

NuScaleDCRaisPEm Resource

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Sent: Wednesday, June 28, 2017 11:12 AM
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Subject: Request for Additional Information No. 74, RAI 8915
Attachments: Request for Additional Information No. 74 (eRAI No. 8915).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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Request for Additional Information No. 74 (eRAI No. 8915)

Issue Date: 06/28/2017

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: Section 5.2.5

QUESTIONS

05.02.05-5

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.

GDC 30, "Quality of reactor coolant pressure boundary," states, in part, "[M]eans shall be provided for detecting and, to the extent practical, identifying the location of the source of reactor coolant leakage."

RG 1.45, Revision 1, Regulatory Positions C.2.3 provide guidance on leakage detection systems:

"In addition to the monitoring systems detailed in the technical specifications, the plant should use other systems to detect and monitor for leakage, even if it does not have the capabilities specified in Regulatory Position C.2.2. These **supplemental instruments/methods** may include, but are not limited to, the following:

- (a) monitoring airborne gaseous radioactivity,
- (b) monitoring the humidity of the containment,
- (c) monitoring the temperature of the containment,
- (d) monitoring the pressure of the containment,
- (e) monitoring acoustic emission, and
- (f) conducting video surveillance."

In addition, RG 1.45, Section B, Subject "Methods for Monitoring Leakage and Identifying Its Source," states the following to explain the function of these **supplemental instruments/methods**:

"Effective methods for monitoring (including detecting) any leakage and **locating its source** are important...

... Because of the need to **identify the source of leakage** to assess its safety significance, plants should install monitoring systems to assist in locating the source of leakage during reactor operation. Plants can accomplish this, in part, by installing a number of instruments throughout containment and monitoring the response of each of these instruments to leakage. An instrument that is closer to a leak is likely to respond sooner than an instrument that is further away, assuming that the two instruments have similar capabilities (e.g., sensitivity). ..."

The staff reviewed FSAR Tier 2, Section 5.2.5, "Reactor Coolant Pressure Boundary Leakage Detection," and Section 9.3.6, "Containment Evacuation System and Containment Flooding and Drain System," and found information about the containment evacuation system (CES) condensate water level and containment pressure, which are used for plant Technical Specifications for leakage detection. Other than a brief discussion of CES gaseous discharge radioactivity monitoring to identify the source of leakage, there is basically no further discussion about these "**supplemental instruments/methods**" for identifying the location and source of leakage. It is not clear why even containment temperature and containment humidity are not discussed for satisfying the above guidance.

The applicant is requested to provide the information, to the extent practical, regarding the supplemental instruments/methods for identifying the location of the source of reactor coolant leakage.