

1997
Annual Report

United States
Nuclear Regulatory Commission



December 31, 1998

The President
The White House
Washington, DC 20500



Dear Mr. President

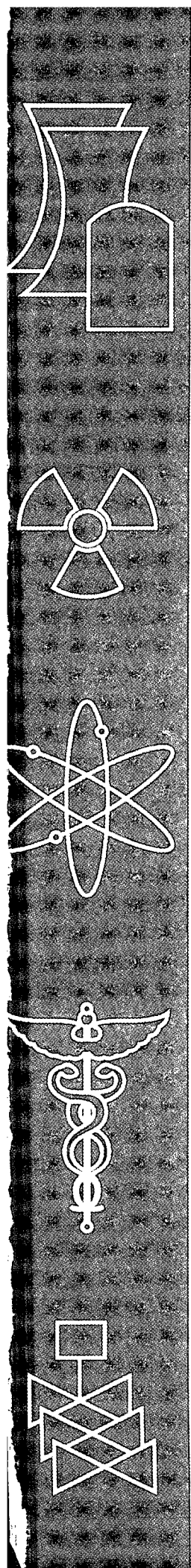
This Annual Report for 1997 of the United States Nuclear Regulatory Commission is enclosed for your transmittal to the Congress, as required by Section 307(c) of the Energy Reorganization Act of 1974.

The report is devoted mainly to activities that occurred in fiscal year 1997. Significant events after that period are included as warranted.

Respectfully,

A handwritten signature in cursive script, reading "Shirley Ann Jackson".

Shirley Ann Jackson,
Chairman



1997

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United States
Nuclear Regulatory Commission



PREVIOUS REPORTS IN THIS SERIES

1975 NRC Annual Report, published April 1976
1976 NRC Annual Report, published April 1977
NUREG-0400, *1977 NRC Annual Report*, published April 1978
NUREG-0516, *1978 NRC Annual Report*, published February 1979
NUREG-0690, *1979 NRC Annual Report*, published March 1980
NUREG-0774, *1980 NRC Annual Report*, published June 1981
NUREG-0920, *1981 NRC Annual Report*, published June 1982
NUREG-0998, *1982 NRC Annual Report*, published June 1983
NUREG-1090, *1983 NRC Annual Report*, published June 1984
NUREG-1145, Vol. 1, *1984 NRC Annual Report*, published June 1985
NUREG-1145, Vol. 2, *1985 NRC Annual Report*, published June 1986
NUREG-1145, Vol. 3, *1986 NRC Annual Report*, published June 1987
NUREG-1145, Vol. 4, *1987 NRC Annual Report*, published July 1988
NUREG-1145, Vol. 5, *1988 NRC Annual Report*, published July 1989
NUREG-1145, Vol. 6, *1989 NRC Annual Report*, published July 1990
NUREG-1145, Vol. 7, *1990 NRC Annual Report*, published July 1991
NUREG-1145, Vol. 8, *1991 NRC Annual Report*, published July 1992
NUREG-1145, Vol. 9, *1992 NRC Annual Report*, published July 1993
NUREG-1145, Vol. 10, *1993 NRC Annual Report*, published August 1994
NUREG-1145, Vol. 11, *1994 NRC Annual Report*, published June 1995
NUREG-1145, Vol. 12, *1995 NRC Annual Report*, published August 1996
NUREG-1145, Vol. 13, *1996 NRC Annual Report*, published September 1997

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NRC Periodic Reports to the Congress

Section 251 Atomic Energy Act of 1954 42 U.S.C. 2016

The Commission shall submit to the Congress, in January of each year, a report concerning the activities of the Commission. The Commission shall include in such report, and shall at such other times as it deems desirable submit to the Congress, such recommendations for additional legislation as the Commission deems necessary or desirable.

Section 303 Public Law 96–295, NRC Authorization Act for FY 1980 (approved June 30, 1980)

The Nuclear Regulatory Commission shall include in its annual report to Congress under section 251 of the Atomic Energy Act of 1954 a statement of—

- (1) the direct and indirect costs to the Commission for the issuance of any license or permit and for the inspection of any facility, and
- (2) the fees paid to the Commission for the issuance of any license or permit and for the inspection of any facility.

Section 602(a) and (b) Nuclear Nonproliferation Act of 1978 22 U.S.C. 3282(a) and (b)

(a) The annual report to the Congress by the Commission and the Department of Energy which are otherwise required by law shall also include views and recommendations regarding the policies and actions of the United States to prevent proliferation which are the statutory responsibility of those agencies....

(b) The reporting requirements of this title are in addition to and not in lieu of any other reporting requirements under applicable law.

Section 307(c) Energy Reorganization Act of 1974 42 U.S.C. 5877(c)

The Commission shall, as soon as practicable after the end of each fiscal year, make a report to the President for submission to the Congress on the activities of the Commission during the preceding fiscal year. Such report shall include a clear statement of the short-range and long-range goals, priorities, and plans of the Commission as they relate to the benefits, costs, and risks of commercial nuclear power. Such report shall also include a clear description of the Commission's activities and findings in the following areas—

- (1) insuring the safe design of nuclear power plants and other licensed facilities;
- (2) investigating abnormal occurrences and defects in nuclear power plants and other licensed facilities;
- (3) safeguarding special nuclear materials at all stages of the nuclear fuel cycle;
- (4) investigating suspected, attempted, or actual thefts of special nuclear materials in the licensed sector and developing contingency plans for dealing with such incidents;
- (5) insuring the safe, permanent disposal of high-level radioactive wastes through the licensing of nuclear activities and facilities;
- (6) protecting the public against the hazards of low-level radioactive emissions from licensed nuclear activities and facilities.

Section 205(f) Energy Reorganization Act of 1974

42 U.S.C. 5845 (f)

The Commission shall develop a long-term plan for projects for the developing of new or improved safety systems for nuclear powerplants.*

*Note that section 205 does not state that this plan is subject to annual update or submission to the Congress.

Section 210 Energy Reorganization Act of 1974

42 U.S.C. 5850

The Commission shall develop a plan for providing for the specification and analysis of unresolved safety issues relating to nuclear reactors and shall take such action as may be necessary to implement corrective measures with

respect to such issues. Such plans shall be submitted to the Congress on or before January 1, 1978, and progress reports shall be included in the annual report of the Commission thereafter.

Section 170p.(2), Atomic Energy Act of 1954

42 U.S.C. 2210(p)(2)

Not later than April 1 of each year, the Commission and the Secretary shall each submit an annual report to the Congress setting forth the activities under this section during the preceding calendar year.*

*Note that under section 170p.(1) there are also due to the Congress by August 1, 1998, reports from the Commission and the Secretary of Energy concerning the need for continuation or modification of the revisions of section 170, but there is no provision for updating those reports at a later date.

Introduction

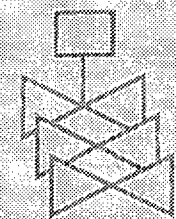
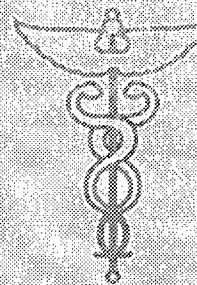
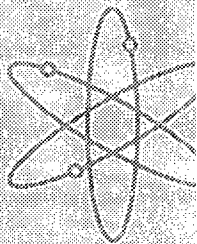
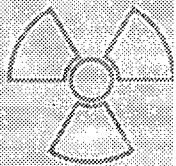
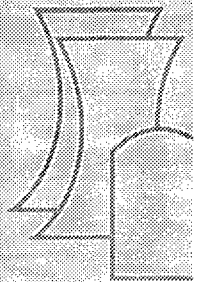
This 23rd annual report of the U.S. Nuclear Regulatory Commission (NRC) describes program activities that contributed to achieving NRC's performance goals from October 1, 1996, through September 30, 1997—Fiscal Year (FY) 1997. Significant activities or organizational changes occurring in FY 1998 are included in this report. This publication satisfies the congressionally mandated reporting requirements listed on pages vii and viii.

The NRC, an independent agency, was created by the Energy Reorganization Act of 1974. In accordance with this act, the President appoints five Commissioners, by and with the advice of the Senate, and designates the Chairman of the Commission from among these Commissioners.

The mission of the NRC is to ensure that nonmilitary uses of nuclear materials in the United States are carried out with proper regard for the protection of public health and safety. NRC accomplishes its mission through—

- licensing the construction, operation, and decommissioning of commercial nuclear reactors, nuclear test and research reactors, nuclear fuel cycle facilities, and uranium enrichment facilities;
- licensing the possession, use, processing, and exporting of nuclear materials, including certain aspects of transporting and disposing of nuclear materials and wastes;
- licensing the siting, design, construction, operation, and closure of low-level radioactive waste disposal sites and a geologic repository for high-level radioactive waste;
- safeguarding nuclear materials and facilities from theft, damage, and sabotage;
- supporting U.S. national interests in the safe use and nonproliferation of nuclear materials; and
- conducting inspections and developing and enforcing regulations governing these activities.

The NRC has established its regulatory requirements, in both reactor and materials applications, to ensure that “no undue risk to public health and safety” results from licensed uses of radioactive materials and facilities specified in the Atomic Energy Act. The objective of these requirements has always been to ensure that the probabilities of accidents with the potential for adversely affecting public health and safety are low. For reactors, these probabilities were first quantified in a systematic way in 1975. For nonreactor activities, this quantification is still evolving.



The NRC continued to improve its regulatory framework in FY 1997 by moving to risk-informed, performance-based regulation. Briefly, a regulation that is risk-informed answers three questions: (1) What can go wrong?, (2) How likely is it?, and (3) What are the consequences?. A risk-informed approach to regulatory decision making represents a philosophy whereby risk insights are considered together with other factors to establish requirements that better focus licensee and regulatory attention on design and operational issues commensurate with their importance to health and safety. Briefly, a risk-informed regulation can either prescribe activities to ensure safe operations or be based on the actual performance (outcome) of an operation. Prescriptive requirements specify particular features, actions, or programmatic elements to be included in the design or process to achieve a desired objective. Performance-based requirements rely on measurable outcomes or results, which provide the licensee more flexibility as to how to achieve the desired outcome.

The NRC applied in FY 1997 and continues to apply a risk-informed, performance-based approach to its rulemaking, licensing, inspection, assessment, enforcement, and other decision making to achieve the goals established in its strategic planning and to perform other regulatory activities discussed in this report.

