RAIO-0917-56151

September 25, 2017

Docket No. 52-048

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
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11555 Rockville Pike
Rockville, MD 20852-2738

SUBJECT: NuScale Power, LLC Response to NRC Request for Additional Information No. 106 (eRAI No. 8919) on the NuScale Design Certification Application

REFERENCE: U.S. Nuclear Regulatory Commission, "Request for Additional Information No. 106 (eRAI No. 8919)," dated July 25, 2017

The purpose of this letter is to provide the NuScale Power, LLC (NuScale) response to the referenced NRC Request for Additional Information (RAI).

The Enclosure to this letter contains NuScale's response to the following RAI Question from NRC eRAI No. 8919:

- 09.02.07-3

This letter and the enclosed response make no new regulatory commitments and no revisions to any existing regulatory commitments.

If you have any questions on this response, please contact Marty Bryan at 541-452-7172 or at mbryan@nuscalepower.com.

Sincerely,

Zackary W. Rad
Director, Regulatory Affairs
NuScale Power, LLC

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Enclosure 1: NuScale Response to NRC Request for Additional Information eRAI No. 8919

Enclosure 1:

NuScale Response to NRC Request for Additional Information eRAI No. 8919

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Response to Request for Additional Information
Docket No. 52-048

eRAI No.: 8919
Date of RAI Issue: 07/25/2017

NRC Question No.: 09.02.07-3

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.

10 CFR 52.47(c)(2) requires that a standard design certification of "a nuclear power reactor design that … uses simplified, inherent, passive, or other innovative means to accomplish its safety functions must provide an essentially complete nuclear power reactor design except for site-specific elements such as the service water intake structure and the ultimate heat sink, and must meet the requirements of 10 CFR 50.43(e)."

FSAR Tier 2, Section 9.2.7.2.1 states that the cooling tower basin is sized to provide for several hours of operation without any makeup water supply. No further information is provided to substantiate such statement.

The applicant is requested to:

- clarify the size of the basin and the duration of the operation without water makeup, and
- identify the source of the makeup water.

NuScale Response:

The SCWS provides cooling water to transfer heat from a number of non-safety auxiliary systems to the SCWS cooling towers, which is the normal heat sink. The SCWS is analogous to the service water systems of some plant designs. However, in most nuclear power plant designs, the service water system removes heat from safety-related systems, whereas the NuScale SCWS serves only non-safety systems.

The SCWS does not perform safety-related or risk significant functions. Detailed design of the cooling tower basin, including its capacity and its ability to operate for periods without makeup water, are site-specific, meeting the exclusion clause of 10 CFR 52.47(c)(2) and are, therefore,

not included in the FSAR and not intended to be part of the certified design. The statement in FSAR 9.7.2.1 regarding operation without makeup water has been removed.

Impact on DCA:

FSAR Section 9.2.7 has been revised as described in the response above and as shown in the markup provided in this response.

- process sampling system chillers
- condensate and feedwater sample coolers
- main steam sample coolers
- turbine generator heat exchangers, lube oil, and governor
- instrument air compressors and coolers

The major components of the SCWS include the SCWS pumps and associated piping, the cooling tower and associated basin, and traveling screens. Figure 9.2.7-1 shows the SCWS process piping and components. Table 9.2.7-1 provides the SCWS equipment design data.

SCWS Pumps and Piping

Three 50% capacity vertical wet pit pumps take suction from intake bays at the cooling tower and discharge into a network of piping that supplies cooling water to the various services around the plant. Each pump can be isolated to ensure system function, control system leakage, and allow system maintenance. The main SCWS pipe is located below grade. Expansion joints at the discharge of each pump compensate for thermal expansion and pump forces. A valve at the discharge of each SCWS pump with monitored position, and opening and closing valve operations are interlocked with their associated pump drivers to prevent reverse flow. Above ground SCWS piping and valves are lined carbon steel designed to ASME B31.1 (Reference 9.2.7-1). The SCWS underground piping is reinforced or pre-stressed, or both, concrete pressure piping and designed to the American Water Works Association standards.

Cooling Tower and Basin

The cooling tower consists of rectangular banks of three cells. Each cell includes a motor-driven mechanical draft fan, and isolation valves. The cooling tower is constructed of nonflammable (nonwooden) materials. The cooling tower superstructure and basin are concrete and are designed to ACI 318 (Reference 9.2.7-2) and ACI 334.2 (Reference 9.2.7-3) standards, as applicable.

The cooling towers are located away from any Seismic Category I or II structures, and safety-related components. If any structural failure of the cooling towers occurred, no Seismic Category I or II structures or safety-related systems or components would be impacted. A failure of a fan could result in the generation of missiles, but due to site arrangement, any damage is confined to the cooling towers, with no damage to Seismic Category I or II structures or safety-related systems or components.

RAI 09.02.07-3

~~The cooling tower basin is sized to provide for several hours of operation without any makeup water supply. During this period, repairs or maintenance can be performed on the makeup water system without shutting down the plant.~~