Table of Accomplishments

Activity	Accomplishment
Reactor Oversight Process SA-1	The most recent self-assessment (SECY-05-0070) concluded that the risk-informed ROP was generally effective in monitoring the activities of operating nuclear power plants and in focusing the agency's resources on significant performance issues for calendar year 2004. The staff continues to pursue initiatives to improve performance indicators and the Significance Determination Process (SDP). Nonetheless, the timeliness of the SDP continues to challenge the staff in instances where inspection findings are potentially greater than "green." As a result, the staff continues to work on initiatives, defined by the SDP Task Action Improvement Plan (which is tracked in the Directors' Quarterly Status Report (DQSR)), to address timeliness and other improvements to the SDP. In June 2005, the staff tested the effectiveness of a newly developed inspection procedure for engineering design inspections per SECY-04-0071, "Proposed Program to Improve the Effectiveness of the Nuclear Regulatory Commission Inspections of Design Issues."
Industry Trends Program Support SA-3	Since the last RIRIP update, the staff has continued to support the NRC's Industry Trends Program (ITP) by analyzing and trending the operating experience data contained in its databases. This included updating trends for initiating events, component and system reliability, common-cause failures, and fire events, and then providing this information on the internal and public RES Web sites.
Reactor Performance Data Collection Program SA-4	In September 2005, the Integrated Data Collection and Coding System (IDCCS) was updated with the latest quarterly data available through August 2005. The data collected include component and system failures, demands on safety systems, initiating events, fire events, and common-cause failures. The data, and data-analysis results, are stored in database systems for use by the NRC staff as part of other regulatory processes to help identify potential safety issues. These include the Industry Trends Program (ITP), the Accident Sequence Precursor (ASP) Program for evaluating the risk associated with operational events and/or conditions, and the Reactor Oversight Process (ROP). In addition, the data are used as input for the risk assessment models known as Standardized Plant Analysis Risk (SPAR) models. The database systems include the Integrated Data Collection and Coding System (IDCCS), Reliability and Availability Data System (RADS), Common-Cause Failure Database, Fire Events Database, and ASP Events Database. RES continues to develop and maintain the operating experience database systems.

Activity	Accomplishment
Accident Sequence Precursor (ASP) Program SA-5	In October 2004, the staff provided input to the NRC's Office of the Chief Financial Officer (OCFO) concerning significant precursors through June 2004. In September 2005, the staff forwarded to the EDO the annual report to document the status and results of the ASP program. The risk associated with operational events and/or conditions is evaluated under the Accident Sequence Precursor (ASP) Program by systematically reviewing and evaluating operating experience to identify precursors to potential severe core damage sequences, documenting precursors, categorizing them by plant-specific and generic implications, and providing a measure of trends associated with nuclear plant core damage risk.
High-Level Waste (HLW) Program SA-7	Development of seven HLW integrated inspection procedures using risk insights was completed by September 2005. In July 2003, the NRC issued the "Yucca Mountain Review Plan — Final Report" as NUREG-1804, Revision 2. The Yucca Mountain Review Plan provides guidance to staff on implementing the risk-informed, performance-based regulations of 10 CFR Part 63. The staff will use the Yucca Mountain Review Plan to ensure that licensing reviews are risk-informed and the proper level of effort is focused on areas important to the safety of the potential geologic repository at Yucca Mountain, Nevada. In addition, the staff is using risk insights to develop a risk-informed Yucca Mountain inspection program. The staff is also refining the current total-system performance assessment (TPA) code to better enable calculations beyond 10,000 years. The staff is integrating risk insights and has developed a License Application Project Plan to guide the process for conducting and documenting the license application review. The staff intends to refine the risk insights baseline as risk information becomes available and to utilize the baseline in reviewing a Yucca Mountain license application and conducting other regulatory activities.
Digital Systems Probabilistic Risk Assessment SA-9	In June 2005, RES staff completed a report documenting the results of the review of EPRI 1002835, "Guideline for Performing Defense-in-Depth and Diversity Assessments for Digital Upgrades, Applying Risk-Informed and Deterministic Methods." This letter report identified insights and issues of digital system modeling. The letter report was also used in the acceptance review of EPRI Topical Report TR-1002835. In June 2005, RES staff presented the "Digital Systems PRA" project plan, status of project, and tasks that have been completed, or are in progress, to the Advisory Committee on Reactor Safeguards, Digital Instrumentation and Control Subcommittee. In August 2005, RES staff completed a report describing how agencies and industries model reliability of digital systems, including failure data and model applications.

