

Part 3: Corporate Management Strategies

Chapter 1. Staff Training to Support Implementation of Risk-Informed Regulation

Kenneth Raglin, Manager

Overview

The NRC staff uses probabilistic risk assessment (PRA) and risk management as important elements of its licensing and regulatory processes. As the agency shifts to greater use of and reliance on PRA methods and risk-informed regulation, all technical staff members, including inspectors, will need to develop an understanding of the strengths and limitations of PRA and other risk methods and their use. In 1994, the Commission endorsed the PRA Implementation Plan to as a means of achieving the concepts in the PRA policy statement. To support the goal of improved regulatory activities through increased use of PRA technology, the plan included an extensive training program. Training of the staff is a critical part of the change in the regulatory culture of the agency.

Three levels of PRA users were identified and a PRA curriculum was developed. The first broad category of PRA user is the Basic User. This category consists of staff who use PRA results and require some basic information on how PRAs are performed and the results are obtained. The second category is called the Advanced User and consists of staff who work with PRA models or manage contractor efforts with PRA models. The Advanced User will require more extensive training. The final category is the Expert Practitioner. This group consists of staff who perform quality assurance and expert advisory functions as well as develop new PRA models.

PRA Training Program

The PRA training program is designed to assist staff members to develop new knowledge, skills, and abilities (KSAs) in PRA methods and statistics. The current PRA curriculum is described in NUREG/BR-0228 "Guidance for Professional Development of NRC Staff in Regulatory Risk Analysis." This document provides a summary of suggested training programs recommended for Nuclear Regulatory Commission personnel who either perform or use the results of probabilistic risk assessments (PRAs) in their day-to-day work activities. Tasks range from using PRA results to working with PRA models. This document is designed to allow the formulation of training programs based on job requirements, educational background, and PRA experience.

As the level of KSAs move from Basic User to Advanced User to Expert Practitioner, less information can be gained in short training courses, and greater emphasis must be placed on formal education and experience. Consequently, the PRA curriculum courses emphasize KSAs to meet the needs of Basic and Advanced Users. Placement of NRC technical staff positions into one of the three KSA categories is the responsibility of NRC line management. NUREG/BR-0228 provides recommendations for this placement and recommended course sequences.

The current curriculum consists of 13 courses: Probability and Statistics for PRA, PRA Basics for Regulatory Applications, PRA Insights into IPEs, PRA for Technical Managers, PRA Technology and Regulatory Perspectives, System Modeling Techniques for PRA, SAPHIRE Basics, Advanced SAPHIRE, Human Reliability Assessment, External Events, Accident Progression Analysis, Accident Consequence Analysis, and Risk Assessment In Event Evaluation. Descriptions of these course can be found in the Technical Training Center's on-line course catalog.

From FY 1995 through FY 2000, some 1976 students have attended PRA curriculum courses; an average of 329 students a year. Attendance peaked in FY 1998 with 507 students. 545 students have attended the PRA Basics for Regulatory Applications course, 272 have attended the PRA for Technical Managers course since its creation in 1997 and 255 students have attended the PRA Technology and Regulatory Perspectives course since its inception in 1998.

Current Initiatives

The current curriculum has evolved to meet staff needs and has been revised as the agency's use of risk insights has matured. The PRA Technology and Regulatory Perspectives course, for example, is the basic course required for all reactor inspector personnel. The course content has been revised and is currently undergoing further review to specifically support the needs of the Reactor Oversight Process. Future revisions will further emphasize the theory, basis, and utilization of the probabilistic-based Significance Determination Process. The course workshops are being redesigned to provide an opportunity for students to utilize established guidance and tools of the Reactor Oversight Process to plan an inspection and evaluate the significance of inspection findings using the SDP. Target date for completion of the course revisions is March 2001. The course has met a critical need during the transition to risk-informed regulation.

The curriculum is also expanding to support NMSS' move to risk-informing its programs. NMSS is developing a three tier approach to staff training. Tier 1 courses would be aimed at managers and supervisors, Tier 2 courses at NMSS technical staff and Tier 3 courses at risk analysts and specialists. Development of the first Tier 2 course is underway. A higher level version of that course will become the first Tier 1 course. Tier 3 courses will likely utilize the agency's Form 368 process for external training.

The working title of the first course is "Introduction to Risk Assessment in NMSS." The course is being developed through HR's PRA training agreement with Idaho National Engineering and Environmental Laboratory (INEEL). The purpose of the course is to provide students with an understanding of:

- Why risk concepts are used in the NRC
- What risk methods are being used, and what students should know about these risk concepts, and
- How the risk concepts are applied, and how the application of risk concepts influences regulatory decision making.

Course topics include:

1. Introduction - NRC Policy on the Use of Risk Information
2. Framework for Risk-Informed Regulation in NMSS
3. Risk Concepts and Methodology
4. Application of Risk Insights to Regulatory Decision Making Activities (Case Studies)
5. Risk Communication

Detailed course objectives have also been developed. Course development started in June, 2000 and the course was successfully piloted the week of September 11, 2000. However, significant work remains before the course is ready for implementation. The current goal is to make the first presentation in December, 2000. Five presentations are planned for FY 2001. Current projections call for approximately 400 headquarters and regional staff to attend the training.

NRR has formed a Working Group on Improving Risk Expertise. The working group is considering two main issues: (1) options for improving probabilistic-based SDP understanding and use and (2) expanding the number of individuals capable of utilizing NRC PRA software tools to perform and interpret basic quantitative risk analysis, and who can (through work experiences) develop a skill set useful for the review of more advanced risk analyses. These individuals would assist the Senior Reactor Analyst's (SRA's) review of issues arising from the probabilistic-based SDPs. The working group is also reviewing improvements in SRA training and qualification. Development of an IMC 1245 standard qualification criteria for SRA certification is being considered along with ways to shorten the time required to qualify as an SRA. These might include shorter SRA rotations and identification of efficiencies in the SRA training course series.

NUREG/BR-0228 "Guidance for Professional Development of NRC Staff in Regulatory Risk Analysis" will also be updated as the new NMSS curriculum is refined and revisions to the SRA qualification program are identified.