



December 18, 2018

Docket No. 52-048

U.S. Nuclear Regulatory Commission  
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**SUBJECT:** NuScale Power, LLC Supplemental Response to NRC Request for Additional Information No. 196 (eRAI No. 9050) on the NuScale Design Certification Application

**REFERENCES:** 1. U.S. Nuclear Regulatory Commission, "Request for Additional Information No. 196 (eRAI No. 9050)," dated August 25, 2017  
2. NuScale Power, LLC Response to NRC "Request for Additional Information No. 196 (eRAI No.9050)," dated October 18, 2017

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

The Enclosure to this letter contains NuScale's supplemental response to the following RAI Question from NRC eRAI No. 9050:

- 16-16

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](mailto:cfosaaen@nuscalepower.com).

Sincerely,

Carrie Fosaaen  
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Enclosure 1: NuScale Supplemental Response to NRC Request for Additional Information eRAI No. 9050



**Enclosure 1:**

NuScale Supplemental Response to NRC Request for Additional Information eRAI No. 9050

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

**eRAI No.:** 9050

**Date of RAI Issue:** 08/25/2017

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

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 model standard technical specifications (STS) in the following documents provide NRC guidance on format and content of TS as acceptable means to meet 10 CFR 50.36 requirements. These documents may be accessed using the Agencywide Documents Access and Management Systems (ADAMS) by their accession numbers.

- NUREG-1431, “STS Westinghouse Plants,” Revision 4 (ADAMS Accession Nos. ML12100A222 and ML12100A228)
  
- NUREG-1432, “STS Combustion Engineering Plants,” Revision 4 (ADAMS Accession Nos. ML12102A165 and ML12102A169)
  
- NUREG-2194, “STS Westinghouse Advanced Passive 1000 (AP1000) Plants,” Revision 0 (ADAMS Accession No. ML16111A132)

The NRC staff needs to evaluate technical differences in the proposed generic TS (GTS) from applicable provisions in these documents, which are referenced by the DC applicant in Design Control Document (DCD) Tier 2, Section 16.1, and the docketed rationale for each difference because conformance to STS provisions is used in the safety review as the initial point of guidance for evaluating the adequacy of the GTS to ensure adequate protection of public health and safety, and the completeness and accuracy of the GTS Bases.



In the Background section of Bases Subsection B 3.3.1, the applicant is requested to do the following:

- a. In the first sentence of the second paragraph, clarify the phrase “ensure safe operation of the reactor and MODULE.” Since the definition of MODULE seems to imply inclusion of the reactor, the phrase seems redundant. The second sentence of the 10th paragraph states, “The reactor module must enter the Condition for the particular [MODULE Protection System] Functions affected.” Consider using “reactor module” in place of “reactor and MODULE” in the first sentence of the second paragraph.

*Note that this is an example of a global (DCA-wide) request to check for consistency in the use of the terms “reactor module”; “modular unit”; “unit”; “plant”; “facility”; “NuScale power module (NPM)”; “MODULE”; “site”; “reactor”; and any other related terms.*

- b. Justify using “parameters” instead of “variables” or “process variables” in the 2nd sentence of the 2nd paragraph, which states:

This is achieved by specifying limiting safety system settings (LSSS) in terms of *parameters* directly monitored by the [MODULE Protection System], as well as LCOs on other reactor system *parameters* and equipment performance.

*Note that this is an example of a global (DCA-wide) request to check for consistency in the use of the terms “parameters” and “variables.” In a public meeting on May 24, 2017, the applicant told the NRC staff that the term “parameter” is used to delineate an item having a fixed number (e.g. setpoint, range). The term “variable” is used to delineate an item that is liable to vary or change (e.g., pressure, temperature). The applicant committed to fix this inconsistency throughout the design certification application. See meeting summary dated June 15, 2017 (ML17159A750).*

- c. The 4th paragraph discusses the limiting trip setpoint (LTSP) instead of the nominal trip setpoint (NTSP) as discussed in the equivalent paragraph in the AP1000 STS Bases for Specifications 3.3.1 and 3.3.8. Explain which term is correct for NuScale in this instance.

- d. Revise, 7th paragraph (see page B 3.3.1-3) for consistency with (i) SL 2.1.1.2, and (ii) the defined term “MODULE,” as follows.

During AOOs, which are those events expected to occur one or more times during the ~~plant~~ MODULE life, the acceptable limits are:

- The critical heat flux ratio (CHFR) shall be maintained above the SL value to prevent critical heat flux (CHF);
- The peak linear heat rate shall be maintained below the SL value to prevent fuel centerline melting ~~Fuel centerline melting shall not occur~~; and
- Pressurizer pressure SL of 2285 psia shall not be exceeded.

Maintaining the *parameters* within the above values ensures that the offsite dose will be within the 10 CFR 50 (Ref. 2) and 10 CFR 100 (Ref. 3) criteria during AOOs.

Maintaining the *parameters* within the above values ensures that the offsite dose will be within the 10 CFR 50 (Ref. 2) and 10 CFR 100 (Ref. 3) criteria during AOOs.

