

CHAPTER 2: PROGRAM PERFORMANCE



“Getting to
Green” for the
five management
initiatives . . .

MEASURING AND REPORTING PERFORMANCE

This chapter presents information on performance measurement at the NRC during FY 2005. The agency's performance measures are reported by each of the five goals contained in the NRC's FY 2004–FY 2009 Strategic Plan. The goals in the Strategic Plan focus on safety, security, openness, effectiveness, and management excellence. Strategic outcomes under each goal define success in meeting each Strategic Plan goal. Further, the performance measures associated with each goal indicate how effectively the NRC is achieving its goals and establish the basis for performance management.

This chapter also describes the achievements and challenges faced by each activity under the agency's major programs of Nuclear Reactor Safety and Nuclear Materials and Waste Safety. The activities under the agency's major programs consist of Nuclear Reactor Licensing, Nuclear Reactor Inspection, Fuel Facilities Licensing and Inspection, Nuclear Materials Users Licensing and Inspection, High-Level Waste Repository, Decommissioning and Low-Level Waste, and Spent Fuel Storage and Transportation Licensing and Inspection.

Following the program-specific discussions, the NRC's progress in "Getting to the Green" for the five management initiatives identified in the President's Management Agenda is described. Lastly, information on data sources, data quality, and the completeness and reliability of the performance data are presented. The discussion focuses primarily on the methods the NRC used to collect and analyze data, ensure data security, and improve the agency's performance measures and data during the current reporting period. Endnotes are referenced throughout the document and located at the end of the report.

The performance measures reported on the following pages reflect measures contained in both the FY 2005 and FY 2006 Performance Budgets. A number of the performance measures contained in the FY 2005 Performance Budget are discontinued after FY 2005 to reflect the evolutionary change in the goals contained in the agency's FY 2004–FY 2009 Strategic Plan. Although those performance measures will not be reported in future *Performance and Accountability Reports*, the agency activities that they represent will continue to be reflected in the report. For example, although there will no longer be a performance measure reflecting the number of medical events that occur each year, this function will continue to be supported by the Commission and are reflected under the Safety and Security goals of the Strategic Plan.



GOALS AND PERFORMANCE MEASURES

Goal 1 — Safety: Ensure Protection of Public Health and Safety and the Environment

Strategic Outcomes

The NRC has five strategic outcomes associated with the Safety goal that determine whether the agency has achieved its goal to ensure protection of public health and safety and the environment.

- 1.1 No nuclear reactor accidents.¹
- 1.2 No inadvertent criticality events.
- 1.3 No acute radiation exposures resulting in fatalities.
- 1.4 No releases of radioactive materials that result in significant radiation exposures.
- 1.5 No releases of radioactive materials that cause significant adverse environmental impacts.

Results: In FY 2005, the NRC achieved all of its Safety goal strategic outcomes.

Performance Measures

In the following table are the FY 2005 Safety goal performance measures and targets stated in the FY 2005 and FY 2006 Performance Budgets. The NRC met all of the FY 2005 Safety goal performance measure targets.

Goal 1: FY 2005 Safety Performance Measures in the FY 2005 and FY 2006 Performance Budgets				
Measure	2002	2003	2004	2005
1. Number of new conditions evaluated as red by the reactor oversight process ² is ≤ 3 .	New metric in FY 2005			0
2. Number of significant accident sequence precursors of a nuclear reactor accident is 0. ³	1	0	0	0
3. Number of operating reactors whose integrated performance entered the Manual Chapter 0350 process, the multiple/repetitive degraded cornerstone column or the unacceptable performance column of the Reactor Oversight Program Action Matrix with no performance exceeding Abnormal Occurrence Criterion I.D.4 is ≤ 4 . ⁴	New metric in FY 2005			0
4. Number of significant adverse trends in industry safety performance with no trend exceeding the Abnormal Occurrence Criterion I.D.4 is ≤ 1 . ⁵	0	0	0	0
5. Number of events with radiation exposures to the public and occupational workers that exceed Abnormal Occurrence Criterion I.A. Reactors 0 Materials ≤ 6 Waste 0	0 0 0	0 0 0	0 0 0	0 1 0
6. Number of radiological releases to the environment that exceed applicable regulatory limits. ⁶ Reactors ≤ 3 ⁷ Materials ≤ 5 Waste 0	0 4 0	0 0 0	0 1 0	0 0 0
7. No more than 300 losses of control ⁸ of licensed material per year. ⁹	272	219	201	211
8. No more than 30 events per year ¹⁰ resulting in radiation overexposures ¹¹ from radioactive material that exceed applicable regulatory limits.	23	16	4	16
9. No more than 45 medical events per year. ¹²	33	39	40	32
10. No non-radiological events that occur during NRC-regulated operations that cause impacts on the environment that cannot be mitigated within applicable regulatory limits, using reasonably available methods. ¹³	0	0	0	0

Analysis of Results

1. **Reactor Oversight Process Red Conditions:** The NRC monitors nuclear power plant performance in three broad areas: reactor safety, radiation safety, and security. The NRC has established the following categories: green, white, yellow, and red, with red being the category of highest significance. Red findings indicate a significant reduction in the safety of a nuclear power plant. There were no red performance indicators or findings in FY 2005.
2. **Significant Precursors:** The second measure tracks significant precursor events, defined as those events that have a probability of 1 in 1,000 or greater of leading to substantial damage to the reactor fuel. In FY 2005, the performance measure threshold was reduced from no more than one significant precursor event per year to no significant precursor events during the year. There were no significant precursor events in FY 2005.
3. **Reactor Performance:** The conditions in this measure indicate that significant issues are found in a plant during inspections conducted under the Reactor Oversight Program. All of the conditions in this measure indicate NRC action will be undertaken based on the findings. There were no reactors that met the conditions in this measure in FY 2005.
4. **Adverse Safety Trends:** This measure tracks the trends of several key indicators of industry safety performance. The indicators provide insights into major areas of reactor performance, including reactor safety, radiation safety, and physical protection. These trends represent industry averages, rather than individual plant performance. Statistical analysis techniques are applied to each indicator to determine its long-term trend. To date, there have been no statistically significant adverse trends in any of the indicators. The data are current as of June 1, 2004.
5. **Radiation Exposures:** Number of events with radiation exposures to the public and occupational workers that exceed Abnormal Occurrence Criterion I.A. There was one radiation exposure exceeding Abnormal Occurrence I.A.
6. **Releases to the Environment:** This measure is an indicator of the effectiveness of the NRC's nuclear materials environmental programs. The industry had no releases to the environment that exceeded regulatory limits in FY 2005.



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7. **Losses of Control:** This measure tracks reportable events of materials entering the public domain in an uncontrolled manner. The industry experienced a total of 211 losses of control of licensed material in FY 2005 through September 30, 2005. Many of the events counted toward this measure do not, by themselves, pose a risk to public health and safety. For example, most of the losses of control of licensed material involve shielded materials, which are unlikely to result in overexposures to individuals or releases to the environment with most eventually recovered. However, these losses are tracked because they may indicate weaknesses in licensees' programs. Very few of the events tracked involve high enough quantities of radioactive material to pose a security concern. This measure has been superseded in FY 2005 by a new security measure that tracks the number of events involving unrecovered risk-significant material. This measure is discontinued after FY 2005.
 8. **Radiation Overexposure:** The industry experienced 16 events in FY 2005 that resulted in radiation overexposures from radioactive material that exceeded applicable regulatory limits through September 30, 2005. For fuel cycle facilities, this measure extends to other hazardous materials that are used with, or produced from, licensed material, consistent with 10 CFR Part 70. Reportable chemical exposures are those that exceed license commitments. They also include chemical exposures involving uranium recovery activities under the Uranium Mill Tailings Radiation Control Act. This measure is discontinued after FY 2005.
 9. **Medical Events:** The industry experienced 32 medical events in FY 2005 through September 30, 2005. Since data collection began under the Government Performance and Results Act, the peak year was FY 1998, when 42 events occurred. This measure pertains to medical events reported under 10 CFR Part 35, "Medical Use of Byproduct Material." The NRC's Medical Use Program includes those who use byproduct material in medical diagnosis and therapy. This measure is discontinued after FY 2005.
 10. **Nonradiological Events:** The industry did not experience any nonradiological events during NRC-regulated operations that had an impact on the environment during FY 2005. This measure involves only chemical releases from the uranium mining and milling facilities that are regulated by the NRC. Examples of events that might be counted include chemical releases resulting from excursions at onsite leach facilities or releases from mill tailings piles that could contaminate groundwater. This measure is discontinued after FY 2005.

Goal 2 — Security: Ensure the Secure Use and Management of Radioactive Materials

Strategic Outcome

The NRC has one strategic outcome associated with this goal that determines whether the agency has achieved its goal to ensure the secure use and management of radioactive materials:

- 2.1 No instances where licensed radioactive materials are used domestically in a manner hostile to the security of the United States.

Results: In FY 2005, the NRC achieved the Security goal strategic outcome.

Performance Measures

In the following table are the FY 2005 Security goal performance measures and targets stated in the FY 2005 and FY 2006 Performance Budgets. The NRC met all of the FY 2005 Security goal performance measure targets.

GOAL 2: FY 2005 Security Performance Measures in the FY 2005 and FY 2006 Performance Budgets				
Measure	2002	2003	2004	2005
1. Unrecovered losses or thefts of risk-significant radioactive sources is zero.	0	0	0	0
2. Number of security events and incidents that exceed the Abnormal Occurrence Criteria I.C. 2-4. is ≤ 4.	New metric in FY 2005			0
3. Number of significant unauthorized disclosures of classified and/or safeguards information is zero. ¹⁴	0	0	0	0

Analysis of Results

1. **Unrecovered Losses or Thefts:** This measure covers any loss or theft of radioactive nuclear material that the NRC has determined to be risk significant. There were no losses or thefts of risk significant radioactive material in FY 2005.
2. **Security Events:** This measure covers substantiated cases of actual or attempts of theft or diversion of licensed nuclear material or sabotage of a nuclear facility, any substantiated loss of special nuclear material, or any substantiated inventory discrepancy judged to be significant relative to normally expected performance

and that is judged to be caused by theft or diversion or by substantial breakdown of the accountability system. Substantiated means a situation where an indication of loss, theft or unlawful diversion such as an allegation of diversion, report of lost or stolen material, statistical processing difference, or other indication of loss of material control or accountability cannot be refuted following an investigation; and requires further action on the part of the agency or other proper authorities. There were no events that met the conditions for this measure in FY 2005.

3. **Significant Disclosures:** Significant unauthorized disclosures of classified and/or safeguard information that cause damage to national security or public safety. There were no documented disclosures during FY 2005.

Goal 3 — Openness: Ensure Openness in Our Regulatory Process

Strategic Outcome

The NRC has one Strategic Outcome associated with this goal that is used to determine whether the agency has achieved its goal to ensure openness in our regulatory processes.

- 3.1 Stakeholders are informed and involved in NRC processes as appropriate.

Results: The NRC met the Openness strategic outcome target in FY 2005.

Performance Measures

In the following table are the FY 2005 Openness goal performance measures and targets stated in the FY 2005 and FY 2006 Performance Budgets. The NRC met all of the FY 2005 Openness goal performance measure targets except the first performance measure.

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GOAL 3: FY 2005 Openness Performance Measure in the FY 2005 and FY 2006 Performance Budgets				
Measure	2002	2003	2004	2005
1. Percentage of selected openness output measures that achieve performance targets is $\geq 70\%$.	New measure in FY 2005			50%
A. Respond to Freedom of Information Requests < 20 days.				12
B. Issue 90 percent of Directors Decisions under 2.206 within 120 days.				100%
C. Make 85 percent of Final Significant Determination Process Determinations within 90 days for all potentially greater than Green Findings.				68%
D. At least 90 percent of Category 2 and 3 meetings on regulatory issues for which public notices are issued 10 days in advance of the meeting.				89%
2. Complete milestones related to collecting, analyzing, and trending information for measuring public confidence.	Met	Met	Met	Met
3. Complete all public outreaches.				
Reactors	Met	Met	Met	Met
Materials	Met	Met	Met	Met
Waste	Met	Met	Met	Met
4. Issue Director's Decisions for petitions filed to modify, suspend, or revoke a license under 10 CFR 2.206 within an average of 120 days.	Number of Days:			
Reactors	126	115	88	NA*
Materials	NA*	NA	48	119
Waste	167	115	NA	NA
* NA – None filed				

Analysis of Results

1. **Openness Output Measures:** This measure is based on the following output measures:
 - (A) Respond to Freedom of Information Act Requests in 20 days or less: This measure tracks the NRC's responsiveness to an important type of public request for information, Freedom of Information Act Requests. In FY 2005, the median number of days for responding to FOIA requests was 12.
 - (B) Issue 90 percent of Director's Decisions under 2.206 within 120 days: This measure tracks the NRC's responsiveness to a special type of public request for information, Director's Decisions. 10 CFR 2.206 gives individuals an opportunity to file a petition to institute a proceeding to modify, suspend, or revoke a license or for any other action that may be proper. All of the Directors Decisions were issued within 120 days.
 - (C) Make 85 percent of Final Significance Determination Process Determinations within 90 days for all potentially greater than green findings: This measure tracks the timeliness of Significance Determination Process determinations. The Agency did not meet this output target. Only 50 percent of final Significance Determination Process determinations were made within 90 days of all potentially Greater than Green findings. This was due to the closure of numerous late Significance Determination Process issues, mainly associated with fire-related inspection findings. However, with increased management focus and several programmatic changes in reactor inspection activities, it is anticipated that significant improvements will be made in FY 2006.
 - (D) At least 90 percent of Category 2 and 3 meetings on regulatory issues for which public notices are issued at least 10 days in advance of the meeting: This measure tracks the timeliness with which the NRC notifies the public of meetings. In FY 2005, the NRC issued 89 percent of Category 2 and 3 meeting notices at least 10 days in advance of the meeting date. OIS provided the offices with quarterly statistics showing their performance under this measure. However, FY 2005 is the first year that offices measured and reported their performance against this goal in their operating plans. During the first and second quarters of FY 2005, the offices' failure to meet the performance measure was attributable to the following: (1) notices were not submitted in time, and/or (2) notices

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were not declared and replicated in ADAMS before submission. As a result, OIS worked closely with the offices to assist them in reaching the performance measure in the third and fourth quarters of FY 2005.

2. **Public Confidence:** This measure contains a series of milestones to be used to measure public confidence. A public meeting feedback form was used to collect comments on the effectiveness of the public meetings in building confidence in the NRC and institute changes where warranted. A database was developed to more accurately and efficiently track the responses to the meeting forms. The milestones for collecting, analyzing, and trending this information were met. This measure is discontinued after FY 2005.
3. **Public Outreaches:** Outreach meetings were held during the year to provide the public with opportunities for meaningful participation in NRC activities. All of the scheduled meetings were held. This measure is discontinued after FY 2005.
4. **Directors Decisions:** 10 CFR 2.206 gives individuals an opportunity to file a petition to institute a proceeding to modify, suspend, or revoke a license or for any other action that may be proper. All of the petitions that were filed were addressed within an average of 120 days in FY 2005. One petition, the Sequoyah Fuels petition, is still pending from FY 2004. It relates to a licensing review, and the Director's Decision cannot be developed until the review is completed. This measure is discontinued after FY 2005.



Goal 4 — Effectiveness: Ensure that NRC Actions are Effective, Efficient, Realistic, and Timely

Strategic Outcome

The NRC has one strategic outcome associated with this goal that determines whether the agency has achieved its goal to ensure that NRC actions are effective, efficient, realistic, and timely:

- 4.1 No significant licensing or regulatory impediments to the safe and beneficial uses of radioactive materials.

Results: NRC failed to achieve the Effectiveness strategic outcome because the PART performance measure associated with this goal was not met (see below).

Performance Measures

In the following table are the FY 2005 Effectiveness goal performance measure and targets stated in the FY 2005 and FY 2006 Performance Budgets. The NRC met all of the FY 2005 Effectiveness goal performance measure targets except for the goals to receive a minimum score of 85 from the Office of Management and Budget on programs assessed using the Program Assessment Rating Tool (PART)



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Goal 4: FY 2005 Effectiveness Performance Measures in the FY 2005 and FY 2006 Performance Budgets				
Measure	2002	2003	2004	2005
1. Programs assessed during the fiscal year using the Program Assessment Rating Tool (PART) receive a minimum score of 85 from OMB: Reactor Licensing Spent Fuel Storage and Transportation Licensing and Inspection	New measure in FY 2005			
				74%
				89%
2. Complete specific milestones in the Risk-Informed Regulation Implementation Plan. Reactors Materials Waste	Met Met Met	Met Met Met	Met Met Met	Not Met Met Met
3. Complete at least two key process improvements per year in selected program and support areas that increase effectiveness, efficiency, and realism. Reactors Materials Waste	2 2 2	2 3 2	2 2 3	2 2 2
4. Complete those major milestones scheduled in accordance with the Commission-approved schedules in order to support completion of license renewal applications within 30 months from receipt of application to a Commission decision if a hearing is held (within 22 months without a hearing). Reactors	Met	Met	Met	Met
5. Complete those specific milestones to reduce unnecessary regulatory burden. Reactors Materials Waste	Met Met Met	Met Met Met	Met Met Met	Met Met Met

Analysis of Results

1. **PART Results:** The NRC did not meet the performance measure target. The Reactor Licensing activity received a score of 74, or “moderately effective” on the Program Assessment Rating Tool evaluation. The Office of Management and Budget has recommended that the NRC eliminate this measure from the Performance Budget because detailed Program Assessment Rating Tool findings, rather than the program’s rating by itself, inform budget recommendations. The NRC will explore whether to delete this performance measure beginning in the FY 2007 Performance Budget.

