



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

February 15, 2022

MEMORANDUM TO: Steven Lynch, Chief
Advanced Reactor Policy Branch
Division of Advanced Reactors and Non-Power
Production and Utilization Facilities
Office of Nuclear Reactor Regulation

FROM: Prosanta Chowdhury, Project Manager *Prosanta Chowdhury*
Advanced Reactor Policy Branch
Division of Advanced Reactors and Non-Power
Production and Utilization Facilities
Office of Nuclear Reactor Regulation

Signed by Chowdhury, Prosanta
on 02/15/22

SUBJECT: SUMMARY OF JANUARY 19, 2022, PERIODIC
ADVANCED REACTOR STAKEHOLDER PUBLIC
MEETING

On January 19, 2022, the U.S. Nuclear Regulatory Commission (NRC) staff held an information meeting with a question-and-answer session with stakeholders to discuss advanced reactor topics including:

- Status Overview of the Advanced Reactor Generic Environmental Impact Statement (GEIS) and Rulemaking Activities
- Implementing Near-field Models in MACCS v4.1 for Better Near-field Dose Calculations
- Light Water Reactor Construction Permit Interim Staff Guidance
- Nuclear Data Assessment for Advanced Reactors
- SCALE/MELCOR Development and Applications for non-light water reactors (non-LWRs)
- Advanced Manufacturing Technologies (AMTs)

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

The meeting notice is available in the NRC's Agencywide Documents Access and Management System (ADAMS) at Accession No. ML22014A262, and the presentation slides are available at ADAMS Accession No. ML22014A256. The Enclosure to this summary lists the attendees for the meeting as captured by Microsoft Teams.

For each topic listed above, the NRC staff provided information and allotted time for stakeholder comments and questions. Stakeholders provided feedback on several of the topics and asked clarifying questions. NRC staff appreciated the feedback and provided response to the questions.

The NRC staff provided updates of the Advanced Reactor Integrated Schedule of Activities on the NRC's public website at <https://www.nrc.gov/reactors/new-reactors/advanced/details#advSumISRA>. The NRC staff noted that the schedule reflects activities that have recently been completed, updated, or added since the November 10, 2021, advanced reactor stakeholder meeting.

The NRC staff presented a status overview of the current rulemaking schedule and status of the Advanced Nuclear Reactor (ANR) Generic Environmental Impact Statement (GEIS) as follows: 1) the proposed rule package SECY-21-0098 is with the Commission; 2) the proposed rule package (ADAMS Accession No. ML21222A044), preliminary draft Guide-4032 (RG 4.2) package (ADAMS Accession No. ML21208A111), and preliminary draft interim staff guidance ISG-COL-30 (ADAMS Accession No. ML21227A005) were made publicly available on December 14, 2021; 3) if approved by the Commission, the proposed rule will be published in the *Federal Register* with a 75-day public comment period; and 4) the final rule publication is estimated for January 2024. It was emphasized that part of the rulemaking process involves the simultaneous updating of all regulations and guidance documents that are affected by the new rule. In response to a comment, the staff reiterated that Nuclear Energy Innovation and Modernization Act (NEIMA) definition of "Advanced Reactors" was used for the ANR GEIS rulemaking.

The NRC staff and NRC contractor Sandia National Laboratories (SNL) presented "Implementing Near-field Models in MACCS v4.1 for Better Near-field Dose Calculations." The presentation informed the stakeholders that on July 30, 2021, the NRC approved the release of MACCS v4.1, which implemented additional models to enhance MACCS capabilities for near-field analysis and optimized regulatory readiness for advanced reactors (ADAMS Accession Nos. ML20059M032 and ML21257A120). The presentation: (1) summarized the technical issues associated with use of MACCS in the nearfield and approach used to resolve them; (2) alerted stakeholders that improved near-field modeling capabilities have been added to MACCS v4.1; and (3) familiarized stakeholders with the improved nearfield capabilities available in MACCS v4.1. In response to a question if a hypothetical site with multiple buildings was considered in the MACCS calculation, the staff clarified that it was not explicitly considered in this project, and it would require more complex data to model; however, there may exist other models that consider this configuration. A question was asked if Draft Guide 4030 (DG-4030), "Use of ARCON Methodology for Calculation of Accident-Related Offsite Atmospheric Dispersion Factors," (proposed new Regulatory Guide (RG) 1.249) (ADAMS Accession No. ML21165A005) was considered in this study; the staff responded that for the purpose of this project, DG-4030 was not considered. For context, this RG describes an approach that is acceptable to the NRC staff to meet the NRC requirements for determining atmospheric relative concentration (χ/Q) values in support of modeling onsite releases to offsite boundaries from a design-basis accident

