NuScaleTRRaisPEm Resource

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To: NuScaleTRRaisPEm Resource
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Subject: RAI-8830 (TR-0516-49417-P, "Evaluation Methodology for Stability Analysis of the NuScale Power Module")
Attachments: RAI 8830.docx

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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.