

POLICY ISSUE INFORMATION

October 28, 2010

SECY-10-0143

FOR: The Commissioners

FROM: Brian W. Sheron, Director
Office of Nuclear Regulatory Research

SUBJECT: ANNUAL UPDATE OF THE RISK-INFORMED AND PERFORMANCE-BASED PLAN

PURPOSE:

To provide the Commission with an annual update on activities contained in the Risk-Informed and Performance-Based Plan (RPP) including a summary of the significant accomplishments achieved over the past year and anticipated for the next year. This paper does not address any new commitments or associated resource implications.

SUMMARY:

The breadth and depth of programs across the agency demonstrate the staff's commitment to the Commission's goals for risk-informed and performance-based regulation. Since the Commission promulgated the Probabilistic Risk Assessment Policy Statement (60 FR 42622) in 1995, the staff has continued to expand the application of risk-informed technology to regulatory initiatives. Many NRC risk-informed programs, such as the Reactor Oversight Program, are mature elements in the regulatory structure and are not discussed in this paper. These mature programs continuously improve as the state-of-the-art continues to advance. Other programs, such as most of those discussed in this paper, are in a developmental stage and are being integrated into the regulatory process of the agency. The staff continues to engage stakeholders as appropriate to improve our regulatory programs.

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BACKGROUND:

On June 1, 2006, the Commission issued a staff requirements memorandum (SRM) (available in the Agencywide Documents Access and Management System [ADAMS] under Accession No. ML061520304) that directed the U.S. Nuclear Regulatory Commission (NRC) staff to improve upon the Risk-Informed Regulation Implementation Plan (RIRIP) by developing an integrated master plan for activities designed to help NRC achieve its goal of a holistic, risk-informed, and performance-based regulatory structure. The Commission also directed the staff to seek ways to communicate more transparently to the public and stakeholders on the purpose and use of PRA in the agency's reactor, materials, and waste regulatory programs. SECY-07-0074, "Update on the Improvements to the Risk-Informed Regulation Implementation Plan," dated April 26, 2007 [ML070890396], conveyed that plan, which the staff retitled as the "Risk-Informed and Performance-Based Plan."

To help meet the Commission's expectations for both a risk-informed and a performance-based regulatory structure, Enclosure 1 of SECY-07-0074 included explicit criteria for the staff's review and consideration of performance-based approaches to help determine which initiatives should be both risk-informed and performance based. SECY-07-0191, "Implementation and Update of the Risk-Informed and Performance-Based Plan," dated October 31, 2007 [ML072700587], discusses the staff's progress in implementing the RPP and includes an updated set of objectives, bases, and goals for the reactor, materials, and waste regulatory arenas. In November 2007, the staff completed its commitment to make all aspects of the RPP available to the general public via the agency's public Web site. The most recent version of the plan was provided as SECY-09-0159 dated October 27, 2009 [ML092680231].

DISCUSSION:

Most of the information on risk-informed and performance-based programs is in Enclosure 1 with the detailed information located on NRC's public Web site <http://www.nrc.gov/about-nrc/regulatory/risk-informed/rpp.html>. The Web site provides a readily accessible overview and current status of the agency's risk-informed and performance-based regulatory activities.

This paper continues to report on the following regulatory initiatives in the reactor area:

- Fire Protection for Nuclear Power Plants.
- Risk-Informed Technical Specifications.
- Risk-Informed Approach to Special Treatment Requirements.
- Initiative to Enhance Risk Tools for Oversight.
- Risk-Informed Rulemaking.
- Infrastructure for a Risk-Informed and Performance-Based Environment for New Light-Water Reactors.
- Human Reliability Analysis.
- Human Reliability Analysis Development for Fire PRA.
- Analytical Tools for Risk Applications.
- SPAR Model Development Program.
- Reactor Performance Data Collection/Industry Trends.

