

May 9, 2013

MEMORANDUM TO: Rani L. Franovich, Chief
Performance Assessment Branch
Division of Inspection and Regional Support
Office of Nuclear Reactor Regulation

FROM: Ronald K. Frahm, Jr., Senior Reactor Operations Engineer **/RA/**
Performance Assessment Branch
Division of Inspection and Regional Support
Office of Nuclear Reactor Regulation

SUBJECT: SUMMARY OF PUBLIC MEETING HELD ON APRIL 15, 2013,
TO CONTINUE DISCUSSIONS REGARDING APPROACH FOR
RISK-INFORMING THE REACTOR OVERSIGHT PROCESS
FOR NEW REACTORS

On April 15, 2013, the U.S. Nuclear Regulatory Commission (NRC) staff hosted a Category 2 public meeting with the Nuclear Energy Institute (NEI) and other interested stakeholders at the NRC's Two White Flint North building in Rockville, Maryland. The purpose of this meeting, as noted in the meeting notice dated April 1, 2013 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML13086A933) was to continue to discuss specific aspects of the Commission's Staff Requirements Memorandum (SRM) to the Office of the Secretary (SECY)-12-0081, "Risk-Informed Regulatory Framework for New Reactors." Prior meetings on the subject were held on February 5, 2013, and March 25, 2013. As a result of the meeting on March 25, 2013 (ADAMS Accession No. ML13100A226), the participants recognized the need to further discuss the deterministic aspects of the integrated risk-informed approach and the feasibility of the relative risk approach. The meeting attendance list is included as Attachment 1. The handouts that were distributed and presented by the staff are included as Attachment 2.

The staff presented a sample decision tree to illustrate a potential approach for measuring the deterministic aspects of the integrated risk-informed approach and provided a few examples. In this conceptual approach, each of the five qualitative factors currently being considered would be assigned a rating factor while progressing through the decision tree to arrive at an overall qualitative rating of not degraded, moderately degraded, degraded, or significantly degraded. This overall qualitative rating would then be considered along with the quantitative risk rating using a significance determination table to arrive at the resultant significance/color in an integrated, structured, and predictable fashion.

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As noted during the prior meeting, industry participants indicated general support for this approach and structure, but restated that if this approach were approved by the Commission then the details in the guidance and evaluation criteria would be critical. Specifically, participants noted that defense-in-depth, safety margins, and uncertainty are difficult to define, and that having a universal understanding of what these concepts mean and how they would be applied in this context would need to be clear and objective. Industry restated its concern with potential “double-counting” in the quantitative and qualitative evaluations, specifically noting uncertainty and cross-system common cause failures as examples. Industry also restated its concern that the qualitative measures seem to only worsen the outcome of a finding, and still not enough credit was being considered to potentially improve the outcome (e.g., a low White finding based on the quantitative risk analysis that becomes Green based on some qualitative credit given). The staff noted its intent to consider these concerns when drafting the paper.

Participants noted that it is important to focus resources on the most safety significant areas as an industry, and not increase inspection resources for new plants because they have lower core damage frequency (CDF) values. Industry also recommended adding an extra rating factor, such as “minor degradation,” to capture those instances where a performance deficiency could minimally degrade defense-in-depth but not to an appreciable degree. Participants also discussed the need to ensure consistency with other on-going efforts, such as Recommendation 1 from the Near-Term Task Force Review of Insights from the Fukushima Dai-Ichi Accident and the related update to Regulatory Guide 1.174, which involve establishing an appropriate regulatory balance using defense-in-depth and risk considerations. Participants noted that this approach could work for the current fleet as well by applying current ROP thresholds in IMC 0609 Appendix A and revising Appendix M as a more structured framework for integrating qualitative considerations.

