

# POLICY ISSUE INFORMATION

March 21, 2003

SECY-03-0044

FOR: The Commissioners

FROM: William D. Travers  
Executive Director for Operations

SUBJECT: UPDATE OF THE RISK-INFORMED REGULATION IMPLEMENTATION PLAN

## PURPOSE:

To present the Commission with an updated and revised version of the Risk-Informed Regulation Implementation Plan (RIRIP).

## SUMMARY:

The RIRIP discusses the agency's actions to risk-inform its regulatory activities and specifically describes each of the activities identified as supporting the goals and objectives of the agency's Strategic Plan and the Probabilistic Risk Analysis Policy Statement.

The RIRIP is organized into two parts. Part 1 provides a general discussion of the document's relationship to the Probabilistic Risk Assessment (PRA) Policy Statement and the Strategic Plan. It also discusses deterministic and other elements for consideration in the process of risk-informing and provides guidance for selecting appropriate "candidates" for risk-informing. Part 2 describes the staff's ongoing risk-informed regulation activities in the reactor safety arena and the waste safety and materials safety arenas.

The agency's recent accomplishments in risk-informing its regulatory activities are described in Attachment 1. Key risk-informing activities to be conducted at the agency over the next 6 months are described in the paragraphs below.

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## Reactor Safety Arena

1. 10 CFR 50.69 (Special Treatment Requirements): On September 30, 2002, the staff submitted a proposed rule package in SECY-02-0176 that included a draft regulatory guide (DG-1121) providing staff comments and clarifications on the industry-proposed implementation guidance contained in draft Revision C of Nuclear Energy Institute (NEI) 00-04 (10 CFR 50.69 System Structure and Component (SSC) Categorization Guideline). The staff will continue to work with the industry and other stakeholders on NEI 00-04 implementation guidance. Challenges include addressing the issue of PRA quality and providing clear rule requirements. Should the Commission decide to publish the proposed rule, the staff will also analyze comments and begin drafting final rule language.
2. Coherence Program: The staff has developed a detailed plan for achieving coherence among reactor safety arena activities and will present the plan to the Commission by June 2003. The staff continues to develop a process for a risk-informed coherence effort that will provide the guidelines and criteria for translating the Commission's high-level guidance into specific activities. The staff will also continue to hold public meetings and workshops and provide periodic updates to the Advisory Committee on Reactor Safeguards and the Commission.
3. Creating a Risk-Informed Environment: The second phase of the program has been initiated and will include several pilot projects. The objectives of the pilot projects are to (1) define the components of a risk-informed environment by accumulating and documenting experience and lessons learned from implementing several risk-informed activities within the Office of Nuclear Reactor Regulation (NRR); and (2) provide concrete assistance in one or more areas of communications, training, or organization to assist broad implementation of risk-informed activities. A process for conducting these pilot projects has been developed and project teams are now being formed. A general kickoff meeting involving all teams was held. The second phase of the program will also include an initiative to examine, and adjust as appropriate, processes and vehicles for providing information to staff about efforts to risk-inform regulatory processes and specific risk-informed activities.
4. Option 3 (Risk-Informing Part 50)
  - ▶ Hydrogen Control Requirements (10 CFR 50.44): The proposed rule was published for comment in the *Federal Register* on August 2, 2002. The staff is analyzing the public comments and preparing a final rule.
  - ▶ Emergency Core Cooling System (ECCS) Acceptance Criteria (10 CFR 50.46): The staff has recommended that separate rulemakings be pursued for proposed changes to ECCS reliability requirements, ECCS acceptance criteria, and ECCS evaluation model requirements. The technical reports for these areas were completed in July 2002. Pending receipt of a Staff Requirements Memorandum (SRM), the recommendations are currently being reviewed by a working group dedicated to developing the draft rules, if approval to proceed is given by the Commission. The technical work for developing Loss-of-Coolant Accident

(LOCA) frequencies to be used for ECCS functional reliability work is still ongoing. Also, the assessment of the feasibility of redefinition of the spectrum of pipe breaks relevant to 10 CFR 50.46 is ongoing.