*Note that the use of the word “parameters” in the above paragraph is an example of a global (DCA-wide) request to check for consistency in the use of the terms “parameters” and “variables.”*

- e. The 14th paragraph below the heading “Measurement Channels” (page B 3.3.1-7) states:

In addition to the self-checking features, the system includes functional testing features. Functional testing of the entire MPS, from SFM input through the opening of individual RTBs and actuation of ESFAS components, can be performed either at power or shutdown. The manual actuation switches in the MCR cannot be tested at power because they would cause a reactor trip or ESF actuation. FSAR, Chapter 7 (Ref. 4), provides more detail on MPS testing.



This discussion implies that the MPS can support performance of a 92 day Frequency CHANNEL OPERATIONAL TEST (COT). The applicant is requested to include a COT surveillance requirement (SR) in Subsection 3.3.1 and an appropriate discussion in the SR section of Bases Subsection B 3.3.1.

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**NuScale Response:**

This response supplements the response with regard to RAI 9050 16-16, item "c" that was provided in NuScale letter RAIO-1017-55987 dated October 18, 2017 (ML17291A482).

The Setpoint Program description in proposed Technical Specification 5.5.10 and the Bases of LCO 3.3.1 are consistent with the definitions and usage of the limiting trip setpoint (LTSP) in TR-0616-49121, Instrument Setpoint Methodology, Rev. 1 (ML18297A378). Section 4.1.3 and 4.1.4 of the methodology describe the relationship between the LTSP and NTSP.

Paragraph b. of Technical Specification 5.5.10 has been modified to require the calculation of the LTSP for each technical specification required automatic protection instrumentation function in conformance with the Instrument Setpoint Methodology.

**Impact on DCA:**

The Technical Specifications have been revised as described in the response above and as shown in the markup provided in this response.

## 5.5 Programs and Manuals

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### 5.5.9 Containment Leakage Rate Testing Program (continued)

- c. Containment leakage rate acceptance criterion is  $< 0.60 L_a$ . During the first unit startup following testing in accordance with this program, the leakage rate acceptance criteria are  $< 0.60 L_a$  for the Type B and Type C tests.
- d. The provisions of SR 3.0.3 are applicable to the Containment Leakage Rate Testing Program.
- e. Nothing in these Technical Specifications shall be construed to modify the testing Frequencies required by 10 CFR 50, Appendix J.

### 5.5.10 Setpoint Program (SP)

- a. The Setpoint Program (SP) implements the regulatory requirement of 10 CFR 50.36(c)(1)(ii)(A) that technical specifications will include items in the category of limiting safety system settings (LSSS), which are settings for automatic protective devices related to those variables having significant safety functions.
- b. The Limiting Trip Setpoint (LTSP), Nominal Trip Setpoint (NTSP), As-Found Tolerance (AFT), and As-Left Tolerance (ALT) for each Technical Specification required automatic protection instrumentation function shall be calculated in conformance with TR-0616-49121-P, "NuScale Instrument Setpoint Methodology."
- c. For each Technical Specification required automatic protection instrumentation function, performance of a CHANNEL CALIBRATION surveillance "in accordance with the Setpoint Program (SP)" shall include the following:
  - 1. The as-found value of the instrument channel trip setting shall be compared with the previously recorded as-left value.
    - i. If all as-found measured trip setpoint values during calibration and surveillance testing are inside the two-sided limits of Nominal Trip Setpoint (NTSP) plus or minus the Performance and Test Acceptance Criteria Band (PTAC), then the channel is fully OPERABLE, no additional actions are required.

## 5.5 Programs and Manuals

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### 5.5.10 Setpoint Program (SP) (continued)

- ii. If during channel OPERABILITY or calibration testing, the measured trip setpoint values are within the As-Found Tolerance band but outside the As-Left Tolerance Band, then the instrumentation channel is fully OPERABLE, however, calibration is required to restore the channel within the as-left tolerance band.
  - iii. If any as-found calibration setting value is outside the as-found Tolerance band, then the channel is inoperable, and corrective action is required. Calibration is required to restore the channel to within as-left tolerance band.
2. The instrument channel trip setting shall be set to a value within the specified ALT around the specified NTSP at the completion of the surveillance; otherwise, the surveillance requirement is not met and the instrument channel shall be immediately declared inoperable.
- d. The difference between the instrument channel trip setting as-found value and the previously recorded as-left value for each Technical Specification required automatic protection instrumentation function shall be trended and evaluated to verify that the instrument channel is functioning in accordance with its design basis.
  - e. The SP shall establish a document containing the current value of the specified LTSP, NTSP, AFT, and ALT for each Technical Specification required automatic protection instrumentation function and references to the calculation documentation. Changes to this document shall be governed by the regulatory requirement of 10 CFR 50.59. In addition, changes to the specified LTSP, NTSP, AFT, and ALT values shall be governed by the approved setpoint methodology. This document, including any revisions or supplements, shall be provided upon issuance to the NRC.

### 5.5.11 Surveillance Frequency Control Program

This program provides controls for Surveillance Frequencies. The program shall ensure that Surveillance Requirements specified in the Technical Specifications are performed at intervals sufficient to assure the associated Limiting Conditions for Operation are met.

- a. The Surveillance Frequency Control Program shall contain a list of Frequencies of those Surveillance Requirements for which the Frequency is controlled by the program.