



UNITED STATES
NUCLEAR REGULATORY COMMISSION
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February 18, 2022

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

FROM: Joseph M. Sebrosky, Senior Project Manager
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Eric Oesterle for

SUBJECT: SUMMARY OF JANUARY 18, 2022, PUBLIC MEETING TO DISCUSS
TECHNOLOGY INCLUSIVE CONTENT OF APPLICATION PROJECT

On January 18, 2022, the U.S. Nuclear Regulatory Commission (NRC) staff held a public meeting with stakeholders to discuss the technology inclusive content of application project (TICAP). The meeting notice is available in the NRC's Agencywide Documents Access and Management System (ADAMS) at Accession No. ML22014A284, and the presentation slides are available at ADAMS Accession No. ML22014A167. The enclosure to this summary provides the attendees for the meeting as captured by Microsoft Teams.

The purpose of this meeting was to discuss with stakeholders issues related to the Nuclear Energy Institute (NEI) Technical Report 21-07, Revision 0-B, "Technology Inclusive Guidance for Non-Light Water Reactors: Safety Analysis Report Content for Applicants Using the NEI 18-04 Methodology" (ADAMS Accession No. ML21343A292). This meeting was a follow-on meeting to previous public TICAP meetings held on:

- May 11, 2021 (meeting summary available at ADAMS Accession No. ML21132A295)
- May 19, 2021 (meeting summary available at ADAMS Accession No. ML21154A290)
- May 26, 2021 (meeting summary available at ADAMS Accession No. ML21158A223)
- June 23, 2021 (meeting summary available at ADAMS Accession No. ML21181A335)
- August 17, 2021 (meeting summary available at ADAMS Accession No. ML21245A442)
- October 5, 2021 (meeting summary available at ADAMS Accession No. ML21301A189)
- November 9, 2021 (meeting summary available at ADAMS Accession No. ML21328A233)
- December 14, 2021 (meeting summary available at ADAMS Accession No. ML21354A833)

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Meeting Highlights

The meeting included a discussion of the following topics:

- guidance for developing principal design criteria (PDCs) for an application using the licensing modernization project (LMP) process,
- level of detail in the safety analysis report (SAR) for anticipated operational occurrences (AOOs), design-basis events (DBEs), and beyond-design-basis events (BDBEs),
- an updated preliminary exemptions, clarifications, and additions table associated with the NRC staff's review of NEI 21-07,
- an industry representative briefing on its intention to develop guidance for the change process for an LMP-based application, and
- next steps for the NEI and staff guidance.

Principal Design Criteria

The NEI TICAP team discussed the proposed changes to NEI 21-07 to address the staff's recommendations regarding the scope of PDCs presented in the public meeting held on December 14, 2021. The NEI TICAP team stated the next revision of NEI 21-07 would address the following:

- The first change aligns with the staff's recommendation that under Title 10 of *The Code of Federal Regulations* (10 CFR) Parts 50 and 52, the full scope of PDCs must address the criteria associated with design, fabrication, construction, testing and performance for important-to-safety structures, systems, and components (SSCs). In addition, the staff's recommendation stated that important-to-safety SSCs includes both safety-related and non-safety-related with special treatment SSCs and that the proposed design criteria should not be limited to those associated with required functional design criteria (RFDC), which only include safety-related SSCs. The changes to the PDC guidance will include:
 - applicable special treatments (e.g., design, fabrication, construction, testing)
 - safety-significant functions associated with complimentary design criteria (non-safety related SSCs with special treatment)
- For the second change, the NEI TICAP team indicated that it would include an option in NEI 21-07 for applicants to request exemptions from the PDC requirement to allow applicants to propose PDCs only for RFDCs and to address a limited set of criteria by addressing the special treatments within the body of the SAR. The NRC staff noted in the December 14, 2021, public meeting that this was a possible option to address the issue. The NEI TICAP team indicated that some applicants may want to retain the approach because the preliminary draft language for the 10 CFR Part 53 rulemaking effort does not currently have a requirement for PDCs. The Part 53 rulemaking concept includes functional design criteria (FDCs) for design basis accidents (DBAs), FDCs for licensing basis events (LBEs) other than DBAs, and FDCs for normal operations. The exemption option could be used if an applicant developed its application to align with 10 CFR Part 50 and later decided to submit an application under 10 CFR Part 53.

