NuScaleDCRaisPEm Resource

From: Chowdhury, Prosanta
Sent: Wednesday, February 28, 2018 9:43 AM
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Cc: Lee, Samuel; Cranston, Gregory; Karas, Rebecca; Schmidt, Jeffrey; Van Wert, Christopher; Bavol, Bruce
Subject: Request for Additional Information No. 373 RAI No. 9406 (04.02)
Attachments: Request for Additional Information No. 373 (eRAI No. 9406) .pdf

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

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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Licensing Branch 1 (NuScale)
Division of New Reactor Licensing
Office of New Reactors
U.S. Nuclear Regulatory Commission
301-415-1647

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Request for Additional Information No. 373 (eRAI No. 9406)

Issue Date: 02/28/2018
Application Title: NuScale Standard Design Certification - 52-048
Operating Company: NuScale Power, LLC
Docket No. 52-048
Review Section: 04.02 - Fuel System Design
Application Section:

QUESTIONS

04.02-9

In Appendices A through D of 10 CFR Part 52, the Commission has approved a two-tiered structure to design certifications. Discussions regarding the two-tiered approach can be found in the final rulemaking and various SECY papers and Staff Requirement Memorandums (SRMs). In particular, in the Staff Request Memorandum (SRM) to SECY-94-084 (ML003708098), the Commission instructed the staff to implement the two-tiered design certification rule structure proposed by the staff. The latest guidance is found in SECY-17-0075 (ML16196A321). SRP Section 14.3.4 provides some general guidance regarding the contents of Tier 1 and specifically states that:

Tier 1 should include those SSCs that could affect the operation of the reactor and core cooling systems [e.g., the following chapters of the Standard Review Plan (SRP): Chapter 4- Reactor, Chapter 5-Reactor Coolant Systems and Connected Systems, Chapter 6-Section 6.3 on Emergency Core Cooling Systems, Chapter 9-9.3.6 on the standby liquid control system, Chapter 15-Transients and Accidents Analyses].

The fuel assembly design is a safety significant structure due to (1) the fuel cladding acting as the first fission product barrier, and (2) the direct safety impacts that the fuel assembly design has on the analyses for normal operation, anticipated operational occurrences (AOOs), and postulated accidents (in particular, Chapter 4 and Chapter 15). Additionally, the empirical nature of the fuel design analysis methods means that the approved safety codes and methods are closely tied to the fuel assembly designs upon which they were built. The safe operation of the reactor and core cooling systems can be directly impacted due to the fuel assembly design having direct impacts on thermal-hydraulic and transient performance. Similarly, the burnup limit is safety significant because it has direct implications on the fuel performance and is an important parameter in the design basis accident radiological consequences analyses.

The staff requests NuScale to provide the Tier 1 description for the fuel system design. For example, the Tier 1 description should include the following (or something equivalent):

Section 1.X.X Fuel Assembly Design

The fuel assembly is designed to ensure that possible fuel damage would not result in the release of radioactive materials in excess of prescribed limits. The fuel assembly is comprised of fuel rods, grids, guide tubes, top and bottom nozzles, plenum springs, and leaf springs. The fuel assembly design utilized in the NuScale reactor must be approved by the NRC for the NuScale reactor design.