

July 24, 2017

Docket No. 52-048

U.S. Nuclear Regulatory Commission  
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**SUBJECT:** NuScale Power, LLC Response to NRC Request for Additional Information No. 37 (eRAI No. 8832) on the NuScale Design Certification Application

**REFERENCE:** U.S. Nuclear Regulatory Commission, "Request for Additional Information No. 37 (eRAI No. 8832)," dated May 26, 2017

The purpose of this letter is to provide the NuScale Power, LLC (NuScale) response to the referenced NRC Request for Additional Information (RAI).


The Enclosure to this letter contains NuScale's response to the following RAI Question from NRC eRAI No. 8832:

- 05.02.05-1

This letter and the enclosed response make no new regulatory commitments and no revisions to any existing regulatory commitments.

If you have any questions on this response, please contact Marty Bryan at 541-452-7172 or at mbryan@nuscalepower.com.

Sincerely,



Zackary W. Rad  
Director, Regulatory Affairs  
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Enclosure 1: NuScale Response to NRC Request for Additional Information eRAI No. 8832



**Enclosure 1:**

NuScale Response to NRC Request for Additional Information eRAI No. 8832

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## **Response to Request for Additional Information Docket No. 52-048**

**eRAI No.:** 8832

**Date of RAI Issue:** 05/26/2017

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**NRC Question No.:** 05.02.05-1

10 CFR 52.47(a)(2) requires that a standard design certification applicant provide a description and analysis of the structures, systems, and components (SSCs) of the facility, with emphasis upon performance requirements, the bases, with technical justification therefor, upon which these requirements have been established, and the evaluations required to show that safety functions will be accomplished.

Regulatory Guide (RG) 1.45 Position C.2.4 indicates that “at least one of the leakage monitoring systems required by the plant technical specifications ... should be capable of performing its function(s) following any seismic event that does not require plant shutdown.

In reviewing the reactor coolant pressure boundary (RCPB) leakage detection with respect to RG 1.45 Position C.2.4, the staff noticed the information in FSAR Tier 2, Section 5.2.1, which states the following:

“The containment evacuation system (CES) inlet pressure instrumentation is designed to Seismic Category I and ensures that these components maintain the capability to perform their safety leak monitoring function during and after a safe shutdown earthquake. Therefore, the CES inlet pressure instrumentation is also capable of detecting changes in the containment atmospheric conditions, including leakage from the RCPB, during a seismic event that does not result in an NPM shutdown.”

However, FSAR Tier 2, Table 3.2-1 indicates that for the CES being used for RCPB leakage detection, other than the pressure indicator, the rest of the system is Seismic Category III, which is not expected to survive in a seismic event.

The applicant is requested to provide the following information to demonstrate how RG 1.45 Position C.2.4 is satisfied:

1. Clarify how the pressure instrument can “maintain the capability to perform its leak monitoring function” if the non-seismic portions of the CES fail following a safe shutdown earthquake.
2. In the CES diagram, identify the location of the pressure instrument and the piping seismic classification associated with the pressure instrument.

**NuScale Response:**

1. Regulatory guide 1.45 position C.2.4 requires that "at least one of the leakage monitoring systems required by the plant technical specifications...should be capable of performing its function(s) following any seismic event that does not require plant shutdown." In the event of a failure of the Seismic Category III portion of the Containment Evacuation System (CES), as the result of a seismic event, containment pressure may increase due to a failure of the CES vacuum pumps or CES pressure boundary. If the failure of the CES or leakage is sufficiently severe, this could result in a loss of vacuum event covered in Chapter 15.1.6 of the Final Safety Analysis Report. A loss of vacuum would result in a shutdown of the affected module and monitoring of leakage would no longer be required consistent with RG 1.45 position C.2.4.

The CES inlet pressure instrumentation which is seismically qualified to Seismic Category I will be used as the primary means of leak detection following a seismic event that does not result in a module shutdown.

2. The highest seismic category for the CES is Seismic Category I for the CES inlet pressure instrumentation. These instruments are connected to the module protection system, which is also Seismic Category I. The piping between the containment isolation valve and the pipe gallery wall is Seismic Category II as it is not required to operate after a safe-shutdown earthquake.

At this time, the CES components within the reactor building pipe gallery (other than the pressure instrumentation mentioned previously) are designed to Seismic Category III as they are not required to operate after a safe-shutdown earthquake. Their structural failure would not impair the capability for safe shutdown or continued operation. The seismic classification may be upgraded to Seismic Category II based on pipe routing near sensitive equipment in the future.

FSAR Figure 9.3.6-1 has been revised to include the CES inlet pressure instrumentation location.

**Impact on DCA:**

Figure 9.3.6-1 has been revised as described in the response above and as shown in the markup provided in this response.

RAI 05.02.05-1

Figure 9.3.6-1: Containment Evacuation System Diagram

