

## NuScaleDCRaisPEm Resource

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**From:** Cranston, Gregory  
**Sent:** Wednesday, June 20, 2018 2:36 PM  
**To:** Request for Additional Information  
**Cc:** Lee, Samuel; Mitchell, Matthew; Yeshnik, Andrew; Bovol, Bruce; Chowdhury, Prosanta; NuScaleDCRaisPEm Resource  
**Subject:** Request for Additional Information No. 492 eRAI No. 9551 (5.2.3)  
**Attachments:** Request for Additional Information No. 492 (eRAI No. 9551).pdf

Attached please find NRC staff's request for additional information (RAI) concerning review of the NuScale Design Certification Application. Password will be sent separately.

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:** 522

**Mail Envelope Properties** (BN3PR09MB035516B10D61995CCE16ECC890770)

**Subject:** Request for Additional Information No. 492 eRAI No. 9551 (5.2.3)  
**Sent Date:** 6/20/2018 2:36:21 PM  
**Received Date:** 6/20/2018 2:36:25 PM  
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**Post Office:** BN3PR09MB0355.namprd09.prod.outlook.com

<b>Files</b>	<b>Size</b>	<b>Date &amp; Time</b>
MESSAGE	402	6/20/2018 2:36:25 PM
Request for Additional Information No. 492 (eRAI No. 9551).pdf		60541

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

## Request for Additional Information No. 492 (eRAI No. 9551)

Issue Date: 06/20/2018

Application Title: NuScale Standard Design Certification - 52-048

Operating Company: NuScale Power, LLC

Docket No. 52-048

Review Section: 05.02.03 - Reactor Coolant Pressure Boundary Materials

Application Section: 5.2.3

### QUESTIONS

05.02.03-18

**Regulatory basis: 10 CFR Part 50, Appendix A, GDC 1 and GDC 30 require that components in the reactor coolant pressure boundary shall be designed, fabricated, erected, and tested to the highest quality standards practicable. 10 CFR Part 50, Appendix A, GDC 4 requires SSCs to be designed and fabricated to accommodate the effects of environmental conditions during normal, off normal, and accident conditions.**

On December 18, 2017 the applicant provided a response to RAI 9193 Question 05.02.03-11. The applicant states that the description of "weld filler classifications compatible with low alloy base metal" is sufficient in detail to meet NRC regulations. The applicant cites the AP1000 and the US-EPR designs as the basis for this conclusion. The staff has reviewed the applicant's response and disagrees.

The staff has requested information on the weld filler materials for the RPV from multiple DCD applicants. This includes the System 80+ (10 CFR Part 52, Appendix C) and the ESBWR (10 CFR Part 52, Appendix E). The staff has also requested this information as part of the DCD review for the US-APWR and the APR1400.

The applicant's requirement of "compatible with the base metal" does not provide sufficient detail to determine if the filler material is suitable for service in the reactor coolant system. The term "compatibility" is not a term commonly used in welding or weldment design.

Define "compatible with low alloy base metal," describe how "compatibility with the base metal" ensures that the RPV welds can be made under fabrication conditions (including any process requirements), and how "compatibility with the base metal" provides a sufficient technical assurance that the probability of RPV failure is consistent with the GDC 4 requirements.

Alternatively, if the applicant utilizes the term "compatible with the base metal" because the weld filler material will be chosen at a later time (during procurement when a component fabricator determines the optimal chemical composition for the weldment) the applicant may revise the DCD Tier 2, FSAR information to identify the weld filler material as a COL Action Item.

05.02.03-19

**Regulatory basis: 10 CFR Part 50, Appendix A, GDC 1 and GDC 30 require that components in the reactor coolant pressure boundary shall be designed, fabricated, erected, and tested to the highest quality standards practicable. GDC 30 also requires the means for detecting and identifying, to the extent practical, the location of the source of RCS leakage.**

On December 18, 2017, the applicant provided a response to RAI 9193 Question 05.02.03-14. The staff has reviewed the applicant's response and agrees that the applicant's approach is acceptable. However, the staff notes that the containment environment monitoring element described by the applicant in the RAI response is not reflected in the Tier 2 DCD information.

One acceptable approach to revising the information in the DCD would be:

COL Item 5.2-5

A COL applicant that references the NuScale Power Plant design certification will develop and implement a Boric Acid Control Program that includes: inspection elements to ensure the integrity of the reactor coolant pressure boundary components for subsequent service, monitoring of the containment atmosphere for evidence of RCS leakage, the type of visual or other nondestructive inspections to be performed, and the required inspection frequency.