#### MINUTES

**Risk-Informed, Performance-Based Principles and Policy Committee (RP3C)**

## December 1, 2021

The meeting transcript is embedded here for full discussions along with the meeting presentation.



**Members Present:**

N. Prasad Kadambi (Chair), Kadambi Engineering Consultants

Robert W. Youngblood III (Vice Chair), Idaho National Laboratory

Patricia Schroeder (Secretary), American Nuclear Society

Kathryn Murdoch, (Secretary pro tem), American Nuclear Society

Amir Afzali, Southern Nuclear Operating Company

Todd Anselmi, Idaho National Laboratory

James August, Individual

Robert Budnitz, Lawrence Berkeley National Laboratory-retired

Robert Burg, Engineering Planning and Management, Inc.

Matthew Darois, Radiation Safety & Control Services, Inc

Donald R. Eggett, Eggett Consulting LLC

George F. Flanagan, Individual

Michelle L. French, WECTEC

Kurt Harris, Flibe Energy, Inc.

Dennis Henneke, GE Hitachi

Marsha C. Kinley, Duke Energy Corporation

Margaret Kotzalas, U.S. Department of Energy

Mark A. Linn, Individual

Jean-Francois (Jef) Lucchini, Los Alamos National Laboratory

Stewart Magruder, AdSTM

Charles (Chip) Martin, Longenecker and Associates

Michael Muhlheim, Oak Ridge National Laboratory

James O'Brien, U.S. Department of Energy

William Reckley, U.S. Nuclear Regulatory Commission

Andrew Smetana, Individual

Ruth Weiner, AECOM

Kent Welter, NuScale Power

**Guests Present:**

Michael Christofaro, Savannah River Nuclear Solutions

Greg Hudson, Metcalfe PLLC

Andrea Maioli, Westinghouse

Meryem Murphy, Virginia Commonwealth University

1. **Welcome, Roll Call & Introductions**

RP3C Chair Prasad Kadambi welcomed all and initiated the meeting.

1. **Approval of Meeting Agenda**

The agenda was approved as presented.

**CATEGORY I:** ADDRESS STANDARDS BOARD’S OBJECTIVES

1. **RP3C Actions on SB SMART Matrix for RP3C**

The matrix filtered for RP3C action is embedded for reference.



Prasad Kadambi reviewed the SMART matrix actions assigned to RP3C which includes Initiatives 1E, 1F, and 1G. He doesn’t see a need for Initiative 1E for RP3C to create an interface matrix between RP3C and the Joint Committee on Nuclear Risk Management (JCNRM) nor do other members as it was felt that the interface is working sufficiently. Kadambi reviewed RP3C efforts to address Initiative 1F and the implications of implementing the initiative. He agreed with Henneke that the process to implement Initiative 1F may need to include JCNRM. The coordination between JCNRM and RP3C in this effort will occur automatically by following the RP3C Guidance Document. Members agreed that the U.S. Nuclear Regulatory Commission’s (NRC’s) Risk-Informed, Performance-Based (RIPB) White Paper should be used as the central organizing principle for a common understanding.

**4. RIPB Guidance Development**

1. Status of RP3C Guidance Document (GD)

A copy of the GD as issued for the RP3C ballot is embedded for reference. ([Link to Ballot](about:blank))



1. Commenting Process and Resolution of Comments

NOTE: A spreadsheet of comments submitted on the GD and supporting file are embedded for reference.



James O’Brien provided some background on the development of the GD. Input from JCNRM was incorporated. He feels that the document is much better but not perfect. Comments on the recent RP3C ballot will be incorporated with the hope of issuing the GD in March 2022. Todd Anselmi, as a working group chair, stated that he feels that the GD will be beneficial to working groups. Andrew Smetana added that he has an action item to send the GD to subcommittee and working group chairs under the Safety and Radiological Analyses Consensus Committee (SRACC) when it is available. Robert Budnitz commended O’Brien for leading the effort to develop the GD. It was acknowledged that in addition to working groups using the GD, they need to enlist RP3C and/or JCNRM for guidance.

The RP3C ballot of the GD closed with 23 votes cast—18 affirmative, 4 abstentions, and 1 negative. Eleven formal comments were submitted. The negative vote will require substantive discussion within RP3C. One abstention comment will require Standard Board discussion.

1. Next Steps Toward Delivery of Training

One training has already been provided. The training will be updated once the GD is finalized.

**5. RP3C Member Survey**

At the request of Prasad Kadambi, Robert Burg conducted a limited poll of RP3C members to gather suggestions about the path forward for RP3C. The poll included mostly open-ended questions. Only a small number of responses were collected. The responses were individually interesting but do not lend themselves to statistical analysis.

At the request of the Standards Board, RP3C will develop a survey for working groups.