The information in this FY 1997 annual report is organized according to regulatory program areas and has been aligned with other NRC publications resulting from the NRC's strategic assessment and rebaselining initiative and the Government Performance and Results Act of 1993 (GPRA):

- The "Strategic Plan: Fiscal Year 1997 Fiscal Year 2002" published in September 1997 (NUREG-1614, Vol. 1)
- The "Accountability Report: Fiscal Year 1997" published in March 1998 (NUREG-1542, Vol. 3)

The GPRA requires each Federal agency to develop a triennial strategic plan, an annual performance plan, and an annual accountability report. In addition, the Chief Financial Officers Act of 1990 (CFO Act) requires that an agency

Chief Financial Officer oversee all financial management activities relating to the program and operations of the agency.

The NRC's Office of the Chief Financial Officer coordinated preparation of the NRC's first Strategic Plan, covering the period FY 1997 through FY 2002. The NRC Strategic Plan describes the agency's long-term program goals and strategies and is based on a strategic assessment and rebaselining of NRC's programs initiated in September 1995. The NRC developed direction-setting issue papers and provided them to NRC's stakeholders for comment. Final Commission policy decisions were made after considering the stakeholder comments. The NRC sought the advice and consultation of the Office of Management and Budget (OMB) and its congressional oversight committees on the draft NRC FY 1997-2002 Strategic Plan. The final plan was submitted to Congress in September 1997.

The NRC's first annual Performance Plan was submitted to Congress with its FY 1999 budget. This plan sets annual goals with measurable performance indicators that are linked to the agency's Strategic Plan. The performance indicators are used to measure or assess the relevant output, service levels, and outcomes related to performance goals. Of the 24 CFO Act agencies, the congressional staff ranked NRC sixth in the quality and completeness of its Strategic Plan and fourth in its Performance Plan. The NRC is working to improve both of these plans for FY 2000.

For the past three years, the NRC has participated in a pilot project, along with other Federal agencies, to streamline financial management reporting by consolidating performance-based reporting into a single accountability report. The NRC's FY 1997 Accountability Report contains the agency's audited financial statement, program performance results and Chairman's statement on management controls, agency financial management systems, and final actions on Office of the Inspector General audit recommendations.

The Strategic Plan and the Accountability Report, in addition to NRC's Annual Report for FY 1996 (NUREG-1145, Vol. 13), are available on NRC's Web site <<http://www.nrc.gov>>.

Changes in the Commission and Organization

As of September 30, 1997, Dr. Shirley Ann Jackson was Chairman of the Commission (her term expires June 30, 1999), and the Commissioners were Greta J. Dicus (her term expires June 30, 1998); Nils J. Diaz (his term expires June 30, 2001); and Edward McGaffigan (his term expires June 30, 2000). One Commissioner position was vacant.

The NRC established an Executive Council in January 1997 to provide an integrated framework for agencywide administration, management, and program planning involved in NRC decision-making. This council is composed of the Executive Director for Operations, the Chief Financial Officer, and the Chief Information Officer.

In addition to establishment of the Executive Council, several key executives were reassigned in FY 1997. Ashok C. Thadani became the Acting Deputy Executive Director for Regulatory Effectiveness, Samuel J. Collins became the Director of the Office of Nuclear Reactor Regulation, and Thomas T. Martin became the Director of the Office for Analysis and Evaluation of Operational Data.

The NRC organization as of September 30, 1997, is shown in the Appendix to this report.

Other Highlights

LICENSE AND ANNUAL FEES

The Omnibus Budget Reconciliation Act of 1990 (Public Law 101–508) requires that in FY 1997, the NRC collect license fees (under 10 CFR Part 170) and annual fees (under 10 CFR Part 171) that approximate 100 percent of the agency's budget authority, less the amount appropriated to the NRC from the Nuclear Waste Fund. Public Law 104–206 appropriated approximately \$476.8 million to the NRC for FY 1997 and excluded \$3.5 million appropriated for regulatory reviews and other activities pertaining to waste stored at the Hanford site, Washington, from license fee

revenue. Approximately \$11 million of the budget was appropriated from the Nuclear Waste Fund. Of the remaining \$462.3 million, NRC collected 99 percent through fees and annual charges. A detailed account of NRC financial management, with an audited financial report, is provided in the Fiscal Year 1997 Accountability Report (NUREG–1542, Vol. 3).

Managing Receivables. Since FY 1991, the NRC has been required by the Omnibus Budget Reconciliation Act to collect 100 percent of its budget, less funds appropriated from the Nuclear Waste Fund, through fees charged to its licensees. The NRC has met this requirement by annually collecting an average of 98 percent of the budget in fees.

Delinquent Debt. The Office of the Chief Financial Officer has continued to improve the collection of receivables and reduce the amount of delinquent debt owed to NRC. As of September 30, 1994, the delinquent debt owed to NRC was \$16.5 million (2,908 accounts). As of September 30, 1997, delinquent debt owed to NRC had been reduced to \$2.1 million (505 accounts).

Prompt Payment. On-time payments subject to the Prompt Payment Act have increased steadily from 82 percent in FY 1994 to 95 percent in FY 1997. Indicative of this performance, the amount of interest penalties incurred has decreased from \$15,000 in FY 1994 to \$3,200 in FY 1997.

PUBLIC INFORMATION

The NRC is committed to providing complete, clear, and accurate information about the agency's programs, policy decisions, and activities to the public. This commitment is accomplished primarily through news releases, pamphlets, fact sheets, and other published materials. Much of this information is available electronically on our Web page at <<http://www.nrc.gov>>.

In the spring of 1997, the Commission directed the Executive Council to create a special coordinating group to propose recommendations to further the Commission's objective of improving public communications with all stakeholders, and particularly with the public at large. The resulting plan recommended ways to improve the quality, clarity, and credibility of

agency communications, with emphasis on communicating in plain English with the necessarily technical matters involved in nuclear oversight. The plan additionally recommended that the NRC identify public concerns earlier, provide clearer oral and written communications, commit to earlier involvement of the public in NRC activities, respond more effectively to public concerns, and improve public access to information.

INTERNATIONAL PARTICIPATION

Gore-Chernomyrdin Commission. At the eighth and ninth meetings of the U.S./Russian Joint Commission on Economic and Technological Cooperation (known as the Gore-Chernomyrdin Commission (GCC)), both countries reaffirmed their view that safe nuclear power is a key component of global nuclear safety and security and stressed the importance of a strong, independent nuclear regulatory authority as a means of promoting and maintaining nuclear safety.

Ukraine. In FY 1997, the Nuclear Safety Working Group worked to effectively implement the Memorandum of Understanding (MOU) with Ukraine, which provides for closure by the year 2000 of the four-unit Chornobyl nuclear power plant.

International Nuclear Regulators Association. In January 1997, Chairman Jackson convened a working group that included the heads of seven other national regulatory bodies (Canada, France, Germany, Japan, Spain, Sweden, and the United Kingdom) to discuss the creation of an International Nuclear Regulators Association (INRA). Following national government review, the group convened in Paris in May 1997 and formally constituted the INRA.

NUCLEAR REACTORS

Indemnity, Financial Protection, and Property Insurance. The 15th annual property insurance reports submitted by power reactor licensees indicated that of the 70 sites insured, 55 are covered for at least the \$1.06 billion required in the revised property and accident recovery insurance rule, published on April 2, 1990, and

that 28 of those sites carry the maximum \$2.95 billion currently available. The remaining 15 sites have sought or been granted exemptions from the full amount of required coverage because of their small size or their operating status.

Safety and Regulatory Issues. In FY 1997, the NRC continued to monitor significant safety and regulatory issues at 104 commercial nuclear power reactors that are licensed to operate and at another 18 that are undergoing decommissioning.

With respect to risk-informed, performance based regulation, work continued in a number of areas both to implement risk-informed, performance-based regulatory approaches for power reactors and to develop the necessary analytical tools and data to allow analyses of those activities that pose a risk to the public safety. NRC also initiated an integrated review of the licensee performance assessment processes to develop a single integrated process that provides for greater objectivity, predictability, and scrutability.

License Renewal. The Atomic Energy Act and NRC regulations limit commercial power reactor licenses to 40 years but also permit the renewal of such licenses. The first 40-year operating license will expire in the year 2006, approximately 10 percent of the rest will expire by the end of 2010, and more than 40 percent will expire by the year 2015. The staff approved a content template for a renewal application for Baltimore Gas and Electric's Calvert Cliffs units. Feedback was also provided to Duke Energy Corporation on renewal reports submitted for its Oconee units in advance of the submittal of a renewal application.

Fire Protection. Background on NRC fire protection issues was provided in the 1996 Annual Report. The staff has completed the action plan to resolve issues related to the adequacy of Thermo-Lag 330-1 as an effective fire barrier and has shifted its focus from generic issues to plant-specific corrective action programs.

Tritium Production. Under the terms of a joint MOU, NRC is providing review and consultation to assist the Department of Energy (DOE) in assessing and resolving technical and licensing issues associated with commercial light-water reactor production of tritium.

Next-Generation Reactor Designs. The NRC's review of the AP600 design continued in FY 1997,

and the AP600 Final Safety Evaluation Report (NUREG-1512) will be published in FY 1999.

NUCLEAR MATERIALS

The materials program is designed to ensure that activities involving uses of radionuclides do not endanger public health and safety. As of September 30, 1997, the NRC administered approximately 5,900 licenses for the possession and use of nuclear materials in medical and industrial applications. This administration represents a reduction of about 500 licenses in the past year, largely as a result of the transfer of licenses to Massachusetts, which became an Agreement State. The 30 Agreement States administer about another 15,000 licenses.

Nuclear materials regulation during FY 1997 comprised—

- more than 3,500 licensing actions. Of this total, 304 were for new licenses, 2,961 were for amendments, 153 were for license renewals, and 157 were sealed source and device reviews;
- approximately 2,200 materials licensee inspections; and
- review of 10 Agreement State and 4 NRC Regional Programs.

FUEL CYCLE FACILITIES

In FY 1997, the NRC completed 89 safety-related source and special nuclear material (S&SNM) license amendments and 5 S&SNM license renewals. On November 26, 1996, NRC issued the first certificate to the U.S. Enrichment Corporation for the operation of the Gaseous Diffusion Plants.

