

NuScaleDCRaisPEm Resource

From: Cranston, Gregory
Sent: Wednesday, January 10, 2018 1:47 PM
To: RAI@nuscalepower.com
Cc: NuScaleDCRaisPEm Resource; Lee, Samuel; Chowdhury, Prosanta; Dias, Antonio; Palmrose, Donald; Tabatabai, Omid
Subject: Request for Additional Information No. 334 RAI No. 9209 (20.1)
Attachments: Request for Additional Information No. 334 (eRAI No. 9209).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. The NRC Staff recognizes that NuScale has preliminarily identified that the response to the question 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
301-415-0546

Hearing Identifier: NuScale_SMR_DC_RAI_Public
Email Number: 363

Mail Envelope Properties (CY4PR09MB1287B8C142B4E5A0EE3CBB4090110)

Subject: Request for Additional Information No. 334 RAI No. 9209 (20.1)
Sent Date: 1/10/2018 1:46:36 PM
Received Date: 1/10/2018 1:46:42 PM
From: Cranston, Gregory

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Post Office: CY4PR09MB1287.namprd09.prod.outlook.com

Files	Size	Date & Time
MESSAGE	804	1/10/2018 1:46:42 PM
Request for Additional Information No. 334 (eRAI No. 9209).pdf		90564

Options

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

Request for Additional Information No. 334 (eRAI No. 9209)

Issue Date: 01/10/2018

Application Title: NuScale Standard Design Certification - 52-048

Operating Company: NuScale Power, LLC

Docket No. 52-048

Review Section: 20.01 - Mitigating Strategies for Beyond Design-Basis External Events (NuScale SMR design)

Application Section: 20.1

QUESTIONS

20.01-11

10 CFR 52.47(a)(2) requires that a standard design certification applicant provide a description and analysis of the structures, systems, and components (SSCs) of the facility, with emphasis upon performance requirements, the bases, with technical justification upon which these requirements have been established, and the evaluations required to show that safety functions will be accomplished. Additionally, the staff's guidance in Section 1.1, Establishment of Baseline Coping Capability, of JLD-ISG-2012-01 (ADAMS Accession Number ML15357A163) states: Section 3.2.1.7 of NEI 12-06, Revision 2, specifies that "[s]trategies that have a time constraint to be successful should be identified and a basis provided that the time can reasonably be met."

NuScale Technical Report TR-0816-50797-NP, Mitigation Strategies for Extended Loss of AC Power Event (ADAMS Accession Number ML17005A148 for non-public and ML17005A120 for publicly available), is, in part, intended to provide an assessment of the NuScale Power Plant response to an extended loss of AC power (ELAP) event. The document discusses the sequence of events and responses of the plant to provide long-term cooling for an ELAP event, such as the cumulative time necessary for the Ultimate Heat Sink (UHS) water level to boil off to specific heights.

NEI 12-06, "Diverse and Flexible Coping Strategies (FLEX) Implementation Guide," Section 3.2.1, "General Criteria and Baseline Assumptions," outlines the general criteria and assumptions to be used in establishing the baseline coping strategy. Subsection 3.2.1.10 discusses instrumentation and controls and states:

The parameters selected must be able to demonstrate the success of the strategies at maintaining the key safety functions as well as indicate imminent or actual core damage to facilitate a decision to manage the response to the event within the Emergency Operating Procedures and FLEX Support Guidelines or within the SAMGs.

Additionally, NEI 12-06 Subsection 3.2.1.10 lists typical parameters that are monitored, such as reactor coolant system (RCS) pressure, temperature, and associated levels.

NuScale's strategy regarding electrical power during an ELAP uses installed plant equipment (batteries). Batteries are limited in duration to roughly 72 hours (see Technical Report TR-0816-50797-P Section 5.6.3). After 72 hours, NuScale does not include a strategy to charge batteries and typical parameters (e.g., RCS pressure and temperature) are no longer available for monitoring expected plant performance. NuScale justifies not having these parameters available after roughly 72 hours based on the long-term cooling evaluation results that indicate safety functions (e.g., core cooling) are established and maintained for 30 days with no operator actions. With no need to take operator actions based on a specific RCS parameter, the post 72 hour mitigative strategy does not consider the parameter necessary. In lieu of a specific RCS parameter, NuScale intends to monitor UHS level to ensure core cooling. However, the staff endorsed guidance (NEI 12-06) takes a position that parameters selected must be able to demonstrate the success of the strategies at maintaining the key safety functions as well as indicate imminent or actual core damage.

NuScale's strategy for monitoring only one parameter (i.e., UHS level) after plant installed batteries (highly reliable...) are exhausted does not conform with past regulatory precedence (other passive designs) in order to demonstrate the success of the strategies or include the ability to indicate core conditions. Therefore, the staff requests NuScale to provide a COL action item that requires developing a strategy to maintain monitoring capability of the key safety functions beyond 72 hours, or include this strategy as part of the NuScale DCA/FSAR.