



RIC 2010 Reliance on Probabilistic Risk Assessment Peer Reviews

Donnie Harrison
NRR/DRA/APLA
March 11, 2010

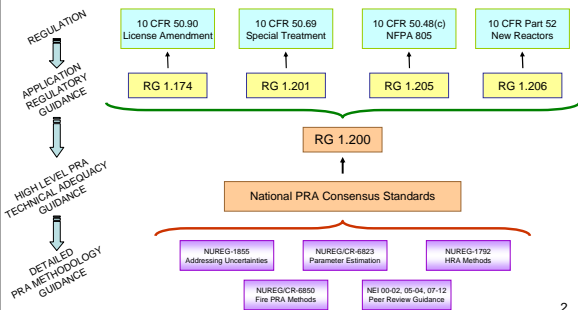


PRA Standards Versus PRA Guidance

- PRA Standard addresses the technical adequacy of the elements of a PRA
 - The standard establishes requirements for *what* constitutes a technically adequate PRA
- PRA Guidance describe *how* to develop or perform the elements of a PRA
- PRA Guidance describe how to develop or perform the elements of a PRA
 - Data Handbook
 - HRA Good Practices
 - Fire PRA Methods
 - Uncertainty Guidance
- Regulatory Guide (RG) 1.200 endorses, with exceptions and clarifications, the ASME/ANS PRA Standards and associated industry peer review guidance



PRA Infrastructure









Objective of PRA Standard

- The Standard “sets forth the requirements for PRAs used to support risk-informed decisions . . . and prescribes a method for applying these requirements for specific applications.”
- Given the above objective, the standard establishes
 - the technical requirements for a base PRA independent of a specific application
 - the requirements for a process to determine the needed scope, level of detail, plant specificity, and realism of base PRA for a specific application
 - the requirements for a PRA configuration control process to ensure that the base PRA represents the as-built and as-operated plant
 - the requirements for a peer review addressing the review process, team qualifications, and documentation

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Why Use a PRA Standard?

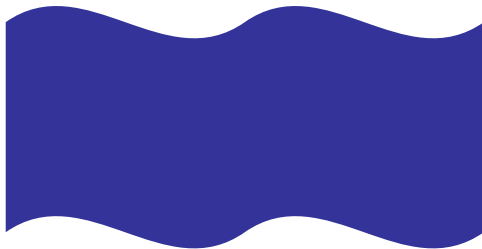
- Acceptability  To ensure the PRA insights and results are sufficiently adequate to be used in decisionmaking
- Consistency  To provide consistent understanding regarding the development of a PRA model
- Transparency  To enable independent understanding of the PRA model and its results
- Cost-Effectiveness  To encourage risk-informed decisionmaking to enhance regulatory and licensee processes and practices

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Without a PRA Standard


- Determination of Acceptable Quality for an Application Can Vary



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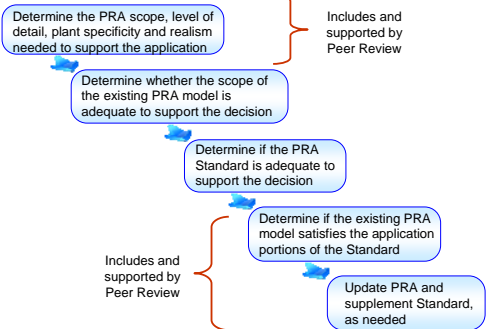
US NRC *Protecting People and the Environment* With a PRA Standard

- Determination of Acceptable Quality for an Application is Stabilized and Clarified



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US NRC *Protecting People and the Environment* Risk-Informed Application Process



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US NRC *Protecting People and the Environment* PRA Standard Peer Review Requirements

- Review Process Requirements** → A written process that defines the objective and purpose and provides the review approach
- Review Frequency Requirements** → Only a single complete peer review is necessary prior to using a PRA unless the PRA is upgraded
- Team Composition and Qualification Requirements** → Personnel with the expertise to assess all PRA Elements and have the collective knowledge of the plant design and operation
- Review Element Requirements** → The reviewer to determine the specific scope and depth of the review of each PRA element
- Documentation Requirements** → Sufficient documentation to demonstrate that the review process appropriately implemented the review requirements, and documentation of the peer review results

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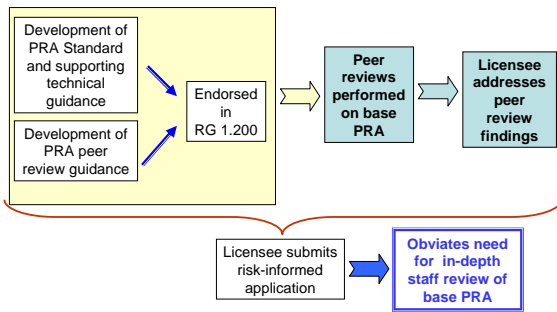
Benefits of Peer Review

