

# **POLICY ISSUE (Information)**

October 31, 2007

SECY-07-0191

FOR: The Commissioners

FROM: Luis A. Reyes  
Executive Director for Operations /RA/

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

PURPOSE:

To provide the Commission with an update regarding (1) the staff's progress in implementing the Risk-Informed and Performance-Based Plan (RPP), formerly known as the Risk-Informed Regulation Implementation Plan (RIRIP); and (2) a summary of the significant accomplishments achieved over the past 6 months and anticipated for the next 6 months. This paper does not address any new commitments or resource implications.

BACKGROUND:

In Staff Requirements Memorandum (SRM) M060503B, "Briefing on Status of Risk-Informed and Performance-Based Reactor Regulation", dated June 1, 2006, which is available in the Agencywide Documents Access and Management System (ADAMS) under Accession No. ML061520304, the Commission directed the staff to improve the RIRIP by developing an integrated master plan for activities designed to help the U.S. Nuclear Regulatory Commission (NRC) achieve its goal of a holistic, risk-informed and performance-based regulatory structure. The Commission also directed the staff to seek ways to more transparently communicate, to the public and stakeholders, the purpose and use of probabilistic risk assessments (PRAs) in the agency's reactor, materials, and waste regulatory programs.

In response to that SRM, on October 25, 2006, the staff provided the Commission with the broad outline of a proposal to improve the RIRIP. In addition to providing the traditional, semiannual

CONTACT: John C. Lane, RES/DRA  
301-415-6442

RIRIP update, SECY-06-0217, "Improvement to and Update of the Risk-Informed Regulation Implementation Plan" dated October 25, 2006 (ML062830222), expressed the staff's commitment to share with the Commission information regarding ongoing progress in implementing the proposed RIRIP improvements, and to provide an update on the development of an integrated master plan.

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 re-titled as the "Risk-Informed and Performance-Based Plan." The new RPP differs significantly from its predecessors, the RIRIP and PRA Implementation Plan. In addition to allowing for the inclusion of performance-based elements for the first time, the RPP restructures the agency's planning process by focusing on the three primary regulatory arenas of reactors, materials, and waste.

The RPP focuses on both the "up-front" planning process as well as project completion. In the planning process, formalized objectives, bases, and goals for each arena help determine which initiatives the NRC should continue, which initiatives the agency should sunset, and which new initiatives the agency should consider. To foster the Commission's expectations for both a risk-informed and a performance-based regulatory structure, RPP includes explicit criteria for the staff's review and consideration of performance-based approaches to help determine which initiatives in the database should be both risk-informed and performance-based. In addition, following the completion of selected projects, the RPP provides for the performance and documentation of an effectiveness review to assess success in achieving their stated objectives. Although no effectiveness reviews are currently scheduled, as part of its periodic RPP updates, the staff will inform the Commission of plans to conduct such reviews and convey their findings.

SECY-07-0074 also expressed the staff's commitment to (1) complete the development of the RPP database, (2) complete the RPP-related public Web pages, (3) inform the Commission of any potential policy issues associated with achieving a holistic, risk-informed, and performance-based regulatory structure, and (4) finalize the objectives and supporting bases for each regulatory arena.

On August 2, 2007, the staff and industry stakeholders briefed the Commission on the status of Risk-Informed and Performance-Based Regulation. That briefing included discussion regarding the status of RPP implementation, as well as improvements to the RPP-related Web pages designed to enhance communication with the public and other agency stakeholders. Following that briefing, the Commission directed in the SRM M070802B, dated August 31, 2007, the staff to ensure that the RPP-related Web pages provide useful information regarding risk and probability — in plain language — that explains the value and use of PRA to the general public.

## DISCUSSION

This paper discusses the staff's progress in implementing the RPP in terms of (1) the resolution of commitments made in SECY-07-0074 (including the RPP objectives and supporting bases, the RPP-related public Web pages and the RPP database); (2) significant risk-informed and performance-based accomplishments achieved by the staff over the past 6 months, and those planned for the near-term; and (3) potential policy issues associated with a risk-informed and performance-based regulatory structure.

## Resolution of SECY-07-0074 Commitments

### *RPP Objectives and Supporting Bases*

Enclosure 1, entitled “Arena and Subarena Objectives, Bases and Goals,” provides guidance which the staff intends to use in assessing ongoing RPP activities to confirm which initiatives the NRC should continue, which initiatives the agency should sunset, and which new initiatives the agency should consider. The staff has finalized these arena and subarena objectives, bases, and goals, which were initially presented to the Commission in draft form in Attachment 1 to SECY-07-0074. These objectives, bases, and goals were developed by an inter-office task group, which incorporated Commission guidance and input from stakeholders. As with the draft, differences exist between the goals established for the various arenas and subarenas, owing to factors such as (1) inherent differences in the complexities and risks associated with regulated, licensed activities, (2) the current state-of-the-art in PRA technology and methods in each arena, (3) the level of stakeholder commitment to risk-informed initiatives, and (4) the potential costs and benefits associated with adopting risk-informed and performance-based approaches.

### *RPP-Related Public Web Pages and RPP Database*

The revised RPP-related public Web pages are currently being finalized (expected to be completed in November, 2007) and will include new information — in plain language— regarding risk and probability to explain the purpose and use of PRA in the nuclear industry to the general public. The various content pages will answer inquiries such as “what is risk,” “what is PRA,” and “what is risk-informed and performance-based regulation.” As part of this Web update, the RPP now provides a readily accessible, comprehensive explanation and overview of the agency’s risk-informed and performance-based regulatory activities (i.e., the RPP database) with related links to more detailed information for the activities identified in the database.

In this context, the staff has completed its periodic update and tabulation of RPP projects, which will soon be available through the revised RPP-related public Web pages. The database is organized according to arenas, and each arena is further subdivided into subarenas. The related projects are then displayed according to their contributions to the three primary functional areas of oversight, licensing, or rulemaking. Each detailed activity plan will be maintained and updated by the responsible program office.

### Significant Accomplishments

Enclosure 2, “Recent Accomplishments and Near-Term Anticipated Accomplishments,” summarizes the major risk-informed and performance-based initiatives that the staff has completed over the past 6 months as well as those activities that are planned for the next 6 months. For example, in the area of byproduct materials handling, the Commission approved, on October 16, 2007, final rulemaking regarding exemptions from the licensing and reporting requirements specified in 10 CFR Parts 30, 31, 32, and 150 for general licenses and distribution of byproduct material. This rulemaking was risk-informed, in part, by NUREG-1717, “Systematic Radiological Assessment of Exemptions for Source and Byproduct Materials.” Regarding the phased approach to PRA quality, in the coming months the staff plans to initiate work on Revision 2 of RG 1.200, “An Approach for Determining the Technical Adequacy of Probabilistic Risk Assessment Results for Risk-Informed Activities.” That revision will endorse the level 1

and large early release frequency PRA Standard (ASME/ANS RA-S-2007), promulgated by the American Society of Mechanical Engineers and the American Nuclear Society, which applies to at-power internal events, internal fire events, and external events.

