

December 11, 2017

MEMORANDUM TO: Samuel S. Lee, Chief  
Licensing Branch 1  
Division of New Reactor Licensing  
Office of New Reactors

FROM: Omid Tabatabai, Senior Project Manager /RA/  
Licensing Branch 1  
Division of New Reactor Licensing  
Office of New Reactors

SUBJECT: SUMMARY OF NOVEMBER 29, 2017, AND DECEMBER 5, 2017,  
PUBLIC MEETINGS WITH NUSCALE POWER, LLC, TO  
DISCUSS STAFF REQUEST FOR ADDITIONAL INFORMATION  
NOS. 9032, 8993, AND 9088, RELATED TO CHAPTER 7,  
"INSTRUMENTATION AND CONTROLS," OF THE NUSCALE  
DESIGN CERTIFICATION APPLICATION

On November 29, 2017, and December 5, 2017, representatives of the U.S. Nuclear Regulatory Commission (NRC) and NuScale Power, LLC (NuScale) held two public teleconference meetings. The purpose of these meetings was to discuss staff's requests for additional information (RAI) Nos. 9032, 8993, and 9088, as they relate to Chapter 7, "Instrumentation and Controls," in the NuScale Design Certification Application (DCA) and to receive clarification from NuScale on their response to these RAIs. NuScale's response to these RAIs are available in the NRC's Agencywide Documents Access and Management System (ADAMS) under Accession Nos. ML17276B165, ML17270A423, and ML17311B169, respectively. A complete copy of NuScale's DCA is available on the NRC public Web page at <https://www.nrc.gov/reactors/new-reactors/design-cert/nuscale/documents.html>.

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Enclosure 1 captures the summary of the topics discussed during these teleconferences. The agenda and list of meeting attendees are included in Enclosures 2 and 3, respectively. The meeting notices for the November 29, 2017, and December 5, 2017 meetings are available in ADAMS under Accession Nos. ML17320A099 and ML17292B021, respectively.

Docket No. 52-048

Enclosures:

1. Meeting Summary
2. Agenda
3. Attendee

SUBJECT: SUMMARY OF NOVEMBER 29, 2017, AND DECEMBER 5, 2017, PUBLIC MEETINGS WITH NUSCALE POWER, LLC, TO DISCUSS STAFF REQUEST FOR ADDITIONAL INFORMATION NOS. 9032, 8993, AND 9088, RELATED TO CHAPTER 7, "INSTRUMENTATION AND CONTROLS," OF THE NUSCALE DESIGN CERTIFICATION APPLICATION DATED: **12/11/2017**

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**U.S. NUCLEAR REGULATORY COMMISSION**  
**SUMMARY OF THE NOVEMBER 29, 2017, AND DECEMBER 5, 2017, TELECONFERENCES**  
**WITH NUSCALE POWER, LLC**

Summary of November 29, 2017 Meeting

1. NuScale Power, LLC Response to Request for Additional Information (RAI) No. 9032

The U.S. Nuclear Regulatory Commission (NRC) staff discussed NuScale's Power, LLC (NuScale's) response to RAI 9032, Question 30467 on the low reactor coolant system (RCS) flow, as part of the diversity and defense-in-depth assessment. The NRC staff's main concern with this response was to understand what happens if there was a loss of RCS flow sensors/indications due to a software common-cause failure and the Module Heatup System malfunctions causing a flow stagnation or flow reversal. During the public meeting, NuScale clarified that RCS flow and reactor power go hand in hand. If there is flow stagnation or reversal, then there would be no power either. The RCS flow indication is used as a boron dilution initial condition but is not credited as part of the transient detection or mitigation. Even if there are no RCS flow indications available, and the reactor power increases, the change in neutron flux ultimately generates the protective actuations in the form of a source range trip for example. NuScale further clarified that the reactor physics with respect to this is explained in Chapter 15, "Transient and Accident Analyses," of the Final Safety Analysis Report and Non-LOCA [Loss-of-Coolant Accident] technical report. NuScale stated that they would discuss internally whether to add their clarification statements into Chapter 7, "Instrumentation and Controls," so that the plant response to such a condition becomes more clear. The NRC staff requested NuScale to either provide a mark-up to the design control document (DCD) or provide the clarifications as a supplement to their RAI response to Question 30467.

2. NuScale Response to RAI No. 8993

The NRC staff discussed NuScale's response to RAI 8993 on the disposition of the application-specific action items (ASAI) in NuScale's Topical Report (TR) 1015-18653, Revision 2, "Design of the Highly Integrated Protection Platform." TR-1015-18653 identifies 65 ASAs that must be implemented for NRC staff approval of the Highly Integrated Protection System platform for safety-related applications in any nuclear power plant. NuScale DCD, Part 2 – Tier 2, Table 7.0-2, "Highly Integrated Protection System Topical Report (HIPS TR) Application Specific Information Cross References," provides a cross-reference of the ASAs with the Chapter 7 subsections in which the ASAs are specifically addressed.

The NRC staff informed the applicant that the response to RAI 8993 provided incorrect references for some of the ASAs with the Chapter 7 subsections. The NRC staff and the applicant agreed to discuss this topic at the December 5, 2017 public meeting.

3. NuScale Response to RAI No. 9088

The NRC staff discussed NuScale's response to RAI 9088 on the removal of the under the bioshield radiation monitoring sensors from Tier 1, Table 3.14-1, "Mechanical and

Electrical/Instrumentation and Controls Common Equipment.” The NRC staff and the applicant agreed to discuss this topic at the December 5, 2017, public meeting.

