

## NuScaleDCRaisPEm Resource

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**Sent:** Friday, May 26, 2017 4:36 PM  
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**Subject:** Request for Additional Information No. 39, RAI 8841  
**Attachments:** Request for Additional Information No. 39 (eRAI No. 8841).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.

Gregory Cranston, Senior Project Manager  
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. 39 (eRAI No. 8841)

Issue Date: 05/26/2017

Application Title: NuScale Standard Design Certification - 52-048

Operating Company: NuScale Power, LLC

Docket No. 52-048

Review Section: 05.02.05 - Reactor Coolant Pressure Boundary Leakage Detection

Application Section: 5.2

### QUESTIONS

05.02.05-2

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.

RG 1.45, Regulatory Positions C.2.1 and C.2.2 provide guidance on leakage detection systems sensitivity and response time:

"Plant procedures should include the collection of leakage to the primary reactor containment from unidentified sources so that the total flow rate can be detected, monitored, and quantified for flow rates greater than or equal to 0.05 gal/min (0.19 L/min).

The plant should use leakage detection systems with a response time (not including the transport delay time) of no greater than 1 hour for a leakage rate of 1 gal/min (3.8 L/min)."

FSAR Tier 2, Section 9.3.6.3 states the following:

"Regulatory Positions C.2.1 and C.2.2, in RG 1.45 are satisfied in that:

- Leakage to the primary reactor containment from unidentified sources can be detected, monitored, and quantified for flow rates greater than or equal to 0.05 gpm using containment vessel (CNV) pressure or containment evacuation system (CES) sample tank level timing.
- Leakage detection response time (not including transport delay time) is less than one hour for a leakage rate greater than 1 gpm using CNV pressure or CES sample tank level timing."

Although, the CNV pressure and CES tank level timing are used indirectly measure leakage flow, FSAR Tier 2 does not indicate how CNV pressure and CES tank level timing are related to the reactor coolant leakage sensitivity and leakage detection response time.

The applicant is requested to clarify how RG 1.45, Regulatory Positions C.2.1 and C.2.2, are satisfied by addressing the following questions:

- a) Clarify how the instrument output of CNV pressure and CES tank level timing correlate to reactor coolant leakage rate.
- b) Demonstrate how the leakage sensitivity of 0.05 gpm and the leakage detection response time of one gpm within one hour are satisfied by using CNV pressure and the correlation.
- c) Demonstrate how the leakage sensitivity of 0.05 gpm and the leakage detection response time of one gpm within one hour are satisfied by using CES sample tank level and the correlation.