## NuScaleTRRaisPEm Resource

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| **From:** | Cranston, Gregory |
| **Sent:** | Tuesday, August 14, 2018 11:59 AM |
| **To:** | Request for Additional Information |
| **Cc:** | Lee, Samuel; Karas, Rebecca; Skarda, Raymond; Bavol, Bruce; Chowdhury, Prosanta; NuScaleTRRaisPEm Resource |
| **Subject:** | Request for Additional Information Letter No. 9575 (eRAI No. 9575) Topical Report Thermal Hydraulic Stability 15.9, SRSB |
| **Attachments:** | Request for Additional Information No. 9575 (eRAI No. 9575).pdf |

Attached please find NRC staff's request for additional information (RAI) concerning review of the NuScale Topical Report.

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.

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# Request for Additional Information No. 9575 (eRAI No. 9575)

Issue Date: 08/14/2018
Application Title: NuScale Topical Report
Operating Company: NuScale
Docket No. PROJ0769
Review Section: 15.09 - A.DSRS NuScale Thermal Hydraulic Stability
Application Section: 15.09

QUESTIONS

15.09-9

Title 10, 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.

In RAI 9218, the staff requested that the applicant explain how the following limitation from NuScale Topical Report, "Evaluation Methodology for Stability Analysis of the NuScale Power Module," TR-0516-49417, Revision 0, July 2016 for the PIM stability methodology would be met by a COL applicant:

The stability analysis methodology presented in the topical report is valid without consideration of a specific control system design provided the design of the module control system satisfies the following requirement: Any closed-loop control systems are designed and examined with respect to their impact on reactor stability by ensuring the respective control parameters (e.g., gain and time constants) are set to avoid any destabilizing effects.

In response to the RAI, the applicant provided language for a COL item (7.0-1) that states:

A COL applicant that references the NuScale Power Plant design certification is responsible for demonstrating the stability of the NuScale Power Module (NPM) during normal and power maneuvering operations for closed-loop module control system (MCS) subsystems that use reactor power as a control input.

The COL Item 7.0-1 appears to consider only a subset of the closed-loop control systems; that subset being only those subsystems that use reactor power as a control input. The limitation described in the topical report appears to more broadly consider any closed-loop control systems.

Therefore, the staff requests the following supplemental information:

- Explain the discrepancy between the COL Item 7.0-1 language and the language of the limitation in the topical report.
- Provide a listing of the closed-loop control systems and identify which control systems use reactor power as a control input.
- For those closed-loop control systems identified above that do not use reactor power as a control input explain why the control parameters do not need to be examined with respect to their impact on stability.