### December 11, 2015

MEMORANDUM FOR:	Mark Tonacci, Chief Licensing Branch 1 Division of New Reactor Licensing Office of New Reactors		
FROM:	Omid Tabatabai, Senior Project Manager / <b>RA</b> / Licensing Branch 1 Division of New Reactor Licensing Office of New Reactors		
SUBJECT:	SUMMARY OF DECEMBER 1 and 2, 2015, CLOSED MEETING WITH NUSCALE POWER, LLC, TO DISCUSS VARIOUS TOPICS RELATED TO INSTRUMENTATION AND CONTROL, AND ELECTRICAL SYSTEMS		

On December 1 and 2, 2015, representatives of the U.S. Nuclear Regulatory Commission (NRC) staff and NuScale Power, LLC, held a two-day closed meeting at NuScale Power, LLC office located at 1100 NE Circle Blvd., Suite 200, Corvallis, OR. The purpose of this meeting was for NuScale staff to discuss various topics related to instrumentation and control (I&C), and electrical systems design. The NRC staff had determined in accordance with Title 10 of the *Code of Federal Regulations* (10 CFR) Section 2.390 that the information discussed during the meeting was proprietary in nature and, therefore, the meeting was closed to the public.

NuScale staff informed the NRC staff that their Topical Report (TR) on Protection Systems was still on schedule for submittal by December 31, 2015. NuScale staff stated that the purpose of the TR is to provide details regarding the design concepts of NuScale's highly integrated protection system platform. By way of submitting this TR, NuScale Power would like the NRC staff to evaluate conformance to the applicable portions of Institute of Electrical and Electronics Engineers (IEEE) 603, "IEEE Standard Criteria for Safety Systems for Nuclear Power Generating Stations"; IEEE 7-4.3.2, "IEEE Standard Criteria for Computers in Safety Systems of Nuclear Power Generating Stations"; Interim Staff Guidance (ISG)-04, "Highly Integrated Control Rooms & Digital Communication Systems"; and SECY 93-087, "Policy, Technical, and Licensing Issues Pertaining to Evolutionary and Advanced Light-Water (ALWR) Designs."

NuScale staff explained how the TR will demonstrate the concepts and principals of I&C design including, independence, redundancy, diversity, predictability and repeatability, calibration, testing, diagnostics, and simplicity. Additional concepts addressed in the TR include: theory of operation; signal path and functional independence; communication; access control; testing, monitoring, and maintenance attributes. During the discussion on this topic, the NRC staff questioned whether NuScale is looking into the impacts of fire on I&C cabinets, and specifically, the potential impacts of fire-induced spurious actuations when external connections to those cabinets are made via fiber optic cables.

#### M. Tonacci

NuScale informed the NRC staff that their plans for submitting a TR regarding Advanced Sensor Qualification Method, which was due to be submitted to the NRC staff on April 2016, has changed and that NuScale would no longer will be submitting this report as a TR. NuScale is considering submitting the report as a technical report instead.

NuScale staff then gave a presentation on first-of-a-kind (FOAK) sensors. In this presentation, NuScale provided a status on their progress regarding the design of NuScale FOAK sensors, and an overview of NuScale power module unique design features that would impact sensor selection, sensor technology, parameters, and the operating environment.

The next topic of discussion was NuScale's I&C Hazard Analysis. NuScale staff stated that they use the system-theoretical process analysis methodology for the hazard analysis and that the methodology focuses on protection systems.

The Office of Nuclear Reactor Regulation (NRR) staff from the Division of Electrical Engineering Branch had three break-out sessions from the concurrent meetings covering I&C topics.

The first session covered the evolution of the electrical power system design from 2010 until the present. This topic of discussion concentrated on the changing design and the design philosophy as a result of lessons learned in developing, maturing and optimizing the overall electrical system design. The second session covered NuScale's topical report, "Safety Classification of Passive Nuclear Power Plant Electrical System," which was submitted to the NRC staff in October 2015. This discussion concentrated on the design philosophy behind NuScale electrical system design and how NuScale intends to use the approved TR in the design certification application submittal. The third session covered NuScale's views on the "preferred" power system as described in Regulatory Guide (RG) 1.32, "Criteria for Power Systems for Nuclear Power Plants."

