

## NuScaleDCRaisPEm Resource

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**From:** Cranston, Gregory  
**Sent:** Monday, January 29, 2018 1:27 PM  
**To:** RAI@nuscalepower.com  
**Cc:** NuScaleDCRaisPEm Resource; Lee, Samuel; Chowdhury, Prosanta; Jackson, Diane; Travis, Boyce; Tabatabai, Omid  
**Subject:** Request for Additional Information No. 357 RAI No. 9235 (6.2.1)  
**Attachments:** Request for Additional Information No. 357 (eRAI No. 9235).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 one or more questions 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.

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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**From:** Cranston, Gregory

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**Options**

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## Request for Additional Information No. 357 (eRAI No. 9235)

Issue Date: 01/29/2018

Application Title: NuScale Standard Design Certification - 52-048

Operating Company: NuScale Power, LLC

Docket No. 52-048

Review Section: 06.02.01 - Containment Functional Design

Application Section: 6.2.1

### QUESTIONS

#### 06.02.01-5

Appendix A to 10 CFR Part 50, General Design Criteria (GDC) 4, "Environmental and dynamic effects design bases," requires that SSCs important to safety shall be designed to accommodate the effects of and to be compatible with the environmental conditions associated with normal operation, maintenance, testing, and postulated accidents, including loss-of-coolant accidents (LOCAs).

GDC 39, "Inspection of containment heat removal system," requires, in part, that the containment heat removal system shall be designed to permit appropriate periodic inspection of important components to assure the integrity and capability of the system.

GDC 53, "Provisions for containment testing and inspection," requires, in part, that the reactor containment shall be designed to permit appropriate periodic inspection of all important areas.

#### Follow-up RAI No 8910, Question 06.02.02-2

In a letter dated August 16, 2017, NuScale responded to staff RAI No. 8910, Question 06.02.02-2, which requested NuScale to provide programmatic assurance that establishes the requirement to perform periodic inspections of the containment vessel (CNV) heat removal surfaces.

NuScale revised FSAR Section 6.2 and Table 6.2-3, "Containment Vessel Inspection Elements," by adding the following inspection element:

Component Description	Examination Category	Examination Method	Notes
<u>CNV Shell</u>			
CNV inner and outer shell	General	Visual	Inspection pursuant to GDC 39

The staff notes that ASME BPVC, Section XI, does not have a "General" examination category. Instead, ASME BPVC, Section XI, Table IWE-2500-1 (E-A), "Examination Category E-A, Containment Surfaces," would be an appropriate examination category for the CNV inner and outer shells. Furthermore, listing the examination method as "visual" is not clear as ASME BPVC, Section XI, Table IWE-2500-1 (E-A) lists both "general visual" and VT-3 examinations.

Based on the part descriptions in ASME BPVC, Section XI, Table IWE-2500-1 (E-A), a "general visual" examination would be for applicable to the CNV inner shell as it is not wetted during normal operation. However, the outer CNV shell is constantly wetted due to its location in the ultimate heat sink. Degradation of the CNV cladding could impact the structural integrity of the CNV low alloy steel base metal by allowing borated water from the ultimate heat sink to contact the base metal. A general visual examination would not provide reasonable assurance to detect signs of corrosion of the low alloy steel. ASME BPVC, Section XI, Table IWE-2500-1 (E-A), lists Item Number E1.12 for "Wetted Surfaces of Submerged Areas." The examination requirement is a VT-3.

Accordingly, the staff requests that NuScale:

- Revise DCD Tier 2, FSAR, Table 6.2-3 to state that the examination method for the CNV outer shell will be a VT-3 in accordance with ASME BPVC, Section XI, Table IWE-2500-1 (E-A), Item Number E1.12.

- Revise DCD Tier 2, FSAR, Table 6.2-3 to state that the examination method for the CNV inner shell will be a general visual in accordance with ASME BPVC, Section XI, Table IWE-2500-1 (E-A), Item Number E1.10.

- Revise DCD Tier 2, FSAR, Table 6.2-3 to state that the examination categories for both the CNV inner and outer shells will be in E-A in accordance with ASME BVPC, Section XI, Table IWE-2500-1. Revise DCD Tier 2, FSAR, Table 6.2-3 to state that the examination categories for both the CNV inner and outer shells will be in E-A in accordance with ASME BVPC, Section XI, Table IWE-2500-1.