NUCLEAR WASTE

The NRC received 26 applications for storage and transportation of spent fuel in FY 1997. The NRC staff completed approximately 30 applications for storage and transportation of spent fuel and approximately 75 applications for transportation packages for other radioactive materials in FY 1997.

ALLEGATION PROGRAM

In FY 1997, the NRC received 1,305 allegations, comprising 3,019 individual concerns. Of the 1,305 allegations, 973 involved reactor issues, 243 involved materials issues, 58 involved Agreement State issues, and 31 involved other non-NRC issues.

PROTECTING THE ENVIRONMENT

One of NRC's uranium recovery performance measures for FY 1997 was to support DOE in the Uranium Mill Tailings Radiation Control Act (UMTRCA) Title I reviews to fulfill the congressionally mandated UMTRCA program completion date. During FY 1997, NRC concurred in construction completion at seven of the DOE sites, and licensed five sites to DOE for long-term care. This meant that by the end of FY 1997, the required actions were completed at 19 of the 24 sites, leaving a remainder of 5 sites for DOE to reclaim in order to finish the surface reclamation of the abandoned mills.

During FY 1997, NRC reviewed the operating history and the safety and environmental aspects of several operating uranium recovery facilities and issued three performance-based renewed licenses.

MANAGING INFORMATION RESOURCES AND TECHNOLOGY

Capital Planning and Investment Control. The Clinger-Cohen Act of 1996 requires each Federal agency head to design and implement a Capital Planning and Investment Control (CPIC) process for evaluating information technology (IT) projects. During FY 1997, NRC completed the development of the new CPIC process and established CPIC guidance that was used in the planning call for the FY 1999 IT budget.

Year 2000 at the NRC. The NRC, like all Federal agencies, has an active Year 2000 program to address software, hardware, embedded chip, and regulatory issues associated with the Year 2000 computer problem. In FY 1997, following the OMB strategy, guidelines, and milestones for Federal agencies; the NRC continued its program of Year 2000 problem awareness by describing actions to the staff that they would probably be

involved in during the months before the year 2000 arrives. For *Nuclear Power Plant Licensees*, the staff issued NRC Information Notice (IN) 96-70, "Year 2000 Effect on Computer System Software," in December 1996. While most of the safety-related reactor protection/shutdown instrumentation and control systems are not computer-operated in nuclear power plants and, therefore, are not susceptible to the Year 2000 problem, other nuclear power plant systems, such as security, emergency data collection, radiation monitoring, and surveillance tracking, are computer-based and need to be assessed for the Year 2000 problem. The staff met with the Nuclear Energy Institute (NEI) in early 1997, and NEI agreed to begin to assist nuclear power plant licensees in addressing the issue. For *Nuclear Materials Licensees*, the NRC sent its materials licensees two major information notices on this problem: IN 96-70, "Year 2000 Effect on Computer System Software," and IN 97-61, "U.S. Department of Health and Human Services Letter, to Medical Device Manufacturers, on the Year 2000 Problem."

Agencywide Documents Access and Management System. Effective management of information is critical to NRC's performance of its mission. Much of this information is in the form of

documents. The Commission's policies, decisions, and bases for regulatory action depend on these documents. Today, the NRC operates in a predominantly paper-based environment with an aging, microfiche-based, legacy document-indexing system that has limited functionality to support its needs. To take advantage of current technology and better accommodate the information needs of the licensees, the public, and the staff, the NRC conceived and began developing in FY 1997 a modern, fully functional document management capability called ADAMS (Agencywide Documents Access and Management System).

FACILITIES PROGRAM

During FY 1997, NRC began its Restack Project for the 18-story building, which consists of replacing all building furnishings and fixtures that have deteriorated during the 10 years NRC has occupied the building. The project consists of 16 phases and is scheduled to be completed in FY 2000. During FY 1997, four floors were completed. The NRC successfully worked with the General Services Administration to obtain support to fund two projects for the One White Flint North building totaling more than \$1 million.

Nuclear Reactor Safety

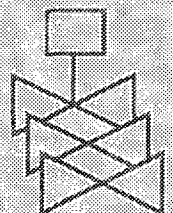
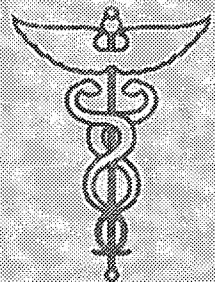
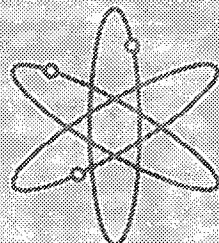
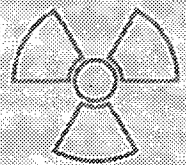
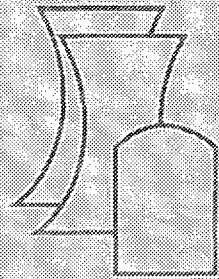
Reactor safety encompasses all U.S. Nuclear Regulatory Commission (NRC) activities to ensure that civilian nuclear reactor facilities are operated in a manner that provides adequate protection of public health and safety. The activities include reactor inspection, performance assessment, regulation development, licensing, reactor regulatory research, identification and resolution of safety issues, independent assessment of reactor operational events and experience, investigations of alleged wrongdoing by licensees, applicants, contractors, or vendors, and imposition of enforcement sanctions for violations of NRC requirements.

In Fiscal Year (FY) 1997, NRC achieved its performance goals for civilian nuclear reactors, having (1) no civilian nuclear reactor accidents, (2) no events that had a 1/1000 or greater probability of leading to a severe accident, (3) no deaths resulting from radiation or radioactivity releases from reactors, and (4) no significant radiation exposures resulting from civilian nuclear reactors. Specific activities contributing to attaining these performance goals are discussed in this section.

The NRC's Office of Nuclear Reactor Regulation (NRR) is responsible for licensing and inspection activities at all nuclear power reactor facilities; for manufacturing, production, and utilization facilities (except for facilities reprocessing fuel and performing isotopic fuel enrichment); and for receipt, possession, and ownership of source, byproduct, and special nuclear material used or produced at facilities licensed under Part 50, "Domestic Licensing of Production and Utilization Facilities," in Title 10, Energy, of the *Code of Federal Regulations*.

In addition, the NRR staff develops policy and inspection guidance for programs assigned to the regional offices and assesses the effectiveness and uniformity of the Region's implementation of those programs. The staff also identifies, and in coordination with the regional offices, takes action regarding conditions and licensee performance at such facilities that may adversely affect public health and safety, the environment, or the safeguarding of nuclear facilities and assesses and recommends, or takes action, in response to incidents or accidents.

The staff is responsible for licensing issues and regulatory policy concerning reactor operators, including the initial licensing examination and requalification examinations; emergency preparedness, including participation in emergency drills with Federal, State, and local agencies; radiation protection; security and safeguards at such facilities, including fitness for duty; and the inspection of nuclear component supplier facilities. NRR responsibilities include the technical review, certification, and licensing of advanced nuclear reactor facilities and the renewal of current power reactor operating licenses. NRR also exchanges safety and regulatory information with other nations having major nuclear power



programs. The primary focus of these exchanges is to obtain information helpful to NRR's domestic regulatory mission. In addition, NRR provides technical support to the Office of International Programs within a limited range of activities.

In FY 1997, the NRC continued to monitor significant safety and regulatory issues at 104 commercial nuclear power reactors that are licensed to operate and another 18 that are undergoing decommissioning.

NRC participated in bilateral exchanges of safety and regulatory information with nations having major nuclear power programs, which included France, Japan, the United Kingdom, Spain, Korea, Taiwan, and Canada. (See also Chapter 5, "Common Defense and Security and International Involvement," in this report.) The main technical topics included in these exchanges were safety performance of high burnup fuels, risk-informed regulation, advanced digital instrumentation and control (I&C) systems, and recent events of regulatory significance. The NRC continued participation in a four-party working group (regulatory authorities of France, Canada, the United Kingdom, and the U.S.) to exchange information on digital I&C systems and was also involved in compilation of material from NRC publications for the U.S. national report for the International Convention on Nuclear Safety.

The NRC represented the United States on the Nuclear Energy Agency Committee on Nuclear Regulatory Activities (CNRA). The CNRA focused, during this year, on Review Procedures and Criteria for different Regulatory Applications of PSA; Inspection Practices; Fuel Safety Margins, and, Future Regulatory Challenges.

NRC sponsors an annual Regulatory Information Conference (RIC) that provides a communication forum to enhance and promote a better understanding of industry and regulatory trends, processes, and initiatives for improving nuclear safety. The Ninth Annual RIC, held on April 15 and 16, 1997, at the Capital Hilton Hotel in Washington, D.C., was attended by over 800 people from industry; other Federal, State, and local government agencies; and the general public. The RIC provided an opportunity for managers and staff from NRC and utilities to meet and

exchange ideas about safety initiatives and regulatory issues.

Reactor Inspection Program

The regional staff performs inspections in such areas as engineering, system modifications, in-service inspection, fire protection, radiation protection, physical security and safeguards, maintenance, and licensee corrective actions. The headquarters staff performs team inspections in similar areas. Resident inspectors provide an onsite NRC presence for continual observation and inspection of licensee activities, such as control room operations, maintenance, surveillance testing, system lineups, radiation control, and physical security.

The reactor inspection program comprises three elements. First, Core Inspections provide a minimum examination of licensee activities. Second, Regional Initiative Inspections follow up on events, issues, or findings from other inspections. The photographs in Figure 2.1 show inspection of a fuel shipment at the Watts Barr Nuclear Plant in Tennessee.

Third, Generic Safety Issue Inspections provide one-time inspection of safety-significant generic issues. In an inspection initiated by Region II, Figure 2.2 shows Chairman Jackson and inspectors observing the replacement of a steam generator at St. Lucie Nuclear Power Plant, Unit 1. In FY 1997, the staff conducted a review of all individual plant evaluation submittals to compile a database of contributors to core damage frequency and important hardware, systems, and modifications to be used as an ongoing reference for input into the inspection and operator licensing programs.

