#### MINUTES

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

## June 13, 2022

**Members Present:**

N. Prasad Kadambi (Chair), Kadambi Engineering Consultants

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

Patricia Schroeder (Secretary), 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.

Brandon Chisholm, Southern Company

Donald R. Eggett, Eggett Consulting LLC

George F. Flanagan, Individual

## Rani Lea Franovich, The Breakthrough Institute

Michelle L. French, WECTEC

Kurt Harris, Flibe Energy, Inc.

Robert Hayes, North Carolina State University

Dennis Henneke, GE Hitachi

Ralph Hill, Individual

Mark Joseph, Oak Ridge National Laboratory

Margaret Kotzalas, U.S. Department of Energy

Svetlana Lawrence, Idaho National Laboratory

Mark A. Linn, Individual

Stewart Magruder, AdSTM

Charles (Chip) Martin, Longenecker and Associates

Michael Muhlheim, Oak Ridge National Laboratory

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

Hanh Phan, U.S. Nuclear Regulatory Commission

Andrew Smetana, Individual

Kent Welter, NuScale Power

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

RP3C Chair Prasad Kadambi welcomed all. Brief introductions were made.

1. **Approval of Meeting Agenda**

NOTE: The meeting presentation is embedded here.



The agenda was reviewed and approved. Robert Youngblood congratulated Prasad Kadambi for receiving an ANS President Citation which was recognized at the ANS Annual meeting. The citation reads as follows:

*N. Prasad Kadambi, ANS member since 1972 and consultant at Kadambi Engineering Consultants, for sustained contributions to ANS, including his leadership in the areas of risk-informed, performance-based rulemaking and advanced reactors.*

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

1. **Updates on RP3C Portions of SB SMART Matrix**

NOTE: The matrix filtered for RP3C actions is embedded.



Prasad Kadambi reviewed the SMART Matrix for RP3C components. He will report to the Standards Board that no action is required for RP3C and the Subcommittee on Risk Application (SCoRA) interaction as the two groups are working well together. A poll to get feedback from working groups was not successful. Kadambi feels we need to have working group chairs to describe their activities and to speak about their challenges on using risk-informed, performance-based (RIPB) methods. RP3C’s main goal now is to train working groups on the Guidance Document (GD). An article on incorporating RIPB methods in ANS standards was published about two years ago. A current effort is underway to update the Professional Divisions Committee on RP3C’s progress. See slides 3 – 6 of the meeting presentation for more details.

**4. RP3C’s RIPB Guidance Document**

1. Status of RP3C Guidance Document (GD)

The GD was approved by the RP3C and issued to the Standards Board. The Standards Board ballot closed 4/27/22 with 16 approvals, 0 negatives, 1 nonresponses, and 2 comments. The GD is posted to the RP3C’s website [HERE](about:blank) for trial use.

James O’Brien has led the work on developing the GD along with many folks over the last couple of years. The GD was updated from a previous trial-use version to incorporate information from the Joint Committee on Nuclear Risk Management (JCNRM) and other enhancements. A revision is expected in a couple of years.

1. Presentation of Content of GD

The structure of the GD was reviewed. The GD is consistent with U.S. Nuclear Regulatory Commission (NRC) SRM-SECY-98-0144. The alignment should help NRC endorsement of ANS standards.

1. Action Plan for Delivery of Training

The training will be provided in two parts – 1) overview of the GD and 2) case studies. Training will likely start in July. Members were directed to let Pat Schroeder know if they would like to be informed of the training dates when scheduled. See slides 8 – 11 of the meeting presentation for more details on the GD and its training.

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

Prasad Kadambi reported on the CoP sessions which are held once a month. The purpose is to have individuals active with RIPB concepts and methods to share their knowledge and experience. There are 24 recorded sessions available publicly on the RP3C website. Kadambi feels there should be enough knowledge in the repository to come up with best practices, but it will take expertise and effort to extrapolate the specific information offered in a presentation to general principles and policies. Kadambi feels that other standards development organizations (SDOs) may be interested in using the knowledge available in the presentations. Robert Youngblood agrees that there is good information in the presentations but feels that it will take a good amount of work to develop best practices. Kadambi welcomed help from all. See slide 12 of the meeting presentation for more details.