2. **Risk-Informed Regulation Implementation Plan:** All of the milestones in the Risk-Informed Regulation Implementation Plan for materials and waste were met. The NRC completed all of the nuclear reactor safety milestones in the Risk-Informed Regulation Implementation Plan (RIRIP) on schedule except for one. The milestone “Issue final regulatory guide for the risk-informed performance-based fire protection rule” was rescheduled to November 2005 due to a delay in the receipt of NEI information and resolution of ACRS comments.

The milestones include publication of the mitigating systems performance index pilot verification report, reevaluation of station blackout risk using upgraded risk models, completion of an expert elicitation process supporting a proposed rule change for loss of coolant accidents, and publishing of a report on good practices for human reliability analysis. This measure is discontinued after FY 2005.

3. **Process Improvements:** There were 2 process improvements each for the NRC’s reactor, material, and waste activities. The process improvements for reactor activities were for allegation and investigation processes. Allegation activities were improved by utilizing voluntary alternative dispute resolution to assist in the resolution of discrimination complaints for engaging in protected activity. The second process improvement was to initiate an integrated case system that tracks allegations, enforcement, and investigation information. Process improvements for materials and waste safety activities included the development of a decision-making framework for security assessments to evaluate and prioritize the need for additional security measures. A notable process improvement was the application of more realistic dose modeling scenarios to accelerate license termination reviews, resulting in the completion of the Yankee Rowe License Termination Plan review in approximately half the average time taken for such a review. The other process improvements were to develop a database to enable the agency to track information for waste disposals

authorized in accordance with 10 CFR 20.2002 and the initiation of an effort focused on continuous improvement in the by product materials program. This measure is discontinued after FY 2005.

4. **License Renewal Applications:** This measure is to ensure that the NRC handles license renewal reviews in an expeditious manner. As of May 31, 2005, the NRC completed license renewal reviews for 10 units in FY 2004 and for 6 units in FY 2005. All 16 renewed licenses were issued within the target time frame of 30 months with a hearing, or 22 months without a hearing. This measure is discontinued after FY 2005.
5. **Unnecessary Regulatory Burden:** Regulatory proceedings and activities are evaluated for timely actions and feedback from licensees to ensure that the NRC is reducing any unnecessary burden of licensees. All of the milestones were met in FY 2005. For example, the NRC completed a final rule that amended the requirements for training and experience in 10 CFR Part 35, "Medical Use of Byproduct Material." The rule amended the regulations governing the requirements for recognition of certain specialty boards whose certification may be used to demonstrate the adequacy of the training and experience of individuals to serve as authorized medical physicists, authorized nuclear pharmacists, radiation safety officers, or authorized users of byproduct material (physicians). The rule reduces regulatory burden by making requirements more flexible. This measure is discontinued after FY 2005.

Goal 5 — Management: Ensure Excellence in Agency Management to Carry Out the NRC's Strategic Objective

Strategic Outcomes

The NRC has two strategic outcomes associated with this goal that determines whether the agency has achieved its goal to ensure the excellence in Agency Management.

- 5.1 Continuous improvement in NRC's leadership and management effectiveness in delivering the mission.
- 5.2 A diverse, skilled workforce and an infrastructure that fully supports the agency's mission and goals.

Performance Measures

In the following table are the FY 2005 Management performance measure and targets stated in the FY 2006 Performance Budget. The NRC failed to achieve the first Management strategic outcome because the performance measure target associated with this goal was not met.

Goal 5: FY 2005 Management Performance Measures in the FY 2006 Performance Budget				
Measure	2002	2003	2004	2005
1. Percentage of selected NRC management programs that deliver intended outcomes is $\geq 70\%$.	New Measure in FY 2005			60%
A. Infrastructure Management				100%
B. Financial Management and Budget & Performance Integration				67%
C. Expanded Electronic Government				50%
D. Recruitment and Staffing				80%
E. Internal Communications				100%

Analysis of Results

- Infrastructure Management:** Infrastructure management activities maintain a healthy, safe, secure, and accessible work environment as well as providing equipment, facilities, and administrative services that employees need. 100 percent of the infrastructure management activities achieved their performance targets.
- Financial Management & Budget and Performance Integration:** Financial management activities provide accurate, timely, and useful financial information to managers for decisionmaking and ensure that the NRC's financial assets are adequately protected consistent with risk. Budget and Performance Integration activities improve the linkage of individual and organizational performance standards to the NRC's Performance Budget and uses and improves the Planning, Budgeting, and Performance Management process to ensure better integration of performance results into NRC planning and budgeting. The NRC did not meet its target for not receiving any material weaknesses on the

audit of the agency's financial statement nor for having all its financial systems meet Governmentwide requirements. The material weakness was associated with inadequate acceptance testing, intensive manual processes, and the lack of comprehensive quality assurance procedures for the Fee Billing System.

The agency has implemented the following improvements to the fee billing process during FY 2005: (1) revised the quality assurance procedures for the Part 170 billing process to include a global reconciliation of each quarterly fee billing cycle; (2) modified the Fee Billing System to improve functionality of the system's interface; (3) expanded the acceptance testing for Fee Billing System software modifications; (4) performed independent verification and validation of the acceptance testing for the Fee Billing System Software Modifications; (5) separated the performance of the fee billing process and global reconciliation functions; (6) hired a staff accountant to further improve internal controls over the billing process; and (7) developed a statistical sampling plan to test that internal controls are functioning as intended.

The NRC's Fee Billing System and the payroll and core accounting systems cross-serviced by the Department of Interior's National Business Center are in substantial noncompliance with Federal financial management system requirements. During FY 2005, the NRC developed a remediation plan for the Fee Billing System. The plan describes our approach for overcoming the deficiencies that resulted in the substantial noncompliance. The plan includes a feasibility assessment of bringing the Fee Billing System into compliance with the Improvement Act and includes the milestones and schedule to replace the Fee Billing System with a compliant system. The Fee Systems Replacement Project is scheduled to be completed by December 2007.

In support of the Federal e-Government effort, the NRC's payroll (Federal Personnel and Payroll System) and core accounting (Federal Financial System) financial systems are cross-serviced by the Department of Interior's National Business Center. The Department of Interior Inspector General recently conducted a multi-phased penetration test of the strengths and weaknesses of the Department of Interior's and the National Business Center's networks and systems architecture. Based on the Department of Interior's Inspector General findings, the National Business Center concluded that the National Business Center's information technology systems have serious weaknesses in complying with some provisions of Appendix III of the Office of Management and Budget Circular A-130, *Management of Federal Information Resources*. As a result, the National Business Center concluded that they do not substantially comply with

the improvement Act requirements. The National Business Center will need to develop a remediation plan to bring their systems into compliance with the Improvement Act. We plan to monitor the Department of Interior's progress in addressing the security issues.

3. **Expanded Electronic Government:** The NRC's overall target for Expanded Electronic Government in FY 2005 was to achieve a "yellow" rating on OMB's e-Gov scorecard. The NRC's Capital Asset Plans and Business Cases (Exhibit 300) submissions were rated very highly, receiving scores of four or five out of a maximum possible of five. Performance criteria for major systems as reflected in achieving cost and schedule goals were achieved. The NRC has institutionalized procedures to avoid duplication of its IT investments using e-Gov Presidential Priority initiatives and the Lines of Business initiatives. The NRC has also put in place procedures to report progress of e-Gov initiatives as required for "high risk" IT investments. Additionally, NRC has in place an effective agencywide IT Security Plan of Action and Milestone remediation process, verified by its Inspector General. The NRC did not achieve an OMB rating of "3" on its Enterprise Architecture, which is required to achieve a "yellow" rating on the e-Gov Scorecard. Resource considerations have required a reassessment of the rate at which the agency will be able to address issues regarding Enterprise Architecture. Aside from NRC's OMB scorecard goal, the other activity that did not meet its target was the percentage of Federal Information Security Management Act compliance across all NRC major applications and general support systems. While information at the NRC is secure, changing requirements under the Act resulted in a compliance rate of 70 percent rather than the NRC's target of 90 percent.
4. **Recruitment and Staffing:** Recruitment and staffing seeks to, among other tasks, use innovative recruitment, development and retention strategies to achieve a high quality, diverse workforce with the skills needed to achieve the agency's mission. 80 percent of recruitment and staffing activities met their targets.
5. **Internal Communications:** The agency's internal communications activities are intended to foster and support a culture of openness and innovation. All of the internal communications activities achieved their performance targets.

NUCLEAR REACTOR SAFETY

Overview

The Nuclear Reactor Safety program ensures that civilian nuclear power reactors and test and research reactors, are operated in a manner that adequately protects the public health and safety and the environment while safeguarding special nuclear materials used in reactors. The NRC regulates 104 nuclear power reactors and 35 test and research reactors that are currently licensed to operate. Nuclear power plants generate approximately 20 percent of the Nation's electricity, and test and research reactors are used to conduct research and development. Almost every field of science (including physics, chemistry, medicine, and biology) uses these reactors.

The Commission's health and safety regulations provide reasonable assurance of adequate protection of public health and safety. These regulations are based on defense-in-depth principles and conservative practices that provide an adequate margin of safety. The collective efforts of the NRC and the nuclear industry are needed in order to maintain safety. The NRC establishes rules, safety standards, and requirements for licensees; conducts thorough in-depth technical reviews of both reactor designs and the safety envelope of licensed operations; oversees safe plant operations; and responds to licensees and other stakeholders. The NRC's licensees are responsible for designing, constructing, and operating nuclear reactors safely.

Ensuring the Safe Operation of Nuclear Reactors

The NRC ensures the safety of nuclear reactors by establishing the related safety standards and requirements and conducting in-depth technical reviews in the course of licensing nuclear power plants and their operators. The NRC also oversees plant operating performance and evaluates security and emergency response activities, establishes clear health and safety regulations, conducts research to resolve safety issues, and provides technical support for developing regulations. Nuclear plant licensees are required to follow the NRC's regulations specifying how plants are to be designed, constructed, and operated.

The NRC provides independent oversight of the plants through the Reactor Oversight Process to verify that NRC licensees are operating their plants safely and in accordance with the NRC's rules and regulations. If violations are found, the NRC may take enforcement actions. Security and emergency response actions ensure that licensees take adequate measures to respond to malevolent actions against reactors and that

public safety measures are in place in the event that an incident occurs. Research actions analyze data from operations and independently undertakes studies that provide the basis for maintaining the safety of nuclear power plants. The following sections describe these safety activities in greater detail.

Nuclear Reactor Licensing Activity

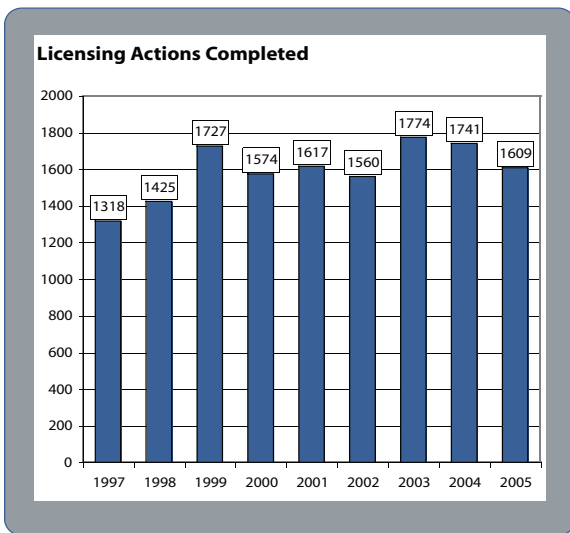


Figure 1

The Reactor Licensing activities establish requirements for licensees that set expectations for the commercial use of radioactive material within the legal framework of the NRC's safety and environmental regulations. This includes assurances that facilities are adequately designed, properly constructed, and correctly maintained, and that trained and qualified operating and technical support personnel can prevent or cope with accidents and other threats to public health and safety. The NRC also reviews license applications and changes to existing licenses, examines and licenses reactor operators, reviews reactor events for safety significance, and improves safety regulations and guidance.

The NRC met three of its five output measures for reactor licensing during FY 2005. The goals successfully achieved were completing a minimum of 1500 reactor licensing actions (see Figure 1) (1609 licensing actions were completed as of September 2005), completing a minimum of 500 other licensing tasks (715 other licensing tasks were completed as of September 2005) and maintaining a working inventory of 1200 or less licensing actions. The missed output measures were completing 100 percent of licensing actions within two years (see Figure 2) and completing extended power uprates within either 12 months or by the licensee's need date (whichever is greater). Both output measures were missed as a result of a single licensing action, the Vermont Yankee extended power uprate. In keeping with the NRC's safety goal, the Vermont Yankee extended power uprate could not be completed within the established output metrics because of issues with the licensee's steam dryer analyses and thermal hydraulic analyses. The targets for licensing action inventory and completion of licensing actions within one year by the end of the fiscal

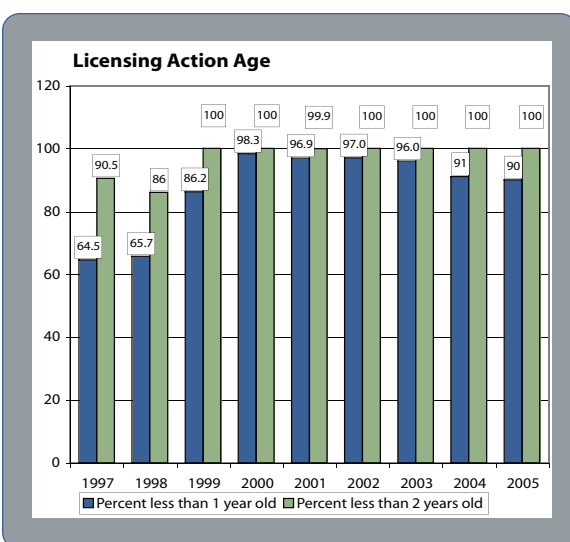


Figure 2

year were revised for FY 2005 to reflect redirection of resources within FY 2004 to higher priority security work including review of security plans, safeguards contingency plans, and training and qualification plans.

As of September 2005, 50 initial operator licensing examinations were given in FY 2005, thereby satisfying facility demand for new operators. Two exams were rescheduled or delayed into 2006 based upon facility requests; however, two additional retake examinations were administered to satisfy facility requests. Four Generic Fundamentals Examinations were administered in FY 2005, achieving the target of three exams.

Power Uprates

Since the 1970s, licensees have been applying for and implementing power uprates as a means of increasing the power output of their plants. The NRC's comprehensive reviews of an application are focused on the potential impacts that the proposed power uprate might have on the existing licensing-basis analyses that demonstrate overall plant safety. The review of a power uprate application assures that the impacts of increasing a plant's power output are fully addressed and that plant operation at the increased power level is safe. Power uprates increased the Nation's electrical generating capacity by approximately 234 MWe in FY 2005.

The NRC has set timeliness standards for these reviews in order to ensure a stable and predictable regulatory environment for the safety and environmental review of these licensing actions.

New Reactor Licensing

The NRC continues to focus on new reactor licensing activities to ensure that the Commission's safety requirements and expectations will be met for future reactors and a stable and predictable framework will exist for potential future license applicants. These activities are in response to the nuclear industry's continued interest in new reactors and the Department of Energy's ongoing efforts to cost-share new reactor licensing projects.

The NRC issued a final safety evaluation report and final design approval for the Westinghouse AP1000 advanced reactor design in September 2004. The rulemaking is scheduled to be completed in December 2005, but major elements of the design have been deferred by the vendor.

The NRC is actively engaged in pre-application reviews of General Electric's Economic Simplified Boiling-Water Reactor and Framatome ANP's EPR designs. The design certification application for the Economic Simplified Boiling-Water Reactor was received

August 24, 2005, however, the application has not yet been docketed. The NRC will determine the schedule for the review once the application has been accepted and docketed. The EPR design certification is expected at the end of 2007.

The NRC conducted research activities to support the pre-application review of the ACR-700 and Economic Simplified Boiling-Water Reactor new reactor designs. For example, the NRC issued an ACR-700 Phenomena Identification and Ranking Techniques report which identified and ranked by importance issues and phenomena and addressed the adequacy of the database for licensing the ACR-700 reactor. Other research activities supported completion of the ACR-700 Pre-application Safety and Assessment Report and the AP1000 Design Certification Safety Evaluation Report.

In September and October 2003, the NRC received early site permit applications for the Clinton, North Anna, and Grand Gulf sites. The NRC continued reviewing the three applications in FY 2005, and expects to complete its review and issue a decision in FY 2007.