During previous years, NRC inspectors have identified numerous inconsistencies between plant configurations and operations and the design and licensing bases. NRC contracted with architect-engineers (AEs) to form teams to conduct Safety System Functional Inspections focused on plant design. These inspections established that although, overall, adequate protection of public health and safety was not compromised by the engineering design documentation issues, weaknesses in design and

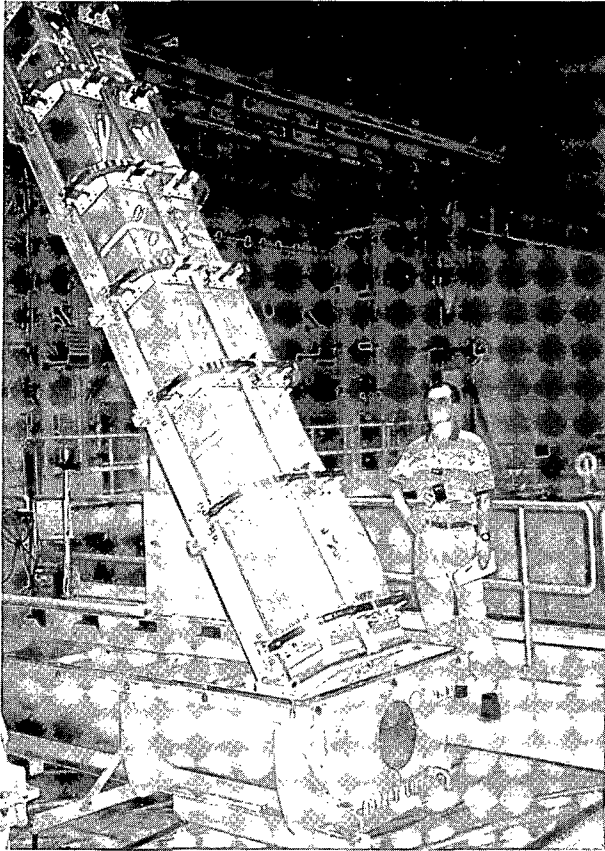


Figure 2.1 A Regional Inspector Checking a Fuel Shipment at the Watts Bar Nuclear Plant in Tennessee

licensing bases control were identified. NRC led 12 AE design inspections in 1997, which identified numerous issues regarding original design, design modifications, calculations, testing, and licensee corrective actions. Some issues challenged the safety systems' ability to mitigate design-basis accidents. Severity Level III violations resulted from five of the inspections. In one case, the licensee shut down both units pending necessary improvements. NRC Information Notice 98-22 describes the numbers and types of deficiencies discovered during these AE inspections. As a result of these inspections, industry performance had improved sufficiently to warrant their suspension.

Performance Evaluation

Plant Performance Reviews (PPRs). The PPR is a semiannual process in which regions integrate and

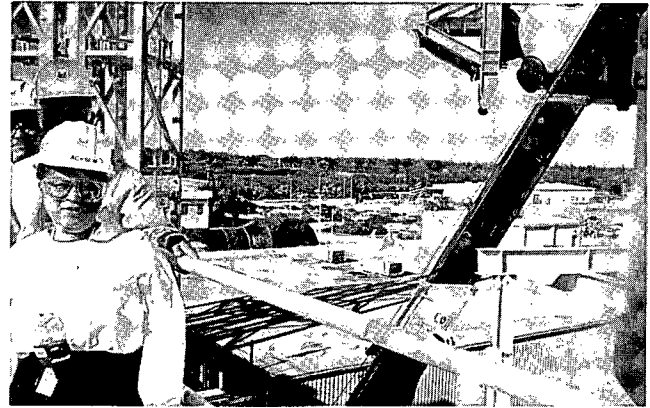
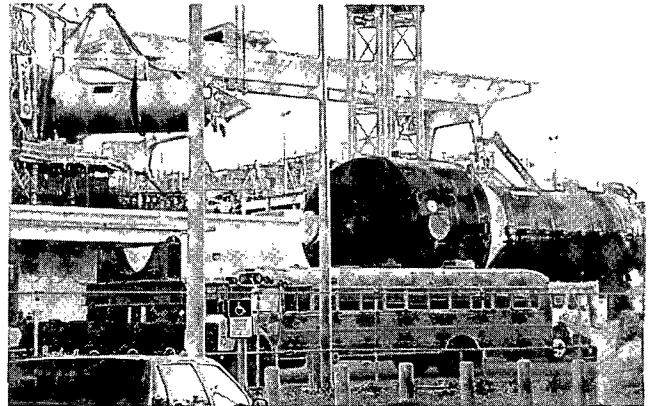


Figure 2.2 Chairman Jackson and Two Inspectors Observe the Replacement of a Steam Generator at St. Lucie Nuclear Power Plant in Florida



assess inspection reports and other objective information in the areas of plant operations, maintenance, engineering, and plant support. Following each PPR, the staff issues a 6-month inspection plan that reflects observed trends or changes in licensee performance.

Systematic Assessment of Licensee Performance (SALP). During FY 1997, the NRC issued 44 SALP reports. Two plant sites (four reactors) received SALP Category 1 ratings, indicating superior safety performance in all four functional areas. The SALP evaluation frequency for these plants was extended to 24 months, and they will receive an appropriate reduction in NRC inspections. Ten plant sites (13 reactors) received at least one SALP Category 3 rating, indicating safety performance that was acceptable but still of concern to the NRC. The NRC will focus an appropriate level of increased inspection at these plant sites and on the plant functional areas that were rated SALP Category 3. All SALP cycles were in accordance with the requirements in

Management Directive 8.6 that establish agency policy for conduct of these assessments. Over 90 percent of SALPs met the directive's timeliness requirements for issuing the SALP report and holding the SALP meeting with the licensee.

Senior Management Meetings (SMMs). The SMM process is a semiannual review and integration of the agency's observations and findings for nuclear reactors, culminating in a meeting of senior managers. The managers determine which plants to place in one of three categories of the NRC Watch List:

1. Category 1 plants are removed from the Watch List.
2. Category 2 plants are authorized to operate, but will be closely monitored by NRC.
3. Category 3 plants are shutdown, require NRC Commission approval to restart, and will be closely monitored by NRC.

During an SMM, the managers identify plants that are exhibiting adverse performance trends that could cause the NRC to place them on a future Watch List. They also identify plants that have had sustained superior performance, as indicated by SALP Category 1 ratings in all four functional areas since the last SMM.

During the two SMMs in 1997, decisions were made to keep five plants on the Watch List, place eight new plants on the list, remove one from the list, issue to three plants letters discussing trends, and give Executive Director for Operations recognition for superior performance to two plants.

During FY 1997, the NRC initiated an integrated review of the assessment processes in order to develop a single integrated process that provides for greater objectivity, predictability and scrutability. In addition, the NRC continued to make incremental changes to the PPR and SALP processes to improve their efficiency and effectiveness.

Maintenance and Quality Assurance

Beginning in July 1996 and continuing through FY 1997, the staff performed baseline inspections of the licensees' implementation of the maintenance rule (56 FR 31306; July 10, 1991). A revision of Regulatory Guide 1.160, which endorses a revision of NUMARC 93-01, the industry guidance document for the plant maintenance rule, was issued in March 1997. This regulatory guide contained clarifying information for the industry based on results from inspections conducted to date.

The staff continued activities on the development of a graded quality assurance (QA) methodology that will allow licensees to adjust the application of QA controls and resources based on the relative safety significance of plant equipment. In parallel, the staff reviewed a proposed QA program change from one licensee to allow the implementation of graded QA.

Human Factors and Operator Licensing

The NRC administers initial examinations and, as necessary, requalification examinations to applicants for reactor operator and senior operator licenses at power reactor facilities. During FY 1997, the NRC issued a proposed amendment to 10 CFR Part 55, "Operators' Licenses," that would require power reactor facility licensees to prepare the initial operator licensing examinations and would support a significant reduction in NRC contract funds. Additional details are provided in the section on Improvements in the Regulatory Framework.

Each year the NRC staff evaluates the effectiveness of licensee training efforts by monitoring the Institute of Nuclear Power Operations (INPO) training program accreditation process. The NRC continues to endorse the INPO accreditation program as an effective means of ensuring proper nuclear plant personnel training.

Instrumentation and Control

In July 1997, the staff issued the final version of the update to NUREG-0800, Standard Review Plan (SRP), Chapter 7, "Instrumentation and Control," which incorporates guidance on acceptance of digital I&C system upgrades to operating plants and provides a stable regulatory approach and basis for implementation of such modifications.

The staff issued NRC Information Notice 96-70, "Year 2000 Effect on Computer System Software," in December 1996. While most of the safety-related reactor protection/shutdown I&C systems are not computer-operated in nuclear power plants and, therefore, are not susceptible to the Year 2000 problem, other nuclear power plant systems, such as security, emergency data collection, radiation monitoring and surveillance tracking, are computer-based and need to be assessed for the Year 2000 problem. The staff met with the Nuclear Energy Institute (NEI) and agreed to begin to assist nuclear power plant licensees in addressing the Year 2000 issue.

Net Positive Suction Head for Emergency Core Cooling and Containment Heat Removal Pumps

The NRC is addressing an issue regarding the possibility of inadequate net positive suction head (NPSH) being available for ECCS (including core spray and decay heat removal) and containment heat removal pumps under certain design-basis accident scenarios.

On October 7, 1997, the staff issued NRC Generic Letter 97-04, which requested that licensees review the current design-basis analyses used to determine the available NPSH for the ECCS and containment heat removal pumps and provide information about these pumps to the NRC. The staff has reviewed the responses from all addressees and has found that the majority of the licensees have NPSH analyses that are consistent with their respective licensing basis. The staff is

currently pursuing resolution with a few licensees to ensure adequate NPSH of the ECCS and containment heat removal pumps. As a result of the issuance of Generic Letter 97-04, several licensees have voluntarily performed new NPSH analyses to correct errors and discrepancies identified during their review.

Emergency Core Cooling System Strainer Blockage in Boiling-Water Reactors

The NRC staff continues to address concerns regarding clogging of ECCS suction strainers. The 1995 and 1996 Annual Reports provide background on this issue. Every addressee has installed, or indicated that it will install, larger passive suction strainers. The Boiling Water Reactor Owners Group (BWROG) has published the results of its work on this issue, along with proposed methods for resolving this issue, in NEDO-32686, Rev. 0, "Utility Resolution Guidance for ECCS Suction Strainer Blockage," which was submitted to NRC for review on November 20, 1996. The staff issued a draft safety evaluation report on this group's guidance on December 31, 1997.