(DBA). This guidance provides procedures for using the ARCON code to estimate χ/Q_s at the exclusion area boundary (EAB) and the outer boundary of the low-population zone (LPZ) out to distances of 1,200 meters (m) (3,937 feet (ft)) from the nearest edge of a building within the powerblock area (PBA).

The NRC staff presented a status of the light water power-reactor (LWR) construction permit (CP) interim staff guidance (ISG). The purpose of the presentation was to support the submission of written comments on the LWR CP draft ISG (ADAMS Accession No. ML21165A157) by facilitating the public's understanding of the document's purpose, its development, and its content. The purpose of the presentation was not to receive formal comments. In response to a question on whether the CP ISG will be used for the review of non-LWR applications, the staff clarified that the non-LWR CP guidance is separate from the LWR CP ISG. The LWR CP ISG is to be used with NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants" (or SRP) to conduct the review of an LWR CP application. The clarifications in the appendix of the ISG supplements the CP guidance in the SRP. The non-LWR CP guidance is contained in Appendix E of the draft white paper for the Advanced Reactor Content of Application (ARCAP) roadmap and follows the Licensing Modernization Project (LMP) process. The staff encouraged submission of written comments on the LWR CP ISG by following the process described in the *Federal Register* Notice. Nuclear Energy Institute (NEI) stated it would submit written comments.

The NRC staff discussed the highlights from research on "Nuclear Data Assessment for Advanced Reactors," performed under a contract with Oak Ridge National Laboratory (ORNL). This research (NUREG/CR-7289; ADAMS Accession No. ML21349A369) informs the NRC regarding: (1) important nuclear data that significantly affect reactivity in advanced reactors (e.g., isotope cross sections, number of neutrons released per fission, thermal scattering kernels); and (2) impact of this nuclear data on key figures of merit impacting nuclear safety (e.g., reactivity balance, shutdown margin, control rod worth, power distribution). Specifically, gaps and uncertainties in nuclear data that impact reactor physics are being investigated in order to inform requirements for margin in the nuclear design. In response to a question whether plutonium was included in the data, the staff clarified that some of the benchmarks considered include the use of plutonium.

The NRC staff provided highlights from research on SCALE/MELCOR Development and Applications for non-LWRs. The presentation provided a status update on the effort of enhancing and applying the SCALE and MELCOR computer codes for advanced non-LWRs, and described work that is underway in 2022. This is a collaborative effort between the NRC, SNL and Oak Ridge National Laboratory (ORNL). In 2022, the staff is performing demonstration simulations with SCALE and MELCOR for a molten-salt-fueled reactor and a sodium-cooled fast reactor. In addition, the staff will be holding public workshops on SCALE and MELCOR modeling for these two classes of non-LWRs, including presenting results from the demonstration simulations. In response to a question on whether NRC has any users' groups for MELCOR users, the staff described the NRC-led Cooperative Severe Accident Research Program which includes MELCOR users' groups for NRC-counterpart organizations in other countries. In response to a question on availability of data to validate the new models that have been added to MELCOR for non-LWR accident simulation, the staff stated that they would continue to validate the new models as data becomes available.

The NRC staff presented an overview of the current status of Advanced Manufacturing

Technologies (AMTs) activities. AMTs are new methods of fabricating whole components and adding surface coatings to existing components that are of high interest to industry. Initial applications of AMTs in the nuclear industry to low safety significant components have begun with more anticipated in the coming years. NRC staff are performing technical and regulatory preparedness activities to enable efficient and effective reviews of AMTs implementations by industry as well as effective interactions through codes and standards bodies. NRC staff have assessed five specific AMTs and developed generic AMT review guidelines as well as AMT-specific review guidelines for three of the AMTs. The work under the current AMT Action Plan is nearly complete and is expected to be followed by another plan, likely in the form of a user need request to the NRC Office of Research (AMT Action Plan: ML19333B980).