The NRC is currently reviewing industry guidance for preparing a Combined Operating License application. The guidance was provided by the Nuclear Energy Institute in its December 2004 submittal, NEI-04-01, "Industry Guidelines for Combined License Applicants Under 10 CFR Part 52."

In June 2005, the NRC issued Inspection Manual Chapter 2502, "Construction Inspection Program: Pre-Combined License Phase," describing the inspections the NRC will conduct during the review of a Combined Operating License application. The NRC also issued nine implementing procedures to support the inspection of quality assurance and the environmental impact of site preparation work. The manual chapter and supporting inspection procedures complete the inspection infrastructure to support the review of a Combined Operating License application.

The NRC continues to develop the regulatory infrastructure needed to inspect new reactor and site license applications and do effective and efficient licensing reviews of those applications. Toward that end, the NRC is currently considering stakeholder comments received in response to proposed revisions to the regulation governing early site permits, design certifications, and combined licenses. The NRC is continuing its interaction with industry representatives on generic issues associated with the receipt of a combined license application. These actions are expected to improve the effectiveness and efficiency of the licensing processes for future applicants.

License Renewal

The reactor license renewal program provides a stable and predictable regulatory process to implement the NRC’s technical and regulatory requirements for the renewal of nuclear power plant licenses. As mandated by the Atomic Energy Act, the NRC issued original reactor operating licenses for 40 years, which may be renewed for up to an additional 20 years. The review process for renewal applications provides continued assurance that the level of safety provided by an applicant’s current licensing basis will be maintained throughout the extended period of operation. To date, the NRC has received applications to renew the licenses for 49 units at 28 sites and has renewed the licenses for 35 units at 20 sites (see Figure 3). The NRC is currently reviewing applications to renew the licenses for the remaining 14 units at 8 sites. As of September 2005, the NRC had issued in FY 2005 renewed licenses for Dresden Nuclear Power Station Units 2 and 3, Farley Units 1 and 2, Arkansas Nuclear One Unit 2, and D.C. Cook Units 1 and 2.

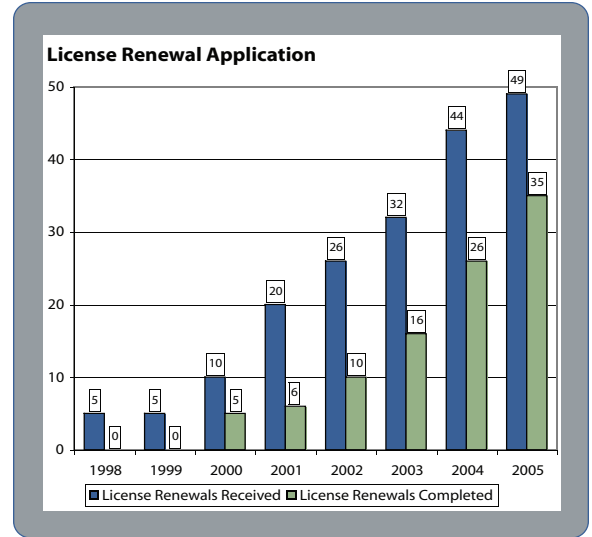


Figure 3

The NRC expects that almost all of the currently licensed units will ultimately apply to renew their licenses. To establish a stable and predictable process, the NRC has specified a timeliness goal of 22 months for those reviews that do not involve a hearing. The NRC met all established schedules for completing license renewal reviews in FY 2005.

Reactor Rulemaking

On October 1, 2004, the NRC issued a final revision to 10 CFR 50.55a, “Codes and Standards.” The final rule incorporated by reference several American Society of Mechanical Engineers Boiler and Pressure Vessel Codes. These codes address construction of nuclear power plant components, inservice inspection of nuclear power plant components, and rules for the operation and maintenance of nuclear power plants.

On November 22, 2004, the NRC published a revision to 10 CFR 50.69, “Risk-Informed Categorization and Treatment of Structures, Systems and Components for Nuclear Power Reactors.” The revised regulation gives nuclear power plant licensees a voluntary alternative in complying with selected deterministic requirements in the Commission’s regulations. The risk-informed regulation establishes an alternate set of requirements incorporating up-to-date analytic tools and risk insights to further enhance plant safety by enabling nuclear power plant licensees to determine more precisely the safety significance of reactor systems, structures, and components and maintain these structures, systems, and components in a manner commensurate with their safety.

The agency issued a revision to 10 CFR Part 50, Appendix E, "Emergency Planning and Preparedness for Production and Utilization Facilities." The final rule amended the regulations related to the NRC approval of licensee changes to emergency action levels and established the exercise requirements for co-located licensees. The final rule was published January 26, 2005.

The NRC issued a proposed revision to 10 CFR 50.48, "Fire Protection." The proposed rule gives nuclear power plant licensees a voluntary alternative to complying with selected deterministic requirements in the Commission's regulations. The proposed rulemaking would allow licensees to rely on operator manual actions based on a performance-based and risk-informed post-fire analysis. The proposed rule was published March 7, 2005.

The NRC proposed an amendment to 10 CFR Part 52, "Early Site Permits; Standard Design Certifications; and Combined Licenses for Nuclear Power Plants." The proposed rule would amend the regulations to certify the AP1000 design. The proposed rule was published on April 18, 2005.

Reactor Licensing Homeland Security

During FY 2005, the NRC continued its efforts to enhance safety of licensees by conducting two plant-specific assessments at each nuclear power plant to identify appropriate measures that could be taken to mitigate the effects of a broad range of terrorist threats. These assessments are intended to identify further effective mitigation capabilities. The first will be an independent NRC assessment of spent fuel pools and will be completed for all plants by the end of 2005. The NRC is developing detailed plans for the second assessment that will address the reactor core and containment at each plant. These assessments are expected to be completed before the end of FY 2006.

The NRC issued safety evaluations approving all of the revised security plans for the nuclear facilities that the agency licenses. As required by agency orders, all licensees have implemented their revised security plans. The agency continues oversight of security plan implementation at all licensee facilities through the Reactor Oversight Process and the Fuel Cycle Facility Operational Safety and Safeguards Inspection Program. Insights from the security plan reviews were used to ensure that the baseline inspections were performed in a manner consistent with licensing decisions in the areas of access authorization and fitness-for-duty and fatigue process checks, testing and maintenance, security training, protective strategy evaluation, owner-controlled area

patrols, and security plan changes. A pilot Significance Determination Process was conducted, and the agency inspected all baseline inspection program requirements at one plant.

As part of the agency's successful participation in the development of the Federal National Response Plan and the National Incident Management System, the agency successfully modified its plans, protocols, and procedures to fully implement the requirements of the National Response Plan and the National Incident Management System. The agency also developed an emergency preparedness and response improvement initiatives plan to upgrade the agency's response and preparedness capabilities. The agency also worked with other Federal agencies (the Federal Emergency Management Agency and the Department of Homeland Security) to upgrade the emergency response and incident preparedness capabilities of its facilities through both licensing and regulation.

International Activities

In May 2005, the NRC cooperated with the International Atomic Energy Agency and plant personnel in an Operational Safety Review Team mission at the Brunswick Nuclear Power Plant in Southport, North Carolina. A 12 member team, consisting of experts from the International Atomic Energy Agency, Canada, Slovakia, the United Kingdom, Russia, Japan, France, the Czech Republic, Germany, and Slovenia conducted an in-depth review of the safety and reliability of plant operation. Operational Safety Review Team (OSART) missions give the host countries (plant and utility management, the NRC, and other government authorities) an objective assessment of operational safety at the host plant with respect to proven international performance and practices.

The NRC has been a leader in working with other national nuclear regulatory authorities, particularly in the arena of advanced reactor oversight. In particular, the NRC has proposed an initiative, the multinational design approval program that will allow several regulatory authorities to work together to share expertise and resources in reviewing new and future reactor designs. The NRC presented this initiative to the other national nuclear regulatory authorities during a meeting at the Nuclear Energy Agency in June 2005.



The NRC headed the U.S. Government delegation to the Third National Report Review Meeting of Contracting Parties to the Convention on Nuclear Safety held April 11–22, 2005. The objective of the Convention on Nuclear Safety is to achieve and maintain a high level of nuclear safety worldwide by enhancing national programs and increasing international cooperation. The Convention is an intensive peer-review process. The U.S. delegation gained valuable insights about the status of nuclear safety in other countries. These insights will help shape future NRC and U.S. Government interactions by focusing on areas where safety can be most improved in the United States and throughout the world.

Nuclear Reactor Inspection

The NRC’s Reactor Oversight Process verifies that nuclear plants are being operated safely and in accordance with the NRC’s rules and regulations. The NRC has full authority to take whatever action is necessary to protect public health and safety and may demand immediate licensee action, up to and including plant shutdown. The Reactor Oversight Process uses both inspection findings and performance indicators to assess the performance of each plant within a regulatory framework of seven cornerstones of safety. Toward that end, the NRC performs a program of baseline inspections at each plant and may perform supplemental inspections and take additional actions to ensure that the plants address significant issues. The NRC communicates the results of its oversight process by posting plant-specific inspection findings and performance indicator information and industry-level indicators, on the NRC’s public Web site. The NRC also conducts public meetings with licensees to discuss the results of the NRC’s assessments of licensee performance.

The Reactor Oversight Process is designed to ensure protection of public health and safety and the environment and supports the agency Safety goal by focusing NRC and industry attention on risk-significant activities. The process consists of risk-informed inspections, a Significance Determination Process to evaluate the risk significance of inspection findings, licensee-reported performance indicator information, and assessment and enforcement activities.

As a second layer of assessment, the NRC trends the qualitative indicators of licensee safety performance, evaluates the indicators for adverse trends, and takes action to improve industry performance and/or to provide feedback to the NRC’s regulatory oversight processes.

In FY 2005, the NRC continued to integrate improvements into its regulatory process as a result of the annual Reactor Oversight Process self-assessments and completed the 2004 assessment in April 2005. The self-assessment results indicate that the Reactor Oversight Process continues to be effective in monitoring operating nuclear power plant activities and focusing NRC resources on significant performance issues and in supporting the NRC's strategic goals. The Reactor Oversight Process has been successful in achieving the goals of being objective, risk-informed, understandable, and predictable and thereby also supports the agency's Effectiveness goal to ensure that NRC actions are effective, efficient, realistic, and timely.

During FY 2005, the NRC maintained its focus on stakeholder involvement and continual improvement of the Reactor Oversight Process as a result of stakeholder feedback and lessons learned. The agency's assessments continue to show that the Reactor Oversight Process has resulted in a more objective, risk-informed, and predictable regulatory process, which focuses NRC and licensee resources on aspects of plant performance that have the greatest impact on safe plant operation. The responses to the NRC's annual survey of external stakeholders, which solicited feedback on the Reactor Oversight Process, were generally favorable. However, some stakeholders raised concerns about the timeliness and subjectivity of the Significance Determination Process, the effectiveness of the performance indicator program, and other areas considered needing improvement. The NRC has evaluated these and other stakeholder insights and has several agency initiatives underway to address stakeholder concerns, including increased management oversight of the inspection finding assessment process.

The NRC continued to implement improvements to the Reactor Oversight Process. Examples of the NRC's improvement initiatives are the development of a Mitigating Systems Performance Index, improvements in the effectiveness of the design engineering inspections, reassessment of baseline inspection procedures to better align the available inspection resources with risk-significant areas, and improvements in the Significance Determination Process.

Davis-Besse Lessons Learned

In March 2002, FirstEnergy Nuclear Operating Company, the licensee for the Davis-Besse Nuclear Power Station, discovered a cavity in the plant's reactor pressure vessel head. The NRC inspected and assessed this safety issue; directed licensees to report the condition of their reactor pressure vessel heads, past incidents of boric acid leakage, and their inspection and examination programs; assessed the operating experience function; and chartered the Davis-Besse Lessons Learned Task Force to look for ways to improve NRC performance. Forty-nine recommendations were adopted and addressed through

action plans to incorporate the reactor pressure vessel inspection requirements into the *Code of Federal Regulations*, coordinate research activities for evaluating potential improvements in detection and monitoring of leakage in reactor coolant system components, assess the NRC's Operating Experience Program, and change the NRC's inspection program. In FY 2005, the NRC implemented changes recommended by a task force that analyzed how the NRC evaluates and disseminates operating experience to NRC staff, licensees, and others. The task force determined that the NRC's current reactor operating experience activities include the necessary functions of identifying short- and long-term safety issues, assessing their significance, and taking corrective action to address the issues. The task force recommended enhancements to current activities. The NRC is currently implementing the recommendations through the new Reactor Operating Experience Program, initiated on January 1, 2005. The new program establishes a single organization to systematically collect, communicate, and evaluate operating experience information, including foreign operating experience. The new process makes significant use of information technology to consolidate a large collection of individual databases and Web sources of information onto a single Web access page and make operating experience information readily available to internal users and members of the public.

A new communication tool to promptly notify NRC staff members of new operating experience in their areas of expertise or practice has been developed and we have created teams of technical review groups to systematically and periodically assess operational data in their specialized areas to identify trends and insights for further attention.

Reactor Inspection Homeland Security

Emergency Preparedness Inspection

The agency provides oversight of inspection activities for emergency preparedness at nuclear reactor facilities as a part of its overall reactor oversight activities and provides technical support for incident response activities regarding actual incidents and exercises, as well as support for inspection activities. The agency successfully modified its plans, protocols, and procedures during the implementation of National Response Plan/ National Incident Management System. As part of this effort, the agency developed an emergency preparedness and response improvement initiatives plan, designed to enable the agency to upgrade its response and preparedness capabilities. The agency also worked with other Federal agencies (FEMA/DHS) to upgrade the Emergency Response and Incident Preparedness capabilities of its facilities through both licensing and regulation.

Security Inspection

The agency completed its transitional force-on-force inspection activities, and began full program implementation in FY 2005. The agency completed 20 force-on-force inspections and schedules each site to be inspected once every 3 years. The agency also identified and addressed challenges in improving the realism of the force-on-force inspection activities. The agency implemented enhancements such as improved Multiple Integrated Laser Engagement System gear, real-time information collection on inspection participants, and site defensibility upgrades.

Safety Research

The NRC's reactor safety research program evaluates and resolves safety issues for nuclear power plants, proposes regulatory improvements, coordinates agency activities related to consensus and voluntary standards for agency use, assesses the effectiveness of certain NRC programs, and evaluates operational events to identify precursors to accidents. The agency conducts its research programs to evaluate areas of potentially high risk or safety significance, reduce uncertainties in risk assessments, and develop the technical basis to support realistic safety decisions. Where possible, the NRC engages in cooperative research with other Government agencies (such as the Department of Energy and the National Aeronautics and Space Administration), the nuclear industry, universities, and international partners. The research program includes key activities to support the agency in addressing issues in the areas of emergency core cooling system sump performance, risk analyses and rulemaking, fire safety, fuel and thermal-hydraulic, severe accident, materials degradation and structural integrity, digital safety systems, and radiological protection.

Emergency Core Cooling System Sump Performance

The NRC established Generic Safety Issue (GSI)-191, "Assessment of Debris Accumulation on Pressurized-water Reactor Sump Performance," to determine whether the transport and accumulation of debris in pressurized-water reactor containments following a loss-of-coolant accident will impede the long-term operation of the emergency core cooling system or containment spray system. Based on events at boiling-water reactors and research findings for pressurized-water reactors, the NRC issued Generic Letter 2004-02 requesting plant-specific evaluations at pressurized-water reactors to ensure compliance with design requirements. The NRC is conducting additional research in a few areas to support these evaluation efforts and provide confirmatory information. These areas include research on chemical effects to determine if the pressurized-water reactor sump pool environment generates byproducts which

contribute to sump clogging, research on pump head losses caused by accumulation of containment materials and chemical byproducts, and research on the effect of injected debris on valve performance. During FY 2005, the NRC and the Electric Power Research Institute, under a memorandum of understanding, completed research on the formation of chemical byproducts. The NRC also conducted research on pump head loss and valve performance to support the staff review of licensee responses to Generic Letter 2004-02.

Risk Analysis and Rulemaking

The reactor research program supports the agency's efforts to use risk information in all appropriate aspects of regulatory decisionmaking, applies risk assessment technology to resolve safety issues, develops a risk-informed regulatory framework, and focuses regulatory activities on significant aspects of licensed activities. In FY 2005, the NRC's risk assessment research program supported numerous agency programs, including the reactor oversight and operating experience programs, rulemaking initiatives, human reliability analysis, new reactor licensing, and risk communication. During FY 2005, the NRC continued to provide support for the industry-wide implementation of the Mitigating System Performance Index, a risk-informed performance indicator intended to address concerns with the current safety system indicators. The NRC completed the accident sequence precursor evaluation for degraded conditions initially identified at the Davis-Besse Nuclear Power Plant in 2002. During FY 2005, the NRC issued a draft report on a reevaluation of station blackout risk. In support of new reactor licensing, the NRC issued the first draft of a regulatory framework which will provide the technical basis for technology-neutral regulations for public comment. To facilitate the communication of risk information, the NRC published guidelines for effective internal communication of risk information. In the area of human reliability analysis, the NRC published a report on good practices for human reliability analysis to support risk-informed decisionmaking.

