



July 10, 2019

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. 197 (eRAI No. 9051) on the NuScale Design Certification Application

- REFERENCES:**
1. U.S. Nuclear Regulatory Commission, "Request for Additional Information No. 197 (eRAI No. 9051)," dated August 25, 2017
  2. NuScale Power, LLC Response to NRC "Request for Additional Information No. 197 (eRAI No.9051)," dated October 18, 2017
  3. NuScale Power, LLC Supplemental Response to "NRC Request for Additional Information No. 197 (eRAI No. 9051)" dated December 27, 2018

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. 9051:

- 16-28

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 Rebecca Norris at 541-602-1260 or at [rnorris@nuscalepower.com](mailto:rnorris@nuscalepower.com).

Sincerely,

Zackary W. Rad  
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Enclosure 1: NuScale Supplemental Response to NRC Request for Additional Information eRAI No. 9051



**Enclosure 1:**

NuScale Supplemental Response to NRC Request for Additional Information eRAI No. 9051

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

**eRAI No.:** 9051

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

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**NRC Question No.:** 16-28

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 (W-STTS) (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.

The staff reviewed Table C-1, “Technical Specification Task Force traveler evaluation,” of Technical Specifications Regulatory Conformance and Development report, TR-1116-52011-NP, Revision 0. Regarding the applicant’s evaluation of unapproved traveler TSTF-541, “Add Exceptions to Surveillance Requirements When the Safety Function is Being Performed,” Revision 0, which is currently under staff review, the staff noted an apparent deficiency in the applicant’s evaluation.

In the “Discussion” field of Table C-1 the applicant states:

*The passive NuScale design includes a limited number of valves with potential for the addressed condition to exist. Exceptions consistent with the traveler were incorporated into the surveillance requirements of 3.6.2[, “Containment Isolation Valves.”]*

Revision 0 of GTS SR 3.6.2.3 states (emphasis added):

Verify each automatic containment isolation valve *that is not locked, sealed, or otherwise secured in position*, actuates to the isolation position on an actual or simulated actuation signal.

This surveillance statement does not include a bracketed Note proposed by the traveler for similar valve actuation SRs; this Note states:

*[-----NOTE-----  
Not required to be met for automatic valves that are locked,  
sealed or otherwise secured in the actuated position.  
-----]*

However, the Bases for GTS SR 3.6.2.3 does include a similar statement (emphasis added):

The Surveillance is *not required* for valves that are locked, sealed, or otherwise secured in the *required position under administrative controls*.

Compared to the traveler’s proposed Note, the GTS Bases sentence uses the phrases “not required for valves” instead of “not required to be met for automatic valves”; and “required position” instead of “actuated position.” The Bases sentence also includes “under administrative controls.” Besides these phrasing differences, the staff also notes that the scope of the traveler does not address automatic containment isolation valves.

The staff also notes that the GTS include the following SRs for verifying [automatic] valve actuation on an “actual or simulated [actuation] signal,” to the position stated, in accordance

with the Surveillance Frequency Control Program:

SR 3.1.9.1	CVCS demineralized water isolation valves	isolation position
SR 3.4.6.2	CVCS automatic valves	isolation position
SR 3.5.1.1	ECCS RVVs and RRVs	open position
SR 3.6.2.3	automatic containment isolation valves	isolation position

Since TSTF-541, Revision 0, is not yet approved by the staff, and considering the above observations, the staff cannot determine whether the proposed application of the intent of the traveler is needed for the NuScale GTS. As of May 28, 2017, the Technical Specifications Branch staff was to schedule a date for providing the TSTF feedback on a white paper regarding TSTF-541 related issues. The TSTF had submitted this white paper to the NRC on January 12, 2017.

The staff compared the phrasing of SR 3.6.2.3 to that of W-STS SR 3.6.3.8, and found them identical. It does not appear that the applicant's consideration of TSTF-541 introduced any deviation in the GTS from Revision 4 of the W-STS. However, the associated GTS Bases do depart from the W-STS Bases as indicated by the following markup of the W-STS Bases for SR 3.6.3.8:

#### SR 3.6.3.8

Automatic containment isolation valves close on a containment isolation signal to ~~prevent~~ minimize leakage of ~~radioactive material~~ fission products from containment and to maintain required RCS inventory following a DBA. This SR ensures that each automatic containment isolation valve will actuate to its isolation position on ~~a containment isolation~~ an actual or simulated actuation signal. ~~The~~ is surveillance is not required for valves that are locked, sealed, or otherwise secured in the required position under administrative controls. ~~[The 18]-month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown that these components~~



~~usually pass this Surveillance when performed at the [18] month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.~~

OR

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

~~-----REVIEWER'S NOTE-----~~

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~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~

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The above deviations from the W-STS Bases for SR 3.6.3.8 appear unrelated to TSTF-541. The applicant is requested to revise the evaluation of TSTF-541 in Table C-1 to indicate that it is not applicable to automatic valve actuation surveillances in the GTS.

