# NuScaleDCRaisPEm Resource

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**Subject:** Request for Additional Information No. 26, RAI 8840
**Attachments:** Request for Additional Information No. 26 (eRAI No. 8840).pdf

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

Please submit your 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

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# Request for Additional Information No. 26 (eRAI No. 8840)

Issue Date: 05/22/2017
Application Title: NuScale Standard Design Certification - 52-048
Operating Company: NuScale Power, LLC
Docket No. 52-048
Review Section: 19 - Probabilistic Risk Assessment and Severe Accident Evaluation
Application Section:

QUESTIONS

19-2

10 CFR 52.47(a)(27) states that a DC application must contain a Final Safety Analysis Report (FSAR) that includes a description of the design-specific probabilistic risk assessment (PRA) and its results. In accordance with the Statement of Consideration (72 FR 49387) for the revised 10 CFR Part 52, the staff reviews the information contained in the applicant's FSAR Chapter 19, and issues requests for additional information (RAI) and conducts audits of the complete PRA (e.g., models, analyses, data, and codes) to obtain clarifying information as needed. The staff uses guidance contained in Standard Review Plan (SRP) Chapter 19.0 Revision 3, "Probabilistic Risk Assessment and Severe Accident Evaluation for New Reactors." In accordance with SRP Chapter 19.0 Revision 3, the staff determines if "the PRA reasonably reflects the as-designed, as-built, and as-operated plant, and the PRA maintenance program will ensure that the PRA will continue to reflect the as-designed, as-built, and as-operated plant, consistent with its identified uses and applications."

The staff has reviewed the information in the FSAR and examined additional clarifying information from the audit of the complete PRA and determined that it needs additional information to confirm that the PRA reasonably reflects the as-designed plant. The containment isolation function supports the passive core cooling and heat removal key safety functions by ensuring sufficient coolant inventory in the reactor pressure vessel and the containment vessel. The staff notes that FSAR Table 19.1-6, "System Success Criteria per Event Tree Sequence," assumes that containment isolation is guaranteed to succeed except for the chemical and volume control system (CVCS) pipe breaks outside containment and the steam generator tube failure (SGTF). The containment isolation function is accordingly not questioned in any of the Level 1 event trees except for the CVCS pipe breaks outside containment and the SGTF.

To allow the staff to evaluate the Level 1 model and assumptions related to the containment isolation function, the staff requests the applicant to explain how the containment isolation function can be guaranteed to succeed in the Level 1 accident sequences. In your response, please provide the following:

a) Identify the potential scenarios (combinations of pathways, equipment failures and human failure events) that could lead to coolant inventory loss from the reactor pressure vessel to outside of the containment vessel.

b) For the scenarios identified in a), explain how the containment isolation function is accounted for in the Level 1 model, if this function is necessary to support any key safety functions (e.g., passive safety functions).

c) For the scenarios identified in a), if the containment isolation function is not necessary to support any key safety functions, please describe any relevant analyses used to support this conclusion. Describe any uncertainty analyses performed for these supporting analyses.

d) Augment FSAR Table 19.1-21, "Key Assumptions for the Level 1 Full Power Internal Events Probabilistic Risk Assessment," and/or Table 19.1-23, "Key Insights from Level 1 Full Power, Internal Events Evaluation," accordingly with a discussion of the dependency of the passive safety functions on the containment isolation function. Include a discussion of the safety-significance of the active backup systems for scenarios resulting in failure of containment isolation.