



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

May 04, 2020

MEMORANDUM TO: Michael I. Dudek, Chief
New Reactor Licensing Branch
Division of New and Renewed Licenses
Office of Nuclear Reactor Regulation

FROM: Marieliz Johnson, Project Manager **/RA/**
New Reactor Licensing Branch
Division of New and Renewed Licenses
Office of Nuclear Reactor Regulation

SUBJECT: SUMMARY OF THE APRIL 1, 2020, CATEGORY 1 PUBLIC
TELECONFERENCE WITH NUSCALE POWER, LLC TO
DISCUSS THE EMERGENCY CORE COOLING SYSTEM
BORON DISTRIBUTION OF THE DESIGN CERTIFICATION
APPLICATION

On April 1, 2020, representatives from the U.S. Nuclear Regulatory Commission (NRC) and NuScale Power, LLC (NuScale), held a Category 1 public teleconference meeting to discuss Emergency Core Cooling System (ECCS) Boron Distribution of the NuScale Design Certification Application. Participants included personnel from the NRC, NuScale and members of the public.

The public meeting notice can be found in the Agencywide Documents Access and Management Systems (ADAMS) under Accession No. ML20091M018. This meeting notice was also posted on the NRC public website located at <https://www.nrc.gov/reactors/new-reactors/design-cert/nuscale/documents.html>.

The Meeting Agenda, List of Participants, and NuScale's Public meeting presentation can be found in Enclosures 1,2, and 3 respectively.

During the April 1, 2020, teleconference meeting, NuScale discussed its presentation (Enclosure 3). NuScale determined that under certain conditions, ECCS actuated later than expected and resulted in a higher containment water level accumulation than is considered in the previous analysis. NuScale's proposed resolution is implementing a design change to ECCS actuation, which will be modified to actuate earlier to eliminate potential concerns related to containment water level accumulation and downcomer dilution. More information on the background is discussed in the March 9, 2020, public teleconference meeting summary (ADAMS Accession No. ML20097C229).

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Some technical questions requested by the NRC staff, that are expected to be addressed as part of the ongoing audit from NuScale are summarized as follows:

1. Which model does NuScale plan on using, Loss of coolant accident (LOCA) or the long-term cooling (LTC) model? The NRC staff pointed out that the figure of merit (FOM) for the water level difference between containment and reactor coolant system (RCS) downcomer is different from the figure of merit of LOCA analysis (critical heat flux (CHF) and collapsed reactor pressure vessel (RPV) water level) and using the existing LOCA or LTC model adequacy must be addressed.
2. The break spectrum is the same as Chapter 15.6.5. However, the NRC staff believes that the limiting case could be a steam space small break LOCA case or decay heat removal system (DHRS) extended operation with the riser uncover.
3. NuScale will evaluate the 65 degrees Fahrenheit pool using the LOCA TR model (item 1) long enough to actuate the ECCS for small break LOCA cases without the code failing to execute.
4. NuScale will use a range of different inputs, which are different from the LOCA minimum level FOM calculation, to evaluate the adequacy of the new setpoints (e.g., decay heat, break model, containment vessel (CNV) condensation model). The NRC staff needs to consider other modeling changes such as a bypass model (item 1).
5. Nuscale will evaluate or justify the Request for Additional Information (RAI) 8930 response for conditions upon ECCS actuation at 24 hours (24 hour timer) for the extended DHRS operation.
6. NuScale will also evaluate extended DHRS operation out to 72 hours, including diluted downcomer water entering the core at the boil-off rate (potential DHRS Pcrit evaluation). NuScale indicated that no significant downcomer dilution occurs out to 72 hours.
7. NuScale will evaluate if the ECCS valves could close at different times causing a potential diluted slug entering the core. Nuscale believes that the new setpoint will not affect the Inadvertent Actuation Block (IAB) block function and that all valves will remain open. This does not answer the question of differences in the main valve opening times based on the CNV level or low RCS pressure setpoints.
8. NuScale will evaluate the new ECCS setpoints on the CNV and RPV water level difference and the potential response for an inadvertent opening of an RPV valve (IORV) of a reactor vent vessel (RVV).
9. Discussion of extended DHRS operation recovery actions' FSAR markups will be discussed later.

NuScale discussed the different chapters, technical reports and topical reports that this design change will impact. Currently, the design change will impact a total of six chapters and even though Chapter 19 is not listed, it may also be updated. NuScale's target date for having the

M. Dudek

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changes to the chapters for its audit review is from April 23, 2020 through May 6, 2020. Final DCA changes are planned to be submitted on the docket on May 20, 2020. This delay may impact our current review schedule.

Docket No. 52-048

Enclosures:

As stated

cc w/encls.: DC NuScale Power, LLC Listserv

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TELECONFERENCE WITH NUSCALE POWER, LLC TO DISCUSS THE
EMERGENCY CORE COOLING SYSTEM BORON DISTRIBUTION OF THE
DESIGN CERTIFICATION APPLICATION DATED: MAY 04, 2020

DISTRIBUTION:

PUBLIC

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MDudek, NRR

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JDonoghue, NRR

DTaneja, NRR

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SRosenberg, NRR

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NAME	MJohnson	CSmith	MJohnson
DATE	4/27/2020	5/04/2020	5/04/2020

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U.S. NUCLEAR REGULATORY COMMISSION
CATEGORY 1 PUBLIC TELECONFERENCE WITH NUSCALE POWER, LLC TO DISCUSS
THE EMERGENCY CORE COOLING SYSTEM BORON DISTRIBUTION OF THE DESIGN
CERTIFICATION APPLICATION

Meeting Agenda

April 1, 2020

2:00 p.m. – 3:30 p.m.