Fire Protection

Background on NRC fire protection issues was provided in the 1996 Annual Report. The staff has completed the action plan to resolve issues related to the adequacy of Thermo-Lag 330-1 as an effective fire barrier and has shifted its focus from generic issues to plant-specific corrective action programs. The staff is issuing confirmatory orders to licensees with outstanding corrective actions to ensure that the completion dates proposed by the licensees are met. The NRC has also completed three of the four pilot fire protection functional inspection (FPFI) programs, one per region. After completion of the fourth FPFI, the staff plans to conduct a workshop to obtain public and industry feedback, report to the Commission the results of the pilot program, and make recommendations for the future.

Risk-Informed Regulatory Approaches

During 1997, the NRC furthered the implementation of risk-informed regulation with the completion of several significant activities described in the Probabilistic Risk Assessment (PRA) Implementation Plan and continued progress on others. Background on this issue, including the PRA Policy Statement (60 FR 42622: August 16, 1995), was provided in NRC's 1995 Annual Report.

The staff contributed to the development of draft risk-informed regulatory guides (RGs) and Standard Review Plans (SRPs) that provide general guidance for applying PRA when considering changes in the licensing basis for a facility. In addition, several application-specific RGs and SRPs based on the general guidance documents were developed. These application-specific guidance documents provide risk-informed methods for establishing technical specifications, graded QA programs, inservice test programs for pumps and valves, and in service inspection programs for piping. In developing the application-specific RGs and SRPs, the NRC staff has been engaged in several pilot licensing projects with licensees and has completed the reviews of the technical specifications and graded QA programs for these projects.

RISK-INFORMED, PERFORMANCE-BASED REGULATION

In implementing its mission to ensure that its licensees operate nuclear power reactors safely, the NRC is continuing to pursue a strategy of focusing on those regulated activities that pose the greatest risk to the public and to do so in the most effective manner possible. During FY 1997, work continued in a number of areas both to implement risk-informed, performance-based regulatory approaches for power reactors and to develop the necessary analytical tools and data to allow analyses of those activities that pose a risk to the public.

Probabilistic Risk Assessment. The NRC developed four draft regulatory guides on risk-informed regulation to support increased licensee

use of PRAs. One of these, DG-1061, "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis," will provide licensees with recommendations for using risk information in support of licensee-initiated changes requiring NRC review and approval. This guide is intended to improve consistency in regulatory decisions in areas in which the results of risk analyses are used, thereby facilitating greater use by licensees. The other draft regulatory guides will provide more detailed guidance to licensees in applying risk-informed methods to changes in the areas of inservice testing, graded QA, and technical specifications. The staff also issued draft NUREG-1560, "Individual Plant Examination Program: Perspectives on Reactor Safety and Plant Performance," which provides information gained from the Individual Plant Examination (IPE) program to support a diversity of activities, such as plant inspection, accident management strategies, maintenance rule implementation, and risk-informed regulation. IPE results also can be used to indicate areas in PRA in which standardization would be useful.

Severe Accidents. To ensure that the NRC has adequate analytical tools and data to allow for independent confirmation of the risk significance of licensees' approaches, the NRC completed significant improvements to the MELCOR code, a key system-level severe-accident computer code that is used to assess the risk significance of severe accidents. Significant activities were also continued to improve the NRC's thermal-hydraulic analytical capabilities for assessment of the significance of operational events, assessment of success criteria for risk-informed regulation, and reduction in burden, such as power uprates and technical specification changes. To improve the NRC's thermal-hydraulic analytical capabilities, the staff initiated (1) the development of a graphical user interface, (2) programs for reflood modeling and for obtaining data on flow regimes, and (3) the development of a generic interface to couple the PARC 3D neutronic code to thermal-hydraulic codes. Significant progress was also made during FY 1997 to improve the NRC's capabilities to assess the ability of nuclear power plants to withstand the challenges of severe accidents, thereby improving the capabilities for quantifying the risk to the public. In December

1996, a model, representative of the major elements of steel boiling-water reactor (BWR) containments was tested to failure at Sandia National Laboratories. The model, as expected, sustained pressure far beyond its design level and provided a means of validating analysis methods used for failure predictions in risk assessments. Experimental research also provided important data for improving the NRC's capabilities to predict failure of the reactor vessel following a severe accident, which will improve the ability to analyze risk-significant sequences and will support decisions on accident management strategies aimed at mitigating the consequences of a severe accident.

Fire Protection. NRC continued its program to reduce requirements that are marginal to safety, concentrating on an industry petition for rulemaking to revise the fire protection requirements in Appendix R to 10 CFR Part 50. In doing so, the Commission approved the development of a proposed rulemaking for a performance-based rule, supported by regulatory guidance, to provide flexibility and opportunity to incorporate technological advances not readily afforded under the current regulatory framework.

Nonpower Reactors

The NRC also ensures the safe operation of test and research reactors not used to generate power on a commercial basis and referred to as nonpower reactors (NPRs). These smaller reactors are designed and used for research and testing in areas such as physics, chemistry, biology, medicine, and materials sciences, and for training of individuals for nuclear-related careers in the power industry, national defense research, and education. The NRC staff reviews new and renewal license applications and license amendments for NPRs to evaluate the safety, environmental, and safeguards aspects of their operation. The NRC also conducts inspections at approximately 40 NPRs each year to ensure their safe operation. It also ensures that the approximately 300 NPR operators are qualified to perform their duties.

Major NPR activities in FY 1997 include the following:

- Twenty-one license amendments, one license renewal, one high- to low-enriched uranium fuel conversion order, and three license terminations were processed. Review of a new NPR application for a facility at the McClellan Air Force Base continued.
- Operator licensing examinations were given to 67 prospective new NPR operator applicants at 25 facilities.
- The conceptual design of the spent fuel pool liner for the Brookhaven National Laboratory High-Flux Beam Reactor was reviewed.

License Renewal

The Atomic Energy Act and NRC regulations limit commercial power reactor licenses to 40 years but also permit the renewal of such licenses. The 40-year term was originally selected on the basis of economic and antitrust considerations—not technical limitations—but once selected, individual plant designs may have been engineered based on an expected 40-year service life.

The first 40-year operating license will expire in the year 2006, approximately 10 percent of the rest will expire by the end of 2010, and more than 40 percent will expire by the year 2015. The timely renewal of licenses for an additional 20 years, where appropriate to do so, may be important to ensuring an adequate energy supply for the Nation during the first half of the 21st century.

A nuclear power plant licensee may apply to the NRC as early as 20 years before expiration of its current license to renew its license for up to 20 years. The application would be subject to public hearings and the formal adjudicatory process. For the initial applications, the NRC expects to take approximately 30 to 36 months from receipt of the application to issuance of a renewed license.

Major license renewal activities in FY 1997 include the following:

- The revisions to the NRC's environmental regulations, 10 CFR Part 51, "Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions,"

were completed to focus on the environmental impacts that would have to be addressed for license renewal on a plant-specific basis by incorporating the results of a Generic Environmental Impact Statement (NUREG-1437). A draft revision of the Environmental Standard Review Plan (ESRP) was published for public comment. The ESRP provides guidance to the NRC staff for performing the environmental evaluations required for licensing activities, including license renewal.

- An updated draft of the Standard Review Plan for License Renewal (SRP-LR) was placed in the NRC's Public Document Room. The SRP-LR provides guidance for NRC staff reviewers for performing safety reviews of license renewal applications.
- The staff approved a content template for a renewal application for Baltimore Gas and Electric's (BG&E's) Calvert Cliffs units. Feedback was also provided to Duke Energy Corporation (Duke) on renewal reports submitted for its Oconee units in advance of the submittal of a renewal application. The staff reviewed environmental report templates for both BG&E and Duke to provide comments on the format and content of the environmental report submitted with a renewal application.

Review of the Department of Energy's Proposal for Tritium Production in Commercial Reactors

Under the terms of a joint memorandum of understanding, NRC is providing review and consultation to assist the Department of Energy (DOE) in assessing and resolving technical and licensing issues associated with commercial light-water reactor (LWR) production of tritium.

Major activities in FY 1997 include the following:

- The staff completed its review of a DOE report on the proposed use of a commercial

LWR to irradiate a number of lead test assemblies (LTAs) containing tritium-producing burnable absorber rods (TPBARs). The staff published NUREG-1607, documenting its review of the DOE LTA report in June 1997. The report is titled "Safety Evaluation Report Related to the Test Assemblies Containing Tritium-Producing Burnable Absorber Rods in Commercial Light-Water Reactors."

- The staff reviewed an application by the Tennessee Valley Authority to permit the irradiation of a total of 32 TPBARs (8 in each of 4 LTAs) in Cycle 2 at the Watts Bar facility. The staff issued the amended technical specifications authorizing the irradiation of 4 LTAs in September 1997. The staff held public meetings to provide for comment and to ensure that the public was made aware of the NRC's review activities.

Certification of Next-Generation Reactor Designs

The NRC has achieved the dual goals of standardization and a more predictable licensing process through certification of two evolutionary reactor designs. Design certification is the highest level of design approval ever issued by the NRC and it is the key for early resolution of licensing issues. The design certification process prepares the NRC for future licensing of next-generation commercial reactors.

- Advanced BWR. The final safety evaluation report (FSER) supplement (NUREG-1503) was issued in May 1997 and the design certification rule became effective June 11, 1997.
- System 80+. The FSER supplement (NUREG-1462) was issued in May 1997 and the design certification rule became effective June 20, 1997.
- AP600. The NRC's review of the AP600 design continued in FY-97 and the FSER (NUREG-1512) will be issued in 1998.
- Simplified BWR (SBWR). The General Electric Company requested that the NRC

terminate its review of the SBWR design; the staff will complete its closeout actions in May 1998.

The Advisory Committee on Reactor Safeguards (ACRS) provided valuable insights on the technical issues associated with the approval of the AP600 design.

Indemnity, Financial Protection, and Property Insurance

The two private nuclear energy liability insurance pools—American Nuclear Insurers and Mutual Atomic Energy Liability Underwriters—paid policyholders a 31st annual refund of premium reserves, under their Industry Credit Rating Plan. Under the plan, a portion of the annual premiums is set aside as a reserve available for refund to policyholders. The amount of the reserve available for refund is determined on the basis of the loss of experience of all policyholders over the preceding 10-year period. Refunds paid in 1997 (for the period from 1987 through 1997) totaled \$29,044,630, which is approximately 48.4 percent of all premiums paid on the nuclear liability insurance policies issued in 1987. The refunds represent about 64.6 percent of the premiums placed in reserve in 1987.