### Policy Issues

In the process of implementing the first iteration of RPP, including the finalized database, the staff did not identify any policy issues that might inhibit or preclude the achievement of a holistic, risk-informed and performance-based regulatory structure. To the contrary, the staff expects that the Web-based presentation of the agency's activities, focused as it is along the major arena, subarena, and functional distinctions, will provide a more holistic explanation than previous iterations of the RIRIP or its predecessor, the PRA Implementation Plan (circa 1994 – 1999). Those earlier approaches delineated projects according to other important, but somewhat higher-level agency-wide performance goals, such as safety and efficiency. By contrast, the staff believes the RPP will be more cohesive, in that it facilitates a clearer understanding of how the various activities contribute — individually and collectively — toward achievement of the agency's vision in regard to risk-informed and performance-based regulation.

### 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 objection.

***/RA/***

Luis A. Reyes  
Executive Director  
for Operations

### Enclosures:

1. Arena and Subarena Objectives, Bases, and Goals
2. Recent Accomplishments and Near-Term Anticipated Accomplishments

## **Arena and Subarena Objectives, Bases, and Goals**

This summary outlines the objectives, bases, and goals that the staff of the U.S. Nuclear Regulatory Commission (NRC) has developed for the agency's three regulatory arenas (i.e., reactor safety, materials safety, and waste management) and their component subarenas. Specifically, this summary discusses the following regulatory arenas and subarenas:

- Reactor Safety Arena
  - Operating Reactors Subarena
  - Research and Test Reactors Subarena
  - New Light-Water Reactors Subarena
  - Advanced Non-Light-Water Reactors Subarena
  
- Materials Safety Arena
  - Fuel Cycle Subarena
  - Byproduct Material Subarena
  
- Waste Management Arena
  - Spent Fuel Storage and Transportation Subarena
  - High-Level Waste Repository Safety Subarena
  - Low-Level Waste and Decommissioning Subarena

The reader should note that inherent differences in the complexities and risks associated with the NRC's various regulated licensed activities (e.g., a nuclear power plant versus a sealed radioactive source) result in differences in the objectives, bases, and goals for the related arenas and subarenas. For example, in the reactor arena, a common set of objectives is typically not practical when considering operating reactors, new light-water reactors (LWRs), advanced non-LWRs, and non-power reactors.

## Reactor Arena Objectives, Bases, and Goals

### Subarena: Operating Reactors

(Lead Office: NRR)

#### Objective:

Make continuing, incremental improvements in rulemaking, licensing, and oversight of operating reactors, while focusing on implementing existing risk-informed and performance-based activities.

This objective focuses on activities that are already in progress to risk-inform the operating reactor subarena, including completed rulemaking activities, guidance documents, and implementation of some initiatives.

The NRC will revisit and update this objective (as appropriate) once the industry has implemented the currently planned activities and feedback becomes available. Effectiveness reviews, conducted as part of the Risk-Informed and Performance-Based Plan (RPP), will also provide input for use in updating this objective in the future.

#### Bases:

The risk-informed initiatives currently in progress were originally selected using screening criteria similar to those presented in the RPP. Consequently, the five activities (listed below) that support the goals for this subarena satisfy the following screening criteria:

- The risk-informed initiatives that are currently underway help to improve the effectiveness and efficiency of the NRC's regulatory process, including improved safety and reduction of unnecessary regulatory burden.
- Information and analytical models of operating reactors, particularly for at-power operations, exist and are fairly mature.
- The cost-beneficial nature of several of the risk-informed initiatives is evidenced by their voluntary adoption by licensees.
- No factors have been identified to date that would motivate changing the regulatory approach in the areas where risk-informed activities are already underway. Stakeholder feedback substantiates that there is no immediate need to initiate any new risk-informed initiatives, and that the NRC should focus on completing currently identified activities and allowing the industry time to implement those activities.
- Goals and activities to meet the objective for this subarena will be performance-based, to the extent that they meet the following four criteria:
  - (1) measurable parameters to monitor performance
  - (2) objective criteria to assess performance
  - (3) flexibility to allow licensees to determine how to meet the performance criteria
  - (4) no immediate safety concern as a result of failure to meet the performance criteria

## Reactor Arena Objectives, Bases, and Goals (continued)

### Subarena: Operating Reactors (continued)

(Lead Office: NRR)

#### Bases: (continued)

Risk-informed activities for operating reactors occur in five broad categories:

- (1) applicable regulations
- (2) licensing process
- (3) revised oversight process
- (4) regulatory guidance
- (5) risk analysis tools, methods, and data

The activities in these categories are derived from the Commission's policy statements and guidance, and include revisions to technical requirements in the regulations; risk-informed technical specifications; a new framework for inspection, assessment, and enforcement actions; guidance on other risk-informed applications (e.g., in-service inspections); and improved standardized plant analysis risk models.

#### Goals:

The following goals are derived from the Commission's policy statements and guidance, which reflect the current phase of NRC and industry development, as well as the current implementation of risk-informed activities:

- Finish the development of current risk-informed regulations (e.g., 10 CFR 50.46a rulemaking) and associated regulatory/staff guidance.
- Implement existing NRC risk-informed activities [e.g., risk-informed technical specifications and pilots for 10 CFR 50.69 and the National Fire Protection Association (NFPA) Standard 805].
- Encourage the industry to implement risk-informed rules and approved/endorsed activities.
- Continue making incremental improvements to the established licensing, rulemaking, and oversight activities.
- Modify/update established activities to account for lessons learned.

## Reactor Arena Objectives, Bases, and Goals (continued)

**Subarena: Research and Test Reactors**

(Lead Office: NRR)

**Objective:**

Implement risk-informed activities to achieve a risk-informed and performance-based regulatory structure for oversight of research and test reactors (RTRs).