Activity	Accomplishment
Risk Management Technical Specifications (RMTS) SA-10	The staff continued to work on risk-informed initiatives to modify the NRC's standard technical specifications: • Initiative 1, "Modified End States," Combustion Engineering (CE) TSTF-422, "Risk-Informed Modification to Selected Action End States for Pressurized-Water Reactors Operated by the CE Owners' Group," and the Boiling-Water Reactor (BWR) TSTF-423, "Risk-Informed Modification to Selected Action End States for Boiling-Water Reactors." In July 2005, the TSTF-422 safety evaluation was published in the *Federal Register*, requesting public comment, as part of the Consolidated Line Item Improvement Process (CLIIP). • Initiative 4b, "Risk-Informed Completion Times." The industry and staff met in March 2005 to define RMTS Initiative 4b requirements with respect to PRA and configuration risk management plan (CRMP) scope and capability. South Texas Project (STP) had already submitted their pilot plant license amendment request in August 2004. Based on a visit to STP earlier in the year to observe their CRMP capabilities, the staff provided STP with requests for additional information (RAIs) in June 2005. • Initiative 7, "Non-TS Support System Impact in TS System Operability." The staff had issued an SER concerning TSTF-372, "Addition of LCO 3.0.8, 'Inoperability of Snubbers'," and a safety evaluation was published in the *Federal Register* (November 2004) requesting public comment, as part of the CLIIP Process. Comments were received and addressed and the notice of availability was published in the *Federal Register* in May 2005. .
Fire Protection SA-11	In February 2003, the staff held a facilitated workshop to discuss risk-informing the post-fire safe-shutdown electrical circuit inspections. The purpose of this workshop was to exchange information with our stakeholders concerning risk-informing the inspections. The staff also held a workshop for a number of regional inspectors in July 2004. The staff issued Regulatory Issue Summary (RIS) 2004-03 on March 2, 2004, to discuss risk-informing this process. The staff revised the inspection procedure, and held another public workshop in October 2004 to discuss how the associated circuit inspections will be risk-informed. In December 2004, a revision to RIS 2004-03, which included the risk-informed inspection process and notification that circuit inspections would resume in January 2005, was issued. Subsequently, the staff issued a second RIS for public comment in May 2005 that re-clarifies compliance expectations with regards to circuits.

Activity	Accomplishment
Incorporate Risk Information into the Decommissioning Regulatory Framework SA-12	During FY 2005 the staff used a risk-informed approach to inventory and evaluate information from 91decommissioning sites to identify which of these sites had subsurface contamination and what caused the contamination. This information was used to identify the types of facilities, components, and operational activities that could have a higher "risk", or potential, for subsurface contamination. Based on these results, risk-informing general inspection guidance was completed in September 2005. In September 2005, the staff also completed draft decommissioning guidance which was published that same month as NUREG-1757, Supplement 1, "Consolidated NMSS Decommissioning Guidance: Updates to Implement the License Termination Rule Analysis - Draft Report for Comment." It addresses LTR Analysis issues in SECY-03-0069. New guidance for the restricted use/institutional control issue provides a risk-informed graded approach for institutional controls at restricted use sites that allows licensees to tailor the type of institutional controls and the specific restrictions on future site use based on a risk framework and insights from dose assessments. This new guidance also includes risk-informed approaches for long-term monitoring and maintenance at restricted use sites. New guidance was also developed for another decommissioning topic on use of engineered barriers. This draft guidance includes a risk-informed graded approach for engineered barriers and an example of how the risk-informed approach is applied to designing erosion protection barriers.