The 15th annual property insurance reports submitted by power reactor licensees indicated that of the 70 sites insured, 55 are covered for at least the \$1.06 billion as required in the revised property and accident recovery insurance rule, published on April 2, 1990, and that 28 of those sites carry the maximum \$2.95 billion currently available. The remaining 15 sites have sought or have been granted exemptions from the full amount of required coverage because of their small size or their operating status.

Decommissioning Nuclear Power Plants

Title 10 of the *Code of Federal Regulations*, Section 50.2 (10 CFR 50.2), defines decommissioning as

the safe removal of a facility from service and reduction of residual radioactivity to a level that permits the release of the property for unrestricted or restricted use and termination of the license.

The decommissioning process begins when a licensee submits certifications to the NRC that operation of the reactor has permanently ceased and all nuclear fuel has been permanently removed from the reactor. Within two years of submitting the certifications, the licensee must submit a Post-Shutdown Decommissioning Activities Report that provides a description of the licensee's planned decommissioning activities, a schedule for accomplishing them, and an estimate of the cost. The licensee must complete decommissioning within 60 years of the date of permanent cessation of operations. At least two years before the license termination date, the licensee must submit a license termination plan that—

1. identifies the remaining work necessary to release the site,
2. updates the decommissioning cost estimate, and
3. provides a supplement to the environmental statement.

When the Commission determines that the plan meets regulatory requirements, it approves the plan by license amendment. The Commission will terminate the license if the work identified in the license termination plan has been performed and the terminal radiation survey demonstrates that the site is suitable for release in accordance with the decommissioning criteria of 10 CFR Part 20, "Standards for Protection Against Radiation."

Major power reactor decommissioning activities for the 18 plants undergoing decommissioning in FY 1997 include the following:

- Two plants entered the decommissioning process: Maine Yankee and Big Rock Point.
- One license was terminated and the site released for unrestricted use: Fort St. Vrain.
- The Yankee Rowe reactor vessel was shipped from Rowe, Massachusetts, to the low-level waste disposal site in Barnwell, South Carolina, for burial.

- Radiological criteria for license termination were added to 10 CFR Part 20.

Figures 2.3 and 2.4 show two scoping surveys for the Connecticut Yankee Haddam Neck Plant when it was being decommissioned.

Licensing Actions

Licensing actions are issues that require NRC review and approval before the facility can be changed. These issues include issuance of licenses, amendments of licenses, NRC-originated orders, exemptions, reliefs, notices of enforcement discretion, and license renewal. Other licensing tasks are issues that do not require NRC approval before they can be implemented, such as evaluating information received from licensees in response to requests for information (e.g., generic

letters and bulletins) or as required by regulation or license condition as part of the NRC's responsibility for reviewing the safety of the operating licensed facilities (e.g., FSER updates, 10 CFR 50.59 reports, or changes to QA, safeguards, and emergency preparedness plans). Also included is responding to petitions from interested parties requesting action in accordance with 10 CFR 2.206 and assisting regions by answering technical questions (task interface agreements).

Activities in the nuclear reactor safety area encompass the management of licensing actions and other licensing tasks as follows:

- assigning, prioritizing and scheduling licensing actions and licensing activities;
- performing technical reviews of licensing applications not assigned to the technical support staff;

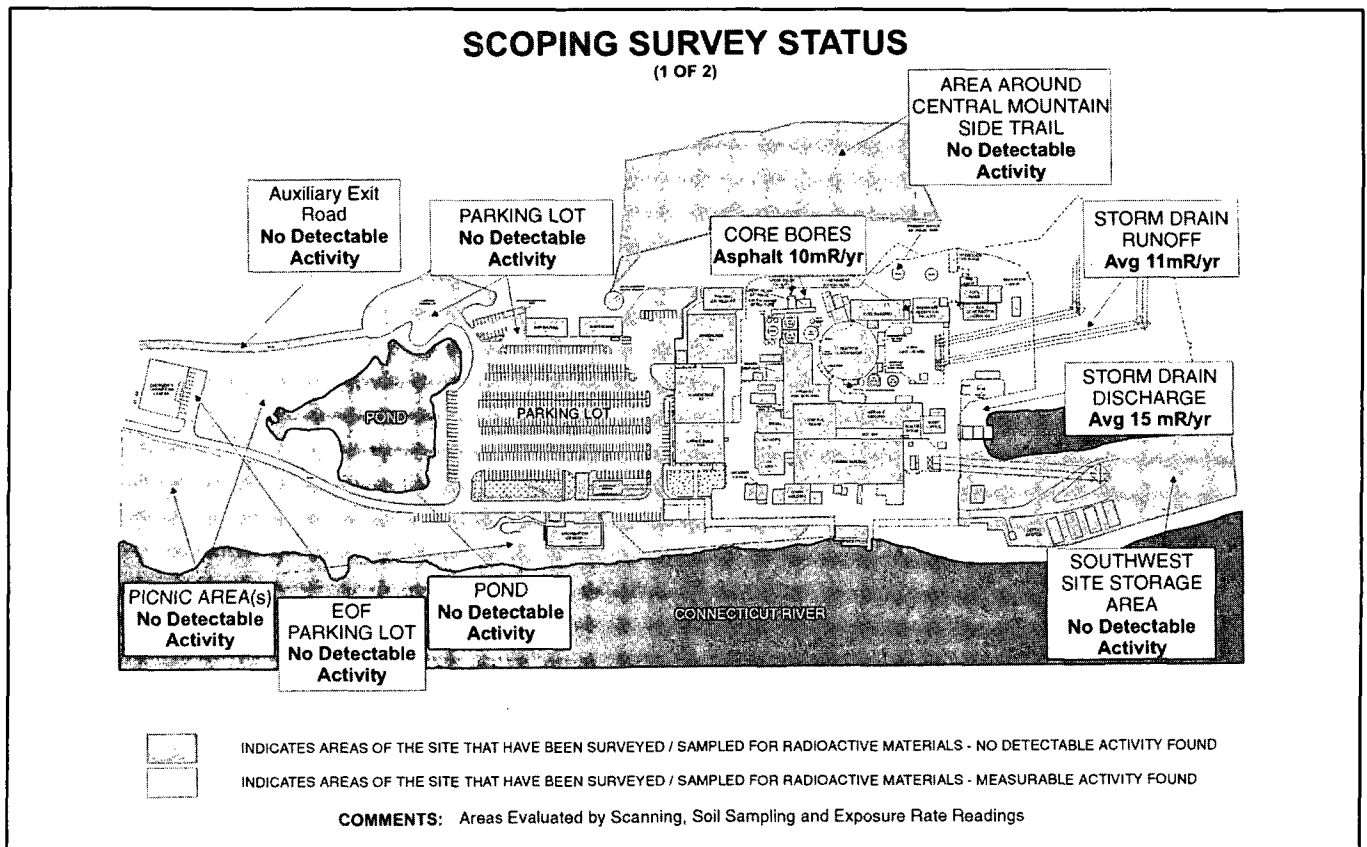


Figure 2.3 Survey Showing Site Land Areas Accessible to the Public That Had No Detectable Radioactivity, Haddam Neck Plant, Connecticut

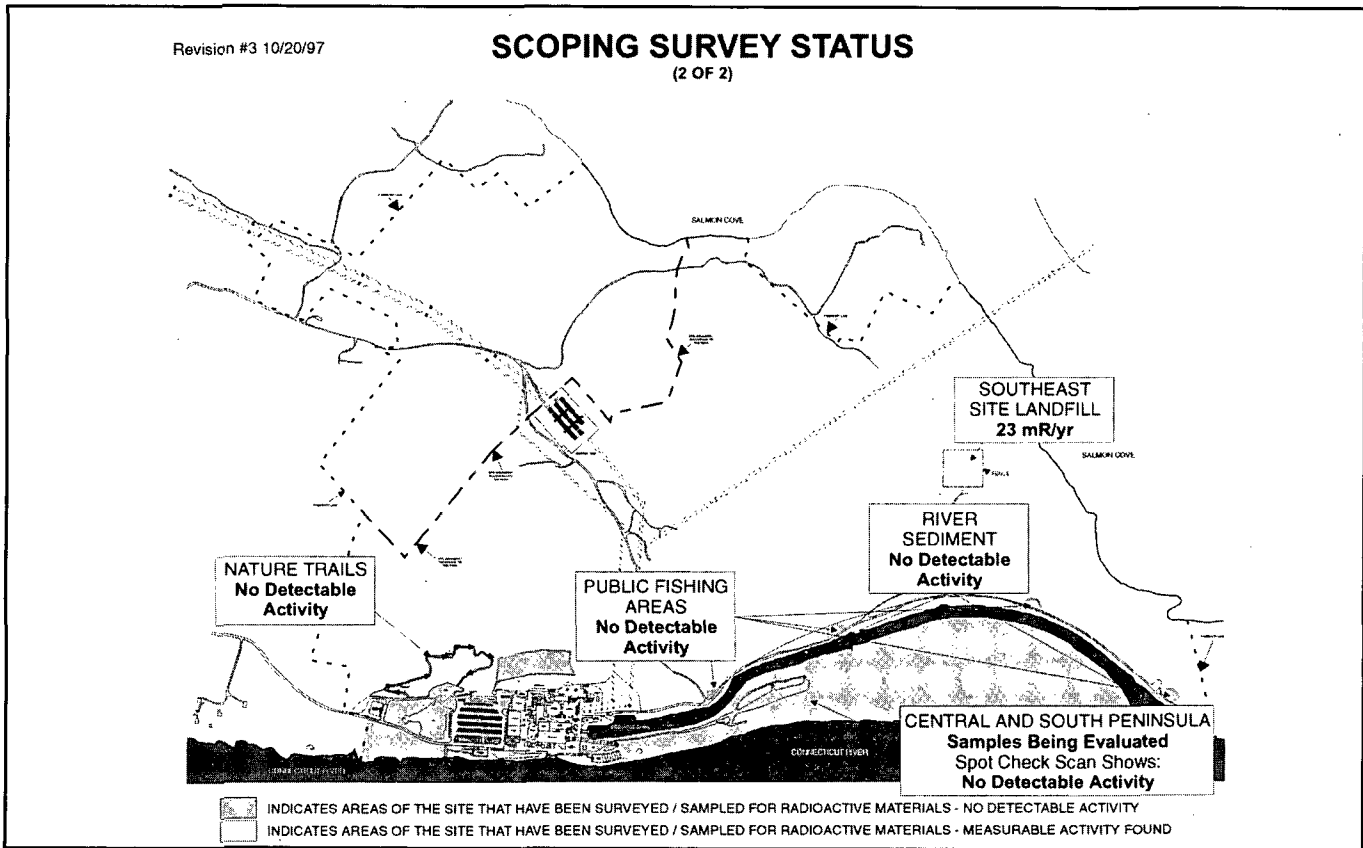


Figure 2.4 Survey Showing Areas of No Detectable Radioactivity and One Area Being Spot-Checked, Haddam Neck Plant, Connecticut

- ensuring that reported operating events are reviewed for safety significance and necessary plant-specific or generic safety concerns are identified;
- ensuring that necessary records are maintained;
- receiving, reviewing, and resolving allegations;
- reviewing final safety analysis report changes, tests, and experiments implemented without (and not subject to) prior staff approval; and
- providing support (including inspection, enforcement, and performance assessment) to other organizational units when their activities relate to the assigned facility.