In revising the Research and Test Reactor Oversight Process (RTROP), the NRC staff intends to develop a risk-informed, performance-based baseline inspection program. Such a program will identify the minimum level of inspection required for an RTR facility, in order to give the NRC sufficient information to determine whether the facility's performance is acceptable. Key inputs to this effort will be a regulatory framework and cornerstones of safety similar to those for power reactors, which define aspects of reactor functions or licensee activities that must be performed in accordance with a certain set of criteria to ensure that the NRC achieves its mission to protect the health and safety of the public. The risk-informed, performance-based RTROP will also include a new Significance Determination Process (SDP), which will characterize inspection findings based on their risk-significance and performance impact for RTRs.

**Bases:**

The risk-informed and performance-based activities (listed below) for this subarena satisfy the following screening criteria:

- The new risk-informed, performance-based RTROP will improve the efficiency of the NRC's regulatory process and help to effectively communicate regulatory decisions regarding inspection findings by establishing a revised baseline inspection program and a new RTR SDP.
- The NRC does not currently have analytical models of RTRs that are of sufficient quality, but such models could reasonably be developed to support a risk-informed RTROP.
- The startup and implementation of this risk-informed, performance-based initiative can be realized at a reasonable cost to the NRC, with little or no financial impact on RTR licensees or the public, and will provide a net benefit by reducing the scope of routine inspection.
- There are no apparent factors (e.g., legislative, judicial, adverse stakeholder reaction) that would preclude implementing a risk-informed, performance-based approach to the regulation of RTRs.
- Goals and activities to meet the objective for this subarena will be performance-based, to the extent that they meet the following four criteria:
  - (1) measurable parameters to monitor performance
  - (2) objective criteria to assess performance
  - (3) flexibility to allow licensees to determine how to meet the performance criteria
  - (4) no immediate safety concern as a result of failure to meet the performance criteria



## Reactor Arena Objectives, Bases, and Goals (continued)

**Subarena: Research and Test Reactors (continued)**

(Lead Office: NRR)

### **Bases: (continued)**

At present there is a lack of either plant-specific or generic probabilistic risk assessment (PRA) studies and models for RTR facilities. Consequently, the first step in establishing a risk-informed, performance-based oversight process for this subarena is to develop detailed risk models for existing RTR facilities. Moreover, because of the wide variation in RTR operating power levels and facility designs (which currently include TRIGAs, pool types, tank types, AGNs, an Argonaut, a PULSTAR, and a critical assembly), the NRC staff will need to obtain several generic risk models to provide the prerequisite risk information for RTRs. The development of these generic RTR risk models could be funded through research grants, scholarships, or fellowships to universities that have programs focused on nuclear PRA studies, which could help to fill a critical skill gap related to the NRC's mission. Then, once these studies have been completed, the NRC staff can develop and implement a risk-informed RTR baseline inspection program.

Risk will be factored into the RTR baseline inspection program in the following four ways:

- (1) Inspectable areas will be based on their risk-importance in measuring a cornerstone objective.
- (2) The inspection frequency, number of activities to inspect, and amount of time to devote to inspecting activities in each inspectable area will be based on risk information.
- (3) The selection of activities to inspect in each inspectable area will be based on risk information.
- (4) Inspectors will be trained in the use of risk information.

The new risk-informed baseline inspection program will have significant knowledge transfer benefits, in that it will shift the agency's reliance from individual inspectors' experience (in identifying risk- and safety-significant areas for review) to a more programmatic capture of risk and safety focus areas for inspection.

The new RTR SDP will characterize inspection findings based on their risk-significance and performance impact. Toward that end, the RTR SDP will assign a color band (green, white, yellow, or red) to each inspection finding to reflect its risk-significance (similar to the color banding used for power reactors).

Because of the current lack of RTR facility-specific PRAs, the NRC staff has not yet proposed risk-informed and performance-based rulemaking, licensing, or oversight activities for RTRs. However, the staff will revisit these functions upon completion of the PRA models (discussed above).

### **Goals:**

The NRC recognizes that models need to be developed before the staff can make significant progress in risk-informing the RTROP. This is reflected in the following goals:

- Develop generic risk models for existing RTR facilities (not before 2012) based upon allocation of the requisite funding in the 2010 budget.
- Develop a risk-informed, performance-based RTR baseline inspection program and a new RTR SDP (3 years after model development).

**Reactor Arena Objectives, Bases, and Goals (continued)**

**Subarena: New Light-Water Reactors**

(Lead Office: NRO)

**Objective:**

Implement risk-informed and performance-based activities to address the PRA elements of Title 10, Part 52, of the *Code of Federal Regulations* (10 CFR Part 52), and to increase the effectiveness and efficiency of the design certification, licensing, and oversight activities that the NRC staff conducts for new LWRs.

This objective has two main parts:

- First, this objective involves using the plant-specific PRA to implement risk-informed and performance-based programs. For example, the Maintenance Rule (10 CFR 50.65) will utilize the PRA to a great extent. Other examples include initiatives that a new reactor licensee may voluntarily pursue, such as risk-informed technical specification completion time, risk-informed inservice inspection, or special treatment under 10 CFR 50.69.
- Second, this objective involves using risk insights and PRA results to improve the NRC's effectiveness and efficiency in the licensing and oversight processes. For example, the staff will use risk insights, in conjunction with other considerations, to focus its review of a new reactor license application on those aspects that are important to risk. Other examples include developing risk-informed acceptance criteria for applications and adopting a risk-informed approach to sampling the inspection, testing, analysis, and acceptance criteria (ITAAC) to confirm the acceptability of the as-built plant.

**Bases:**

The risk-informed and performance-based activities (listed below) for this subarena satisfy the following screening criteria:

- The stated objective will help to improve the effectiveness and efficiency of the NRC's regulatory process, while increasing nuclear plant safety and reducing unnecessary regulatory burden.
- The bases for developing a risk-informed and performance-based regulatory structure for licensing and oversight of new LWRs are articulated in several Commission documents, policy statements, and processes (including the 10 CFR Part 52 rulemaking).

## Reactor Arena Objectives, Bases, and Goals (continued)

**Subarena: New Light-Water Reactors (continued)**

(Lead Office: NRO)

### **Bases: (continued)**

- Goals and activities to meet the objective for this subarena will be performance-based, to the extent that they meet the following four criteria:
  - (1) measurable parameters to monitor performance
  - (2) objective criteria to assess performance
  - (3) flexibility to allow licensees to determine how to meet the performance criteria
  - (4) no immediate safety concern as a result of failure to meet the performance criteria

An applicant for a combined operating license (COL) for a new LWR is required to perform a PRA. The NRC staff expects such PRAs to be used for the following purposes:

- Identify risk-informed safety insights.
- Demonstrate how risk compares to the Commission's goals.
- Assess the balance between accident prevention and mitigation.
- Identify and address vulnerabilities, reduce risk contributors, and select among design alternatives during the design phase.
- Demonstrate that the plant design represents a reduction in risk (compared to existing operating plants).
- Demonstrate that the design addresses the requirements in 10 CFR 50.34(f), as they relate to Three Mile Island (TMI).