- Overall enhancement of all licensee PRAs
- Overall consistency in industry approaches
- Enhancements in PRA staff knowledge and experience
- Enhancements in documentation
- Confidence in the PRA can increase its use in design and operational decisions
- Obviates the need for an in-depth review of the base PRA by the NRC reviewers
 - NRC focuses on the licensee's resolution of peer review findings as they impact the specific application and on the risk impacts of the specific application (more efficient use of resources)

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A Goal of PRA Standards, Peer Review, and RG 1.200



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Background on PRA Quality Expectations and Peer Reviews

December 2003

- Commission issued SRM COMNJD-03-0002, *PRA Quality Expectations and Requirements*
 - Approved implementation of a phased approach to achieving an appropriate quality (i.e., technical adequacy) for PRAs for NRC risk-informed regulatory decisionmaking

July 2004

- Staff issued SECY-04-0118, *Plan for the Implementation of the Commission's Phased Approach to Probabilistic Risk Assessment Quality*
 - Staff proposed that a licensee's application be rejected if the licensee's PRA did not address the available and NRC-endorsed PRA standards and regulatory guidance needed for that specific application

October 2004

- Commission approved the staff plan and the recommended staff positions

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Background on PRA Quality Expectations and Peer Reviews

March 2007

- NRC issued Regulatory Issue Summary (RIS) 2007-06, *Regulatory Guide 1.200 Implementation*
 - Informed licensees of how the NRC will implement its technical adequacy review of plant-specific PRAs used to support risk-informed licensing actions
 - Limited-scope applications are allowed a one-year implementation period
 - Implementation period allows additional time for licensees to:
 - Develop or revise their PRA
 - Perform self-assessments and any necessary peer reviews
 - Address any findings of these reviews and previous reviews
 - Broad-scope risk-informed applications are expected to meet the endorsed standard at the time of their application

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Regulatory Guide 1.200, Revision 2 Expectations

March 2009

- Staff issued Revision 2 of RG 1.200, *An Approach for Determining the Technical Adequacy of Probabilistic Risk Assessment Results for Risk-Informed Activities*
 - Provides NRC endorsement, with qualifications and modifications, of ASME/ANS RA-Sb-2009, *Standard for Level 1/Large Early Release Frequency Probabilistic Risk Assessment for Nuclear Power Plant Applications*.
 - Licensees can use RG to demonstrate the technical adequacy of a PRA used in a risk-informed licensing action
 - Standard substantially expands the scope of the initiating events addressed, including internal fire, seismic, wind, external flood and other external events
- Regulatory Guide 1.200, Revision 2
 - Issued March 2009
 - Effective implementation date April 2010

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Regulatory Guide 1.200, Revision 2 Implementation

- The staff will review risk-informed applications using RG 1.200, Revision 2, consistent with the Commission's guidance on PRA quality (COMNJD-03-0002 and SECY-04-0118) and RIS 2007-06
- Starting in April 2010, all risk-informed applications are expected to conform with ASME/ANS RA-Sb-2009, as endorsed by RG 1.200, Revision 2, as appropriate for the application
 - All significant contributors to the decision (either important to the delta or total risk calculation) are expected to be evaluated using appropriate PRA methods conforming with the NRC-endorsed PRA standards
 - Valid bounding approaches can be used to address the risk contributors not modeled in the licensee's PRA analyses
 - Licensees may be able to reduce or limit the scope of their requested licensing action to reduce the significance of specific contributors so that the licensee's PRA is adequate for the application
 - Licensee-proposed compensatory measures and actions can be used to address uncertainties and limitations in the PRA modeling, but cannot be used as a substitute for modeling in the PRA the contributors that are significant to the risk-informed decision

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Regulatory Guide 1.200,
Rev 2 Implementation
(cont'd)

- Also starting in April 2010, all risk-informed applications are expected to conform with NEI 00-02, 05-04, and 07-12, as endorsed by RG 1.200, Revision 2; for example,
 - The peer reviews assess the appropriateness of the assumptions
 - The peer review scope includes the topics provided in the standard for each technical element
 - If self-assessment is used, it is to the current standard
- The staff will reject risk-informed applications not consistent with the above expectations

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Peer Reviews and
Licensee Implementation

- PRA quality determination closely tied to industry peer review
- PRA usability impacted by long-standing unresolved peer review findings
- PRA documentation issues (D F&Os) are important and need to be fixed
- Peer reviews of new PRA Standard hazard groups (fire, seismic, low power/shutdown) need NRC observation to gain appreciation and confidence in peer review implementation

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Summary

- Peer reviews are an important and vital part of determining PRA quality for risk-informed applications
- Peer reviews provide benefits beyond just determining the quality of a licensee's PRA
- Peer reviews obviate the need for an in-depth review of the base PRA by the NRC – focusing the NRC review on the risk impacts of the specific application
- To gain the full benefits of the peer review, licensees need to pro-actively address peer review findings, including documentation issues
- For the NRC to gain further appreciation and confidence in peer review implementation need NRC observations of peer reviews of the newly included hazard groups

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