NuScaleDCRaisPEm Resource

From: Chowdhury, Prosanta
Sent: Wednesday, May 2, 2018 4:22 PM
To: Request for Additional Information
Cc: Lee, Samuel; Cranston, Gregory; Franovich, Rani; Karas, Rebecca; Schmidt, Jeffrey; NuScaleDCRaisPEm Resource
Subject: Request for Additional Information No. 462 eRAI No. 9495 (15)
Attachments: Request for Additional Information No. 462 (eRAI No. 9495).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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From: Chowdhury, Prosanta

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Request for Additional Information No. 462 (eRAI No. 9495)

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

15-16

General Design Criterion 10, "Reactor design," in Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, Appendix A, requires that the reactor core and associated coolant, control, and protection systems shall be designed with appropriate margin to assure that specified acceptable fuel design limits are not exceeded during any condition of normal operation, including the effects of anticipated operational occurrences.

In response to RAI 8771, the applicant provided additional 15.0.6 figures in its Final Safety Analysis Report (FSAR) as requested by the staff. For the decay heat removal system (DHRS) cooldown case using the non-loss of coolant accident (non-LOCA) NRELAP5 model, the staff noted that reactor pressure vessel (RPV) pressure as given by FSAR Figure 15.0-13, continues to drop after approximately 8000 secs, while reactor power, FSAR Figure 15.0-8, and average reactor coolant system (RCS) temperature, Figure 15.0-11, have stabilized (are constant). It is unclear to the staff why RPV pressure continues to drop after the other parameters have stabilized for a cooldown scenario in which no loss of RPV inventory occurs. For a critical reactor with constant inventory, the continued RPV pressure drop would indicate continued heat removal, and hence a decreasing average temperature and increasing reactor power. Therefore, the staff is requesting additional information that explains this RPV system behavior to ensure model fidelity and that the peak return to power minimum critical heat flux ratio (MCHFR) condition was evaluated.

In addition, it is unclear why the rate of RPV pressure drop increases from approximately 6500 seconds up to just prior to the point of returning to power. Therefore, the staff is requesting additional information to understand the system behavior to ensure model fidelity and a conservative prediction of the MCHFR.