5. The staff continues to work on the risk-informed technical specification initiatives. The safety evaluations for Initiative 1, Technical Specification Actions End State Modifications, and Initiative 3, Modification of Mode Restraint Requirements, have been completed. Proposed standard technical specifications (STS) changes for Initiative 3 will be reviewed, approved and offered via the Consolidated Line Item Improvement Process (CLIIP) within the next 6 months. A safety evaluation will be completed for the Combustion Engineering Owners Group submittal for Initiative 6, Modification of LCO 3.0.3 Actions and Completion Times, within the next 6 months.
6. In December 2002, the staff issued for public comment the draft regulatory guide (DG-1122) and a Standard Review Plan (SRP) chapter on assessing PRA adequacy. The staff is continuing to work on the final regulatory guide and SRP chapter, as well as Appendices A (staff position on the American Society of Mechanical Engineers (ASME) PRA standard on internal events) and B (staff position on the NEI PRA review guidance on internal events).
7. The Office of Nuclear Regulatory Research forwarded a draft NUREG report, "Technical Basis for Revision of the Pressurized Thermal Shock (PTS) Screening Criteria in the PTS Rule (10 CFR 50.61)," to NRR in December 2002. This report documents the results of a multiyear study reevaluating the technical basis of 10 CFR 50.61. The staff is working to finalize this report and to assess rulemaking options.
8. The staff is working to issue a data handbook for probabilistic risk assessments. The data handbook defines methods and tools for data analysis used in risk assessments and is expected to be completed in FY 2003.
9. The staff is revising NUREG/CR-6595, "An Approach for Estimating Frequencies of Various Containment Failure Modes and Bypass Events," which describes an approach for estimating large early release frequency (LERF). NUREG/CR-6595 currently includes some considerations for low-power and shutdown (LPSD) operation, but does not include a simplified Level 2 analysis focusing specifically on LPSD. The objective of the revision is to include a simplified Level 2 probabilistic safety analysis (PSA) specifically for LPSD conditions, similar to that presented for full power operations. This analysis should be adequate to produce an estimate of LPSD risk in terms of radionuclide release frequency when coupled to a more detailed Level 1 analysis. This work includes performing a literature search to identify containment failure modes and mechanisms unique to shutdown, developing LPSD Level 2 simplified event trees and guidance, testing and modifying the trees and guidance, and coordinating with the American Nuclear Society effort on the LPSD PSA standard. The currently used full-power LERF model in the NUREG will also be updated. The draft report is expected to be issued in March 2003.

## Waste Safety and Materials Safety Arenas

1. In support of the Commission's policies on risk-informing the regulatory process and performance goals, the staff is working to develop probabilistic risk assessment methods and quantify the risk of dry storage of spent nuclear fuel. The study is intended to accomplish the following objectives: (a) quantify the risk of dry cask storage of spent nuclear fuel, (b) provide insights for risk-informed inspection programs, (c) identify areas for risk-informing 10 CFR Part 72 regulatory requirements, and (d) provide analytic tools that can be used to implement the waste safety goals. A pilot PRA on dry cask storage will be completed during 2003 and discussed with the ACRS/ACNW Joint Committee.
2. To make the 10 CFR Part 72 regulations more risk-informed and performance-based, the staff is working on a proposed rule that would allow the dry cask independent spent fuel storage installations (ISFSIs) and monitored retrievable storage (MRS) system applicants to use the probabilistic seismic hazard analysis (PSHA) methods in evaluating the hazards due to an earthquake event, instead of the current 10 CFR Part 72 provisions requiring the deterministic methods of 10 CFR Part 100 Appendix A. The proposed rule also would remove the requirement that a design earthquake (DE) of a dry cask ISFSI or MRS facility be equivalent to the Safe Shutdown Earthquake for a nuclear power plant, and allow the DE to be determined based on the lower risk at a dry cask ISFSI or MRS facility compared to a nuclear power plant. The final rule is planned to be sent to the Executive Director for Operations in June 2003.
3. During the Phase 1 work completed in Fiscal Year 2001, the Office of Nuclear Material Safety and Safeguards (NMSS) Risk Task Group (RTG) concluded that quantitative safety goals could be useful in risk-informing certain applications within the materials and waste areas. Consequently, the RTG has worked collaboratively with RES to task the Brookhaven National Laboratory to develop draft safety goals for materials and waste activities. A draft safety goal development report will be issued within the agency and the PRA Steering Committee and other offices will be briefed to seek feedback and comments.
4. The staff is currently reviewing and consolidating all decommissioning policy and guidance documents to support the use of efficient and risk-informed approaches by staff and licensees. During the next 6 months, the staff intends to complete the final version of Volume 1 of a three-volume NUREG report documenting the policy and guidance, and to release Volumes 2 and 3 for public comment. The guidance provides an approach to dose assessment that accounts for the site-specific risk significance of radionuclides and exposure pathways, and allows licensees to address radionuclides and exposure pathways based on their contribution to risk. The risk informed site-specific dose modeling guidance (1) allows for site-specific selection of risk-significant exposure scenarios, exposure pathways and critical groups; (2) requires the use of conceptual models, numerical models and computer codes that incorporate the more risk-significant elements of a site; (3) calls for site-specific data for the more risk-significant input parameters, and allows more generic data for less risk-significant parameters; and (4) encourages the use of probabilistic techniques to evaluate and quantify the magnitude and effect of uncertainties in the risk assessment, and the sensitivity of the calculated risks to individual parameters and modeling assumptions.

