

# CHAPTER 2: PROGRAM PERFORMANCE

## MEASURING AND REPORTING OUR PERFORMANCE

This chapter presents information on the program-specific performance of the U.S. Nuclear Regulatory Commission (NRC) during fiscal year (FY) 2004. The presentation begins with a discussion of the NRC's performance measurement system and alignment of resources to strategic goals, followed by a discussion of the homeland security and safeguards programs, a summary of the NRC's program performance for Nuclear Reactor Safety, Nuclear Materials Safety, Nuclear Waste Safety, and International Nuclear Safety Support. Within each program, the discussion of performance includes an overview of the agency's key initiatives and some of our major accomplishments. The discussion also includes program-specific performance results for NRC goals and measures, along with relevant budget information and the results of all program evaluations or studies completed during FY 2004.

Following the program-specific discussions, this chapter describes the NRC's progress in "Getting to the Green" for the five management initiatives identified in the President's Management Agenda. Finally, this chapter briefly discusses the sources and quality of data presented in this report, with a particular focus on the methods the NRC uses 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 data presentation and located in an "Endnotes" section at the end of the report. The endnotes provide definitions and clarify technical terms in the data.

## OUR PERFORMANCE MEASUREMENT SYSTEM

The NRC's performance measurement system includes both strategic goals and strategic goal measures, as well as performance goals and performance goal measures. The strategic goals represent the agency's mission and reflect the overall outcomes to be achieved. The performance goals focus on outcomes which are key contributors to achieving the agency's strategic goals.

**BUDGET AUTHORITY BY PROGRAM** in millions



**DISTRIBUTION OF EMPLOYEES BY PROGRAM**



# PROGRAM PERFORMANCE

The performance measures associated with each strategic and performance goal indicate how effectively the NRC is achieving its goals and establish the basis for performance management. The measures also establish how far and how fast the agency will move in the direction established by the goals. The NRC has recently completed the triennial update of the agency's Strategic Plan, and is currently reviewing performance measures to determine whether the agency can find more effective ways to measure and report our performance to the American public.

## ALIGNING RESOURCES TO GOALS

Collectively, the outcome-based performance goals are the key indicators for successful progress in achieving the agency's strategic goals. The performance goals and their associated measures reflect the agency's move toward more outcome-based performance. Agency work (programs and activities) is being planned, managed, monitored, and assessed according to contributions to the achievement of these performance goals, with public health and safety and common defense and security as the primary consideration. Ongoing program evaluations will form the basis to identify whether existing programs are successfully achieving the goals or whether revised or new initiatives are needed.

Planned activities are established to support four major programs that are aligned with the four strategic goals of the agency; Nuclear Reactor Safety, Nuclear Materials Safety, Nuclear Waste Safety, and International Nuclear Safety Support. Resources are aligned with these four programs in order to accomplish the work necessary to achieve the outcomes associated with the strategic goals of the agency.

## FUTURE IMPROVEMENTS IN PERFORMANCE MANAGEMENT

The performance measurement information contained in the FY 2004 Performance and Accountability Report (PAR) complies with current Office of Management and Budget (OMB) guidance and displays substantial progress in integrating performance management and budget processes across the agency. The NRC released an updated Strategic Plan on August 12, 2004. Future performance reports will continue to integrate performance management and budget by aligning agency resources with the goals of safety, security, openness, effectiveness and management in the new Strategic Plan.

## 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,



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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 No. 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 2004 unless otherwise noted in the Performance Report.

### DATA RELIABILITY

The OMB considers data to be reliable when agency managers and decision-makers 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 decision-makers regularly use the reported data on an ongoing basis in the course of their duties.

## HOMELAND SECURITY

### OVERVIEW

For over 25 years, the NRC has required its licensees to maintain adequate safeguards of radioactive materials through rigorous security programs. In response to the terrorist attacks on September 11, 2001, the Commission launched a comprehensive evaluation of the security and safeguards programs of nuclear power plants, nuclear materials, fuel cycle and waste facilities, spent fuel storage and transportation, and activities involving the transportation of non-spent fuel radioactive material.

As a result, the NRC and its licensees have taken many significant actions to enhance the security of licensed activities and contribute to the Nation's common defense and security consistent with the existing threat environment. In FY 2004, the NRC continued using a

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risk-informed approach to establish the security and safeguards requirements for licensed materials. In particular, the Commission issued orders to certain NRC and Agreement State licensees to enhance security further by requiring the licensees to adopt additional security measures. Although licensees had already voluntarily implemented many of the new measures, the Orders issued in FY 2004 provided the means to make those measures legally binding and to ensure consistent implementation.

## ENHANCING SECURITY FOR CHANGES IN THE THREAT ENVIRONMENT

The NRC continues to enhance the level of security at nuclear power reactors by requiring upgraded security in the areas of physical protection; access authorization (including improved background checks); security force training, qualification, and work hours; and protection against a revised design-basis threat. In order to ensure prompt and flexible enhancements to security, the NRC continues to issue advisories to notify licensees of short-term changes in the threat environment. The Commission used these advisories as a tool to alert licensees to the potential threats posed by terrorist attacks. The agency will continue to use this approach to achieve prompt actions, as required in the future. The NRC maintains appropriate security enhancements by issuing orders that require certain categories of licensees to upgrade their security programs.

The NRC achieves agencywide enhancements to security through primary vulnerability assessments, protection of sensitive information, emergency preparedness and incident response, coordination with other federal organizations, and international efforts. The following sections discuss the NRC's significant accomplishments in these key areas.

## VULNERABILITY ASSESSMENTS

The NRC has assessed the potential for and consequences of terrorists targeting a nuclear power plant for aircraft attack, the physical effects of such a strike, and compounding factors such as meteorology that would affect the impact of potential radioactive releases. As a result of these preliminary assessments, the NRC required that nuclear power plant licensees implement enhancements to mitigate potential consequences in the unlikely event of a successful attack on a nuclear power plant. Additionally, the NRC conducted detailed site-specific engineering studies of a limited number of nuclear power plants to assess potential vulnerabilities to deliberate attacks involving large commercial aircraft. For the facilities analyzed, the vulnerability studies confirm that the likelihood of both damaging the reactor core and releasing radioactivity that could affect public health and safety is low. Additional site-specific studies of operating nuclear power plants are underway or being planned to determine the need, if any, for additional mitigating capability on a site-specific basis.



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The NRC continues to assess nuclear facilities and nuclear materials to identify potential vulnerabilities to a series of land-based, waterborne, and cyber assaults. For example, the NRC is also extensively involved in industry and government interagency working groups to identify technologies that may prove beneficial for securing reactor sites and the Nation's electrical power grid. Further NRC efforts will yield the technical bases for future regulatory decisions, including risk mitigation measures associated with specific types of attacks on power reactor facilities, spent fuel pools, spent fuel storage and transportation casks, and certain radioactive material transportation packages.

The NRC developed a self-assessment methodology for cyber vulnerabilities. The NRC is currently working with the nuclear industry to apply that methodology and mitigate risk-significant vulnerabilities. The NRC is developing guidance for cyber-security inspections based on the results of the cyber vulnerability self-assessments.

### PROTECTION OF SENSITIVE INFORMATION

Following the terrorist attacks on September 11, 2001, the volume of classified and sensitive unclassified information being developed, transmitted, and stored has substantially increased. As a result, the NRC identified the need to communicate such information rapidly among the agency's headquarters, regional offices, licensees, and other partner agencies involved in homeland security and incident response. The NRC developed a program that permits sharing of classified and sensitive unclassified information with authorized representatives, routinely limited to the SECRET National Security information level.

### EMERGENCY PREPAREDNESS AND INCIDENT RESPONSE

The emergency preparedness and incident response programs are vital NRC activities. In June 2004, the NRC reorganized to integrate these two programs more effectively. The NRC continues to work with the Department of Homeland Security and other Federal agencies in revising Federal response plans and developing and administering a National Incident Management System and a unified National Response Plan in accordance with Homeland Security Presidential Directive 5, "Management of Domestic Incidents."

The NRC significantly upgraded its Incident Response Operations Center in FY 2004, with additional staffing, improved emergency response procedures, and significant equipment upgrades (such as secure telephone and fax units, upgraded satellite phones and an improved teleconferencing system).

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The NRC established an alternative incident response center at one of the agency's regional offices. This alternative incident response center has the same capabilities as the headquarters operations center in the event of a loss of the headquarters facility.

The NRC continues to enhance the level of security at nuclear power reactors by requiring upgraded security in the areas of physical protection; access authorization (including improved background checks); security force training, qualification, and work hours; and protection against a revised design-basis threat.

The NRC completed an expanded pilot force-on-force exercise program at 15 volunteer commercial nuclear power reactors that reduced artificialities and increased the realism of the exercises. In implementing the resulting transitional force-on-force program, the NRC increased the frequency of force-on-force drills at power reactor facilities from once every 8 years to once every 3 years.

The NRC participated in several full-participation exercises involving scenarios with radiological events at nuclear power plants. The NRC participated in the Top Officials (TOPOFF) series of exercises (a follow-on to TOPOFF-2 in May 2003, the largest and most complex Federal interagency exercise ever conducted).

The NRC participated in the first national Continuity of Operations exercise in May 2004, as well as several integrated Department of Defense exercises during the fiscal year. Notably, several of these exercises included terrorist scenarios. For example, the exercise at the Indian Point nuclear power station included a terrorist scenario that involved an aircraft attack on the facility. The Indian Point exercise demonstrated proficiency in the incident response capability and preparedness areas.

Security enhancements for export/import controls of high-risk sources are underway, and the NRC is working with the Department of Energy to upgrade the database that the Nation uses to track transfers and inventories of special nuclear material and source material, including material from abroad. The NRC is working with licensees and States to confirm the accuracy of inventories in this Nuclear Material Management and Safeguards System (NMMSS).

For the first time in two years, NRC held a public meeting to address the agency's integrated approach toward security and emergency response; and the challenges of communicating with the public on security matters without releasing sensitive information. Participants included senior NRC management and staff and a broad spectrum of stakeholders, including: members of the public, representatives from several non-governmental organizations, the media, and a



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U.S. Senate office. A teleconferencing capability was used to include members of the public who were unable to come to NRC headquarters.

### COORDINATION WITH OTHER FEDERAL ORGANIZATIONS

The NRC has hosted regional meetings for State Homeland Security Advisors and representatives from Federal, State, and local governments and organizations. The purpose of these meetings was to strengthen the NRC's linkages with State and local officials, and to increase their awareness of the initiatives undertaken by the NRC and the Department of Homeland Security, as they relate to the National Response Plan and other significant homeland security, incident response, and emergency preparedness activities.

In February 2004, the NRC participated in the "Unified Defense 04" exercise, a major exercise led by the U.S. Northern Command and involving the Department of Defense and other Federal, State and local agencies. This exercise focused on a scenario involving a hurricane of national significance, a general emergency at an NRC-regulated nuclear power plant resulting in a radiological release to the environment and the establishment of protective actions, and detonation of a nuclear device by terrorists.

The most significant incident during FY 2004 involving the NRC and its licensees, as well as other Federal, State, and local agencies was the follow up to the historic electrical power blackout on August 14, 2003. As the blackout raced across a multi-State area, power grid instabilities caused the nearly simultaneous automatic shutdown of nine nuclear power plants. The NRC and its licensees promptly responded to ensure public safety as part of a coordinated national response. FY 2004 analysis of the blackout, the Nation's first large-scale incident with simultaneous challenges to safety systems at multiple nuclear power plants, provided the NRC valuable insight for use in enhancing the agency's response capabilities.

In February 2004, the NRC and Department of Energy conducted a technical exchange concerning security and safeguards for the proposed geologic high-level waste repository at Yucca Mountain, Nevada. Through that technical exchange, staff representatives from both agencies discussed the Yucca Mountain Review Plan, as well as a variety of physical protection and material control and accountability issues.

### INTERNATIONAL EFFORT

In the past 3 years, the U.S. Government, in tandem with the International Atomic Energy Agency, began addressing security concerns in developing the Code of Conduct for the Safety and Security of Radioactive Sources, a non-legally binding document that was published in

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final form in January 2004, and adopted by Member States in FY 2004. Through this joint effort, the NRC made key contributions to revising the Code of Conduct and, as a result, the Member States subsequently adopted the U.S. Government's positions as proposed or with modifications that were acceptable to the U.S. Government. The NRC is currently working with other Federal agencies to implement the Code of Conduct by developing a proposed rule to require general or individual specific export and import licenses for high-risk sources. The proposed rule was issued for public comment in September 2004. This proposed rule will address the NRC's domestic program to increase security in the use of such sources, while assisting the U. S. Government in complying with the Code of Conduct. The NRC participated in a series of meetings that the International Atomic Energy Agency sponsored during FY 2004 to promote implementation of the Code of Conduct. NRC staff representatives participated in a conference in Morocco, to discuss activities aimed at implementing the international standards for radiation safety and security of radioactive sources.

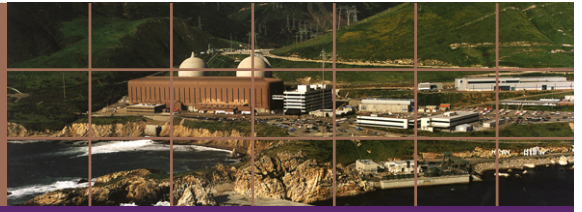
NRC staff representatives met with the Russian Federation's Federal Service for Nuclear Oversight (formerly Gosatomnadzor) to discuss strengthening the security and regulatory control of high-risk radioactive sources in Russia. The NRC continued to support the Russian Federation's Federal Service for Nuclear Oversight in the area of plutonium disposition in the Russian Federation. This support of the Russian independent nuclear safety regulator has been provided through an interagency agreement with the Department of Energy. Under that agreement, the NRC has exchanged information on vulnerabilities, mitigation strategies, and security improvements with a select group of countries to understand their security challenges and action plans.

## LEGISLATIVE INITIATIVES

Working together with the Homeland Security Council, its oversight committees in Congress, the Administration, and other Federal agencies, the NRC continues to support legislative proposals to enhance the security of nuclear facilities and materials.

The NRC supports the enactment of provisions that: (1) would enable licensee guards to possess more powerful weaponry, (2) enlarge the classes of NRC-regulated entities whose employees would be subject to fingerprinting and criminal history background checks, (3) expand the NRC's regulatory jurisdiction to additional classes of radioactive material as a means of enhancing protection of the public from use of the materials in radiological dispersal devices, (4) add new Federal criminal sanctions to cover acts that could endanger materials and activities regulated by the NRC, and (5) authorize the NRC to carry out training and fellowship programs to address shortages of individuals with critical nuclear safety regulatory skills.





## NUCLEAR REACTOR SAFETY

### NUCLEAR REACTOR SAFETY

*Strategic Goal: Prevent radiation-related deaths and illnesses, promote the common defense and security, and protect the environment in the use of civilian nuclear reactors.*

#### OVERVIEW

The Nuclear Reactor Safety program is conducted to ensure that civilian nuclear power reactors, as well as test and research reactors, are operating in a manner that adequately protects the health and safety of the public and the environment while safeguarding special nuclear materials that are used in reactors. The NRC regulates 104 nuclear power reactors and 35 test and research reactors that are currently licensed to operate. Of these licensed reactors, nuclear power plants generate approximately 20 percent of the Nation's electricity, while test and research reactors are used to conduct research and development. Almost every field of science (including physics, chemistry, 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 have the responsibility to design, construct, and operate nuclear reactors safely.

#### ENSURING THE SAFE OPERATION OF NUCLEAR REACTORS

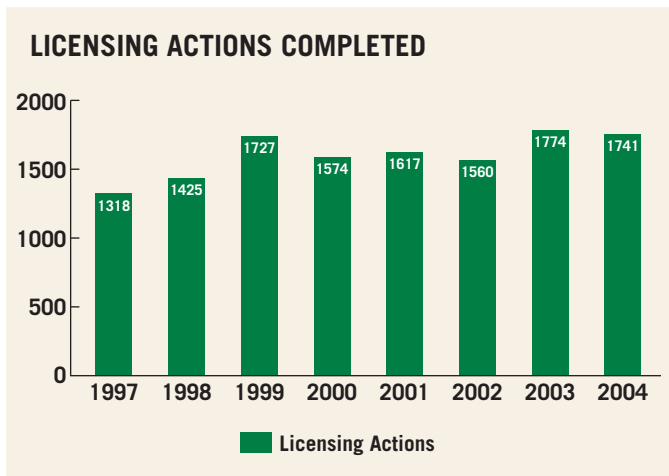
The NRC ensures the safety of nuclear reactors by establishing the related safety standards and requirements and conducting in-depth technical reviews in the course of licensing nuclear power plants and their operators. The NRC also oversees plant operating performance, maintains a security and emergency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

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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. The security and emergency response programs 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. The research program analyzes 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 programs in greater detail.

## REACTOR LICENSING

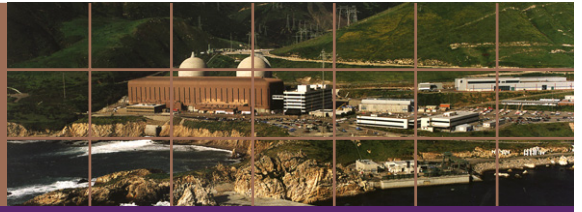
The reactor licensing program establishes requirements for licensees that sets expectations for the commercial use of radioactive material within the legal framework of the NRC's safety or environmental regulations. This includes assurances that facilities are adequately designed, properly constructed, 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's licensing activities include reviewing license applications and changes to existing licenses, examining and licensing reactor operators, reviewing reactor events for safety significance, and improving safety regulations and guidance.



The NRC met or exceeded three of its established five output measures for reactor licensing during FY 2004. The goals successfully achieved were completing a minimum of 1,500 reactor licensing actions (1,741 licensing actions were completed), completing a minimum of 350 other licensing actions (671 other licensing actions were completed), and completing 100 percent of licensing actions within two years. The two missed goals were maintaining a working inventory of 1,000 or less licensing actions, which has grown to an inventory of 1,135 actions; and completing 96 percent of the licensing actions within one year by the end of the fiscal year (91 percent of licensing actions were completed in less than 1 year at the end of FY 2004). The missed targets were a result of the

redirection of resources to higher priority security work including review of security plans, safeguards contingency plans, and training and qualification plans.

