



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

February 12, 2021

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

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

SUBJECT: SUMMARY OF THE JANUARY 12, 2021, U.S. NUCLEAR  
REGULATORY COMMISSION CATEGORY 1 PUBLIC  
TELECONFERENCE WITH NUSCALE POWER, LLC, TO  
DISCUSS STAFF COMMENTS ON NUSCALE POWER LLC'S  
TOPICAL REPORT, TR-0915-17772, REVISION 2

On January 12, 2021, representatives from the U.S. Nuclear Regulatory Commission (NRC) and NuScale Power, LLC (NuScale), held a Category 1 public teleconference to discuss NRC staff's comments on Topical Report (TR), TR-0915-17772, "Methodology for Establishing the Technical Basis for Plume Exposure Emergency Planning Zones at NuScale Small Modular Reactor Plant Sites," Revision 2. NuScale submitted Revision 2 of the TR on August 4, 2020 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML20217L422). Participants included personnel from the NRC, NuScale, and members of the public.

The public meeting notice can be found in ADAMS under Accession No. ML20314A238. This meeting notice was also posted on the NRC's public Web site.

Enclosed are the meeting agenda (Enclosure 1), list of attendees (Enclosure 2), and meeting summary (Enclosure 3). NRC staff's presentation slides can be accessed via ADAMS Accession No. ML21006A177.

Docket No. 99902043

Enclosures:

1. Meeting Agenda
2. List of Attendees
3. Meeting Summary

cc w/encl: DC NuScale Power, LLC Listserv

CONTACT: Prosanta Chowdhury, NRR/DNRL  
301-415-1647

SUBJECT: SUMMARY OF THE JANUARY 12, 2021, U.S. NUCLEAR REGULATORY COMMISSION CATEGORY 1 PUBLIC TELECONFERENCE WITH NUSCALE POWER, LLC, TO DISCUSS STAFF COMMENTS ON NUSCALE POWER LLC'S TOPICAL REPORT, TR-0915-17772, REVISION 2  
DATED: FEBRUARY 12, 2021

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**ADAMS Accession No.:****Package: ML21006A176****Summary: ML21029A251****\*via email****NRR-106**

<b>OFFICE</b>	NRR/DNRL/NRLB: PM	NRR/DNRL/NRLB: LA	NRR/DRA/APLC: BC
<b>NAME</b>	PChowdhury*	SGreen*	SRosenberg*
<b>DATE</b>	01/29/2021	02/01/2021	02/02/2021
<b>OFFICE</b>	NRR/DANU/UART: BC	NRR/DNRL/NRLB: PM	
<b>NAME</b>	MHayes*	PChowdhury*	
<b>DATE</b>	02/02/2021	02/12/2021	

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**U.S. NUCLEAR REGULATORY COMMISSION**

**SUMMARY OF THE JANUARY 12, 2021, U.S. NUCLEAR REGULATORY COMMISSION**

**CATEGORY 1 PUBLIC TELECONFERENCE WITH NUSCALE POWER, LLC, TO DISCUSS STAFF**

**COMMENTS ON NUSCALE POWER LLC'S TOPICAL REPORT, TR-0915-17772, REVISION 2**

**January 12, 2021**

**1:00 p.m. – 4:00 p.m.**

**Meeting Agenda**

<b><u>Time</u></b>	<b><u>Topic</u></b>
1:00 p.m.	Introductory Remarks
1:15 p.m.	Staff Presentation on Revision 2 of the Emergency Planning Zone (EPZ) Sizing Methodology Topical Report (Slides 1 through 5)
2:00 p.m.	Public Comments
2:15 p.m.	Staff Presentation on Revision 2 of the EPZ Sizing Methodology Topical Report (Slides 6 through 10)
3:15 p.m.	Public Comments
3:30 p.m.	Closed Session to Discuss Proprietary Information (if necessary)
4:00 p.m.	Concluding Remarks and Adjourn

**U.S. NUCLEAR REGULATORY COMMISSION**

**SUMMARY OF THE JANUARY 12, 2021, U.S. NUCLEAR REGULATORY COMMISSION  
CATEGORY 1 PUBLIC TELECONFERENCE WITH NUSCALE POWER, LLC, TO DISCUSS  
STAFF COMMENTS ON NUSCALE POWER LLC'S TOPICAL REPORT, TR-0915-17772,**

