

## NuScaleDCRaisPEm Resource

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**From:** Chowdhury, Prosanta  
**Sent:** Thursday, April 5, 2018 2:28 PM  
**To:** Request for Additional Information  
**Cc:** Lee, Samuel; Cranston, Gregory; Franovich, Rani; Karas, Rebecca; Thurston, Carl; NuScaleDCRaisPEm Resource  
**Subject:** Request for Additional Information No. 408 eRAI No. 9325 (15.00.02)  
**Attachments:** Request for Additional Information No. 408 (eRAI No. 9325).pdf

Attached please find NRC staff's request for additional information (RAI) concerning review of the NuScale Design Certification Application.

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 14 days.

If you have any questions, please contact me.

Thank you.

Prosanta Chowdhury, Project Manager  
Licensing Branch 1 (NuScale)  
Division of New Reactor Licensing  
Office of New Reactors  
U.S. Nuclear Regulatory Commission  
301-415-1647

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**Options**

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## Request for Additional Information No. 408 (eRAI No. 9325)

Issue Date: 04/05/2018

Application Title: NuScale Standard Design Certification - 52-048

Operating Company: NuScale Power, LLC

Docket No. 52-048

Review Section: 15.00.02 - Review of Transient and Accident Analysis Methods 01/2006

Application Section:

### QUESTIONS

15.00.02-1

Title 10 of the *Code of Federal Regulations* (10 CFR) Part 52, Section 47 (a)(2) states, "A description and analysis of the structures, systems, and components (SSCs) of the facility, with emphasis upon performance requirements, the bases, with technical justification therefor, upon which these requirements have been established, and the evaluations required to show that safety functions will be accomplished." Likewise, 10 CFR Part 50, Appendix K, II.4 – Required Documentation, requires that, "To the extent practicable, predictions of the evaluation model, or portions thereof, shall be compared with applicable experimental information." Additionally, GDC-10 Reactor design states the reactor core and associated coolant, control, and protection systems shall be designed with appropriate margin to assure that specified acceptable fuel design limits are not exceeded during any condition of normal operation, including the effects of anticipated operational occurrences.

As stated in RG 1.203, an evaluation model (EM) is the calculational framework for evaluating the behavior of the reactor system during a postulated transient or design-basis accident. As such, the EM may include one or more computer programs, special models, and all other information needed to apply the calculational framework to a specific event, as illustrated by the following examples:

- 1) Procedures for treating the input and output information (particularly the code input arising from the plant geometry and the assumed plant state at transient initiation).
- 2) Specification of those portions of the analysis not included in the computer programs for which alternative approaches are used.
- 3) All other information needed to specify the calculational procedure.

The entirety of an EM ultimately determines whether the results are in compliance with applicable regulations. Therefore, the development, assessment, and review processes must consider the entire EM.

NRELAP5 code and input models used are key components of FSAR 15.0.2 "Review of Transient and Accident Analyses" results. The staff noted that NRELAP5 models that support the Chapter 15 accident analysis (including NRELAP5 analyses for FSAR Chapters 15.1.1 through 15.6.6) are built from a base model, EC-A010-1782 "NuScale NRELAP5 Module Basemodel," rev. 0, that did not address a large number of small changes in NuScale Power Module (NPM) geometry as contained in EC-A010-1507, rev 3 "Transient Model Input Parameters." It appears that the base model, EC-A010-1782, was built from EC-A010-1507, rev

0. NRC staff understands that the NuScale engineering change notice (ECNs) are designed to account for each NRELAP5 model document modification needed as changes or errors are identified that affect that document's inputs or results, however, it appears to NRC staff that many document changes are without ECNs. NRC staff is trying to understand (1) how the applicant plans to reconcile the changes made in the NPM design to the NRELAP5 analyses for FSAR Chapters 15.1.1 through 15.6.6 and (2) how NRC staff can determine that the analysis model results remain valid such that margins are understood and protected.

Please provide a description of all NRELAP5 analyses that support FSAR Chapters 6 and 15 and confirm that the geometry inputs used and results obtained include adequate margin per applicable requirements of GDC-10 and 10 CFR 52.47. Additionally, please provide a list of changes in NPM geometry, or other design changes, since EC-A010-1507, rev. 0 (which is bases of EC-A010-1782) to current Rev. 3 (including any later updates) so staff can better understand the design changes made.