Figures 2.5 through 2.8 detail the performance elements of the licensing action reviews showing actual completions, inventory, inventory age

profile, and median age. Accomplishments with respect to the NRC's licensing action-related programs such as improved standard technical specifications are discussed in the following paragraph.

Improved Standard Technical Specifications

The NRC continues to place high priority on license amendment applications related to full conversion to the improved Standard Technical Specifications (STS). About 85 percent of all commercial nuclear units have converted, are converting, or plan to convert to the improved STS as of August 1998. During FY 1997, the NRC issued a license amendment approving implementation of the improved STS for one unit, bringing the total number of units converted to the improved STS to 15 units at 11 sites. However,

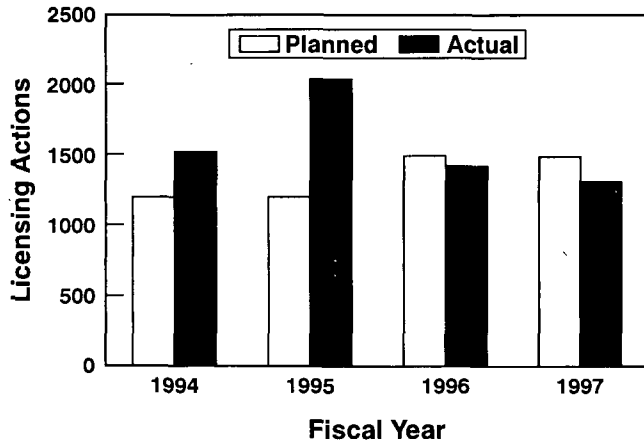


Figure 2.5 Licensing Action Completions

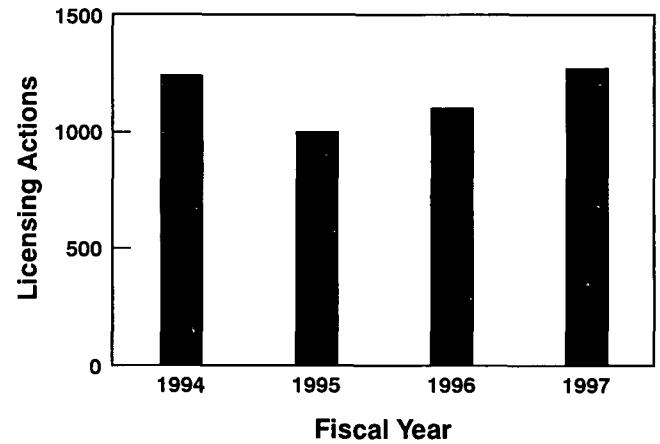


Figure 2.6 Licensing Action Inventory

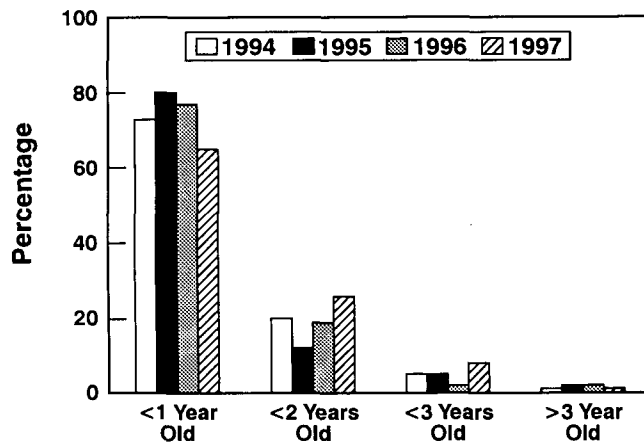


Figure 2.7 Age of Licensing Actions

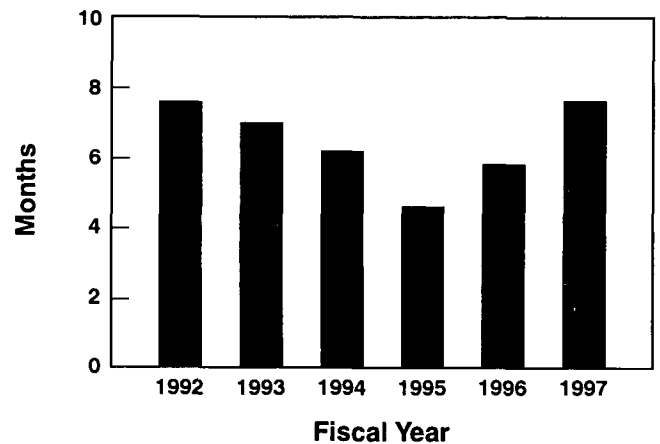


Figure 2.8 Median Age of Licensing Action Inventory

new applications to convert to the improved STS were received during FY 1997 for 25 additional units at 14 sites. Including prior year applications, this increase resulted in applications to convert to the improved STS for a total of 34 units at 19 sites being actively reviewed during FY 1997. The NRC responded to this increased rate of applications through the use of additional resources reviewing the applications and by improving the efficiency of the review process. This response has resulted in an increase in the rate of approval of applications to convert to the improved STS in FY 1998 consistent with the increased rate of applications.

The NRC continues to work with an NEI task force established to coordinate industry initiatives for further improvements to the STS. To keep the public apprised of efforts related to the improved

STS, the NRC has posted to the internet the improved STS, changes to the STS, and schedules for licensee implementation of the improved STS. Looking to the future, the NRC developed regulatory guidance and worked on voluntary pilot applications to make technical specification requirements more risk-informed as part of the overall Probabilistic Risk Assessment Implementation Plan.

Allegation Program

The Allegation Program is managed by the Agency Allegation Advisor, organizationally located in NRR, and administered by the Allegation Coordinators and agency staff in the Offices of NRR, Nuclear Material Safety and

Safeguards, and State Programs and in each region. The allegation program is a reactive program structured to respond to safety and regulatory concerns submitted to the NRC by industry employees and members of the public. Actions to review and resolve safety and regulatory concerns according to their significance are determined and prioritized within the allegations program and the results of NRC's review are communicated to the individual who raised the concern.

In FY 1997, the NRC received 1,305 allegations, comprising 3,019 individual concerns. Of the 1,305 allegations, 973 involved reactor issues, 243 involved materials issues, 58 involved Agreement State issues, and 31 involved other non-NRC issues. Of the 1,305 allegations received, 251 were purported to involve wrongdoing and 182 stated that someone had been discriminated against for raising a safety or regulatory concern. In the same time frame, the NRC completed action on 1,238 allegations, comprising 2,595 individual concerns. In 33 percent of the allegations on which action was completed, the NRC was able to substantiate the validity of at least part of the concerns raised. The average time to complete the review of allegations was 119 days for allegations that did not involve wrongdoing and 371 days for allegations involving wrongdoing. This average is a significant improvement over the average time to complete reviews in FY 1996, 150 days and 446 days, respectively.

Research Supporting Nuclear Reactor Safety

Research conducted and rulemakings promulgated by the NRC in FY 1997 contributed in a significant way to NRC's success in achieving its performance goals. The results from research helped resolve important safety issues, allowed NRC to support industry initiatives, enhanced the agency's understanding of new nuclear-related technologies, led to improvements in the regulatory framework, provided burden relief to the industry and contributed to a more risk-informed, performance-based regulatory approach for the agency as enumerated in the following specific activities.

RESOLVING SAFETY ISSUES

During FY 1997, research was performed in several areas to support evaluation and resolution of important safety issues.

Degradation of Steam Generator Tubes. One such issue is the degradation of steam generator tubes in PWRs. Since steam generator tubes make up more than 50 percent of the primary pressure boundary and represent one of the final barriers against the release of fission products, failure of tubes could result in a LOCA and a substantial release of radioactivity to the environment. Analytical and experimental research supported the development of a generic letter on steam generator tube integrity and alternate repair programs. Analyses were performed, using the SCDAP/RELAP code, for the Surry and Arkansas Nuclear One, Unit 2, plants to provide pressure and temperature profiles that were subsequently used in research tests to validate models for predicting the failure of steam generator tubes under severe accident conditions. Additional analyses were performed, using the MELCOR and MAACS codes, to evaluate offsite consequences of steam generator tube failures under severe accident conditions. To ensure that the research results reflect the behavior of actual service degradation, samples of steam generator tubes, tubesheet, and tube support plate elements were obtained from the retired McGuire steam generators. These samples will serve as the basis for the staff's independent evaluation of the integrity analyses and nondestructive examination methods being proposed for use by the industry.

Suppression Pool Suction Strainer Blockage. Another issue that NRC has been considering for several years stems from an event at a foreign plant in which the suction strainers in the suppression pool of a BWR became blocked during a relatively minor accident. Debris blockage of the suction strainers can impede or prevent the ECCS from injecting water into the reactor during an accident. As the staff examined this issue and the implications for U.S. plants, NRC initiated an aggressive regulatory and research program to address the issue. During FY 1997, the research program completed the technical basis to resolve the strainer blockage issue, including experimental testing and the development of a computer code for analyzing the generation, transport, and pump head loss

produced by LOCA-generated debris. The results of this program's work, coupled with related industry actions, led the U.S. industry to replace the BWR suction strainers with a new design, thereby mitigating a potentially serious condition.