**REVISION 2**

**January 12, 2021**

**List of Attendees**

<b><u>Name</u></b>	<b><u>Organization</u></b>
Prosanta Chowdhury	U.S. Nuclear Regulatory Commission (NRC)
Robert Taylor	NRC
Anna Bradford	NRC
Robert Caldwell	NRC
Michael Dudek	NRC
Mike Franovich	NRC
Gregory Cranston	NRC
Marie Pohida	NRC
Michelle Hart	NRC
Stacey Rosenberg	NRC
Elijah Dickson	NRC
Joseph Anderson	NRC
Amanda Marshall	NRC
Todd Smith	NRC
Kevin Hsueh	NRC
Raymond Hoffman	NRC
Alissa Neuhausen	NRC
Dan Barss	NRC
Martin Stutzke	NRC
Ian Jung	NRC
Michelle Hayes	NRC
Arlon Costa	NRC
John Segala	NRC
Getachew Tesfaye	NRC
Jessie Quichocho	NRC
Robert Kahler	NRC
Eric Schrader	NRC
Ann-Marie Grady	NRC
Delaney Simmons	NRC
Michael Spencer	NRC

<u>Name</u>	<u>Organization</u>
Megan Wright	NRC
Kenneth Erwin	NRC
Deb Luchsinger	NuScale Power, LLC (NuScale)
Tom Bergman	NuScale
Liz English	NuScale
Steve Mirsky	NuScale
Michael Melton	NuScale
Luke McSweeney	NuScale
Cyrus Afshar	NuScale
Sarah Bristol	NuScale
Jeremiah Doyle	NuScale
Scott Weber	NuScale
Gary Becker	NuScale
Sarah Bristol	NuScale
Mark Chitty	NuScale
Jim Curry	NuScale
Kevin Deyette	NuScale
Jeremiah Doyle	NuScale
Lisa Fairbanks	NuScale
Carrie Fosaaen	NuScale
Robert Gamble	NuScale
Bill Galyean	NuScale
Eve Leary	NuScale
Andy Lingenfelter	NuScale
Cindy Williams	NuScale
Sarah Fields	Uranium Watch
Tammy Morin	Holtec International
Jodine Jansen-Vehc	Holtec International
Kati Austgen	Nuclear Energy Institute (NEI)
Eric Meyer	Generation Atomic
Archie Manoharan	Tennessee Valley Authority (TVA)
Emma Redfoot	Oklo
David Daigle	Contingency Management Consulting Group, LLC

**U.S. NUCLEAR REGULATORY COMMISSION**

**SUMMARY OF THE JANUARY 12, 2021, U.S. NUCLEAR REGULATORY COMMISSION**

**CATEGORY 1 PUBLIC TELECONFERENCE WITH NUSCALE POWER, LLC, TO DISCUSS**

**STAFF COMMENTS ON NUSCALE POWER LLC'S TOPICAL REPORT, TR-0915-17772,**

**REVISION 2**

**January 12, 2021**

**Meeting Summary**

On January 12, 2021, the U.S. Nuclear Regulatory Commission (NRC or Commission) staff held a Category 1 public teleconference meeting with NuScale Power, LLC, to discuss staff comments on NuScale Topical Report (TR), TR-0915-17772, "Methodology for Establishing the Technical Basis for Plume Exposure Emergency Planning Zones at NuScale Small Modular Reactor Plant Sites," Revision 2. NuScale submitted Revision 2 of the TR on August 4, 2020 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML20217L422). Staff's presentation slides used during this meeting can be accessed via ADAMS Accession No. ML21006A177. Over 60 individuals participated, including industry stakeholders and members of the public, in the meeting. The meeting was divided into a public portion and a closed portion. Members of the public were offered two opportunities to communicate with the NRC staff at designated points during the formal presentation and discussion. As a reference, a summary of the April 15, 2020, public meeting along with NuScale's presentation slides on NuScale proposed changes in the then forthcoming Revision 2 of the TR can be found in ADAMS under Accession Package No. ML20108F269.

The meeting was opened with some background information of the TR, such as, submission dates for the three revisions, staff's requests for additional information issued on Revision 0 and Revision 1, and the remaining issues, staff's subsequent communication with NuScale on key aspects of concerns identified in Revision 2, and scheduling today's public meeting. Staff expressed concern about the significant scope change included in the TR Revision 2 (from Revision 1) in that the TR now includes non-light-water reactors (NLWRs) and advanced light-water reactors (ALWRs) for any site and it lacks the supporting information for staff's determination to justify such applicability.

