



United States Nuclear Regulatory Commission

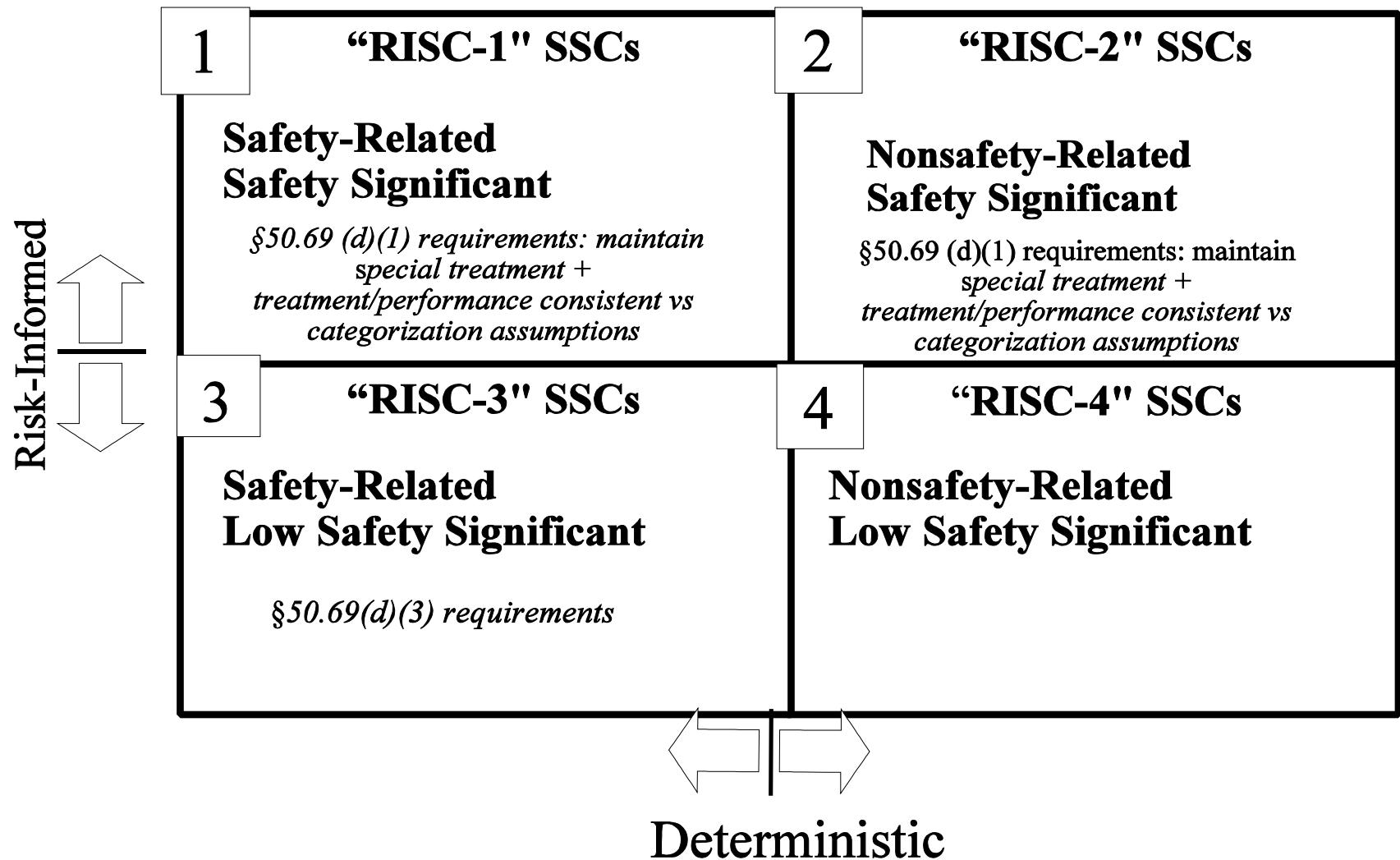
Risk-Informing the Special Treatment Requirements of the NRC Regulations

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Background

- The NRC is currently working on a draft rule, 10 CFR 50.69, for the risk-informing of special treatment requirements
- Under this rule, licensees would be allowed to adjust the treatment applied to plant SSCs based on their safety significance while still providing assurance that the SSCs will perform their design functions.