PRA results and insights are used to support the following programs (among others):

- Regulatory Treatment of Non-Safety Systems (RTNSS)
- Inspection, test, analysis, and acceptance criteria (ITAAC)
- Reliability Assurance Program (RAP)
- Future aspects of regulatory oversight, technical specifications, the Maintenance Rule (10 CFR 50.65), and others

## Reactor Arena Objectives, Bases, and Goals (continued)

**Subarena: New Light-Water Reactors (continued)**

(Lead Office: NRO)

### Goals:

The following goals are derived from the Commission's policy statements and guidance, which reflect the current phase of NRC and industry development, as well as the current implementation of risk-informed activities:

- Ensure (during the design certification phase) that the applicant used risk-informed safety insights to select among alternative features, operational strategies, and design options to reduce or eliminate the significant risk contributors of existing operating plants.
- Ensure that the risk associated with the design compares favorably with the Commission's goals of less than 1E-04/year for core damage frequency (CDF) and less than 1E-06/year for large release frequency (LRF).
- Using the results and insights from the PRA, ensure that the COL applicant supported the RTNSS process, including the identification of structures, systems, and components (SSCs).
- Using the results and insights from the PRA, ensure that the COL holder supported regulatory oversight processes, as well as programs associated with plant operations (such as technical specifications, reliability assurance, human factors, and Maintenance Rule implementation).
- Using the results and insights from the PRA, ensure that the applicant identified and supported the development of specifications and performance objectives for plant design, construction, inspection, and operation (such as the ITAAC, RAP, technical specifications, and COL action items and interface requirements).

## Reactor Arena Objectives, Bases, and Goals (continued)

**Subarena: Advanced Non-Light-Water Reactors**

(Lead Office: RES)

### **Objective:**

Develop a coherent risk-informed, performance-based regulatory structure for design certification, licensing, and oversight of advanced non-LWRs.

A coherent risk-informed, performance-based regulatory structure would offer significant improvements in effectiveness and efficiency (compared to the structure that has evolved for LWRs). For example, such coherence would ensure that the safety reviews conducted by the NRC consider design and operational aspects in an integrated manner. The bases for developing such a regulatory structure for licensing and oversight of advanced non-LWRs are articulated in numerous Commission documents and policy statements. However, this guidance occurs largely in the context of existing and new LWRs and, consequently, needs to be adapted for advanced non-LWRs.

### **Bases:**

The bases for a coherent risk-informed, performance-based regulatory structure arise from the potential to realize benefits that are captured in the screening criteria that the NRC staff considers in undertaking regulatory improvement initiatives:

- **Effectiveness:** One hallmark of effectiveness is the ability to model the tradeoffs that are involved in a complex safety review. Sometimes, such tradeoffs are represented as the ability to achieve desired outcomes in the licensing process. A risk-informed, performance-based regulatory structure is inherently better able to do this, especially if it is applied in the early phases of developing a new regulatory structure for non-LWRs.
- **Effective Communication:** The explicit modeling of decision-making promotes transparency. Sometimes, the traditional prescriptive regulatory structure lack transparency because they tend to emphasize compliance with a prescribed quantity, rather than focusing on the safety function.
- **Research:** The NRC staff has conducted significant research into the models and methodologies for the risk-informed, performance-based regulatory structure and the products and expertise from this work are available for implementation. Particularly notable examples include NUREG-1860, NUREG/BR-0303, and SECY-05-0138. Specific details will need to be determined and guidance developed based on the particular technology and design aspects of the application.
- **Costs:** The implementation of a coherent risk-informed, performance-based regulatory structure for advanced non-LWRs will entail a combination of short- and long-term costs. The new regulatory approaches are likely to result in short-term costs. However, when considered in the context of implementing the Commission's strategic objectives, there are sound reasons to expect a significant reduction in the total cost to society.
- **Obstacles:** There are no apparent factors (e.g., adverse stakeholder reaction) that would preclude implementing a risk-informed, performance-based approach to the design certification, licensing, and oversight of advanced non-LWRs.

## Reactor Arena Objectives, Bases, and Goals (continued)

**Subarena: Advanced Non-Light-Water Reactors (continued)**

(Lead Office: RES)

### **Bases: (continued)**

The NRC developed its strategic planning process as a result of considerable effort (beginning in the late-1990s) to improve the agency's regulatory structure in a forward-looking way, while preserving the gains that the agency had achieved in operating reactor safety.

Using the most recent version of the Strategic Plan, development of a coherent risk-informed, performance-based regulatory structure for advanced non-LWRs will involve implementing the strategies that the Commission articulated in the goals of "Safety" and "Effectiveness."

Under "Safety" strategies, the Commission directed the staff to "Use sound science and state-of-the-art methods to establish risk-informed and, where appropriate, performance-based regulations." In addition, under "Effectiveness" strategies, the Commission directed the staff to "use performance-based regulation to minimize unnecessarily prescriptive requirements."

In addition, the Commission defined "Effectiveness" as the ability to achieve intended outcomes, which is the main thrust of a performance-based approach. These factors continue to be part of the draft Strategic Plan for the Fiscal Year (FY) 2007–2012 that the Commission has issued for public comment.

The basic infrastructure for the implementation of a risk-informed, performance-based approach exists at a high-level in Commission documents, such as the "White Paper on Risk-Informed and Performance-Based Regulation." The staff has also developed some specific guidance, including the risk-informed process for implementing the single-failure criterion (SECY-05-0138), but more may need to be developed. In many instances, the high-level documents superficially apply only to existing LWRs; however, more thorough study reveals considerable applicability to all reactor technologies. For example, the Reactor Oversight Process (SECY-99-007 and SECY-99-007A, as well as related staff requirements memorandum) provides a risk-informed, performance-based structure, although it is overlaid on top of existing LWR requirements.

### **Goals:**

The staff's risk-informed and performance-based goals for advanced non-LWRs relate to the following activities:

- Conduct the pre-application review of the Pebble-Bed Modular Reactor design, so as to facilitate the submittal of a design certification application which considers risk-informed and performance-based approaches.
- Develop a licensing strategy that considers risk-informed and performance-based approaches for the Next-Generation Nuclear Plant prototype that meets the intent of the Energy Policy Act of 2005.
- Participate in the Global Nuclear Energy Partnership and bring forth risk-informed and performance-based approaches in support of National policy objectives.

