NuScaleDCRaisPEm Resource

From: Cranston, Gregory
Sent: Sunday, January 28, 2018 2:33 PM
To: RAI@nuscalepower.com
Cc: NuScaleDCRaisPEm Resource; Lee, Samuel; Chowdhury, Prosanta; Dudek, Michael; Lavera, Ronald; Markley, Anthony
Subject: Request for Additional Information No. 347 RAI No. 9299 (12.2)
Attachments: Request for Additional Information No. 347 (eRAI No. 9299).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.

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. 347 (eRAI No. 9299)

Issue Date: 01/28/2018
Application Title: NuScale Standard Design Certification - 52-048
Operating Company: NuScale Power, LLC
Docket No. 52-048
Review Section: 12.02 - Radiation Sources
Application Section: 12.2, 11.4

QUESTIONS

12.02-25

10 CFR 52.47(a)(5) requires applicants to identify the kinds and quantities of radioactive materials expected to be produced in the operation and the means for controlling and limiting radiation exposures within the limits set forth in 10 CFR Part 20. 10 CFR 20.1101(b) and 10 CFR 20.1003, require the use of engineering controls to maintain exposures to radiation as far below the dose limits in 10 CFR Part 20as is practical. The DSRS Acceptance Criteria section of NuScale DSRS section 12.2, "Radiation Sources,' states that the applications should contain the methods, models and assumptions used as the bases for all sources described in DCD Section 12.2.

NuScale DCD Tier 2, Revision 0 Section 11.4.2, "System Description," states that spent filters are removed from the filter housing and placed into a high integrity container (HIC). Once the HIC is full, it is dewatered, sealed, and stored for eventual offsite processing and disposal. DCD Section "11.4.2.2 Wet Solid Waste," indicates that this may include spent cartridge filters as well as filter membranes from the Tubular Ultra Filtration system (TUF) and the Reverse Osmosis unit (RO). DCD Table 11.4-3: "Estimated Annual Volumes of Wet Solid Waste," states that some of these filters may be Waste Class B or C.

DCD Section 12.2.1.3, "Chemical and Volume Control System," states that cartridge filters clean radioactive particulate from radioactive fluid streams. DCD Section 12.2.1.7, "Solid Radioactive Waste System," states there is storage space provided in the Radioactive Waste Building for processed waste packages that contain spent filters.

Department of Energy (DOE) DOELLW-114F "Greater-Than-Class C Low-Level Waste Characterization, Appendix F: Greater-Than-Class C Low-Level Radioactive Waste Light Water Reactor Projections," states that some individual PWR filters may have dose rates in the 50 rad/hour to 200 rad/hour range. The dose rates reported in DOELLW-114F were based on operating experience from commercial nuclear power plants.

Key Issue:

DCD Tier 2, Revision 0 subsection 12.2.1.7, "Solid Radioactive Waste System," states that the assumed values used to develop the solid radioactive waste system (SRWS) source terms are listed in Table 12.2-18. DCD subsection 12.2.1.7 also states that Table 12.2-19, "Solid Radioactive Waste System Component Source Terms – Radionuclide Content," lists the radionuclide inventory of the major SRWS components and Table 12.2-20, "Solid Radioactive Waste System Component Source Terms – Source Strengths" lists the SRWS component source strengths. The information contained in DCD Table 12.2-18, DCD Table 12.2-19 and DCD Table 12.2-20 does not describe the source term in the HIC containing filters. Based on information made available to the staff during the RPAC Chapter 12 Audit, the staff was not able to determine the source term in the HIC containing filters

The radionuclide concentrations listed in DCD subsection 12.2 are the basis of the information used to establish plant source terms, consistent with NuScale DSRS 12.2 Acceptance Criteria, which states that all of the sources of radiation exposure to workers and members of the public (from contained sources) are identified, characterized, and considered in the design and operation of the facility. This section of the DSRS also states that unless described within other sections of the FSAR, source descriptions should include the methods, models, and assumptions used as the bases for all values provided in FSAR Section 12.2.

Question

To facilitate staff understanding of the application information sufficient to make appropriate regulatory conclusions, with respect to the descriptions of the sources of radiation present in the facility, the staff requests that the applicant:

- Provide the radionuclide content of the HICs containing filters,
- Provide the methods, models and assumptions, used to develop the assumed radionuclide concentrations, and associated basis,

OR

Provide the specific alternative approaches used and the associated justification.