

NuScaleDCRaisPEm Resource

From: Cranston, Gregory
Sent: Wednesday, June 14, 2017 12:45 PM
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Cc: NuScaleDCRaisPEm Resource; Lee, Samuel; Chowdhury, Prosanta; Jackson, Diane; Tabatabai, Omid; Travis, Boyce
Subject: Request for Additional Information No. 61, RAI 8862
Attachments: Request for Additional Information No. 62 (eRAI No. 8862).pdf

Attached please find NRC staff's request for additional information concerning review of the NuScale Design Certification Application.

Please submit your 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.

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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. 62 (eRAI No. 8862)

Issue Date: 06/14/2017

Application Title: NuScale Standard Design Certification - 52-048

Operating Company: NuScale Power, LLC

Docket No. 52-048

Review Section: 06.02.05 - Combustible Gas Control in Containment

Application Section: 6.2

QUESTIONS

06.02.05-1

10 CFR Part 50.44, "Combustible gas control for nuclear power reactors" subpart (c), "Requirements for Future Water-Cooled Reactor Applicants and Licensees," requires in part that all containments must have the capability to ensure a mixed atmosphere during design-basis and significant beyond design basis accidents.

As part of the topical report TR-0716-50424, "Combustible Gas Control", which supports FSAR Section 6.2.5, a justification is provided for containment mixing in the annular region of the containment, but not the upper portion of the containment where the geometry more closely resembles a dome. Documents audited by the staff provided a qualitative argument comparing the conditions in this region to those the annular region. From this argument, it is not clear to the NRC staff that conditions in the upper region of the containment lend themselves to the same degree of turbulence argued to be present in the annular region. Provide a detailed justification regarding why the entirety of containment, including the dome region, is well mixed. The topical report should be updated to reflect this justification. Additionally, provide a mark-up of FSAR changes to support a sufficient explanation for the basis of the statement.

06.02.05-2

10 CFR Part 50.44, "Combustible gas control for nuclear power reactors" subpart (c), "Requirements for Future Water-Cooled Reactor Applicants and Licensees," requires in part that all equipment required to establish safe shutdown and ensure containment function must have the capability to withstand a hydrogen burn and detonation resulting from at least the hydrogen generated following a fuel clad-coolant reaction involving 100 percent of the fuel cladding, unless such detonations can be shown to be unlikely to occur. Following such a hydrogen burn, this equipment must continue to perform its function during design-basis and significant beyond design basis accidents.

FSAR Section 6.2.5.1 states that "Systems and components within containment that are relied upon to establish and maintain safe shutdown or support containment structural integrity are evaluated for the impact of combustion loading." No further clarity is provided in Section 6.2.5, and statements in Section 19.2.3.3.8, "Equipment Survivability", indicate only that containment integrity is maintained by ensuring the containment penetrations and seals remain intact and that post accident monitoring continue to function. Provide, in FSAR section 19.2.3.3.8, an inventory of systems, and components required to maintain and establish safe shutdown and support containment structural integrity, as well as the titles of any NuScale references demonstrating systems required other than the containment vessel and

penetrations will continue to function following a hydrogen combustion event. Additionally, provide a mark-up of the FSAR section changes.