



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

November 23, 2021

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

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

SUBJECT: SUMMARY OF PUBLIC MEETINGS WITH NUSCALE POWER, LLC
ON OCTOBER 27 AND NOVEMBER 4, 2021

The U.S. Nuclear Regulatory Commission (NRC) staff conducted observation public meetings/teleconferences with NuScale Power, LLC (NuScale), on October 27 and November 4, 2021. The purpose of the October 27 public meeting was to discuss two topics regarding NuScale Topical Report (TR)-0915-17772, "Methodology for Establishing the Technical Basis for Plume Exposure Emergency Planning Zones," Revision 2 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML20217L422): (1) conditions of applicability proposed for the NRC staff's safety evaluation, and (2) the NRC staff's feedback on seismic risk considerations and proposed methodology based on an evaluation performed by the staff. The November 4 public meeting was a follow-up to the October 27 meeting, on the same subjects.

The meeting notices can be found in ADAMS under Accession Nos. ML21299A166 and ML21306A060. The meeting notices were also posted on the NRC public Web site.

CONTACT: Alina Schiller, NRR/DNRL
301-415-8177

Enclosed are the meetings summary (Enclosure 1), meeting agendas (Enclosure 2), and lists of attendees (Enclosure 3). The documents referenced during the discussion can be found under ADAMS Accession Nos. ML21295A622, ML21295A621 (non-public), ML21308A440, and ML21309A056 (non-public).

Docket No. 99902043

Enclosures:

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

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

U.S. NUCLEAR REGULATORY COMMISSION
OBSERVATION PUBLIC TELECONFERENCE WITH NUSCALE POWER, LLC (NUSCALE)
ON NUSCALE'S TOPICAL REPORT-0915-17772, REVISION 2

October 27 and November 4, 2021

Meetings Summary

On October 27 and November 4, 2021, the Nuclear Regulatory Commission (NRC) staff conducted observation public meetings/teleconferences with NuScale Power, LLC (NuScale), to discuss: (1) proposed conditions of applicability for the staff's safety evaluation (SE), and (2) the staff's feedback and proposed methodology based on its independent evaluations regarding the consideration of seismic risk identified in NuScale's Topical Report (TR)-0915-17772, "Methodology for Establishing the Technical Basis for Plume Exposure Emergency Planning Zones (EPZ)," Revision 2. The November 4, 2021, public meeting was a follow-up to the October 27, 2021, meeting on the same subjects.

The October 27, 2021, public meeting commenced with opening remarks by NRC and NuScale management and an introduction of participants as well as external stakeholders.

Topical Report's Conditions of Applicability

The NRC staff proceeded with a presentation (Agencywide Documents Access and Management System (ADAMS) Accession No. ML21295A622) of conditions of applicability, which are proposed to be included in the staff's SE report. A summary of the discussion is as follows:

- The staff proposes to write a condition of use by an applicant for an operating license under Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50 (slide 3 of the presentation).
- The resolution of the request for information (RAI) 9828 Question 1.05-43, related to qualitative health objectives (QHOs), is linked to the review and status of RAI 9828 Question 1.05-44 and will be resolved-closed when the Question 1.05-44 is resolved-closed (slide 4 of the presentation).
- With respect to NuScale's response to RAI 9828 Question 1.05-44 related to external event screening, since NuScale had agreed to remove the 1E-5 screening criteria for all external events other than seismic, the staff developed a methodology to provide feedback on the seismic risk screening threshold specific to this application (slide 5 of the presentation) which was discussed in detail during the second (closed) portion of the meeting.
- Regarding RAI 9828 Question 1.05-45, the staff proposes to write a condition of use related to probabilistic risk assessment (PRA) uncertainty (slide 6 of the presentation).
- With respect to RAI 9828 Question 1.05-46, the staff proposes to write a condition of use for PRA technical acceptability (slide 7 of the presentation).

