

NuScaleDCRaisPEm Resource

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Sent: Friday, July 07, 2017 2:47 PM
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Subject: Request for Additional Information No. 86, RAI 8866
Attachments: Request for Additional Information No. 86 (eRAI No. 8866).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. 86 (eRAI No. 8866)

Issue Date: 07/07/2017

Application Title: NuScale Standard Design Certification - 52-048

Operating Company: NuScale Power, LLC

Docket No. 52-048

Review Section: 09.02.02 - Reactor Auxiliary Cooling Water Systems

Application Section: DCD Tier 2 Section 9.2.8

QUESTIONS

09.02.02-1

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.

General Design Criterion (GDC) 2, "Design Bases for Protection Against Natural Phenomena," of Appendix A to 10 CFR Part 50, requires SSCs important to safety to be designed with the ability to withstand, in particular, the effects of an earthquake, and SRP 9.2.7 provides guidance on how GDC 2 requirements will be met for the chilled water system (CHWS).

In FSAR Tier 2, Subsection 9.2.8.1, "Design Bases," the applicant states, in part, "[G]eneral Design Criteria (GDC) 2, 4, and 5 were considered in the design of the CHWS. The CHWS is not required to function during or after a natural phenomenon event or other events that result in the generation of missiles, pipe whipping, or discharging fluids. Portions of the system that are in proximity to Seismic Category I SSC are designed to Seismic Category II standards. ... See Section 9.2.8.3 for the safety evaluation. The safety, risk significance, seismic, quality, and other design classifications for CHWS structures, systems and components are provided in Table 3.2-[1]."

In FSAR Tier 2, Subsection 9.2.8.3, "Safety Evaluation," the applicant states, in part, "[C]onsistent with GDC 2, the portions of the CHWS whose structural failure could adversely affect the function of Seismic Category I SSC or personnel serving a safety related function are classified as Seismic Category II. All other CHWS equipment is classified as Seismic Category III."

In FSAR Tier 2, Table 3.2-1, "Classification of Structures, Systems, and Components," all components of the CHWS are classified as Seismic Category III.

The staff noted that the CHWS provides cooling water to the control room HVAC system which, in turn, provides habitable environment for the control room occupants during normal operation and abnormal plant condition (i.e. loss of onsite power). It is unclear to the staff which CHWS components are classified as Seismic Category II, as stated in the safety evaluation (FSAR, Tier 2, Subsection 9.2.8.3).

The applicant is requested to clarify the assigned Seismic Category classification of the CHWS components in FSAR Table 3.2-1.

09.02.02-2

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.

General Design Criterion (GDC) 5, "Sharing of Structures, Systems, and Components," of Appendix A to 10 CFR Part 50, requires SSCs important to safety not to be shared among nuclear power units unless it can be shown that such sharing will not significantly impair their ability to perform their safety function and SRP 9.2.7 provides guidance on how GDC 5 requirements will be met.

In FSAR Tier 2, Subsection 9.2.8.1, "Design Bases," the applicant states, in part, "[G]eneral Design Criteria (GDC) 2, 4, and 5 were considered in the design of the CHWS. ... Consistent with GDC 5, the components in the CHWS do not have a safety function or a function for shutting a unit down or maintaining a NPM in a safe shutdown condition. Operation of the CHWS does not interfere with the ability to operate or shut down a unit. See Section 9.2.8.3 for the safety evaluation."

The staff could not determine from the system description nor the safety evaluation presented in FSAR Tier 2, Section 9.2.8, whether the CHWS is a shared system and how GDC 5 requirements will be met.

The applicant is requested to address the above staff's concerns (CHWS is or is not a shared system, how GDC 5 is met) and revise the FSAR accordingly, or justify this lack of information.

09.02.02-3

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.

In FSAR Tier 2, Subsection 9.2.8.2.2, "Component description," under the heading of "Chilled Water System Chillers," the applicant states, in part, "[T]he CRVS standby CHWS chiller provides chilled water to the respective CRVS chilled water coils. Heat is removed via a remote air cooled condensing unit located outdoors. Refrigerant piping interconnects the outdoor remote condensing unit to the indoor evaporator and compressor."

FSAR Tier 2, Figure 9.2.8-1, "Chilled Water System Diagram," shows major components of the chilled water system (CHWS).

The staff noted an error in Figure 9.2.8-1 regarding the labeling of components within the control room HVAC system (CRVS) standby CHWS chiller. The "CONDENSOR" and the "REMOTE ... CONDENSING UNIT" are actually one single component.

The applicant is requested to correct this error in Figure 9.2.8-1.