

NuScaleDCRaisPEm Resource

From: Chowdhury, Prosanta
Sent: Wednesday, May 2, 2018 9:25 AM
To: Request for Additional Information
Cc: Lee, Samuel; Cranston, Gregory; Franovich, Rani; Karas, Rebecca; Schmidt, Jeffrey; NuScaleDCRaisPEm Resource
Subject: Request for Additional Information No. 457 eRAI No. 9501 (15)
Attachments: Request for Additional Information No. 457 (eRAI No. 9501).pdf

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

The NRC Staff recognizes that NuScale has preliminarily identified that the response to one or more questions in this RAI is likely to require greater than 60 days. NuScale is expected to provide a schedule for the RAI response by email within 14 days.

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. 457 (eRAI No. 9501)

Issue Date: 05/02/2018

Application Title: NuScale Standard Design Certification - 52-048

Operating Company: NuScale Power, LLC

Docket No. 52-048

Review Section: 15 - Introduction - Transient and Accident Analyses

Application Section:

QUESTIONS

15-12

10 CFR 52.47(a)(11) requires an applicant for design certification to provide proposed technical specifications prepared in accordance with the requirements of 10 CFR 50.36. 10 CFR 50.36(c)(2)(ii)(B) requires that a technical specification limiting condition for operation (LCO) be established for a "process variable, design feature, or operating restriction that is an initial condition of a design basis accident or transient analysis that either assumes the failure of or presents a challenge to the integrity of a fission product barrier." The initial condition ranges assumed in the evaluation of design basis events is provided in Table 15.0-6 of the Final Safety Analysis Report (FSAR). This table includes the range of reactor coolant system (RCS) average temperatures and pressures assumed to bound the RCS average temperature and pressure ranges during planned normal operation, including startup. These are listed in Table 15.0-6 as the Tavg and pressurizer pressure parameter ranges, which form the analytical bounds for planned power operation.

NuScale generic technical specifications (GTS) do not include an LCO for the Tavg parameter directly. However, the staff noted that LCO 3.4.1 includes a LCO for RCS pressure, flow, and cold leg temperature (Tcold), with TS bases that state, "The limits placed on RCS pressure and temperature ensure that the minimum critical heat flux ratio (MCHFR) will be met for each of the transients analyzed." In their response to RAI 8772, Question 4.03-1, NuScale clarified that the RCS cold temperature is based on preserving thermal margin to critical heat flux.

The staff interprets FSAR Table 15.0-6 as providing the analysis initial condition ranges that are used in the Chapter 15 transient and accident analysis (LOCA and non-LOCA), to determine the appropriate acceptance criteria are met. Further, the NuScale Containment Response Analysis Methodology Technical Report, TR-0516-49084, incorporated by reference into the FSAR, provides the methodology for selection of the initial conditions of the analyses, but not in all cases the numerical values, such as Tavg.

1. The staff is seeking clarification of whether NuScale intends that LCO 3.4.1 protects the initial average RCS temperature and pressure ranges assumed in Table 15.0-6 for all of the design basis events listed above (LOCA and non-LOCA), as well as the initial conditions for the peak containment pressure analysis. If LCO 3.4.1 is only intended to ensure CHF is met for "each of the transients analyzed," please specify the TS LCO that is intended to ensure CHF is met for the LOCA analysis and peak containment pressure is met for FSAR Section 6.2.1 analyses. If LCO 3.4.1 is intended for the LOCA and peak containment pressure analyses, please update the Technical Specification Bases for LCO 3.4.1, and also include the methodology for the containment pressure analyses in Technical Specification Section 5.6.3.

2. In addition, the staff is seeking clarification regarding FSAR Figure 4.4-9, "Analytical Operating Limits". FSAR Section 4.4.3.2, "Operating Restrictions", states that, "Figure 4.4-9 provides the operating map indicating the permissible operating range that is constrained by each of the following considerations." The staff interprets Figure 4.4-9 as defining the transient operating space (i.e., upset conditions a reactor enters during an AOO) as determined by the trip setpoints and not the initial permissible operating range for planned normal operation, which would be governed by Technical Specification LCOs. The staff is requesting that NuScale provide additional information regarding Figure 4.4-9 and revise the FSAR, if necessary, to clarify its intent.