Forty-five initial operator licensing examinations were given in FY 2004. Although 50 exams were estimated and budgeted, several were rescheduled or delayed into 2005 based upon facility



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requests. Four Generic Fundamentals Examinations (GFEs) were administered in FY 2004, exceeding 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. As a result, the review of a power uprate application provides assurance that the impacts of increasing a plant's power output are fully addressed and that plant operation at the increased power level is safe. In FY 2004, power uprates increased the Nation's in electrical generating capacity of approximately 45 MWe.

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. In FY 2004, the NRC met its timeliness standard for each category of power uprate reviews.

### LICENSE TRANSFERS

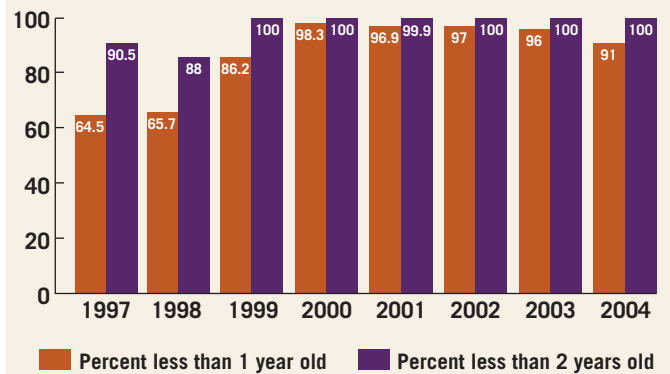
In the area of other licensing actions, the NRC has engaged in financial review activities for nuclear power plants as States have taken steps toward deregulating the power market, unbundling services, and generally consolidating the utility industry. The cases that the NRC has reviewed involved such issues as the sale of a passive owner's minority share and the creation of a separate holding company. The NRC completed three license transfers.

### 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 (DOE) ongoing programs 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.

LICENSING ACTION AGE



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The NRC is actively engaged in pre-application reviews of General Electric's Economic Simplified Boiling-Water Reactor and Atomic Energy of Canada, Ltd.'s Advanced Candu Reactor (ACR-700) designs, with design certification applications expected in FY 2005.

In September and October 2003, the NRC received three early site permit applications for the Clinton, North Anna, and Grand Gulf sites. The NRC will continue reviewing these applications in FY 2005, with completion projected for FY 2006.

The NRC issued NUREG-1789, "10 CFR Part 52 Construction Inspection Program Framework Document," in April 2004. The information contained in this document details the overall philosophy and approach that the NRC will use to inspect new nuclear power reactors being licensed and constructed under Title 10, Part 52, of the Code of Federal Regulations (10 CFR Part 52).

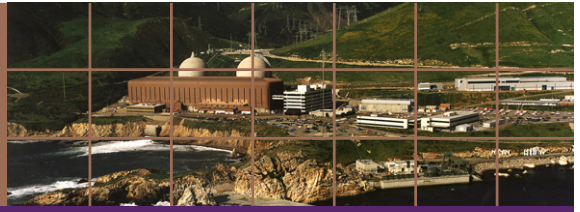
The NRC continues to develop the regulatory infrastructure needed to inspect new reactor and site license applications, and for effective and efficient licensing review of those applications. Toward that end, the NRC is currently considering stakeholder comments received in response to proposed revisions 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 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 44 units at 24 sites and has renewed the licenses for 26 units at 15 sites. The NRC is currently reviewing applications to renew the licenses for the remaining 18 units at 9 sites.

The NRC expects that all of the currently licensed units will ultimately apply to renew their licenses. In order to establish a stable and predictable process, the NRC has specified a timeliness



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goal of 22 months for those reviews that do not involve a hearing. The NRC met or exceeded all established schedules for completing license renewal reviews in FY 2004.

The NRC issued renewed licenses for St. Lucie Units 1 and 2, Fort Calhoun Station, Units 1 and 2 of the McGuire Nuclear Station, Units 1 and 2 of the Catawba Nuclear Station, Unit 2 of the H.B. Robinson Steam Electric Plant, the Virgil C. Summer Nuclear Station, and R.E. Ginna Nuclear Power Plant in FY 2004.

### REACTOR INSPECTION AND PERFORMANCE ASSESSMENT PROGRAM

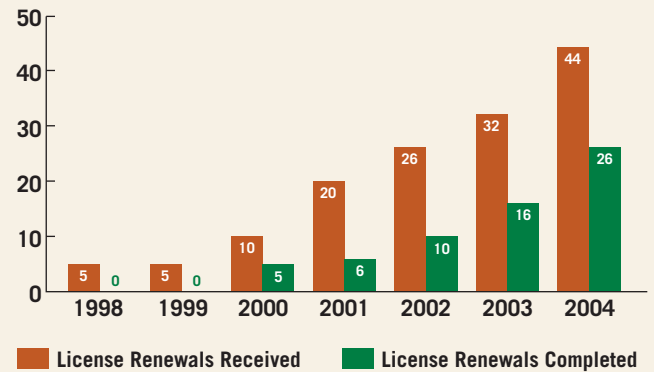
The NRC's Reactor Oversight Process verifies that nuclear plants are being operated safely and in accordance with the NRC's rules and regulations. The NRC has full authority to take whatever action is necessary to protect public health and safety and may demand immediate licensee action, up to and including 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 baseline program of inspections at each plant and may perform supplemental inspections and take additional actions, as necessary, to ensure that the plants address significant issues. The NRC communicates the results of its oversight process by placing plant-specific inspection findings and performance indicator information, as well as 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 maintain safety by focusing NRC and industry attention on risk-significant activities while reducing unnecessary regulatory burden on licensees. The process comprises 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 into the NRC's regulatory oversight processes.

In FY 2004 the NRC continued to integrate improvements into its regulatory process as a result of the annual Reactor Oversight Process self-assessments and completed the calendar year 2003

**LICENSE RENEWAL APPLICATIONS** Cumulative in Units



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assessment in April 2004. The self-assessment results indicate that the Reactor Oversight Process was generally effective in monitoring operating nuclear power plant activities and focusing NRC resources on significant performance issues and in supporting the NRC's performance goals.

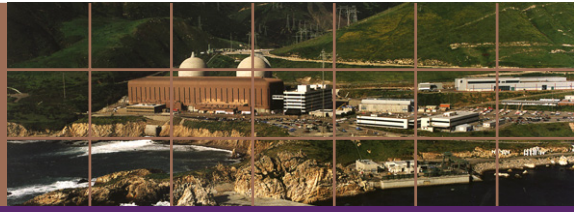
The NRC maintained its focus on stakeholder involvement and continued to improve various aspects of the Reactor Oversight Process as a result of feedback and lessons learned. The responses to the NRC's annual survey of external stakeholders, which solicited feedback on the Reactor Oversight Process, were generally favorable; however, some stakeholders raised concerns about the complexity and subjectivity of the significance determination process, the effectiveness of the performance indicator program, and other areas for improvement. These and other stakeholder insights and views have been evaluated for improvements to the Reactor Oversight Process in fulfilling the regulatory principles of being predictable, understandable, objective, and risk-informed.

## *Davis-Besse Lessons Learned*

In March 2002, First Energy 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 that focus on incorporating the reactor pressure vessel inspection requirements into the *Code of Federal Regulations*, coordinating research activities for evaluating potential improvements in detection and monitoring of leakage in reactor coolant system components, assessing the NRC's operating experience function, and changing the NRC's inspection program. In FY 2004, NRC implemented changes that focused on identifying repetitive equipment problems and better management of resident inspector staffing levels. In addition, a task force analyzed how the NRC evaluates and disseminates operating experience to staff, licensees and others.

## 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 selected 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 to develop the technical basis to support realistic safety



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decisions. Where possible, the NRC engages in cooperative research with other government agencies such as Department of Energy and National Aeronautics and Space Administration, the nuclear industry, universities, and international partners. The research program includes the key areas of risk analysis, fuel and thermal-hydraulic research, materials degradation, structural integrity research, new reactors, and digital safety systems research.

### *Risk Analysis and Rulemaking*

Work is underway to advance the state of the art and apply risk assessment methods to provide a technical basis for improving reactor regulatory programs. 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 the most risk significant aspects of licensed activities. The research program improves risk technology and modeling techniques, reduces uncertainties, and develops improved data. In FY 2004, the NRC continued to focus on making risk-informed changes to regulations such as acceptance criteria for emergency core cooling systems (10 CFR 50.46) and protection against reactor pressure vessel thermal shock (10 CFR 50.61). Furthermore, the NRC is developing additional regulatory guidance on risk standards to support risk informed decisionmaking.

### *Fuel and Thermal-Hydraulic Research*

The NRC is conducting studies of fuel behavior with advanced cladding and 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 use of advanced fuel cladding alloys and permit higher fuel burnup. This first of a kind experimental program, along with analytic methods that have been developed, 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 independent audit capability for assessing the performance of mixed-oxide fuels under normal, transient, and accident conditions and is now performing assessments of fuel performance. This work provides the technical basis for use and disposal of weapons grade plutonium in a power reactor.

The NRC has an extensive thermal-hydraulic program comprising experimental testing, model development, and validation. The application of these models and experimental results provide

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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 is being used in the staff review of the AP1000 and Economic Simplified Boiling-Water Reactor new reactor designs.

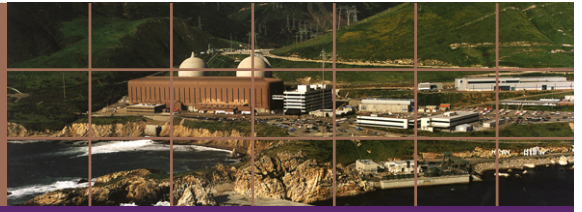
## *Materials Degradation and Structural Integrity Research*

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-base alloys and associated weldments (e.g., cracking of the control rod drive mechanism nozzles at pressurized water reactors) have highlighted the importance of aging/degradation research and has focused worldwide interest on being proactive in managing the degradations; that is, finding degradation and dealing with it prior to any significant loss of safety margin. Therefore, the major goal of the research in this area is to provide data and analysis methods to support the development of regulatory strategies to assure that the safety is maintained. Many of the structural integrity research projects relate to the evaluation of aging and environmental effects on plant components and structures. These projects include evaluations of methods for non-destructive examination to identify potential degradation, methods for conditional assessment, understanding of degradation mechanisms, methods to evaluate performance of degraded components, and methods to repair and mitigate the potential effects of these conditions. Methods are being developed to evaluate the effects of degradation of passive components on plant risk to support risk-informed regulatory decisions. In part, this research involves cooperative efforts with the industry and other international organizations to share operating experience and experimental data. In addition to addressing aging effects, the structural integrity research has helped to establish the technical bases to support reactor license renewal. Structural integrity research also involves evaluation and validation of analytical models and methods, independent and confirmatory integrity evaluations, assessment of impact of new information, and development of technical bases for potential revision of rules and regulatory guides. This research continues to lead to improved efficiencies at the NRC and to the reduction of unnecessary burden by providing increasingly realistic methods and assumptions for regulatory decisions.

## *Digital Safety Systems Research*

The instrumentation and control systems originally installed in nuclear power plants use analog technology. The replacement components for these systems are increasingly costly and difficult to obtain. Therefore, licensees are beginning to upgrade their instrumentation and control systems with digital control systems. Several current projects provide the technical basis for





## NUCLEAR REACTOR SAFETY

assessing the ability of existing digital technologies to perform their intended functions under the adverse environmental conditions that may be expected in a nuclear power plant. Such conditions include electromagnetic and radio frequency interference, as well as abnormal conditions such as smoke and steam environments. The NRC is also conducting research to advance the state-of-the-art assessment of the reliability 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. Several current projects are examining emerging technologies to identify issues that must be addressed in the licensing process and provide the technical basis for the agency's safety review.

### INDUSTRY TRENDS PROGRAM<sup>1</sup>

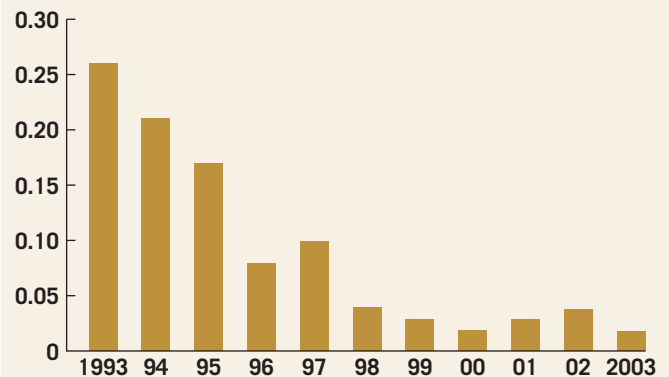
The NRC measures the effectiveness of its Nuclear Reactor Safety programs based on the continued safe operation of the Nation's nuclear power plants. In addition to monitoring the performance of individual plants, the NRC compiles data on overall safety performance using several industry-level performance indicators, some of which are addressed in the following pages. 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 1993.

#### *The Industry's Safety Performance Record*

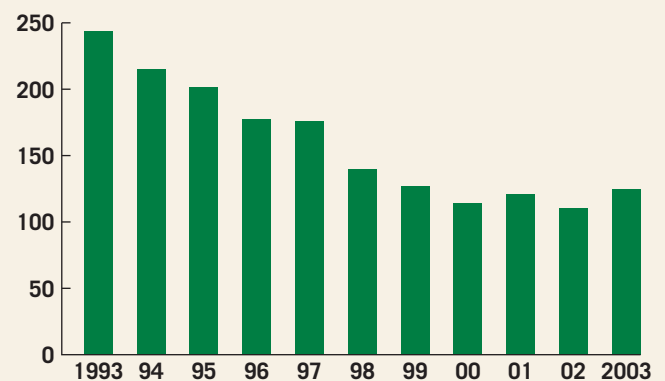
Several industry indicators of safety performance show significant statistical improvement. One such indicator is significant events, which meet specific criteria, such as degradation of important safety equipment. In reviewing operating events and assessing their safety significance, the NRC has determined that the statistical trend for number of significant events has declined since 1993.

The total radiation dose received by workers at nuclear plants is an indicator of the effectiveness of the controls on occupational radiation exposure. Worker radiation dose shows a significant reduction in the statistical trend since 1993.

**SIGNIFICANT EVENTS Per Reactor**

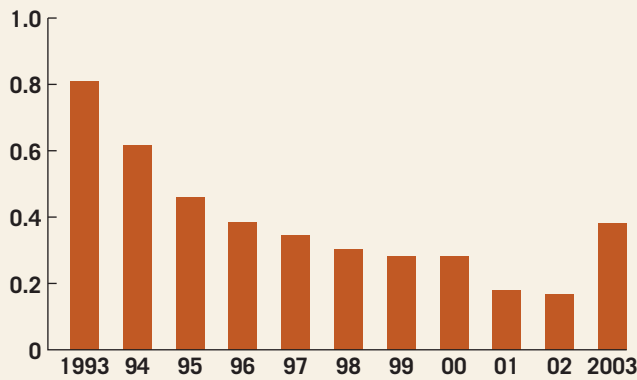


**COLLECTIVE RADIATION EXPOSURE Per Person-cSv**



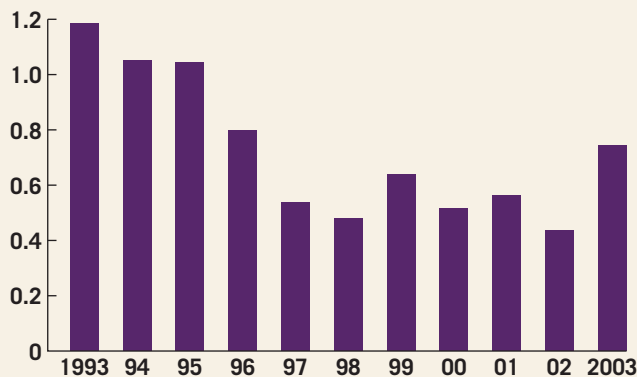
# PROGRAM PERFORMANCE

**SAFETY SYSTEM ACTUATIONS Per Reactor**



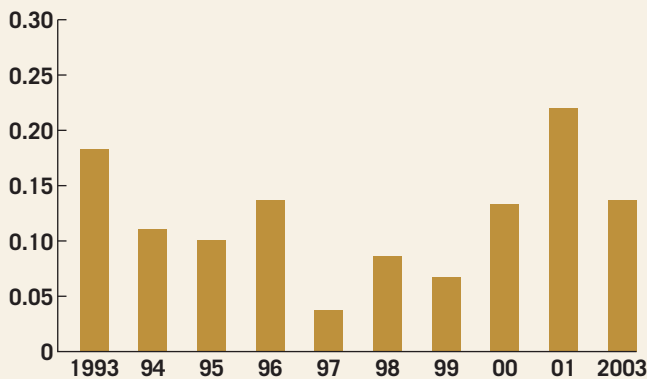
Safety systems mitigate off-normal events, such as the August 2003 widespread power blackout, by providing reactor core cooling and water addition. Actuations of safety systems that are monitored include certain emergency core cooling and emergency electrical power systems. Actuations can occur as a result of “false alarms” (such as testing errors) or in response to actual events. The statistical trend for number of safety system actuations has declined since 1993.

**AUTOMATIC SCRAMS Per Reactor**



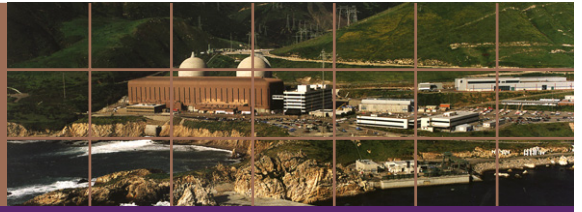
A scram is a basic reactor protection safety function that shuts down the reactor by inserting control rods into the reactor core. Scrams can result from events that range from relatively minor incidents or human error to precursors of accidents. The August 2003 massive power blackout accounts for most of the increase in scrams from FY 2002, but has not affected the statistical trend for number of scrams, which has been declining steadily since 1993.

**PRECURSOR OCCURRENCE RATE Per Reactor Per Year**



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. Due to the complexities associated with evaluating precursor events, the data always lag other indicators. Available data through FY 2002 is shown.

Safety system failures (top of opposite page) 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 1993.



## NUCLEAR REACTOR SAFETY

Power Generation and Average Capacity Factor are indicators that are not a part of NRC's Industry Trends Program. As noted on the charts, this data is obtained from DOE.

Improvements in safety have occurred at a time when nuclear power generation has increased significantly, from 455,000 gigawatt hours in 1987 to approximately 764,000 gigawatt hours in 2003.

The average annual capacity factor, a measure of power plant efficiency, has increased from 62 percent in 1987 to 88.4 percent in 2003.