Activity	Accomplishment
Develop a regulatory guide and guidance documents for related technical issues on PRA technical acceptability EF-2	The staff completed the five pilot applications of Regulatory Guide 1.200 for trial use. Lessons learned from the pilots were documented and issued; a public meeting was held on June 16, 2005, to discuss the result of the pilots and the impact on Appendices A and B of RG 1.200. The American Society for Mechanical Engineers (ASME) has issued Addendum B of their PRA standard (based on NRC staff comments documented in Appendix A of RG 1.200) for trial use.
Develop structure for new plant licensing EF-6	The staff has developed and implemented a plan to develop a regulatory structure for new plant licensing. The structure includes four major activities: 1. Development of a technology-neutral framework including guidelines and criteria for the regulatory structure 2. Subsequent derivation of content of a set of technology-neutral requirements 3. formulation of guidance for applying the (technology-neutral) framework on a technology-specific basis 4. formulation of technology-specific regulatory guides The staff has only performed work to date on Part 1 (technology-neutral framework) and associated policy and technical issues for new plant licensing. In July 2005, the staff issued a Commission paper regarding issues related to the level of safety and integrated risk.
Methods for Assessing Fire Safety in Nuclear Facilities EF-7	The development of risk-informed, performance-based fire standards and regulations requires a sound understanding of fire and its contribution to power plant risk. A fire research program has been developed and is being implemented to address the complex issues associated with fire risk and to support risk-informed changes to these standards and regulations. The staff worked with the National Fire Protection Association (NFPA) to develop a performance-based risk-informed fire protection standard (NFPA 805) for nuclear power plants. RES and the Electric Power Research Institute (EPRI) are providing the technical basis for this implementation by developing fire PRA methods, tools, and data, as documented in final NUREG/CR-6850 (EPRI 10011989), "EPRI/NRC-RES Fire PRA Methodology for Nuclear Power Facilities," – issued in August 2005 – and providing verification and validation (V&V) of a range of fire models. Also, RES and EPRI held a highly successful public workshop in June 2005 to discuss this methodology. Industry needs this fire PRA methodology and the fire model V&V tools to justify changes to fire protection programs. In addition, RES is developing guidance to assist NRR specialists in reviewing these risk-informed analyses.

Activity	Accomplishment
Human Reliability Analysis (HRA) Good Practices EF-9	In July 2004, the staff issued draft NUREG-1792, "Good Practices for Implementing Human Reliability Analysis (HRA)," for public comment. Following the incorporation of public comments, the staff published the final NUREG-1792 in April 2005. The HRA good practices were developed as part of the NRC's activities to address PRA quality issues and provide guidance for implementing RG 1.200. NUREG-1792 provides a technical basis for performing an HRA or formulating questions to evaluate the quality of an HRA. In June 2005, the staff worked with domestic and international developers and users of HRA methods to evaluate existing HRA methods against NUREG-1792. The results will be published in a NUREG/CR in FY 2006.
Advanced Reactors (ESBWR, ACR-700) EF-10	The staff completed its preliminary generic development for modeling passive systems in PRAs in December 2004. In support of the upcoming design certification review of the General Electric Company's Economic and Simplified Boiling Water Reactor (ESBWR), the staff has used the information learned from the generic model development to prepare a report summarizing the good practices in modeling passive systems in PRAs and identification of potential pitfalls in some modeling techniques. This report has been transmitted to NRR. The generic model will also be used to develop an ESBWR-specific passive system model to provide staff with an independent tool to assess the adequacy of the ESBWR PRA portion of the design certification application. Because of Dominion's withdrawal of interest in the ACR-700 and in conformance with AECL's letter, dated February 16, 2005, the work on the ACR-700 is in the process of an orderly shutdown with the preparation of documentation to summarize all of the information learned. This work started with the CANDU3 information (an AECL application subsequently withdrawn), and it is possible that the ACR-700 (or a subsequent design) may become active at some time in the future. This information has been documented so that it will be available if needed in the future. In September 2005, the staff completed a draft report identifying good practices for modeling passive systems for the ESBWR.