NRC staff then summarized the emergency planning regulatory basis. Following this, the staff and NuScale engaged in discussing each concern identified by the staff in TR Revision 2, including clarifying any questions and addressing any misunderstanding or gaps. The staff's key concerns include the following (refer to the staff slides for additional details):

1. The TR should not screen out potentially risk significant external events; external events should have equivalent treatment to internal events; external event initiators are to be screened at  $<1\text{E-}5$  per year frequency (includes internal fires); TR screens internal events at core damage frequency  $<1\text{E-}7$  per year; staff is concerned that risk significant external events could be screened out. The staff cited the following examples: (1) If external event initiator frequency is  $<1\text{E-}5$  per year but core damage frequency  $>1\text{E-}7$  per year, the staff understands, according to this TR, the external event would be screened out; (2) if a severe external event has an initiator of  $5\text{E-}6$  per year and causes

core damage 50 percent of the time, the resulting core damage frequency would be  $2.5E-6$  per year. The staff understands this sequence could be screened out and may challenge Commission goals for new reactors (Large Release Frequency or LRF) and the Quantitative Health Objectives (QHOs). PWR Large LOCAs have a frequency roughly  $6E-6$ /year but are not screened from the design basis evaluation or from probabilistic risk assessment (PRA). RG 1.76, Revision 1, "Design Basis Tornado and Tornado Missiles for Nuclear Plants," analysis is based on an annual exceedance frequency of  $1E-7$ /year.

NuScale stated they did not find a basis or precedent for this requirement regarding internal and external events having equivalent treatment.

2. The screening threshold in the TR should be consistent with the QHOs. In this regard, the staff stated that Revision 1 of the TR had a lower core damage frequency screening threshold; that SOARCA (State-of-the-Art Reactor Consequence Analyses) is a consequence analysis for operating reactors which selected accident scenarios  $>1E-6$  in frequency to focus on more likely scenarios; that the Tennessee Valley Authority (TVA) Clinch River Nuclear (CRN) Site early site permit (ESP) only applies to the CRN Site; and that NuScale TR applies to any advanced reactor design at any site.

NuScale stated that for the TVA CRN Site ESP, the EPZ sizing methodology was approved without conditions in the permit, thus the TVA CRN Site Safety Analysis Report (SSAR) establishes a precedent with respect to the event frequency screening criteria and values used in the TVA EPZ sizing methodology. The staff reminded that the TVA CRN SSAR referenced four LWR designs in their plant parameter envelope which was used as the context under which TVA's EPZ size methodology was reviewed. NuScale commented that in NuScale's methodology, regardless of event frequency screening based on the PRA, the Design Basis Source Term is always evaluated for EPZ sizing.

The NRC Management commented that the PRA policy statement says to use state of the art methods which should be state of practice to evaluate external events, and that much progress has been made on external hazards.

3. Consideration of numerical uncertainties against the numerical screening threshold should align with the 1995 PRA policy statement and Draft Guidance 1350 (ADAMS Accession No. ML18082A044).

NuScale stated that PRA technical adequacy is an application of the methodology, and referred to assumption 4 on page 21 and 22 of TR Revision 2; that adequacy of PRA needs to be addressed by the combined license (COL) applicant; and that demonstration of technical adequacy would address concerns regarding uncertainties. NuScale further stated that the TR avoided that level of detail; and that Regulatory Guide (RG) 1.174 ("An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis") (ADAMS Accession No. ML17317A256) states how staff reviews uncertainty in applications. In response to an inquiry by the staff regarding guidance in the TR on uncertainty against the thresholds, NuScale said they were not opposed to having more discussion in the TR on uncertainties, but said it was the COL applicant's responsibility to provide the details on implementation.

4. Where NRC-endorsed standards on hazards/modes do not exist, PRA used for TRs should be developed using RG 1.200, Revision 3, "Acceptability of Probabilistic Risk Assessment Results for Risk-Informed Activities," (ADAMS Accession No. ML202388871) or RG for NLWR PRA Standard for Capability Category (CC) II.

NuScale stated that they understood the comment as it relates to the application of the methodology. In response to a staff inquiry, NuScale acknowledged that there was no reference to PRA peer review in the TR; and that there was no reference to CC in the TR either. NuScale said it would be the COL applicant's responsibility for technical adequacy, and that guidance was under the umbrella of a technically adequate PRA, including the CCs.

5. PRA screening should be based on accident sequence families in lieu of a single accident sequence.

NuScale stated that the TR was for accident sequence sequencing across applications versus families, and suggested that an enhancement to the TR would be helpful to clarify no parsing of sequences. NuScale further stated that they would anticipate a review of the sequences as part of the COL application and that it would be part of the technical adequacy review.

6. A Condition similar to the Limits and Conditions of the staff approved NuScale TR on "Risk Significance Determination" (ADAMS Accession No. ML16284A016) should be considered. If this condition is implemented, the staff would not have any concerns about the treatment of defense-in-depth in the TR.

NuScale stated that they did not believe the condition is needed. NuScale referenced Section 3.1 of the TR, and said that Section 3.7 of the TR references RG 1.174. The staff asked whether the defense-in-depth attributes from RG 1.174 would be used to evaluate the screened-in sequences and the screened-out sequences as a check to ensure the screening was risk informed. NuScale generally agreed with this expectation. However, NuScale stated their concern that the inclusion of this condition would cause the approval to have very little weight. NuScale believes that the screening criteria are acceptable.

