

## NuScaleDCRaisPEm Resource

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**From:** Cranston, Gregory  
**Sent:** Monday, August 13, 2018 4:01 PM  
**To:** Request for Additional Information  
**Cc:** Lee, Samuel; Karas, Rebecca; Travis, Boyce; Baval, Bruce; Chowdhury, Prosanta; NuScaleDCRaisPEm Resource  
**Subject:** Request for Additional Information No. 497 eRAI No. 9570 (5.4.3)  
**Attachments:** Request for Additional Information No. 497 (eRAI No. 9750).pdf

Attached please find NRC staff's request for additional information (RAI) 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.

**Hearing Identifier:** NuScale\_SMR\_DC\_RAI\_Public  
**Email Number:** 533

**Mail Envelope Properties** (BN1PR09MB0258E2429F7037E662FC304D90390)

**Subject:** Request for Additional Information No. 497 eRAI No. 9570 (5.4.3)  
**Sent Date:** 8/13/2018 4:00:54 PM  
**Received Date:** 8/13/2018 4:01:01 PM  
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**Post Office:** BN1PR09MB0258.namprd09.prod.outlook.com

<b>Files</b>	<b>Size</b>	<b>Date &amp; Time</b>
MESSAGE	364	8/13/2018 4:01:01 PM
Request for Additional Information No. 497 (eRAI No. 9750).pdf		17954

**Options**

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

## **Request for Additional Information No. 497 (eRAI No. 9750)**

Issue Date: 08/13/2018

Application Title: NuScale Standard Design Certification - 52-048

Operating Company: NuScale Power, LLC

Docket No. 52-048

Review Section: 05.04.07 - Residual Heat Removal (RHR) System

Application Section: 5.4.3

### QUESTIONS

05.04.07-7

10 CFR Part 50, Appendix A, GDC 34 requires in part that a system to remove residual heat shall be provided, the safety function of which shall be to transfer fission product decay heat and other residual heat from the reactor core at a rate such that design limits and conditions are not exceeded. NuScale has adopted a PDC that uses identical language to the GDC with the exception of the power provisions, which are not pertinent to this question. In order to satisfy GDC 34, NuScale states the DHRS design ensures the RCS average temperature is below 420 degrees F within 36 hours after an initiating event without challenging the RCPB or uncovering the core. While the analytical performance of the system is documented in the FSAR, the staff requires additional information to confirm that the decay heat removal function of the as-built system as a whole will perform in accordance with the analytical assumptions.

As part of the response to RAI 8817, Question 14.3-1, NuScale provided no information related to testing of the DHRS as part of ITAAC 02.08.08 that would demonstrate how the as-built DHRS thermal performance will exceed its design assumptions. While staff recognizes prototype and legacy testing play a large part in showing adequate system performance from a design perspective, staff believes it to be important to demonstrate adequate performance of the as-built system before it is called on to perform its safety function given the relative importance of the system.

As such, staff requests that NuScale include a test or a commitment to perform a test (either supplementing an existing test or a new one) that involves operating the DHRS valves with a heated system (not necessarily full temperature and pressure) such that natural circulation flow removes heat from the loop and the thermal performance of the system can be measured. The test, if not run at design basis conditions, should then be compared against a limiting analysis using the tool of record (NRELAP) for the test conditions to show that the as-built performance meets or exceeds analytical assumptions. This approach corresponds to that used for previous novel decay heat removal systems.