

NuScaleTRRaisPEm Resource

From: Chowdhury, Prosanta
Sent: Tuesday, May 8, 2018 3:29 PM
To: Request for Additional Information
Cc: Lee, Samuel; Cranston, Gregory; Karas, Rebecca; Thurston, Carl; Franovich, Rani; NuScaleTRRaisPEm Resource
Subject: Request for Additional Information Letter No. 9085 (eRAI No. 9085) Topical Report, LOCA, 15.06.05, SRSB
Attachments: Request for Additional Information No. 9085 (eRAI No. 9085).pdf

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

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.

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Licensing Branch 1 (NuScale)
Division of New Reactor Licensing
Office of New Reactors
U.S. Nuclear Regulatory Commission
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Request for Additional Information No. 9085 (eRAI No. 9085)

Issue Date: 05/08/2018

Application Title: NuScale Topical Report

Operating Company: NuScale

Docket No. PROJ0769

Review Section: 15.06.05 - Loss of Coolant Accidents Resulting From Spectrum of Postulated Piping Breaks Within the Reactor Coolant Pressure Boundary

Application Section:

QUESTIONS

15.06.05-12

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." Regulatory Guide 1.203 describes a process that the staff of the U.S. Nuclear Regulatory Commission (NRC) considers acceptable for use in developing and assessing evaluation models (EMs) that may be used to analyze transient and accident behavior that is within the design basis of a nuclear power plant.

As stated in RG 1.203, an 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, and
- (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. Additionally, Appendix K.II "Required Documentation" requires the applicant to perform appropriate sensitivity studies to confirm that important phenomena that may affect results are evaluated.

The analysis of a Loss of Coolant Accident (LOCA) depends on the initial stored energy in the primary coolant and the performance of the NuScale Power Module helical coil steam generator (HCSG) can influence the temperatures and flow rates in the Reactor Pressure Vessel (RPV). Staff noted that the applicant did not perform an evaluation to identify potentially more conservative conditions relative to the steam generator initial condition for the LOCA transients, (e.g., tube plugging and fouling). Please provide an analysis of limiting HCSG initial conditions and confirm that the primary to second heat transfer across the HCSG is conservatively predicted such that the RPV internal energy is maximized.