### THE NRC'S ROLE IN IMPROVING SAFETY

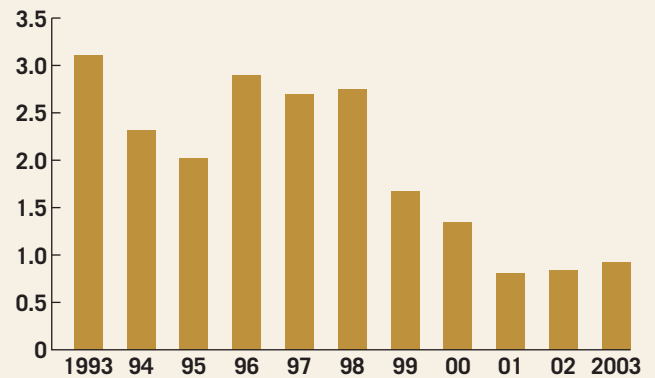
The improvement in the safety performance of nuclear power plants is the result of the combined efforts of the nuclear industry and the NRC. Both the nuclear industry and the NRC have gained experience in the operation and maintenance of nuclear power facilities.

The NRC establishes the safety standards and safety requirements, performs in-depth technical reviews of proposed reactor designs, and oversees plant operating performance. It will not allow licensees to operate their plants if safety performance falls below acceptable levels.

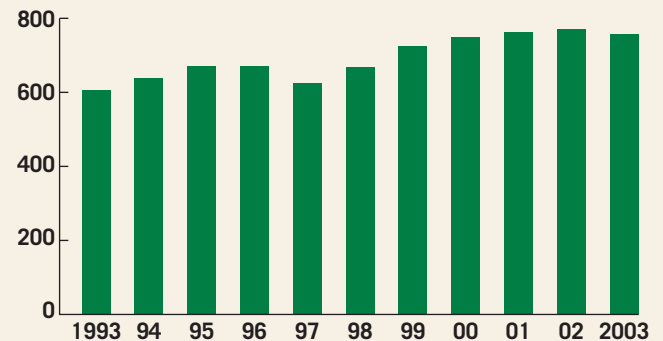
Licensees have the primary role in maintaining safety. They are responsible for designing, maintaining and operating nuclear power plants in a manner that provides adequate protection of public health and safety.

Experience in plant operations and feedback from 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.

**SAFETY SYSTEM FAILURES Per Year**

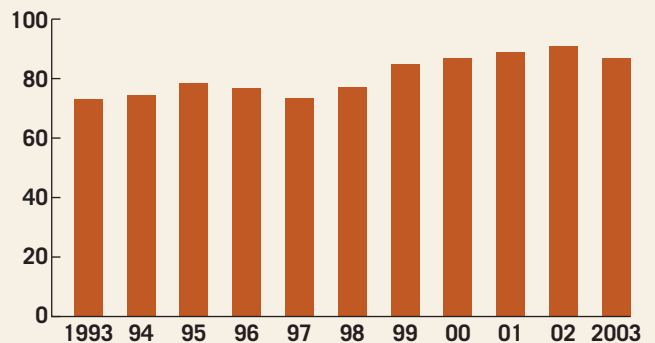


**NUCLEAR POWER GENERATION Gigawatt Hours**



Source: DOE/EIA Monthly Energy Review

**AVERAGE CAPACITY FACTOR Percent**



Source: DOE/EIA Monthly Energy Review

# PROGRAM PERFORMANCE

## ANNUAL GOALS AND MEASURES

*Strategic Goal 1: Prevent radiation-related deaths and illnesses, promote the common defense and security, and protect the environment in the use of civilian nuclear reactors.*

### *Strategic Goal Results*

The NRC has identified five measures to determine whether the NRC has met its Nuclear Reactor Safety strategic goal. These are top-level measures that define the NRC's success in overseeing reactor licensees. The goal of the NRC's regulatory efforts is to prevent the occurrence of any of the events described in the measures below.

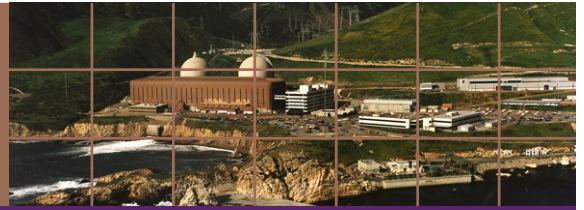
Measure	2001	2002	2003	2004
1-1. No nuclear reactor accidents. <sup>2</sup>	0	0	0	0
1-2. No deaths resulting from acute radiation exposures from nuclear reactors. <sup>3</sup>	0	0	0	0
1-3. No events at nuclear reactors resulting in significant radiation exposures. <sup>4</sup>	0	0	0	0
1-4. No radiological sabotages at nuclear reactors. <sup>5</sup>	0	0	0	0
1-5. No events that result in releases of radioactive material from nuclear reactors causing an adverse impact <sup>6</sup> on the environment.	0	0	0	0

**Results: The NRC has met all of the strategic goal measure targets.**

## PERFORMANCE GOALS

In addition to our strategic goals, the NRC has four performance goals and measures for Nuclear Reactor Safety:

- (1) Maintain safety, protection of the environment, and the common defense and security.
- (2) Increase public confidence.
- (3) Make NRC activities and decisions more effective, efficient, and realistic.
- (4) Reduce unnecessary regulatory burden on stakeholders.



## NUCLEAR REACTOR SAFETY

### PERFORMANCE GOAL RESULTS

#### Performance Goal 1: Maintain safety, protection of the environment, and the common defense and security.

Measure	2001	2002	2003	2004
1-1. No statistically significant adverse industry trends in safety performance <sup>7</sup> .	0	0	0	0
1-2. No more than one event per year identified as a significant precursor of a nuclear accident <sup>8</sup> .	0	1	0	0
1-3. No events resulting in radiation overexposures from nuclear reactors that exceed applicable regulatory limits <sup>9</sup> .	0	0	0	0
1-4. No more than three releases per year to the environment of radioactive material from nuclear reactors that exceed the regulatory limits <sup>10</sup> .	0	0	0	0
1-5. No breakdowns of physical security that significantly weaken the protection against radiological sabotage, theft, or diversion of special nuclear materials in accordance with abnormal occurrence criteria <sup>11</sup> .	0	0	0	0

**Results: The NRC has met all of the performance goal measure targets.**

**1-1. Adverse Safety Trends:** The first 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.

**1-2. Significant Precursors:** The second measure tracks “significant” precursor events, which are defined as those events that have a probability of 1 in 1,000 or greater of leading to substantial damage to the reactor fuel. With one potentially significant precursor event in FY 2002, the data are current as of September 30, 2004.<sup>12</sup>

**1-3. Overexposures:** The third measure tracks individual radiation overexposures within any nuclear power plant. Radiation levels are carefully monitored within the plants, and this measure focuses on instances in which an individual is exposed to radiation levels that exceed set limits. Any exposures below these limits would not be expected to harm an individual. The data are current as of September 30, 2004.

# PROGRAM PERFORMANCE

**1-4. Releases to the Environment:** In addition to the NRC's duty to ensure safe operation within nuclear plants, the NRC has established a performance goal to ensure that the environment is not harmed by radioactive releases from the generation of nuclear power. These releases can be in the water that is used for cooling within the plant or through vents to the atmosphere. Radioactivity releases to the environment are tracked using set regulatory limits. Any releases below these limits would not be expected to harm either an individual or the environment. The data are current as of September 30, 2004.

**1-5. Security:** The fifth measure reflects the effectiveness of NRC regulations that are designed to promote the physical security of the Nation's nuclear plants. Any breakdowns of security are reported, and the NRC assembles in Headquarters an information assessment team to investigate the incident.

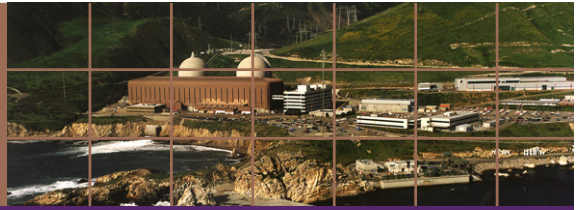
## Performance Goal 2: Increase public confidence.

Measure	2001	2002	2003	2004
2-1 Complete milestones relating to collecting, analyzing, and trending information for measuring public confidence.	Met	Met	Met	Met
2-2 Complete all public outreaches.	Met	Met	Met	Met
2-3 Issue Director's Decisions for petitions filed to modify, suspend, or revoke a license under 10 CFR 2.206 <sup>13</sup> within an average of 120 days.	Met	Not met	Met	Met

**Results: The NRC met all of the performance goal measure targets.**

**2-1. Public Confidence:** The FY 2004 target for this performance measures is to "Create a Web-based system to compile and analyze trends in the responses of the feedback forms to assess the NRC's meeting performance." The NRC has analyzed the data, and the results were transmitted to the staff.

**2-2. Public Outreach:** Public outreach meetings give the public opportunities for meaningful participation in NRC activities and enable the NRC to give the public information concerning those activities. For the second measure, the NRC held all 37 of the scheduled public outreach meetings associated with this measure. The NRC collected and considered feedback from the public and used that feedback to define the scope and possible environmental impacts of license renewal activities. In addition, the NRC conducted outreach activities to answer the public's



## NUCLEAR REACTOR SAFETY

questions concerning issues related to Davis-Besse and the early site permit process for the Clinton, North Anna, and Grand Gulf sites.

**2-3. Director's Decisions:** During FY 2004, the NRC issued five Director's Decisions, with an average response time of 88 days. Because of the complexity associated with petitions, some require the full 120 days and some require more. In order to meet the average of 120 days or less, NRC must complete some Director's Decisions in below average time.

### Performance Goal 3: Make NRC activities and decisions more effective, efficient, and realistic.

Measure	2001	2002	2003	2004
3-1 Complete specific reactor milestones in the Risk-Informed Regulation Implementation Plan.	Met	Met	Met	Met
3-2 Complete at least two key process improvements per year in selected program and support areas that increase efficiency, effectiveness, and realism.	Met	Met	Met	Met
3-3 Complete all license renewal application reviews within 30 months of receipt if a hearing is held, within 22 months without a hearing, beginning in FY 2003 (25 months without a hearing prior to FY 2003). Complete all non-standard license renewal application reviews within the schedule agreed upon with the applicant.	Met	Met	Met	Met

**Results:** The NRC met all of the performance goal measure targets.

**3-1. Risk-Informed Regulation:** The first measure focuses on progress in developing a coordinated approach to implementing risk-informed decisions throughout the NRC's regulatory processes. The NRC completed the specific nuclear reactor safety milestones identified for each year in the Risk-Informed Regulation Implementation Plan on schedule. The milestones include completing rulemaking for the performance-based fire protection rule endorsing the NFPA-805 standard promulgated by the National Fire Protection Association (10 CFR 50.48). Other milestones include approving Risk Management Technical Specifications Initiatives that allow for a risk-informed evaluation to determine whether it is better to shut down or continue to operate a reactor plant under certain conditions and to define actions to be taken when certain support equipment is not operable but is still functional. The Risk-Informed Regulation Implementation Plan is available on NRC's public Web site at <http://www.nrc.gov/reading-rm/doc-collections/commission/secys/2004/secy2004-0068/2004-0068scy.html>

# PROGRAM PERFORMANCE

**3-2. Process Improvements:** The second measure concerns actions to improve the NRC's internal processes. During FY 2004, the NRC improved its processes in two key aspects of the Nuclear Reactor Safety program, thereby increasing the effectiveness and efficiency of the reactor licensing and inspection programs.

First, the NRC improved effectiveness and efficiency in the review of early site permits through the development of a review standard. The Office of Nuclear Reactor Regulation issued the Early Site Permit Review Standard (RS-002). The review standard: (1) describes the process for reviewing an early site permit application and provides guidance for completing the steps in the process, (2) provides detailed guidance for reviewing early site permit applications, (3) provides a sample safety evaluation for the NRC to use as guidance for documenting the results of early site permit application reviews, and (4) provides references to inspection guidance that supports the NRC's determinations concerning early site permits. The second process improvement targeted the efficiency of the Significance Determination Process through the development of several risk assessment tools by the Office of Nuclear Reactor Regulation. These tools distill complicated reactor-related risk information into a usable format for use by NRC inspection staff, senior reactor analysts, and risk analysts. The purpose of Significance Determination Process risk assessment tools is to increase the standardization of risk assessments and improve efficiency in the NRC's objective of attaining timely performance assessments of reactor licensee's performance deficiencies. These products required several years of significant staff effort and, in many cases, involved partnerships among the Office of Nuclear Reactor Regulation, the Office of Nuclear Regulatory Research, national laboratories, and external stakeholders.

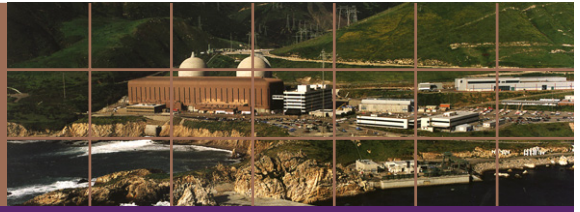
**3-3. License Renewals:** The third measure is to ensure that the NRC handles license renewal reviews in an expeditious manner. As of June 30, 2004, the NRC completed license renewal reviews for 10 units, and issued all 10 renewed licenses within the target time frame of 30 months with a hearing or 22 months without a hearing.

## Performance Goal 4: Reduce unnecessary regulatory burden on stakeholders.

Measure	2001	2002	2003	2004
4-1 Complete specific milestones to reduce unnecessary regulatory burden.	Met	Met	Met	Met

**Result:** The NRC met this performance goal measure target.





## NUCLEAR REACTOR SAFETY

**4-1. Discussion:** The target for this performance goal was to complete activities to reduce unnecessary regulatory burden. Completion of these activities enabled the NRC to meet its internal goals associated with reducing unnecessary regulatory burden sufficiently to justify the cost of the initiative. The initiative is described in SECY-02-0081, “Staff Activities Related to the NRC Goal of Reducing Unnecessary Regulatory Burden on Power Reactor Licensees.”

In FY 2004, the NRC identified and pursued several licensing actions and rulemakings to reduce unnecessary regulatory burden. The milestone for FY 2004 was to complete the initiative such that the cost savings resulting from the effort far exceed the cost of the initiative. The NRC completed one item in FY 2004 to eliminate requirements for monthly operating reports and occupational radiation exposure reports. The completion of this item provides savings to the NRC and the industry that exceed the cost of the total initiative. The NRC is continuing its work on several additional items. Completion of these activities will yield significant additional savings from the initiative.

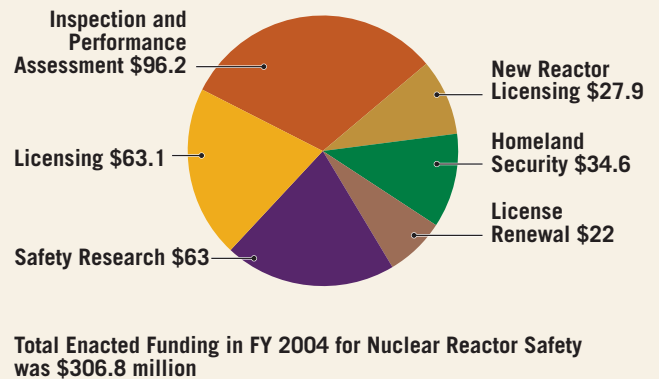
### FUNDING FOR ACHIEVING GOALS

The Nuclear Reactor Safety budget, totaling \$306.8 million in FY 2004, was spent primarily on six key programs. Each program plays a specific and linked role to ensure safety at nuclear power plants. For example, the licensing program sets the standards and procedures for operating nuclear power plants, while the inspection and performance assessment program inspects the plants and collects 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 2004, the NRC completed a program evaluation of its reactor operating experience functions, as documented in a report dated November 26, 2003 (ADAMS Accession #ML033350063). A task force completed the evaluation and determined that the NRC’s current reactor operating experience activities include the necessary functions to perform the short- and long-term identification of safety issues, assess their significance, and take action to address those issues. Nonetheless, the task force found that the NRC lacked a clear vision of how all of its operating experience activities should function together and be integrated with the NRC’s licensing, inspection, and research program activities. The task force made 23 recommendations to enhance current activities. The NRC is currently implementing those recommendations.

**BUDGET AUTHORITY BY PROGRAM** in Millions



# PROGRAM PERFORMANCE

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 contained 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. Nonetheless, the team identified and documented areas for improvement in the coordination and communication of activities. The NRC is currently evaluating possible approaches for implementing the team's recommendations.

In FY 2003, the NRC's Office of the Inspector General conducted an independent program evaluation of the NRC's oversight of research and test reactors (Audit Report OIG-03-A-16). Through that evaluation, the Office of the Inspector General found that the program met expectations for reviewing and approving licensee requests for changes to licenses, met licensee demands for licensing reactor operators, and generally satisfied inspection requirements. Nonetheless, the Office of the Inspector General documented six recommendations to further enhance the effectiveness of the research and test reactor program. In FY 2004, the NRC completed actions on all six recommendations.

## NUCLEAR MATERIALS SAFETY

***Strategic Goal:*** Prevent radiation-related deaths and illnesses, promote the common defense and security, and protect the environment in the use of source, byproduct, and special nuclear materials.

### OVERVIEW

The Nuclear Materials Safety program encompasses NRC-regulated aspects of nuclear fuel cycle facilities and nuclear materials activities, including all regulatory activities carried out by the NRC and the Agreement States to ensure that nuclear materials and facilities are used in a manner that protects the health and safety of the public and the environment, while also protecting against radiological sabotage and theft or diversion of special nuclear materials.

The NRC and 33 Agreement States regulate more than 20,000 specific and 150,000 general licensees. This diverse regulated community includes uranium extraction, conversion, and enrichment, as



## NUCLEAR MATERIALS SAFETY

well as nuclear fuel fabrication facilities. It also includes large and small users of nuclear material for industrial, medical, or academic purposes. Specifically, these users include radiographers, hospitals, private physicians, nuclear gauge users, large and small universities, and others.

### ENSURING THE SAFE USE OF NUCLEAR MATERIALS

Nuclear Materials Safety encompasses several distinct programs including fuel facilities licensing and inspection, materials users licensing and inspection, materials safety research, and State and tribal programs. The following sections discuss the NRC's achievements in each of these programs.