In addition, the staff has added the following initiatives in the reactor area:

- Risk-Informed Security. NSIR has requested RES to explore the feasibility of using available methods to risk-inform the regulatory approach to security. Currently, this effort is underway. Its deliverable would include a report that evaluates those candidate risk management strategies that are potentially applicable and identifies the informational and analytical gaps that would need to be closed to use those strategies. This work is reported as a reactor initiative, but may also be applicable to non-reactor facilities.
- Risk-Informed Emergency Action Levels. NSIR has requested RES to explore the feasibility of risk-informing the relation between emergency action levels (EALs) and protective actions taken. This work is intended to verify that current EALs are consistent with risk insights. This work is continuing and its status will be updated in the next annual Commission paper.
- Use of Risk Insights to Enhance Safety Focus of Small Modular Reactor Reviews. As directed in the SRM dated August 31, 2010, "Use of Risk Insights to Enhance Safety Focus of Small Modular Reactor Reviews," the staff is developing a plan for a framework and design specific review plans for the integral pressurized water reactor (iPWR) class of SMRs. Further, the staff's plan will include developing enhanced approaches for applying risk insights into the design or licensing reviews for SMRs. The staff is working with industry and will provide their plan to the Commission in mid-February as directed in the SRM.

This paper continues to report on the following regulatory initiatives in the materials and waste area:

- Developing Significance Determination Process (SDP) Tools for the Fuel Cycle Oversight Process (FCOP) Revision.
- Depleted Uranium Rulemaking.

In addition, the staff has added the following initiatives in the materials and waste area:

- Extended Storage and Transportation of Spent Nuclear Fuel. Staff has developed plans to review regulatory programs for spent fuel storage and transportation to evaluate their adequacy for ensuring safe and secure storage and transportation of spent nuclear fuel for periods considered beyond 120 years. A project plan has been proposed by the staff for Commission approval in COMSECY-10-0007, "Project Plan for the Regulatory Program Review to Support Extended Storage and Transportation of Spent Nuclear Fuel," dated June 15, 2010 [ML101390216] that includes gap assessments, technical reviews, and additional research implementation. Detailed plans will be developed based on the results of the gap assessments.

Finally, several initiatives in the materials and waste areas not listed here are provided on the RPP website.

The Commission approved the staff plan for a phased approach to stabilize PRA quality in the SRM dated October 6, 2004 [ML042800369] to SECY-04-0118, "Plan for the Implementation of the Commission's Phased Approach to Probabilistic Risk Assessment Quality," dated July 13, 2004 [ML041470505]. More detailed information is provided in Enclosure 2 on the evolution of our approach to PRA quality, which supports many of the agency's programs. The staff continues to work on efforts associated with PRA quality:

- Stabilizing the PRA Quality Expectations. The staff has had several ongoing efforts in stabilizing expectations for PRA quality. These efforts have been part of the Phased Approach Plan to PRA Quality, SECY-04-0118. The plan involves a three-phased approach that defines the Commission's expectations for PRA quality for current or anticipated applications and the process for achieving that quality while allowing risk-informed decisions to be made using currently available methods until the necessary guidance documents defining quality were developed and implemented. Phase 1 allowed licensee submittals (e.g. licensee amendment applications) without NRC-endorsed PRA standards, while Phase 3 relied on NRC-endorsed PRA standards for defining PRA quality. The Commission stated in the SRM to SECY-04-0118: "...once Phase 3 guidance is in place, Phase 1 applications would no longer be acceptable."

Central to the plan was (1) the development of national consensus PRA standards by Standard Development Organizations (SDOs) and associated industry peer review guidance and (2) staff endorsement in Regulatory Guide (RG) 1.200. Revision 2 to RG 1.200 was issued in March 2009 and endorsed the ASME/ANS standard for an at-power, Level 1/Limited Level 2 (large early release) PRA addressing both internal and external hazards. Publication of Revision 2 to RG 1.200 completed Phase 3 of the staff plan for operating reactors. Licensee's PRAs in support of the application under consideration are expected to meet the ASME/ANS PRA standard as endorsed in RG 1.200, Revision 2, where appropriate. Non-conforming applications would be returned. See Enclosure 2 for a more detailed discussion of the Phased Approach Plan.

At the time the plan was developed, it did not address new reactor licensing. Further, though Phase 3 has been completed, the staff is continuing to work with the SDOs in revising the current standard to address emerging issues for operating reactors, to address a PRA standard for low-power and shutdown conditions and developing new standards to support new reactor licensing and advanced non-light-water reactors. In addition, other staff activities involve development of peer review guidance and technical methodology guidance (e.g., treatment of uncertainties, seismic, human reliability analysis). The staff will continue to work closely with industry in these efforts.

COORDINATION:

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

/RA/

Brian W, Sheron, Director
Office of Nuclear Regulatory Research

Enclosures:

1. Recent Accomplishments and Near-Term Anticipated Accomplishments
2. Stabilizing Probabilistic Risk Assessment (PRA) Quality Expectations

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