Fire Safety Research

The NRC's fire risk research program supports regulatory activities in the areas of fire protection and fire risk analysis. During FY 2005, the research program focused on activities supporting the implementation of a new risk-informed, performance-based fire protection rule. This work focused on (1) development of state-of-the-art fire performance risk assessment methodology as part of the fire risk re-quantification effort and (2) the verification and validation of fire models. On September 13, 2005, the NRC issued a joint report with the Electric Power Research Institute describing state of the art fire risk assessment methods for nuclear power facilities. To support the development of guidance documents for risk-informed, performance-based fire protection programs, the NRC has continued an international cooperative effort with the National Institute

of Standards and Technology to benchmark, verify, and validate fire models. Other research activities in the fire safety area have included full-scale endurance testing of the Hemyc and MT Electrical Raceway Fire Barrier Systems, which are designed to protect certain plant equipment needed to achieve a safe-shutdown condition during a nuclear plant fire.

Fuel and Thermal-Hydraulic Research

The NRC is studying the behavior of fuel with advanced cladding at high burnup. This experimental work confirms that safety is being maintained as the industry seeks the economies of advanced fuel designs and high utilization (burnup). This work will provide the technical basis for using advanced fuel cladding alloys and will permit higher fuel burnup. This first-of-a-kind experimental program and new analytic methods, will establish new safety limits for energy deposition and clad oxidation during postulated accidents. The NRC, the international community, and industry are co-funding much of this work to achieve significant efficiencies.

The NRC has developed an independent audit capability for assessing the performance of mixed-oxide fuels under normal, transient, and accident conditions and is now assessing fuel performance. This work provides the technical basis for using and disposing of weapons-grade plutonium in a power reactor. These analyses and experiments to determine the adequacy of loss-of-coolant accident criteria for high-burnup and mixed-oxide fuels support development of performance-based fuel criteria for the 10 CFR 50.46 rulemaking and assessment of the adequacy of the revised source term (NUREG-1468) for high-burnup and mixed-oxide fuels.

The NRC has an extensive thermal-hydraulic program comprising experimental testing, model development, and validation. These models and experimental results are used in developing the technical basis for risk-informing the regulations, addressing emergent safety issues, and providing the capability for independent audit calculations for proposed new designs. This effort supports the staff review of the AP1000 and Economic Simplified Boiling-Water Reactor new reactor designs.

Severe Accident Research

The NRC has developed an independent audit capability for rare-event (severe-accident) analysis and is participating in research to maintain severe accident expertise within the NRC. The severe accident research allows the NRC to assess, develop and maintain an independent state-of-the-art severe accident analytical tool (MELCOR code) for risk-informing its regulations, assessing the security of nuclear power plants and

spent fuel pools, certifying new reactor designs, and providing a technical basis for determining whether the use of mixed-oxide fuel and high-burnup uranium fuel in operating reactors will pose an undue risk to the health and safety of the public.

A recently released version (Version 1.8.6) of the MELCOR code will be used for independent severe-accident analysis to support the agency review of the Economic Simplified Boiling-Water Reactor design. Test data on air oxidation of nuclear fuel cladding was used to realistically assess the potential for a zirconium fire in a spent fuel pool accident. Realistic thermal-hydraulics and severe accident and consequence analyses were performed to assess the protection of nuclear power plants, including spent fuels pools against postulated terrorist attacks. These activities contribute to the Nuclear Reactor Safety goal to prevent radiation-related deaths and illness, promote the common defense and security, and protect the environment in the use of civilian nuclear reactors.

Materials Degradation and Structural Integrity Research

The ability of structures, systems, and components to withstand normal operational loads, design-basis loads, and accidental loads (including natural hazards such as seismic events, tornados, and floods) is important to safe operation of nuclear power plants. Recent events related to the cracking of nickel-based alloys and associated weldments (e.g., cracking of the control rod drive mechanism nozzles at pressurized-water reactors) have highlighted the importance of aging and degradation research and have focused worldwide interest on proactive management of the degradations (identifying components susceptible to degradation and taking steps to avoid, or finding and dealing with degradation before any significant loss of safety margin). The NRC conducted a research study using a panel of international experts to identify and evaluate the degradation potential for several thousand components in light-water reactors. The components with a higher-likelihood of degradation were identified for potential inclusion in proactive materials degradation management programs. The NRC is continuing to study these components to assess the need for further NRC actions. The NRC conducted a meeting in August 2005 to develop an international cooperative group and a plan for the research needed for implementing proactive materials degradation management programs. Potential participants were identified, and a detailed program plan was initiated. The NRC also evaluated the adequacy of risk assessments of passive-component degradation and the integration of the results into the regulatory decisionmaking process. Improvements were identified for implementation.

Digital Safety Systems Research

Nuclear facility licensees are replacing analog instrumentation and control equipment with digital equipment. The main reasons for these analog-to-digital upgrades are that analog replacement parts are becoming more difficult to obtain and that digital systems potentially offer better performance and more features than analog systems. There are challenges for the agency and the nuclear industry stemming from the introduction of this new technology into nuclear facilities. Several current projects are being conducted to provide the technical basis for assessing the ability of existing digital technologies to perform their intended functions under the adverse environmental conditions expected in a nuclear power plant, such as electromagnetic and radio frequency interference and abnormal conditions such as smoke and steam environments. The NRC is also conducting research to advance probabilistic risk assessment of complex digital safety systems, including software-based and commercial off-the-shelf systems. This research leverages work that has been performed for other agencies and countries to maximize the efficient use of NRC resources.

In addition, new advanced reactor plants are expected to use advanced digital instrumentation and control systems. These systems will incorporate design features that do not exist in the current generation of U.S. nuclear power plants. Several current projects are examining emerging technologies in digital systems to identify issues that must be addressed in the licensing process and provide the technical basis for the agency's safety review.

Radiological Protection Research

The NRC provided comments on new draft recommendations on radiation exposure from the International Commission on Radiological Protection, which periodically evaluates current information on radiation health effects and then revises its recommendations as appropriate. The NRC maintained some ongoing activities to monitor radiation exposures and events, including the Radiation Exposure and Information Reporting System database of occupational exposure records for certain classes of NRC licensees. NRC guidance on recording and reporting occupational radiation exposure was updated and Abnormal Occurrences in 2004 were identified and reported to Congress.

Industry Trends Program

The NRC measures the effectiveness of its Nuclear Reactor Safety program activities based on the continued safe operation of the Nation's nuclear power plants. In addition to monitoring the performance of individual plants, the NRC compiles data on overall safety performance using several industry-level performance indicators, some of which are addressed in the following pages. The NRC analyzes data that is outside of the prediction limits for safety that are set using statistical analysis. These indicators show significant improvement in the long-term trends for safety performance of nuclear power plants since 1988, the baseline year for the statistical analyses. The baseline year for the precursor occurrence rate is 1993. For ease of viewing, all the charts in this section display data since 1993.

The industry safety indicators are derived through complex engineering and scientific analyses by the NRC's Office of Nuclear Reactor Regulation and Office of Nuclear Regulatory Research. The analyses of some events for FY 2004 and FY 2005 are still ongoing. The performance indicator results are subject to minor variations as licensees submit revisions to the source data and may differ slightly from data reported in previous years as a result of refinements in data quality. The results of these analyses are reported annually to both the Commission and to Congress.



The Industry’s Safety Performance Record

Several industry indicators of safety performance show significant statistical improvement since 1988. One such indicator is significant events, which meet specific criteria such as degradation of important safety equipment (see Figure 4).

The total (collective) radiation dose received by workers is an indication of the radiological challenges of maintaining and operating nuclear power plants. The trend shows a reduction in collective dose since 1988 and demonstrates the effectiveness of the controls on radiation exposure implemented to meet these challenges (see Figure 5).

Safety systems mitigate off-normal events such as the widespread power blackout in August 2003 by providing reactor core cooling and water addition. Actuations of safety systems that are monitored include certain emergency core cooling and emergency electrical power systems. Actuations can occur as a result of “false alarms” (such as testing errors) or in response to actual events. The statistical trend for number of safety system actuations highlights the improved performance since 1988 (see Figure 6).

A scram is a basic reactor protection safety function that shuts down the reactor by inserting control rods into the reactor core. Scrams can result from events that range from relatively minor incidents or human error to precursors of accidents. The massive power blackout in August 2003 accounts for most of the increase in scrams in FY 2003, but has not affected the statistical trend for number of scrams, which has been declining steadily since 1988 (see Figure 7).

The NRC assesses the risk significance of events at plants. A precursor event is an event that has a probability of greater than 1 in 1 million of leading to substantial damage to the reactor fuel. There is no statistically significant adverse trend in the occurrence rate of precursor events since 1993, the

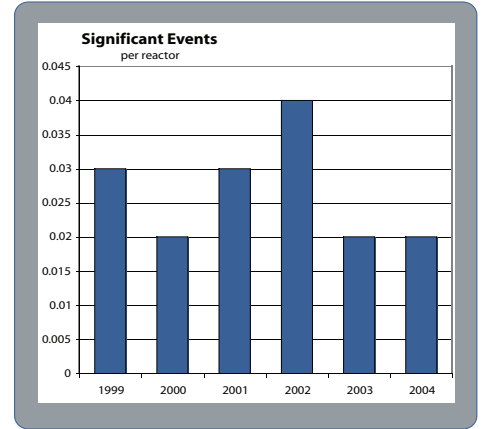


Figure 4

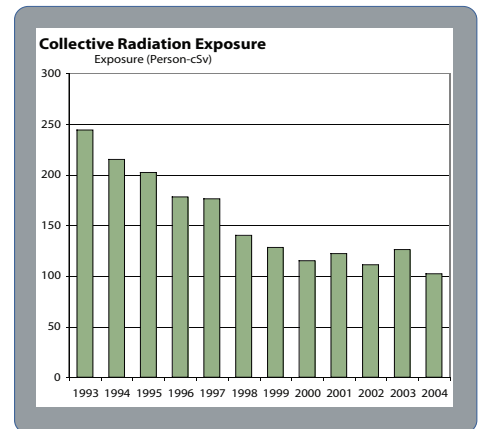


Figure 5

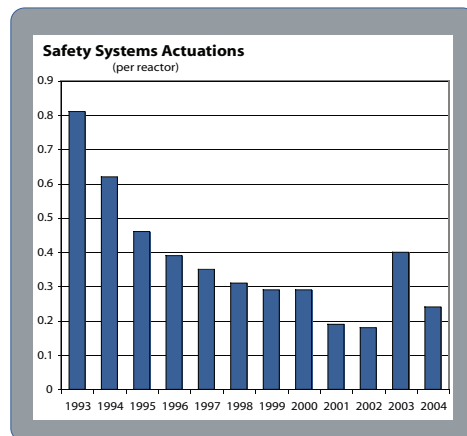


Figure 6

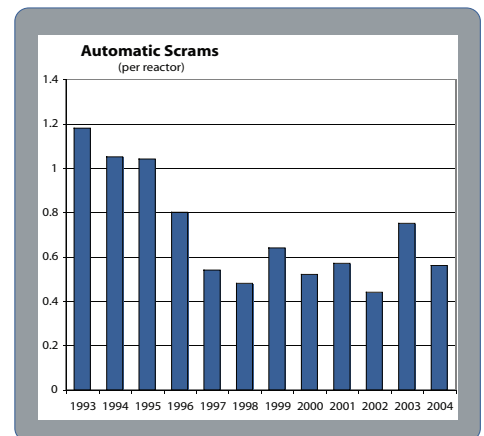


Figure 7

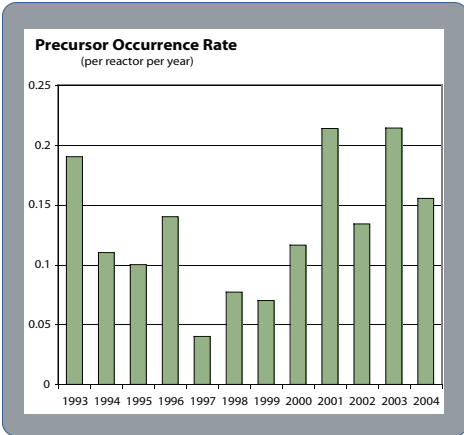


Figure 8

baseline year for the statistical analysis. Due to the complexities associated with evaluating precursor events, the data always lag behind other indicators. Precursor data through FY 2004 (FY 2004 contains preliminary data) is shown (see Figure 8).

Safety system failures include any events or conditions that could prevent a safety system from fulfilling its safety function. The statistical trend for number of safety system failures across the industry has declined since 1988 (see Figure 9).

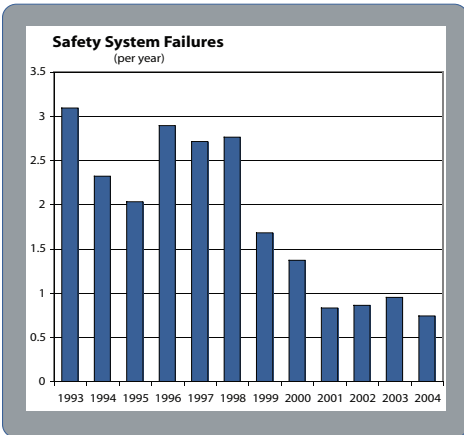


Figure 9

The Power Generation and Average Capacity Factor indicators are not a part of the NRC's Industry Trends Program. The data are obtained from the Department of Energy, and are displayed from 1993 through 2004. Improvements in safety have occurred at a time when nuclear power generation has increased significantly, from 610,000 gigawatt hours in 1993 to approximately 789,000 gigawatt hours in 2004 (see Figure 10).

The average annual capacity factor, a measure of power plant efficiency, has increased from 73 percent in 1993 to 90.5 percent in 2004 (see Figure 11).

The NRC's Role in Improving Safety

The improvement in the safety performance of nuclear power plants is the result of the combined efforts of the nuclear industry and the NRC. Both the nuclear industry and the NRC have gained experience in the operation and maintenance of nuclear power facilities. The NRC establishes safety standards and safety requirements, performs in-depth technical reviews of proposed reactor designs, and oversees plant operating performance. The NRC will

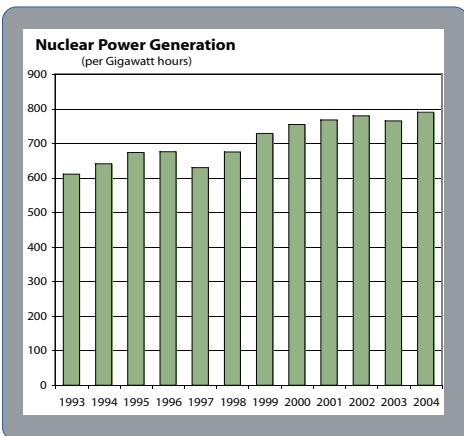


Figure 10

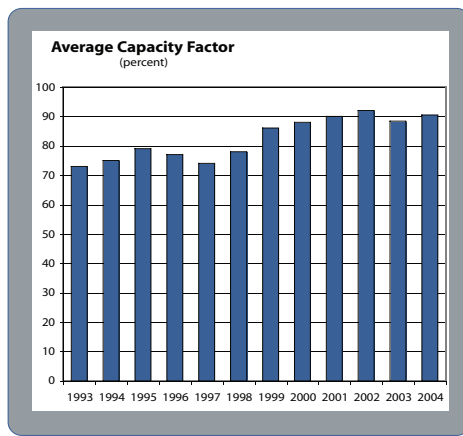


Figure 11

not allow licensees to operate their plants if safety performance falls below acceptable levels. Licensees are primarily responsible for maintaining safety. They are responsible for designing, maintaining, and operating nuclear power plants in a manner that provides adequate protection of public health and safety.

Plant operating experience data have yielded a steady stream of improvements in the reliability of plant systems and components, plant operating procedures, training of power plant operators, and regulatory oversight.

Funding for Achieving Goals

The Nuclear Reactor Safety budget was \$443.1 million for FY 2005. This budget was allocated to two major activities, reactor licensing and reactor inspection (see Figure 12).

Each activity has a specific and linked role in ensuring safety at nuclear power plants. The licensing activity sets the standards and procedures for operating nuclear power plants, and the inspection and performance assessment activity results in inspection of the plants and the collection of information to ensure that licensing obligations are being met and that each plant's performance is within the required safety range.

Program Evaluation

In FY 2005, the NRC continued to integrate improvements into its regulatory process as a result of the annual Reactor Oversight Process self-assessments. The NRC completed the 2004 assessment in April 2005. The report, "Reactor Oversight Process Self-Assessment for Calendar Year 2004," (SECY-05-0070), is available through the NRC public Web site. The 2004 self-assessment results indicate that the Reactor Oversight Process met its program goals of being objective, risk-informed, understandable, and predictable. The Reactor Oversight Process was also effective in supporting the NRC's strategic goals of Safety, Security, Openness, Effectiveness, and Management Excellence. The NRC implemented several additional Reactor Oversight Process improvements recommended by the Davis-Besse Lessons Learned Task Force, the Office of the Inspector General, other independent evaluations, and internal and external stakeholders. The Reactor Oversight Process self-assessment metrics were all met, except for one of the eight performance indicator metrics, four of nine Significance Determination Process metrics, one of eleven assessment metrics and two of eighteen overall metrics.

