

NuScaleDCRaisPEm Resource

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Sent: Monday, May 22, 2017 2:02 PM
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Subject: Request for Additional Information No. 27, RAI 8788
Attachments: Request for Additional Information No. 27 (eRAI No. 8788).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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Hearing Identifier: NuScale_SMR_DC_RAI_Public
Email Number: 39

Mail Envelope Properties (8921f4397b794afabbde7123653839d9)

Subject: Request for Additional Information No. 27, RAI 8788
Sent Date: 5/22/2017 2:02:16 PM
Received Date: 5/22/2017 2:02:18 PM
From: Cranston, Gregory

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Post Office: HQPWMSMRS08.nrc.gov

Files	Size	Date & Time
MESSAGE	527	5/22/2017 2:02:18 PM
Request for Additional Information No. 27 (eRAI No. 8788).pdf		178804

Options

Priority: Standard
Return Notification: No
Reply Requested: No
Sensitivity: Normal
Expiration Date:
Recipients Received:

Request for Additional Information No. 27 (eRAI No. 8788)

Issue Date: 05/22/2017

Application Title: NuScale Standard Design Certification - 52-048

Operating Company: NuScale Power, LLC

Docket No. 52-048

Review Section: 08.01 - Electric Power - Introduction

Application Section: 8.1

QUESTIONS

08.01-1

General Design Criteria (GDC) 50, "Containment Design Basis," requires, in part, that the design of containment penetrations, including electrical penetrations containing circuits of the ac power system and the capability of electrical penetration assemblies in containment structures to withstand a loss-of-coolant (LOCA) without loss of mechanical integrity and the external circuit protection for such penetrations. The staff has reviewed the following sections in the design certification application and noted some inconsistencies in addressing the Electrical Penetration Assemblies (EPA) and their conformance to GDC 50.

- FSAR Tier 2 Section 3.1.5.1 states that the NuScale Power Plant Design conforms to GDC 50. However, FSAR Tier 2, Section 8.1.4.3, bullet 3, states that "the AC and DC electrical power system circuits do not penetrate the containment vessels; therefore, conformance with GDC 50 is not necessary."
- FSAR Tier 2, Section 8.3.1.2.7, under GDC 50, states that "the only circuits that penetrate the CNVs are I&C circuits that serve to control power and operate safety-related and nonsafety-related equipment (e.g., sensors, execute devices) associated with each NPM as described in Section 7.0.4. There are no AC electrical power system cables that penetrate the CNVs".
- FSAR Tier 2, Section 8.3.2.2.2, under GDC 50 compliance, states that "The CNV electrical penetration assemblies for the Class 1E and non- Class 1E circuits are included in the containment design and conform to GDC 50 as discussed in FSAR Tier 2 Section 6.2.1." EPAs are further discussed in the following:
 - Electrical penetration assemblies (example: CNV38/39) are indicated in FSAR Tier 2 Table 6.1-1,
 - FSAR Tier 2 Figure 6.2-2b shows electrical penetration assembly,
 - FSAR Tier 2, Section 6.2.4, under Containment Isolation, itemized Electrical Penetration for power supply as 3 total on the top head, and,
 - FSAR Tier 2, Section 6.2.6.2 describes the leakage tests for Electrical Penetration Assemblies (EPA)
- FSAR Tier 1, Section 2.1.1, under Design Commitments, the 10th bullet states that "The NPM Class 1E containment electrical penetration assemblies are sized to power their design loads." In addition, FSAR Tier 1 Section 2.1.1, the last bullet states, "The CNTS Class 1E containment electrical penetration assemblies are rated to withstand fault currents for the time required to clear the fault from its power source."
- FSAR Tier 1 Table 2.1-2, and Table 2.1-3 lists Class 1E electrical penetrations for CNTS pressurizer heater power, and control rod drives. It is not specific whether these equipment require AC/DC power supply.

The staff requests NuScale to:

1. clarify whether or not electrical penetration assembly in the Class 1E containment conforms to GDC 50,
2. clarify whether there are electrical penetration assemblies for power circuits and supplies,
- 3.. provide a list of the safety-related low voltage power circuits and control power circuits (AC and DC) that penetrate the containment (i.e., EPA), and

4. if there is a Class 1E circuit that is included in the containment design, as stated in FSAR Tier 2 Section 8.3.2.2.2, explain why the EPA will not meet GDC 50 as Class 1E containment EPA, as stated in FSAR Tier 2 Section 8.1.4.3.