

## NuScaleDCRaisPEm Resource

---

**From:** Cranston, Gregory  
**Sent:** Friday, May 26, 2017 3:00 PM  
**To:** RAI@nuscalepower.com  
**Cc:** NuScaleDCRaisPEm Resource; Lee, Samuel; Chowdhury, Prosanta; Karas, Rebecca; Schmidt, Jeffrey; Franovich, Rani; Baval, Bruce  
**Subject:** Request for Additional Information No. 28, RAI 8771  
**Attachments:** Request for Additional Information No. 28 (eRAI No. 8771).pdf

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

**Hearing Identifier:** NuScale\_SMR\_DC\_RAI\_Public  
**Email Number:** 40

**Mail Envelope Properties** (64eaa047662d4673a534a7dbc3acd1ca)

**Subject:** Request for Additional Information No. 28, RAI 8771  
**Sent Date:** 5/26/2017 3:00:00 PM  
**Received Date:** 5/26/2017 3:00:01 PM  
**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  
"Karas, Rebecca" <Rebecca.Karas@nrc.gov>  
Tracking Status: None  
"Schmidt, Jeffrey" <Jeffrey.Schmidt2@nrc.gov>  
Tracking Status: None  
"Franovich, Rani" <Rani.Franovich@nrc.gov>  
Tracking Status: None  
"Bavol, Bruce" <Bruce.Bavol@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	527	5/26/2017 3:00:01 PM
Request for Additional Information No. 28 (eRAI No. 8771).pdf		125219

**Options**

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

## Request for Additional Information No. 28 (eRAI No. 8771)

Issue Date: 05/26/2017

Application Title: NuScale Standard Design Certification - 52-048

Operating Company: NuScale Power, LLC

Docket No. 52-048

Review Section: 15 - Introduction - Transient and Accident Analyses

Application Section:

### QUESTIONS

15-1

15.0.06 Return to Power

According to General Design Criterion (GDC) 27, reactivity control systems shall be designed to reliably control reactivity changes to ensure that under postulated accident conditions and with appropriate margin for stuck rods the capability to cool the core is maintained. As described in the staff's response (ML16116A083) to the NuScale Gap Analysis Summary Report, Revision 1, Gap 11, GDC27, the staff has determined the applicant's design does not meet GDC 27 and, as such, the applicant has requested an exemption to GDC 27. The exemption to GDC 27 states, in part, that the return to power assuming a stuck rod is sufficiently unlikely and that specified acceptable fuel design limits (SAFDLs) for critical heat flux would not be exceeded even if it occurred. To demonstrate that SAFDLs are not exceeded, the applicant has analyzed a return to power in FSAR Section 15.0.06. An accurate determination of the minimum critical heat flux (MCHF) is dependent upon assessing reactor stability at these low power conditions and hence GDC 12 also applies.

Based on the detail provided in Section 15.0.06, the staff is unable to reach a reasonable assurance finding that the SAFDLs will not be exceeded. The staff is requesting that Final Safety Analysis Report (FSAR) Section 15.0.06, which assumes the use of the decay heat removal system (DHRS), be modified to include details provided for a licensing basis event, and the short term transient analyses in the various subsections of Chapter 15 should reference Section 15.0.06 for the potential long term acceptability of the events. Additional information should include, but not be limited to, a description of the evaluation model(s); the critical heat flux (CHF) correlation used and basis for the correlation (or a reference there to); the assumed radial and axial power distributions and the basis for those power distributions (or a reference there to); and a justification of how reactor stability is maintained under these conditions such that the MCHF can be accurately determined. In addition to Figure 15.0-8, "Power Response on a Return to Power," the staff is requesting the FSAR be updated to include plots of reactor coolant system average temperature, pressurizer pressure, core reactivity, hot channel nuclear enthalpy rise factor (F-delta-H), and MCHF ratio verses time.