### FUEL FACILITIES LICENSING AND INSPECTION

The NRC licenses and inspects all commercial nuclear fuel facilities that are involved in processing and fabricating uranium ore into reactor fuel. These licensing and inspection activities are a key aspect of the agency's nuclear fuel cycle safety and safeguards program. As such, these activities include conducting 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 41 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 129 fuel cycle licensing actions and conducted 86 inspections of fuel cycle licensees during FY 2004.

The NRC is currently involved in several significant fuel cycle licensing reviews. Among these reviews, the NRC staff is currently evaluating the application from Duke, Cogema, Stone & Webster to construct a mixed-oxide fuel fabrication facility on the Department of Energy's Savannah River site near Aiken,

#### NUMBER OF CORE SAFETY AND SAFEGUARDS INSPECTIONS COMPLETED

All Inspections Completed as Scheduled in Fuel Cycle Master Inspection Plan



# PROGRAM PERFORMANCE

South Carolina. The proposed use of mixed-oxide fuel is part of a national nonproliferation initiative to dispose of surplus weapons-grade plutonium by irradiating it in existing commercial light-water reactors. In FY 2004, the Department of Energy directed Duke, Cogema, Stone & Webster to change the location of the facility's controlled area boundary. Consequently, on June 15, 2004, the NRC received a revised construction authorization request from Duke, Cogema, Stone & Webster addressing the location change among others. NRC expects to complete its review by February 2005.

In February 2004, the NRC completed its review of the license application received from the United States Enrichment Corporation, Inc., for a commercial gas centrifuge lead cascade test and demonstration facility. The NRC issued its related environmental assessment and safety evaluation report in January 2004 and, on February 24, 2004, the Commission issued the United States Enrichment Corporation, Inc., a license for the lead cascade facility. The United States Enrichment Corporation, Inc., submitted a license application for a commercial-scale facility to NRC on August 23, 2004. The NRC received a license application and environmental report from the Louisiana Energy Services for the National Enrichment Facility, a commercial gas centrifuge uranium enrichment facility, which would be located in Eunice, New Mexico. The NRC is currently reviewing that license application. A draft environmental impact statement was issued September 30, 2004 (NUREG-1790).

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 Title 10, Part 70, of the Code of Federal Regulation (10 CFR Part 70), which increases the use of risk information for fuel cycle facilities. During this fiscal year, the NRC initiated 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.

## MATERIALS USERS LICENSING AND INSPECTION

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



## NUCLEAR MATERIALS SAFETY

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. NRC also inspects to identify and analyzes operational experience from NRC and Agreement State licensees.

In FY 2004, NRC completed review of 3,389 materials licensing actions and 1,275 materials program inspections.

The NRC worked with the Department of Energy to facilitate the recovery of nearly half of the 5,500 unwanted or orphaned greater-than-class-C radioactive sources that were initially identified for accelerated recovery under the Department of Energy's Offsite Source Recovery Program. This program is an ongoing effort and since the creation of the initial list, additional sources meeting the criteria have been registered for recovery. Recovery of the remaining half of the original 5,500 sources, as well as newly registered sources will continue.

The NRC is currently developing an initial national inventory of high-risk radioactive sources. Within the first few months, over 99 percent of licensees had responded to the NRC's voluntary information collection request. This inventory is responsive to recommendations of the Department of Energy/NRC Interagency Working Group on Radiological Dispersal Devices, which outlined actions to increase controls on, and prevent access to, radioactive sources of greatest concern.

The NRC, the Department of Energy, the Organization of Agreement States, and the Conference of Radiation Control Program Directors, Inc. are working together to develop a national source tracking system, which will ensure timely "cradle-to-grave" tracking of high-risk sources.

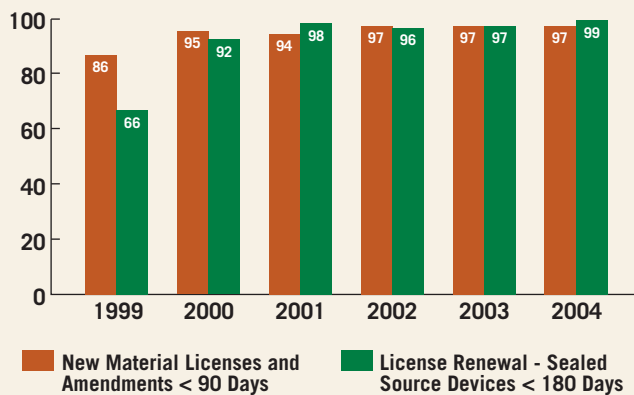
The NRC finalized Inspection Manual Chapter 2800, "Materials Inspection Program," which was previously issued in draft form. The revised inspection guidance is more complete than the earlier version and is suitable for use by both qualified inspectors and inspectors-in-training. The revised guidance increases the use of risk insights, and incorporates information gathered during use of the draft guidance. The new procedures included in the revised manual chapter have resulted in more effective use of resources.

The NRC issued for public comment, a proposed rule to amend requirements for training and experience in 10 CFR Part 35, "Medical Use of Byproduct Material." The proposed rule would amend requirements for recognition of speciality boards whose certifications may be used to demonstrate the adequacy of the training and experience of individuals to serve as radiation safety officers, authorized medical physicists, authorized nuclear pharmacists, or authorized users. In so doing, the proposed rule would reduce regulatory burden by making requirements more flexible.

# PROGRAM PERFORMANCE

The NRC monitors materials safety issues through the agency's event evaluation and incident response activities. In particular, the NRC met regularly to evaluate the safety significance of the events reported by agency licensees and Agreement States.

**TIMELINESS REVIEW OF NUCLEAR MATERIAL LICENSING APPLICATIONS** Percent Completed on Time



The NRC's timeliness in reviewing nuclear material license renewals and sealed source and device designs has improved from 1999 through 2004.

## 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 shares its regulatory responsibilities with 33 Agreement States. To ensure adequate protection public health and safety, as well as the compatibility of Agreement State programs with NRC programs, the NRC conducted nine 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 NRC regional materials programs to attain a uniform materials safety policy throughout the Nation. NRC conducted nine reviews of Agreement State programs and one review of an NRC regional office.

In accordance with the Atomic Energy Act, the NRC entered into an amendment to the Agreement with the State of Utah transferring to the State regulatory authority for byproduct material (uranium mill tailings and other uranium milling wastes) which became effective August 16, 2004.

Also in accordance with the Atomic Energy Act, the NRC entered into nine agreements for States to conduct security inspections for NRC.

## MATERIALS RESEARCH

The research program includes developing a technical basis to risk-inform the regulatory requirements for materials licenses by developing risk assessment tools and safety goals/guidelines for materials applications.



## NUCLEAR MATERIALS SAFETY

The NRC developed a database with national and international data sets needed to perform radiologic and dosimetric calculations. This tool will enable NRC staff and licensees to quickly assess radiation exposures by having the needed information in a single database.

In response to recommendations from the Government Accountability Office, the NRC cooperated with other Federal agencies to assess the significance of radioactive material released to municipal sewage systems and published a report on the results of a survey to evaluate the extent of radioactivity occurring in sewage sludge.

### ANNUAL GOALS AND MEASURES

**Strategic Goal-1: Prevent radiation-related deaths and illnesses, promote the common defense and security, and protect the environment in the use of source, byproduct, and special nuclear materials.**

#### *Strategic Goal Results*

The NRC has established five measures to determine whether the agency has met its Nuclear Materials Safety strategic goal. These top-level measures define the NRC's success in overseeing nuclear materials licensees. The goal of the NRC's regulatory efforts is to prevent the occurrence of any of the events described in the measures below.

Measure	2001	2002	2003	2004
1-1 No deaths resulting from acute radiation exposures from civilian uses of source, byproduct, or special nuclear materials, or deaths from other hazardous materials used or produced from licensed material. <sup>14</sup>	0	0	0	0
1-2 No more than six events per year resulting in significant radiation or hazardous materials exposures <sup>15</sup> from the loss or use of source, byproduct, and special nuclear materials.	0	0	0	0
1-3 No events resulting in releases of radioactive material resulting from civilian uses of source, byproduct, or special nuclear materials that cause an adverse impact on the environment. <sup>16</sup>	0	0	0	0
1-4 No losses, thefts, or diversion of formula quantities of strategic special nuclear material, radiological sabotages, or unauthorized enrichment of special nuclear material regulated by the NRC. <sup>17</sup>	0	0	0	0
1-5 No unauthorized disclosure or compromise of classified information causing damage to national security. <sup>18</sup>	0	0	0	0

**Results: The NRC has met all of the strategic goal measure targets.**

# PROGRAM PERFORMANCE

## PERFORMANCE GOALS

In addition to our strategic goals, the NRC had four performance goals and associated performance measures for the Nuclear Materials Safety program:

- (1) Maintain safety, protection of the environment, and the common defense and security.
- (2) Increase public confidence.
- (3) Make NRC activities and decisions more effective, efficient, and realistic.
- (4) Reduce unnecessary regulatory burden on stakeholders.

## PERFORMANCE GOAL RESULTS

### Performance Goal-1: Maintain safety, protection of the environment, and the common defense and security

Measure	2001	2002	2003	2004
1-1 No more than 300 losses <sup>19</sup> of control of licensed material per year. <sup>20</sup>	244	272	219	175
1-2 No occurrences of accidental criticality. <sup>21</sup>	0	0	0	0
1-3 No more than 30 events per year <sup>22</sup> resulting in radiation overexposures <sup>23</sup> from radioactive material that exceed applicable regulatory limits.	27	23	16	7
1-4 No more than 45 medical events per year. <sup>24</sup>	33	33	39	35
1-5 No more than 5 releases per year <sup>25</sup> to the environment of radioactive material from operating facilities that exceed the regulatory limits. <sup>26</sup>	0	4	0	0
1-6 No more than 5 substantiated cases per year of attempted malevolent use <sup>27</sup> of source, byproduct, or special nuclear material.	0	0	0	0
1-7 No breakdowns of physical protection or material control and accounting systems resulting in a vulnerability to radiological sabotage, theft, diversion, or unauthorized enrichment of special nuclear material. <sup>28</sup>	0	0	0	0
1-8 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. <sup>29</sup>	0	0	0	0

**Results:** The NRC has met all of the performance goal measure targets.





## NUCLEAR MATERIALS SAFETY

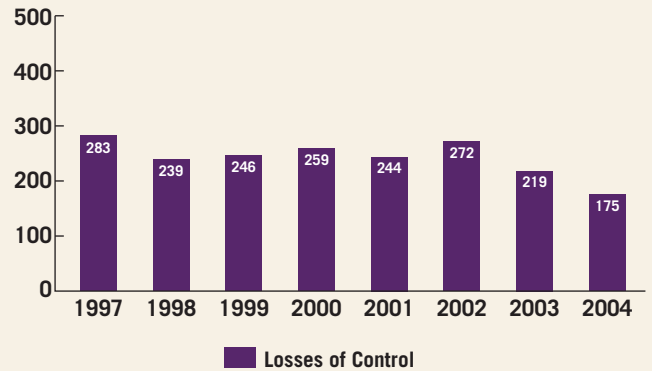
**1-1 Losses of Control:** The industry experienced a total of 175 losses of control of licensed material in FY 2004, which was within the target of 300 losses. This measure tracks reportable events of materials entering the public domain in an uncontrolled manner. Many of the events counted toward this 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, the NRC includes these losses because they may indicate weaknesses in licensees' programs. Very few of the events tracked in the graph on the top right involve high enough quantities of radioactive material to pose a security concern.

**1-2 Accidental Criticality:** The industry did not experience any instances of accidental criticality in FY 2004 or in any year since data collection began in FY 1997.

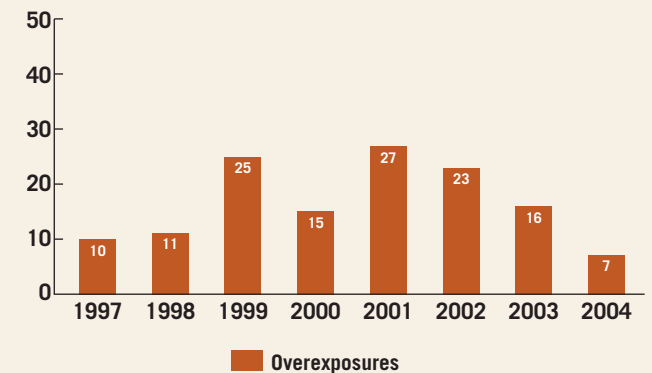
**1-3 Radiation Overexposures:** The industry experienced 7 events in FY 2004 that resulted in radiation overexposures from radioactive material that exceeded applicable regulatory limits. For fuel cycle facilities, this measure extends to other hazardous materials that are used with, or produced from, 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.

**TARGET: NO MORE THAN 300 LOSSES OF CONTROL OF LICENSED NUCLEAR MATERIAL**

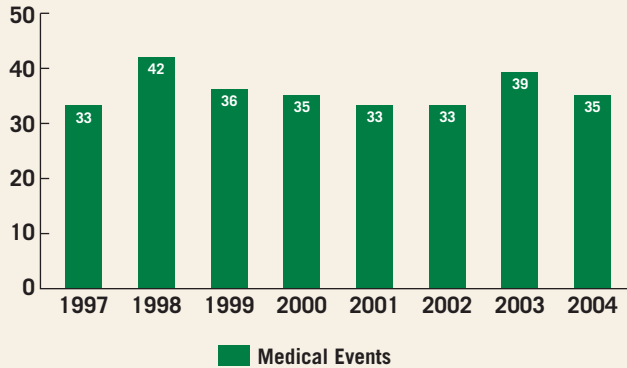


**TARGET: NO MORE THAN 30 EVENTS RESULTING IN RADIATION OVEREXPOSURES**



# PROGRAM PERFORMANCE

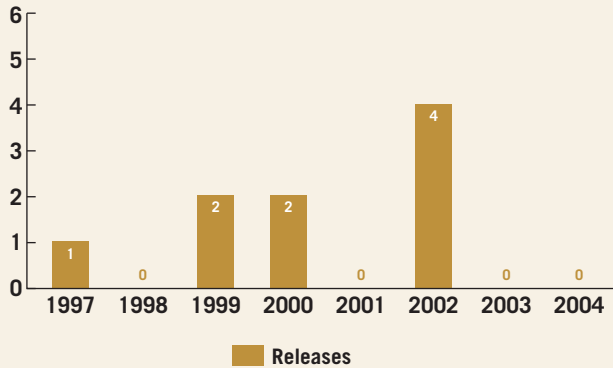
## TARGET: NO MORE THAN 45 MEDICAL EVENTS



**1-4 Medical Events:** The industry experienced 35 medical events in FY 2004. 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.

**1-5 Releases to the Environment:** The fifth measure is an indicator of the effectiveness of the NRC’s nuclear materials environmental programs. The industry did not experience any releases to the environment that exceeded regulatory limits in FY 2004.

## TARGET: NO MORE THAN 5 RELEASES TO THE ENVIRONMENT



**1-6 Malevolent Uses:** The industry did not experience any instances of attempted malevolent use of source, byproduct, or special nuclear material in the reporting period from FY 2001-FY 2004.

**1-7 Breakdowns of Protection or Control:** The industry did not experience any breakdowns of physical protection or material control and accounting systems resulting in a vulnerability to radiological sabotage, theft, diversion, loss of special nuclear material, or unauthorized enrichment of special nuclear material in FY 2004 or in any year since data collection began in 1990.

**1-8 Nonradiological Events:** The industry did not experience any nonradiological events during NRC-regulated operations that had an impact on the environment during FY 2004, or in any year since data collection began under the Government Performance and Results Act in FY 1997. This measure involves only chemical releases from the uranium mining and milling facilities that are regulated by the NRC. As such, it is limited to nonradiological environmental impacts from operations, including remediation. Examples of events that might be counted include chemical releases resulting from excursions at in situ leach facilities or releases from mill tailings piles that could contaminate groundwater.



## NUCLEAR MATERIALS SAFETY

### Performance Goal-2: Increase public confidence.

Measure	2001	2002	2003	2004
2-1 Complete milestones related to collecting, analyzing, and trending information for measuring public confidence.	Met	Met	Met	Met
2-2 Complete all public outreaches.	Met	Met	Met	Met
2-3 Issue Director's Decisions for petitions filed to modify, suspend, or revoke a license under 10 Code of Federal Regulation 2.206 within an average of 120 days.	NA	NA	NA	TBD

**Results:** The NRC has met all of the performance goal measure targets.

**2-1 Public Confidence:** The FY 2004 target for this performance measures is to “Create a Web-based system to compile and analyze trends in the responses of the feedback forms to assess the agency’s meeting performance.” The NRC has analyzed the data, and the results were transmitted to the staff.

**2-2 Public Outreach:** Public outreach meetings provide opportunities for meaningful public participation in NRC activities and information concerning those activities. In FY 2004, the NRC held over 20 public outreach meetings associated with this measure. Examples of public outreach efforts in FY 2004 include the Uranium Recovery Workshop, a workshop on Integrated Safety Analysis Summary reviews, a series of public meetings on the proposed Louisiana Energy Services gas centrifuge facility and the U.S. Enrichment Corporation’s Full-Scale American Centrifuge Facility, the annual meetings of the Organization of Agreement States and the Conference of Radiation Control Program Directors, and two meetings of the Advisory Committee on the Medical Use of Isotopes. The NRC had also planned to conduct a public meeting to discuss the final safety evaluation report concerning the Savannah River mixed-oxide fuel fabrication facility, but this meeting has been delayed until FY 2005 to allow for evaluation of the changes that Duke Cogema Stone & Webster submitted in June 2004.

**2-3 Directors Decisions:** In FY 2004, the NRC received two petitions that were filed under 10 CFR 2.206 with regard to the Nuclear Materials Safety program. The Director’s Decision on the Sequoyah Fuels petition is on hold pending completion of the associated licensing review. The Radiac Research Corporation petition was closed in 48 days.

# PROGRAM PERFORMANCE

## Performance Goal-3: Make NRC activities and decisions more effective, efficient, and realistic.

Measure	2001	2002	2003	2004
3-1 Complete specific materials milestones in the Risk-Informed Regulation Implementation Plan.	Met	Met	Met	Met
3-2 Complete at least two key process improvements per year in selected program and support areas that increase effectiveness, efficiency, and realism.	Met	Met	Met	Met

**Results:** The NRC has met all of the performance goal measure targets.

**3-1 Risk-Informed Regulation:** This measure focuses on progress in developing a coordinated approach to implementing risk-informed decisions throughout the agency's regulatory processes. The NRC completed the specific nuclear materials program milestones identified for each fiscal year in the Risk-informed Regulation Implementation Plan on schedule. Specific FY 2004 activities included updating the Risk-informed Regulation Implementation Plan, completing a feasibility/scoping study to identify and prioritize human reliability analysis needs, evaluating and incorporating recommendations to improve the effectiveness and efficiency of the Byproduct Materials Program, and updating the NRC's plans to risk-inform materials regulatory processes to reflect successes and lessons learned in implementation.

