

NuScaleDCRaisPEm Resource

From: Cranston, Gregory
Sent: Friday, June 15, 2018 2:07 PM
To: Request for Additional Information
Cc: Lee, Samuel; Karas, Rebecca; Budzynski, John; Baval, Bruce; Schmidt, Jeffrey; Chowdhury, Prosanta; NuScaleDCRaisPEm Resource
Subject: Request for Additional Information No. 491 eRAI No. 9557 (5.2.2)
Attachments: Request for Additional Information No. 491 (eRAI No. 9557).pdf

Attached please find NRC staff's request for additional information (RAI) concerning review of the NuScale Design Certification Application. Password will be sent separately.

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.

Hearing Identifier: NuScale_SMR_DC_RAI_Public
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Options

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Request for Additional Information No. 491 (eRAI No. 9557)

Issue Date: 06/15/2018

Application Title: NuScale Standard Design Certification - 52-048

Operating Company: NuScale Power, LLC

Docket No. 52-048

Review Section: 05.02.02 - Overpressure Protection

Application Section: 5.2.2

QUESTIONS

05.02.02-2

Supplemental RAI to RAI 8957 O 03.09.06-8

Background

In RAI 8957, Question 03.09.06-8, the staff noted that NuScale FSAR Tier 2, Section 5.2.2.6, "Applicable Codes and Classification," states that the RSVs are designed in accordance with ASME BPV Code, Section III, Subarticle NB-3500; and function to satisfy the overpressure protection criteria described in ASME BPV Code, Section III, Article NB-7000. As such, the staff submitted a request to NuScale to provide a detail design description including specific design aspects to address the capacity certification for the various fluid conditions over their full range of operating conditions up to and including design-basis accident conditions.

However, the NuScale response did not include sufficient detail to address the sizing of the RSVs. The response stated that analyses of bounding overpressurization transients showed that reactor coolant pressure boundary pressure remained below 110% of design pressure. NuScale FSAR Tier 2, Section 5.2.2.2.1, "Overpressure Protection During Power Operations," states that a turbine trip at full power without bypass capability is the most severe AOO and is the bounding event used in the determination of RSV capacity and the RPV overpressure analyses. The response did not provide the assumptions and reactor input parameters used in the analysis as cited in NUREG-0800, Section 5.2.2, "Overpressure Protection," SRP Acceptance Criteria 3.B.i through v; for example, the staff could not conclude that the analysis had credited the second safety-grade signal from the reactor protection system as initiating the reactor scram as specified in Acceptance Criteria 3.B.iii.

Basis

General Design Criterion (GDC) 15, as it relates to designing the Reactor Coolant System (RCS) and associated auxiliary, control, and protection systems with sufficient margin to assure that the design conditions of the reactor coolant pressure boundaries (RCPB) are not exceeded during any condition of normal operation, including anticipated operational occurrences (AOOs).

NUREG-0800, Section 5.2.2, "Overpressure Protection," SRP Acceptance Criteria 3.B states that to assure sufficient overpressure protection, the designs of the safety valves should have sufficient capacity to limit the pressure to less than 110 percent of the RCPB design pressure during the most severe AOO with reactor scram, as specified by ASME Code Article NB-7000.

Request

Please provide a detailed discussion of the RSV sizing capacity and the RPV overpressure protection analyses including the assumptions and initial conditions relative to the guidance in NUREG-0800, Section 5.2.2 Acceptance Criteria 3.B.