At the conclusion of the two-day meeting, the NRC staff encouraged further dialogue and early communication of technical issues related to the I&C and electrical systems. The NRC staff also expressed interest in observing and/or reviewing the results from the proof-of-concept testing of instrumentation and FOAK sensors. Finally, the NRC staff requested NuScale to make their report titled, "Nuclear Steam Supply System Architecture Report" available on their electronic reading room for the NRC staff's review.

The meeting agenda and the list of meeting attendees are included in Enclosures 1 and 2, respectively. The meeting notice is available in the NRC Agencywide Documents Access and Management System (ADAMS) with Accession Number ML15300A183. There were no presentation slides submitted to the NRC. Please direct any inquiries to Omid Tabatabai, at (301) 415-6616, or via email to omid.tabatabai@nrc.gov.

M. Tonacci

ADAMS is the system that provides text and image files of NRC public documents and can be accessed at the NRC Electronic Reading Room at http://www.nrc.gov/reading-rm/adams.html. If you do not have access to ADAMS or have problems accessing the documents located in ADAMS, contact the NRC Public Document Room staff at (800) 397-4209, (301) 415-4737, or pdr@nrc.gov.

Project No.: PROJ0769

Enclosure:

- 1. Meeting Agenda
- 2. Attendees

cc: NuScale DC Listserv

M. Tonacci

ADAMS is the system that provides text and image files of NRC public documents and can be accessed at the NRC Electronic Reading Room at http://www.nrc.gov/reading-rm/adams.html. If you do not have access to ADAMS or have problems accessing the documents located in ADAMS, contact the NRC Public Document Room staff at (800) 397-4209, (301) 415-4737, or pdr@nrc.gov.

Project No.: PROJ0769

Enclosure:

- 1. Meeting Agenda
- 2. Attendees

cc: NuScale DC Listserv

### DISTRIBUTION:

PUBLIC LB1 R/F NuScale DC Listserv OTabatabai, NRO MTonacci, NRO GCranston, NRO JMcLellan,NRO TJackson, NRO JZimmerman, NRR RidsAcrsAcnwMailCenter RidsOgcMailCenter RidsNroDnrILb1

ADAMS A	CCESSION No.: ML15342	A133	*via email	NRC-001
OFFICE	NRO/DNRL/LB1:PM	NRO/DNRL/	_B1:LA	NRO/DNRL/LB1:LPM
NAME	OTabatabai*	JMcLellan*		GCranston*
DATE	12/9/2015	12/10/2015		12/10/2015

OFFICIAL RECORD COPY

## Meeting Agenda

# Day 1, December 1, 2015

9:00am - 12:00pm	Protection System Topical Report Presentation Design Overview of Plant and Electrical System (break out session)
12:00pm - 1:00pm	Lunch
1:00pm - 3:00pm	Simulator Demonstration
3:00 pm - 5:00 pm	Advanced Sensor Design NuScale Topical Report on Classification of Electrical Systems (break-out session)

# Day 2, December 2, 2015

8:30am - 10:30am	I&C Hazard Analysis Offsite Power Sources Discussion (break-out session)
10:30am - 12:00pm	Upper-Module Mock-up visit
12:00pm - 1:00pm	Lunch
1:00pm - 2:00pm	Meeting Summary/Conclusion

Enclosure 1

### **List of Attendees**

Omid Tabatabai, NRC Terry Jackson, NRC Joseph Ashcraft, NRC Dinesh Taneja, NRC Luis Betancourt, NRC Jacob Zimmerman, NRC Robert Fitzpatrick, NRC Brian Arnholt, NuScale Jeff Kosky, NuScale Tom Bergman, NuScale Jason Pottorf, NuScale Mark Burzynski, NuScale Duane Filchner, NuScale Zackary Rad, NuScale Hughes Wike, NuScale Jennifer Ades Levinzon, NuScale Gary Becker, NuScale Gregg Clarkson, NuScale Scott Patterson, NuScale Paul Butchart, NuScale Tamas Liszkai, NuScale Ted Hough, NuScale Cyrus Afshar, NuScale Rufino Ayala, NuScale Ryan McGee, NuScale Chris Vitello, NuScale Mark Ealing, ULTRA/NuScale Alex Eichhorn, ULTRA/NuScale Marvin Harrison, ULTRA/NuScale