In response to comments by US Nuclear Industry Council and NEI regarding availability of the NRC guidance for AMTs, the staff stated that the NRC is interested to learn more on industry initiatives related to AMTs; two draft guidance documents will be coming out in the near future (dates not finalized). A question was asked if “autopsies” of materials in decommissioned plants would be done to provide operational experience data on AMTs; the staff responded that materials from decommissioned plants were made using conventional manufacturing methods, so they would not be particularly useful for assessing AMT components.

Members of the public were in attendance and the NRC did not receive public meeting feedback forms. To see information regarding previously held periodic advanced reactor stakeholder public meetings, the NRC staff suggest that stakeholders visit the NRC’s public website at <https://www.nrc.gov/reactors/new-reactors/advanced/details.html#stakeholder>. The next advanced reactor stakeholder meeting is currently scheduled for March 16, 2022.

Please direct any inquiries to me at 301-415-1647 or via e-mail at Prosanta.Chowdhury@nrc.gov.

Enclosure:
Attendance List

SUBJECT: SUMMARY OF JANUARY 19, 2022, PERIODIC ADVANCED REACTOR
STAKEHOLDER PUBLIC MEETING DATED: FEBRUARY 15, 2022

DISTRIBUTION:

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RidsNrrDanu Resource

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SLynch, NRR

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ADAMS Accession Number:

Package: ML22048A512

Memo: ML22033A232

NRR-106

OFFICE	NRR/DANU/UARP/PM	NRR/DANU/UARP/BC	NRR/DANU/UARP/PM
NAME	PChowdhury	SLynch	PChowdhury
DATE	01/31/2022	2/15/2022	2/15/2022

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January 19, 2022, Periodic Advanced Reactor Stakeholder Public Meeting Attendance List

Name	Organization
Ashcraft, Joseph	NRC
Beasley, Benjamin	NRC
Bowman, Eric	NRC
Boyce, Tom	NRC
Bussey, Scott	NRC
Chereskin, Alexander	NRC
Chowdhury, Prosanta	NRC
Chui, Melissa	NRC
Compton, Keith	NRC
Costa, Arlon	NRC
Coyne, Kevin	NRC
Cubbage, Amy	NRC
Davis, Jennifer	NRC
de Messieres, Candace	NRC
Erwin, Kenneth	NRC
Giacinto, Joseph	NRC
Glowacki, Brian	NRC
Gordon, Matthew	NRC
Grady, Anne-Marie	NRC
Hansing, Nicholas	NRC
Hathaway, Alfred	NRC
Hayes, Michelle	NRC
Hoellman, Jordan	NRC
Holahan, Trish	NRC
Humberstone, Matthew	NRC
Iyengar, Raj	NRC
Jervey, Richard	NRC
Jung, Ian	NRC
Khan, Maryam	NRC
Kyriazidis, Lucas	NRC
Lauron, Carolyn	NRC
Lynch, Steven	NRC
Marchlewski, Henry	NRC
Martin, Kamishan	NRC
Muniz, Adrian	NRC
Mussatti, Daniel	NRC
Oesterle, Eric	NRC
Orenak, Michael	NRC
Phan, Hanh	NRC
Philpott, Stephen	NRC
Poehler, Jeffrey	NRC
Reed, Beth	NRC

Name	Organization
Regan, Christopher	NRC
Rubenstein, James	NRC
Sampson, Michele	NRC
Schaperow, Jason	NRC
Schneider, Stewart	NRC
Sebrosky, Joseph	NRC
Seymour, Jesse	NRC
Smith, Maxwell	NRC
Stutzke, Martin	NRC
Sutton, Mallecia	NRC
Tharakan, Binesh	NRC
Travis, Boyce	NRC
Tregoning, Robert	NRC
Valliere, Nanette	NRC
Van Wert, Christopher	NRC
Vechioli Feliciano, Lucieann	NRC
Walker, Shakur	NRC
Widmayer, Derek	NRC
Williams, Donna	NRC
Willingham, Laura	NRC
Jason A. Christensen	Idaho National Laboratory
Jim C. Kinsey	Idaho National Laboratory
Thomas Hicks	Idaho National Laboratory
Aaron England	Stakeholder
Adam Stein (Breakthrough Institute)	Stakeholder
Alan Ahn	Stakeholder
Albert, Marc	Stakeholder
Afzali, Amir	Stakeholder
Andrew Richards	Stakeholder
Arndt, Steven	Stakeholder
AUSTGEN, Kati	Stakeholder
Behnke, Donald H.	Stakeholder
Bergman, Jana	Stakeholder
Brandon Hartle	Stakeholder
Brian Froese	Stakeholder
Burg, Rob	Stakeholder
Caramello Marco	Stakeholder
Celik, Cihangir	Stakeholder
Charlotte Geiger (X-energy)	Stakeholder
Chen, Yiren	Stakeholder
Christopher P. Chwasz	Stakeholder
Clayton, Daniel James	Stakeholder
Courtenay, Christopher C	Stakeholder
Cyril Draffin (USNIC)	Stakeholder