## BACKGROUND

In a January 2000 memorandum to the Commission, the staff outlined a strategy for implementing risk-informed regulation. The strategy evolved into the initial version of the Risk-Informed Regulation Implementation Plan (RIRIP), which the staff gave to the Commission in March 2000. The Commission reviewed the plan and, after a briefing by the staff in March, directed the staff in April 2000 to include in the next update of the implementation plan an internal communications plan, staff training requirements, and a discussion of internal and external factors that may impede risk-informed regulation. The first complete version of the implementation plan was issued in October 2000.

In a SRM dated January 4, 2001, the Commission requested that the staff provide a more detailed communication plan to better highlight the agency's goal of improving public confidence, prioritize activities, identify necessary resources and tools, address how performance-based regulatory approaches will be integrated into the process of risk-informing regulations, and identify critical-path activities and those that have crosscutting dimensions.

In response to the SRM, the December 2001 update of the RIRIP, specifically Part 2, included expanded arena chapters that describe the staff's progress in prioritizing the various implementation activities and identifying the necessary resources and tools, critical-path activities, and activities that have crosscutting dimensions. The arena chapters also describe arena-specific activities related to communication with both internal and external stakeholders. This update of the RIRIP includes updates and additions to the activity descriptions. One new risk-informed initiative associated with achieving coherence among reactor arena activities was added to this RIRIP update (See RS-EER 1-8). The activities associated with updating the Graded QA guidance, guidance for licensing changes that are not risk-informed, and the Individual Plant Examination - Eternal Events (IPEEE) Insights report have all been completed and have been removed from the RIRIP. Additionally, the effort to develop risk-informed and/or performance-based safeguards requirements has been put on hold pending the completion of the top-to-bottom review of safeguards and security and has also been removed from the RIRIP.

### RIRIP Content and Organization

Part 1 of the RIRIP (Attachment 2) describes the plan's relationship to the PRA Policy Statement and its relevance to the NRC's Strategic Plan. Part 1 also discusses certain key features of the traditional deterministic approach that should be preserved in establishing risk-informed regulatory programs, since risk information will be used to complement the traditional approach. In addition, Part 1 provides draft guidance that the staff has used for selecting candidate requirements, practices, and processes to risk inform.

To complete the plan, Part 2 of the RIRIP describes the staff's risk-informed regulation activities, with chapters addressing the nuclear reactor safety arena and the nuclear materials and waste safety arenas. Each chapter is organized around the Strategic Plan strategies that are relevant to risk-informed regulation in the given arena. In addition, each chapter describes the implementation activities for each strategy and identifies significant milestones and training and communications considerations for each activity. Budgetary resources for each implementation activity for Fiscal Year 2002 were provided in the July 2002 version of the RIRIP

(SECY-02-0131). Budgetary resources for Fiscal Year 2003 are not provided in this version of RIRIP because the agency was operating under a continuing resolution when the RIRIP was prepared. Budgetary resources for Fiscal Year 2003 will be included in the next RIRIP update. Relationships among implementation activities are described and critical-path items are identified. Gantt charts for some of the implementation activities are also provided to illustrate the relationships among tasks within activities.

## RESOURCES

In response to the Commission's direction regarding the October 2000 version of the RIRIP, the plan lists the priority rating of each risk-informed regulation implementation activity. These priorities were determined through the Planning, Budgeting and Performance Management (PBPM) process. The offices have different prioritization processes; however, each office uses the performance goals defined in the agency's Strategic Plan to prioritize office activities as part of the budget process. As with other staff activities, changes to the resources allocated to implementation activities for risk-informed regulation will continue to be made consistent with the PBPM process to reflect changes to the agency's budget and priorities.

Over the past few years, the staff has made significant progress toward risk-informing its regulatory activities. Attachment 1 to this Commission paper summarizes the staff's recent significant accomplishments. While the staff has made considerable progress, work remains to be done. Using the Probabilistic Risk Assessment (PRA) Policy Statement and the NRC's Strategic Plan as a foundation, the RIRIP describes activities that are planned and underway and the interrelationships among the activities.

## COORDINATION

The Office of the Chief Financial Officer has reviewed this paper for resource implications and has no objections. The Office of the General Counsel has also reviewed this paper and has no legal objections.

*/RA/*

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Attachments: 1. Table of Accomplishments  
2. Risk-Informed Regulation Implementation Plan

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