



Staff Recommendations Regarding a Risk Management Regulatory Framework:

Implementation Details on Option 2 – Alternative Risk- Informed Licensing Basis

Public Meeting

July 29, 2015

Background

- NRC white paper (ML15107A402) released on May 6, 2015
- Discussed 3 options to increase use of risk information for power reactor safety
 - Option 1 – Maintain Current Regulatory Framework
 - Option 2 – Establish a Risk-Informed Alternative Licensing Basis
 - Option 3 – Establish a Plant Specific Risk Management Regulatory Framework
- *Federal Register* notice (80 FR 27191) published on May 12, 2015
 - www.regulations.gov Docket ID NRC-2013-0254
 - Comment period ended June 11, 2015

Option 2 – Risk-Informed Alternative Licensing Basis

- In public meetings on May 27, 2015 and June 8, 2015, industry representatives stated that:
 - Without additional details of how the Option 2 process would work, it is very difficult to assess safety benefits and costs
 - NRC should not present its recommendations to the Commission without having developed more details regarding how the processes would work
- Staff has worked to develop additional details associated with Option 2
- Additional thoughts/description are provided in Attachment to the meeting notice for this meeting
- Re-opened public comment period (www.regulations.gov)
- Purpose of today's meeting is to:
 - Expand on concepts originally envisioned for Option 2
 - Obtain stakeholder feedback on further development of these concepts

RMRF Options for Power Reactors

- Staff originally considered a wide range of possibilities for risk-informed regulation
 - Incremental – continue to expand use of PRA under the current regulatory framework (Option 1)
 - Modest step change – implement Option 2 (or similar) from draft “white paper”
 - Wholesale change – implement NUREG-2150 concept in full (Option 3 from draft “white paper”)
- Stakeholder feedback from public meetings indicated that more details were necessary on Option 2.

Option 2: Risk-Informed Alternative Licensing Basis

- Implemented by rule
- Alternative – Licensees may elect to adopt or not
- Requires a “suitable” PRA model
 - Provide plant-specific risk insights
 - Allow risk informing of certain accidents and transients included in their licensing basis
 - Mitigate risk-significant events and/or accident sequences
- *Need more detail to inform external stakeholders (purpose of this presentation)*

Benefits of Option 2

- Focus resources (NRC and licensee) on safety significant issues
 - Increase safety by mitigating plant-specific vulnerabilities
- Reduce burden (some non-risk significant portions of the licensing basis may be removed)
- Increase resource efficiency
 - Licensees may be able to expand self-approval of some changes
 - Risk-informed amendments would not require review of the base PRA (already reviewed)
- Increase operational flexibility for licensees (e.g., risk-managed Technical Specifications)

Desirable Features of the Implementing Regulation

- Be performance based
- Allow risk-informed amendments to the license without the need for an exemption
- Have objective acceptance criteria for risk, defense-in-depth, and safety margins
- Allow licensees to fully achieve the benefits of burden reduction commensurate with risk significance
- Require licensees to address discovered vulnerabilities without need for NRC backfit

Possible Rule Content

- Scope – Rule would specify regulations and aspects of the licensing basis that may be risk-informed
- For each item in the scope:
 - Appropriate PRA scope, level of detail, and technical adequacy
 - Appropriate risk metrics, defense-in-depth elements, and safety margins
 - Acceptance criteria for risk, defense-in-depth, and safety margin

Possible Rule Content (cont.)

- Definition of “vulnerability” (in terms of risk, defense-in-depth, or safety margin) and the criteria for:
 - Identifying vulnerabilities
 - Adding an event or accident related to identified vulnerabilities to the plant’s licensing basis
 - Determining what action (e.g., analysis, plant modification, procedure change, etc.) should be taken to address the vulnerability
 - Determining the pedigree of the engineering analysis and the treatment requirements for SSCs that prevent or mitigate the consequences of the events or accidents related to the vulnerability

Possible Rule Content (cont.)

- The criteria for self-approval of changes to the licensing basis (a risk-informed 50.59; possible risk-informed definition of OPERABILITY)
- PRA update periodicity
- Corrective action and reporting requirements

Stakeholder Input

- Questions?
- Comments?

Thoughts on “Suitable” PRA

- Lessons learned from major risk-informed applications (e.g., NFPA-805) requires new approaches to address PRA suitability (scope, level of detail, and technical adequacy)
- Separate NRC and Industry Risk Informed Steering Committee (RISC) working groups (WG) on PRA Technical Adequacy
- Potential scope of plant changes under Option 2 may require more robust approach than current process

Items for Consideration

- Peer review is an audit or sampling approach; it cannot review the entire PRA
- PRA methods are not standardized
- Different analysts can obtain different risk numbers for identical plant designs
- There is no standard qualification process or knowledge requirements for PRA practitioners
- Focus on peer review tends to mask the PRA Standard requirement for “process check”

Potential Approach: PRA “Certification”

Note: for discussion purposes only; not an approved NRC position

- Performed by an independent body that could include NRC participation
- Must:
 - Be in-depth
 - Cover the entire model
 - Ensure that acceptable methods are employed
 - Ensure satisfactory resolution of the review findings
- Outcome: a “certified” PRA model
 - Licensees could use to make licensing decisions with much less NRC review than at present
 - Risk-informed license amendments
 - As-found compliance issues

Potential Approach (cont.)

Note: for discussion purposes only; not an approved NRC position

- Create a national PRA certification authority
 - Similar to Underwriter's Laboratory concept
 - Could be part of INPO, EPRI, NRC, or other organization
- The PRA certification authority could have the following major roles:
 - Certification of PRA practitioners (similar to PE)
 - Specification of "acceptable methods"
 - Determination and documentation of PRA model quality
 - (Optional) Determination of the adequacy of modeling of application of the PRA model
- NRC would still have to accept the final model

Key Features

- Objective means of judging PRA suitability
- Improved efficiency of NRC staff review
- Better consistency of PRA model results across plants
- No outstanding findings (must be fixed and re-reviewed before model is certified)
- Formal qualification and certification of practitioners
- Certified PRA model could be used for all regulatory applications (licensing & oversight)
- Supports Commission's PRA Policy Statement and Phased Approach to PRA Quality (under the current regulatory framework)

Discussion & Feedback

- The NRC staff is interested in hearing from stakeholders on the “certified PRA” concept
 - Pros and cons
 - Unintended consequences?
 - Industry interest?

Stakeholder Input

- Industry/Nuclear Energy Institute comments
- Union of Concerned Scientists comments

Stakeholder Input

Members of the Public:

- Questions?
- Comments?

Path Forward on RMRF

- Continue to accept public comments on Option 2 until August 17, 2015
 - www.regulations.gov ; Docket NRC-2013-0254
- Review public comments/stakeholder feedback
- Decide which options should be presented to Commission in SECY paper
- Finalize RMRF SECY paper
- Meet with ACRS subcommittee (Oct.) and full committee (Nov.)
- Provide final SECY paper to Commission by December 18, 2015