

Clarifications to PRA Information to Support Design Certification and Combined License Applications

Division of Safety Systems and Risk Assessment
Office of New Reactors

July 2007

Outline

- Clarifications to RG 1.206 and SRP Section 19.0
- Applicable regulations
- Uses of the PRA
- Recent NEI Comments
 - Areas of Agreement
 - Items Under Discussion

Clarifications

- The staff is considering how to make clarifications to RG 1.206 and SRP Section 19.0 concerning PRA information to support DC and COL applications:
 - Formal revision of RG 1.206 and SRP Section 19.0,
 - Regulatory Information Summary (RIS), or
 - Letter to NEI and prospective DC and COL applicants
- The staff and industry should prioritize the resolution of the comments

Applicable Regulations (1 of 3)

- Design Certifications:
 - 10 CFR 52.47(a)(27) - The FSAR must contain "...a description of the design-specific probabilistic risk assessment (PRA) and its results."
- Combined Licenses:
 - 10 CFR 52.79(a)(46) - The FSAR must contain "...a description of the plant-specific probabilistic risk assessment (PRA) and its results."

Applicable Regulations (2 of 3)

- If the COL application references a standard design approval, then:
 - 10 CFR 52.79(c)(1) - The plant-specific PRA information must use the PRA information for the design approval and must be updated to account for site-specific design information and any design changes or departures.
- If the COL application references a standard design certification, then:
 - 10 CFR 52.79(d)(1) - The plant-specific PRA information must use the PRA information for the design certification and must be updated to account for site-specific design information and any design changes or departures.
- If the COL application references the use of one or more manufactured nuclear power reactors licensed under subpart F of this part, then:
 - 10 CFR 52.79(e)(1) - The plant-specific PRA information must use the PRA information for the manufactured reactor and must be updated to account for site-specific design information and any design changes or departures.

Applicable Regulations (3 of 3)

- For COL holders: PRA maintenance and upgrading
 - 10 CFR 50.71(h)(1) - No later than the scheduled date for initial loading of fuel, each holder of a combined license under subpart C of 10 CFR part 52 shall develop a level 1 and a level 2 probabilistic risk assessment (PRA). The PRA must cover those initiating events and modes for which NRC-endorsed consensus standards on PRA exist one year prior to the scheduled date for initial loading of fuel.
 - 10 CFR 50.71(h)(2) - Each holder of a combined license shall maintain and upgrade the PRA required by paragraph (h)(1) of this section. The upgraded PRA must cover initiating events and modes of operation contained in NRC-endorsed consensus standards on PRA in effect one year prior to each required upgrade. The PRA must be upgraded every four years until the permanent cessation of operations under § 52.110(a).
 - 10 CFR 50.71(h)(3) - Each holder of a combined license shall, no later than the date on which the licensee submits an application for a renewed license, upgrade the PRA required by (h)(1) to cover all modes and all initiating events.

Uses of the PRA

- The applicant's PRA and severe accident evaluation are used as follows:
 - During the design phase to identify and address vulnerabilities, reduce risk contributors, select among design alternatives
 - Identify risk-informed safety insights
 - Demonstrate how risk compares to the Commission's goals
 - Assess the balance between accident prevention and mitigation
 - Demonstrate that the plant design represents a reduction in risk compared to existing operating plants
 - Demonstrate that the design addresses the TMI-related requirements in 10 CFR 50.34(f)
- PRA results and insights are used to support other programs:
 - RTNSS
 - Regulatory oversight processes (MSPI, SDP, TS, MR, etc.)
 - ITAACS, RAP, COL Action Items, etc.

