

NuScaleTRRaisPEm Resource

From: Chowdhury, Prosanta
Sent: Tuesday, March 27, 2018 10:29 PM
To: Request for Additional Information
Cc: Lee, Samuel; Cranston, Gregory; Karas, Rebecca; Skarda, Raymond; Bavol, Bruce; NuScaleTRRaisPEm Resource
Subject: Request for Additional Information Letter No. 9417 (eRAI No. 9417) Topical Report, Thermal Hydraulic Stability, 15.09, SRSB
Attachments: Request for Additional Information No. 9417 (eRAI No. 9417).pdf

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

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.

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Licensing Branch 1 (NuScale)
Division of New Reactor Licensing
Office of New Reactors
U.S. Nuclear Regulatory Commission
301-415-164

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Request for Additional Information No. 9417 (eRAI No. 9417)

Issue Date: 03/28/2018

Application Title: NuScale Topical Report

Operating Company: NuScale

Docket No. PROJ0769

Review Section: 15.09 - A.DSRS NuScale Thermal Hydraulic Stability

Application Section:

QUESTIONS

15.09-4

Title 10 *Code of Federal Regulations* (10 CFR), Part 50, Appendix A, General Design Criterion (GDC), "Reactor design," requires that the reactor core and associated coolant, control, and protection systems shall be designed with appropriate margin to assure that specified acceptable fuel design limits (SAFDLs) are not exceeded during any condition of normal operation, including the effects of anticipated operational occurrences (AOOs). Title 10 CFR, Part 50, Appendix A, GDC 12, "Suppression of Reactor Power Oscillations," requires that the reactor core and associated coolant, control, and protection system shall be designed to assure that power oscillation which can result in conditions exceeding SAFDLs are not possible or can be reliably and readily detected and suppressed. Title 10 CFR Part 52.47, "Contents of applications; technical information,"

Standard Review Plan (SRP) Section 15.0.2, "Review of Transient and Accident Analysis Method," and Regulatory Guide (RG) 1.203, "Transient and Accident Methods," provide guidance for complying with GDCs 10 and 12. Standard Review Plan 15.0.2 and RG 1.203 state that documentation must include a complete description of the code assessment, including showing a model nodalization diagram and all code options used for the calculations. Assessments must also compare code predictions to analytical solutions, where possible, to show the accuracy of the numerical methods in the mathematical models. RG 1.203 states that numerical solution convergence studies, including the basis for the time steps used and the chosen convergence criteria should be provided.

The staff reviewed the response to the original RAI, RAI 8801, and found that the response was insufficient for the staff to reach a conclusion regarding the adequacy of the stability analysis methodology. The following supplemental information is therefore requested:

- Provide a summary of numerical results of the sensitivity studies described in the original response.
- Quantify the impact on the decay ratio for the different nodalization and time step cases analyzed. It is acceptable to respond to this request by providing the results as a table that in one column describes the nodalization, in a second column provides the time step, in a third column provides the Courant number, and in a fourth column provides the decay ratio.
- Compare the sensitivity of the results to nodalization/time-step to the uncertainty in the decay ratio.