RAIO-0419-65218

April 15, 2019

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. 506 (eRAI No. 9614) on the NuScale Design Certification Application

**REFERENCE:** U.S. Nuclear Regulatory Commission, "Request for Additional Information No. 506 (eRAI No. 9614)," dated October 16, 2018

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. 9614:

- 16-59

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 Carrie Fosaaen at 541-452-7126 or at cfosaaen@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. 9614

**Enclosure 1:**

NuScale Response to NRC Request for Additional Information eRAI No. 9614

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

**eRAI No.:** 9614
**Date of RAI Issue:** 10/16/2018

**NRC Question No.:** 16-59

Paragraph (a)(11) of 10 CFR 52.47 and paragraph (a)(30) of 10 CFR 52.79 state that a design certification (DC) applicant and a combined license (COL) applicant, respectively, are to propose technical specifications (TS) prepared in accordance with 10 CFR 50.36 and 50.36a. 10 CFR 50.36 sets forth requirements for TS to be included as part of the operating license for a nuclear power facility.

The applicant is requested to explain why DHRS actuation on High Narrow Range Containment Pressure is apparently not required to be operable with RCS Wide Range Hot Temperature < 350°F, which is below the T-3 interlock, even though the NPM is not being PASSIVELY COOLED, because decay heat removal is accomplished using the turbine bypass system, the condensate and feedwater system, and the circulating water system. The Applicability of Function 3.3.1.22b in MODE 3 is "When not PASSIVELY COOLED." However, T-3 automatically bypasses Function 3.3.1.22b below 350°F. See GTS Bases Revision 1, Subsection B 3.3.1, Applicable Safety Analyses, LCO, and Applicability section:

Pages B 3.3.1-14 and -15 regarding Wide Range RCS Hot Temperature Interlock, T-3;

1. On decreasing temperature, the T-3 interlock automatically bypasses:

    - High Narrow Range Containment Pressure trip for DHR actuation...

Pages B 3.3.1-15 and -16 regarding Containment [Vessel] Level Interlock, L-1:

2. On decreasing containment water level or not RT-1 (Reactor Trip Permissive not established [when one or both divisional reactor trip breakers indicate closed]), the L-1

interlock automatically enables the following trip signals for DHR actuation:

- High Narrow Range Containment Pressure

Pages B 3.3.1-35 and -36 regarding Narrow Range Containment pressure, in particular, High Narrow Range Containment Pressure Decay Heat Removal System Actuation:

Four High Narrow Range Containment Pressure DHRS channels are required to be OPERABLE in MODES 1 and 2, and MODE 3 without PASSIVE COOLING in operation. In MODE 3 with PASSIVE COOLING in operation, sufficient cooling for decay heat loads is met. In MODES 4 and 5 the reactor is subcritical and passively cooled.

The applicant is requested to capitalized "passively cooled" in the last sentence, because this expression is a defined term.

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**NuScale Response:**

*Part 1*

As provided in NuScale letter LO-0419-65170 dated April 15, 2019 describing the separation of the DHRS actuation signal from the secondary system isolation (SSI), the High Containment Pressure signal no longer directly actuates the DHRS. The signal initiates an SSI which causes the main steam and feedwater lines to be isolated. The SSI high narrow range containment pressure signal incorporates the same T-3 and L-1 interlocks described in the RAI as formerly applicable to the DHRS actuation logic.

During a normal shutdown, decay heat is removed from the reactor using the non-safety turbine bypass system, the condensate and feedwater system, and the circulating water system. Those systems are non-credited, non-safety systems and functions that are the preferred means of managing a shutdown when available.

If normal preferred systems capability is or becomes unavailable, decay heat will be removed by one of the passive safety-related systems. Two divisions of ECCS and two divisions of DHRS are available to perform this function. Those systems are required to be OPERABLE when the plant is in MODES 1, 2, and in MODE 3 when not PASSIVELY COOLED.

Loss of decay heat removal would result in automatic actuation of the SSI upon exceeding one of its initiating signals, for example increased main steam temperatures and high main steam

superheat. This actuation would result in closure of the main steam and feedwater lines, and result in DHRS automatic actuation on high RCS hot temperature, high main steam pressure, high pressurizer pressure, or low AC voltage. The evolution of the event would vary depending upon which conditions existed at the initiation of the transient, however automatic functions remain available to initiate decay heat removal through the credited passive safety-related systems.

Note that although uncredited, the plant operators would be notified of any loss of decay heat removal capability and would respond by restoring the preferred cooling or if necessary by initiating DHRS or ECCS operation manually if needed.

*Part 2*

The use of ‘passively cooled’ in this sentence is not meant as the defined term ‘PASSIVELY COOLED.’

This is consistent with TSTF-GG-05-01, Rev. 1, NEI Writer’s Guide for Improved Technical Specifications section 3.3.2.b, the use of the terms without capitalization is appropriate. In MODES 4 and 5, the reactor is passively cooled either through the submerged containment wall, or by direct contact of the reactor vessel and reactor fuel via the de-energized and open reactor recirculation valves, with the ultimate heat sink pool. Collectively these are passive cooling methods of decay heat removal, however they are not necessarily consistent with the defined term PASSIVELY COOLED. No changes to the Bases based on this comment.

**Impact on DCA:**

There are no impacts to the DCA as a result of this response.