Recent NEI Comments

- Following the public meeting on July 19, 2007, NEI provided some comments via email on RG 1.206 and SRP Section 19.0
- Staff response:
 - The staff believes that it understands all comments
 - The staff agrees with some comments, but disagrees with others

Areas of Agreement (1 of 7)

- Format and content of FSAR Chapter 19
 - Use of the format in Appendix A of Section C.I.19 to RG 1.206 is optional; COL applicants may (and, in some cases, must) follow the format of the generic DCD
 - However, the content of applications should include all items identified in Appendix A
 - The staff will develop a cross-reference table that maps Appendix A to each format used for specific plant types (e.g., ABWR, AP1000, etc.), which will be used to guide its acceptance review

Areas of Agreement (2 of 7)

- Seismic and fire PRAs
 - Until the time when consensus standards are developed and endorsed by the staff, COL applicants may continue to use the methods used in the DC PRA for evaluating seismic and fire risks
 - However, once consensus standards are developed and endorsed by the staff, the staff expects that DC applicants, COL applicants, and COL holders will follow these standards

Areas of Agreement (3 of 7)

- Applicability of 10 CFR 50, Appendix B to the PRA
 - 10 CFR 50, Appendix B does not apply to DC or COL PRAs
 - However, the staff expects the applicant to subject its PRA to quality control:
 - Use qualified personnel
 - Use procedures that ensure control of documentation, including revisions, and provide for independent review, verification, or checking of calculations and information
 - Documentation and maintenance of records, including archival documentation as well as submittal documentation
 - Use of procedures that ensure appropriate attention and corrective actions are taken if assumptions, analyses, or information used previously are changed or determined to be in error
 - The staff will clarify its guidance in Section C.I.19 of RG 1.206

Areas of Agreement (4 of 7)

- Applicability of Tier 2 change process
 - Changes affecting Chapter 19 of the FSAR that do not involve changes to other Tier 2 information are not subject to the Tier 2 (50.59-like) process
- Screening process for PRA maintenance
 - FSAR updates specified in 10 CFR 50.71 are “snapshots” of the PRA
 - Chapter 19 of the FSAR should describe that a screening process will be used to determine if a plant modification may be deferred or not incorporated during the next scheduled PRA maintenance update, or should be incorporated into the PRA as soon as practicable.
 - Applicants need to explain what is meant by “as soon as practicable,” considering the actual and anticipated uses of the PRA, e.g.:
 - Uses of the PRA during construction (annual FSAR updates) vs. uses during plant operation
 - Supporting risk-informed license amendment requests
 - Satisfying the 10 CFR 50.65(a)(4) requirement for configuration risk management

Areas of Agreement (5 of 7)

- PRA technical adequacy
 - In accordance with RG 1.200 and the ASME PRA Standard, applicants should decide for themselves the appropriate PRA Capability Category for a DC or COL PRA, considering the actual and anticipated uses of the PRA
 - The staff generally concurs that Capability Category I is adequate for the uses of the PRA listed in Section C.I.19.2 of RG 1.206

Areas of Agreement (6 of 7)

- One-year grace period for PRA upgrades
 - The Statement of Considerations to the revised Part 52 indicates that the one-year period was selected because the COL holder chooses the date of initial fuel loading, and thus is in a position to determine when the “one-year prior” requirements comes into effect.
 - Options for getting relief from the one-year period include:
 - Petitioning the Commission to change 10 CFR 50.71(h)
 - Seeking an exemption from 10 CFR 50.71(h)

Areas of Agreement (7 of 7)

- The NRC has not issued a formal definition of LRF; however, there are several working definitions that may be suitable:
 - EPRI PSA Applications Guide
 - Appendix A to NUREG-6595, Rev. 1
 - Use the total release frequency (i.e., include any sequence which does not result in an intact containment)
- COL applicants should use the definition of “large release” used to develop the DC PRAs
- The staff is considering ways to reconcile the use of LRF for Part 52 licensing and the use of LERF for risk-informed license amendment requests in RG 1.174
 - Need interaction with the ACRS and, possibly, the Commission

Items Under Discussion (1 of 2)

- When does the holder need to commence PRA maintenance and upgrade?
- How to clarify the relationship among the PRA scope, the generic DCD, and NRC-endorsed consensus standards?
- What, if any, PRA quantitative results need to be included in the FSAR?
- Should the staff use RAIs and onsite audits to “routinely” obtain information about the PRA?

Items Under Discussion (2 of 2)

- When is it necessary to provide plant-specific PRA information in Chapter 19 of the FSAR (meaning of the phrase “significant change” in C.III.1, Chapter 19)?
- Should the SAMDA evaluation be presented in the FSAR or the ER?
- What is meant by “inputs to regulatory oversight processes?”