Although significant progress has been made in 2004, the NRC expects to make continued improvements to the Reactor Oversight Process based on lessons learned and stakeholder feedback. The NRC will continue to actively solicit input from the NRC's internal and external stakeholders and will evaluate potential program improvements

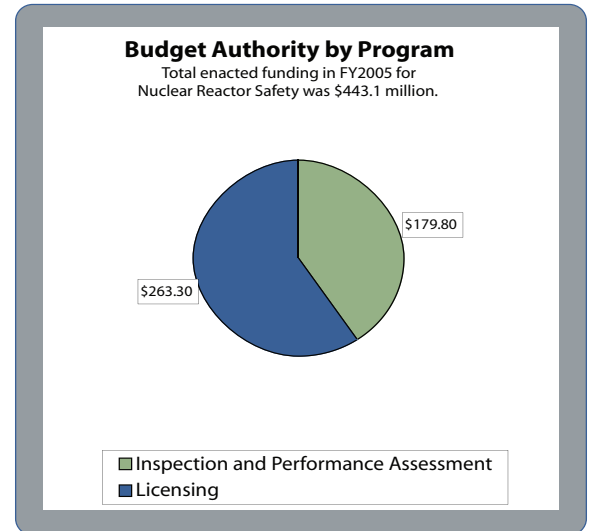


Figure 12

via the ongoing self-assessment process. The NRC will also continue to report the results of its annual self-assessment as part of the Commission briefing following the Agency Action Review Meeting.

The NRC has started to implement many of the recommendations developed during the FY 2004 program evaluation of the agency's operating experience program. On January 1, 2005, the NRC implemented many of these changes through the initiation of the enhanced power reactor Operating Experience Program. The NRC's Office of the Inspector General conducted an independent review of the NRC's Reactor Operating Experience Task Force Report (Audit Report OIG-04-A-13). The Office of the Inspector General concluded that the Reactor Operating Experience Task Force Report was comprehensive and that the report's conclusions and recommendations adequately addressed the identified program weaknesses. The Inspector General also documented six recommendations to further enhance the effectiveness of the Operating Experience Program. In FY 2005, the NRC resolved four recommendations, and two recommendations remain open pending Inspector General review of program documents scheduled to be revised in FY 2006.

In addition, a task force performed an assessment of the NRC's process for reviewing the scoping and screening portions of license renewal applications to verify compliance with the requirements of 10 CFR Part 54, "Requirements for Renewal of Operating Licenses for Nuclear Power Plants." That assessment included a review and audit of the applicant's scoping and screening methodology, a technical review of the scoping and screening results documented in the application, and inspection of the implementation of the scoping and screening results. The intent of the assessment was to determine whether the NRC can better define the interface between organizations to minimize overlapping activities, if any, and to improve the effectiveness and efficiency of the review process. The task force's assessment showed that the various NRC organizations were conducting their related activities with approved program procedures and in accordance with regulatory requirements. The team identified areas for improving the coordination and communication of activities. The NRC is currently evaluating possible approaches for implementing the team's recommendations.

In FY 2005, the Inspector General completed an audit of the NRC's Baseline Inspection Program (OIG-05-A-06, December 22, 2004). Overall, the audit found that NRC staff, licensees, and stakeholders view the Reactor Oversight Process. The Inspector General audit identified several weaknesses in the baseline program, and the report made 10 recommendations to improve the efficiency and effectiveness of the baseline inspection program. The NRC is in the process of making program changes to address the recommendations from the audit.

In addition, a task force evaluated the NRC's program for handling licensing actions submitted by licensees for operating nuclear power plants (excluding license renewal). Such applications include proposed changes to facility operating licenses and technical specifications, requests for relief from the requirements of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code, responses to orders, and proposed exemptions from NRC regulations. The team assessed the current work processes, performance measures, and data related to the timeliness and productivity of the NRC staff. The assessment also included feedback from licensees and other stakeholders as well as insights from a recent evaluation performed using the Program Assessment Rating Tool developed by the Office of Management and Budget. The team concluded that the existing program has been successful in enabling the safe operation of commercial nuclear power plants. The team identified and documented possible improvements in the management of the program, related work processes, and the performance measures. The NRC is currently evaluating the team's recommendations.

Program Assessment Rating Tool

Over the past several years, the Office of Management and Budget has conducted reviews utilizing the Program Assessment Rating Tool of the Nuclear Reactor Safety activity. The following sections include a description of the activities, the Office of Management and Budget recommendations, and NRC's response and their impact upon program performance.

Reactor Licensing

In FY 2005, the Office of Management and Budget rated the reactor licensing activity as "moderately effective," which is the second highest rating category, and gave the activity an overall score of 74. The NRC is currently awaiting the recommendations from the Office of Management and Budget, and NRC's actions and results realized will be included in next year's report.

Reactor Inspection

The Office of Management and Budget rated this activity as "effective" with an overall score of 89 in FY 2003. The activity earned high scores for Program Purpose and Design and for Program Management. It was noted that the purpose of the activity was clear, well-designed, and results-oriented. Also noted was that this activity has met all of its performance measures since Government Performance and Results Act reporting began in 1997.

The Office of Management and Budget recommended including better linkage of budget requests to NRC's annual and long-term goals and the linkage of performance measures in the organization's operating plan to support the safety performance measures in the FY 2004–FY 2009 Strategic Plan. The second recommendation was for more transparency in how allocation decisions are made and how the activity contributes to achievement of the agency's long-term goals as well as conduct a complete review of operating plan format and content to improve their effectiveness as management tools.

The NRC has responded to the first recommendation through its initiative to define outcomes and outputs that align with performance measures. Additionally, the NRC is working to improve its cost management capabilities to better align its costs with outcomes. The NRC also demonstrated via direct linkage of FY 2005 Operations Plan performance measures to the FY 2004–FY 2009 Strategic Plan strategies for meeting the Strategic Plan objective and goals. Each of the operating plan's safety performance measures reference one or more of the Strategic Plan strategies under the safety goal.

To respond to the second recommendation, the NRC has moved to the implementation of costing to the NRC's safety and security goals in the Strategic Plan beginning with the FY 2006 request. In addition, the NRC has demonstrated better linkage of budget requests to agency goals through utilization of the common prioritization process for establishing the linkage between operational activities, including the resources allocated to support these activities, and the agency's strategic and long-term goals. The NRC's Reactor Inspection and Performance Assessment program managers have responded to the Office of Management and Budget recommendation by linking operational activities and the agency's strategic and long-term goals in the revised operating plans.

NUCLEAR MATERIALS AND WASTE SAFETY

Overview

The Nuclear Materials and Waste Safety program encompasses regulatory oversight for five activities—Fuel Facilities Licensing and Inspection, Nuclear Materials Users Licensing and Inspection, High-Level Waste Repository, Decommissioning and Low-Level Waste, and Spent Fuel Storage and Transportation Licensing and Inspection. This oversight includes all regulatory activities carried out by the NRC and the Agreement States to ensure that nuclear materials and waste facilities are used

in a manner that protects the public health and safety and the environment, while also protecting against radiological sabotage and theft or diversion of special nuclear materials. The following sections discuss the NRC's achievements in each of these activities.

Fuel Facilities Licensing and Inspection Activity

The Fuel Facilities Licensing and Inspection activity oversees uranium extraction, conversion, and enrichment activities and nuclear fuel fabrication facilities. The NRC licenses and inspects all commercial nuclear fuel facilities that process and fabricate uranium ore into reactor fuel. Licensing and inspection actions are a key aspect of the agency's nuclear fuel cycle safety and safeguards program. Inspection actions include detailed health, safety, safeguards, and environmental licensing reviews and inspections of licensees' programs, procedures, operations, and facilities to ensure safe and secure operations.

Each of the Nation's 37 fuel cycle facilities holds a license or certificate that specifies the materials the licensee may possess and sets restrictions on how those materials may be used. In addition to authorizing the possession and use of source, special nuclear, and byproduct material, each license or certificate establishes related licensee responsibilities (such as worker protection, environmental controls, and financial assurance). The NRC issues these fuel cycle facility licenses or certificates in accordance with requirements promulgated in the *Code of Federal Regulations*. Applications for licenses or certificates demonstrate how the licensees will operate their facilities to ensure adequate safety and safeguards.

The NRC completed 95 fuel cycle licensing actions and conducted 99 inspections, covering 204 inspection modules, at fuel cycle licensees during FY 2005 (see Figure 13). In FY 2005, the NRC began tracking fuel cycle inspection modules completed rather than inspections conducted because inspection modules focus on the specific areas being inspected (e.g., chemical, nuclear criticality safety) rather than on site visits. Therefore, tracking inspection modules completed is a better measure of program performance than the number of inspections. Because multiple modules may be completed during a given inspection activity, the number of modules will be consistently greater than the number of inspections. Beginning in FY 2006, NRC will no longer report on number of inspections completed, but will report on the number of inspection modules completed.

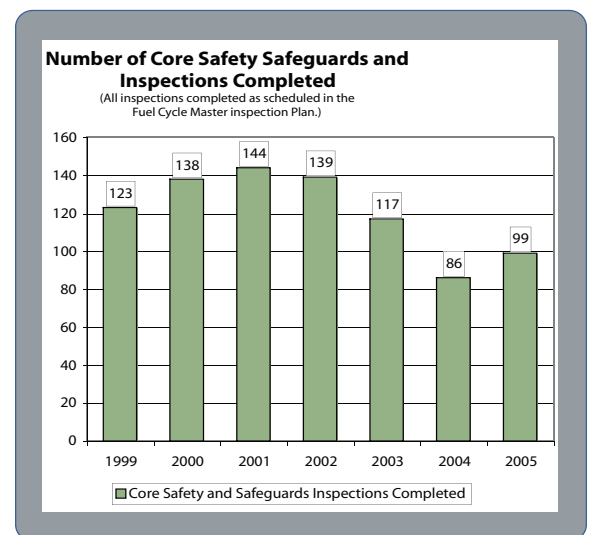


Figure 13

The NRC is currently involved in several significant fuel cycle licensing reviews and has recently completed several of them. Pursuant to a bilateral agreement between the Department of Energy and the Russian Federation, Duke, Cogema, and Stone & Webster submitted a request to the NRC for authorization to construct a mixed-oxide fuel fabrication facility on the Department of Energy's Savannah River site near Aiken, South Carolina. Under this agreement, the U.S. and the Russian Federation would each convert 34 metric tons of weapons-grade plutonium that has been declared excess to national security needs into forms less usable in nuclear weapons. The NRC issued a final environmental impact statement in February 2005, and on March 30, 2005, the NRC issued a construction authorization and published a final safety evaluation report on Duke, Cogema, and Stone & Webster construction authorization request. These were significant milestones in the Department of Energy's Surplus Plutonium Disposition Program. No further NRC action is required prior to construction of the mixed-oxide fuel fabrication facility.

In June 2005, the NRC completed its review of the Louisiana Energy Services license application for the National Enrichment Facility, a proposed commercial gas centrifuge uranium enrichment facility to be located in Lea County, New Mexico. The NRC's safety evaluation report (NUREG-1827) and final environmental impact statement (NUREG-1790) were issued on June 15, 2005. The NRC completed these reviews on an aggressive 18-month schedule. During the reviews, the NRC conducted three public meetings near the proposed facility to provide information on the NRC licensing process and to seek input from the public for an environmental impact statement. In preparing the final environmental impact statement, the NRC addressed nearly 4,200 comments received on the draft environmental impact statement.

USEC, Inc., submitted a license application to the NRC on August 23, 2004, for the American Centrifuge Plant, a proposed commercial gas centrifuge uranium enrichment facility to be located in Piketon, Ohio. The NRC is currently reviewing this license application. The NRC has conducted two public meetings near the proposed facility to provide information on the NRC licensing process and to seek input from the public for the environmental impact statement.

The NRC is conducting integrated safety analysis summary reviews for individual license amendment requests. These independent reviews are part of the agency's implementation of the revised regulation established in Part 70 of Title 10, of the *Code of Federal Regulations* (10 CFR Part 70), which increases the use of risk information for fuel cycle facilities. During this fiscal year, the NRC continued reviews of an integrated safety analysis submitted by BWX Technologies, Inc., and partial integrated safety analyses submitted by Westinghouse Electric Co., LLC, and Global Nuclear Fuel-Americas, LLC.

The NRC also initiated reviews of integrated safety analyses submitted by Nuclear Fuel Services, Inc., and Framatone ANP-Richland. In addition, reviews were initiated on supplemental portions of analyses submitted this fiscal year by Westinghouse Electric Co., LLC, and Global Nuclear Fuels.

For other fuel facilities, significant activities in FY 2005 include the Atomic Safety and Licensing Board panel decision of March 28, 2005, which upheld the NRC's issuance of three amendments to the Nuclear Fuel Services, Inc., license for the Blended Low Enriched Uranium Project. This project is part of a Department of Energy initiative to reduce existing supplies of surplus highly enriched uranium through reuse or disposal. Nuclear Fuel Services, Inc., has contracted with Framatome ANP, Inc., to downblend surplus highly enriched uranium into a low-enriched uranium dioxide product that will be converted to commercial reactor fuel for use in a Tennessee Valley Authority nuclear power reactor.

Regarding the NRC oversight of uranium recovery activities, in FY 2005, after successful reclamation, the Petrotonics Company and the Sohio Western Mining Company transferred ownership of the Shirley Basin South and L-Bar uranium mill tailings sites, respectively, to the U.S. Department of Energy for long-term custody, pursuant to Title II of the Uranium Mill Tailings Radiation Control Act of 1978 and the NRC's implementing regulations in 10 CFR Part 40. Subsequent to this transfer, the NRC accepted the U.S. Department of Energy's long-term surveillance plans for these sites. This acceptance established the U.S. Department of Energy as the long-term custodian and caretaker of the Shirley Basin South and L-Bar sites. In a concurrent action, the NRC terminated Petrotonics' and the Sohio Western Mining Company's specific licenses for these sites.

The agency reviews and approves facility specific physical security plans and fundamental nuclear material control and accounting plans for facilities that the agency regulates. These plans document the safeguards measures in place to deter and protect against threats of radiological sabotage and theft or diversion of special nuclear material at designated fuel cycle facilities.

This activity also supports the US-Russian effort to reduce the stockpile of weapons-grade plutonium by performing technical reviews of the exemption requests and the revised physical security plan to allow the use of four mixed oxide fuel lead test assemblies at the Catawba Nuclear Station. The purpose of the lead test assemblies effort at Catawba is to confirm that the mixed oxide fuel performs as expected in a nuclear power reactor. In FY 2005, the agency completed 12 material control and accounting and 8 physical security licensing actions, submitted the final safeguards evaluation report (NUREG-1827) for the Louisiana Energy Services National Enrichment Facility license

application, completed initial reviews for the USEC American Centrifuge Plant license application and issued requests for additional information, and completed 63 export license reviews. The agency also supported material control and accountability reviews for the hearings on Duke Power’s mixed oxide fuel applications.

Materials Users Licensing and Inspection Activity

The Nuclear Materials Users Licensing and Inspection activity oversees large and small users of nuclear material for industrial, medical, or academic purposes (radiographers, hospitals, private physicians, nuclear gauge users, large and small universities, and others). The NRC and 33 Agreement States regulate more than 20,000 specific and 150,000 general materials licensees. The NRC currently regulates and inspects approximately 4,500 specific licensees for the use of nuclear byproduct and other radioactive materials.

These uses include medical diagnosis and therapy, medical and biological research, academic training and research, industrial gauging and nondestructive testing, production of radiopharmaceuticals, and fabrication of commercial products (such as smoke detectors) and other radioactive sealed sources and devices. Detailed health and safety reviews and inspections of licensee procedures and facilities provide reasonable assurance of safe operations and the development of safe products. The NRC routinely inspects materials licensees to ensure that they are using nuclear materials in a safe manner, maintaining accountability of those materials, and protecting public health and safety. The NRC also analyzes operational experience from NRC and Agreement State

licensees. In particular, the NRC meets regularly to evaluate the safety significance of the events reported by licensees and Agreement States.

In FY 2005, the NRC completed review of 3,274 materials licensing actions and approximately 1,300 materials program inspections. The NRC’s timeliness in reviewing nuclear material license renewals and sealed source and device designs has improved from 1999 through 2005 (see Figure 14). In FY 2005, 608 of 632 (96%) renewals and sealed source and device design reviews were completed within 180 days, and 2,568 of 2,641 (97%) of new applications and license amendments were completed within 90 days.

