

## NuScaleDCRaisPEm Resource

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**From:** Cranston, Gregory  
**Sent:** Tuesday, April 25, 2017 12:58 PM  
**To:** RAI@nuscalepower.com  
**Cc:** NuScaleDCRaisPEm Resource; Karas, Rebecca; Lee, Samuel; Thomas, Matt; Franovich, Rani; Chowdhury, Prosanta  
**Subject:** RE: Request for Additional Information No. 10 (eRAI No. 8743) Section 15.01.05 (SRSB)  
**Attachments:** Request for Additional Information No. 10 (eRAI No. 8743).pdf

Revised letter No. in Subject line

Attached please find NRC staff's request for additional information concerning review of the NuScale Design Certification Application.

Please submit your 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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**Received Date:** 4/25/2017 12:58:03 PM  
**From:** Cranston, Gregory

**Created By:** Gregory.Cranston@nrc.gov

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**Options**

**Priority:** Standard

**Return Notification:** No

**Reply Requested:** No

**Sensitivity:** Normal

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**Recipients Received:**

## **Request for Additional Information No. 10 (eRAI No. 8743)**

Issue Date: 04/25/2017

Application Title: NuScale Standard Design Certification - 52-048

Operating Company: NuScale Power, LLC

Docket No. 52-048

Review Section: 15.01.05 - Steam System Piping Failures Inside and Outside of Containment (PWR)

Application Section: 15.01

### **QUESTIONS**

#### **15.01.05-1**

In accordance with 10 CFR 50, Appendix A, General Design Criterion (GDC) 31, "Fracture prevention of reactor coolant pressure boundary," the reactor coolant pressure boundary (RCPB) shall be designed with sufficient margin to ensure that when stressed under operating, maintenance, testing, and postulated accident conditions (1) the boundary behaves in a non-brittle manner and (2) the probability of rapidly propagating fracture is minimized. The design shall reflect consideration of service temperatures and other conditions of the boundary material under operating, maintenance, testing, and postulated accident conditions and the uncertainties in determining (1) material properties; (2) the effects of irradiation on material properties; (3) residual, steady state and transient stresses; and (4) size of flaws.

To meet the requirements of GDC 31, as it relates to the steam line break (SLB) accident resulting in a limiting reactor coolant system (RCS) pressure, the accident analysis should consider appropriate uncertainties for determining conservative temperatures and pressures at the RCPB to show that the probability of rapidly propagating fracture is minimized for this transient.

In FSAR Tier 2, Section 15.1.5.3.2, "Input parameters and Initial Conditions," under the "Steam Line Break Case Resulting in a Limiting Reactor Coolant System Pressure" heading, the applicant states that beginning-of-life (BOL) steam generator (SG) characteristics are used and a 30% uncertainty is added to the SG heat transfer. The staff notes that BOL SG characteristics and adding to the steam generator heat transfer allows for more heat to be removed from the primary system, ultimately resulting in a less limiting primary system pressure transient. Based on the docketed information, the staff is unable to determine the adequacy of a 30% uncertainty addition to the steam generator heat transfer. Furthermore, the staff is unable to determine if SG tube plugging and fouling is appropriately accounted for in this analysis since BOL SG conditions are used. The staff requests the applicant to either (1) provide justification in the FSAR as to why the applicant adds to the steam generator heat transfer and does not subtract from the steam generator heat transfer or (2) modify the FSAR as necessary. The staff also requests the applicant to provide justification in the FSAR as to why SG tube plugging and fouling are not accounted for in this steam line break case resulting in a limiting RCS pressure. If SG tube plugging and fouling need to be accounted for, the staff requests the applicant to modify the FSAR as necessary.