<b>Materials Arena Objectives, Bases, and Goals</b>	
<b>Subarena: Fuel Cycle</b>	(Lead Office: NMSS)
<b>Objective:</b>	
For fuel cycle facilities, make continuous improvement in licensing and oversight, and risk-inform new regulations as needed, while performing existing risk-informed functions.	
<b>Bases:</b>	
<p>SECY-99-100 and SECY-04-0182, as well as the related staff requirements memorandum (SRM), provide the conceptual framework for risk-informing the NRC's fuel cycle activities. Guidance on how to apply this framework is provided in "Risk-Informed Decision-Making for Material and Waste Applications," which is available in the NRC's Agencywide Documents Access and Management System (ADAMS), under Accession No. ML042730524. In particular, individual risk-informed applications must meet the established screening criteria.</p> <p>The screening criteria applied to the goals (below) of implementing the NRC's revised regulatory requirements, as specified in Title 10, Part 70, of the <i>Code of Federal Regulations</i> (10 CFR Part 70), would indicate that the given activity was undertaken to increase confidence in the margin of safety of fuel cycle facilities by requiring the use of a risk-informed approach to identify and manage items that are relied on for safety. Cost/benefit was not a consideration, and technical feasibility was known because two licensees had already implemented such systems. The revision of 10 CFR Part 70 is expected to reduce staff effort, while improving regulatory effectiveness, by providing more frequent updates of licensee design information and related risk information.</p>	
<b>Goals:</b>	
<p>The staff has established the following goals for risk-informed and performance-based activities in this subarena:</p> <ul style="list-style-type: none"> <li>• Implement the revised regulatory requirements of 10 CFR Part 70 by completing the review and approval of integrated safety analyses submitted by all affected facilities.</li> <li>• Revise the existing licensing guidance to reflect lessons learned from these reviews.</li> <li>• Complete revision of inspection guidance to make use of the resulting risk information to focus inspections.</li> <li>• Update the existing risk-informed decision-making guidance to reflect experience.</li> <li>• Overhaul the Fuel Cycle Oversight Program to make it more risk-informed and performance-based; this will include adopting appropriate approaches from the Reactor Oversight Program.</li> </ul>	

**Materials Arena Objectives, Bases, and Goals (continued)**

**Subarena: Byproduct Material**

(Lead Office: FSME)

**Objective:**

Utilize risk information on a case-by-case basis for byproduct material regulation, licensing, and oversight.

**Bases:**

NUREG/CR-6642, "Risk Analysis and Evaluation of Regulatory Options for Nuclear Byproduct Material Systems," documents the underlying analysis of byproduct material systems. (This report is not publicly available.) Insights from NUREG/CR-6642 and other studies have been incorporated into the NUREG-1556 series, "Consolidated Guidance about Materials Licenses," which provides NRC staff and licensees with information to support various byproduct applications. This material continues to provide input to the agency's risk-informed and performance-based rulemaking, licensing, and oversight activities.

In June 2001, the NRC published NUREG-1717, "Systematic Radiological Assessment of Exemptions for Source and Byproduct Material," which documents the staff's assessment of doses associated with byproduct and source material exemptions. NUREG-1717 also includes dose assessments for certain devices that are currently used under general or specific licenses that have been identified as candidates for use under exemptions. In addition, staff activities identified in SECY-07-0147, "Response to U.S. Government Accountability Office Recommendations and Other Recommendations to Address Security Issues in the U.S. Nuclear Regulatory Commission Materials Program," will address possible revisions to the agency's regulatory framework.

**Goals:**

The staff has established the following goals for risk-informed and performance-based activities in this subarena:

- Continue making incremental improvement (as practicable) to enhance the risk-informed and performance-based nature of rulemaking and guidance development, licensing, and oversight activities for byproduct materials.
- Encourage the industry and NRC licensees to use a risk-informed and performance-based approach in demonstrating compliance with the NRC's risk/dose criteria.



**Waste Arena Objectives, Bases, and Goals (continued)**

**Subarena: Spent Fuel Storage and Transportation**

(Lead Office: NMSS)

**Objective:**

Utilize risk information on a case-by-case basis to prioritize and address regulatory initiatives in spent fuel storage and transportation.

**Bases:**

SECY-99-100 and SECY-04-0182, as well as the related staff requirements memorandum (SRM), provide the conceptual framework for risk-informing the NRC's waste activities. Guidance on how to apply this framework is provided in "Risk-Informed Decision-Making for Material and Waste Applications," which is available in ADAMS, under Accession No. ML042730524. In particular, individual risk-informed applications must meet the established screening criteria.

In this subarena, the NRC staff is limited in its ability to risk-inform the agency's regulatory activities because it is not cost-beneficial to perform risk-assessment of each of the numerous storage or transport designs. As a result, the agency has conducted (or sponsored) risk assessments for a few selected designs. In addition, the staff may apply risk assessments to specific activities on a case-by-case basis, provided that the screening criteria are met. For example, the staff has completed and documented a pilot study PRA of a dry cask storage facility, and determined that the risk from that facility was negligibly small.

The goal described below meets the screening criterion for cost/benefit by assessing risk impacts by judgment.

**Goals:**

The staff has established the following goal for risk-informed and performance-based activities in this subarena:

- Produce risk-informed updated versions of NUREG-1536, "Standard Review Plan for Dry Cask Storage Systems," and NUREG-1567, "Standard Review Plan for Spent Fuel Dry Storage Facilities."

**Waste Arena Objectives, Bases, and Goals (continued)**

**Subarena: High-Level Waste Repository Safety**

(Lead Office: NMSS)

**Objective:**

Utilize risk information to prioritize and assess licensing information to implement the NRC's existing risk-informed framework for repository safety.

**Bases:**

Title 10, Part 63, of the *Code of Federal Regulations* (10 CFR Part 63) requires that an applicant for a license for a geologic repository must submit a system performance assessment, showing that the net risk (expected value of dose) is less than a limiting value. Such assessments provide quantitative information on features, events, and processes affecting risk. Consequently, NUREG-1804, "Yucca Mountain Review Plan," states that the NRC staff should use this risk information to focus its review on what is important to this performance criterion. Risk sensitivity studies have also been used to develop risk-informed guidance for inspections, and to model abstraction review strategies.