Participants then discussed the feasibility and utility of the hybrid approach to relative risk that was presented during the previous public meeting. Industry generally supported this approach if the total baseline CDF, including internal and external events (e.g., seismic, internal fires, internal flooding), is used for new reactor applications. If the total CDF were considered, the baseline CDFs for new reactors could be higher than 10^{-6} ; and since the slope changes from relative to flat at 10^{-6} , there would effectively be no change to the existing framework when applied to new reactors. Participants concluded that the hybrid approach would essentially be the “use-as-is” option and would therefore not resolve the shortcomings noted in the ROP tabletop exercises as discussed in SECY-12-0081.

Industry then discussed the problems associated with alternate risk metrics and/or thresholds that were presented in the 2009 NEI white paper. Industry noted that while many of those problems would no longer be a concern with the hybrid approach to relative risk, some would persist. Specifically, the approach for new reactors would be different from the current approach used for operating reactors, which would be difficult to explain when communicating with internal and external stakeholders. Additionally, meeting participants generally acknowledged that the fidelity of risk tools is reduced at very low values. Consequently, prolonged analysis to achieve a higher degree of confidence in outcomes could impede timely regulatory responses to performance. For all these reasons, participants favored an integrated risk-informed approach (using deterministic factors) over a relative risk approach.

Participants agreed that additional meetings were not needed to specifically discuss this topic during the development of the SECY paper, but the staff also noted its intent to provide status updates at upcoming ROP Working Group meetings. The staff noted that a meeting has been scheduled with the ACRS Subcommittee on PRA and Reliability on July 22, 2013, and that industry will be given an opportunity to present its views. This meeting will likely be followed by a Full Committee meeting on September 5 or 6, 2013, and a letter from the ACRS to advise the Commission on this matter. The staff noted its intent to provide the ACRS with a draft version of the SECY paper prior to the Subcommittee meeting and plans to make that draft paper publicly available. The staff also noted that a public meeting will be scheduled to solicit feedback and comments from industry and the public on the draft SECY paper.

Attachments:

As stated

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As stated

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DATE	5/8/2013	5/9/2013

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**APPROACH FOR RISK-INFORMING
THE ROP FOR NEW REACTORS**

April 15, 2013

Meeting Attendance

Ronald Frahm	NRC/NRR/DIRS
Rani Franovich	NRC/NRR/DIRS
Stephen Vaughn	NRC/NRR/DIRS
Eric Powell	NRC/NRO/DSRA
Donnie Harrison	NRC/NRO/DSRA
Jeff Circle	NRC/NRR/DRA
James Slider	NEI
Biff Bradley	NEI
Roy Linthicum	Exelon/PWROG
Patrick O'Regan	EPRI
Kelli Roberts	Southern Nuclear

