

NuScaleDCRaisPEm Resource

From: Cranston, Gregory
Sent: Monday, March 4, 2019 4:47 PM
To: Request for Additional Information
Cc: Lee, Samuel; Hayes, Michelle; Pohida, Marie; Franovich, Rani; Chowdhury, Prosanta; NuScaleDCRaisPEm Resource
Subject: RE: Request for Additional Information No. 518 eRAI No. 9659 (19)
Attachments: Request for Additional Information No. 518 (eRAI No. 9659).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 by [April 22, 2019](#), to the RAI to the NRC Document Control Desk.

If you have any questions, please contact me.

Thank you.

Hearing Identifier: NuScale_SMR_DC_RAI_Public
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Subject: RE: Request for Additional Information No. 518 eRAI No. 9659 (19)
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From: Cranston, Gregory

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Request for Additional Information No. 518 (eRAI No. 9659)

Issue Date: 03/03/2019

Application Title: NuScale Standard Design Certification - 52-048

Operating Company: NuScale Power, LLC

Docket No. 52-048

Review Section: 19 - Probabilistic Risk Assessment and Severe Accident Evaluation

Application Section: 19.1.7

QUESTIONS

19-39

Regulatory basis

10 CFR 52.47(a)(27) requires a description of the design-specific probabilistic risk assessment (PRA) and its results.

Discussion

Standard Review Plan, Chapter 19.0, Revision 3, page 19.0-22 identifies the need for in-depth NRC review of refueling operations for small, modular reactors, which are different from traditional LWRs, to ensure that the PRA model is of acceptable scope and level of detail. This same page also requires staff to verify that applicants for plants with multiple modules use a systematic process to identify accident sequences, including significant human errors that could lead to core damage or large release from multiple modules.

Section 19.1.7.4 of the NuScale Design Certification Application (DCA) discusses how a module dropped during refueling transport might impact other modules. Rev. 1 of the DCA states that if the module is dropped on an operating module near the top, it could damage the DHRS piping or heat exchangers. In Rev. 2 of the DCA, NuScale added that "additional pipe breaks may occur, leading to a [chemical and volume control system] CVCS line break outside containment." Additionally, Rev. 1 of the DCA states that if the operating module was struck near the bottom, the safety systems would remain nominally available, whereas Rev. 2 replaced this conclusion with "the collision is expected to cause a torque about the module support lugs, resulting in similar stresses to the piping on top of the operating module." The risk insights from this evaluation, which is the same in both revisions, are that a dropped module may incur core damage while the struck modules incur initiating events at full power.

Because Rev. 2 of the DCA postulates additional damage to the operating module beyond what was described in Rev. 1, the staff needs additional information to conclude the qualitative multi-module risk assessment is technically adequate and complete.

Request for Additional Information

Provide justification that multi-module risk insights for the struck module that is assumed to be operating at full power are unaffected by the additional damage described in Rev. 2 of the DCA. Specifically, describe which pipes in the CVCS, decay heat removal system and the containment flooding and drain system are assumed to fail and why. Also explain if the capability of the containment isolation valves to close is compromised, given that the strike to the operating module has sufficient force to cause pipe breaks.