The NEI TICAP team took an action to revise NEI 21-07 to include the changes described during the meeting. The NEI TICAP team noted that PDC associated with areas outside of LMP (e.g., normal operations) are outside the scope of NEI 21-07 and should be addressed by the

advanced reactor content of application project (ARCAP). The NRC staff took an action to consider whether it would develop guidance associated with NEI's TICAP team proposed exemption approach that could include example justifications for the exemptions. The NRC staff also took an action to consider the guidance associated with proposed exemption related to the PDC requirement to develop PDC associated with SSCs that are important to safety. This proposed exemption to allow PDCs to only address RFDCs had not been identified in the NRC staff's December 14, 2021, presentation.

Level of Detail in the Safety Analysis Report for AOOs, DBEs, and BDBEs

Prior to the meeting the NRC staff provided additional considerations for developing guidance in this area in an email dated January 12, 2022 (see ADAMS Accession No. ML22012A274). The staff noted that NEI 21-07 guidance for SAR Chapter 2 provided a level of detail for AOOs, DBEs and BDBEs that the staff believed was appropriate and that the NEI 21-07 guidance for SAR Chapter 3, proposing that such information would be included in the probabilistic risk assessment (PRA) documents retained only in plant records, conflicts with the appropriate guidance on SAR level of detail in Chapter 2. The NEI TICAP team agreed that there was a discrepancy between the SAR Chapter 2 and SAR Chapter 3 guidance. However, the NEI TICAP team stated that it would remove the level of detail guidance found in SAR Chapter 2 (that the NRC staff indicated was appropriate) to make it consistent with SAR Chapter 3 guidance.

The NEI TICAP team stated that it would consider making changes to NEI 21-07, Section 2.1.1, "Overview of PRA," guidance to partially address the NRC staff's concerns. The NEI TICAP team and the NRC staff stated that it would review guidance found in the American Society of Mechanical Engineers (ASME)/American Nuclear Society (ANS) Standard ASME/ANS RA-S-1.4-2021, "Probabilistic Risk Assessment Standard for Advanced Non-Light Water Reactor Nuclear Power Plants," Table 4.3.17.8-5, to determine if the information provided in this table might provide insights for resolving the issue on the appropriate level of detail in the SAR for AOOs, DBEs, and BDBEs.

The staff raised the issue of the lack of a definition for the term 'accessible environment' found in NEI 21-07 Chapter 2 guidance. The use of this term is noted at the bottom of page 1 of the document attached to the January 12, 2022, email referenced above. The NEI TICAP team took an action to look at the guidance in this area and determine if a change to the guidance is needed.

Updated Preliminary List of Exceptions, Clarifications and Additions to NEI 21-07

Prior to the meeting the NRC staff provided an updated table with a preliminary list of exceptions, clarifications, and additions to NEI 21-07 (see ADAMS Accession No. ML22013B183). The NRC staff updated this table, which had been discussed in previous TICAP public meetings, based on revisions to the TICAP guidance found in NEI 21-07, Revision 0-B, and proposed changes that NEI indicated that it would make. There was general agreement that the updated table accurately captured the status of the NRC staff's review based on revisions to the NEI 21-07 guidance. The NRC staff took an action to review the status of item 3.3 in the table, related to AOO information in the SAR, to ensure that it is not

redundant to other issues identified in the Table and that it appropriately considered industry's position on this issue.

Development of Guidance for an LMP-based Change Process

A member of industry stated that Southern Company was sponsoring an effort to develop guidance for controlling changes to licensing basis information developed using the LMP process. The industry representative stated that this effort is Phase 3 of LMP-based guidance development. The representative considers Phase 1 LMP-based guidance to be captured in NEI 18-04, Revision 1, "Risk-Informed Performance-Based Technology Guidance for Non-Light Water Reactors," and Phase 2 of the LMP-based guidance development being captured in the proposed guidance found in NEI 21-07. The industry representative indicated that it is expected that they would be engaging the staff on the LMP-based change process guidance and the representative desired to participate in public meetings on the topic in the near term.