**3-2 Process Improvements:** This measure concerns actions to improve the NRC's internal processes. This year, the NRC conducted two process improvement reviews. For the first such review, the NRC's Office of Nuclear Material Safety and Safeguards conducted an assessment of its recruitment processes. The challenge was to ensure that the office could continue to recruit the staff it needs to accomplish its mission. The review resulted in recommendations to: (1) continue to focus on local recruitment opportunities; (2) continue to focus on events and activities that have historically been successful; (3) encourage the staff to develop relationships with colleges and universities that offer academic programs that meet our critical skills needs; (4) continue to advertise available positions in appropriate newspapers, magazines, and trade journals; (5) look for opportunities to expand routine NRC business activities to include recruitment efforts; and (6) develop informational materials that target specific skills and career opportunities so that information is readily available even if the staff is not able to physically attend a recruitment event. The NRC anticipates that implementing these recommendations will enhance the office's recruitment process and continue to ensure that the Office of Nuclear Material Safety and Safeguards meets its staffing needs.



## NUCLEAR MATERIALS SAFETY

In addition, the staff completed a final report in November 2003 on an FY 2003 process improvement review of the fuel cycle facility licensing process. That report included eight recommendations in such areas as strengthening communications with applicants and improving project management. The staff has since developed a plan for implementing the recommendations.

### Performance Goal-4: Reduce unnecessary regulatory burden on stakeholders.

Measure	2001	2002	2003	2004
4-1 Complete specific milestones to reduce unnecessary regulatory burden.	Not Met	Met	Met	Met

**Results:** The NRC has met the performance goal measure target.

**4-1 Reduce Burden:** The NRC met the target in FY 2004 by completing a proposed rule to amend the training and experience requirements specified in 10 CFR Part 35, “Medical Use of Byproduct Material.” The proposed rule would amend requirements for recognition of speciality boards whose certification may be used to demonstrate the adequacy of training and experience of individuals to serve as radiation safety officers, authorized medical physicists, authorized nuclear pharmacists, or authorized users. In addition, the rule would revise the existing requirements for demonstrating the adequacy of training and experience for pathways other than board certification. In so doing, the proposed rule would reduce regulatory burden by making requirements more flexible.

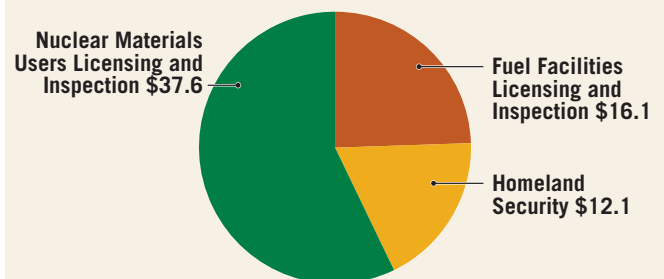
### FUNDING FOR ACHIEVING GOALS

The Nuclear Materials Safety budget totaled \$65.8 million in FY 2004. This budget was allocated to three key program areas, including fuel facilities licensing and inspection, nuclear materials users licensing and inspection, and homeland security.

### PROGRAM EVALUATION

The NRC’s Strategic Plan did not contain any program evaluations for the Nuclear Materials Safety program in FY 2004. Nonetheless, the NRC continued to evaluate its programs and integrated improvements to the National Materials Program and

#### BUDGET AUTHORITY BY PROGRAM in Millions



**Total Enacted Funding in FY 2004 for Nuclear Material Safety was \$65.7 million**

# PROGRAM PERFORMANCE

the Integrated Materials Performance Evaluation Program Reviews. The NRC evaluated the Materials Licensing and Inspection Program using the Program Assessment Rating Tool promulgated by the Office of Management and Budget.

## INTEGRATED MATERIALS PERFORMANCE EVALUATION PROGRAM

The Integrated Materials Performance Evaluation Program is an ongoing oversight program designed to evaluate the quality, adequacy, and consistency of NRC and Agreement State materials programs using a set of common performance indicators. In FY 2004, the NRC completed a review of the Region IV materials program. That review was conducted by a multi-disciplinary team, which included the participation of NRC and Agreement State personnel. The team found that the Region IV 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 is adequate to protect public health and safety.

## MATERIALS LICENSING AND INSPECTION PROGRAM

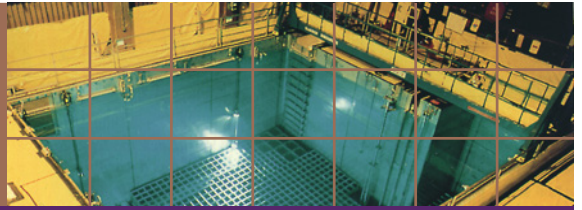
In FY 2004, the NRC evaluated its Materials Licensing and Inspection Program using the Program Assessment and Rating Tool promulgated by the Office of Management and Budget. The Office of Management and Budget rated the program "effective," which is the highest rating category, and assigned an overall score of 93.

## NUCLEAR WASTE SAFETY

Strategic Goal: Prevent significant adverse impacts from radioactive waste to the current and future health and safety of the public and the environment and promote the common defense and security.

### OVERVIEW

The Nuclear Waste Safety program encompasses regulatory activities associated with the disposal of radioactive wastes, decommissioning of nuclear reactors and other facilities, storage of spent nuclear fuel, transportation of radioactive materials, and waste safety research. The NRC's activities under the Nuclear Waste Policy Act focus on the proposed geologic high-level waste repository at Yucca Mountain, Nevada. The NRC conducts its low-level waste activities in accordance with the Low-Level Radioactive Waste Policy Act.



## NUCLEAR WASTE SAFETY

### ENSURING THE SAFE STORAGE TRANSPORTATION AND DISPOSAL OF NUCLEAR WASTE

Nuclear Waste Safety encompasses several distinct program areas, including high-level waste regulation, decommissioning and low-level waste management, spent fuel storage and transportation licensing and inspection, and waste safety research as described in the following sections.

#### HIGH-LEVEL WASTE REGULATION

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 respective roles of the NRC, the Department of Energy, and the Environmental Protection Agency (EPA) as they relate to the high-level waste program. Specifically, the Department of Energy is responsible for the actual disposal of the Nation's high-level waste, commencing with site characterization and repository design, and continuing through development, operation, and ultimate closure of a deep geologic repository. The Environmental Protection Agency has been charged with developing environmental standards specific to the Yucca Mountain repository, consistent with recommendations of the National Academy of Sciences. The NRC has developed and will modify if necessary technical criteria for licensing, consistent with the standards promulgated by the Environmental Protection Agency. Both the EPA 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 EPA's 10,000-year compliance period. EPA is now developing standards that will comply with the Court's decision. The NRC, in turn, will incorporate those new standards into its own standards."

The NRC also has extensive pre-licensing responsibilities and will be the regulatory authority to issue a license, if appropriate, 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 NRC made its revised Risk-Insights Baseline Report available to the public. The NRC expects to use this revised report, together with the Yucca Mountain Review Plan and the Integrated Issue Resolution Status Report, to conduct a risk-informed review of the license application that the Department of Energy may ultimately submit for a high-level waste repository at Yucca Mountain. The NRC also continued exchanges with the Department of Energy concerning the technical issues that are most important to licensing the potential high-level

# PROGRAM PERFORMANCE

waste repository and responded to the Department of Energy's questions and concerns. These exchanges resolve subissues or lead to agreements for the Department of Energy to submit additional information to address the NRC's concerns. The NRC staff expects to address all agreements with the Department of Energy in calendar year 2004.

The NRC completed its evaluation of the quality of technical reports submitted by the Department of Energy and issued a report of its findings. That report stressed to the Department of Energy the importance of improving the quality of the information that would support a potential license application.

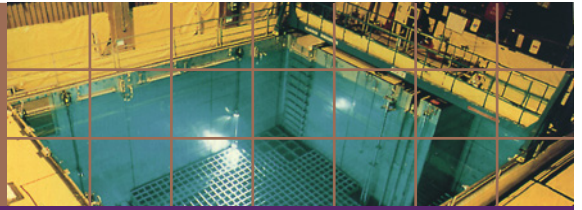
The NRC maintained and improved its Electronic Information Exchange capability and Agencywide Documents Access and Management System that enable the electronic receipt, processing, and review of High-Level Waste documentary material. The NRC established a comprehensive test lab for conducting end to end testing of the information systems that will support further agency processing, review and adjudication of the application. The NRC also revised the Commission's Rules of Practice in 10 CFR Part 2, Subpart J, to establish specific requirements and standards for the electronic submission of adjudicatory materials to the electronic hearing docket by parties to the high-level licensing proceeding. Particular focus was given to filings that will be of a size and nature that will create transmission, viewing, or downloading challenges for the NRC staff, parties, and the public, such as the Department of Energy's license application and supporting materials.

The NRC certified, per 10 CFR Part 2, Subpart J requirements, that its relevant High-Level Waste documents were made available via the Licensing Support Network, an Internet-based system that provides access to all relevant information concerning the potential repository at Yucca Mountain.

In anticipation of receiving the Department of Energy's application for a high-level waste repository at Yucca Mountain, the NRC is currently constructing a 15,000 square foot hearing facility in Las Vegas, Nevada to support adjudicatory hearings. The hearings are scheduled to begin in FY 2005.

The NRC is investing in a Digital Data Management System that will provide the necessary technology and functionality for the agency to meet its obligation to conducting the adjudicatory proceeding regarding the Department of Energy's application for construction of a high-level waste repository at Yucca Mountain, Nevada. 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 so as to be in the vicinity of the Yucca Mountain site; a second at NRC





## NUCLEAR WASTE SAFETY

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 bring prepared materials to the evidentiary hearing electronically; and provide continual real-time access to the hearing record by the presiding officer and distribution to the parties in the litigation.

### PACKAGE PERFORMANCE STUDY

The NRC is currently studying the performance of spent nuclear fuel transportation packages under accident conditions, including high-speed impact and fire. In connection with that study, the NRC published NUREG-1768, "United States Nuclear Regulatory Commission Package Performance Study Test Protocols," for public comment in February 2003. NUREG 1768 contained a draft proposal for the content and conduct of the test program, as well as the analyses to support the test program.

In May 2004, the NRC approved full-scale testing of a single NRC-certified spent fuel rail transportation cask. The testing is to utilize a single full-scale NRC-certified rail transportation cask of a type currently being used, or expected to be used in the foreseeable future, to transport spent nuclear fuel. The demonstration test is to be realistic, and include a fully engulfing fire.

The NRC continues to interact with the Department of Energy to ensure that the NRC's research will support the latest Department of Energy strategy on spent nuclear fuel shipment. The research results will be available before the initiation of spent nuclear fuel shipment to a potential Yucca Mountain repository.

### DECOMMISSIONING AND LOW-LEVEL WASTE MANAGEMENT

Decommissioning involves removing 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. This program includes both power and nonpower reactors, as well as materials and fuel facilities. 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.

The NRC conducts decommissioning licensing and inspection activities for commercial nuclear facilities that are currently in the decommissioning process. Licensing actions require NRC review and approval before they can be implemented by licensees. By conducting inspections,

# PROGRAM PERFORMANCE

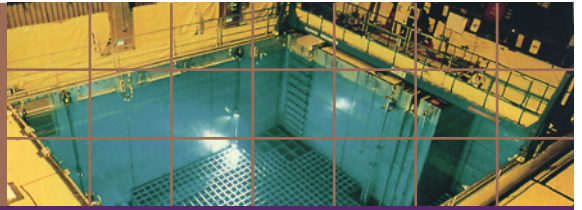
the NRC evaluates the licensee's ability to store or dismantle and decontaminate the facility safely, while still maintaining the licensed configuration of the facility and managing the use of decommissioning funds as described in the regulations. In particular, the decommissioning program focuses on resolving key issues (including dose assessments for remediated sites), evaluating institutional controls for restricted-use sites, reviewing decommissioning plans, conducting environmental reviews, and preparing environmental impact statements, as appropriate.

The NRC implemented a comprehensive decommissioning program with well-defined procedures, standards, and oversight to ensure that all sites receive the appropriate level of review.

The NRC completed follow-on activities associated with the FY 2003 reviews of the decommissioning program and the License Termination rule. To address the issues identified in the analysis of the License Termination rule, the NRC issued a regulatory issues summary in June 2004 that informed licensees and other stakeholders of the options available for use in resolving the license termination issues as well as plans for future actions (including guidance and rulemaking) and plans to further risk-inform the implementation of the License Termination rule. The NRC also drafted an integrated plan that identifies the actions and activities required to address the programmatic issues identified in the FY 2003 decommissioning program evaluation.

The NRC implemented the use of more realistic exposure scenarios in evaluating compliance with the License Termination rule and approved an "industrial use" scenario for use in evaluating the Fansteel facility in Muskogee, Oklahoma. Approval of that scenario will facilitate the cleanup of the site in a manner that protects the health and safety of the public and the environment. In addition, the NRC determined that a more realistic exposure scenario could be used to determine compliance with the dose criteria at the contaminated Kiski Valley Water Pollution Control Authority facility in Vandergrift, Pennsylvania. The Commission is currently applying more realistic scenarios at two sites in Michigan.

In the area of low-level-waste, the NRC decided to defer rulemaking on assured isolation facilities for long-term storage of low-level waste based on a determination that there is insufficient need for such facilities at this time. Instead, the agency will annually assess the need for, and interest in, such facilities for the long-term storage of low-level waste as well as the State and Compact views and industry interest in evaluating the need for rulemaking and/or regulatory guidance. The NRC will also participate, as appropriate, with the Conference of Radiation Control Program Director's Inc. in the development of a suggested State regulation.



## NUCLEAR WASTE SAFETY

The NRC completed two safety evaluation reports for the Millstone Power Station's missing spent fuel rods. Dominion Nuclear, the current licensee for the Millstone plant, determined that off-site disposal (at either the Barnwell, South Carolina, or Hanford, Washington low-level waste disposal facilities) was one possibility for the location of the missing spent fuel segments. Consequently, the agency issued its related safety evaluation reports in coordination with the Environmental Protection Agency, Department of Energy, and the States of South Carolina and Washington. Those reports address the potential impacts of disposing of fuel at a low-level waste burial site and concluded that there would be minimal impact and no need for further action in this instance.

The NRC staff continued to evaluate the public comments concerning disposition of solid materials and is currently working to develop environmental impact information related to several alternatives for proceeding as well as implementing guidance related to those alternatives.

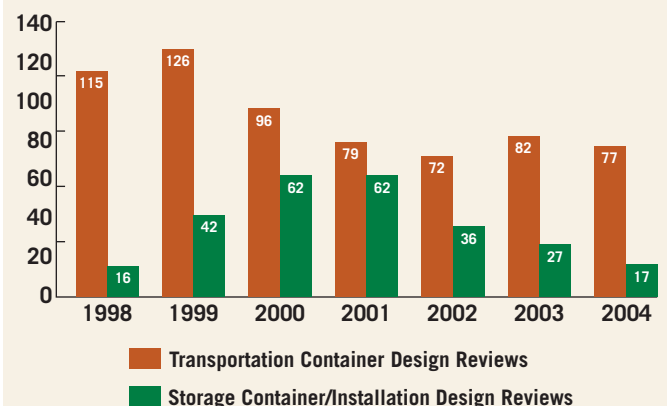
### SPENT FUEL STORAGE AND TRANSPORTATION LICENSING AND INSPECTION

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.

The NRC completed 77 transport container design reviews and 17 storage container and installation design reviews during FY 2004.

The NRC completed rulemakings associated with certificate of compliance amendments for five different storage cask designs. These rulemakings and amendments address the storage needs of specific utilities intending to use the modified storage cask designs.

#### STORAGE AND TRANSPORTATION DESIGN REVIEWS COMPLETED



## PROGRAM PERFORMANCE

The NRC issued a final rulemaking to revise 10 CFR Part 71 to make U.S. transportation and safety requirements compatible with the most recent international standards issued by the International Atomic Energy Agency and to include other changes initiated by the NRC.

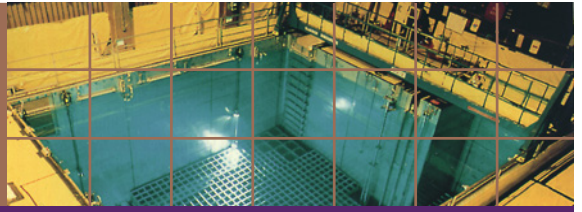
The NRC and the Department of Transportation held a joint public workshop to discuss operational concerns for implementing 10 CFR Part 71 as well as Title 49 of the Code of Federal Regulations. Both regulations became effective on October 1, 2004.

As a co-U.S. representative, along with the Department of Transportation, to the International Atomic Energy Agency's Transportation Safety Standards Committee, the NRC is actively participating in an International Atomic Energy Agency effort to conduct a 2-year review and revision of the international standards for transporting radioactive material.

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. As a result of a March 2003 ruling of the Atomic Safety and Licensing Board Panel, which required the applicant to demonstrate that a military aircraft crash would not pose a significant threat to the facility, the applicant submitted an analysis of the consequences of an F-16 aircraft crash at the proposed facility. The NRC reviewed the probabilistic, structural, and fire consequence analyses of an F-16 crash provided by both the applicant and the State of Utah. The NRC also completed independent confirmatory analyses of an F-16 crash, with contractor support from the Sandia and Oak Ridge National Laboratories. The Atomic Safety and Licensing Board Panel hearings on the aircraft crash consequence issue were completed in mid-September, 2004. The Atomic Safety and Licensing Board Panel decision is expected by the end of January 2005.

The NRC completed and issued a final environmental impact statement and a draft safety evaluation report for an independent spent fuel storage installation located on the site of the Department of Energy's Idaho National Engineering and Environmental Laboratory. Spent nuclear fuel and associated radioactive material from the Unit 1 High-Temperature Gas-Cooled Reactor at the Peach Bottom Atomic Power Station; the Shippingport Atomic Power Station; and various training, research, and isotope reactors would be repackaged and stored at the proposed Idaho Spent Fuel Storage Facility. The draft safety evaluation report and the final environmental impact statement would support a recommendation for issuance of a license under 10 CFR Part 72.