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**NuScale Response:**

**Supplemental NRC Question Raised During Public Meeting on June 12, 2019**

- 2. EXCEPTIONS TO SRS FOR BREAKERS AND VALVES WHEN IN ACTUATED POSITIONS
  - Closed/open to comply with ACTIONS but open/closed under administrative controls

- Can't meet SR, placed in actuated position, but placed in normal position under administrative controls
- RAI 197-9051, Question 16-28
- Reliance on operator manual action when in non-actuated position under administrative controls for multiple valves, breakers
- Class 1E isolation devices

### **Supplemental Response**

After the discussion during the June 12, 2019 public meeting and as described during the meeting, the exceptions to Surveillance Requirements (SRs) were re-evaluated for their need and appropriateness in the NuScale technical specifications (TS). NuScale's position continues to be that it is inappropriate to require SR performance on OPERABLE actuated components because of NuScale's unique design that only uses credited components with a single actuated safety position.

However the industry standard concepts based on previous designs that are the basis for 1.0, Use and Application, LCO 3.0, Limiting Condition for Operation (LCO) Applicability, and SR 3.0 Surveillance Requirement Applicability do not consider the unique NuScale passive design. Recognizing that the 'old standard' rules were utilized in the NuScale TS to conform to the design specific review standards and standard review plan expectations, the NuScale re-evaluation considered the need for the included SR exceptions rather than the safety case for their inclusion. The review considered not whether the proposed exceptions were safe, which had previously been the focus of consideration for inclusion, but whether they were considered important to the successful operation of a NuScale plant to

- limit unnecessary component operation;
- reduce testing unrelated to the capability to perform a credited safety function; and
- prevent alignment of safety components to their un-actuated positions thereby unnecessarily requiring them to function during presumably already existing off-normal conditions that resulted in their alignment to the actuated position.

The review resulted in broad classifications of actuated components under discussion - those performing an isolation function, those actuating systems such as emergency core cooling (ECCS) and decay heat removal (DHRS), and those that interrupt electrical power. In some cases components fall into more than one grouping, such as the main steam isolation valves (MSIVs) that close to isolate the secondary side of the plant and also close to form a part of the closed loop boundary of the DHRS.

In the actuation component classification cases, when a component is in its actuated position the unit cannot or is less likely to be able to continue to operate because the actuated safety system is operating or partially aligned to operate. These systems are typically required to be OPERABLE when greater than MODE 3 and passively cooled - conditions unlikely to be maintained due to the passive nature of the plant response to these conditions that generally results in the plant exiting the Applicability of the specifications. The review noted exceptions that were proposed for reactor vent valves (RVVs) and reactor relief valves (RRVs) in SR 3.5.1.1 and SR 3.5.1.2. Although appropriate from a plant safety perspective, the conditions that could result in use and operational need for these exceptions are limited. Based on this, NuScale has removed the exceptions to SR 3.5.1.1 and SR 3.5.1.2.

The isolation function group of actuated components present different challenges because operations are more likely to be able to continue with such a component in its actuated position while OPERABILITY is restored. The exceptions to those SRs are more likely to unnecessarily result in challenges to the plant safety and availability. Based on this the related SR exceptions are retained.

The final grouping of SRs with exceptions are those associated with testing breakers and other devices that interrupt electrical power. These include the reactor trip breakers, the pressurizer heater breakers, and the Class 1E isolation devices that protect and ensure the quality of electrical power to the module protection system (MPS). These devices are described in detail in FSAR Tier 2, Chapter 7, Instrumentation and Controls. An actuated component that isolates the electrical power supply has performed its safety function. In each case, continued operation with a component in its actuated configuration does not immediately jeopardize the ability of a unit to continue to operate because alternate power supply paths with credited protective devices remain available. Based on this, the exceptions provided for SRs related to the electrical isolation components are retained.

