NuScaleDCRaisPEm Resource

From:	Cranston, Gregory
Sent:	Tuesday, October 23, 2018 10:36 AM
To:	Request for Additional Information
Cc:	Lee, Samuel; Dudek, Michael; Stutzcage, Edward; Tabatabai, Omid; Chowdhury, Prosanta; NuScaleDCRaisPEm Resource
Subject:	Request for Additional Information No. 509 eRAI No. 9608 (14.3.8)
Attachments:	Request for Additional Information No. 509 (eRAI No. 9608).pdf

Attached please find NRC staff's request for additional information (RAI) concerning review of the NuScale Design Certification Application.

Please submit your technically correct and complete response by December 17, 2018, RAI to the NRC Document Control Desk.

If you have any questions, please contact me.

Thank you.

Hearing Identifier: NuScale_SMR_DC_RAI_Public
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Request for Additional Information No. 509 (eRAI No. 9608)

Issue Date: 10/23/2018
Application Title: NuScale Standard Design Certification - 52-048
Operating Company: NuScale Power, LLC
Docket No. 52-048
Review Section: 14.03.08 - Radiation Protection Inspections, Tests, Analyses, and Acceptance Criteria
Application Section: 14.3.8

QUESTIONS

14.03.08-1

This is a follow-up to RAI 9303, Question 12.03-52

Regulatory Basis

10 CFR 52.47(b)(1), requires that the application contain the Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC), that are necessary and sufficient to provide reasonable assurance that, if the inspections, tests, and analyses are performed and the acceptance criteria met, a facility that incorporates the design certification (DC) has been constructed and will be operated in conformity with the DC, the provisions of the Atomic Energy Act (AEA), and NRC regulations.

Appendix A to 10 CFR Part 50— "General Design Criteria (GDC) for Nuclear Power Plants," Criterion 61—"Fuel storage and handling and radioactivity control," requires systems which may contain radioactivity to be designed with suitable shielding for radiation protection and with appropriate containment, confinement, and filtering systems.

GDC Criterion 60— "Control of releases of radioactive materials to the environment," requires that the nuclear power unit design include means to control suitably the release of radioactive materials in gaseous and liquid effluents and to handle radioactive solid wastes produced during normal reactor operation, including anticipated operational occurrences.

The Acceptance Criteria of DSRS Section 12.3-12.4, "Radiation Protection Design Features," contains a number of criteria related to the radiation protection design, including:

Systems, Structures and Components (SSC) that are described in the application, should be designed to maintain radiation exposures to operating and maintenance personnel ALARA. Structures housing radioactive waste processing systems or components should be classified using the guidance for potential exposure to site personnel found in RG 1.143.

In addition, DSRS Section 14.3.8 indicates that the reviewer should ensure that Tier 1 identifies and describes, commensurate with their safety significance, those SSCs that provide radiation shielding, confinement or containment of radioactivity, ventilation of airborne contamination, or radiation (or radioactivity concentration) monitoring for normal operations and during accidents.

Background

In a letter issued by the NRC to NuScale, "NuScale Letter on Draft Standard ITAAC," and "Draft Standardized DCA ITAAC Tables - Enclosure to NuScale Letter on Draft Standard ITAAC," dated April 8, 2016 (ADAMS Accession Nos. ML16096A132 and ML16097A123), the staff described the ITAAC that are applicable to the staff review of the NuScale application. These standard ITAAC included:

R07 "As-Built Inspection and Reconciliation Analysis," to verify that the structures, systems, and components of the non-Seismic Category I radioactive waste system are designed and constructed to the standards of RG 1.143 to withstand the design loads without loss of structural integrity.

In Tier 2, Sections 11.2, 11.3, and 11.4, the applicant addresses compliance with RG 1.143 and provides the design criteria for which the components of the radwaste systems are to be designed. In the response to RAI 9303, Question 12.03-52, the applicant provided several reasons for not including an ITAAC for verifying that the radwaste systems are designed in accordance with those criteria. These reasons included that the radwaste systems were not safety-related or risk significant, that they did not support safety or risk-significant functions, and because the DCD included several other ITAAC related to the radwaste systems and the radwaste building. These include ITAAC that mitigate the release of radioactivity by initiating the closure of valves upon detection of a high radiation signal. However, these ITAAC do not ensure that the systems are built to the proper criteria. The staff agrees that the radwaste systems are not safety-related, however, they contain some of the most radioactive components in the plant, besides the core and spent fuel. An ITAAC ensuring that the systems are built properly will provide the staff with reasonable assurance that a radwaste system failure will not result in a significant radiological release or worker exposure event. Therefore, the staff does not believe that the response includes adequate justification for excluding the ITAAC.

Key Issue

DCD Tier 1, Chapter 1 "Certified Design Descriptions and Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC)," does not contain ITAAC corresponding to R07, with respect to verifying that the as-built SSCs containing radioactive waste meet the design criteria, consistent with the guidance contained within RG 1.143, provided for demonstrating compliance with the provisions of 10 CFR Part 20 related to the protection of the health and safety of members of the public and protection of occupational radiation workers.

Question

Please provide the specified ITAAC (R07) to ensure that the as-built components of the radwaste systems meet the appropriate design criteria or describe an equivalent way that will ensure that the radwaste systems will be built as designed.