The NRC continued to support the National Academy of Sciences studies on: (1) the risks of transporting high-level waste including spent fuel, and (2) the safety and security of spent fuel



## NUCLEAR WASTE SAFETY

storage. The objective of the first study is to develop an independent high-level synthesis of the key technical and societal concerns regarding spent fuel and high-level radioactive waste transportation and to identify technical and policy options for addressing those issues and managing transportation risk. The insights gained from the study could be used to focus the NRC's future programmatic goals and outreach efforts. The second study was mandated by Congress to evaluate the safety and security of wet pool storage and dry storage including single-dual and multi-purpose canisters and casks. A classified version of the study report was issued in mid-July 2004, with a non-classified version scheduled to be issued by the end of December 2004.

### WASTE SAFETY RESEARCH

The Waste Safety Research Program supports a number of the NRC's nuclear waste programs. Ongoing research studies involve the development of information and tools to assess the movement of radionuclides in the environment resulting from decommissioning and waste management activities and the assessment of dose to the public associated with those activities.

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 decision-making in terminating licenses.

The NRC will complete a significant revision of the agency's probabilistic risk assessment of a dry cask storage system, which will include more realistic analysis in response to related peer review comments. The staff currently plans to present its findings to the Advisory Committee on Nuclear Waste in FY 2005 before issuing the draft report for public comment. The draft study determined that a stainless steel welded canister with a concrete overpack poses a very low risk to the public.

### ANNUAL GOALS AND MEASURES

**Strategic Goal:** Prevent significant adverse impacts from radioactive waste to the current and future health and safety of the public and the environment and promote the common defense and security.

#### STRATEGIC GOAL RESULTS

The NRC has established four measures to determine whether the agency has met its Nuclear Waste Safety strategic goal. These are top-level measures that define the NRC's success in overseeing radioactive waste. The goal of the NRC's regulatory efforts is to prevent the occurrence of any of the events described in the measures that follow.

# PROGRAM PERFORMANCE

Measure	2001	2002	2003	2004
1-1 No deaths resulting from acute radiation exposure from radioactive waste. <sup>30</sup>	0	0	0	0
1-2 No events resulting in significant radiation exposure <sup>31</sup> from radioactive waste.	0	0	0	0
1-3 No releases of radioactive waste causing an adverse impact on the environment. <sup>32</sup>	0	0	0	0
1-4 No losses, thefts, diversion, or radiological sabotage <sup>33</sup> of special nuclear material or radioactive waste.	0	0	0	0

**Results: The NRC has met all of the strategic goal measure targets.**

## PERFORMANCE GOALS

In addition to our strategic goals, the NRC has a set of four performance goals and associated performance measures for Nuclear Waste Safety.

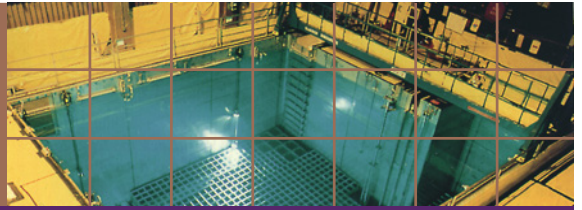
- (1) Maintain safety, protection of the environment, and the common defense and security.
- (2) Increase public confidence.
- (3) Make NRC activities and decisions more effective, efficient, and realistic.
- (4) Reduce unnecessary regulatory burden on stakeholders.

## PERFORMANCE GOAL RESULTS

### Performance Goal-1: Maintain safety, protection of the environment, and the common defense and security.

Measure	2001	2002	2003	2004
1-1 No events resulting in radiation overexposures from radioactive waste that exceed applicable regulatory limits. <sup>34</sup>	0	0	0	0
1-2 No breakdowns of physical protection resulting in a vulnerability to radiological sabotage, theft, diversion, or loss of special nuclear materials or radioactive waste. <sup>35</sup>	0	0	0	0
1-3 No radiological releases to the environment from operational activities that exceed the regulatory limits. <sup>36</sup>	0	0	0	0
1-4 No instances where radioactive waste and materials under the NRC's regulatory jurisdiction cannot be handled, transported, stored, or disposed of safely now or in the future. <sup>37</sup>	0	0	0	0

**Results: The NRC has met all of the performance goal measure targets.**



## NUCLEAR WASTE SAFETY

**1-1 Radiation Overexposures:** No radiation overexposures from radioactive waste exceeded regulatory limits in FY 2004 or in any year since data collection began under the Government Performance and Results Act in FY 1997. This measure focuses on events that could result in overexposures of the public or workers.

**1-2 Breakdowns of Physical Protection:** No breakdowns of physical protection resulted in a vulnerability to radiological sabotage, theft, diversion, or loss of special nuclear materials or radioactive waste in FY 2004, or in any year since data collection began under the Government Performance and Results Act in FY 1997. Events considered under this performance measure include those that may compromise public health and safety by creating a vulnerability to radiological sabotage, theft, diversion, or loss of special nuclear materials or radioactive waste.

**1-3 Radiological Releases:** No radiological releases to the environment from operational activities exceeded the regulatory limits in FY 2004 or in any year since data collection began under the Government Performance and Results Act in FY 1997.

**1-4 Handling of Radioactive Waste and Materials:** There were no instances in which the NRC failed to provide an adequate regulatory framework for the safe handling, transportation, storage, or disposal of radioactive waste and materials under the agency's regulatory jurisdiction in FY 2004 or in any year since data collection began under the Government Performance and Results Act in FY 1997.

### Performance Goal-2: Increase public confidence.

Measure	2001	2002	2003	2004 <sup>1</sup>
2-1 Complete milestones related to collecting, analyzing, and trending information for measuring public confidence.	Met	Met	Met	Met
2-2 Complete all of the public outreaches.	Met	Met	Met	Met
2-3 Issue Director's Decisions for petitions filed to modify, suspend, or revoke a license under 10 Code of Federal Regulation 2.206 <sup>38</sup> within an average of 120 days. <sup>39</sup>	NA	Not met	Met	NA

**Results:** The NRC has met all of the performance goal measure targets.

# PROGRAM PERFORMANCE

**2-1 Measuring Public Confidence:** The FY 2004 target for this performance measure is to “Create a Web-based system to compile and analyze trends in the responses of the feedback forms to assess the agency’s meeting performance.” The NRC’s has analyzed the data, and the results were transmitted to the staff.

**2-2 Public Outreach:** Public outreach meetings give the public opportunities for meaningful participation in NRC activities, and give the NRC a means to provide the public with information concerning those activities. In FY 2004, the NRC held over 40 public outreach meetings associated with this measure.

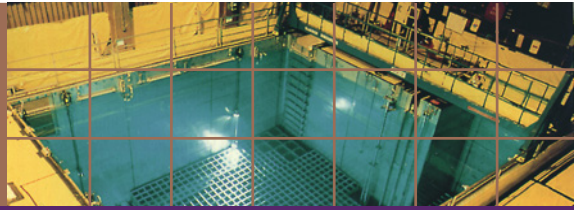
Public meetings held to communicate the NRC’s role in the potential licensing of the proposed geologic high-level waste repository at Yucca Mountain, Nevada, included an open house meeting, a public outreach presentation, a workshop for tribal representatives on the licensing process and technical issues associated with the proposed repository, and a presentation to the National Conference of State Legislatures High-Level Waste Working Group.

In FY 2004, outreach efforts associated with the Package Performance Study continued with resolution of more than 250 comment letters and concerns expressed at public meetings conducted during FY 2003 on NUREG-1768, “United States Nuclear Regulatory Commission Package Performance Study Test Protocols.” During FY 2004, the NRC continued to engage the public through related presentations at the Waste Management ‘04 Symposium, the Department of Energy’s Technical Exchange Committee meeting in April 2004, the May public meeting of the National Academy of Sciences Study on Transportation of Radioactive Material, and several other meetings with State and local governments.

Through September 2004, the NRC participated in more than 30 workshops, conferences, and town hall meetings with representatives of various Federal, State, and local agencies; international bodies; the nuclear industry; and public interest groups focused on spent fuel storage and transportation issues. The NRC conducted several public meetings with interested stakeholders on various sites or projects undergoing environmental review or scoping processes; these activities included the West Valley Demonstration Project and controlling the disposition of solid materials.

In addition, as co-chair of the Interagency Steering Committee on Radiation Standards, the NRC arranged and hosted the Committee’s annual public workshop in June 2004. The Committee conducts its annual meeting to give stakeholders an opportunity to offer input concerning issues to be reviewed by the many participating Federal agencies with radiation safety responsibilities. As a separate public outreach effort, the NRC upgraded the Web site of the Interagency Steering Committee on Radiation Standards. The newly designed website





## NUCLEAR WASTE SAFETY

([www.iscors.org](http://www.iscors.org)) will facilitate general communications among members of the Interagency Steering Committee on Radiation Standards, its subcommittees, and stakeholders throughout the United States.

To further facilitate communication with stakeholders in FY 2004, the NRC augmented its public Web site to include semiannual reports related to the rulemaking for the control of the disposition of solid material, along with notice of and links to NUREG/CR-6682, “Summary and Categorization of Public Comments on Controlling the Disposition of Solid Materials.” The March 2004 Scoping Summary Report, which is also available on the Web site, provides a concise summary of the public comments received on the scope of the generic environmental impact statement as well as the alternatives and environmental impacts that the generic environmental impact statement should address.

**2-3 Director’s Decisions:** The third measure assesses the timeliness of the Director’s Decisions regarding petitions to modify, suspend, or revoke a license under 10 CFR 2.206. The NRC received no petitions in FY 2004 in the Nuclear Waste Safety program.

### Performance Goal-3: Make NRC activities and decisions more effective, efficient, and realistic.

Measure	2001	2002	2003	2004
3-1 Complete specific waste milestones in the Risk-Informed Regulation Implementation Plan.	Met	Met	Met	Met
3-2 Complete at least two key process improvements per year in selected program and support areas that increase effectiveness, efficiency, and realism.	Met	Met	Met	Met
3-3 Complete all major precicensing milestones needed to prepare for a licensing review of the potential Yucca Mountain repository, consistent with Department of Energy’s schedules and before Department of Energy submits its license application.	Not met	Not met	Met	Met

**Results:** The NRC has met all of the performance goal measure targets.

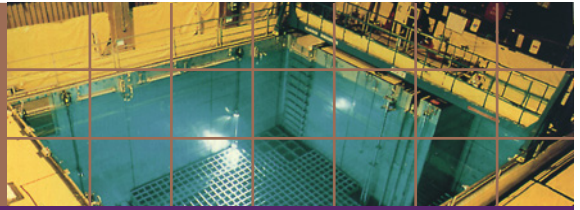
**3-1 Risk-Informed Regulation:** This measure focuses on progress in developing a coordinated approach to implementing risk-informed decisions throughout the agency’s regulatory processes. The NRC completed the specific Nuclear Waste Safety milestones identified for each fiscal year in the Risk-Informed Regulation Implementation Plan on schedule. Specific activities included updating the plan in April 2004; briefing the Commission on the status of risk-informed

# PROGRAM PERFORMANCE

activities in October 2003, March 2004, and April 2004; using risk insights to conduct an independent assessment of certain documents that will be used to support the agency's review of a Department of Energy license application for a repository at Yucca Mountain; completing the progress report/computer manual for the Preclosure Safety Assessment Tool; and implementing the recommendations from the License Termination rule analysis and the decommissioning program evaluation conducted in 2003.

**3-2 Process Improvements:** This measure concerns actions to improve the NRC's internal processes. This year, the NRC completed three process improvement reviews. For the first such review, the NRC's Office of Nuclear Material Safety and Safeguards conducted an assessment of its recruitment processes. The challenge was to ensure that the office could continue to recruit the staff it needs to accomplish its mission, given that only limited resources were available for recruitment. The review resulted in recommendations to: (1) continue to focus on local recruitment opportunities; (2) continue to focus on events and activities that have historically been successful; (3) encourage the staff to develop relationships with colleges and universities that offer academic programs that meet our critical skills needs; (4) continue to advertise available positions in appropriate newspapers, magazines, and trade journals; (5) look for opportunities to expand routine NRC business activities to include recruitment efforts (e.g., if a business meeting is taking place near a college/university with a program that meets our critical skills needs, the staff could arrange to meet with professors and/or students to talk about career opportunities); and (6) develop informational materials that target specific skills and career opportunities so that information is readily available even if the staff is not able to attend a recruitment event. The NRC anticipates that implementing these recommendations will enhance the office's recruitment process and continue to ensure that the Office of Nuclear Material Safety and Safeguards meets its staffing needs.

In another process improvement effort, culminating an FY 2003 business process improvement review, the NRC's Office of Nuclear Material Safety and Safeguards implemented several recommendations to improve the effectiveness of the spent fuel transportation and storage technical review process. Examples include actions to promote closer team involvement during the review process and more realistic scheduling of review milestones, given the complexity of the issues and the technical disciplines needed for the review. In another review associated with the spent fuel transportation and storage program, the Office of Nuclear Material Safety and Safeguards developed a master inspection plan that integrates headquarters and regional responsibilities related to the scope, frequency, and prioritization philosophy for the inspection programs conducted under 10 CFR Part 71 ("Packaging and Transportation of Radioactive Material") and Part 72 ("Licensing Requirements for the Independent Storage of Spent Nuclear Fuel").



## NUCLEAR WASTE SAFETY

In the third process improvement initiative, the Office of Nuclear Material Safety and Safeguards undertook efforts to improve the manner in which the NRC conducts its decommissioning program. These included improving the process for requests for technical assistance from other NRC offices and implementing the comprehensive decommissioning program approach to managing decommissioning at licensed and unlicensed sites.

**3-3 Prepare for Licensing Review of Potential Yucca Mountain Repository:** The milestone established for FY 2004 was to certify the NRC's documentary material for the purposes of the Licensing Support Network 1 month after the Department of Energy certified its document collection. DOE certified its collection on June 30, 2004, but on August 21, 2004, an Atomic Safety and Licensing Board struck DOE's certification. Nonetheless, the NRC certified its documentary material on July 31, 2004 and thus, met this milestone on time.

### Performance Goal-4: Reduce unnecessary regulatory burden on stakeholders.

Measure	2001	2002	2003	2004
4-1 Complete those specific milestones to reduce unnecessary regulatory burden.	Met	NA	Met	NA

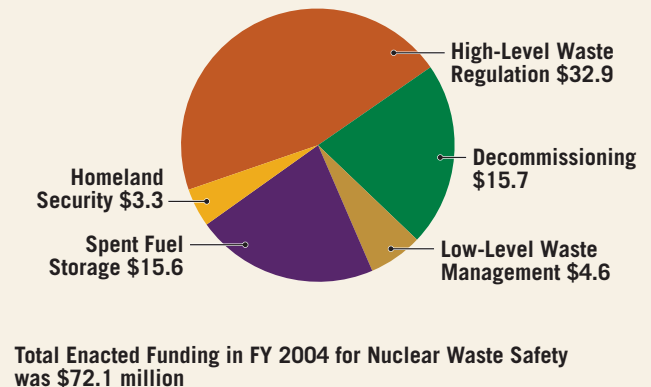
**Results:** The NRC has met the performance goal measure target.

4-1 Reduce Burden: The FY 2004 Performance Plan identified one milestone for this performance goal measure in FY 2004. Specifically, "If an application to adopt Standard Technical Specifications for a specific spent fuel dry storage cask design is received, the NRC will perform an acceptance review. If the application is acceptable, staff will commence its review of the application, to implement the Standard Technical Specifications, if the design is approved." As of September 30, 2004, the NRC had received one applications to adopt a modified version of the Standard Technical Specifications.

### FUNDING FOR ACHIEVING GOALS

The Nuclear Waste Safety budget totaled \$72.1 million in FY 2004. This budget was allocated to five key programs, each of which plays a specific role in protecting the health and safety of the public and the environment from radioactive waste. Most

**BUDGET AUTHORITY BY PROGRAM** in Millions



# PROGRAM PERFORMANCE

of the funding was budgeted for high-level waste regulation and spent fuel storage and transportation. The regulation of decommissioning accounted for about one-quarter of the funding, and low-level waste management and homeland security made up the remainder.

## PROGRAM EVALUATION

The NRC's Strategic Plan did not contain any program evaluations for the Nuclear Waste Safety program in FY 2004. Nonetheless, the NRC continued to evaluate the decommissioning program.

As a follow-up to the FY 2003 program evaluation of the decommissioning process, in FY 2004, the NRC incorporated the Site Decommissioning Management Plan sites into a comprehensive decommissioning program that includes routine decommissioning sites, formerly licensed sites, Site Decommissioning Management Plan sites, non-routine/complex sites, fuel cycle sites, and test/research and power reactors. This comprehensive decommissioning program facilitates the cleanup of routine and complex sites in a manner that is consistent with the goals of the former Site Decommissioning Management Plan and the related Action Plan.

In addition, to address the recommendations from the FY 2003 decommissioning program evaluation, in FY 2004, the NRC drafted an integrated plan to identify activities and schedules. The agency also completed initial follow-on activities associated with its 2003 evaluation of the issues impacting the implementation of Subpart E of 10 CFR Part 20 (the License Termination rule), which included developing a regulatory issues summary to inform licensees and other stakeholders of the License Termination rule analysis and future follow-on activities.

## INTERNATIONAL NUCLEAR SAFETY SUPPORT

***Strategic Goal:*** Support U.S. interests in the safe and secure use of nuclear materials and nuclear nonproliferation.

### OVERVIEW

The International Nuclear Safety Support program encompasses the formulation and implementation of regulatory policy concerning international nuclear safety, import/export licensing for nuclear materials and equipment, treaty implementation, and deterrence of nuclear proliferation. It also encompasses information exchange and safety and safeguards cooperation and assistance. The international activities of the NRC support broad national interests of the United States as well as the domestic mission of the agency.



## INTERNATIONAL NUCLEAR SAFETY SUPPORT

### MAINTAINING A PROGRAM OF INTERNATIONAL COOPERATION

The NRC maintains a program of international cooperation to enhance the safe, secure, and environmentally acceptable civilian uses of nuclear energy both within the United States and throughout the world. This program includes working with international organizations, such as the International Atomic Energy Agency and the Nuclear Energy Agency.

The International Nuclear Safety Support program also encompasses the issuance of import/export licenses. This responsibility includes activities to ensure compliance with statutes, treaties, conventions, and agency agreements for cooperation. It also supports the work of the Agency for International Development as it relates to the countries of Europe and Eurasia.