Requirements of the PSA

- **PSA scope:** Internal events, full power PSA is required. Capable of quantifying CDF and LERF. External events and low-power and shutdown modes of operation shall also be considered, either by PSA modeling or by the integrated decision-making process.
- **Technical adequacy of the PSA:** PSA must reasonably represent the current configuration and operating practices at the plant. Sufficient technical quality to represent a coherent and integrated model with sufficient detail to support SSC categorization. PSA should be peer reviewed against a standard or set of criteria that is endorsed by the NRC.
- **PSA updates:** The PSA should be updated on a periodic basis. These updates are mandatory prior to implementation of changes to plant design or procedures if these changes affect the categorization of SSCs.

Determination Safety Significance of SSCs Using the PSA

- Safety significance of SSCs modeled in the PSA should be determined using methods such as PSA importance measures. Results of these evaluations will be one input to the integrated decision-making panel (IDP).
- Safety significance should be based on both CDF and LERF.
- The sensitivity of the safety significance of an SSC to uncertainties in the parameter values for component availability/reliability and human error probabilities should be evaluated and provided to the IDP for deliberation.

SSC Categorization by the Integrated Decision-Making Panel

- Safety significance of SSCs must be determined using an integrated decision-making process. Categorization of SSCs should consider: insights from the PSA; engineering and traditional analyses; and the defense-in-depth philosophy.
- For each safety related SSC categorized as of potentially low safety significance by the PSA, the IDP must justify low safety significance
 - SSC implicitly modeled (or implicitly taken credit for) in the PSA
 - Initiating events and plant operating modes not modeled in the PSA
 - Defense in depth
 - Common cause failures and active degradation mechanisms

Requirements of the Integrated Decision-Making Panel

- Panel shall be staffed with expert, plant-knowledgeable members whose expertise includes PSA, safety analyses, plant operation, design engineering, and system engineering.
- A structured and systematic process using documented criteria shall be used to guide the decision-making process.
- The SSC categorization and IDP process will be submitted to the NRC for review and approval.

Evaluation of the Change in Risk

- The effects of treatment on the capability and reliability of RISC-3 SSCs should be characterized.
- Based on this characterization, the change in risk from reclassifying SSCs should be evaluated.
- Allowed changes to CDF and LERF must be small (in accordance with guidelines in Reg Guide 1.174).
- If PSA models are not available for an external initiating event or plant operating mode, the IDP should provide justification, on the basis of bounding analyses or qualitative considerations, that the risk will not be significantly impacted.

Treatment Requirements

- For RISC-1 and RISC-2 SSCs: maintain current regulatory requirements. Requirements are added to these SSCs to keep their performance consistent with the performance that formed the basis for the categorization process.
- For RISC-3 SSCs: must maintain functionality. Proposed rule contains high level requirements with respect to design control, procurement; maintenance, inspection, test and surveillance; and corrective action. Alternative treatment requirements will allow more flexibility by licensees in treating RISC-3 SSCs.

Monitoring

- Monitoring should be performed so that indication of SSC degradation can be obtained, and corrective actions can be implemented. SSC performance should be consistent with the level of performance allocated in the risk analysis or credited in the IDP process.
- Results of the monitoring program should also be incorporated into the PSA update process.

NRC and Industry Activities

- August 2001 - NRC granted exemptions from special treatment requirements for low safety significant SSCs for STP - Proof of Concept.
- NEI 00-04, “Option 2 Implementation Guideline”: Staff has reviewed and commented on early versions of document. NEI to submit revised version by end of June 2002. Staff has observed pilot activities involving the integrated decision-making panel process at four sites.
- NEI 00-02, “Probabilistic Risk Assessment Peer Review Process Guidance”: Based on review of NEI 00-02 and NEI 00-04, NRC has drafted guidance for a focused-scope staff review of PRA results used in the 50.69 categorization process

Recent and Upcoming Rulemaking Activities

- September, 2001 - conceptual rule language published.
- Nov. 2001, Jan. 2002 and Feb. 2002 - public meetings to discuss rule language and concepts.
- April 2002 - revised version of rule language published.
- September 2002 - Proposed 50.69 rule package for public comment. Package will include: draft rule language, technical basis for the rule, Reg Guide for implementation of the rule including NRC comments on industry's guidance documents NEI 00-02 and NEI 00-04.