NuScaleTRRaisPEm Resource

From:	Cranston, Gregory
Sent:	Tuesday, August 14, 2018 12:04 PM
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. 9576 (eRAI No. 9576) Topical Report Thermal Hydraulic Stability 15.9, SRSB
Attachments:	Request for Additional Information No. 9576 (eRAI No. 9576).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. 9576 (eRAI No. 9576)

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

15.09-10

Title 10 of the Code of Federal Regulations (CFR), Part 50.34 "Contents of Application; technical information," requires licensees to submit safety analyses that demonstrate how a given reactor complies with associated safety criteria. NuScale has submitted the PIM stability analysis methodology for NRC review and approval such that it may be used to demonstrate that the NuScale power module complies with the requirements of General Design Criteria (GDC) 12 of Title 10 CFR 50 Appendix A. SRP 15.0.2, "Review of Transient and Accident Analysis Methods," which provides guidance for the review of transient and accident analysis methods, directs the reviewer to review the quality assurance program, and in particular the software configuration control and testing procedures to ensure compliance with the requirements of Title 10 CFR 50 Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Reprocessing Plants".

During the NRC staff audit of the software test plan and associated procedures for PIM, the staff found that the regression testing requirements leave PIM susceptible to a condition the staff refers to as "code drift." Code drift refers to a process whereby multiple, subsequent changes to an evaluation model or code result in a significant change in the results. Code drift can occur if each change results in only a small difference in the results from version to version in each change, but the difference continues to accumulate in a consistent direction. Without tracking of the integrated effect of changes, it would be possible for changes to accumulate such that each change from an approved version results in code drift and a significant difference goes undetected. In summary, software testing is conducted to approve changes and relies only on comparing an updated code version to the previous version – and does not include any static benchmark – the change process could result in code drift.

In order to make an affirmative finding with regard to the above regulatory requirement important to safety, the NRC staff requested that NuScale describe how code drift is avoided through the regression testing process of PIM in RAI 9333 Question 01-67.

In the response to RAI 9333 Question 01-67, the applicant states that "no code drift has occurred through Version 1.2 of PIM, and any future code drift will be captured as part of the testing and verification process." However, the response does not provide any discussion as to how this conclusion was reached and does not describe any aspects of the testing and verification process in a specific sense that would preclude future code drift.

Therefore, in order to make an affirmative finding with regard to the above regulatory requirement important to safety, the NRC staff requests that NuScale describe those specific tests that are performed as part of the routine testing and verification process that ensure code drift has not occurred and further, that would capture future code drift if it were to occur, and that the quality assurance plan ensures the aforementioned specific test are effective in diagnosing any possible code drift.