Under its authority for regulating nuclear material used for medical purposes, in March 2005 the NRC issued a final rule to amend the agency’s requirements for training and experience in 10 CFR Part 35, “Medical Use of Byproduct Material.” This rule amended the

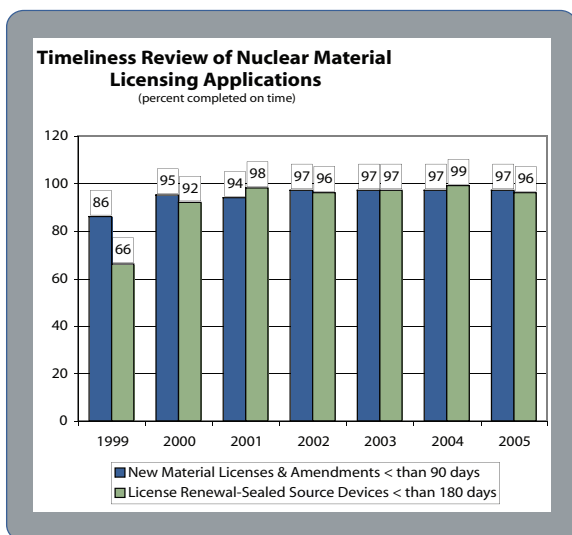


Figure 14

CHAPTER 2

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regulations for recognition of certain specialty boards whose certification may be used to demonstrate the adequacy of the training and experience of individuals to serve as medical physicists, nuclear pharmacists, radiation safety officers, and authorized users (physicians). The rule provides a more flexible and performance-based approach to the requirements, thus reducing regulatory burden. The associated guidance document has been revised to reflect the amended training and experience requirements.

The NRC worked with the Department of Energy to recover unwanted or orphaned greater-than-Class C radioactive sources that were initially identified for accelerated recovery under the Department of Energy Offsite Source Recovery Program. From the inception of the Offsite Source Recovery Program in 1997 through FY 2005, over 11,000 sources have been recovered from over 420 sites on the priority list. Several large devices were recovered for which the NRC issued a certificate of compliance to allow transport of the devices and to facilitate storage by the Department of Energy. In addition to these efforts, in FY 2005 the NRC entered into a cooperative agreement with the Conference of Radiation Control Program Directors' National Orphan Radioactive Material Disposition Program to facilitate disposition of orphaned or unwanted material held by the Agreement States or the NRC licensees.

In collaboration with the Department of Homeland Security, the Department of Energy, and other agencies, the NRC continued to assess the potential use of radioactive sources in radiological dispersion devices and to identify necessary enhancements in the control of radioactive sources. The NRC issued a proposed rule that would establish the regulatory foundation for the National Source Tracking System, a database for tracking radioactive sources of concern. The proposed rule would require the NRC and Agreement State licensees to report transactions involving the manufacture, transfer, receipt, and disposal of nationally tracked sources (Category 1 and 2 sources from the IAEA Code of Conduct). A source registry has been implemented and an interim database developed as a first stage for a truly national source tracking system. The NRC works with the Agreement States to inspect the higher priority licensees and to develop appropriate security enhancements for lower priority licensees. Final enhanced security measures will be issued and an inspection program will be implemented to verify the implementation of these measures. The agency is developing a process to screen new license applications for applicants that need to implement the enhanced security measures and to identify suspicious uses of nuclear materials.

The NRC has taken the lead in implementing portions of the International Atomic Energy Agency's Code of Conduct for the Security of Radioactive Sources. The NRC also has enhanced the security requirements for licensees that hold radioactive materials designated "radionuclides of concern in quantities of concern." The NRC continued

its participation in the International Atomic Energy Agency Radiation Safety Standards Committee and its Transportation Safety Standards Committee. The NRC's involvement in these committees enhances public safety and contributes to international and domestic regulatory stability. The NRC also participated in an International Atomic Energy Agency safety standards committee for reviewing and developing of safety standards and guides for storage of spent nuclear fuel. The NRC also participated in Nuclear Energy Agency committee efforts to develop guidelines for spent nuclear fuel interim storage, and to improve radiation protection regulatory programs.

In July 2005, the NRC participated in an initial meeting with the European Commission in Luxembourg. At this meeting, substantive discussions were held on nuclear materials issues including waste, clearance, radionuclides of concern, export/import, and source tracking. This initial interaction will facilitate future coordination and cooperation with the European Commission.

State and Tribal Programs

The NRC establishes and maintains effective communications and working relationships with States, local governments, Indian tribes, and interstate organizations. The NRC has relinquished its regulatory responsibilities through agreements with 33 Agreement States in accordance with Section 274b of the Atomic Energy Act. To ensure adequate protection of public health and safety and the compatibility of Agreement State programs with the NRC programs, the NRC conducted eight Integrated Materials Performance Evaluation Program reviews of Agreement State programs. The Integrated Materials Performance Evaluation Program uses a common evaluation process that applies to both Agreement State and the NRC regional materials programs to maintain a uniform materials safety policy throughout the Nation. In addition, the NRC conducted one review of an NRC regional office and a review of the NRC Sealed Source and Device Evaluation program. Also in accordance with Section 274i of the Atomic Energy Act, the NRC modified four of the nine agreements with States to conduct additional security inspections for the NRC.

High-Level Waste Repository Activity

The High-Level Waste activity is focused on the permanent storage and disposal of high-level nuclear waste. The NRC conducts its high-level waste program in accordance with the Nuclear Waste Policy Act, as amended, and the Energy Policy Act of 1992. This legislation specifies an integrated approach and a long-range plan for high-level

waste storage, transportation, and disposal. It also prescribes the roles of the NRC, the Department of Energy, and the Environmental Protection Agency with respect to the high-level waste program.

The Department of Energy is responsible for disposing of the Nation's high-level waste, beginning with site characterization and repository design, and the development, operation, and ultimate closure of a deep geologic repository. It is also responsible for characterizing the potential site at Yucca Mountain in the State of Nevada. The Environmental Protection Agency has been charged with developing environmental standards for the Yucca Mountain repository consistent with recommendations of the National Academy of Sciences.

The NRC's responsibilities include licensing decisions and regulatory oversight of the permanent storage and disposal of high-level nuclear waste. The NRC has developed and will modify as necessary technical criteria for licensing, consistent with the standards promulgated by the Environmental Protection Agency. The NRC also has extensive pre-licensing responsibilities and will issue a license after determining whether the license application that the Department of Energy ultimately submits for a geologic repository at Yucca Mountain complies with the applicable regulatory standards.

The Environmental Protection Agency and the NRC issued their standards in 2001. On July 9, 2004, both sets of standards were vacated by a Federal Court of Appeals insofar as the standards incorporated the Environmental Protection Agency 10,000-year compliance period. The Environmental Protection Agency has revised its Yucca Mountain standards to be consistent with the court decision. The NRC published a draft regulation in September 2005 to amend its Yucca Mountain regulations to reflect the new Environmental Protection Agency standards. The NRC staff has also been conducting efforts to modify computer codes and run calculations to project more than 10,000 years into the future. Early in FY 2005, the Department of Energy determined that it needed more time to prepare its license application and that they would not meet their projected December 2004 submission date.

The NRC continued to focus on the actions needed to lay the groundwork for the NRC to independently conduct a license application review during FY 2005. The NRC has been working with the Department of Energy to address key technical issues and raise issues that could impact the quality of the license application. The NRC has 293 agreements with Department of Energy related to nine key technical issues. These agreements were developed to incorporate sound science into the review of the Yucca Mountain license application. Using the risk insights report to focus pre-licensing activities on significant

risk issues, the NRC completed an evaluation of high-risk agreements by the end of the 1st quarter of FY 2005 and finished evaluating moderate to low-ranked agreements by the end of the 2nd quarter.

In FY 2005, the NRC issued an update of the Consolidated Issue Resolution Status Report (NUREG-1762, Rev. 1, April 2005). This publicly available report summarizes the status of technical information developed in the course of pre-licensing interactions between the NRC and the Department of Energy. The report covers issues related to pre-closure safety, post-closure performance, and other aspects of the proposed repository. The NRC expects to use the revised report and the Yucca Mountain Review Plan to conduct a risk-informed review of a license application.

The NRC enhanced its electronic information exchange capability to enable the electronic receipt of high level waste documentary material. The electronic hearing docket was used in the proceeding for the Pre-License Application Presiding Officer. The NRC obtained security approval to deploy the protective order file to support the proceeding. The NRC tested its preparedness “end-to-end” exercises on how organizations processes, procedures, functions, and systems receive, process, and respond to documents and filings. The agency’s management group completed the operational readiness review for the release and determined that it met the service-level requirements and functionality for the pre-license application phase.

The NRC is investing in a digital data management system that will provide the necessary technology and functionality to meet the agency’s obligation to conduct the adjudicatory proceeding for the high-level waste repository. The digital data management system will provide information technology and audio/visual capabilities in at least two hearing rooms (one in the Las Vegas area near Yucca Mountain site, the other at NRC headquarters in Rockville, Maryland); enable the creation and use of an integrated, comprehensive digital record for the high level waste repository licensing proceeding; record, store, and display the text and image of documents presented in the hearing; permit access and retrieval of the entire record; allow counsel for the parties to electronically bring prepared materials to the evidentiary hearing; and provide continual real-time access to the hearing record by the presiding officer and distribution to the parties in the litigation.

Decommissioning and Low-Level Waste Activity

The Decommissioning and Low-Level Waste activity involves licensing and inspection activities at 18 decommissioning power reactors, 17 research and test reactors, 12 uranium recovery sites, as well as 40 complex materials and fuel facility sites. Decommissioning removes radioactive contamination from buildings, equipment, groundwater, and soil to levels that permit the release of the property with or without restrictions on its future use. The NRC terminates the license for decommissioned facilities after the licensees demonstrate that the residual onsite radioactivity is within the regulatory limits and sufficiently low to protect the health and safety of the public and the environment. The criteria for terminating a license are defined in Subpart E of 10 CFR Part 20.

During FY 2005, the NRC oversaw decommissioning activities at numerous complex sites and power reactor sites. Six complex materials licenses, two uranium mill licenses, and two operating reactor license were terminated. In addition, the NRC approved the license termination plans for the Big Rock Point and Yankee Rowe power reactor sites. The NRC's review of the license termination plans, an intermediate step leading to license termination, ensures that the procedures and practices proposed by the site operators will protect the public health and safety and that the proposed decommissioning activities will make the sites suitable for release from regulatory control. Approval of a plan allows the site operator to begin the final stage of cleanup before requesting termination of the site license. Before a site license is terminated or modified, the site must be in compliance with the NRC's decommissioning criteria in 10 CFR Part 20 Subpart E. Completion of the decommissioning activities at these sites allows the sites to be returned to productive use while ensuring that residual radioactivity at the sites does not pose an unacceptable risk to the public.

During FY 2005, the NRC continued to improve the NRC's oversight of decommissioning of nuclear facilities by implementation of the Integrated Decommissioning Improvement Plan. The activities of the Integrated Decommissioning Improvement Plan will ensure that sites are decommissioned using realistic risk-informed approaches and will result in updated decommissioning guidance and new regulations to prevent problematic sites.

Under the Low-Level Radioactive Waste Policy Amendments Act of 1985, the NRC is responsible for licensing a commercial greater-than-Class disposal facility developed by the Department of Energy. There is currently no disposal facility in the U.S. for greater-than-Class wastes, and all of the waste must be temporarily stored. During FY 2005, the NRC supported the Department of Energy in its efforts to develop a disposal option for greater-than-Class-C low-level radioactive waste. The NRC provided

information to the Department of Energy on inventories of greater-than-Class-C waste in the U.S. The NRC's actions will help ensure that there is a safe, secure disposal path for these wastes and that the national policy of permanent disposal of all radioactive wastes is fulfilled.

The NRC also supported the National Academies and the Government Accountability Office in studying low level waste. The NRC is funding a study of "Improving the Regulation and Management of Low-Activity Radioactive Wastes" by the National Academies and is providing information to its study committee on the NRC's activities in this area. The staff expects that the recommendations in the final report of the study committee will be useful in identifying options for effectively disposing of waste. The Government Accountability Office is studying the NRC's security measures for storing of Class B, C, and greater-than-class-C wastes. The findings and recommendations of the Government Accounting Office report will provide insights into the requirements and practices for ensuring and improving the safe storage of these wastes.

The National Defense Authorization Act of 2004 includes new NRC responsibilities for reviewing Department of Energy waste incidental to reprocessing determinations for the Savannah River Site and the Idaho National Engineering and Environmental Laboratory. Waste incidental to reprocessing is residual waste contained in tanks at the Department of Energy sites that may, in some instances, be safely grouted in place, rather than removed and disposed of in a geologic repository for high-level waste. The act requires that the Department of Energy consult with the NRC on waste incidental to reprocessing determinations and plans for disposal of waste that exceeds Class C concentrations. Additionally, the NRC is to monitor the Department of Energy compliance with the requirements of 10 CFR Part 61 and report to Congress, the State, and the Department of Energy if the NRC finds the Department of Energy is not in compliance. The NRC review helps to ensure the safe disposal of such material. In FY 2005, the NRC has initiated this work under a reimbursable agreement with the Department of Energy. Beginning in FY 2006, the NRC is authorized to conduct this work using budgeted resources.

In FY 2005, the NRC participated in the IAEA's Symposium on Low-Level Radioactive Waste Disposal to present information on United States' effort to provide for safe, efficient disposal of materials of this type. In addition, the NRC chaired a meeting on decommissioning issues, co-sponsored by the International Atomic Energy Agency and the Nuclear Energy Agency, which focused on the importance of coordinating the activities of these agencies in tracking multi-disciplinary issues and achieving a more realistic and streamlined approach to decommissioning.

Spent Fuel Storage and Transportation Activity

The Spent Fuel Storage and Transportation activities address the review and approval of Type B and fissile radioactive material transportation packages, the review and approval of dry spent fuel storage casks, and the licensing and inspection of independent spent fuel storage facilities. Millions of shipments of radioactive materials are safely and securely transported each year within the United States. Several Federal agencies share responsibility for regulating the safety and security of those shipments. The NRC closely coordinates its transportation-related activities with those of the Department of Transportation and, as appropriate, the Department of Energy. To carry out its regulatory responsibilities for spent fuel storage and radioactive material transportation, the NRC certifies and inspects both transport container package designs and spent fuel storage cask designs. The NRC also licenses and inspects the interim storage of spent fuel at both reactor sites and away-from-reactor sites. This helps to ensure that licensees provide safe interim storage of spent reactor fuel and transport nuclear materials in packages that provide a high degree of safety.

During 2005, the NRC completed 73 transport container design reviews and 37 storage container and installation design reviews (see Figure 15). The fluctuations in the number of transportation and storage/installation completions each year are based on licensees' needs, such as spent fuel storage capacity. The NRC's timely and effective review of transportation and interim storage licensing requests provides for the public health and safety by ensuring that shipments are made in NRC-approved packages that meet rigorous performance requirements and that spent fuel is safely stored, and thereby enabling continued reactor operations. During 2005, the NRC also conducted 21 inspections of independent spent fuel installations, and radioactive material package certificate holders.

The NRC devoted significant effort to the Private Fuel Storage license application to construct and operate an away-from-reactor independent spent fuel storage installation on the reservation of the Skull Valley Band of Goshute Indians, a Federally recognized Indian tribe. The Atomic Safety and Licensing Board Panel completed hearings on the consequences of a military aircraft crash in mid-September 2004. The Atomic Safety and Licensing Board panel issued their decision in February 2005 and issued a decision in

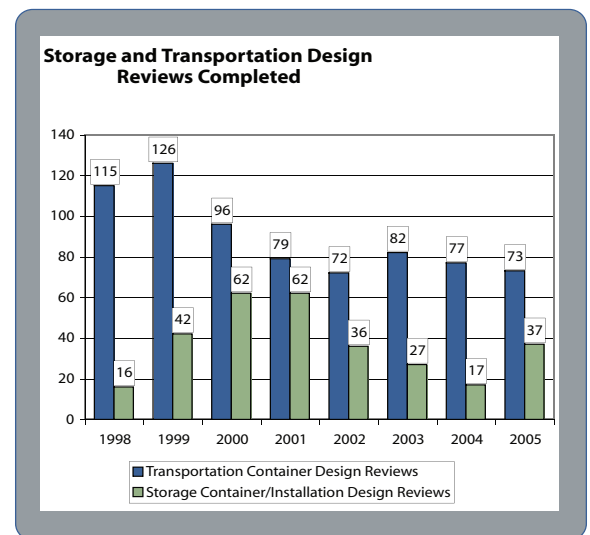


Figure 15

May 2005 on an appeal of their February decision. The Commission recently authorized the NRC staff to assist the Private Fuel storage license once the staff has made the requisite findings under NRC regulations.

In the past year the NRC issued new independent spent fuel storage installation licenses to the Department of Energy for the Idaho Spent Fuel facility, and the Diablo Canyon nuclear power plant. In addition, licenses were renewed for the H.B. Robinson, G.E. Morris, and Surry independent spent fuel storage installation. These were the first ever independent spent fuel storage installation license renewals to be issued for a 40-year period. These licensing actions will provide for the safe storage of spent fuel while allowing continued licensee operations.

The National Academy of Sciences delivered a classified report on spent fuel transportation security to the House and Senate Committees on Appropriations in July 2004 and published an unclassified summary in March 2005. The NRC responded to Congress with a report on March 14, 2005, describing the specific actions the NRC has taken in response to the National Academy of Sciences recommendations.

The agency finalized its Radioactive Material Quantities of Concern and Additional Security Measures on April 26, 2005 and continues to cooperate with the Department of Homeland Security and the Department of Transportation to enhance security for transported radioactive materials.