As the regulator of the world's largest civilian nuclear program, the NRC has extensive regulatory experience to contribute to other nations' programs in such areas as nuclear reactor safety, nuclear safety research, radiation protection, nuclear materials safety and safeguards,<sup>40</sup> nuclear facility and materials security, transportation, waste management, spent fuel storage, and decommissioning of nuclear facilities. In addition, the NRC supports the development and implementation of international regulatory standards, policies, and practices. The NRC, in turn, can learn from the regulatory experiences of other countries. Toward that end, the NRC gains access to non-U.S. safety, security, and safeguards information through interaction with foreign entities, thereby leveraging the agency's resources.

The NRC participated extensively in developing the Code of Conduct for the Safety and Security of Radioactive Sources, which the International Atomic Energy Agency published in its final form in January 2004.

At the 2002 IAEA General Conference, with the strong support of the U.S., a Resolution was passed which endorsed a document entitled "Guidance on the Import and Export of Radioactive Sources." The Resolution also noted that more than 30 countries have made clear their intention to implement effective import and export controls by December, 2005. (Note: For the U.S. Government, NRC has published in the Federal Register a proposed rule which fully meets the intent of the General Conference Resolution.)

NRC staff representatives met with the Russian Federation's Federal Service for Nuclear Oversight (formerly Gosatomnadzor) to discuss strengthening the security and regulatory control of high-risk radioactive sources in Russia.

## PROGRAM PERFORMANCE

NRC staff representatives participated in a conference in Morocco, to discuss activities aimed at implementing the international standards for radiation safety and security of radioactive sources.

The NRC participated in an International Atomic Energy Agency Operational Safety Review Team “premission” to China and an Operational Safety Review Team mission to the Ukraine; a follow-up International Regulatory Review Team mission to Armenia; and a Transport Safety Appraisal Service mission to France.

In March 2004, the International Atomic Energy Agency put in place an international action plan on transportation safety, which will strategically shape international transport and commerce over the next several years. The NRC, in cooperation with the Departments of Transportation, State, and Energy, had a lead role in ensuring that the action plan addressed U.S. interests and objectives. The Expert Group on International Nuclear Liability was also formed as a result of these activities.

In March 2004, NRC staff representatives participated in the 17<sup>th</sup> International Atomic Energy Agency Waste Safety Standards Committee meeting. One of the outcomes of the meeting was the approval of DS161 in August 2004 and is now RS-G-1.7, “Application of the Concepts of Exclusion, Exemption, and Clearance,” and the recommendation to forward RS-G-1.7 for publication, subject to the changes agreed to at the meeting.

As a result of the NRC’s participation in the biennial Nuclear Energy Agency Steering Committee Meetings in 2004, and the leadership roles of the NRC’s senior management in three key technical committees, the NRC staff continued to negotiate the Nuclear Energy Agency’s Strategic Plan to identify possible additions to the plan to foster better resource leveraging, with emphasis on programs that will ultimately benefit the technical work conducted by the United States.



# INTERNATIONAL NUCLEAR SAFETY SUPPORT

## ANNUAL GOALS AND MEASURES

**Strategic Goal-1: Support U.S. interests in the safe and secure use of nuclear materials and nuclear nonproliferation.**

### STRATEGIC GOAL RESULTS

The NRC has established the following three measures to determine whether the agency has met its strategic goal in the International Nuclear Safety Support arena.

Measure	2001	2002	2003	2004
1-1 Fulfill 100 percent of the significant obligations over which the NRC has regulatory authority arising from statutes, treaties, conventions, and Agreements for Cooperation.	100%	100%	100%	100%
1-2 No significant proliferation incidents attributable to some failure of the NRC.	0	0	0	0
1-3 No significant safety or safeguards events that result from the NRC's failure to implement its international commitments.	0	0	0	0

**Results: The NRC has met all of the strategic goal measure targets.**

**1-1. Significant Obligations:** The NRC carried out 100 percent of the significant obligations over which it has regulatory authority arising from statutes, treaties, conventions, and agreements for cooperation<sup>41</sup> during FY 2004. For example, the NRC facilitated the timely processing of all export license applications and provided timely comments to the Executive Branch when consulted on proposed international nuclear agreements and technology transfers. In addition, the staff prepared the U.S. National Report in anticipation of the agency's participation in the Third Review Meeting of the Contracting Parties under the Convention on Nuclear Safety to be held in Vienna, Austria, in April 2005.

The NRC also participates in the development of other international legal framework documents. In November 2003, for example, the NRC participated in the Review Meeting of Contracting Parties to the Joint Convention on the Safety of Spent Fuel Management and Radioactive Waste Management to conduct a peer review of the ratifying parties' national safety programs for management of spent fuel and radioactive waste. Currently, an interagency working group, comprising staff representatives from the NRC, the Department of Energy, and the Environmental Protection Agency, is revising the U.S. National Report, which is due to the International

# PROGRAM PERFORMANCE

Atomic Energy Agency by October 15, 2006. The peer review process proved to be a very valuable experience for participants, who all gained important insights on issues associated with the safety of spent fuel and radioactive waste management.

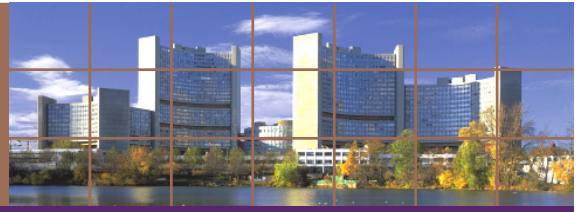
The NRC also participated in defining the International Atomic Energy Agency's Safeguards Additional Protocol and is responsible for ensuring compliance with the U.S.-International Atomic Energy Agency Safeguards Agreement by facilitating licensee inspections by and reporting to the International Atomic Energy Agency. The International Atomic Energy Agency conducted monthly inspections at one licensee's facility, four additional licensees provided monthly reporting of materials accounting data, and all licensees provided monthly reporting of imports and exports of nuclear materials. The NRC's portion of the list of U.S. facilities eligible for International Atomic Energy Agency safeguards has been reviewed and updated to include NRC-licensed facilities that are not of direct national security significance. The NRC also initiated discussions regarding the commitments for International Atomic Energy Agency safeguards at centrifuge enrichment plants.

**1-2. Proliferation:** The NRC achieved its second performance measure in FY 2004. Reports by the U.S. Government, the International Atomic Energy Agency, and other authoritative international organizations did not attribute any significant proliferation incidents<sup>42</sup> to any failure by the NRC.

**1-3. Safety or Safeguards Events and Support:** In FY 2004, no significant safety or safeguards events resulted from any failure by the NRC to implement its international commitments. As a result of extensive NRC cooperation and planning with the Department of Energy, on October 1, 2003, the upgraded Nuclear Materials Management and Safeguards System (the national tracking database) was officially implemented. In order to meet U.S. Government commitments to foreign governments as established in peaceful nuclear cooperation agreements, the upgrades included incorporating an improved "Obligations Tracking" mechanism and replacing the outdated country control number format that had been used from 1980 through September 20, 2003. The country control number method needed to be replaced because it was too rigid to accommodate multiple foreign country obligations on a single item or to accommodate portions of material quantities with foreign obligations. In addition, to obtain feedback, resolve issues, and provide guidance regarding the upgrade, the NRC sponsored a special workshop on January 13, 2004, for sponsors and facilities affected by the new reporting format for obligations tracking. The transition to the upgraded system has effectively been accomplished.

The NRC was also instrumental in ensuring that the International Atomic Energy Agency's safeguards implementation goals were achieved at the NRC-licensed highly enriched uranium





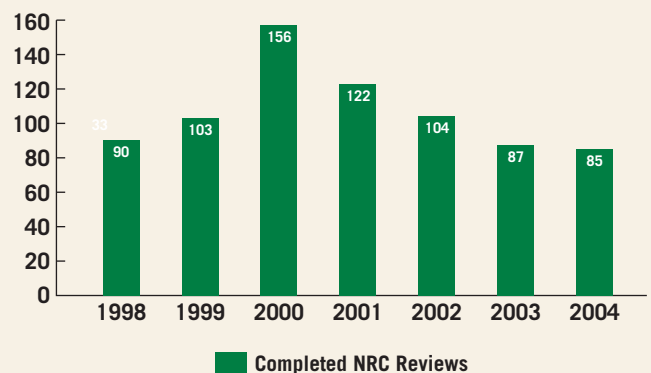
## INTERNATIONAL NUCLEAR SAFETY SUPPORT

downblending facility in Lynchburg, Virginia. Effective interactions between the NRC, the facility operator, and the International Atomic Energy Agency resulted in the timely upgrading, repair, and maintenance of International Atomic Energy Agency safeguards equipment and effective verification of nuclear material downblending activities. The NRC supported the Executive Branch in preparing the Additional Protocol and its implementing legislation for submittal for Senate approval. The NRC also participated in preparing documents for submittal to the Senate, meetings with Senate Foreign Relations Committee staff, and Senate hearings. The Senate provided its approval to ratify the treaty on March 30, 2004, and rule changes required for implementing the Additional Protocol at licensee facilities are currently undergoing NRC approval. Completion of the rulemaking awaits Office of Management and Budget approval of the joint NRC-Department of Commerce reporting forms.

The NRC supported bilateral meetings addressing international safeguards policy and technical implementation issues with Japan, the Republic of Korea, Australia, Argentina, Brazil, Germany, France, the United Kingdom, the European Atomic Energy Community, and the International Atomic Energy Agency. In addition, the NRC participated in meetings to evaluate the compliance of key elements of the international safeguards approach for the Rokkasho Reprocessing Plant with the criteria contained in the U.S.-Japan Nuclear Cooperation Agreement.

During FY 2004, the NRC approved several significant export licenses, including licenses authorizing the export of byproduct materials to India (a restricted destination) and two license amendments authorizing the export of highly-enriched uranium for use as target material for medical isotope production. In addition, the NRC approved the export of plutonium to France for use in fabricating four mixed-oxide fuel lead test assemblies, which will ultimately be returned to the United States for irradiation testing in the Catawba nuclear power reactor. The use of these lead test assemblies in a commercial nuclear power reactor will facilitate NRC licensing of commercial-scale mixed-oxide fuel use in the United States. These activities are important to support timely and cost-effective implementation of the U.S.-Russia Agreement on plutonium disposition. As of September 30, 2004, the NRC completed 85 import/export licensing actions undertaken this year within the 60-day processing deadline.

**NRC EXPORT/LICENSING ACTIONS COMPLETED**



# PROGRAM PERFORMANCE

During FY 2004, the NRC successfully concluded five bilateral exchange agreements between the Commission and appropriate foreign counterparts to ensure that an effective framework exists for the agency's international exchanges in FY 2004 and beyond. This effort included renewing the NRC's protocol for exchange of technical information and cooperation in nuclear safety matters with the Chinese National Nuclear Safety Administration as well as the NRC's administrative arrangement for the exchange of classified information with the Canadian Nuclear Safety Commission, both for 5-year periods. Additionally, the NRC developed a new regime for sharing sensitive NRC information with certain foreign government entities.

## FUNDING FOR ACHIEVING GOALS

The International Nuclear Safety Support budget totaled \$5.9 million in FY 2004.

## PROGRAM EVALUATION

The NRC's Strategic Plan did not identify any program evaluations for International Nuclear Safety Support in FY 2004.

## ADDRESSING THE PRESIDENT'S MANAGEMENT AGENDA

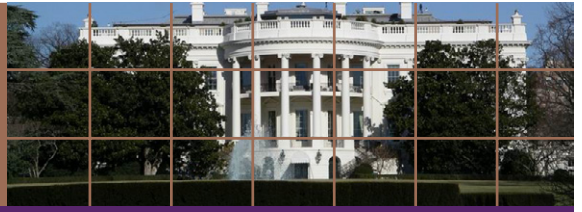
### OVERVIEW

The President's Management Agenda prescribed Governmentwide initiatives to reform the United States Government to be more citizen-centered, results-oriented, and market-based, and to actively promote competition rather than stifling innovation. Toward that end, the President 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, and the following five sections discuss our FY 2004 accomplishments in each of the five areas, respectively.

### STRATEGIC MANAGEMENT OF HUMAN CAPITAL

#### *Strategic Alignment*

In FY 2004, the NRC updated its 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 Strategic Plan for FY 2004–FY 2009 and with the agency's action plans for recruitment, training and development, and diversity management. In accordance



## ADDRESSING THE PRESIDENT'S MANAGEMENT AGENDA

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 NRC offices completed changes to their organizational structures that led to improvements in operations. These changes included realignment of functions, reductions in span of control, and elimination of unnecessary layers of management.

Over the past 3 years, the NRC has used a systematic strategic workforce planning process to make significant improvements in the agency's strategic workforce planning methodology and automated system. This approach has resulted in a variety of accomplishments, as described in the following paragraphs.

The strategic workforce planning workgroup conducted briefings for managers and supervisors to share results from responses to the annual strategic workforce planning survey. These briefings featured agencywide best practices, accomplishments, critical skills needs and gap closure strategies and trends, among other topics.

More than 80 percent of the NRC's supervisors, managers, and employees used the automated strategic workforce planning system to identify critical skills and indicate their respective levels of expertise. Based on their input, the strategic workforce planning workgroup has created standard and ad hoc reports to display the data in a user-friendly format. One regional office developed a human capital management program to provide an effective workforce tool for managers and supervisors, and to communicate activities and plans for workforce planning and for other supervisory activities. The resultant plan is available to staff, managers, and supervisors on the agency's internal Web site.

The strategic workforce planning workgroup continues to evaluate end user information to upgrade the strategic workforce planning system. In order to increase communication with the offices as they work together to address critical skill gaps, the workgroup adopted a number of suggestions, including a new supervisor evaluation feedback sheet and a gap analysis tracking form linked to the strategic workforce planning Web page. The workgroup expects these changes to increase its communication with the offices as they work together to address critical skills gaps.

Notably, the Web site sponsored by the Office of Personnel Management mentions the NRC's strategic workforce planning process and the related automated system. As a result, the NRC has received numerous requests for information and has demonstrated its strategic workforce

# PROGRAM PERFORMANCE

planning system and methodology to a variety of Federal agencies. This year, for example, the NRC assisted the Library of Congress staff in customizing our strategic workforce planning system for their own future use, and the Commodity Futures Trading Commission has plans to do the same.

## *Talent*

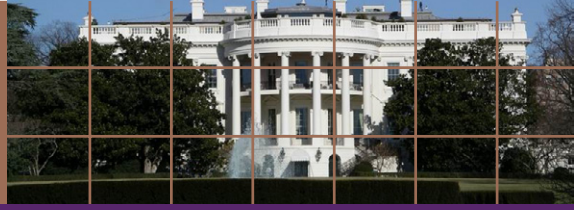
Through a valuable partnership between the program offices and the Office of Human Resources, the NRC continues to take advantage of a wide variety of human capital strategies to address identified critical skill gaps and to meet and/or exceed the agency's human capital goals. These strategies include recruitment and retention incentives, the Cooperative Education Program, the Honor Law Graduate Program, the Graduate Fellowship Program, the Summer Employment Program, rotational assignments, 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. The NRC's attrition rate of 6 percent, which includes external losses (other than retirements) of 1.5 percent, is among the lowest attrition rates in the Federal Government according to a recent report issued by the American University's Institute for the Study of Public Policy Implementation.

The NRC offers a wide range of flexible work options and employee-friendly programs and policies designed to make the NRC a workplace of choice and to enhance organizational effectiveness. These programs include flexible workplace options, adjustable work schedules, health and fitness centers, employee assistance, and child care tuition assistance, among others.

Results from the NRC's annual strategic workforce planning needs survey revealed that recruitment and training/development are the strategies that the agency's various offices most commonly use to address human capital challenges and ensure that the staff has the skills needed to fulfill the agency's mission. Sufficient training courses were scheduled to address identified needs. As a result, the NRC participated in more than 60 recruitment events to recruit diverse and highly qualified individuals for the agency's mission-critical occupations.

## *Leadership and Knowledge Management*

The NRC provides technical and professional training based on results from an annual training needs survey to support the agency's formal qualification and development programs and to enhance the technical and professional competencies needed to carry out the agency's activities. The NRC also uses knowledge management and succession planning strategies to close identified critical skill gaps and to ensure continuity of leadership.



## ADDRESSING THE PRESIDENT'S MANAGEMENT AGENDA

Towards that end, the NRC has made substantial progress in implementing a variety of initiatives and tools to create a knowledge-sharing culture. This year, the NRC included knowledge management as part of its annual strategic workforce planning and training needs survey to facilitate the collection of knowledge management information.

The NRC established a knowledge management Web page, which will serve as a focal point for sharing information concerning knowledge management and the various innovative methods being used both within and outside of the NRC to capture and transfer critical knowledge among employees and stakeholders. As the agency's knowledge management efforts evolve, this Web page will also serve as a portal to link together the NRC's various knowledge communities.

The NRC continues to offer leadership competency development programs, such as the Senior Executive Service Candidate Development Program and the Leadership Potential Program. These programs comprise a critical aspect of the NRC's succession and leadership development strategies to ensure that leaders are ready to assume future mid-level and senior-level leadership positions throughout the agency. Notably, the agency has successfully placed 91 percent of 2003 Senior Executive Service Candidate Development Program graduates in Senior Executive Service positions and 67 percent of 2002 Leadership Potential Program graduates in supervisory or leadership positions. Currently, the agency has 25 individuals participating in the 2003 Leadership Potential Program and has selected 31 individuals to participate in the 2004 Senior Executive Service Candidate Development Program.

### *Performance Culture*

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 accomplishments with the agency's Strategic Plan, Performance Budget, and office operating plans. The expected outcome is to receive certification by the Office of Personnel Management and the Office of Management and Budget that the NRC's system makes meaningful distinctions between the performance of various executives.

In addition, the NRC has a performance management program, which includes agency-level and Governmentwide recognition for high performers at all levels, from Presidential Rank Awards for Senior Executive Service managers to monetary and non-monetary, and recognition awards for other employees.

# PROGRAM PERFORMANCE

## *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 5-year period. The analysis includes workforce size and composition, hires, attrition, rotational assignments, performance appraisals, and awards. These statistics are shared throughout the agency.

The NRC's Executive Resources Board provides institutional continuity in executive succession planning and personnel management by overseeing the NRC's Senior Executive and Senior Level System merit staffing. The Board also provides oversight and coordination of all agency work related to the President's Management Agenda.

