

## NuScaleDCRaisPEm Resource

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**Sent:** Friday, August 18, 2017 11:18 AM  
**To:** RAI@nuscalepower.com  
**Cc:** NuScaleDCRaisPEm Resource; Lee, Samuel; Chowdhury, Prosanta; Lupold, Timothy; Strnisha, James; Tabatabai, Omid  
**Subject:** Request for Additional Information No. 186, RAI 9009 (6.2.2)  
**Attachments:** Request for Additional Information No. 186 (eRAI No. 9009).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

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## **Request for Additional Information No. 186 (eRAI No. 9009)**

Issue Date: 08/18/2017

Application Title: NuScale Standard Design Certification - 52-048

Operating Company: NuScale Power, LLC

Docket No. 52-048

Review Section: 06.02.02 - Containment Heat Removal Systems

Application Section:

### QUESTIONS

#### 06.02.02-3

10 CFR 50.46(b)(5) regarding long-term cooling and the effects of LOCA-generated debris, latent debris, and chemical products on component performance.

DSRS Section 6.2.2 is staff guidance for an acceptable method of meeting the regulations in 10 CFR 50.46(b)(5) and it lists acceptance criteria for the capability of components credited for long-term cooling as follows: Evaluate the effects of LOCA-generated debris, latent debris, chemical products, and associated effects on component performance. Potential effects include blockage at narrow flow passages (e.g., tight clearance valves), and wear and abrasion of components.

NuScale FSAR Tier 2, Section 6.2.2.2, "System Design," states that Tier 2, Section 6.3.2.5 describes conformance with RG 1.82 and the approach used to address Generic Safety Issue 191 (GSI-191), "Assessment of Debris Accumulation on Pressurized Water Reactor Sump Performance." The NuScale FSAR states that blockage is not a concern for valves but does not provide a basis for the potential effects of LOCA-generated debris, latent debris, chemical products, and associated effects on component performance due to blockage, wear and abrasion.

To support a finding under 10 CFR 50.46(b)(5), the staff is requesting NuScale to address the following question regarding effects of LOCA-generated debris, latent debris, chemical products, and associated effects on component performance due to blockage, wear and abrasion. Revise the DCD as applicable.

Identify the type, quantity, and maximum size of LOCA-generated debris, latent debris, and chemical products.

#### 06.02.02-4

10 CFR 50.46(b)(5) regarding long-term cooling and the effects of LOCA-generated debris, latent debris, and chemical products on component performance.

To support a finding under 10 CFR 50.46(b)(5), the staff is requesting NuScale to address the following question regarding effects of LOCA-generated debris, latent debris, chemical products, and associated effects on component performance due to blockage, wear and abrasion: Revise the DCD as applicable.

Blockage due to debris is a concern for tight-clearance valves. The applicant does not address potential blockage due to valves that are not in the fully open position. Address the potential of blockage or reduced flow due to the effects of LOCA-generated debris, latent debris, and chemical products on tight-clearance valves (such as RVVs, RRVs and any throttle valves or check valves in the flowpath during long-term cooling) that may not be in the fully open position during post-LOCA operation.

#### 06.02.02-5

10 CFR 50.46(b)(5) regarding long-term cooling and the effects of LOCA-generated debris, latent debris, and chemical products on component performance.

To support a finding under 10 CFR 50.46(b)(5), the staff is requesting NuScale to address the following question regarding effects of LOCA-generated debris, latent debris, chemical products, and associated effects on component performance due to blockage, wear and abrasion. Revise the DCD as applicable.

Debris settling in low flow areas is a concern during post-LOCA operation. The applicant does not address the effect of debris settling during post-LOCA operation on component performance. Provide additional information to address settling of LOCA-generated debris, latent debris, and chemical products in low flow areas and its effect on system/component operation. For example, the applicant is requested to address the quantity and type of material that will settle, locations where it will settle, and its impact on the performance of components in the applicable systems.

#### 06.02.02-6

10 CFR 50.46(b)(5) regarding long-term cooling and the effects of LOCA-generated debris, latent debris, and chemical products on component performance.

To support a finding under 10 CFR 50.46(b)(5), the staff is requesting NuScale to address the following question regarding effects of LOCA-generated debris, latent debris, chemical products, and associated effects on component performance due to blockage, wear and abrasion. Revise the DCD as applicable.

Potential blockage of small diameter tubing/piping is a concern during post-LOCA operation. The applicant does not address the potential blockage of small diameter tubing/piping during post-LOCA operation. Identify all small diameter tubing/piping such as instrument lines, sensing lines, inadvertent actuation block (IAB) pressure sensing lines in the ECCS system and long-term cooling flowpath and evaluate the effects of LOCA-generated debris, latent debris, and chemical products for potential blockage that could affect component function.

#### 06.02.02-7

10 CFR 50.46(b)(5) regarding long-term cooling and the effects of LOCA-generated debris, latent debris, and chemical products on component performance.

To support a finding under 10 CFR 50.46(b)(5), the staff is requesting NuScale to address the following question regarding effects of LOCA-generated debris, latent debris, chemical products, and associated effects on component performance due to blockage, wear and abrasion. Revise the DCD as applicable.

Wear and abrasion of components and piping is potential concern during post-LOCA operation. The applicant does not address the potential effects of wear and abrasion of components during post-LOCA operation. Address the potential effects of wear and abrasion of components due to LOCA-generated debris, latent debris, and chemical products during post-LOCA operation.