The staff expressed concern with allowances provided in Notes that allow the plant to intermittently place actuated components in their un-actuated position. These allowances are similar to those that occur in previous plant design standard technical specifications such as NUREG-1431, Rev. 4, LCOs 3.6.2, 3.6.3, 3.7.10, 3.7.12, 3.7.13, and 3.7.14. Similar allowances are provided in other standardized pressurized and boiling water reactor technical specifications.

The allowances in the NuScale technical specifications are similar to those in the STS and only apply when the associated LCO is not met and a Condition has been entered that specifies a Required Action resulting in placing the component in its actuated position. Each allowance limits its application to intermittent use.



Extended operation of the plant while dependent on these allowances is unrealistic and contrary to the regulations of 10 CFR 50. Operations dependent on the allowance is unrealistic because it is contrary to the stated intent of the exception and inconsistent with the 'intermittent' nature of the allowance. The required administrative controls imposes a significant administrative burden on the operating staff with the requirement for a dedicated operator to be at the controls while implementing the allowance.

Additionally, continued operation in a manner inconsistent with the allowance would constitute a change to the way the facility is operated. 10 CFR 50.71(e) requires that all changes made in the facility or procedures in the FSAR be reflected in the facility final safety analysis report including those made under 10 CFR 50.59. That regulation would prohibit such operations as a change to the procedures as described in the final safety analysis report (defined in 10 CFR 50.59(a)(5)) that would require a change to the technical specifications.

Based on the burden and requirements, and industry adoption of similar allowances it is unlikely that the allowance for intermittent application of the Notes will result in inappropriate usage.

**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.

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
<p>SR 3.5.1.1</p> <p style="text-align: center;"><del>NOTE</del></p> <p style="text-align: center;"><del>Not required to be met for valves that are open.</del></p> <hr style="border-top: 1px dashed red;"/> <p>Verify each RVV and RRV actuates to the open position on an actual or simulated actuation signal.</p>	<p>In accordance with the Surveillance Frequency Control Program</p>
<p>SR 3.5.1.2</p> <p style="text-align: center;"><del>NOTE</del></p> <p style="text-align: center;"><del>Not required to be met for valves that are open.</del></p> <hr style="border-top: 1px dashed red;"/> <p>Verify the open <del>actuation time</del><u>ACTUATION RESPONSE TIME</u> of each RVV and RRV is within limits.</p>	<p>In accordance with the INSERVICE TESTING PROGRAM</p>
<p>SR 3.5.1.3</p> <p>Verify the inadvertent actuation block function of each RVV and RRV.</p>	<p>In accordance with the Surveillance Frequency Control Program</p>
<p>SR 3.5.1.4</p> <p>Verify the inadvertent actuation block setpoint is within limits for each RVV and RRV.</p>	<p>In accordance with the INSERVICE TESTING PROGRAM</p>

BASES

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SURVEILLANCE  
REQUIREMENTSSR 3.5.1.1

Verification that the RVVs and RRVs are OPERABLE by stroking the valves open ensures that each train of ECCS will function as designed when these valves are actuated. One RVV is designed to be actuated by either division of the MPS and it must be verified to open from each division without dependence on the other. The RVVs and RRVs safety function is to open as described in the safety analysis. ~~A Note is provided indicating that the SR is not required to be met for a valve that is open. This Note is necessary to allow a valve to be credited with performing its safety function when it may not be able to satisfy the SR requirements.~~ When an ECCS valve is open it has performed its safety function.

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.5.1.2

Verifying that the open ~~actuation time~~ ACTUATION RESPONSE TIME of each RVV and RRV is within limits is required to demonstrate OPERABILITY. The open ~~actuation time~~ ACTUATION RESPONSE TIME test ensures that the valve will open in a time period less than or equal to that assumed in the safety analysis. The opening times are as specified in the INSERVICE TESTING PROGRAM. One RVV is designed to be actuated by either division of the MPS and its actuation time must be tested from each division without dependence on the other.

~~Actuation time~~ ACTUATION RESPONSE TIME is measured from output of the module protection system equipment interface module until the valves are open.

~~A Note is provided indicating that the SR is not required to be met for a valve that is open. This Note is necessary to allow a valve to be credited with performing its safety function when it may not be able to satisfy the SR requirements.~~ When an ECCS valve is open it has performed its safety function.

Frequency of this SR is in accordance with the INSERVICE TESTING PROGRAM.