The NRC staff noted it had a comment on NEI 21-07 related to the change control process for defense-in-depth information and that it may be more appropriate to include the change control process for this information in NEI 21-07 rather than in a separate guidance document. The staff stated that it would engage NRR Division of Reactor Oversight (DRO) about the forthcoming effort since the DRO is responsible for change control guidance for the currently operating power reactor fleet under 10 CFR 50.59. The staff also indicated that it would engage the Division of New and Renewed Licenses (DNRL) because of the possibility the change process that was under development could affect 10 CFR Part 52. For example, the change process for a standard design is codified in the respective 10 CFR Part 52 design certification appendix rather than 10 CFR 50.59.

Next Steps

The NEI TICAP team briefly described minor changes that it intended to make to NEI 21-07 Sections 6.4.1, "Description for SR SSC-1," and 7.3.1, "Description for NSRST SSC-1," to make the guidance clearer. A snapshot of the proposed change to Section 6.4.1 was shown during the meeting as follows:

applicable to the SR SSC

- o A description of all modes of SSC operation, including an account of the performance modes of SSC operation relevant to the RSFs
- o Identification of operator actions needed to implement the RSFs - where reliability and capability targets for human actions needed to accomplish an RSF are derived from the PRA, measures applied to achieve the target values should be addressed Chapter 11
- o Controls and displays needed to accomplish RSFs – where human actions are required to accomplish RSFs, a description of required controls and displays should be provided
- o Logic circuits and interlocks needed to support RSFs

Author
Terminology modified to track more precisely with NEI 18-04.

Author Deleted: safety-related

Author Deleted: safety functions

A snapshot of the proposed change to Section 7.3.1 was shown during the meeting as follows:

The screenshot shows a document with several redaction lines and author annotations. At the top, there is a line of text: "of SSC operation relevant to the safety-significant functions". Below this, a bulleted list item is partially visible: "o Identification of any operator actions needed to implement safety-significant functions -- where reliability and capability targets for human actions needed to accomplish safety-". A red dashed line extends from the end of this list item to the right margin, where the text "Author Deleted: safety-significant" is written. Below the list item, there is a copyright notice: "© NEI 2021. All rights reserved." and the URL "nei.org 63". A thick horizontal bar, colored light blue on top and dark blue on the bottom, spans the width of the page. Below this bar, the date "December 2021" is centered. Another red dashed line extends from the end of a line of text: "significant functions are derived from the PRA, measures applied to achieve the target values should be addressed Chapter 11" to the right margin, where the text "Author Terminology modified to track more precisely with NEI 18-04 and Section 6.4.1." is written. Below this, another bulleted list item is partially visible: "o Controls and displays needed to support safety-significant functions – where human actions are required to accomplish safety-significant functions, a description of required controls and displays should be provided".

The NRC staff's initial feedback was that the proposed changes seemed reasonable, but the staff would withhold any final determination until after it completed its review of Revision 1 to NEI 21-07. The NEI TICAP team stated that it was targeting late February or early March for providing Revision 1 to NEI 21-07. The NRC staff stated that the guidance contained in NEI 21-07, Revision 1, should be at the point where the staff could develop a draft regulatory guide with appropriate exceptions, clarifications, and additions, that could be issued for public comment.

Enclosure:
Attendance List

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DATED: FEBRUARY 18, 2022

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ADAMS Accession Number: ML2208A393

NRC-001

OFFICE	NRR/DANU/UARP/PM	NRR/DANU/UARP/BC	NRR/DANU/UARP/PM
NAME	JSebrosky	SLynch	JSebrosky (EOesterle for)
DATE	2/1/2022	2/15/2022	2/18/2022

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**January 18, 2022, Public Meeting to Discuss
Technology Inclusive Content of Application Project
Attendance List***

