

NuScaleDCRaisPEm Resource

From: Cranston, Gregory
Sent: Friday, December 15, 2017 9:42 AM
To: RAI@nuscalepower.com
Cc: NuScaleDCRaisPEm Resource; Lee, Samuel; Chowdhury, Prosanta; Burkhardt, Lawrence; Williams, Stephen
Subject: Request for Additional Information No. 301 RAI No. 9236 (11.5)
Attachments: Request for Additional Information No. 301 (eRAI No. 9236).pdf

Attached please find NRC staff's request for additional information 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. The NRC Staff recognizes that NuScale has preliminarily identified that the response to this question in this RAI is likely to require greater than 60 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
301-415-0546

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Request for Additional Information No. 301 (eRAI No. 9236)

Issue Date: 12/15/2017

Application Title: NuScale Standard Design Certification - 52-048

Operating Company: NuScale Power, LLC

Docket No. 52-048

Review Section: 11.05 - Process and Effluent Radiological Monitoring Instrumentation and Sampling Systems

Application Section: 11.5

QUESTIONS

11.05-1

11.5 RAI - Determination of RCS coolant leakage of 1.0 gpm within 2 hours

Regulatory Basis: GDC 13, 30, and 64

In review of DCD sections 11.5.2.1.2, 11.5.2.2.7, and 11.5.2.2.8, the staff determined that there is not enough information presented in the DCD to verify the low end nominal ranges provided in DCD Table 11.5-1. 10 CFR Part 50, Appendix A, GDC 13 requires instrumentation to monitor variables and systems over their anticipated ranges for normal operation, for anticipated operational occurrences, and for accident conditions as appropriate to assure adequate safety. GDC 30 requires an applicant to identify sources of leakages. GDC 64, requires monitoring for the reactor containment atmosphere, spaces containing components for recirculation of loss-of-coolant accident fluids, effluent discharge paths, and the plant environs for radioactivity that may be released from normal operations, including anticipated operational occurrences, and from postulated accidents. Regulatory Guide 1.45 describes that all monitoring to detect leakages should be able to respond to a leakage increase of 1.0 gpm in 1 hour.

Key Issue:

The staff is unable to confirm the applicant's ability to detect RCS coolant leakage based on the assumed RCS activities presented in DCD section 11.1.

As discussed in the audit, the staff requests the applicant provide the equations and data used to determine the RCS coolant leakage rates for the Condenser Air Removal System monitors (11.5.2.1.2), the Containment Evacuation System monitors (11.5.2.2.7) and the Main Steam System monitors (11.5.2.2.8). Information such as volumes, leakage rates, and assumed RCS activity concentrations should be clearly stated in the response. The staff also requests the applicant provide a discussion on the applicability of a plate out factor given the containment vessel design.

In addition the staff notes discussions in DCD sections 11.1.1.2 and 11.5.2 that mentions the injection of natural argon gas to maintain a constant level in the RCS coolant for leakage detection purposes. It is not clear to staff what the assumed level of Ar-41 will be in the RCS coolant. Is this value based on the primary coolant realistic source terms presented in DCD Table 11.1-6? Or is some higher level of Argon anticipated? If some level of Argon needs to be maintained where is the requirement specified?

The staff requests that the necessary methodology and parameters to perform this calculation be contained in DCD section 11.5. The necessary pointers, parameters, and applicable guidance needs to be clearly stated for the staff to make a determination of compliance with 10 CFR Part 50, Appendix A, GDCs 13, 30, and 64.