The staff also shared the following significant observations:

One item in TR Revision 2 that could be challenging during the review is its applicability to NLWRs. The methodology is primarily based on LWRs and lacks guidance on NLWRs, and the differences are attributed to the differences in design of LWRs and NLWRs as well as how the PRA is to be developed and used. For example,

- For some NLWRs, the risk metrics of core damage frequency and large early release frequency are not expected to be used;
- For some NLWRs, the concept of a "functional containment" instead of a "traditional" containment is expected to be used; the TR lacks detailed guidance on this matter. Dose criteria on "less severe" or "more severe" in the methodology, which is based on intact or non-intact containment, may not be applicable;



- The differences in the development and use of PRAs for LWRs and NLWRs are reflected in the ASME/ANS NLWR PRA Standard (to be issued). For NLWR PRAs, the risk is, for example, assessed based on a 'per plant' basis (vs per module in the NuScale EPZ TR) including all radiological sources for all plant operating states;
- In the Licensing Modernization Project (LMP) for NLWRs (RG 1.233, "Guidance for a Technology-Inclusive, Risk-Informed, and Performance-Based Methodology to Inform the Licensing Basis and Content of Applications for Licenses, Certifications, and Approvals For Non-Light-Water Reactors," (ADAMS Accession No. ML20091L698)) and Nuclear Energy Institute 18-04, Revision 1), Design Basis Accidents (DBAs), which come from risk-informed Design Basis Events (DBEs) based on the frequency-consequence target, are different from the traditional Chapter 15 ("Transient and Accident Analysis") DBAs. Thus, the NuScale TR methodology's use of DBAs may not be the same for NLWRs. Other licensing basis events in the LMP, such as anticipated operational occurrences, DBEs, and beyond DBEs, are also defined differently from those discussed in the NuScale TR;
- There are a number of cases in the TR where LWR terms are used instead of technology neutral terms; this complicates the applicability of this TR for ALWR and NLWRs.

The staff stated that they believe that Revision 2 of the NuScale EPZ TR would be difficult to apply to NLWRs unless specific guidance is provided. Options for a path forward include a revision of the TR to add such guidance or limiting the applicability of the TR to LWRs.

During the meeting, NuScale indicated that they understood the staff comments on the subject. NuScale responded that they tried to keep the TR general and elements of the methodology could be applied to NLWRs. They also offered, as a potential consideration, an option to use "conditions of use" as part of the NRC staff approval. NuScale will consider the staff comments and the options discussed and will interact with the NRC staff in the future for additional discussion.

Members of some industry organizations (Archie Manoharan of Tennessee Valley Authority, Emma Redfoot of Oklo, and Tammy Morin and Jodine Jansen-Vehec of Holtec International) expressed their support for the TR stating that the TR was aligned with the TVA CRN Site methodology using 1E-7 per year frequency, as well as the NRC SMR/ONT (Small Modular Reactors/Other New Technologies) rulemaking; therefore, the NRC staff approval should be built upon the approved precedent of 1E-7 per year frequency; in addition, Eric Meyer of Generation Atomic opined that the benefits of nuclear energy against air pollution from fossil fuel and the trade-offs of nuclear plants versus fossil plants should be considered.

Sarah Fields of Uranium Watch commented that: The purpose of the TR was to eliminate EPZ and save costs; the advanced reactor community does not understand the impact of eliminating the EPZ; and the NRC staff must carefully address the proposal in the TR justifying a reduced EPZ size. The staff responded by saying the NRC regulations are still in place for the requirement of an EPZ.

The staff and NuScale recapped the following key points (refer to the staff concerns and observations above):

1. Regarding concern 1, the external event initiator frequency screening, the staff disagrees with use of references from decommissioned plants. No NuScale action items.
2. Regarding concern 2, on the discussion of the QHOs, SECY-13-0029 was mentioned. The staff will revisit SECY-13-0029. No NuScale action items.
3. Regarding concern 3, NuScale will consider adding clarification to the TR on the treatment of uncertainty.
4. Regarding concern 5, NuScale will consider adding a clarification to the TR to not parse sequences.
5. Regarding concern 6, NuScale will wait to hear from the staff about the need for the proposed condition.
6. NuScale discussed potentially providing a condition of use and applicability of the TR to NLWRs.
7. NuScale and NRC staff will deliberate internally and plan to engage in two to three weeks from today.

The NRC staff did not commit to a schedule for review of the TR. NuScale confirmed there was no proprietary information to discuss in the pre-dedicated closed portion of the teleconference. Therefore, no closed session was held. The meeting was adjourned at 3:58 p.m. (Eastern time).