**CATEGORY II:** EXPAND RIPB METHODS

**6. Establishment of ANS Advanced Reactors Working Group (ARWG)**

Prasad Kadambi reported that the activities of the ARWG got going last January. He is the chair of the group. All ANS divisions are asked to bring their support to the ARWG to better reflect ANS contributions toward advanced reactors. The group was initially setup with the Operations and Power Division (OPD), Nuclear Installations Safety Division (NISD), Fuel Cycle and Waste Management Division (FCWMD), and the Standards Committee. The group includes the executives from these four groups. Other groups, such as the Young Member Group (YMG) also participate. A web portal for the ARWG should be setup soon. ARWG products are intended to flag opportunities for ANS leadership to influence the regulatory landscape for advanced reactors. Currently the activities include what is called the modernization which includes Part 53. It is the Society involvement that is the outcome objective of the ARWG. Kadambi sees an opportunity because of the mandates in the Nuclear Energy Innovation and Modernization Act (NEIMA) call out RIPB concepts and methods. ANS provided comments on Part 53 and made a presentation to the Advisory Committee on Reactor Safety (ACRS) based on the letter. The building blocks for the ANS approach were laid out some years ago with Position Statements 46 and 35. ARWG is currently engaged in an activity with the NISD to prepare a proposal on NEIMA and RIPB for consideration by the ANS leadership. Kadambi expects to hear back from the NISD in a few weeks. Additionally, ANS was a co-signatory to a letter with The Breakthrough Institute proposing improvements to a limited-scope Part 73 rulemaking for new reactor licensing.

Kadambi continued, stating that the ARWG maintains awareness of NRC activities pertaining to advanced reactors and added several observations. To be technology neutral, he feels that we need to be performance based. A letter was just drafted by the ARWG to be sent jointly by leadership of The Breakthrough Institute and ANS to the NRC Commissioners regarding joint non-governmental organizations (NGOs) concerns regarding the NRC’s regulatory engagement in developing a “Risk-Informed, Technology-Inclusive Regulatory Framework for Advanced Reactors.” The letter is currently with ANS leadership for consideration.

Amir Afzali reviewed the current letter and expressed several concerns. He believes the current letter is inconsistent with the letter issued last February. He also sees it as an inappropriate attack on NRC staff and feels that this is not how a technical society should work. Afzali wants to be on record documenting that he is opposed to the letter and plans to address the letter with the Standards Board. Kadambi who has been working closely with ANS President Steve Nesbit feels that the ARWG was motivated by the narrow timeframe and the need to do something. Afzali feels that the timeline is inaccurate. He believes that the lack of planning has resulted in urgency and that the letter may not be beneficial to the industry. Dennis Henneke agreed with Afzali and questioned the makeup of the ARWG and who on the group are representing the advanced reactor designer. Robert Budnitz expressed his sentiments that he feels the NRC is modernizing appropriately contrary to what is expressed in the letter.

Afzali, Henneke, and Budnitz reshared their sentiments to Rani Franovich when she was able to join. Franovich listed members of the ARWG. With their concerns recognized, Franovich and Kadambi will carry their message to the ARWG. Kadambi suggested that Henneke participate in the ARWG through his division. Henneke feels that the JCNRM should be engaged directly.

ACTION ITEM 6/2022-01: Rani Franovich and Prasad Kadambi to carry Amir Afzali’s, Dennis Henneke’s, and Robert Budnitz’s message to the ARWG that the letter is inappropriate and inaccurate and that advanced reactor designers need to be included in the makeup of the group.

See slides 13 – 18 of the meeting presentation for more details.

