NuScaleDCRaisPEm Resource

From:	Cranston, Gregory
Sent:	Tuesday, July 25, 2017 9:21 AM
To:	RAI@nuscalepower.com
Cc:	NuScaleDCRaisPEm Resource; Lee, Samuel; Chowdhury, Prosanta; Marshall, Amanda; Anderson, Joseph
Subject:	RE: Request for Additional Information No. 103, RAI 8916 (9.3.6)
Attachments:	Request for Additional Information No. 103 (eRAI No. 8916).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.

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

Hearing Identifier: NuScale_SMR_DC_RAI_Public
Email Number: 122

Mail Envelope Properties (f0f8d863e5fc443d9cf3b3a972521516)

Subject: RE: Request for Additional Information No. 103, RAI 8916 (9.3.6)
Sent Date: 7/25/2017 9:21:04 AM
Received Date: 7/25/2017 9:21:04 AM
From: Cranston, Gregory

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Post Office: HQPWMSMRS08.nrc.gov

Files	**Size**	**Date & Time**
MESSAGE	560	7/25/2017 9:21:04 AM
Request for Additional Information No. 103 (eRAI No. 8916).pdf	108271	

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

Request for Additional Information No. 103 (eRAI No. 8916)

Issue Date: 07/25/2017
Application Title: NuScale Standard Design Certification - 52-048
Operating Company: NuScale Power, LLC
Docket No. 52-048
Review Section: 09.03.06 - Containment Evacuation and Flooding Systems
Application Section: 9.3.6

QUESTIONS

09.03.06-2

GDC 34 states that “Suitable redundancy...shall be provided to assure that for onsite electrical power system operation (assuming offsite power is not available) and for offsite electrical power system operation (assuming onsite power is not available), the system safety function can be accomplished, assuming a single failure.”

BTP 5-4 states that “The system(s) that can be used to take the reactor from normal operating conditions to cold shutdown shall satisfy the following functional requirements: A. The design shall be such that the reactor can be taken from normal operating conditions to cold shutdown using only safety-grade systems.”

SECY-94-084 allows an alternative to BTP 5-4 position for passive systems based on the following:

> After the passive RHR system or main steam system effected the initial shutdown, a non-safety-grade reactor shutdown cooling system will be available to bring the plant to cold shutdown conditions for inspection and repair. EPRI stated that “these non-safety systems are required to be highly reliable . . . and there is no single failure of these systems or their support systems which would result in inability to terminate use of the passive safety grade system and achieve cold shutdown if desired.

NuScale DCD Tier 2 Section 5.4.3.1 states the following:

> Water Reactor Utility Requirements Document (Reference 5.4-3) was determined to be acceptable by the Nuclear Regulatory Commission as documented in SECY-94-084. Per SECY-94-084 and NUREG-1242, Volume 3, Part 2, transition of a passive plant from safe shutdown conditions to cold shutdown conditions may be reached using nonsafety-related systems. The nonsafety-related containment flood and drain system is used to flood the containment to allow passive long term decay heat removal via convection and conduction to the reactor pool via the RCS, RPV shell, flooded containment, and CNV shell.

NuScale DCD Tier 2 Figure 9.3.6-2 shows that a single CFDS line to the module has valves in series (CFDS containment isolation valves, CFDS module isolation valve, and the valve upstream of the six module isolation valves in parallel), and therefore, a failure of any of those valves may make the CFDS inoperable.

Explain how the CFDS is protected from a single failure and provide a markup to update the DCD.

09.03.06-3

NuScale DCD Tier 2 Section 9.3.6.5 states that "[t]he CES and the CFDS have indication and alarms associated with system critical parameters to alert operators in the MCR of potentially adverse conditions." The staff could not find a list of critical parameters.

The applicant is requested to provide a list of critical parameters for the CES and CFDS, identify the location in the DCD (if already listed), and provide a markup to update the DCD to clarify this section.

09.03.06-4

NuScale DCD, Tier 2, Section 9.3.6.2.3 states the following:

> High-radiation levels in the gases removed from the CNV actuate an alarm in the MCR. If the radiation level in the CES gaseous process flow exceeds a specified limit, or upon monitor failure, the discharge path is transferred from the RBVS to the GRWS and the following automated functions are initiated:
>
> - service air to the CES isolates
> - service air to the CES vacuum pumps isolates

NuScale DCD, Tier 2, Figure 9.3.6-1, shows only a single line coming from the service air system to the CES. Therefore, isolating service air to the CES would automatically isolate the CES vacuum pumps; as such, the reason for identifying two separate isolating functions is not clear.

NuScale is requested to clarify and provide a markup to update the DCD accordingly.