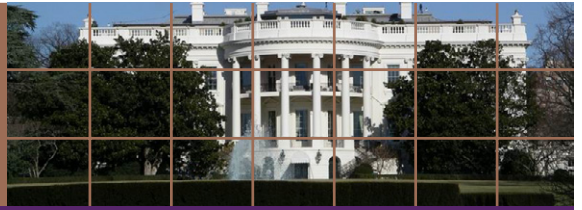
## **BUDGET AND PERFORMANCE INTEGRATION**

The NRC continues to make progress in achieving budget and performance integration in accordance with the President's Management Agenda. This progress includes identifying new outcome-based performance measures aligned with the agency's Strategic Plan for FY 2004–FY 2009, 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 2004, as discussed in the following paragraphs.

### *Integrating Planning and Budgeting*

The NRC's Planning, Budgeting, and Performance Management process is the fundamental framework for the agency's planning and budgeting activities. This process establishes plans that define clear goals to be accomplished and tracks progress throughout the year to ensure that the NRC achieves the desired results. The process also links the NRC's various budget accounts to the associated goals to identify clearly the budgetary resources that are devoted to each goal.

The NRC continued developing management directives that define the roles and responsibilities of offices and individuals involved in the NRC Planning, Budgeting and Performance Management (PBPM) process. These directives will provide guidance to agency employees on planning, budgeting, and performance management. The NRC expects to complete and implement these management directives in FY 2005.



## ADDRESSING THE PRESIDENT'S MANAGEMENT AGENDA

### *Full Budgetary Cost*

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 Nuclear Materials Users Licensing and Inspection program was evaluated using the Program Assessment Rating Tool promulgated by the Office of Management and Budget. The program was rated effective, which is the highest rating possible. This experience yielded valuable insights for future reviews and evaluations of NRC programs. The NRC has also modified the agency's performance appraisal system for senior executives to improve alignment accountability for performance with achieving organizational objectives. During FY 2004, the NRC established a schedule for Program Assessment Rating Tool reviews and supporting program evaluations through FY 2007.

## COMPETITIVE SOURCING

One of the NRC's corporate management strategies is to acquire goods and services in an efficient manner. Toward that end, the NRC has 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 Internet.

In the area of competitive sourcing, the NRC submitted the FY 2003 Federal Activities Inventory Reform Act Inventory to the Office of Management and Budget in June 2003, and received approval from the Office of Management and Budget on May 28, 2004. That inventory identifies 269 commercial activity full-time equivalents, which are available for public-private competition. It was published on the NRC external web site on June 10, 2004. One challenge to the 2003 commercial inventory was received. The NRC rendered its initial decision denying the challenge on August 13, 2004. The FY 2004 Federal Activities Inventory Reform Act Inventory was submitted to Office of Management and Budget on June 30, 2004.

# PROGRAM PERFORMANCE

The NRC revised the Competitive Sourcing Plan based on guidance issued by Office of Management and Budget in July 2003. The NRC subsequently submitted a revised Competitive Sourcing Plan to OMB on December 15, 2003. The NRC will conduct three business case analyses during each fiscal year to determine whether the selected commercial activities are appropriate for public-private competition based on a review of factors outlined in the NRC's Competitive Sourcing Plan. Specific factors include the potential for performance improvement and cost savings, severability of the work from core agency functions, and human capital management. Four Business Case Analyses covering 18 Full-Time Equivalents are planned for completion in FY 2004. If any of the business case analyses conclude that a public-private competition is warranted, the resultant competition will commence in early FY 2005.

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 the target of 30 percent for eligible service contracting dollars expended through performance-based contracting.

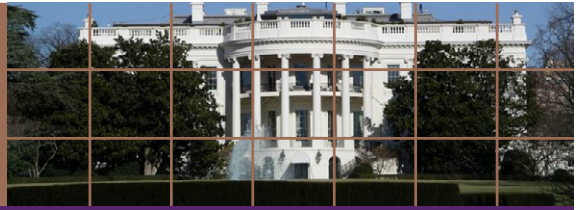
The NRC continues to post on the Governmentwide point-of-entry Web site all required synopses and solicitations for acquisitions valued at more than \$25,000.

## EXPANDED ELECTRONIC GOVERNMENT

The NRC actively pursues implementation of expanded electronic government. The NRC has made important strides in utilizing electronic and technological solutions to provide high-quality services to citizens while reducing the cost of delivering those services.

The NRC has evaluated, or is currently participating in 15 of the 25 electronic government initiatives promulgated by Office of Management and Budget. The agency is making substantial progress toward integrating its processes associated with Capital Planning and Investment Control, the Federal Information Security Management Act, and Enterprise Architecture. The NRC has increased the focus on information technology system performance measurement and tracking. The NRC has conducted an "E-Gov gap analysis" to address electronic government requirements and compliance with several related legislative initiatives, such as the Government Paperwork Elimination Act, the Federal E-Gov Strategy, and the Federal Enterprise Architecture.





## ADDRESSING THE PRESIDENT'S MANAGEMENT AGENDA

The NRC emphasizes requirements and benefits of electronic government to key staff and managers. Toward that end, the agency has held a series of briefings and discussions with agency personnel to communicate the value of E-Gov initiatives. The NRC has evaluated the alignment of key electronic government requirements with the agency's mission, budget, and architecture; security compliance; interagency coordination; Web applications and information compliance; and Capital Planning and Investment Control compliance for information technology. The NRC has designed a guidance, oversight, and status reporting structure for related activities in order to monitor the agency's progress in furthering the use of electronic government.

### *E-Gov Initiatives*

The NRC completed an examination of agency involvement in individual Presidential Priority Initiatives. At the end of FY 2003, the NRC was participating in 13 such initiatives. Today, we are evaluating, or participating in 15 of the 25 initiatives. The NRC has consistently fulfilled individual project requests related to the Presidential Priority Initiatives and has demonstrated exemplary performance with regard to the payroll consolidation initiative. The NRC has Memoranda of Understanding in place for six initiatives (including Integrated Acquisition Environment, E-Clearance, E-Payroll, E-Travel, E-Training, and Business Gateway) and is currently implementing or reviewing proposed agreements for three additional initiatives (including USA Services, Recruitment-One-Stop, and E-Records Management). Notably, the Inspector General has acknowledged the results of the NRC's payroll consolidation, through which the agency realized a one-time savings of \$1.2 million, and a recurring savings of approximately \$1.0 million. The NRC was the first Federal agency to transfer production payroll operations under the Presidential Priority Initiatives program.

The NRC's communications with the public (particularly with regard to information concerning agency policies and new initiatives) are supported through periodic meetings with stakeholders as well as the agency's public Web site. The NRC has an Agencywide Documents Access and Management System (ADAMS) Users Group, which consists of members of the public who meet twice a year. This forum provides an opportunity to discuss and inform enhancements to ADAMS, which provides public access to all of the agency's publicly available documents. The NRC offers two access paths to ADAMS through the agency's public Web site and via dial-in service.

### *Capital Planning and Investment Control*

In January 2004, the NRC issued a revision of Management Directive 2.2, which documents the NRC's Capital Planning and Investment Control process. Specifically, that revision streamlined the Capital Planning and Investment Control process for information technology

# PROGRAM PERFORMANCE

investments utilizing three tiers based on the level of management control and oversight that each investment requires. In accordance with that process, the NRC's major information technology systems now have a business case, and the NRC has validated those business cases against new criteria (Exhibit 300) required by Office of Management and Budget. The NRC will continue to review and adopt OMB guidance in this area, implement necessary changes to the agency's Capital Planning and Investment Control process, and update Management Directive 2.2 as necessary.

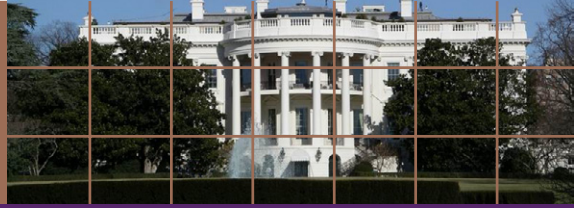
## *Enterprise Architecture*

The NRC has made progress in embracing Enterprise Architecture. The agency refined its Enterprise Architecture activities to reflect Office of Management and Budget guidance and to align related activities with the new Federal Enterprise Architecture. The NRC established an output measure associated with the percentage of Agency Enterprise Architecture data that is aligned with the Office of Management and Budget guidance. The NRC implemented and began populating an automated Enterprise Architecture tool to capture and document the agency's Enterprise Architecture and to identify patterns to aid in decisions concerning information technology investments. The agency specifically designed this tool to provide the necessary reports to facilitate the Capital Planning and Investment Control process, involvement of the Environmental Configuration Control Board, preparation of Office of Management and Budget Exhibit 300 reports, and other processes used for investment planning and decision-making related to information technology.

The NRC moved beyond strengthening the integration of Enterprise Architecture with Capital Planning and Investment Control to develop an integrated policy and streamlined process to link information technology investment decisions to the agency's mission more effectively. The NRC developed Enterprise Architecture strategy documents, including an Enterprise Architecture Revitalization Plan to facilitate Enterprise Architecture progress. In addition, the NRC conducted an Enterprise Architecture Readiness Assessment to validate the agency's Enterprise Architecture strategy and better focus our Enterprise Architecture efforts. The NRC also made significant progress toward completing our integrated Enterprise Architecture, Capital Planning and Investment Control, systems development life cycle, and security integrated policy and processes.

## *Federal Information Security Management Act*

In FY 2004, the NRC continued to maintain compliance with the Federal Information Security Management Act. The agency's major operational applications and general support systems



## ADDRESSING THE PRESIDENT'S MANAGEMENT AGENDA

meet the requirements of Management Directive 12.5, "NRC Automated Information Systems Program," including a system security plan, contingency plan, certification, and accreditation. The NRC has increased efforts to conduct independent review, testing, and evaluation of major system security plans. Among all Government agencies, the NRC's compliance with the requirements of the FY 2003 Federal Information Security Management Act resulted in the only grade of "A" issued by the House Committee on Government Reform's Subcommittee on Technology, Information Policy, Intergovernmental Relations, and the Census.

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 established an information technology security Web page, providing information that agency employees need to facilitate 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. The corrective action plan established under the Federal Information Security Management Act is the primary mechanism that senior agency officials use in managing the agencywide automated information systems security program. The NRC provides the required quarterly reports to Office of Management and Budget.

During FY 2004, the NRC maintained the effectiveness of the information security program for properly handling, distributing, accounting for, and providing licensee access to classified and sensitive information. The agency completed significant enhancements to our secure communications capabilities. In addition, the NRC made significant enhancements to response facilities at headquarters and in the regions, including upgrades to an alternative continuity of operations site and to the display and data subsystems in the headquarters Operations Center.

### ***Government Paperwork Elimination Act (GPEA)***

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, 2004. 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.

# PROGRAM PERFORMANCE

## *Citizen One-Stop Access to the NRC*

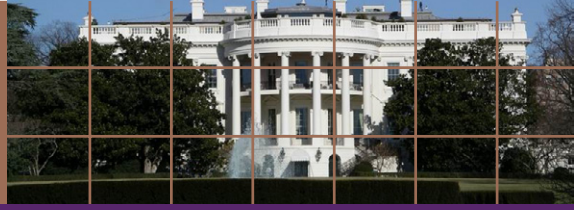
The most important enhancement to the NRC's public Web site in FY 2004 was the addition of a new content area entitled "Hearing Opportunities and License Applications," which provides current information concerning the agency's receipt of major applications or notices of intent to file major applications, as well as current opportunities to request hearings and petition to intervene for major licensing and regulatory actions. A second major enhancement was the addition of "For the Record," which is a new document collection established to publish the NRC's responses to information concerning controversial issues or to significant media reports that could be misleading. The NRC will also use this document collection to respond more efficiently to large write-in campaigns. The NRC added an additional document collection, entitled "Commission Policy Statements," which includes all statements dating back to 1965. In addition, the NRC added significant information concerning "Emergency Preparedness," which became a "Key Topic" on the NRC's home page. Key Topics are used to feature subjects with high public interest.

## *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 and loaded directly into the agency's information systems. Electronic information exchange plays a major role in enabling the NRC to meet the Government Paperwork Elimination Act requirement to allow the public the option of transacting business with the agency electronically.

The NRC continues to utilize the Electronic Hearing Docket, which allows electronic filings through electronic information exchange. The Electronic Hearing Docket is the NRC's official hearing docket for the Department of Energy's anticipated application for a license to construct a high-level waste repository at Yucca Mountain, Nevada. The Electronic Hearing Docket meets the requirements of Title 10, Section 2.1.1013, of the *Code of Federal Regulations* (10 CFR 2.1.1013), as they relate to receiving electronic filings from parties to the high-level waste proceedings.

The NRC provides shared document discovery and facilitates electronic motions practice for the adjudicatory hearing concerning the Department of Energy's anticipated license application for a high-level waste repository at Yucca Mountain using the Licensing Support Network. The Licensing Support Network is intended to benefit the repository licensing proceedings by making



## ADDRESSING THE PRESIDENT'S MANAGEMENT AGENDA

all parties' relevant documents publicly accessible before docketing, ultimately providing the parties significant information regarding the proposed repository and enables them to provide information to the electronic and publicly accessible docket through a fully electronic filing process. The NRC and the Nevada Counties of White Pine and Lincoln have begun to make their relevant materials available through this system.

### *Productivity Improvements*

Beginning in FY 2004, the NRC established an output measure to monitor technical assessments of new information technologies in order to demonstrate productivity improvements in business processes across the agency.

The NRC completed the first phase and is well into the second phase of a major redesign of the NRC's internal Web site. This project is contributing significantly to improving the efficiency and effectiveness with which the NRC staff can access the information they need to do their jobs, obtain the services they need, and develop their knowledge and skills. By improving the dissemination of announcements and news, the internal Web site is also improving communications with the agency.

## IMPROVED FINANCIAL PERFORMANCE

### *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 outside the agency. The remaining internally maintained and managed financial systems are periodically reviewed for opportunities to improve performance, interface with other systems, and/or be cross-serviced. Our current systems satisfy operational and reporting requirements and provide timely, accurate, and useful information to agency managers. The NRC's systems are in substantial compliance with Federal laws and regulations, except for the Fee Billing System.

In support of the E-Gov initiative, the NRC successfully transferred the payroll and human resources systems from internally maintained and managed systems to the Federal Payroll Processing System, which is provided through a cross-service arrangement with the National Business Center of the Department of the Interior. The NRC initiated a related project to evaluate a long-term solution for reporting time and labor data.

# PROGRAM PERFORMANCE

An NRC initiative improved the operational efficiency of the agency's cost accounting system by significantly reducing processing time. Specifically, the cost accounting system provides agency managers periodic reports that reflect cost information at various activity levels used in preparing the statement of net costs for the agency's annual financial statements.

The NRC initiated a two-phased project to consolidate, improve, modernize, and migrate the agency's license fee bill generator system to a single, contemporary information technology environment. Phase One, which consists of a requirements analysis, will be completed in FY 2005. Phase Two, which is scheduled to begin late in FY 2005, will involve implementing the recommendations that evolve from Phase One.

### *Accurate and Timely Financial Information*

The NRC received an unqualified opinion on the FY 2004 financial statements, and the FY 2003 Performance and Accountability Report earned the agency a Certificate of Excellence in Accountability Reporting from the Association of Government Accountants.

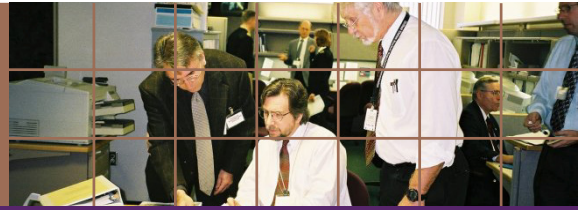
### *Integrated Financial and Performance Management Systems for Day-to-Day Operations*

The NRC has achieved a high level of financial systems integration, which supports the agency's day-to-day operations. Toward that end, core accounting is interfaced with the cost accounting, human resources management, 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 ratios and performance data.

### *Annual Financial Statements and Internal Controls*

The NRC received an unqualified audit opinion on the agency's financial statements in FY 2004. 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.

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 also developed an internal controls training program, which was provided to more than 200 NRC executives, managers, and financial management staff throughout FY 2003 and FY 2004.



## DATA SOURCES AND QUALITY

The NRC 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 largely driven 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, transportation and 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), which is available on the agency's public Web site at [www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr0090/v25](http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr0090/v25).

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, all 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.

# PROGRAM PERFORMANCE

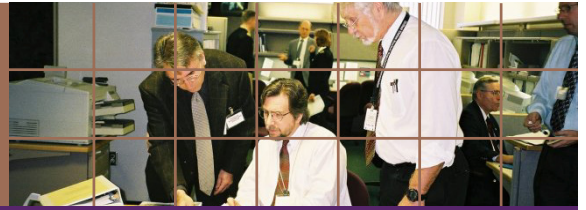
The NRC also has established procedures for the systematic review and evaluation of events reported by NRC and Agreement State licensees. The objective of the review is to identify events that are significant from the standpoint of public health and safety based on criteria that include specific thresholds. The NRC uses a number of sources to determine the reliability and technical accuracy of event information reported to the agency. Such sources include periodic inspections of licensees and reviews of Agreement States. In addition, daily interaction and exchange of event information occurs between the NRC's headquarters and regional offices, and periodic conference calls are placed between headquarters, the regional offices, and Agreement States to discuss event information. Events identified as meeting the abnormal occurrence criteria are validated and verified by all applicable 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 is 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 11, 2003. Through that assessment, the Office of the Inspector General found that the NRC has increased the overall level of security for its information systems by successfully completing all required system security documentation as well as all requirements of the Act concerning the security certification and accreditation of all NRC information systems.





## DATA SOURCES AND QUALITY

### IMPROVEMENTS IN PERFORMANCE DATA

The NRC analyzed the data verification procedures for all of the agency's performance measures during FY 2004. This analysis consisted of an evaluation of all data collection, analysis, and reporting procedures for completeness, accuracy, consistency, 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 and metrics is provided in the agency's Performance Budget for Fiscal Year 2005 (NUREG-1100, Vol. 20), which the Commission submitted to Congress in February 2004. The Performance Budget is also available on the NRC's public Web site at [www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1100/](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 also makes performance data accessible to citizens through our the public Web site. For example, a citizen who wanted to verify and/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), which is accessible through our public Web site at [www.nrc.gov/reading-rm/adams.html](http://www.nrc.gov/reading-rm/adams.html), by searching for "licensee event report."

# PROGRAM PERFORMANCE