**6. Report on Community of Practice (CoP) Sessions**

The CoP was an initiative suggested by Kent Welter about two years ago. So far, there have been 19 presentations. Prasad Kadambi considers the presentations as a knowledge base. Four of the presentations include a focus on the NRC’s RIPB White Paper. He feels this a case for making the White Paper the basis for standardizing RIPB to support the Nuclear Energy Innovation and Modernization Act (NEIMA). James August suggested that a standard could use an appendix to explain how RIPB methods are incorporated. Kadambi felt that this suggestion would need to be considered by the Standards Board.

**CATEGORY II:** EXPAND RIPB METHODS

**7. ANS Input to Rulemaking Under 10 CFR Part 53, “Risk-Informed, Technology-Inclusive Regulatory Framework for Advanced Reactors”**

ANS President Steven Nesbit has asked Prasad Kadambi to lead the Advanced Reactor Working Group (ARWG) under the Operations and Power Division (OPD). The ARWG will begin with OPD, Nuclear Installations and Safety Division (NISD), and Fuel Cycle & Waste Management Division (FCWMD) along with the Standards Committee representing ANS as a stakeholder. He sees RP3C integral to the ARWG. A letter from ANS to NRC (ML21063A107) received scant staff attention. The ANS letter points to the Commission’s White Paper as the basis for standardizing advanced reactor applications. Amir Afzali sees the Part 53 rulemaking as an important activity and a conversation that we need to be engaged in.

**8. Focus on ANS-ASME Roles in RIPB Methods**

Recent activities and initiatives by standards development organizations (SDOs) have highlighted the need for harmonization. The Standards Board is considering forming a Standards Executive Advisory Committee (EAC) if recommended by the Policy Task Group. Kadambi will suggest to the EAC, if approved, to address harmonization understanding of RIPB among SDOs. Also, harmonization of industry standards is the main objective of the Nuclear Standards Collaborative now in its initial stages of formation.

**9. Re-Activation of the Terminology Group in RP3C**

A terminology group under the RP3C held an initial meeting but suspended its work because of other activities that did not come to pass. The recent experience with proposed standards ANS-30.3, “Light-Water Reactor Risk-Informed Performance-Based Design,” and ANS-30.2, “Categorization Classification of SSCs for New Nuclear Power Plants,” have highlighted the need for action to make progress. Several members acknowledged the need for harmonization on terminology and standards in general. An acknowledgement of a performance-based approach for the application was recommended. RP3C will be discussing RIPB terminology and associated issues as part of using the Guidance Document to help WGs

**CATEGORY III** SUPPORT TO WORKING GROUP APPLICATION OF RIPB METHODS

**10. SUBSTANTIVE DISCUSSION OF SPECIFIC STANDARDS**

More details about the below projects can be found in the meeting presentation—see slides 19-26.

1. RP3C Input on ANS-30.1, “Integrating Risk and Performance Objectives into New Reactor Nuclear Safety Designs​” (new standard)—M. Linn/G. Flanagan ([Link to RP3C Ballot](about:blank))

ANS-30.1 Working Group Chair Mark Linn reported that his working group has been very challenged with comments and has elevated the path forward to the Standards Board. The Standards Board may direct that 1) work should be continued on the standard, 2) work should be completely terminated, or 3) the standard should be converted to a guidance document. The decision is expected to be made at tomorrow’s Standards Board meeting.

1. Status of ANS-30.3, “Light-Water Reactor Risk-Informed Performance-Based Design” (new standard)—K. Welter/M. French ([Link to RP3C Ballot](about:blank))

The draft saw many changes as a result of the Large Light Water Reactor Consensus Committee (LLWRCC) ballot. A revised draft is anticipated to be issued for a recirculation ballot to approve substantive changes. NRC endorsement will be sought once the standard is approved. Dennis Henneke added that unlike ANS-30.1, ANS-30.3 is successful because it is very high level and uses standardized practices.

1. Status of ANS-30.2, “Categorization Classification of SSCs for New Nuclear Power Plants” (new standard)

Work on the draft is progressing well. The draft is expected to be approved by the working group in August of 2022 to start the approval process.

1. Status of ANS-2.21, “Criteria for Assessing Atmospheric Effects on the Ultimate Heat Sink” (revision of ANSI/ANS-2.21-2012 (R2016))—M. Kinley/P. Kadambi ([Link to RP3C Ballot](about:blank))

The draft is currently out for a recirculation ballot with the Environmental and Siting Consensus Committee until December 11, 2021. Public review closes January 20, 2022.

1. RP3C Input on ANS-20.2, “Nuclear Safety Design Criteria and Functional Performance Requirements for Liquid-Fuel Molten Salt-Reactor Nuclear Power Plants” (new standard)—D. Holcomb ([Link to RP3C Ballot](about:blank))

The draft has been issued to the Advanced Initiatives Subcommittee and to RP3C, the Subcommittee on Risk Application, LLWRCC, Nonreactor Nuclear Facilities Consensus Committee, and the Fuel, Waste, and Decommissioning Consensus Committee for review. A total of 53 comments were submitted. The group is meeting weekly to address comments. The ballot to the Research and Advanced Reactors Consensus Committee is expect in early 2022.