- The staff has no further comments on NuScale's proposed responses to RAI 9828, Questions 1.05-47 and RAI 1.05-48 (slide 8 of the presentation).
- Regarding the accident does analysis, the staff proposes to write a condition of applicability to bring awareness to utilize appropriate dose conversion factor (DCF) files to meet specific regulatory requirements. The condition will point to which MACCS DCF files to use and how to use them (slide 9 of the presentation).

NRC Staff's Feedback on Seismic Risk Consideration in NuScale EPZ methodology

The staff began the discussion by presenting key messages (ADAMS Accession No. ML21295A622, slide 12). In its key messages, the staff stressed that their approach for evaluating seismic risk consideration in the TR is limited to identifying an acceptable spectrum of sequences for EPZ sizing and does not impact the reactor design and operation. The staff clarified that the 1E-6/year annual exceedance frequency (AEF) screening mentioned in the post-Fukushima 10 CFR 50.54(f) letter for hazard development was not directly identified as a screening threshold without an evaluation because of the markedly different context and purpose (slide 13 of the presentation). The staff pointed out that in current contemporary seismic PRAs used for risk-informed applications, the endorsed PRA standard is based on the sequence core damage frequency (CDF) screening (not on AEF screening) and its small relative contribution to seismic CDF (slide 14 of the presentation).

NuScale clarified that their methodology does not propose a screening threshold to develop a seismic PRA. Rather, the entire seismic PRA is developed consistent with the PRA standard and then screening would be applied for EPZ sizing based on the methodology in the TR. Therefore, there is no screening out of seismic risk from the seismic PRA that feeds into the EPZ TR method.

Based on NuScale's comment, the staff clarified that the discussion of the 1E-6/year AEF did not indicate that it was identified as a screening threshold and was to clarify the different context and purpose for that value in the 10 CFR 50.54(f) letter compared to the TR.

NuScale stated the CDF and large release frequency (LRF) are not tied into the EPZ and, therefore, the EPZ is not correlated with the QHOs at the design stage and asked how those two metrics could be used to determine a risk gap. The NRC staff clarified that, given the current availability of information, they used the CDF and LRF as surrogates to inform the staff about the potential extent of the risk gap and acceptable spectrum of sequences from a seismic perspective, that can be then fed into the EPZ sizing methodology. The staff agreed that the evaluation is not tied to the QHOs because the EPZ are not connected to the QHOs and noted additional details would be discussed during the closed portion of the meeting for better understanding.

At the end of the open portion of the meeting, the staff provided an overview of the evaluation approach for developing the feedback (slides 15-16 of the presentation).

NuScale asked about the ultimate acceptance criteria or what is an appropriate risk gap and the basis for selecting an appropriate risk gap. The NRC staff explained that they did not use a fixed threshold or criterion; rather, multiple considerations (e.g., the absolute risk gap, the relative risk gap, consideration of multi-module risk and sequences which carry those types of impacts) were used collectively to determine the staff's basis and evaluation results.

NuScale stated the CDF and LRF are not tied into the EPZ and, therefore, the EPZ is not correlated with the QHOs at the design stage and asked how those two metrics could be used to determine a risk gap. The NRC staff clarified that, given the current availability of information, they used the CDF and LRF as reasonable surrogates which can be used to inform about the potential extent of the risk gap and acceptable spectrum of sequences from a seismic perspective, that can be then fed into the EPZ sizing methodology. The staff agreed the evaluation is not tied to the QHOs and noted additional details would be discussed during the closed portion of the meeting for better understanding.

At the conclusion of the open session of the meeting, there was an opportunity for the public to provide comments and ask questions. Dr. Edwin Lyman of Union of Concerned Scientists commented on considering cliff edge effects and relative change in actual EPZ size based on screened out sequences to conclude whether a risk gap, which Dr. Lyman stated was really a consequence gap, would have a significant impact on the outcome. Dr. Lyman thought a consequence gap, resulting in an EPZ size change of 10 percent, was an appropriate threshold for delineating significant impact. In response to Dr. Lyman's observation, the Director of the Office of Nuclear Reactor Regulation, Division of Risk Assessment commented that multi-module impacts that could be rapid in time had been considered in the staff's evaluation to address potential cliff edge effects, and the evaluation was also informed by the proposed rule for EPZ sizing for small modular reactors and other nuclear technologies.

