

NuScaleDCRaisPEm Resource

From: Cranston, Gregory
Sent: Saturday, December 16, 2017 7:54 AM
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Cc: NuScaleDCRaisPEm Resource; Lee, Samuel; Chowdhury, Prosanta; Dias, Antonio; Li, Chang; Baval, Bruce
Subject: Request for Additional Information No. 302 RAI No. 9276 (5.2.5)
Attachments: Request for Additional Information No. 302 (eRAI No. 9276).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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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. 302 (eRAI No. 9276)

Issue Date: 12/16/2017

Application Title: NuScale Standard Design Certification - 52-048

Operating Company: NuScale Power, LLC

Docket No. 52-048

Review Section: 05.02.05 - Reactor Coolant Pressure Boundary Leakage Detection

Application Section: 5.2.5

QUESTIONS

05.02.05-6

10 CFR 50, Appendix A, General Design Criterion (GDC) 30 requires, in part, that means “be provided for detecting and, to the extent practical, identifying the location of the source of reactor coolant leakage.” Regulatory Guide 1.45, “Guidance on Monitoring and Response to Reactor Coolant System Leakage,” describes acceptable methods for implementing GDC 30 with respect to the selection of reactor core pressure boundary (RCPB) leakage detection systems.

In TS LCO 3.4.7, “RCS Leakage Detection Instrumentation,” NuScale uses three reactor coolant system (RCS) detection methods: (a) containment evacuation system (CES) condensate, (b) CES pressure, and (c) CES radiation monitor. The detection capability of methods (a) and (b) satisfies the quantitative guidance of detecting 1 gpm leakage within one hour, as indicated in RG 1.45. However, method (c) does not satisfy the above quantitative guidance, but provides qualitative capability for the RCS leakage detection as indicated in FSAR Section 5.2.5.

As a follow-up to the teleconference with NuScale on October 18, 2017 relating to the clarification on NuScale’s response to eRAI 8863 Question 06.02.04-4, the staff reviewed the statement in the RAI response that “with two of the methods inoperable due to high containment pressure, reactor operators will perform the required actions within specified completion times according to the technical specifications.” The referenced TS LCO 3.4.7 has in the “required actions” for Condition A, “One required leakage detection channel inoperable,” to perform SR 3.4.5.1, once per 24 hours. This “required action” does not meet NRC guidance in RG 1.45, Regulatory Positions C.2.2 and C.2.3. Position C.2.3 states that plant technical specifications should identify at least two independent and diverse methods that have the detection capabilities specified in C.2.2, which is detecting the leakage of up to 1 gpm within one hour. The staff finds that performing SR 3.4.5.1 may not meet the criterion of detecting 1 gpm leakage within one hour. If the two required methods used to satisfy the LCO requirement are either (a) and (c), or (b) and (c), and if in Condition A (One required leakage detection channel inoperable) and the only remaining available method under this condition is method (c), the CES gaseous radioactivity monitor, which does not have the capability specified in C.2.2 of RG 1.45, then the performance of SR 3.4.5.1 is inadequate. Therefore, Position C.2.3 of RG 1.45 is not satisfied.

Therefore, LCO 3.4.7, which could rely on the two methods (a) and (c), or methods (b) and (c), would not meet Position C.2.3 if either method (a) or (b) were inoperable. Since LCO 3.4.7 specifies two of the three methods, (a), (b), and (c) shall be operable, and method (c), gaseous radioactivity monitor, does not meet the capability guidance of C.2.2, the TS does not meet RG 1.45 and is inadequate.

The applicant is requested to revise the proposed LCO 3.4.7 to be consistent with RG 1.45 Positions C.2.2 and C.2.3 as discussed above.