<u>Time</u>	<u>Topic</u>
2:00 p.m. – 2:15 p.m.	Welcome and Introductions
2:15 p.m. – 2:40 p.m.	Technical discussion
2:40 p.m. – 2:50 p.m.	Public – Questions and Comments
2:50 p.m. – 3:30 p.m.	Closed Portion
3:30 p.m.	Adjourn

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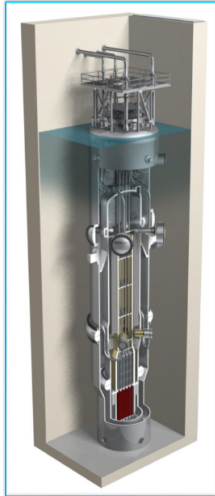
List of Attendees

April 1, 2020

<u>NAME</u>	<u>AFFILIATION</u>
Marieliz Johnson	U.S. Nuclear Regulatory Commission (NRC)
Rebecca Patton	NRC
Michael Dudek	NRC
Bruce Bovol	NRC
Joseph Donoghue	NRC
Dinesh Taneja	NRC
Jeffrey Schmidt	NRC
Ryan Nolan	NRC
Thomas Scarbrough	NRC
Shanlai Lu	NRC
Omid Tabatabai-Yazdi	NRC
Marie Pohida	NRC
Stacey Rosenberg	NRC
Gregory Cranston	NRC
Joseph Ashcraft	NRC
Tony Nakanishi	NRC
Alissa Neuhausen	NRC
Carl Thurston	NRC
Dawnmathews Kalathiveettil	NRC
Matthew Presson	NuScale Power, LLC (NuScale)
Mike Melton	NuScale
Ben Bristol	NuScale
Meghan McCloskey	NuScale
Taylor Coddington	NuScale
Morris Byram	NuScale
Marty Bryan	NuScale
Andy Lingenfelter	NuScale
Paul Infanger	NuScale
Brian Arnholt	NuScale
Sarah Bristol	NuScale
Scott Patterson	NuScale
Vern Hull	NuScale

<u>NAME</u>	<u>AFFILIATION</u>
Karl Gross	NuScale
Jim Curry	NuScale
Rebecca Norris	NuScale
Zack Rad	NuScale
Tom Bergman	NuScale
Robert Gamble	NuScale
Pravin Sawant	NuScale
Gary Becker	NuScale
Cindy Williams	NuScale
Steve Pope	NuScale
Adam Brigantic	NuScale
Sarah Fields	Public

Public Meeting Presentation



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Topic

Emergency Core Cooling System
(ECCS) Boron Distribution

April 1, 2020

Presenters

Ben Bristol

Supervisor, System Thermal-Hydraulics

Matthew Presson

Licensing Project Manager

Sarah Bristol

Supervisor, PRA

Andy Lingenfelter

Fuel Engineering Manager

Mike Melton

Licensing Manager

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Agenda

- ECCS Boron Transport
 - Update and Resolution/ECCS Actuation Change
- ECCS Actuation Change - Schedule /Discussion
- Conclusion

ECCS Boron Transport – Update/Resolution

Update:

In preparation for Ch. 15 ACRS subcommittee meeting NuScale determined under certain conditions, ECCS actuated later than expected and resulted in higher containment water level accumulation than is considered in RAI 8930 response basis.

Resolution and Design Change to ECCS Actuation:

NuScale is implementing a design change to ECCS actuation, which will be modified to actuate earlier to eliminate potential concerns related to containment water level accumulation and downcomer dilution.

No change in resolution since prior NRC
pubic update on March 9th.

ECCS Actuation Change – Schedule for discussion Audit Documents

Documents for audit	Ready for audit in eRR
Analytical Limits Report Rev 8	April 13
IORV Assessment	April 14
CNV P&T Assessment	April 17
LTC Assessment	April 14
LOCA Spectrum Assessment	April 23
ECCS Actuation Design Change Basis	April 23
PRA Assessment	April 23

ECCS Actuation Change – Schedule for discussion Documents for submittal

Rev 4 Errata Letter Transmittal with all CPs	Provide to support audit	Process for NRC transmittal by
CP for Tier 1, Chapter 2 Table	April 23	May 20
CP for Chapter 3	April 23	
CP for Chapter 6	April 23	
CP for Chapter 7	April 23	
CP for Chapter 15	May 2	
CP for Part 4 Technical Specification and Basis	May 6	

Documents for submittal	Provide to support audit	Process for NRC transmittal by
TR-0616-49121 Setpoint Methodology TR	April 23	May 20
TR-0316-22048 Advanced Sensor Methodology TR	April 23	May 20
TR-1116-52011 Tech Spec Regulatory Conformance and Development TR	May 6	May 20

NuScale would appreciate NRC feedback
on any schedule priorities

ECCS Boron Transport – Conclusion

- NuScale is highly committed to plant safety, and to providing a safe and passive design
- In supporting this commitment, NuScale's position is that this design change is appropriate to include as part of finalizing the DCA

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