

## NuScaleDCRaisPEm Resource

---

**From:** Cranston, Gregory  
**Sent:** Saturday, August 19, 2017 7:56 AM  
**To:** RAI@nuscalepower.com  
**Cc:** NuScaleDCRaisPEm Resource; Lee, Samuel; Chowdhury, Prosanta; Dias, Antonio; Stubbs, Angelo; Murray, Demetrius  
**Subject:** RE: Request for Additional Information No. 192, RAI 9067 (9.2.3)  
**Attachments:** Request for Additional Information No. 192 (eRAI No. 9067).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:** 215

**Mail Envelope Properties** (a26b5c8f08e04bb5ae007d2215cc43bd)

**Subject:** RE: Request for Additional Information No. 192, RAI 9067 (9.2.3)  
**Sent Date:** 8/19/2017 7:55:33 AM  
**Received Date:** 8/19/2017 7:55:37 AM  
**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

"Chowdhury, Prosanta" <Prosanta.Chowdhury@nrc.gov>

Tracking Status: None

"Dias, Antonio" <Antonio.Dias@nrc.gov>

Tracking Status: None

"Stubbs, Angelo" <Angelo.Stubbs@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:** HQPWMSMRS07.nrc.gov

<b>Files</b>	<b>Size</b>	<b>Date &amp; Time</b>
MESSAGE	560	8/19/2017 7:55:37 AM
Request for Additional Information No. 192 (eRAI No. 9067).pdf		107487

**Options**

**Priority:** Standard

**Return Notification:** No

**Reply Requested:** No

**Sensitivity:** Normal

**Expiration Date:**

**Recipients Received:**

## Request for Additional Information No. 192 (eRAI No. 9067)

Issue Date: 08/19/2017

Application Title: NuScale Standard Design Certification - 52-048

Operating Company: NuScale Power, LLC

Docket No. 52-048

Review Section: 09.02.06 - Condensate Storage Facilities

Application Section: 9.2.3 - Demineralized Water

### QUESTIONS

#### 09.02.06-4

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 therefor, upon which these requirements have been established, and the evaluations required to show that safety functions will be accomplished.

GDC 2 establishes requirements with respect to the demineralized water system (DWS) design regarding protection against the effects of natural phenomena such as earthquakes, tornados, hurricanes and floods GDC 2 requires that SSCs important to safety be designed to withstand the effects of natural phenomena without loss of capability to perform their safety functions. The application of GDC 2 to the DWS design ensures that SSCs important to safety will not be adversely affected by DWS failure due to physical interaction of failed portions of the DWS with SSCs important to safety, or due to effects of discharged fluids from the DWS on SSCs important to safety due to the failure of non-seismic portions of the DWS.

FSAR Tier 2, Section 9.2.3.1 states that the DWS does not perform safety-related functions, is not credited for mitigation of design basis accidents, has no safe shutdown functions and that General Design Criteria 2, 4, and 5 were considered in the design. FSAR Tier 2, Section 9.2.3.3 states that, in general, the DWS is a Seismic Category III system because the system is not required to continue operating after a seismic event, and failure of its SSCs is not expected to affect the operability of Seismic Category I SSC or the occupants of the control room. Any portions of the DWS whose structural failure could adversely affect the function of Seismic Category I SSCs are seismic Category II, in accordance with Section 3.2. However, FSAR Tier 2, Table 7.1-4, "Engineered Safety Features Actuation System Functions", includes demineralized water isolation as an ESF function which suggest that the DWS isolation valves and associated piping should be safety related. FSAR Tier 2, Table 3.2-1, "Classification of Structure Systems, and Components," specifies that all of the components of the DWS are classified as non-safety and non-risk significant and are designed to seismic III classification.

The applicant is requested to:

- Clarify the safety and seismic classification for the portion of the DWS that is required to support the DWS safety-related isolation function. The response should include identification of all piping components and instrumentation that are relied on to ensure DWS isolation. The response should also discuss how the DWS complies with GDC 2, including considerations regarding the potential of physical interaction of failed DWS piping with SSCs important to safety, or impact of fluid discharge (leaks sprays, etc.) from DWS piping onto SSCs important to safety.
- Identify areas in the reactor building or control building were the DWS may be designed to seismic II and identify what important to safety SSCs are in proximity to the DWS, and discuss why the Seismic II portion of the DWS near SSCs important to safety provides the necessary protection to comply with GDC 2.

#### 09.02.06-5

FSAR Tier 2, Section 9.2.3.1 states the DWS supports the control room ventilation system by providing the normal control room heating ventilation and air conditioning system water used by the humidifier. It is unclear from the information available in the FSAR as to whether any DWS piping penetrates the control room envelope and habitability boundary, and whether any portion of the DWS is in close proximity to SSCs important to safety in the control building.

The applicant is requested to:

- Indicate whether the DWS penetrates the control room envelope and habitability boundary. If it does, specify the design requirements for that portion of the system including seismic classification of piping, and isolation features used to ensure the control room envelope and habitability boundary will be maintained. The response should also discuss how the DWS design in the control building complies with GDC 2.