

## NuScaleTRRaisPEm Resource

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**From:** Bavol, Bruce  
**Sent:** Thursday, June 08, 2017 10:04 AM  
**To:** NuScaleTRRaisPEm Resource  
**Subject:** FW: Topical Report (TR-0516-49417) - Request for Additional Information Letter No. 16 (eRAI No. 8801)  
**Attachments:** NuScale Topical Report (TR) Requests for Additional Information - eRAI No. 8801.pdf

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**From:** Bavol, Bruce  
**Sent:** Tuesday, June 06, 2017 4:22 PM  
**To:** 'Request for Additional Information' <RAI@nuscalepower.com>  
**Cc:** 'Gardner, Darrell' <dgardner@nuscalepower.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:** RE: Topical Report (TR-0516-49417) - Request for Additional Information Letter No. 16 (eRAI No. 8801)

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:** 20

**Mail Envelope Properties** (6e860f952e214171b974cec7f627ecfc)

**Subject:** FW: Topical Report (TR-0516-49417) - Request for Additional Information Letter  
No. 16 (eRAI No. 8801)  
**Sent Date:** 6/8/2017 10:04:09 AM  
**Received Date:** 6/8/2017 10:04:11 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	1040	6/8/2017 10:04:11 AM
NuScale Topical Report (TR) Requests for Additional Information - eRAI No. 8801.pdf		
144046		

**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:** Monday, June 05, 2017 7:33 AM  
**To:** NuScaleTRRaisPEm Resource  
**Subject:** NuScale Topical Report (TR) Requests for Additional Information - eRAI No. 8801  
**Attachments:** RAI 8801.docx

TR-0516-49417-P, "Evaluation Methodology for Stability Analysis of the NuScale Power Module" RAI 8801 Question (29730)

Bruce M. Bavol

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**Hearing Identifier:** NuScale\_SMR\_DC\_TR\_Public  
**Email Number:** 17

**Mail Envelope Properties** (b28b44c270ba4eeea774d0d8970076a4)

**Subject:** NuScale Topical Report (TR) Requests for Additional Information - eRAI No. 8801  
**Sent Date:** 6/5/2017 7:32:33 AM  
**Received Date:** 6/5/2017 7:32:34 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	331	6/5/2017 7:32:34 AM
RAI 8801.docx	23881	

**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 8801 Question (29730)

#### (Question 29730) 15.09 - DSRS NuScale Thermal Hydraulic Stability

Title 10 Code of Federal Regulations (CFR), Part 50, Appendix A, General Design Criterion (GDC), "Reactor design," requires that the reactor core and associated coolant, control, and protection systems shall be designed with appropriate margin to assure that specified acceptable fuel design limits (SAFDLs) are not exceeded during any condition of normal operation, including the effects of anticipated operational occurrences (AOOs). Title 10 CFR, Part 50, Appendix A, GDC 12, "Suppression of Reactor Power Oscillations," requires that the reactor core and associated coolant, control, and protection system shall be designed to assure that power oscillation which can result in conditions exceeding SAFDLs are not possible or can be reliably and readily detected and suppressed. Title 10 CFR Part 52.47, "Contents of applications; technical information,"

Standard Review Plan (SRP) Section 15.0.2, "Review of Transient and Accident Analysis Method," and Regulatory Guide (RG) 1.203, "Transient and Accident Methods," provide guidance for complying with GDCs 10 and 12. Standard Review Plan 15.0.2 and RG 1.203 state that documentation must include a complete description of the code assessment, including showing a model nodalization diagram and all code options used for the calculations. Assessments must also compare code predictions to analytical solutions, where possible, to show the accuracy of the numerical methods in the mathematical models. RG 1.203 states that numerical solution convergence studies, including the basis for the time steps used and the chosen convergence criteria should be provided. Section 5.8 of topical report, TR-0516-49417-P, describes the numerical solution, but, does not provide sufficient detail about the required nodalization or time step size. Therefore to demonstrate compliance with GDCs 10 and 12:

- 1) Provide complete and detailed nodalization diagrams for calculations used to assess and validate the stability methodology.
- 2) Provide the time step size used for the calculations provided in the TR.
- 3) Provide a description of the nodalization and time step size selection methodology that is used for licensing applications.
- 4) Justify the nodalization and time step size. This justification should consider numerical diffusion and, where applicable, provide velocity field information and Courant number.