

## NuScaleTRRaisPEm Resource

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**From:** Bavol, Bruce  
**Sent:** Thursday, June 08, 2017 10:11 AM  
**To:** NuScaleTRRaisPEm Resource  
**Subject:** FW: Topical Report (TR-0516-49417) - Request for Additional Information Letter No. 15 (eRAI No. 8830)  
**Attachments:** RAI-8830\_TR-0516-49417-P, Stability.pdf

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**From:** Bavol, Bruce  
**Sent:** Wednesday, May 31, 2017 8:57 AM  
**To:** Request for Additional Information <RAI@nuscaldpower.com>  
**Cc:** 'Gardner, Darrell' <dgardner@nuscaldpower.com>; Cranston, Gregory <Gregory.Cranston@nrc.gov>; Skarda, Raymond <Raymond.Skarda@nrc.gov>; Karas, Rebecca <Rebecca.Karas@nrc.gov>; Schmidt, Jeffrey <Jeffrey.Schmidt2@nrc.gov>  
**Subject:** Topical Report (TR-0516-49417) - Request for Additional Information Letter No. 15 (eRAI No. 8830)

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.

Bruce M. Bavol

Project Manager  
NuScale, Licensing Projects Branch 1  
Office of New Reactors  
Nuclear Regulatory Commission  
Work Phone: (301) 415-6715  
Email: [Bruce.Bavol@nrc.gov](mailto:Bruce.Bavol@nrc.gov)

**Hearing Identifier:** NuScale\_SMR\_DC\_TR\_Public  
**Email Number:** 21

**Mail Envelope Properties** (d9b6b4b83d6d4981bf68b5234faccd2c)

**Subject:** FW: Topical Report (TR-0516-49417) - Request for Additional Information Letter  
No. 15 (eRAI No. 8830)  
**Sent Date:** 6/8/2017 10:11:24 AM  
**Received Date:** 6/8/2017 10:11:25 AM  
**From:** Baval, Bruce

**Created By:** Bruce.Baval@nrc.gov

**Recipients:**  
"NuScaleTRRaisPEm Resource" <NuScaleTRRaisPEm.Resource@nrc.gov>  
Tracking Status: None

**Post Office:** HQPWMSMRS03.nrc.gov

<b>Files</b>	<b>Size</b>	<b>Date &amp; Time</b>
MESSAGE	1035	6/8/2017 10:11:25 AM
RAI-8830_TR-0516-49417-P, Stability.pdf		140806

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

## NuScaleTRRaisPEm Resource

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**From:** Bavol, Bruce  
**Sent:** Tuesday, May 30, 2017 1:50 PM  
**To:** NuScaleTRRaisPEm Resource  
**Cc:** Cranston, Gregory; Skarda, Raymond; Karas, Rebecca; Schmidt, Jeffrey  
**Subject:** RAI-8830 (TR-0516-49417-P, "Evaluation Methodology for Stability Analysis of the NuScale Power Module")  
**Attachments:** RAI 8830.docx

Bruce M. Bavol

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**Hearing Identifier:** NuScale\_SMR\_DC\_TR\_Public  
**Email Number:** 16

**Mail Envelope Properties** (1d25533bb08b4ea7985b8f686f1990da)

**Subject:** RAI-8830 (TR-0516-49417-P, "Evaluation Methodology for Stability Analysis of the NuScale Power Module")  
**Sent Date:** 5/30/2017 1:50:09 PM  
**Received Date:** 5/30/2017 1:50:10 PM  
**From:** Baval, Bruce

**Created By:** Bruce.Baval@nrc.gov

**Recipients:**

"Cranston, Gregory" <Gregory.Cranston@nrc.gov>  
Tracking Status: None  
"Skarda, Raymond" <Raymond.Skarda@nrc.gov>  
Tracking Status: None  
"Karas, Rebecca" <Rebecca.Karas@nrc.gov>  
Tracking Status: None  
"Schmidt, Jeffrey" <Jeffrey.Schmidt2@nrc.gov>  
Tracking Status: None  
"NuScaleTRRaisPEM Resource" <NuScaleTRRaisPEM.Resource@nrc.gov>  
Tracking Status: None

**Post Office:** HQPWMSMRS03.nrc.gov

<b>Files</b>	<b>Size</b>	<b>Date &amp; Time</b>
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RAI 8830.docx	23023	

**Options**

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

## **NuScale Standard Design Certification - 52-048**

### **TR-0516-49417-P, “Evaluation Methodology for Stability Analysis of the NuScale Power Module”**

#### **RAI 8830 Questions (29801)**

##### **(Question 29801) 15.09 - DSRS NuScale Thermal Hydraulic Stability**

Title 10 of the Code of Federal Regulations (CFR), Part 50, Appendix A, General Design Criterion (GDC), 12- Suppression of reactor power oscillations, requires that oscillations be either not possible or reliably detected and suppressed. The Design-Specific Review Standard (DSRS), 15.9.A, “Design-Specific Review Standard for NuScale SMR Design, Thermal Hydraulic Stability Review Responsibilities,” indicates that the applicant’s analyses should correctly and accurately identify all factors that could potentially cause instabilities and their consequences. The analyses should also demonstrate that design features that are implemented prevent unacceptable consequences to the fuel.

Section 8.2.5 of the topical report, TR-0516-49417-P, discusses reactivity and power distribution anomalies. The results indicate that the beginning of cycle (BOC) condition is more stable than the end of cycle (EOC) condition, which is the opposite of the expected core life behavior. The topical report discussion, however, does not address this inconsistency in the PIM method predictions when compared to earlier results in the report.

In order to make an affirmative finding associated with the above regulatory requirement important to safety, NRC staff requests NuScale to describe and justify the apparent inconsistency in relative stability performance for BOC vs. EOC. The discussion should address the impact of reactivity feedback coefficients on stability performance.