NuScaleDCRaisPEm Resource

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Sent:	Friday, July 07, 2017 2:39 PM
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Subject:	Request for Additional Information No. 85, RAI 8898
Attachments:	Request for Additional Information No. 85 (eRAI No. 8898).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. 85 (eRAI No. 8898)

Issue Date: 07/07/2017
Application Title: NuScale Standard Design Certification - 52-048
Operating Company: NuScale Power, LLC
Docket No. 52-048
Review Section: 09.02.06 - Condensate Storage Facilities
Application Section: 09.02.06

QUESTIONS

09.02.06-1

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.

GDC 2 establishes requirements with respect to the condensate storage facilities (CSFs) design regarding protection against the effects of natural phenomena such as earthquakes, tornados, hurricanes and floods. Despite not being an important to safety system, the application of GDC 2 to the CSF design ensures that nearby SSCs important to safety will not be adversely affected by physical interaction with failed portions of the CSF or by flooding due to the failure of non-seismic portions of the CSF.

FSAR Tier 2, Section 9.2.6 contains a discussion about the condensate storage tanks (CSTs) and their use in supporting the NuScale Power Module's condensate and feedwater system. The CSTs are classified as seismic category III (non-seismic) in FSAR Tier 2, Table 3.2-1, "Classification of Structure Systems, and Components," and their location is specified as being in the Turbine Generator Building.

As indicated in Section I of SRP 9.2.6, the staff's review of the condensate storage facilities includes the review of provisions for mitigating the environmental effects of system leakage or storage tank failure. Details on these provisions are not included in the NuScale FSAR.

The FSAR discussion is also limited to the CSTs and does not include any other portion of the CSF such as the condensate transfer system and its associated SSCs.

In FSAR Tier 2, Chapter 1, the plant layout figures show the CSTs located outside the turbine generator buildings, which seems not to be in agreement with the location information in FSAR Tier 2, Table 3.2-1.

The applicant is requested to:

- provide a discussion of the provisions and CSF design features to ensure adequate protection against the effects of natural phenomena as indicated in Section I of SRP 9.2.6.
- expand the description of the CSF in order to include other portions such as the condensate transfer system and its associated SSCs. Diagrams would be helpful.
- identify the actual location of the CSTs and make any clarification needed to assure that the CSTs location information in the FSAR is accurate and consistent.

The FSAR should be modified accordingly

09.02.06-2

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.

GDC 60 requires that nuclear power unit designs include a means to control the release of radioactive materials in liquid effluents produced during normal reactor operation, including anticipated operational occurrences. The technical rationale for GDC 60 being applicable to the condensate storage facilities (CSFs) is provided in SRP 9.2.6 which states, in part, that the criteria in GDC 60 apply to all tanks that are located outside the reactor containment and include radioactive materials in liquids. These tanks have the potential for uncontrolled releases of radioactive materials attributed to spillage. Through its connections with the reactor coolant system (in boiling-water reactors) or secondary coolant system (in pressurized water reactors), the CSF potentially contains radioactive material, thus the CSTs must comply with GDC 60. Meeting the requirements of GDC 60 ensures that radiation exposures for operating personnel and the general public are as low as is reasonably achievable. Regulatory Guide 1.143 provides specific guidance for implementing GDC 60.

The current NuScale FSAR does not indicate that the CSFs meet the GDC 60 requirements, or that the design was developed using the guidance provided in Regulatory Guide 1.143.

The applicant is requested to describe how the NuScale CSFs meet the requirements of GDC 60 including design features for leakage detection, leakage prevention and leakage containment. The FSAR should be modified accordingly.

09.02.06-3

10 CFR 20.1406 requires, in part, that each design certification applicant describe how the facility design and procedures for operation will minimize, to the extent practicable, contamination of the facility and the environment, as well as the generation of radioactive waste. Regulatory Guide 4.21 provides guidance on meeting the requirements of 10 CFR 20.1406.

Since the condensate storage facilities (CSFs) interface with systems containing radioactive fluids, and can potentially contain radioactive fluids due to primary to secondary leakage (i.e., steam generator tube leakage), 10 CFR 20.1406 applies to the CSFs.

The current NuScale FSAR does not discuss how the CSFs comply with 10 CFR 20.1406.

The applicant is requested to describe how the CSFs comply with 10 CFR 20.1406, including information describing design features for leakage prevention and early leak detection. Also to be identified is whether the system uses any buried piping and how monitoring and inspection will be performed for those portions of the system. The FSAR should be modified accordingly.