1. ANS-60.1, “Civil Nuclear Export Control” (new standard)—M. Harding

The standard will provide guidance for U.S. vendors that want to do business internationally. Kadambi is part of the working group although it is mostly lawyers.

1. ANS-57.11, “Integrated Safety Assessments for Nonreactor Nuclear Facilities”—M. Kotzalas ([Link to RP3C Ballot](about:blank))

The standard will be a way to provide quality around the requirements for nonreactor nuclear facilities. DOE has expressed interest in funding a pilot of the standard at one of their facilities. The working group is looking for RP3C support and a fresh set of eyes. Training on the guidance document would be helpful. Members interested in helping were asked to contact Margaret Kotzalas.

**11. INVITE INPUT FROM STANDARDS ON RIPB SCHEDULE**

See the embedded Schedule of RIPB Standards in Development for reference.



* RP3C interaction/input on the following PINS or standards on the RIPB Schedule (not discussed elsewhere):
* ANS-2.22, “Environmental Radiological Monitoring at Operating Nuclear Facilities”
* ANS-2.26, “Categorization of Nuclear Facility SSCs for Seismic Design”
* ANS-2.32, “Remediation of Radioactive Contamination in the Subsurface at Nuclear Power Plants”
* ANS-2.34, “Characterization and Probabilistic Analysis of Volcanic Hazards”
* ANS-2.36, “Accident Analysis for Aircraft Crash into Reactor and Nonreactor Nuclear Facilities”
* ANS-3.5.1, “Nuclear Power Plant Simulators for Use in Simulation-Assisted Engineering and Non-Operator Training”
* ANS-3.11, “Determining Meteorological Information at Nuclear Facilities”
* ANS-3.13, “Nuclear Facility Reliability Assurance Program (RAP) Development”
* ANS-3.15, “Risk-Informing Critical Digital Assets (CDAs) for Nuclear Power Plant Systems”
* ANS-15.22, “Classification of Structures, Systems and Components for Research Reactors”
* ANS-56.2, “Containment Isolation Provisions for Fluid Systems After a LOCA”
* ANS-57.2, “Design Requirements for LWR Spent Fuel Storage Facilities at NPPs”
* ANS-57.9, “Design Criteria for an Independent Spent Fuel Storage Installation (Dry Storage Type)”

**12. Changing Environment**

The NRC has put out a number of documents for public comment as part of the Part 53 rulemaking including the following:

* NUREG-2246 on Fuel Qualification
* Employs objectives’ hierarchy in an incomplete manner
* DG-1380 on ASME Sec. III, Div. 5, including NUREG-2245
* RI regulatory guidance; no PB approach
* DG-1383 on ASME Sec. XI, Div. 2
* RI regulatory guidance related to ANS-3.13
* ISG for ISI/IST Programs
* RI regulatory guidance related to ANS-3.13

**13. Review of Open Action Items**

* 6/2021-01: Prasad Kadambi to check with James O’Brien on a date for completing the modified Guidance Document.

DUE DATE: July 15, 2021

RESPONSIBLE: Prasad Kadambi, James O’Brien

STATUS: Completed

The revised GD was issued to RP3C for approval on 10/27/21 with the close date of 11/26/21.

* 6/2021-02: Ed Wallace to work with Pat Schroeder to make the appropriate version of the GD available to members for input.

DUE DATE: July 1, 2021

RESPONSIBLE: Ed Wallace, Pat Schroeder

STATUS: Completed

* 6/2021-03: RP3C members, especially working group chairs, to provide assistance/feedback on the GD to make it more useful.

DUE DATE: August 15, 2021

RESPONSIBLE: RP3C members

STATUS: Completed

Member comments collected via ballot.

**14. Other Business**

No other business was discussed.

**15. Next Meeting**

Upcoming ANS meetings:

* Upcoming ANS meetings:
* ANS Annual Meeting in Anaheim, California, at the Anaheim Hilton from June 12-16, 2022
* ANS Winter Meeting in Phoenix, Arizona, Arizona Grand Resort from November 13-17, 2022

A face-to-face RP3C meeting is anticipated on Monday, June 13, 2022, during the ANS 2022 Annual Meeting.

Robert Youngblood asked members to let him know if they are willing to support a RIPB panel at the upcoming meeting. He thought that the GD would make a good topic.

**16. Adjournment**

With no further business, the meeting was adjourned.

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

LIST OF EMBEDDED FILES:

1. Meeting transcript
2. Meeting presentation
3. RP3C Actions on SB SMART Matrix for RP3C
4. RP3C Guidance Document
5. Comment spreadsheet on Guidance Document ballot
6. Supporting file combining Hill, Linn, and Stamm comments
7. Schedule of RIPB Standards in Development