The value of this risk-informed framework is that it will enhance the staff's effectiveness and efficiency in reviewing the license application for the proposed high-level waste repository at Yucca Mountain, Nevada, and provide reasonable assurance of compliance with the regulations. Because the NRC has developed its own independent system performance assessment capability, technical feasibility has been demonstrated. Moreover, the cost of this approach is justified by the staff's enhanced efficiency in completing the review in the timeframe mandated by the statute.

**Goals:**

The staff has established the following goals for risk-informed and performance-based activities in this subarena:

- Develop Version 5.1 of the Total System Performance Assessment (TPA) computer code.
- Perform a risk-informed review of the Yucca Mountain repository license application.

**Waste Arena Objectives, Bases, and Goals (continued)**

**Subarena: Low-Level Waste and Decommissioning**

(Lead Office: FSME)

**Objective:**

Facilitate the application of risk-informed and performance-based approaches in implementing the NRC's rulemaking, licensing, and oversight functions for low-level waste and decommissioning on a case-by-case basis.

**Bases:**

The NRC staff engages with the agency's licensees and stakeholders (including the public) in making significant decommissioning decisions and implementing significant actions focusing on risk-significance and potential environmental impacts. The NRC's Office of Federal and State Materials and Environmental Management Programs (FSME), in coordination with the Office of Nuclear Regulatory Research (RES) and the Center for Nuclear Waste Regulatory Analysis (CNWRA), is making progress toward developing and evaluating probabilistic environmental models and codes for risk/dose analysis. Use of probabilistic distributions as inputs to uncertain physical and behavior parameters has also been increased. In addition, the agency has updated its decommissioning guidance and conducted training on the use of dose distributions (e.g., peak-of-the-mean, or mean-of-the-peaks) to demonstrate compliance with the dose criteria in Subpart E of Title 10, Part 20, of the *Code of Federal Regulations* (10 CFR Part 20). The NRC also uses probabilistic tools with uncertainty analysis to review and assess dose impacts to demonstrate compliance with the dose criteria set forth in Subpart E of 10 CFR Part 20.

**Goals:**

The staff has established the following goals for risk-informed and performance-based activities in this subarena:

- Continue to evaluate current dose modeling approaches for low-level waste and decommissioning, and provide recommendations for a path-forward to enhance the use of risk-informed and performance-based approaches in licensing reviews and regulatory implementation.
- Continue making incremental improvement (as practicable) in rulemaking and guidance development, licensing, and oversight, to enhance the use of risk-informed and performance-based approaches.
- Encourage the industry and NRC licensees to use a risk-informed and performance-based approach in demonstrating compliance with the NRC's risk/dose criteria.

## Recent Accomplishments and Near-Term Anticipated Accomplishments

This summary highlights the major risk-informed and performance-based initiatives that the staff of the U.S. Nuclear Regulatory Commission (NRC) has either completed over the past 6 months, or scheduled to be conducted over the next 6 months.

### 1. Fire Protection for Nuclear Power Plants

The staff continues its effort to implement the risk-informed Fire Protection Rule and conduct fire protection research activities. The following summaries highlight the past and planned accomplishments in this area:

- In 2004, the staff completed rulemaking to endorse a voluntary alternative risk-informed Fire Protection Rule for operating nuclear power plants, as set forth in Title 10, Section 50.48(c), of the *Code of Federal Regulations* [10 CFR 50.48(c)]. The final rule endorsed consensus standard NFPA-805, "Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants," promulgated by the National Fire Protection Association (NFPA). In addition, in conjunction with the rule, the Nuclear Energy Institute (NEI) developed NEI 04-02, "Guidance for Implementing a Risk-Informed, Performance-Based Fire Protection Program Under 10 CFR 50.48(c)," which the staff endorsed in Regulatory Guide (RG) 1.205, "Risk-Informed, Performance-Based Fire Protection for Existing Light-Water Nuclear Power Plants." The staff has also chosen two pilot plants (Oconee Nuclear Station and Shearon Harris Nuclear Power Plant) and, to date, 42 operating nuclear power plants have submitted letters of intent to adopt NFPA-805 as their licensing basis.
- During the past 6 months, as part of the NFPA 805 implementation process, the staff has conducted three pilot plant observation visits and conducted numerous public meetings with those pilots and the NEI 805 Task Force. The staff also issued a Regulatory Information Summary (RIS 2007-19) to formalize the "frequently asked questions" process, and participated in the NEI Fire Protection Information Forum. In addition, the staff is continuing its review of NEI's request for additional enforcement discretion.
- In the area of fire modeling, in May 2007, the NRC published NUREG-1824, "Verification and Validation of Selected Fire Models for Nuclear Power Plant Applications." The staff also initiated the next phase of the fire modeling project, which will consist of a collaborative effort with the Electric Power Research Institute to develop a fire model user's guide for nuclear power plant applications. In addition, the staff held the Fire Model Phenomena Identification and Ranking Technique meeting and issued NUREG/CR-6931, regarding the Cable Response to Live Fire test project, as a draft for public comment.
- Over the next 6 months, the staff expects to conduct two additional NFPA 805 pilot observation visits and a review of the fire-related probabilistic risk assessment (PRA) for each pilot plant. The staff will also continue to conduct monthly FAQ-related public meetings with the NEI 805 Task Force and reach a resolution regarding NEI's request for additional enforcement discretion. In addition, the staff plans to host a fire protection workshop for regional inspectors.

## **2. Digital Systems PRA**

The Risk-Informing Digital Instrumentation and Control Task Working Group (TWG), in support of the Digital Instrumentation and Control Steering Committee, is addressing issues related to the risk assessment of digital systems. In so doing, the TWG is placing particular emphasis on risk-informing digital system reviews for operating plants, new reactors, and fuel cycle facilities. The TWG's efforts will be consistent with the NRC's Policy Statement on PRA, which states, in part, that the agency supports the use of PRA in regulatory matters "to the extent supported by the state-of-the-art in PRA methods and data and in a manner that complements the NRC's deterministic approach and supports the NRC's traditional defense-in-depth philosophy." Toward that end, the TWG issued the Digital System Project Plan on July 12, 2007, and has held three public meetings with industry stakeholders since April 2007. Also, in November 2007, the staff plans to issue draft interim staff guidance (ISG) for use in reviewing current methods in modeling digital systems for design certification and combined operating license (COL) application PRAs. (The staff plans to issue the final ISG in March 2008.) In addition, over the next 6 months, the staff plans to publish a contractor-prepared NUREG-series report on approaches for using traditional PRA methods for digital systems, and another on the benchmark implementation of two dynamic methodologies for reliability modeling of digital systems. These two reports are part of the agency's overall effort to advance the state-of-the-art in digital systems risk and reliability modeling to the point where it will be possible to risk-inform licensing reviews for digital systems and incorporate related models into nuclear power plant PRAs.

