

NuScaleDCRaisPEm Resource

From: Cranston, Gregory
Sent: Friday, September 29, 2017 4:03 PM
To: RAI@nuscalepower.com
Cc: NuScaleDCRaisPEm Resource; Lee, Samuel; Lupold, Timothy; Hansing, Nicholas; Murray, Demetrius
Subject: Request for Additional Information No. 247 RAI No. 9132 (14.3.3)
Attachments: Request for Additional Information No. 247 (eRAI No. 9132).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.

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

Hearing Identifier: NuScale_SMR_DC_RAI_Public
Email Number: 271

Mail Envelope Properties (fb4d9c84e5fc40bf8630db9630b64d23)

Subject: Request for Additional Information No. 247 RAI No. 9132 (14.3.3)
Sent Date: 9/29/2017 4:02:47 PM
Received Date: 9/29/2017 4:02:51 PM
From: Cranston, Gregory

Created By: Gregory.Cranston@nrc.gov

Recipients:

"NuScaleDCRaisPEm Resource" <NuScaleDCRaisPEm.Resource@nrc.gov>

Tracking Status: None

"Lee, Samuel" <Samuel.Lee@nrc.gov>

Tracking Status: None

"Lupold, Timothy" <Timothy.Lupold@nrc.gov>

Tracking Status: None

"Hansing, Nicholas" <Nicholas.Hansing@nrc.gov>

Tracking Status: None

"Murray, Demetrius" <Demetrius.Murray@nrc.gov>

Tracking Status: None

"RAI@nuscalepower.com" <RAI@nuscalepower.com>

Tracking Status: None

Post Office: R4PWMSMRS03.nrc.gov

Files	Size	Date & Time
MESSAGE	556	9/29/2017 4:02:51 PM
Request for Additional Information No. 247 (eRAI No. 9132).pdf		92534

Options

Priority: Standard

Return Notification: No

Reply Requested: No

Sensitivity: Normal

Expiration Date:

Recipients Received:

Request for Additional Information No. 247 (eRAI No. 9132)

Issue Date: 09/29/2017

Application Title: NuScale Standard Design Certification - 52-048

Operating Company: NuScale Power, LLC

Docket No. 52-048

Review Section: 14.03.03 - Piping Systems and Components - Inspections, Tests, Analyses, and Acceptance Criteria

Application Section: 14.3.3

QUESTIONS

14.03.03-3

The NRC regulations in 10 CFR 52.47(b)(1) require that a design certification application contain the inspections, tests, analyses, and acceptance criteria (ITAAC) that are necessary and sufficient to provide reasonable assurance that, if the inspections, tests, and analyses are performed and the acceptance criteria met, a plant that incorporates the design certification is built and will operate in accordance with the design certification, the provisions of the Atomic Energy Act, and the NRC's regulations. The ITAAC proposed in the NuScale FSAR Tier 1, Section 2.1, "NuScale Power Module," to verify the capability of safety-related valves in the NuScale Power Module (NPM) for the NuScale Power Plant to perform their safety functions are not sufficient to satisfy 10 CFR 52.47(b)(1). The NRC staff understands that the ITAAC for the qualification of safety-related valves in the NuScale Power Plant will be provided in NuScale FSAR Tier 1, Section 2.8, "Equipment Qualification." In light of this understanding, the applicant does not need to address the qualification of the NPM safety-related valves in the ITAAC in NuScale FSAR Tier 1, Section 2.1. However, the NRC staff requests that the NuScale design certification applicant address the following aspects regarding the proposed ITAAC for the NPM safety-related valves:

a. NuScale FSAR Tier 1, Table 2.1-4, "NuScale Power Module Inspections, Tests, Analyses, and Acceptance Criteria," specifies in ITAAC #13, 14, 15, 16, 17, and 21 that safety-related valves in the reactor coolant system (RCS), containment isolation system (CNTS), emergency core cooling system (ECCS), and decay heat removal system (DHRS) change position under design differential pressure and/or flow conditions depending on the specific ITAAC. These proposed ITAAC in NuScale FSAR Tier 1, Table 2.1-4 are not sufficient to verify the capability of the NPM safety-related valves during preoperational testing. For example, the Design Commitment should specify that the NPM safety-related valves change position under design-basis temperature, differential pressure, and flow conditions. Consistent with the staff's draft standardized ITAAC (e.g., see April 8, 2016, transmittal letter providing draft ITAAC, ML16096A121), the inspections, tests, and analysis (ITA) should specify that a diagnostic stroke test will be performed of the NPM safety-related valves under preoperational temperature, differential pressure, and flow conditions. The Acceptance Criteria should specify that each NPM safety-related valve listed in the applicable ITAAC table strokes fully open and fully closed by remote operation under preoperational temperature, differential pressure, and flow conditions with sufficient diagnostic data to correlate valve performance to its design-basis capability as established by the type test performed in accordance with the applicable functional qualification ITAAC. As discussed above, the NRC staff requests that the NuScale design certification applicant revise the proposed ITAAC to verify the capability of the NPM safety-related valves during preoperational testing.

b. NuScale FSAR Tier 1, Table 2.1-4 proposes ITAAC #18, 19 and 20 to verify the loss of motive power capability of CNTS, ECCS, and DHRS safety-related valves, respectively. The ITAAC need to verify that each applicable system safety-related valve will perform its function to fail to (or maintain) its safety-related position on loss of motive power under preoperational temperature, differential pressure, and flow conditions sufficient to correlate valve performance to its design-basis capability as established by the type test performed in accordance with the applicable functional qualification ITAAC. The NRC has prepared standardized ITAAC for verification of the loss of motive power capability for safety-related valves in new reactors (e.g., see April 8, 2016, transmittal letter providing draft ITAAC, ADAMS Accession No. ML16096A121). For example, the standardized Design Commitment specifies that the applicable system's safety-related valves will perform their function to fail to (or maintain) their safety-related position on loss of motive power under design-basis temperature, differential pressure, and flow conditions. The standardized ITA specifies that a stroke test will be performed of these safety-related valves under preoperational temperature, differential pressure and flow conditions. The standardized Acceptance Criteria specify that each applicable system safety-related valve listed in the ITAAC table performs its function to fail to (or maintain) its safety-related position on loss of motive power under preoperational temperature, differential pressure, and flow conditions sufficient to correlate valve performance to its design-basis capability as established by the type test performed in accordance with the applicable functional qualification ITAAC. The NRC staff requests that the NuScale design certification applicant discuss the intent of its proposed ITAAC in comparison to the standardized ITAAC or revise the proposed ITAAC to verify the capability of the NPM safety-related valves during pre-operational testing.