Materials and Waste Safety Research

The NRC has undertaken research activities to develop risk assessment tools, methods, and guidance for implementing risk-informed approaches for materials applications. The ultimate goal of these activities is to develop a technical basis to risk-inform the regulatory requirements for materials licenses. The need for more realistic tools for accurately assessing radiation doses to workers and the public is also being addressed. In addition, research activities are being undertaken to develop information on the currently licensed sources and materials that will support a rulemaking to risk-inform the regulations for using byproduct and source material.

The NRC is also conducting research for the development of a human reliability analysis capability specific to the materials program to help reduce the misuse of radioisotopes and radioactive material in medical and industrial applications and to develop tools to improve the NRC reviews of spent fuel handling.

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Research activities support a number of the NRC's nuclear waste activities. One ongoing research study is to develop information and tools to assess the movement of radionuclides in the environment resulting from decommissioning and waste management activities. Another study concerns dose to the public from these activities.

The NRC published three reports intended to improve decommissioning reviews during this fiscal year. The first was NUREG/CP-0187, "Proceedings of the International Workshop on Uncertainty, Sensitivity, and Parameter Estimation for Multimedia Environmental Modeling," October 2004. The report concerns better ways to evaluate uncertainty in assessing environmental systems performance. The second was NUREG/CR-6870, "Consideration of Geochemical Issues in Groundwater Restoration at Uranium In Situ Leach Mining Facilities," June 2005. This report addresses how to estimate remediation costs for in-situ leach mining facilities and will directly assist licensing staff in evaluating financial assurance requirements for in situ leach mine licensees. The third report was NUREG/CR-6871, "Documentation and Applications of the Reactive Geochemical Transport Model," June 2005. This work demonstrated the application of an improved approach to modeling complex soil chemistry.

The NRC implemented several improvements in dose modeling capability to improve the agency's ability to estimate more realistically the potential long-term impact of radionuclides in the environment and enhance the agency's decisionmaking in terminating licenses.

Enhancements to three modeling or analysis tools should improve staff capabilities to evaluate sites for release. The first enhancement was a probabilistic version of RESRAD-OFFSITE. It was released for beta testing along with a draft user's manual in October 2004. This is the first version of the widely used RESRAD family of codes that can be used in cases where contamination has migrated away from the initial point of release. A second code, the FRAMES2 modeling platform with linkage to other modeling codes for specific environmental pathways was released in March 2005. This tool will be helpful in addressing sites with complex environments or the potential for widespread contamination. Finally, SADA version 4.1, along with a draft user's guide, was released in May 2005. This product is a tool for designing sampling programs to efficiently determine the extent of potential contamination to develop realistic survey plans.

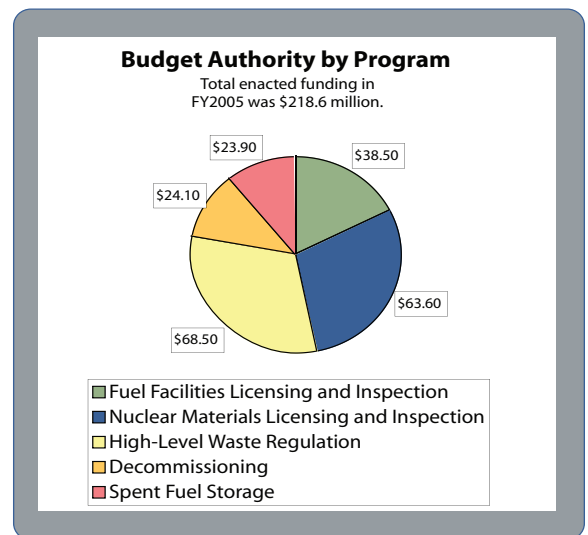


Figure 16

Funding for Achieving Goals

The Nuclear Materials and Waste Safety budget was \$218.6 million in FY 2005. This went to the key activities of Fuel Facilities Licensing and Inspection, Nuclear Materials Users Licensing and Inspection, High-Level Waste Repository, Decommissioning and Low-Level Waste, and Spent Fuel Storage and Transportation (see Figure 16).

Program Evaluation

The NRC conducted an integrated materials performance evaluation of the Region I materials program in FY 2005. The integrated materials performance evaluation program is an ongoing oversight program designed to evaluate the quality, adequacy, and consistency of the NRC and Agreement State materials programs using a set of common performance indicators. The evaluation was conducted by a multi-disciplinary team of NRC and Agreement State personnel. The team found that the Region I operations are fully satisfactory with respect to the technical quality of licensing and inspections, the status of the inspection program, responses to incidents and allegations, and technical staffing and training. The Management Review Board supported the team's proposed findings and determined that the program is operating in a manner that adequately protects the public health and safety.

During FY 2005, an NRC team was established to perform an evaluation of the NRC's High-Level Waste Repository program. This evaluation examined the agencywide regulatory program for the proposed high-level waste repository at Yucca Mountain, Nevada, from the perspective of the Office of Management and Budget's Program Assessment Rating Tool (PART). This evaluation concluded that the program is well positioned to accomplish its objectives. The evaluation contains several recommendations for FY 2006 actions that will help the program prepare for a PART review, currently scheduled to occur in FY 2007.

Program Assessment Rating Tool

Over the past several years, the Office of Management and Budget has conducted reviews utilizing the Program Assessment Rating Tool of the Nuclear Materials and Waste Safety program activities. The following sections include a description of the activities, the Office of Management and Budget recommendations, and NRC's response and their impact upon program performance.

Spent Fuel Storage and Transportation Licensing and Inspection

In FY 2005, the NRC evaluated its Spent Fuel Storage and Transportation Licensing and Inspection activity using the Program Assessment Rating Tool promulgated by the Office of Management and Budget. The Office of Management and Budget rated the activity as “effective,” which is the highest rating, and gave the activity an overall score of 89.

Fuel Facilities

Office of Management and Budget Recommendations

The Office of Management and Budget rated this activity as effective with an overall score of 89 in FY 2003 (Budget Year 2005). The activity earned high scores for Program Purpose and Design and for Program Management. The Office of Management and Budget noted that the purpose of the activity was clear, well-designed, and results-oriented. Also noted was that this activity has met all of its performance measures since the Government Performance and Results Act program reporting began in 1997. The Office of Management and Budget’s recommendations included better linkage of budget requests to accomplishing annual and long-term goals and complete evaluation of performance measures in the organization’s operating plan and revise them as necessary to support the safety performance measures in the NRC’s FY 2004–FY 2009 Strategic Plan. Another recommendation is for more transparency in how allocation decisions are made and how the activity contributes to achievement of the agency’s long-term goals, and complete the NRC’s review of operating plan format and content to improve their effectiveness as management tools.

NRC Response

The NRC has developed better linkage of budget requests to its annual and long term goals through its initiative to define program outcomes and outputs that align with performance measures. Additionally, the NRC is working to improve its cost management capabilities to better align its costs with outcomes. The NRC also demonstrated via direct linkage of FY 2005 Operations Plan performance measures to the NRC FY 2004–FY 2009 Strategic Plan strategies for meeting the Strategic Plan objective and goals. Each of the operating plan’s safety performance measures reference one or more of the Strategic Plan strategies for the agency’s safety goal.

In addition, the NRC moved to implement costing to the NRC’s two primary goals in the FY 2004–FY 2009 Strategic Plan (safety and security) beginning with the FY 2006 Performance Budget. In addition, the NRC has demonstrated better linkage of budget requests to agency goals through utilization of the common prioritization process for

establishing the linkage between operational activities, including the resources allocated to support these activities, and the agency's strategic and long-term goals. The NRC's Fuel Cycle Licensing and Inspection program managers have responded to the Office of Management and Budget recommendation by linking operational activities and the agency's strategic and long-term goals in the revised operating plans.

The NRC also responded to completing a review of the organization's operating plan format and content. The scope of the project was separated into two phases to address: improvements that could be implemented in the short-term; and, improvements that would require longer-term planning and evaluation. The short-term improvement efforts were completed in December 2004 through the development of a performance reporting framework containing common reporting criteria and format. This format was implemented during the first quarter of FY 2005. The longer-term efforts to improve the efficiency of operating plans are currently being addressed by an agencywide workgroup.

Nuclear Materials Users Licensing and Inspection

Office of Management and Budget Recommendations

This Program Assessment Rating Tool review was conducted in FY 2004 for the FY 2006 Performance Budget. The Office of Management and Budget rated this activity as effective with an overall score of 93. The Office of Management and Budget recommendations include having the NRC provide a clearer demonstration of the contributions of specific activities to agency goals in the FY 2007 Performance Budget; create program goals that will support the mission of the agency; and schedule an evaluation of the program consistent with guidance in the Office of Management and Budget Circular A-11 prior to the submission of the FY 2007 Performance Budget. With respect to the third Office of Management and Budget recommendation, the NRC's Office of the Inspector General is currently conducting a review of the Nuclear Materials Users program area. The Office of the Inspector General report is expected in late FY 2005.

NRC Response

The NRC is currently developing milestones to address the Office of Management and Budget recommendations and the results will be included in next year's *Performance and Accountability Report*.

ADDRESSING THE PRESIDENT'S MANAGEMENT AGENDA

Overview

The President's Management Agenda prescribes Governmentwide initiatives to reform the U.S. Government to be more citizen-centered, results-oriented, and market-based, and to actively promote competition rather than stifling innovation. To achieve this goal, the Administration has identified five initiatives to improve Government performance in the areas of (1) strategic management of human capital, (2) budget and performance integration, (3) competitive sourcing, (4) expanded electronic Government, and (5) improved financial management. The NRC has responded to these Governmentwide initiatives in the following five sections, and discusses agency accomplishments during FY 2005 in each of the five areas, respectively.

Initiative 1: Strategic Management of Human Capital

Strategic Alignment

In FY 2005, the NRC continued the work begun in FY 2004 in its updated Strategic Human Capital and Workforce Restructuring Plan, which describes objectives and strategies for addressing the agency's human capital challenges. This plan aligns with the agency's FY 2004–FY 2009 Strategic Plan and with the agency's action plans for recruitment, training and development, and diversity management. In accordance with the plan, the NRC continues to identify future human capital investments through the agency's planning, budgeting, and performance management process.

Workforce Planning and Deployment

Various offices within the NRC improved operations when the agency completed changes in organizational structure. These changes included the realignment of functions, reductions in the span of control, elimination of unnecessary layers of management, and reorganizations. One initiative created a new low-level waste section to manage effectively the new duties stemming from the National Defense Authorization Act and the NRC's new responsibilities to monitor disposal actions and to consult with the Department of Energy on waste incidental to reprocessing determinations.

These improvements in organizational structure are integrated with continuing efforts to use the agency's strategic workforce planning process to improve workforce deployment, maintain technical capacity, and make informed decisions on human capital strategies for recruitment, development, and retention.

In addition, over the past four years, the NRC made significant improvements in the agency's strategic workforce planning methodology and system based on emerging needs and end user feedback. The Office of Personnel Management continues to cite the NRC's strategic workforce planning process and related Web-based application as an exemplary model for other Federal agencies.

Talent

Through partnerships between the program offices and the Office of Human Resources, the NRC employs human capital strategies to maintain the technical excellence of the NRC workforce, prepare for emerging work, address identified critical skill gaps, and meet and exceed the agency's human capital goals. These strategies include recruitment, relocation and retention incentives, student loan repayments, waivers of dual compensation limitations, partnerships with colleges and universities, the Cooperative Education Program, the Honor Law Graduate Program, the Graduate Fellowship Program, the Summer Employment Program, the Nuclear Safety Professional Development Program, rotational assignments, succession planning, mentoring, and training and development opportunities. These strategies have had a positive impact on the agency's efforts to recruit and retain staff with critical skills.

Leadership and Knowledge Management

The NRC uses succession planning, training and development, and knowledge management strategies to close identified critical skill gaps and to ensure continuity of leadership. The NRC continues to offer leadership competency development programs such as executive leadership seminars, the Senior Executive Service Candidate Development Program, leadership training for new supervisors and team leaders, and the Leadership Potential Program. These programs comprise a critical aspect of the NRC's succession and leadership development strategies by ensuring that leaders are prepared to assume entry-level, mid-level and senior-level leadership positions throughout the agency.

The NRC provides a wide variety of in-house, contracted, and online technical and professional training in the areas of reactor technology, engineering support, health physics, regulatory skills, communications, acquisition, and computer support. The NRC develops and conducts courses based on results from an annual training needs survey.

Performance Culture

Last year, the NRC implemented a new Senior Executive Service performance management system to improve its value as a management tool and to incorporate legislative changes as well as regulatory changes implemented by the Office of Personnel Management. The new system aligns individual executive performance expectations with the agency's Strategic Plan, Performance Budget, and office operating plans. The Office of Personnel Management and the Office of Management and Budget certified the NRC's Senior Executive System for FY 2004 and FY 2005, thus signifying that the NRC's system makes meaningful distinctions between the performances of various executives.

Accountability

The NRC continues to evaluate how well the agency is succeeding in achieving the human capital goals and outcomes in the areas of recruitment, staffing, retention, and training and development. In addition, the NRC staff briefs the Commission annually on the agency's human capital efforts.

Twice each year, the NRC analyzes and reports to the Commission on the status of workforce statistics by demographic groups over a five-year period. The analysis includes workforce size and composition, hires, attrition, rotational assignments, performance appraisals, and awards. These statistics are shared throughout the agency.

Initiative 2: Budget and Performance Integration

The NRC continues to make progress in achieving budget and performance integration in accordance with the President's Management Agenda. This progress includes adopting new outcome-based performance measures aligned with the agency's FY 2004–FY 2009 Strategic Plan, accurately monitoring program performance, and integrating performance information with associated costs. To address these initiatives, the NRC has pursued and completed a number of actions in FY 2005, as discussed in the following sections.

Integrating Planning and Budgeting

The NRC's planning, budgeting, and performance management process links the NRC's various budget accounts to the agency's primary goals of safety and security and clearly identifies the budgetary resources devoted to them. The agency's FY 2006 budget request identifies the alignment of resources to these two primary goals.

Full Cost Budget

NRC program managers currently receive cost reports that show the full cost of major programs. These reports allow managers to plan and manage their programs better throughout the budget year. The NRC's Performance Budget presents the "full cost" budget to achieve the agency's goals. The agency's FY 2005 budget request is the first budget submission in which the NRC has shown the full cost at the program level. The NRC will continue to refine the integration of outputs, goals, and assignment of full cost across programs as outlined in the Office of Management and Budget guidance for the FY 2006 budget.

Program Effectiveness

The NRC's Reactor Licensing activity and Spent Fuel Storage and Transportation Licensing and Inspection activities were evaluated using the Program Assessment Rating Tool promulgated by the Office of Management and Budget. The Spent Fuel Storage and Transportation Licensing and Inspection activity was rated effective, which is the Office of Management and Budget's highest rating. The Reactor Licensing activity was rated as moderately effective, the second highest rating. This finding resulted from the assessment that this activity needed more challenging annual measures and better efficiency measures. The NRC's experience from both reviews has yielded valuable insights for improving the measurement of the efficiency and effectiveness of its activities.

The NRC has modified its performance appraisal system for senior executives. The degree to which each senior executive's individual performance contributes to achieving the organization's goals and objectives is now an important part of their appraisal. The new system has been certified by both the Office of Management and Budget and the Office of Personnel Management as showing accountability for performance.

Initiative 3: Competitive Sourcing

One of the NRC's corporate management strategies is to acquire goods and services in an efficient manner. To achieve that, the NRC established output measures associated with the implementation of the competitive sourcing initiative under the President's Management Agenda, adopted a performance-based approach to contracting, and posted procurement synopses on the agency's Web site.

The NRC submitted its FY 2004 Federal Activities Inventory Reform Act inventory to the Office of Management and Budget in June 2004, and received approval from the Office of Management and Budget on November 16, 2004. That inventory

identifies 248 commercial activity full-time equivalent units, which are available for public-private competition. The NRC published the inventory to its external Web site on November 17, 2004. One challenge to the 2004 commercial inventory was received. The NRC rendered its initial decision denying the challenge on February 10, 2005. The NRC denied the appeal to this decision on March 11, 2005. The NRC submitted its 2005 Federal Activities Inventory Reform Act inventory to the Office of Management and Budget on June 30, 2005.

The NRC conducted four business case analyses covering 18 full-time equivalents during FY 2004 to determine whether the selected commercial activities were appropriate for public-private competition based on the factors outlined in the NRC's Competitive Sourcing Plan. Based upon the Source Selection Authority's completed review of the four business case analyses, the NRC determined that it was not cost effective and, therefore, not appropriate to initiate public-private competitions for these activities. Three business case analyses are underway in FY 2005 and are planned to be completed by September 30, 2005, in accordance with NRC's Competitive Sourcing Plan.

The NRC continues to implement performance-based contracting for facility management services, data entry, information technology, and other support services. To give vendors a better understanding of contract requirements, the NRC includes such criteria as measurable performance requirements, quality standards, quality surveillance plans, and provisions for reducing the fee or price when the vendor fails to perform services as required. The NRC continues to exceed its target for expending eligible service contracting dollars through performance-based contracting. As a result, the agency has experienced improved vendor performance and lowered acquisition costs.