**7. Focus on RIPB Methods for Operating Reactors**

* Potential for RP3C Role in LWR Sustainability Program

Prasad Kadambi introduced Svetlana Lawrence the Risk-Informed Systems Analysis Pathway Lead at Idaho National Laboratory. A presentation was made on the goal of the Light Water Reactor Sustainability Program (LWRS) which is to enhance the safe, efficient, and economical performance of our nation's nuclear fleet and extend the operating lifetimes of this reliable source of electricity. In closing, Lawrence welcomed any suggestions for using RIPB methods. Lawrence’s presentation is available as slides 19 – 23 of the meeting presentation.

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

**8. SUBSTANTIVE DISCUSSION OF SPECIFIC STANDARDS**

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))

Mark Linn reported that ANS-30.1 is being converted to a guidance standard at the direction of the Standards Board. The redirection requires a bit of re-work. The majority of the comments from the previous ballot were from the RP3C. The working group is trying to have resolutions and a revised draft completed by the end of summer. See slides 24 – 25 of the meeting presentation for more details.

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))

Kent Welter reported that the standard is nearing the end and is expected to be approved soon. The last resolution has been on the definition of “risk-informed approach.” Editing of the standard has been expedited. NRC endorsement will be sought once the standard has been published. See slide 26 of the meeting presentation for more details.

1. Status of ANS-30.2, Categorization Classification of SSCs for New Nuclear Power Plants (new standard)—K. Welter/M. French

Welter stated that the standard builds on more traditional guidance and tries to bridge the gap between light water reactors and nonlight water reactors. An effort has been made to harmonize the standard with international guidance so there’s no barrier to international use. Welter projected that a draft of the standard will be completed August 2023. See slides 27 – 32 for more details.

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))

Details on the status of ANS-20.2 can be found on slide 33.

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

Kadambi provided this report as a member of the working group. He stated that this standard is quite different than other ANS standards. He thinks the key is to think about performance objectives within all the regulations involved. More details are available on slide 34 of the meeting presentation.

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

Margaret Kotzalas provided an update on the standard’s progress. The working group will meet a full day on Wednesday during the ANS Annual Meeting. Kotzalas and April Smith revised the standard completely. She thinks that the standard could be ready for the next ballot soon. Industry members that resigned are not interested in rejoining the working group. The NRC is not actively participating; however, the DOE has expressed interest which is the current focus. The revised draft removes NRC references from the standard to make it more general. Dennis Henneke expressed concern that the working group is preceding without industry representatives. More details can be found on slide 35 of the meeting presentation.

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



Prasad Kadambi recognized a long list of standards that are in development using RIPB methods. With the number of these projects growing, those that need help are asked to contact Kadambi. Working group chairs of these projects are ex officio members of RP3C and are included in all RP3C communications and meeting notices. 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-2.18, Evaluating Radionuclide Transport in Surface Water for Nuclear Reactor and Nuclear Facility Sites
* 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)

**10. Changing Environment**

Prasad Kadambi explained that he likes to capture the landscape as part of the changing environment. Climate change concerns have drawn a much more diverse group of stakeholders into the discussions related to nuclear power.

A webinar is being scheduled some time in July to substitute for an executive session for NGOs that was initially planned for the June ANS Annual Meeting. The webinar will discuss what is going on and where we can help the Part 53 process. The webinar will bring together people from Non-Governmental Organizations (NGOs) interested in advanced reactors and Part 53 to establish common ground. Kadambi sees this as an opportunity to bring in additional individuals to the ANS standards program. Amir Afzali expressed his sentiments that the webinar will not be successful without the right participation and would not want for ANS to lose credibility.

**11. Review of Open Action Items**

All action items were closed at the last meeting, and no new action items were assigned at the December 1, 2021, meeting needing to be reviewed.

**12. Other Business**

No other business was discussed.

**13. Next Meeting**

Upcoming ANS meetings:

* Upcoming ANS meetings:
* ANS Winter Meeting in Phoenix, Arizona, Arizona Grand Resort from November 13-17, 2022
* ANS Annual Meeting in Indianapolis, Indiana, at the Marriott Indianapolis Downtown from June 11-14, 2023

Prasad Kadambi expects that the next RP3C meeting will be held during the ANS Winter Meeting either physical, virtual, or hybrid.

**14. Adjournment**

The meeting was adjourned with no further business.