NAME	AFFILIATION	NAME	AFFILIATION
John Segala	NRC/NRR/DANU	Amir Afzali	Southern Company
Martin Stutzke	NRC/NRR/DANU	Brandon Chisholm	Southern Company
Steven Lynch	NRC/NRR/DANU/UARP	Ben Holtzman	Nuclear Energy Institute (NEI)
Prosanta Chowdhury	NRC/NRR/DANU/UARP	Ed Lyman	Union of Concerned Scientists
Maryam Khan	NRC/NRR/DANU/UARP	Cyril Draffin	U.S. Nuclear Industry Council
Eric Oesterle	NRC/NRR/DANU/UARP	Steven Nesbit	LMNT Consulting
Jordan Hoellman	NRC/NRR/DANU/UARP	Ed Wallace	GNBC Associates
Joe Sebrosky	NRC/NRR/DANU/UARP	Neil Haggerty	Excel
Stephen Philpott	NRC/NRR/DANU/UARP	Eddie Grant	Excel
Arlon Costa	NRC/NRR/DANU/UARP	Frank Akstulewicz	A to Z Reactor Consulting Services
Amy Cabbage	NRC/NRR/DANU/UARP	Dennis Henneke	GE Power
Binesh Tharakan	NRC/NRR/DANU/UARP	Lisa Schichlein	GE Power
William Jessup	NRC/NRR/DANU/UARL	Karl Fleming	KNF Consulting
Eric Bowman	NRC/NRR/DANU/UARL	Raymond Wang	X-energy
Michelle Hayes	NRR/NRR/DANU/UTB1	Jon Facemire	X-energy
Candace de Messieres	NRC/NRR/DANU/UTB2	Steve Vaughn	X-energy
Michael Orenak	NRR/NRR/DANU/UTB1	Charlotte Geiger	X-energy
Hosung Ahn	NRC/NRR/DANU/UTB1	Ingrid Nordby	X-energy
Alexander Chereskin	NRC/NRR/DANU/UTB1	Tanju Sofu	Argonne National Lab
Boyce Travis	NRC/NRR/DANU/UTB1	Adam Stein	Breakthrough Institute
Michelle Hart	NRC/NRR/DANU/UTB2	Mike Keller	Hybrid Power Technologies
Hanh Phan	NRC/NRR/DANU/UTB2	Jeff Julius	Jensen Hughes
Christopher Van Wert	NRC/NRR/DANU/UTB1	Christopher Courtenay	Duke Energy
Timothy Lupold	NRC/NRR/DANU/UTB1	Roger Mattson	INL
Ian Jung	NRC/NRR/DANU/UTB1	Mike Montecalvo	TerraPower
Carolyn Lauron	NRC/NRR/DNRL/NRLB	Bryan Eyers	TerraPower
Ed Miller	NRC/NRR/DORL/LPL2-1	Amanda Spalding	Westinghouse
Robert Roche-Rivera	NRC/RES/DE/RGPMB	William Winslow	U.S. Army
Robert Krsek	NRC/COMM/JB	Andrew Zach	Senate Committee on Environment and Public Works (EPW)
Shakur Walker	NRC/COMM/DW	Matthew Marzano	Senate EPW
Henry Marchiewski	OCHCO/ADHRTD/NRANB	Dave Grabaskas	Argonne National Lab
Scott Bussey	OCHCO/ADHRTD/RTTB	Adam Stein	Breakthrough Institute

Bob Weisman	NRC/OGC	Farshid Shahrokhi	Not Available (NA)
Marcia Carpentier	NRC/OGC	Lisa Peterson	NA
Weijun Wang	NRC/RES/DE/SGSEB	Paul Loza	NA
Carolyn Wolf	NRC/OCA	Ben Chen	NA
Derek Widmayer	NRC/ACRS	Rob Burg	NA
Jim Kinsey	INL	Alan Levin	NA
Chris Chwasz	INL	Kiersten Smith	NA
Tom King	INL	Kurt Harris	NA
Tom Hicks	INL	Michael Mayfield	NA
Ewa Muzikova	NA	Stanton Harris	NA
Steven Pope	NA	Mike Dunkelberger	NA
Mike Tschiltz	NA	Donald Behnke	NA
Ian Gifford	NA	William Horak	NA
Henry Marchlewski	NA	Meg Audrian	NA
Matthew Gordon	NA	Robert Ballentine	NA
Jana Bergman	NA	Maggie Staiger	NA
Keeshia Goodenough	NA	Archie Manocharan	NA
Scott Nelson	NA	Lance Sterling	NA

* Attendance list based on Microsoft Teams Participant list. List does not include 3 individuals that connected via phone.