor pool floor, The NPM lug restraints, the ground floor, the RBC crane rails, and the roof of the RXB and the main control room floor and the ground floor of the CRB. If the results are bounded by the current design envelope, they are not incorporated and the full suite of cases are not run. When forces, moments, or accelerations produced by the focused analyses are not bounded, that information is incorporated into the design envelope for all affected locations. The full suite of cases are not re-performed. However, the change is incorporated into the models so that any subsequent re-analysis of any soil-earthquake combination will include the change." The applicant's intent and rationale and the meaning of some of the words in these statements are not clear to the staff.

(a) The applicant is requested to clarify what "selected cases" and "current design envelope" in the quoted paragraph mean or represent. Please re-phrase the paragraph as necessary to clarify the applicant's intent and purposes.

(b) The applicant states that, when forces, moments, or accelerations produced by the focused analyses are not bounded, that information is incorporated into the design envelope for all affected locations but the full suite of cases are not re-performed. Please clarify what "focused analyses" refers to and provide technical justification for the full suite of cases not being re-performed when the results of the focused analyses are not bounded by the current design envelope.

(c) The applicant also states that the change is incorporated into the models so that any subsequent re-analysis of any soil-earthquake combination will include the change. Please clarify what the word "change" refers to and provide a context and timeline for "any subsequent re-analysis" - when it will be done and in what circumstances.