Name	Organization
Daigle, David Louis	Stakeholder
Darrell Gardner (Kairos Power)	Stakeholder
David Andersson	Stakeholder
Deborah A Luchsinger (Services - 6)	Stakeholder
Dehoff, Ryan	Stakeholder
Edwin Lyman	Stakeholder
Elzinga, William J	Stakeholder
Fulton, John Douglas	Stakeholder
Frank Akstulewicz	Stakeholder
Goodman, Dave	Stakeholder
Grabaskas, Dave	Stakeholder
Grant, Eddie	Stakeholder
Henneke, Dennis (GE Power Portfolio)	Stakeholder
Holtzman, Benjamin	Stakeholder
Ian Gifford	Stakeholder
Ingrid Nordby (X-energy)	Stakeholder
Jeff Julius - Jensen Hughes	Stakeholder
Justin Wheat	Stakeholder
Kalene Walker	Stakeholder
Keeshia B. Goodenough	Stakeholder
Kissinger, Peter W.	Stakeholder
Kurt Harris	Stakeholder
Lanier, David A.	Stakeholder
Lefebvre, Robert Alexander	Stakeholder
Lesica, Sue	Stakeholder
Light, Russell S	Stakeholder
Luxat, David Lyle	Stakeholder
Marzano, Matthew (EPW)	Stakeholder
Mcdowell, Bruce K	Stakeholder
Merrifield, Jeffrey S.	Stakeholder
Michelle Byman	Stakeholder
Mike Montecalvo (TerraPower)	Stakeholder
Mirela Nitoi	Stakeholder
Mory Diané	Stakeholder
Mynatt, Norman Lynn	Stakeholder
Neil Haggerty	Stakeholder
Nelson, Scott	Stakeholder
Niko McMurray (ClearPath)	Stakeholder
O'Neill, Martin	Stakeholder
Paese, Richard M	Stakeholder
Paul Loza	Stakeholder
Peter Carusona	Stakeholder
Peter Hastings (Kairos Power)	Stakeholder
Peterson, Lisa	Stakeholder

Rani Franovich	Stakeholder
Raymond Wang (X-energy)	Stakeholder
Robert Budnitz	Stakeholder
Schiele, Raymond Joseph	Stakeholder
Schilthelm, Steve W	Stakeholder
Scott E. Ferrara	Stakeholder
Shahrokhi Farshid (FRA-CORP)	Stakeholder
Sigmon, Chet Austin	Stakeholder
Smith, Adam	Stakeholder
Sofu, Tanju	Stakeholder
Sola Talabi	Stakeholder
Spalding, Amanda J	Stakeholder
Stadtlander, Richard A.	Stakeholder
Steele, Stella M.	Stakeholder
Stephen J. Burdick	Stakeholder
Steven Kraft	Stakeholder
Steven Pope	Stakeholder
Stu Magruder	Stakeholder
Tammy Morin	Stakeholder
Thomas Marcille	Stakeholder
Tom Braudt	Stakeholder
Van Rooyen, Isabella J	Stakeholder
Van-Derpoel, Lynn	Stakeholder
Vaughn, Elizabeth A	Stakeholder
Wagner, Kenneth Charles	Stakeholder
Wieselquist, William	Stakeholder
William M Winslow, U.S. Army	Stakeholder
Zach, Andrew (EPW)	Stakeholder
Zhu, Ming	Stakeholder

* Attendance list based on Microsoft Teams Participant list. List does not include individuals that connected via phone.