#### 4. SetPoint Methodology Technical Report

NuScale Technical Report (TeR) 0616-49121, “NuScale Instrument Setpoint Methodology Technical Report,” describes NuScale’s methodology for determining safety-related instrument setpoint uncertainties and includes example calculations of total loop uncertainties. The staff asked the applicant why the low temperature overpressure protection engineered safety feature actuation system function is not included in TeR-0616-49121. The NRC staff and the applicant agreed to discuss this topic at the December 5, 2017, public meeting.

#### Summary of December 5, 2017 Meeting

##### 1. NuScale Response to RAI No. 9032

The NRC staff discussed NuScale’s response to RAI 9032, Question 30467 on the low RCS flow, as part of the diversity and defense-in-depth assessment. NuScale agreed to submit a supplemental response to this question with the following information:

- The applicant will describe how the neutron flux signals will provide the protective action to shut down the reactor.
- The applicant will modify Note 2 of Table 7.1-18, “Digital Sensors Credited for Mitigating Anticipated Operational Occurrences and Postulated Accidents,” to describe the functions of the RCS flow sensors.
- The applicant will add a pointer to Chapter 15 of the Final Safety Analysis Report and the Non-LOCA [Loss-Of-Coolant Accident] technical report

NuScale indicated it will provide a supplemental RAI response by January 2018.

##### 2. NuScale Response to RAI No. 8993

The NRC staff discussed NuScale’s response to RAI 8993 on the disposition of the ASAls in NuScale’s TR 1015-18653, Revision 2, “Design of the Highly Integrated Protection Platform.” The NRC staff informed the applicant that the response to RAI 8993 provided incorrect references for some of the ASAls with the Chapter 7 subsections. NuScale agreed to submit a supplemental response with the following edits:

- ASAI 3-6 (Compliance to regulations):

Add a statement in Final Safety Analysis Report (FSAR) Section 7.1.1 for how these regulatory requirements are met. FSAR Table 7.0-1, “NuScale Instrumentation and Controls Design and Applicable Regulatory Requirements Matrix,” will be revised to provide the missing references for Institute of Electrical and Electronics Engineers Standard 7-4.3.2-2003 with the relevant Chapter 7 subsections.

- ASAI 9 (Allocation of safety functions):

Add pointer in FSAR Table 7.0-2, "Highly Integrated Protection System Topical Report (HIPS TR) Application Specific Information Cross References," to FSAR Section 7.1.2.4.

- ASAI 11 (Unique identification requirements for diverse field-programmable gate arrays):

Add pointer in FSAR Table 7.0-2 to FSAR Section 7.2.9, "Identification."

- ASAI 17 (Equipment qualification regulations):

Remove pointer in FSAR Table 7.0-2 to FSAR Section 7.2.1.

- ASAI 27 (Clause 5.8.3 - displays):

Remove pointer in FSAR Table 7.0-2 to FSAR Section 7.2.12. Add pointer in FSAR Table 7.0-2 to FSAR Section 7.2.13.

- ASAI 29 (Manual Bypass):

Remove pointer in FSAR Table 7.0-2 to FSAR Section 7.2.4.

- ASAI 32 (Repair):

Add pointer in FSAR Table 7.0-2 to FSAR Section 7.2.9.

- ASAI 61 (Enable nonsafety control switch):

Remove pointers in FSAR Table 7.0-2 to FSAR Sections 7.2.3, 7.2.4, and 7.2.12.

NuScale indicated it will provide a supplemental RAI response by January 2018.

### 3. NuScale Response to RAI No. 9088

The NRC staff discussed NuScale's response to RAI 9088 on the removal of the under the bioshield radiation monitoring sensors from Tier 1, Table 3.14-1, "Mechanical and Electrical/Instrumentation and Controls Common Equipment." During the public meeting, the applicant stated that justification for removing these sensors from Tier 1, Table 3.14-1 was their safety classification. The applicant indicated that these sensors are classified as nonsafety-related non-risk significant (B2). The NRC staff understands the applicant's position, will consider it further, and will determine if a supplemental RAI is needed to resolve the matter.

### 4. SetPoint Methodology Technical Report

NuScale Technical Report (TeR)-0616-49121, "NuScale Instrument Setpoint Methodology Technical Report," describes NuScale's methodology for determining safety-related instrument setpoint uncertainties and includes example calculations of total loop uncertainties. The staff asked the applicant why the low temperature overpressure protection engineered safety feature

actuation system function is not included in TeR-0616-49121. NuScale agreed to provide a markup to FSAR Section 7.2.7 and TeR-0616-49121 by January 2018 that describes this clarification.

## **MEETING AGENDA**

**Tuesday, November 29, 2017**

2:00-2:10 p.m.	Welcome and Introductions
2:10-2:30 p.m.	Discussion of the RAI Response 9032, 8993, and 9088
2:30-2:40 p.m.	Public Questions and Comments
2:40-2:45 p.m.	Meeting Conclusion

**Tuesday, December 5, 2017**

2:00-2:10 p.m.	Welcome and Introductions
2:10-2:20 p.m.	Follow-up Discussions on RAI Response 9032, 8993, and 9088, and the Set Point Methodology Technical Report
2:20-2:30 p.m.	Public Questions and Comments
2:30-2:40 p.m.	Meeting Conclusion



## **LIST OF ATTENDEES**

### **NuScale**

Jeff Kosky  
Darrell Gardner  
Paul Buchar  
Rufino Ayala  
Ben Bristol  
Brian Arnholt

### **NRC Staff**

Prosanta Choudhry  
Dinesh Taneja  
Joseph Ashcraft  
Dawnmathews Kalathiveettil  
Yaguang Yang  
Luis Betancourt  
Omid Tabatabai  
Derek Halverson  
Ronald Lavera  
Edward Stutzcage  
James Gilmer