

NuScaleDCRaisPEm Resource

From: Chowdhury, Prosanta
Sent: Thursday, April 12, 2018 8:17 AM
To: Request for Additional Information
Cc: Lee, Samuel; Cranston, Gregory; Baval, Bruce; Karas, Rebecca; Drzewiecki, Timothy; NuScaleDCRaisPEm Resource
Subject: Request for Additional Information No. 421 eRAI No. 9462 (04.04)
Attachments: Request for Additional Information No. 421 (eRAI No. 9462).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. 421 (eRAI No. 9462)

Issue Date: 04/12/2018

Application Title: NuScale Standard Design Certification - 52-048

Operating Company: NuScale Power, LLC

Docket No. 52-048

Review Section: 04.04 - Thermal and Hydraulic Design

Application Section:

QUESTIONS

04.04-3

GDC 10, *Reactor design*, requires that the reactor core and associated coolant, control, and protection systems be designed with appropriate margin to assure that specified acceptable design limits are not exceeded during any condition of normal operation, including the effects of anticipated operational occurrences. FSAR, Tier 2, Section 4.4.2.9, states that uncertainties or biases are incorporated into the subchannel methodology to provide conservatism and that these uncertainties establish the design limit for the critical heat flux (CHF) correlation. FSAR, Tier 2, Section 4.4.2.9 further states that the derivation of these penalties or conservative biases are discussed in TR-0915-17564, "Subchannel Analyses Methodology." The methodology used to obtain the penalties and the methodology used to combine the penalties are described in Section 3.12 and Section 3.4 of TR-0915-17564, respectively. Section 1.1 of TR-0915-17564 states that the analysis results presented within the report are for demonstration of the analytical methodology and approval of the results are not sought as part of the report.

The penalties that are used to establish the design limits for the NSP2 and NSP4 CHF correlations supporting the NuScale Design Certification Application are not provided in FSAR Section 4.4. NRC staff needs to establish a finding that the penalties applied to the NSP2 and NSP4 CHF correlations provide suitably conservative safety limits for use in transient and accident analyses. Accordingly, NRC staff requests that NuScale update FSAR, Tier 2, Section 4.4.2.9.2 to provide the penalties and their bases used to set the CHF ratio limits of 1.262 and 1.284 for the NSP2 and NSP4 CHF correlations, respectively.

04.04-4

GDC 10, *Reactor design*, requires that the reactor core and associated coolant, control, and protection systems be designed with appropriate margin to assure that specified acceptable design limits are not exceeded during any condition of normal operation, including the effects of anticipated operational occurrences. FSAR, Tier 2, Section 4.4.2.10, states that the enthalpy rise peaking factor specified in technical specifications includes an additional term, T_q , to accommodate azimuthal tilt that could increase the enthalpy rise peaking factor above the design limit for core design calculations. Section 3.10.4 of TR-0915-17564, "Subchannel Analysis Methodology," Revision 1 (ML17046A333), provides a similar discussion of flux tilt. NRC staff needs to establish a finding that the methodology for calculating T_q is suitably conservative. Accordingly, NRC staff requests that the applicant update the FSAR to describe the methodology used to determine T_q .