## **3. Risk-Informed Environment**

In December 2006, the staff issued an action plan entitled "Fostering a Risk-Informed Environment in the Office of Nuclear Reactor Regulation." That plan outlined five major actions designed to broaden the staff's knowledge and application of risk insights in its day-to-day activities. Specifically, those five actions related to staff qualification plans and training, first-line supervisors' risk knowledge, and knowledge management tools. Since that time, the staff has completed all five actions. The staff also added a unit on risk-informed regulation to the office qualification plans, and created a Web-based forum for knowledge management in the area of risk-informed regulation. In addition, an interoffice PRA Training Focus Group developed two new basic courses on risk-informed regulation for managers and non-PRA technical staff. Those courses were piloted in the fourth quarter of Fiscal Year (FY) 2007, and are now included in the curriculum offered by the NRC's Technical Training Center.

## **4. Risk-Informed Technical Specifications (RITS)**

The staff continues to work on the RITS initiatives to add a risk-informed component to the standard technical specifications (STS). The following summaries highlight the major accomplishments in this area:

- Initiative 1, "Modified End States," would allow equipment to be repaired during hot-shutdown rather than cold-shutdown. The topical reports supporting this initiative for boiling-water reactor (BWR), Combustion Engineering (CE), and Babcock & Wilcox (B&W) plants have been approved, and revisions to the BWR and CE STS have been made available. The Westinghouse

topical report, submitted in September 2005, is currently under review, with approval anticipated in FY 2008, while revisions to the B&W STS are expected to be issued in January 2008.

- Initiative 4b, “Risk-Informed Completion Times,” modifies technical specification completion times to reflect a configuration risk management approach that is more consistent with the approach described in the Maintenance Rule, as specified in 10 CFR 50.65(a)(4). The staff also approved Revision 0 of the NEI 06-09, “Risk-Managed Technical Specifications (RMTS) Guidelines: Industry Guidance Document,” in April 2007, and issued the license amendment for the first pilot plant (South Texas Project) in July 2007. In addition, the submittal from the second pilot plant (Ft. Calhoun Station) is expected in FY 2008.
- Initiative 5b, “Risk-Informed Surveillance Frequencies,” relocates surveillance test intervals to a licensee-controlled document and provides a risk-informed method to change the intervals. Toward that end, the staff approved the industry’s guidance document (Revision 0 of NEI 04-10) in September 2006, along with the license amendment for the pilot plant (Limerick Generating Station). Revision 1 of NEI 04-10, which proposes to relocate staggered testing requirements and makes other administrative changes, is currently under staff review, with approval anticipated in FY 2008. In addition, the staff is currently reviewing the associated Technical Specification Task Force guidance (TSTF-425) to revise the STS, which the staff expects to approve and make available via the Consolidated Line Item Improvement Process in FY 2008.
- Initiative 6, “Modification of Limiting Condition for Operation (LCO) 3.0.3, ‘Actions and Completion Times,’” revises the surveillance requirement LCO by requiring that risk be taken into account in determining the correct course of action. A revised CE topical report will be submitted for staff review in Fall 2007. That topical report will support a future revision of the CE Standard TS to incorporate this initiative. In addition, a topical report for Westinghouse plants is expected to be submitted in FY 2008.

## **5. Risk-Informed Decision-Making**

The Office of Nuclear Reactor Regulation (NRR) developed Revision 1 of its Office Instruction LIC-504, “Integrated Risk-Informed Decision-Making for Emergent Issues,” to address recommendations that the U.S. Government Accountability Office raised in its report, GAO-04-415, entitled “Nuclear Regulation — NRC Needs To More Aggressively and Comprehensively Resolve Issues Related to the Davis-Besse Nuclear Power Plant’s Shutdown,” issued in May 2004. The staff subsequently issued Revision 2 of LIC-504 on February 12, 2007, to incorporate comments from pilot applications of Revision 1. In addition, the staff presented an overview of LIC-504, as well as training on critical thinking and decision-making, to the NRR Executive Team and Leadership Team on April 19, 2007, and to the NRR Branch Chiefs on June 26, 2007.

## **6. Risk-Informed Rulemaking Activities Currently in Progress**

- The staff prepared a proposed rule containing emergency core cooling system

evaluation requirements, as an alternative to those specified in 10 CFR 50.46, "Acceptance Criteria for Emergency Core Cooling Systems (ECCS) for Light-Water Nuclear Power Reactors," which could be used in lieu of the current requirements. That proposed rulemaking is designed to redefine the large-break loss-of-coolant accident (LOCA) requirements to provide a risk-informed alternative maximum break size. Since October 2006, the staff produced a draft final rule and briefed the NRC's Advisory Committee on Reactor Safeguards (ACRS). In response, the ACRS recommended that Commission should not issue the proposed rule in its present form. As a result, the staff prepared SECY-07-0082, "Rulemaking To Make Risk-Informed Changes to Loss-of-Coolant Accident Technical Requirements: 10 CFR 50.46a, 'Alternative Acceptance Criteria for Emergency Core Cooling Systems for Light-Water Nuclear Power Reactors'," dated May 16, 2007, which provided a plan (including resource and schedule estimates) for responding to the ACRS recommendation and related comments. Then, in an SRM related to SECY-07-0082, August 10, 2007, the Commission agreed with the staff's recommendation that the rulemaking should be assigned a medium priority. Nonetheless, the SRM also stated the Commission's expectation that the staff would continue to make progress on the 10 CFR 50.46 rulemaking and apply resources to the effort in FY 2008. The staff anticipates issuing the final NUREG-series report on expert elicitation results for LOCA frequencies by December 2007.

