

NuScaleDCRaisPEm Resource

From: Cranston, Gregory
Sent: Friday, December 15, 2017 8:37 AM
To: RAI@nuscalepower.com
Cc: NuScaleDCRaisPEm Resource; Lee, Samuel; Chowdhury, Prosanta; Mitchell, Matthew; Reichelt, Eric; Vera Amadiz, Marieliz
Subject: RE: Request for Additional Information No. 297 RAI No. 9213 (3.6.3)
Attachments: Request for Additional Information No. 297 (eRAI No. 9213).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.

The NRC Staff recognizes that NuScale has preliminarily identified that the response to the question 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.

Gregory Cranston, Senior Project Manager
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. 297 (eRAI No. 9213)

Issue Date: 12/15/2017

Application Title: NuScale Standard Design Certification - 52-048

Operating Company: NuScale Power, LLC

Docket No. 52-048

Review Section: 03.06.03 - Leak-Before-Break Evaluation Procedures

Application Section:

QUESTIONS

03.06.03-11

In response to RAI 8843 concerning the Leak-Before-Break (LBB) application for main steam system (MSS) and feedwater system (FWS) line breaks, the applicant stated that technical specifications (TS) limiting conditions for operation (LCO) 3.4.5 is for reactor coolant system (RCS) leakage and not for MSS/FWS piping leakage. The staff found the response to be unacceptable for the following reasons:

1. In order to meet the requirements of Title 10 of the Code of Federal Regulations Part 50, Appendix A, General Design Criterion 4 and the guidance of Standard Review Plan Section 3.6.3, the procedures under Regulatory Guide (RG) 1.45 "Guidance on Monitoring and Responding to Reactor Coolant System Leakage" address the monitoring of the RCS leakage. The applicability of these procedures support the implementation of a leakage limit as specified in LCO 3.4.5 for the RCS. However, the applicant is proposing to use the RG 1.45 procedures to monitor leakage of MSS and FWS piping without a corresponding LCO leakage limit. To correctly use RG 1.45 procedures for MSS and FWS leakage, a limit similar to LCO 3.4.5 for RCS leakage must be specified for MSS and FWS leakage.
2. The proposed procedures do not require a licensee to take action in the event a MSS/FWS leak is identified to remediate the source of the leak to ensure that integrity of the MSS/FWS will be maintained under all design basis scenarios.

Equipment in the containment of a NuScale small modular reactor will not be protected from dynamic effects of main steam line and feedwater line breaks in the NuScale design, based on the assumption for the success of LBB

Standard Review Plan Section 3.6.3 states that, "The specifications for plant specific leakage detection systems inside the containment should be equivalent to those in RG 1.45," which in turn requires that under certain circumstances (e.g., to support LBB for smaller diameter pipes), leakage monitoring system specifications may need to exceed the quantitative criteria in RG 1.45. In addition, 10 CFR 50.36(a)(2) requires the applicant for a design certification under Part 52 of this chapter to include technical specifications in accordance with the requirements of this section for the portion of the plant that is within the scope of the design certification. The failure of the proposed LBB lines could lead to the failure of the instrumentation used to detect/indicate a significant abnormal degradation of the reactor coolant pressure boundary as indicated in Criterion 1 10 CFR 50.36(c)(2)(ii), or a failure to the integrity of a fission product barrier due to jet impingement and pipe whip (see Criterion 2 of 10 CFR 50.36(c)(2)(ii)).

Based on the above review, the applicant is requested to propose a TS LCO leakage limit consistent with the moment versus leak rate curves used for flaw stability criteria - especially since both the MSS and FWS involve small diameter piping. The staff has previously requested moment versus leak rate curves for the MSS and FWS piping in RAI 9113 Question 03.06.03-8