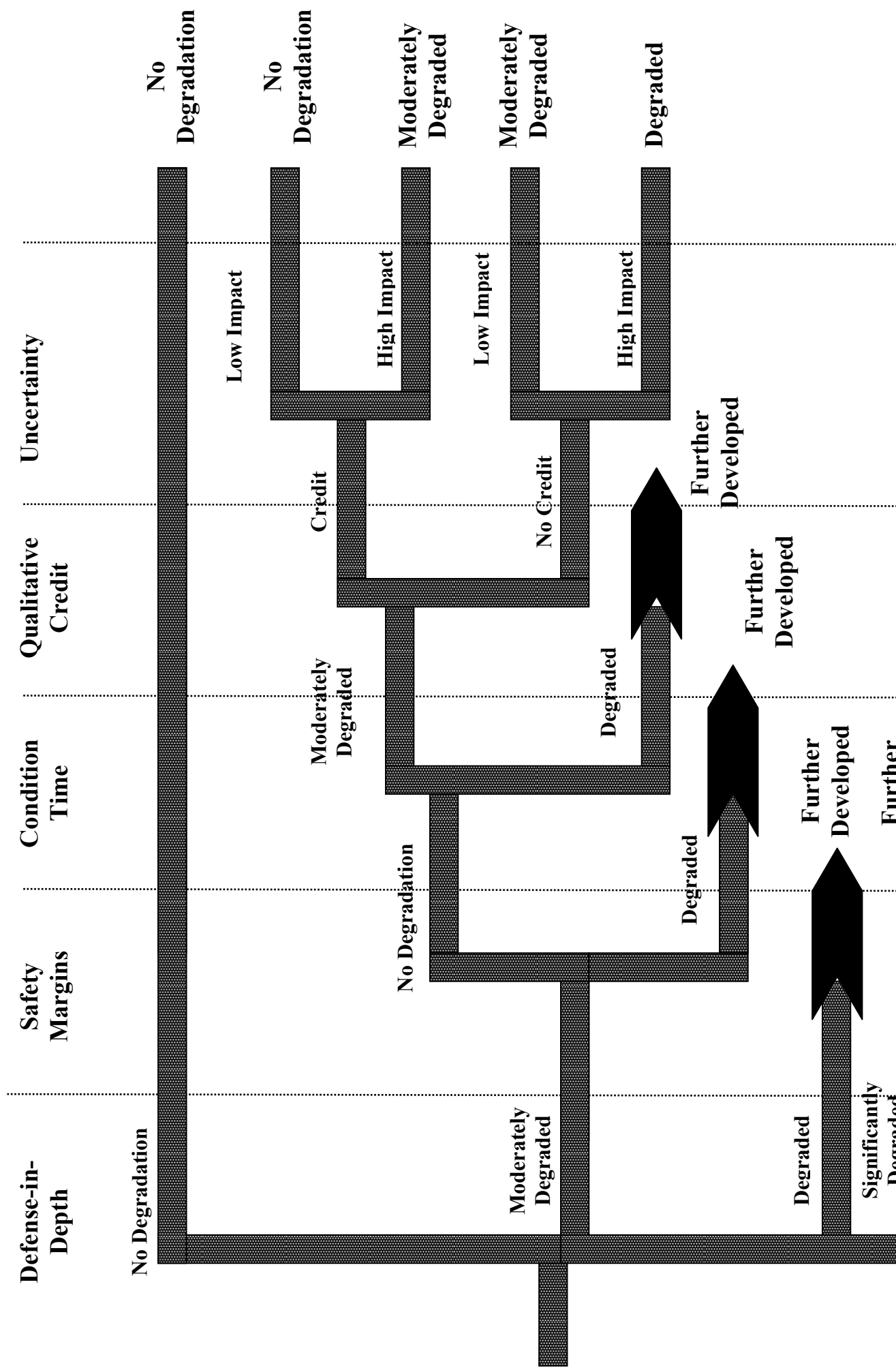
By Teleconference:

Kathi Austgen	NEI
Victoria Anderson	NEI
Cyrus Afshar	NuScale Power
Jonathon Li	GE-Hitachi
Richard Anderson	Westinghouse
Chris Carney	Southern Nuclear
Elijah Holsenbeck	Southern Nuclear
April Rice	SCANA/

Meeting Handouts

Attachment 2

SAMPLE DECISION TREE TO BE USED FOR QUALITATIVE MEASURES



Aggregate of qualitative ratings for Defense-in-Depth, Safety Margins, Condition Time, Qualitative Credit, and Uncertainty

ΔCDF (CCDP normalized to one year)	$\Delta CDF < 10^{-6}$	$10^{-6} \leq \Delta CDF < 10^{-5}$	$10^{-5} \leq \Delta CDF < 10^{-4}$	$\Delta CDF \geq 10^{-4}$
$\Delta LERF$ (CLERP normalized to one year)	$\Delta LERF < 10^{-7}$	$10^{-7} \leq \Delta LERF < 10^{-6}$	$10^{-6} \leq \Delta LERF < 10^{-5}$	$\Delta LERF \geq 10^{-5}$
Qualitative Rating				
No Degradation	Green	White	Yellow	Red
Moderately Degraded	Green	White	Yellow	Red
Degraded	White	Yellow	Red	Red
Significantly Degraded	Yellow	Red	Red	Red