After the public portion of the October 27 meeting, the NRC staff continued discussions with NuScale during a closed meeting (ADAMS Accession No. ML21295A621 (non-public)).

The November 4, 2021, public meeting commenced with opening remarks by NRC and NuScale management and an introduction of participants as well as external stakeholders.

During the November 4 public meeting, the NRC staff continued its discussion associated with considerations for evaluating seismic risk and proceeded with its presentation (ADAMS Accession No. ML21308A440). Specifically, the staff focused this discussion on the regulatory and technical basis for the periodic monitoring aspect of a risk-informed application, which is one of five key principals of risk-informed decision-making. The purpose of periodic monitoring is to ensure inputs that resulted in the risk-informed determination of the EPZ size continue to remain valid. A summary of the discussion follows:

The staff stated that one key insight from the evaluation was that the option for a site and design specific screening threshold can result in both a defensible and favorable threshold compared to the fixed threshold if the site and design specific threshold is developed using a rigorous approach, such as that the staff employed. The staff identified that: the multi-module sequence CDF screening which is in the current TR methodology should not be applicable to seismic sequences if AEF is used; 1E-5/year AEF threshold would have to be removed from the TR if NuScale decides to accept the staff's feedback; and 1E-7/year sequence CDF screening threshold for seismic events, which was discussed in the past public meetings, continues to be a viable option (slide 2, ADAMS Accession No. ML21308A440).

The staff provided the regulatory and technical basis for periodic monitoring to demonstrate that the basis for the plant specific EPZ remains valid, following a change to the design of the plant or operational practices (slide 3, ADAMS Accession No. ML21308A440). The staff noted

the EPZ is a subset of the emergency planning. The staff also reiterated the periodic monitoring is not for resizing the EPZ, but to make sure the inputs that resulted in the risk-informed determination of the EPZ size continue to remain valid.

At the conclusion of the open session of the meeting, there was an opportunity for the public to provide comments and ask questions. Jo Seaman asked if the risk assessment involves a worst-case scenario risk assessment, whether it is a health risk assessment, and if it is based on radiation doses or would include a cumulative risk of other pollutants that can be released at that time. The NRC staff responded that the methodology which was presented would involve the use of PRA following certain NRC-endorsed consensus standards for the development of that particular type of risk assessment and the expectation is that the risk assessment is as realistic as practical. The staff mentioned the severe accident modeling of the facility and computation of figures of merit are in terms of dose and the metrics used are for health effects (1 to 5 rem over 48 hour-period in terms of total effective dose equivalent as well as 200 rem computed over a short period of time). The staff clarified the assessment is only for radiation health effects and not cumulative in the terms of other exposures such as that from chemical releases.

After the public portion of the November 4 meeting, the NRC staff continued discussions with NuScale during a closed meeting (ADAMS Accession No. ML21309A056 (non-public)).

AGENDAS FOR PUBLIC MEETINGS
U.S. NUCLEAR REGULATORY COMMISSION
OBSERVATION PUBLIC TELECONFERENCES WITH NUSCALE POWER, LLC (NUSCALE)
ON NUSCALE'S TOPICAL REPORT-0915-17772, REVISION 2

October 27, 2021
12:00 p.m. – 2:30 p.m. EST

<u>OPEN</u>		
<u>Time</u>	<u>Topic</u>	<u>Led By</u>
12:00 p.m. EST	Opening Remarks	All
12:10 p.m. EST	Discussion of Identified Topics	NRC/NuScale
12:50 p.m. EST	Opportunity for Public Comment	Public/NRC
1:00 p.m. EST	Open Portion Concludes	
<u>CLOSED</u>		
	(If needed)	
1:00 p.m. EST	Discussion of Identified Topics	NRC/NuScale
2:30 p.m. EST	Adjourn	

