



Plans for Increasing NRC Staff Capabilities to Use Risk Information in Decision-Making Activities

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NRC Has a Longstanding Commitment to Increasing the Use of Risk Informed Decision-Making (RIDM)

- PRA Implementation Plan, 1994
- Risk-Informed Regulation Implementation Plan, 2000
- Risk-Informed and Performance-Based Plan, 2006 – Present
- Risk Management Regulatory Framework, 2012

→ Current Approach



Significant Progress Has Been Made but Cultural, Process, and Technical Challenges Still Remain

1. Staff members have varying degrees of awareness, knowledge, and support for RIDM processes and applications.
2. The staff is working to more fully integrate reviews to include complementary insights from traditional engineering and risk assessment approaches.

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Challenges Cont.

3. Guidance for reviewing formal "risk-informed" submittals is well established. Guidance for the use of risk insights in other types of licensing reviews could be enhanced.

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    graph TD
      A[1. Change meets current regulations unless it is explicitly related to a requested exemption or rule change.] --> B[Integrated Decisionmaking RG 1.174]
      C[2. Change is consistent with defense-in-depth DiD philosophy.] --> B
      D[3. Maintain sufficient safety margins.] --> B
      E[4. Proposed increases in CDF or risk are small and are consistent with the Commission's Safety Goal Policy Statement.] --> B
      F[5. Use performance measurement strategies to monitor the change.] --> B
  
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Challenges Cont.

4. Licensee probabilistic risk assessments (PRAs) have varying levels of maturity limiting generic applicability of risk-informed initiatives.

*Are models across the fleet peer-reviewed?**

Event Type	Yes (%)	No (%)
Internal Events	90%	10%
Internal Flooding	93%	7%
Internal Fire	63%	37%
Seismic, High Winds, or External Flooding	46%	54%

*Source: 2013 letter from NEI to NRC (ADAMS Accession No. ML133548997)

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Challenges Cont.

4. Licensee probabilistic risk assessments (PRAs) have varying levels of maturity limiting generic applicability of risk-informed initiatives.

Level of PRA Acceptability Depends on the Application

Acceptability Required scope, level of detail, technical elements, and plant representation

- 4b, Risk-Informed Completion Times
- NFPA-805, Risk-Informed Fire Protection
- 50.69 SSC Categorization
- 5b, Risk-Informed Surveillance Frequencies
- Risk-Informed Inservice Inspection

- Greater reliance on PRA
- More flexibility for licensee
- More complex staff review

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Challenges Cont.

- Unrealistic PRA modeling assumptions can mask or change high-risk contributors leading to over or underestimates of total risk thereby potentially affecting operational flexibility.
- Aggregated quantitative risk values can approach risk acceptance guidelines.

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NRC Has a Cross-Cutting Approach to Overcome Challenges

- Evaluate and Update Guidance
- Develop a Graded Approach for Using Risk Information in Licensing Reviews
- Enhance Mandatory Training Requirements Related to RIDM for Managers and Staff
- Advance Risk-Informed Initiatives
- Enhance Communication on Risk-Informed Activities

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NRC Has a Cross-Cutting Approach to Overcome Challenges

Challenge \ Strategy	Strategy I Evaluate and Update Guidance	Strategy II Develop Graded Approach	Strategy III Enhance Staff Training	Strategy IV Advance Risk Initiatives	Strategy V Increase Commun.
1. Knowledge and Support	X		X		X
2. Review Integration	X	X	X		X
3. Guidance Development	X	X	X		X
4. PRA Acceptability				X	X
5. PRA Realism	X			X	X
6. Risk Aggregation	X			X	X

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A 'Living' RIDM Action Plan Provides a Framework for Implementing Strategies

- Expand use of review teams with risk analysts and technical staff
- Broaden understanding of risk and risk insights
- Apply a graded approach for using risk information in licensing reviews
- Address RIDM related recommendations from an NRC differing professional opinion panel report
 - Evaluate guidance
 - Evaluate use of internal risk-informed tools
- Evaluate the use of LERF in various regulatory applications

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Action Plan Cont.

NRC RIDM Mission
 Enhance the integration of risk information into the organization's decision making practices and processes to improve the technical basis for regulatory activities, increase efficiency, and improve effectiveness

Policy Paper Strategies

- Strategy I: Evaluate/Update Guidance
- Strategy II: Develop Graded Approach
- Strategy III: Enhance Mandatory Training
- Strategy IV: Advance Risk-informed Initiatives
- Strategy V: Enhance Communication

Tasks

- PHASE 1: Evaluate tasks to generate findings and recommendations
- PHASE 2: Implement recommendations

Cross-Cutting
 Communication

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The NRC Maintains its Commitment to Increasing the Use of RIDM

- Staff recognizes the evolving cultural, process, and technical challenges associated with increasing the use of RIDM.
- Staff has articulated a strategic vision for addressing challenges for the reactor program.
- A 'living' action plan has been developed and is enabling positive change towards increased use of RIDM.

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References

- U.S. Nuclear Regulatory Commission, Policy Issue, SECY-17-0112, "Plans for Increasing Staff Capabilities To Use Risk Information in Decision-Making Activities," (ADAMS Accession No. ML17270A197).
- Action Plan: Risk-Informed Decision-Making - Operating Reactor Business Line (CAC No. A11008) (ADAMS Accession No. ML18005A911).

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Acronyms

<ul style="list-style-type: none"> • CDF: Core Damage Frequency • LERF: Large Early Release Frequency • DID: Defense-In-Depth • F&O: Fact and Observation (Finding) • LAR: License Amendment Request • NEI: Nuclear Energy Institute • NFPA: National Fire Protection Association • NRR: Office of Nuclear Reactor Regulation • NTF: Near Term Task Force • PRA: Probabilistic Risk Assessment • RG: Regulatory Guide 	<ul style="list-style-type: none"> • RICT: Risk-Informed Completion Time • RIDM: Risk-Informed Decision-Making • RITS: Risk-Informed Technical Specifications • SFCP: Surveillance Frequency Control Program • SSC: Structure, System, or Component • SR: Surveillance Requirement • SRM: Staff Requirements Memorandum • TS: Technical Specification • TSIF: Technical Specification Task Force
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