Activity	Accomplishment
ROP Support — Mitigating Systems Performance Index and Risk Assessment Standardization Project EF-20	The NRC's Office of Nuclear Regulatory Research (RES) supports the agency's Reactor Oversight Process (ROP) by developing and piloting the Mitigating Systems Performance Index (MSPI). MSPI monitors risk associated with changes in performance of selected mitigating systems, accounting for plant-specific design and performance data. As such, the MSPI enhances the safety of nuclear plants by addressing known problems with the existing Safety System Unavailability Performance Indicator, and providing a measure of both system reliability and availability. Public workshops for MSPI implementation were held monthly throughout FY 2005. As part of the Risk Assessment Standardization Project (RASP) support effort, the staff developed final guidelines for internal events during power operation in April 2005. In addition , as part of RASP support, final Accident Sequence Precursor (ASP) expert elicitation guidelines were issued in June 2005.
SPAR Model Development Program EF-21	In April 2005, RES staff provided NRR and regional offices with a progress report – for the first half of FY 2005 – on enhanced Revision 3 SPAR model accomplishments, including equipment failure data update and an improved loss of offsite power (LOOP) module. SPAR models are used to (1) evaluate the risk significance of inspection findings in SDP Phase 3 analyses; (2) evaluate risk associated with operational events/conditions in the ASP program; (3) improve the quality of probabilistic risk assessments (PRAs) — including identification of modeling issues that are risk-significant, and ranking and prioritizing those issues as part of the PRA quality efforts (e.g., as part of R.G. 1.200); (4) perform analyses in support of Generic/Safety Issue resolution (e.g., GSI-189 and GSI-191) by screening (or prioritizing) analyses, performing detailed analysis to determine if licensees should be required to make change(s) to their plants, assessing whether NRC should modify or eliminate an existing regulatory requirement, and performing flexible and quick analyses that result in minimum resources required to perform generic studies; (5) perform analyses in support of the staff's risk-informed review of license amendments (e.g., tech spec changes, notices of enforcement discretion (NOEDs), fire-protection requirements); and (6) independently verify the Mitigating Systems Performance Index (MSPI).

Activity	Accomplishment
10 CFR 50.46 [including frequency estimates for loss-of-coolant accidents (LOCA) and single-failure criterion (SFC)] EF-22	In March 2005, the staff forwarded the proposed rule defining the risk-informed ECCS requirements and evaluation criteria for associated plant design and operational changes to the Commission (SECY-05-0052). On July 29, 2005, the Commission approved publication of the proposed rulemaking subject to the comments and specific changes provided in the SRM. In addition, the Commission directed that the proposed rule be issued for public comment by October 28, 2005. The draft NUREG-1829, "Estimating Loss-of-Coolant Accident (LOCA) Frequencies Through the Elicitation Process," provides preliminary LOCA frequency estimates which have been developed using an expert elicitation process to consolidate service history data and insights from probabilistic fracture mechanics (PFM) studies with the knowledge of plant design, operation, and material performance. Separate BWR and PWR piping and non-piping passive system LOCA frequency estimates have been developed as a function of effective break size and operating time. The document was issued as draft NUREG-1829 for public comment in June 2005. In an SRM, dated March 31, 2003, the Commission directed the staff to pursue "a broader change to the single failure criterion" (broader than just the relaxation of the requirement to be able to mitigate a large-break LOCA coincident with loss of offsite power with an additional single failure) and inform the Commission of its findings. In response to this SRM, the staff developed a Commission paper (SECY-05-0138) and the associated technical report in August 2005. This Commission paper presented the results of the staff's technical evaluation regarding a risk-informed and performance-based change to the single-failure criterion.