November 4, 2021
12:00 p.m. – 1:30 p.m. EST

<u>OPEN</u>		
<u>Time</u>	<u>Topic</u>	<u>Led By</u>
12:00 p.m. EST	Introduction	All
12:05 p.m. EST	Discussion of Identified Topics	NRC/NuScale
	Opportunity for Public Comment	Public/NRC
12:30 p.m. EST	Open Portion Concludes	
<u>CLOSED</u>		
	(If needed)	
12:30 p.m. EST	Discussion of Identified Topics	NRC/NuScale
1:30 p.m. EST	Adjourn	

PUBLIC MEETINGS
U.S. NUCLEAR REGULATORY COMMISSION (NRC)
OBSERVATION PUBLIC TELECONFERENCES WITH NUSCALE POWER, LLC (NUSCALE)
ON NUSCALE'S TOPICAL REPORT TR-0915-17772, REVISION 2

October 27, 2021

List of Attendees

Name	Organization
Getachew Tesfaye	NRC
Robert Caldwell	
Mike Dudek	
Mike Franovich	
Marie Pohida	
Stacey Rosenberg	
Shilp Vasavada	
Elijah Dickson	
Raymond Hoffman	
Kevin Hsueh	
Alina Schiller	
Prosanta Chowdhury	
Robert Kahler	
Steven Alferink	
Michelle Hart	
Robert Taylor	
Daniel Ju	
Jessie Quichocho	
Todd Smith	
Keith Compton	
Anne-Marie Grady	
Greg Cranston	
Eric Schrader	
Mihaela Biro	
Andrea Kock	
Meena Khanna	
Mike McCoppin	
Charles Murray	
Carolyn Wolf	

Carrie Fosaaen	
Jeremiah Doyle	
Liz English	
Gary Becker	
Cindy Williams	
Mark Shaver	
Robert Gamble	
Jim Curry	
Ross Snuggerud	NuScale
Peter Subaiya	
Kevin Deyette	
Brandon Haley	
Mark Chitty	
Andy Lingenfelter	
Scott Weber	
Steve Mirsky	
Edwin Lyman	Union of Concerned Scientists
David Young	Nuclear Energy Institute
Sola Talabi	Pittsburgh Technical
Mark Reese	ODOE
Austin Clark	Kairos Power
Drew Peebles	Kairos Power
Peiwen Whysall	Kairos Power
Jordan Hagaman	Kairos Power
Mike Snodderly	
Lori Ferris	
Carli Luppold	
Sandi Duffey	

Note: All participated via teleconference.

**November 4, 2021
List of Attendees**

Name	Organization
Getachew Tesfaye	NRC
Robert Caldwell	
Mike Dudek	
Brian Smith	
Marie Pohida	
Stacey Rosenberg	
Shilp Vasavada	
Elijah Dickson	
Raymond Hoffman	
Alina Schiller	
Steven Alferink	
Daniel Ju	
Jessie Quichocho	
Todd Smith	
Anne-Marie Grady	
Mihaela Biro	
Meena Khanna	
Charles Murray	
Bill Maier	
Binesh Tharakan	
Mark Chitty	NuScale
Jeremiah Doyle	
Jim Osborn	
Bill Galyean	
Liz English	
Gary Becker	
Cindy Williams	
Mark Shaver	
Andy Lingenfelter	
Jim Curry	
Edwin Lyman	Union of Concerned Scientists

Mark Dietrich	IDEQ
Adam Stein	Breakthrough Institute
Jo Seaman	Colorado
Mark Reese	ODOE
Archie Manoharan	TVA
Lloyd Generette	USEPA
Landry Austin	IDEQ
Janet Hlavaty-LaPosa	FEMA

Note: All participated via teleconference.