- In 2005, the staff completed the development of the technical basis to support a risk-informed rulemaking to modify the pressurized thermal shock screening criteria in 10 CFR 50.61. That technical basis was reviewed at various stages by the NRC's external stakeholders, a select external peer review panel of technical and regulatory experts, the ACRS, and various NRC technical staff. In addition, in July 2006, the staff made the technical basis reports available for public review and comment, and published the final reports in December 2006. The staff also issued SECY 07-0104, "Proposed Rulemaking — Alternate Fracture Toughness Requirements for Protection against Pressurized Thermal Shock Events (RIN 3150-AI01)" on June 25, 2007. That paper requested the Commission's approval to publish for public comment a proposed rule that would provide new fracture toughness requirements for pressurized-water reactors. In response, on September 11, 2007, the Commission directed the staff to proceed with soliciting public comments. The proposed rule was published in the *Federal Register* for public comment on October 3, 2007 (72 FR 56275).
- The staff received and evaluated public comments on the Advanced Notice of Proposed Rulemaking (71 FR 26267) regarding whether to issue a risk-informed and performance-based revision of 10 CFR Part 50 for advanced reactors (which would become 10 CFR Part 53). After considering those comments, the staff prepared SECY-07-0101, "Staff Recommendations Regarding a Risk-Informed and Performance-Based Revision to 10 CFR Part 50 (RIN 3150-AH81)," dated June 14, 2007. In that paper, the staff recommended that the Commission should approve deferring the rulemaking until after the development of the licensing strategy for the Next-Generation Nuclear Plant or receipt of a design certification or license application for the Pebble Bed Modular Reactor. In response, in an SRM dated September 10, 2007, the Commission approved the staff's recommendation.

## **7. High-Level Waste**

The staff completed Version 5.1 of the Total-System Performance Assessment code in June 2007, followed by a related comprehensive user's guide in July 2007.

The purposes of these efforts were to (1) facilitate calculations beyond 10,000 years, (2) incorporate proposed revisions to the regulatory requirements specified in 10 CFR Part 63, and (3) accommodate a review of potential U.S. Department of Energy design changes.

## **8. Byproduct Materials Rulemaking**

The Commission approved the final rulemaking regarding exemptions from the licensing and reporting requirements specified in 10 CFR Parts 30, 31, 32, and 150 for general licenses and distribution of byproduct material (SECY-07-0113).

This rulemaking was risk-informed, in part, by NUREG-1717, "Systematic Radiological Assessment of Exemptions for Source and Byproduct Materials."

The Commission published the final rule in the *Federal Register* on October 16, 2007 (72 FR 58473).

## **9. Analytical Tools for Risk Applications**

For Version 7 of the Systems Analysis Program for Hands-on Analysis and Integrated Reliability Evaluations (SAPHIRE) code, the staff completed a module to perform uncertainty analysis for importance measures. In addition, over the next 6 months, the staff plans to complete a modification to SAPHIRE 7 to implement a new common-cause failure evaluation module, and complete the SAPHIRE 8 beta release for acceptance review.

## **10. Industry Trends Program Support**

Over the past 6 months, the staff published the following contractor-prepared NUREG-series reports:

- NUREG/CR-6932, "Baseline Risk Index for Initiating Events (BRIIE)"
- NUREG/CR-6268, Revision 1, "Common-Cause Failure Database and Analysis System: Event Collection, Classification, and Coding"
- NUREG/CR-6928, "Industry-Average Performance for Components and Initiating Events at U.S. Commercial Nuclear Power Plants"

In addition, the staff updated the NRC's public Web site with trends, charts, and graphs for system and component studies, common-cause failures, and initiating events through FY 2005.

## **11. Reactor Performance Data Collection Program**

Over the past 6 months, the staff updated the Integrated Data Collection and Coding System with FY 2007 data and provided the data to the Operating Experience Clearinghouse. In addition, the staff updated the agency's LERSearch database to reflect the latest licensee event reports (LERs) and to add LERs from 1981.

The staff will further enhance that database in FY 08 to provide additional



search options and provide more risk-related operational data.

## **12. Standardized Plant Analysis Risk (SPAR) Model Development**

Over the past 6 months, the staff completed the following SPAR model development activities:

- cut-set-level reviews of 17 models
- the Browns Ferry Unit 1 interim model (to support the plant's restart in May 2007)
- six external events models, including two to support the State-of-the-Art Reactor Consequence Analyses
- two new next-generation low-power/shutdown models

The staff also initiated a project to extend the SPAR models for three plant classes to support analyses beyond Level 1. In addition, an addendum to the memorandum of understanding between the EPRI and the NRC's Office of Nuclear Regulatory Research (RES) was approved by RES to address the resolution of key PRA-related technical issues with industry stakeholders.

In FY 2008, the staff will continue to implement enhancements to the Revision 3 SPAR models and complete additional external events and low-power/shutdown models to support the Accident Sequence Precursor program and the Significance Determination Process. In addition, the staff plans to extend the Level 1 SPAR models to incorporate containment systems for six additional plant classes.

## **13. Phased Approach to PRA Quality**

The increased use of PRAs in the NRC's regulatory decision-making process requires consistency in the quality, scope, methodology, and data used in such analyses. A key aspect of implementing a phased approach to PRA quality is the development of PRA standards and related guidance documents. To achieve that objective, professional societies, the nuclear industry, and the staff have undertaken initiatives to develop national consensus standards and guidance on the use of PRA in regulatory decision-making.

Over the next 6 months, the staff expects to initiate work on Revision 2 of RG 1.200, "An Approach for Determining the Technical Adequacy of Probabilistic Risk Assessment Results for Risk-Informed Activities." That revision will endorse the "Level 1 and Large Early Release Frequency (LERF) PRA Standard (ASME/ANS RA-S-2007), promulgated by the American Society of Mechanical Engineers (ASME) and the American Nuclear Society (ANS), which applies to at-power internal events, internal fire events, and external events.

With the issuance of Revision 1 of RG 1.200, which endorsed the ASME standard for a Level 1/LERF PRA of internal events at-power, and in anticipation of Revision 2 of RG 1.200, the staff also began developing Web-based training on the use of RG 1.200, which will be completed early in 2008. In addition, the staff entered into a cooperative agreement with ASME to develop training on its Level 1/LERF PRA standard for internal events at-power. That training will involve three major modules. Module 1, which will be ready late in 2007, will be Web-based and targeted toward both analysts and managers. Module 2, which will be ready early in 2008, will also be Web-based

and targeted toward analysts and managers. Module 3, which will be ready in mid-2008, will be classroom training targeted exclusively toward PRA analysts. Finally, the staff plans to issue draft NUREG-1855, "Treatment of Uncertainties from PRAs in Risk-Informed Decision-Making," for public review and comment. That NUREG-series report provides information and guidance on uncertainties associated with PRA, including their impact on PRA results and decision-making.

#### **14. Risk Insights in Support of New Reactor License Application Reviews**

In September 2007, the staff completed the development of risk insights for the Advanced Boiling Water Reactor (ABWR). The ABWR risk insights will assist the staff in performing risk-informed review of the COL application for South Texas Project Units 3 and 4. The staff is also developing risk insights for the AP1000 and ESBWR designs. These risk insights are expected to be completed in the near future to support the review of upcoming COL applications.