The NRC continues to post on its external Web site all required synopses and solicitations for acquisitions valued at more than \$25,000.

Initiative 4: Expanded Electronic Government

The NRC continued to integrate and align its information technology investments with the Federal Government's Electronic Government program. The NRC uses Electronic Government services for payroll, security clearance, acquisition support, Governmentwide customer service, recruitment and training, and the NRC is currently implementing support for travel. In addition, for the 15 Presidential Priority initiatives that the NRC participates in through internal agency coordination, the NRC ensures alignment and consistency with Governmentwide standards and solution approaches. The NRC established procedures to avoid information technology investments that would duplicate other Federal Electronic Government programs and to take advantage

of the SMARTBUY program. The NRC is participating in the Finance and Human Capital Lines of Business, and the agency is well positioned to take advantage of these programs because the NRC currently receives payroll and human resource services from Department of the Interior. The NRC is also participating in the Information Technology Security Lines of Business. The agency completed analysis of our Electronic Government implementation and alignment efforts as requested by the Office of Management and Budget and established key milestone dates, as appropriate. The NRC's Licensing Support Network system has been singled out by the Office of Management and Budget, and included in its annual Electronic Government report to Congress, as an example of a highly effective cross-agency initiative.

Enterprise Architecture

The NRC continued to make progress in embracing enterprise architecture. An enterprise architecture team was formed to ensure the timely coordination and completion of business-driven plans aligned with the Federal enterprise architecture for both the short and long term. The NRC is implementing business outreach activities through an Enterprise Architecture Communication Plan. The NRC is populating an automated enterprise architecture tool to capture and document the agency's enterprise architecture and to identify patterns and aid decisionmaking for information technology investments.

The NRC emphasizes enterprise architecture in its information technology systems development life cycle and is completing an integrated policy and process called the Project Management Methodology. The NRC project manager will have a single guide to meet both internal and external requirements. The Project Management Methodology consolidates existing NRC management directives and supporting processes for enterprise architecture, capital planning and investment control, systems development life cycle management methodology, and infrastructure development process model into one directive and handbook with an associated Web site, automated tool, and established processes. Besides fully integrating the consolidated policies and processes, the Project Management Methodology guide includes checkpoints for associated processes such as information technology security and records management. The Information Technology Business Council and Information Technology Advisory Council, comprising senior business managers, continue to play an important role in linking information technology investment decisions to the agency's mission and goals. The recently completed Enterprise Architecture Readiness Assessment provides useful information that serves our business strategic planning for information technology and enterprise architecture implementation efforts. The continuing accomplishments in enterprise architecture

enable the building of better NRC business models that will provide the understanding necessary for us to more effectively solve business problems and provide better, more efficient information technology services.

Federal Information Security Management Act

The NRC's compliance with the requirements of the 2004 Federal Information Security Management Act was ranked third among all Government agencies and resulted in a grade of "B" issued by the House Committee on Government Reform's Subcommittee on Technology, Information Policy, Intergovernmental Relations, and the Census. In FY 2005, the NRC has increased efforts to conduct more rigorous independent review, testing, and evaluation of major system security plans. These increased efforts reveal previously undiscovered and unidentified security risks. In response, the NRC extended some system certification schedules to ensure full and complete system certification.

The NRC has an effective information technology security training and awareness program. All employees are required to complete an online information technology security training course, and NRC information systems security officers and other employees and support contractors with significant security responsibilities are required to complete a more advanced online technical security course. The NRC maintains an information technology security Web site and provides information to agency employees for the timely awareness of information technology security issues. The NRC has a robust incident reporting program in place and files monthly reports to the Federal Computer Incident Response Center.

E-Authentication Guidance

The Office of Management and Budget issued "E-Authentication Guidance for Federal Agencies," which updated earlier guidance under the Government Paperwork Elimination Act to ensure that online Government services are secure and protect privacy. This updated guidance directed agencies to conduct electronic authentication risk assessments and categorize all existing transactions and systems that require user authentication into four "identity assurance levels" by September 15, 2005. The NRC awarded a contract to complete these assessments for all electronic transactions in accordance with guidance promulgated by the National Institute of Standards and Technology. The NRC received an extension from OMB and will complete this effort by the end of December 2005.

Electronic Information Exchange—Minimizing the Burden on Business

The NRC maintains an electronic information exchange program, which provides for the transmission of digitally signed electronic documents to the NRC over the Internet. Information received in this manner can then be electronically disseminated directly into the agency's information systems. The NRC's Electronic Information Exchange program plays a major role in enabling the agency to meet the Government Paperwork Elimination Act requirement to allow the public the option of transacting business electronically with the agency. The NRC implemented system changes to accommodate the High-Level Waste activities. During FY 2005, approximately 30 legal briefs have been filed via Electronic Information Exchange in the High-Level Waste Pre-License Application Presiding Officer proceeding.

High-Level Waste Meta-System

Over the last three years, the NRC has been integrating several major agency applications—Agency Documents Access and Management System, Electronic Information Exchange, Electronic Hearing Docket, Digital Data Management System, and Licensing Support Network—and business processes to support licensing of the Department of Energy's nuclear waste disposal repository at Yucca Mountain, Nevada. In order to meet the challenges of licensing Yucca Mountain, the NRC has implemented new information systems and leveraged much of the existing information technology and information management architecture by enhancing computer applications, upgrading computing infrastructure, and improving business processes to provide a more robust, secure, and integrated environment. This collection of business processes, computer applications, and information technology infrastructure components is referred to as the High-Level Waste Meta-System. The High-Level Waste Meta-System's capability to support the High-Level Waste business process has been validated by performing iterative exercises of the entire business process. On June 2, 2005, the NRC conducted an Operational Readiness Review that resulted in the acceptance of Release 1 of the High-Level Waste Meta-System to support the High-Level Waste activities and adjudicatory proceedings.

Improvements to the NRC's Internal and Public Web Sites

The NRC participated in the American Customer Satisfaction Index and deployed the American Customer Satisfaction Index survey on our public Web site. The NRC will evaluate the statistics compiled from the survey results and measure how our public Web site performs in relation to other Government and private industry participants. The results will be used to identify areas that may need improvement.

The NRC launched a new public meeting notice system, accessible through our public Web site, which allows the public to search public meetings by docket number, facility name, meeting location, participants, and meeting dates. Agency stakeholders now can more easily identify and plan for meetings that are of interest to them.

The NRC has improved its emergency readiness to use its public Web site effectively. Staff from our emergency response, public affairs, and Web content management organizations collaborated to prepare appropriate procedures, Web page templates, and content that will be used during an emergency. The new procedures were tested and improved during two exercises in March and May 2005. In addition, the NRC began using a Web hosting service that prevents an overload in the event of a "denial of service" attack on our Web site or in emergency in which many members of the public try to access the agency Web site.

Sensitive Information Screening

Early this year, the NRC removed numerous documents from its publicly available records library (accessible from our public Web site) and screened these documents for information that could reasonably be expected to be useful to terrorists. The majority of these documents, with the exception of documents related to materials licenses, have been returned to public access after an extensive staff review effort and significant work by our IT staff to selectively remove and then restore segments of the information as the screening was completed.

Productivity Improvements

The NRC conducted a pilot to assess the viability of the Citrix Web Interface remote access system for high-speed remote access. As a result of the pilot, the Office of Information Services will offer a new service to the agency's remote workforce. Broadband Remote Desktop is a method where users can access the NRC network via their own existing high-speed broadband connection with their Internet service provider. The Broadband Remote Desktop will provide connectivity to the agency network via the Citrix servers at NRC headquarters or the Regional offices. Using a Web browser and the

NRC digital certificate, remote users can access their network files, NRC e-mail, and other network applications. The positive results of the pilot indicated that this technology would improve productivity of staff working offsite, and production implementation is currently underway.

The NRC upgraded the agency's firewall environment. The primary function of an agency firewall is to protect the NRC's network resources from Internet-based threats. This firewall is vendor-supported technology with an improved level of protection, availability, and performance for the NRC's Local Area Network/Wide Area Network. The firewall implementation resulted in better security, performance, and enforced NRC Internet policies.

The NRC developed a half-day hands-on computer course "Making 508-Compliant Government Purchase Card Decisions" in the agency's Professional Development Center. The course is intended for NRC staff who need to use Government purchase cards to purchase computers, software, telecom, faxes, calculators, and videos that comply with Section 508 of the Americans with Disabilities Act. This course provides users with a systematic process tool for identifying which items meet the requirements. The use of these tips and tools will result in a productivity improvement for Government credit card holders.

Initiative 5: Improved Financial Management

Financial Management Systems

The NRC's financial systems strategy is to improve business processes, systems performance, and access to information while reducing life-cycle costs by relying on commercially available software and cross-service providers wherever possible. The NRC's core accounting, payroll, and human resources systems are cross-serviced by a Federal agency Center of Excellence. The remaining internally maintained and managed financial systems are periodically reviewed to identify ways to improve performance, interface with other systems, and utilize cross-servicing, as appropriate. The agency also provides electronic access to daily financial transaction data and reports, as well as agency standard cost ratio and performance data. Our current systems satisfy operational and reporting requirements and provide timely, accurate, and useful information to agency managers.

The NRC's financial systems are in substantial compliance with the Improvement Act, except for its Fee Billing System and the payroll and core accounting systems cross-serviced by the Department of Interior (DOI) National Business Center (NBC). These systems are in substantial noncompliance with Federal financial management system requirements.

Improvements were also made in the cost accounting system in FY 2005. An obligation model was created that will allow tracking costs by obligation which resource managers use to make decisions regarding resource utilization. New reports were created in the Cost Accounting System, which is used to monitor charges to the Nuclear Waste Fund by program offices using a full cost methodology. Also, the Cost Accounting System was updated to reflect the FY 2005 budget structure. All financial and managerial cost reports were issued on time or ahead of schedule for FY 2005.

Accurate and Timely Financial Information

The NRC received an unqualified opinion on the FY 2005 financial statements, and the *FY 2004 Performance and Accountability Report* earned the agency a Certificate of Excellence in Accountability Reporting from the Association of Government Accountants.

Integrated Financial and Performance Management Systems

The NRC has achieved a high level of financial systems integration, which supports the agency's day-to-day operations. To achieve this integration, core accounting is interfaced with the cost accounting, payroll, and fee billing systems. The agency also provides electronic access to daily financial transaction data and periodic summary reports for management use. Senior managers receive monthly budget execution reports as well as agency standard cost ratio and performance data.

Annual Financial Statements and Internal Controls

The NRC earned an unqualified audit opinion on the agency's financial statements in FY 2005. The NRC will continue to pursue actions that will result in the issuance of financial statements with unqualified audit opinions and no material internal control weaknesses. During FY 2005, NRC continued efforts to eliminate the auditor-identified material internal control weakness related to the Fee Billing System. NRC implemented improvements to the fee billing process and resolved two reportable conditions, but further corrective action is needed to address the remaining three.

In order to promote a high level of data integrity, the NRC has a robust system of internal controls designed to ensure that financial data are entered in a timely and accurate manner. The system of internal controls requires monthly reconciliation of data and quarterly certification by managers throughout the agency. The agency has an established program for routinely assessing performance and financial information. Annually, managers are required to provide reasonable assurance that effective controls are in place to ensure the integrity of their program and financial operations. These reasonable assurance assessments are reviewed by an executive agency management group, which in turn provides assurance to the Chairman of the Commission. This is the basis for the Chairman's assurance statement contained in the agency's annual Performance and Accountability Report.

DATA SOURCES AND QUALITY

The NRC's data collection and analysis methods are driven largely by the regulatory mandate that Congress entrusted to the agency. Specifically, the NRC's mission is to regulate the Nation's civilian use of byproduct, source, and special nuclear materials to ensure adequate protection of public health and safety, protect the environment, and promote the common defense and security. In undertaking this mission, the NRC oversees nuclear power plants, nonpower reactors, nuclear fuel facilities, interim spent fuel storage, radioactive material transportation, disposal of nuclear waste, and the industrial and medical uses of nuclear materials. Section 208 of the Energy Reorganization Act of 1974, as amended, requires the NRC to inform Congress of incidents or events that the Commission determines to be significant from the standpoint of public health and safety. The NRC developed the abnormal occurrence criteria to comply with the legislative intent of the Act to determine which events should be considered "significant." Based on those criteria, the NRC prepares an annual "Report to Congress on Abnormal Occurrences" (NUREG-0090, Vol. 26), which is available on the agency's public Web site at <http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr0090>.

One important characteristic of this report is that the data presented normally originate from external sources such as Agreement States and NRC licensees. The NRC believes that these data are credible because (1) agency regulations require Agreement States, licensees, and other external sources to report the necessary information; (2) the NRC maintains an aggressive inspection program that, among other activities, includes auditing licensee programs and evaluating Agreement State programs to ensure that they are reporting the necessary information as required by the agency's regulations; and (3) the agency has established procedures for inspecting and evaluating licensees.

The NRC employs multiple database systems to support this process, including the Licensee Event Report Search System, the Accident Sequence Precursor Database, the Nuclear Materials Events Database, and the Radiation Exposure Information Report System. In addition, nonsensitive reports submitted by Agreement States and NRC licensees are available to the public through the NRC's Agencywide Documents Access and Management System, which is accessible through the agency's public Web site at <http://www.nrc.gov>.

The NRC has established procedures for the systematic review and evaluation of events reported by NRC and Agreement State licensees. NRC's objective is to identify events that are significant from the standpoint of public health and safety based on criteria that include specific thresholds. The NRC verifies the reliability and technical accuracy of event information reported to the agency. The NRC periodically inspects licensees and reviews Agreement State programs. In addition, NRC headquarters, the Regional offices, and Agreement States hold periodic conference calls to discuss event information. Events identified as meeting the abnormal occurrence criteria are validated and verified by all applicable NRC headquarters program offices, Regional offices, and agency management before being reported to Congress.

Data Security

Data security is ensured by the agency's automated information security program, which provides administrative, technical, and physical security measures to protect the agency's information, automated information systems, and information technology infrastructure. Specifically, these measures include the policies, processes, and technical mechanisms used to protect classified information, unclassified safeguards information, and sensitive unclassified information that are processed, stored, or produced on the agency's automated information systems. Data security for information maintained outside the NRC's infrastructure is provided by the hosting contractor or organization.

For major systems, the NRC ensures compliance with agency standards through independent reviews conducted under the Federal Information Security Management Act. The NRC's Office of the Inspector General completed its independent assessment of the agency's implementation of the Act on September 30, 2004. Through that assessment, the Office of the Inspector General found that the NRC has continued to improve its security program by completing a majority of program and system level corrective actions identified in the FY 2003 Federal Information Security Management Act review, including additional corrective actions identified through FY 2004, and developing processes and procedures for updating the NRC system inventory and implementing security configurations on NRC servers.

Performance Data Completeness and Reliability

In order to manage for results, it is essential for the NRC to assess the completeness and reliability of our performance data. Comparisons of actual performance with the projected levels are possible only if the data used to measure performance are complete and reliable. Consequently, the Reports Consolidation Act of 2000 requires the Chairman of the NRC to assess the completeness and reliability of the performance data used in this report. In addition, the Office of Management and Budget Circular A-11 specifically describes how Federal agencies should assess the completeness and reliability of their performance data.

Data Completeness

The Office of Management and Budget considers data to be complete if an agency reports actual performance data for every performance goal and indicator in the annual plan. Actual performance data may include preliminary data if those are the only data available when the agency sends its report to the President and Congress. The data presented in this report meet these requirements for data completeness, in that we have reported actual or preliminary data for every strategic and performance goal measure.

The actual data for strategic and performance goal measures covers the entire fiscal year for 2005 unless otherwise noted in the *Performance and Accountability Report*.

Data Reliability

The Office of Management and Budget considers data to be reliable when agency managers and decisionmakers do not demonstrate either a refusal or a marked reluctance to use the data in carrying out their responsibilities. The data presented in this report meet this requirement for data reliability in that the NRC's managers and decisionmakers regularly use the reported data on an ongoing basis in the course of their duties.



Improvements in Performance Data

The NRC analyzed the data verification procedures for the agency's performance measures during FY 2005. This analysis consisted of an evaluation of all data collection, analysis, and reporting procedures for completeness, accuracy, consistency,

CHAPTER 2

PROGRAM PERFORMANCE

and timeliness. The analysis also included an evaluation of NRC management controls, which ensure that the reported data are valid and reliable. As a result, the NRC believes that its performance data are both valid and reliable.

A more complete discussion concerning the validation and verification of the NRC's performance measures is provided in the agency's Performance Budget for FY 2006 (NUREG-1100, Vol. 21), which the Commission submitted to Congress in February 2005. The Performance Budget is available on the NRC's public Web site at <http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1100/>. Appendix IV to the NRC's Performance Plan provides an extensive explanation of the NRC's data verification and validation procedures for each performance measure.

The NRC makes performance data accessible to citizens through the public Web site. For example, a citizen who wanted to verify or know more about licensee event reports, which provide the raw data for most of our performance measures, could simply retrieve any or all of those reports through the NRC's Agencywide Documents Access and Management System (ADAMS), accessible through our public Web site at <http://www.nrc.gov/reading-rm/adams.html>, by searching for "licensee event report."

