

Working Group #2: Treatment of Uncertainty in Decision Making

Risk Informed Steering Committee
Meeting

April 1, 2015

Presentation Outline

- Discuss progress of Treatment of Uncertainty in Decisionmaking Working Groups (WG2)
- Briefly discuss the NRC WG review of the resulting recommendations from this effort
- Discuss suggested path-forward actions

WG2 Progress

- NEI WG submitted White Paper on recommendations for Treatment of Uncertainty in Risk-Informed Decisionmaking (RIDM)
- NRC WG provided comments and feedback on the NEI WG White Paper
- NRC prepared draft memo, briefed NRC RISC
- Session held at the NRC Regulatory Information Conference [\(RIC 2015\)](#)

NRC WG Review of NEI WG White Paper

- Recommendations were based on multiple public meetings, tabletop, and workshop insights
- NRC WG agrees with the recommendations provided in the NEI WG White Paper
- Based on this review, NRC WG drafted memo that indicates agreement, path forward
- NRC WG memo to NRC RISC will include NRC's point of view on the characterization of issues regarding treatment of uncertainty in RIDM

Overall Recommendations

1. Clarify Expectations for the Treatment of Uncertainty
2. Provide Guidance on Risk Aggregation
3. Develop Guidance on Integrating PRA Results into a Decisionmaking Framework
4. Develop Additional Guidance on Addressing Specific Challenges
5. Provide Guidance on Addressing Mitigating Strategies in RIDM
6. Conduct Annual Industry-NRC meetings on RIDM
7. Provide Education for Practitioners on Current Guidance
8. Provide a Training Course on RIDM and the Role of Uncertainty

#1: Clarify Expectations for the Treatment of Uncertainty

- Perform “pilot” of NUREG-1855, Revision 1, *“Guidance on the Treatment of Uncertainties Associated with PRAs in Risk-Informed Decision Making.”*
- Based on the NUREG-1855, Revision 1, “pilot,” consider additional enhancements and modifications
- NRC WG recommends considering how to incorporate some of the main guidance from NUREG-1855, Revision 1, into Regulatory Guide 1.174, *“An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis.”*
- NRC WG, which is comprised of staff from licensing, oversight, and research, recognizes that this guidance should be propagated through other NRC documents.

#2: Provide Guidance on Risk Aggregation

- Consideration of multiple hazards and their aggregated results within PRA was deemed to need guidance in the NEI White Paper
- The NRC WG recommends consideration of additional activities evaluating both the technical and regulatory aspects of “Risk Aggregation.”
 - Technical aspects: consideration of the technical acceptability and completeness of the information
 - Regulatory aspects: RIDM when “risk aggregation” challenges NRC’s subsidiary safety goals or other associated application-specific acceptance guidelines.
- NRC WG recommends further technical coordination with Industry in this area as well as consideration of regulatory implications.

#3: Develop Guidance on Integrating PRA Results into a Decisionmaking Framework

- The NEI White Paper includes overarching recommendation to integrate the PRA results in RIDM and points to several existing documents
- NRC WG agrees current guidance should be as consistent as possible, recognizing different applications
 - Language and terminology
 - Guidance from NUREG-1855 into other regulatory documents
- NRC WG recommends NRC RISC provide direction for coordination on NUREG-1855 with various RIDM documents and other recommendations from WG2

#4: Develop Additional Guidance on Addressing Specific Challenges

- Implementation of RIDM when faced with very large, irreducible uncertainties
- Both WGs recognized challenge in the treatment of the uncertainties associated with external hazards
- NRC WG recommends support for
 - On-going efforts to enhance current guidance based on the output of research activities (e.g., external flood) with engagement from industry technical experts
 - Enhance understanding of other external hazards and events
- Efforts should be directed at enhancing other recommendations (i.e., integration, risk aggregation)

#5: Provide Guidance on Addressing Mitigating Strategies (MS) in RIDM

- Wider topic of the treatment of MS in PRA should be pursued by RISC
- WGs recognized that uncertainty may play a significant role in crediting plant-specific MS in PRAs
- NRC WG noted that on-going efforts exist (e.g., development of guidance on Significance Determination Process evaluations for MS)
- NRC WG suggests that a focused effort be initiated to address this topic, with engagement of industry technical experts

#6: Conduct Annual Industry-NRC meetings on RIDM

- NEI WG recommends annual Industry-NRC meeting
- NRC WG agrees with recommendation and recommends initiation of activities on this item

#7: Provide Education for Practitioners on Current Guidance

- NEI WG recommends a joint NRC-Industry workshop on NUREG-1855, Revision 1
- NRC WG agrees with recommendation and recommends initiation of activities on this item

#8: Provide a Training Course on RIDM and the Role of Uncertainty

- Communication and training activities were discussed as part of the objectives of WGs.
- Brief evaluation by NRC WG indicates internal training exists but it is usually geared towards providing:
 - detailed technical information for risk practitioners, or
 - a brief overview of PRA concepts for non-practitioners
- NRC WG recommends further evaluation with respect to enhancing communication between practitioners and non-practitioners
 - Internal training
 - On-going periodic training between NRC and industry

Additional NRC WG Comments on the NEI White Paper

- Despite recommendations, the NRC has the ability to make sound risk-informed decisions, while recognizing the various uncertainties in PRA.
- As part of WG2, several references were reviewed indicating significant present and past efforts.
- Discussion of conservatism and biases should continue, but that PRAs should not be viewed a priori as inherently conservative, immature, or biased.
- RIDM framework has yielded significant benefits in NRC regulatory actions and focus should be on enhanced technical adequacy, appropriate uncertainty treatment

Path Forward

- NRC RISC to consider NRC WG memo, support for NRC-based activities (e.g., updating regulatory guidance), including significant on-going efforts, additional efforts and further interactions with industry
- Subcommittee briefing to Advisory Committee on Reactor Safeguards (ACRS) on May 6, 2015
- Implementation of NRC-based recommendations (short-term and long-term) via responsible program offices and sunset of RISC WG2