Pressure Vessels. During FY 1997, the NRC undertook detailed evaluations of an industry proposal to significantly reduce the required inspections for BWR pressure vessels. NRC's concern was that the industry proposal could result in an unacceptably high probability of failure for the BWR pressure vessels. The research program delivered probabilistic fracture mechanics analyses of BWR vessels and provided significant technical contributions to the staff's final safety assessment of the industry proposal. The final outcome of this work was a decision by the staff to essentially eliminate the requirement to inspect the beltline circumferential weld in BWR pressure vessels, which will provide a significant burden reduction for the industry. However, the staff also identified a concern with the potential failure of the axial welds and will continue its dialogue with the industry on this important issue.

Motor-Operated Valves. Another area of significant interest to both the NRC and the industry is the aging and overall performance of mechanical components, such as motor-operated valves. A nuclear power plant has hundreds of safety-related motor-operated valves. Their operability and reliability are essential for preventing and mitigating accidents or, when needed, to shut down the reactor and maintain it in a safe shutdown condition. During FY 1997, the NRC published a report detailing research results on motor-operated valve actuator motor and gearbox testing. The results showed that the technical information published by the actuator manufacturer could result in overestimating the output torques of these critical components, which could result in a safety problem of considerable magnitude, that is, the failure of key valves during an operational transient that could exacerbate the severity of the transient. In response to these research results, the manufacturer is publishing updates to its technical information to correctly reflect the torque capacities of its motor actuators.

BWR Internals. One of the most obvious manifestations of aging degradation is the

cracking of metal components. Stress-corrosion cracking in BWR internals has been a problem for several years, and the staff and industry have been working to better understand and manage the problem. In those situations in which the cracking cannot be mitigated by mechanical repairs, components have been replaced. However, replacement is not always an attractive alternative, owing to cost and the resulting radiological dose to the plant staff. Consequently, the industry has been examining the use of weld repairs on irradiated reactor internal components. The NRC research staff examined the technical literature related to underwater welding of highly irradiated in-vessel components and published a report describing the initial findings, which suggest that underwater weld repairs may be viable for many applications. This initial research has led to further discussions between the industry and the NRC research staff regarding the additional experimental work that will be needed to demonstrate the technical adequacy of this underwater weld technique and the limits on its application. If this technique can be implemented, it offers the potential for a significant cost savings by allowing repairs of cracked internals components instead of requiring replacement.

Dry Cask Independent Spent Fuel Storage Installations. An area of significant concern to the NRC over the past year was the issue of cracking in the structural lid welds of the VSC-24 dry cask storage system. The VSC-24 system is used at three plant sites (Arkansas Nuclear One, Point Beach, and Palisades), and instances of cracking were observed in 4 of 19 casks. The NRC was concerned about the overall integrity of this design and the potential for a release of radioactive materials into the environment if one of these welds failed. In response, the NRC Spent Fuel Project Office (SFPO) issued Confirmatory Action Letters (CALs) to the affected licensees prohibiting them from loading VSC-24 casks until an evaluation could be completed. The NRC staff (from SFPO and the Offices of Nuclear Material Safety and Safeguards, Nuclear Regulatory Research, and Nuclear Reactor Regulation) was instrumental in evaluations regarding the determination of the root causes of the cracking and subsequent evaluations of the cask structural integrity. Subsequently, the staff required nondestructive volumetric examinations of the structural lid welds to provide confirmation

of structural integrity. The staff also conducted independent testing of the cask materials and independent fracture mechanics analyses to establish appropriate structural integrity criteria for the nondestructive examinations. On the basis of the testing and analyses, the staff was able to issue a safety assessment of several licensee submittals on the inspection and structural integrity of the VSC-24 that enabled lifting of the CALs in July 1998.

RESEARCH SUPPORT FOR INDUSTRY INITIATIVES AND ASSESSMENT OF NEW TECHNOLOGIES

As the nuclear power industry introduces new technologies into nuclear power plants to replace obsolete equipment and to improve performance, the NRC must have reasonable assurance that these technologies will not adversely impact safety. During FY 1997, research was performed in several areas to evaluate and assess new technologies. Experimental and analytical research was performed to develop both the analytical tools and the necessary criteria to review licensee proposals to increase fuel burnup to improve the economics of the fuel cycle. In addition, an update of the steady-state fuel behavior code, FRAPCON, was issued for use in auditing licensing submittals. An experimental program plan was also completed for measuring high-burnup effects on LOCA criteria and cladding mechanical properties. The results of the experimental program will ensure that adequate criteria are used in licensing safety analyses.

In another area, licensees are continuing to introduce advanced digital instrumentation into power plants to either replace obsolete analog instrumentation or to achieve performance improvements. Experimental and analytical research is continuing to develop the technical basis for safety reviews of these applications. In FY 1997, this research resulted in the issuance of six regulatory guides directed toward assuring high functional reliability and design quality in software used in safety systems.

Finally, experimental and analytical research continued in FY 1997 to support certification review of the AP600 design. An integrated probabilistic and thermal-hydraulic screening of the AP600 design was completed to identify

safety-significant transients. Analyses of small- and large-break LOCAs were performed, using the RELAP5 and TRAC-P thermal-hydraulic computer codes, to assess the adequacy of system performance of the design. Further, a series of beyond-design-basis accident tests were completed at the ROSA and APEX facilities to assess the thermal-hydraulic performance of the Westinghouse proposed passive safety systems used in the AP600 design and a series of tests were completed to provide confirmatory data on the performance of passive autocatalytic recombiners (PARs). The PARs, proposed by Westinghouse for use in AP600, are to provide for control of hydrogen following a design-basis accident.

REDUCTION OF UNNECESSARY LICENSEE BURDEN

The following proposed rulemakings were promulgated to reduce unnecessary licensee burden which, in turn, would allow licensees to redirect their limited resources to activities that have greater safety significance:

A proposed rule to change the audit frequency for emergency planning and safeguards contingency plans (10 CFR Parts 50 and 73). The proposed rule responded to petitions for rulemaking (PRM-50-59 and PRM-50-60) on these issues.

A proposed rule to update the requirements for the physical security of nuclear power reactors by revising or eliminating requirements in five areas: key controls for access to vital areas, maintenance of access lists for vital areas, response to vital area doors, search requirements for on-duty guards, and requirements for vehicle escort (10 CFR Part 73).

A proposed rule to amend the regulations regarding appropriate relief from insurance coverage for various spent fuel configurations during permanent plant shutdown. This change addressed a petition for rulemaking (PRM-50-57).

A proposed rule to modify the financial assurance requirements for decommissioning nuclear power plants under certain circumstances.

IMPROVEMENTS IN THE REGULATORY FRAMEWORK

The following actions were taken to improve the regulatory framework.

The NRC staff completed research in the earth sciences and earthquake engineering and coordinated their results with the Electric Power Research Institute's results in these areas. This research resulted in publication in FY 1997 of a final rule amending the seismic and geologic siting and earthquake engineering criteria for new nuclear power plant applicants. The amendment to the regulation now explicitly recognizes that there are inherent uncertainties in establishing the seismic and geologic design parameters and allows for the option of using a probabilistic seismic hazard methodology capable of propagating uncertainties as a means of addressing these uncertainties. The amended regulation also provides an option for an applicant to eliminate some response and design analyses, thereby eliminating one of the major criticisms of the previous regulation. Four regulatory guides and three standard review plan sections were published in FY 1997 that provide guidance to an applicant on procedures and acceptance criteria acceptable for NRC staff review of the conduct of (1) siting investigations; (2) probabilistic seismic hazard analyses, determining the earthquake ground motion used in design; and (3) plant shutdown and restart following an earthquake.

A proposed rule was promulgated to require licensees to prepare, conduct, and grade the licensing examinations given to reactor operators and senior reactor operators (10 CFR Part 55). Although not specified in the *Code of Federal Regulations*, current practice was for the NRC or its contractors to prepare and conduct these examinations. The results of a pilot program indicate that, with experience, the licensees can do an adequate job of preparing, conducting, and grading these examinations.

NRC published Volume 1 of NUREG/CR-6504, "An Updated Nuclear Criticality Slide Rule," which contains the technical basis for the slide rule. This functional slide rule provides a more efficient and readily usable method for estimating pertinent nuclear criticality accident information.

Analysis and Evaluation of Operational Plant Data

Trends in overall safety performance of power reactors were derived from many activities of the Office for Analysis and Evaluation of Operational Data (AEOD). The Performance Indicator (PI) and Accident Sequence Precursor (ASP) Programs have been applied to analyze data and information in a consistent manner over a number of years. As measured by these indicators, U.S. industry average safety performance has improved steadily. The number of precursors occurring annually has declined significantly since 1984, and five of the seven performance indicators—automatic scrams, safety system actuations, significant events, equipment forced outages per 1000 critical hours, and collective radiation exposure—show statistically significant improvement since 1985. The number of initiating events resulting in scrams has declined significantly, and this decline is reflected in fewer and less complicated plant transients (safety system actuations, significant events, and ASPs). However, equipment problems persist, as evidenced by the percentage of scrams caused by equipment failure (the leading cause of all scrams), the relatively constant values for safety system failures and the forced outage rate since 1985, and the lack of improvement in equipment forced outages per 1000 critical hours since 1994. Industry average unit availability and capacity factors also improved considerably between 1985 and 1995. However, this improvement was due not to fewer forced outage hours, but to greatly reduced scheduled outage hours. This is a consequence of longer fuel cycles, which result in greater intervals between refueling outages, and of shorter refueling outages. Industry average availability and capacity factors declined in 1996 and 1997 primarily because a number of plants were in extended shutdown.

Accident Sequence Precursor Program. The ASP Program is a formal program in which nuclear power plant events are analyzed using PRA techniques. The ASP Program quantitatively evaluates operational experience using a rigorous method that integrates actual initiating events, plant conditions, and the reliability of standby safety equipment into an overall quantitative assessment, which is expressed as a conditional

core damage probability (CCDP). An ASP is an operational event or plant condition that is an important element of a postulated core-damaging (severe accident) sequence. Sequences considered in the ASP Program are those associated with inadequate core cooling, which would be expected to result in core damage. Results of the ASP Program are peer-reviewed by outside consultants, other NRC offices, and the affected licensees. They are used in NRC initiatives such as the Senior Management Meeting process. There were six ASP events or conditions in 1997, none of which resulted in a CCDP equal to or greater than 10^{-3} . There were no civilian nuclear reactor accidents in 1997. Figure 2.9 shows conditional core damage probability results from the ASP Program.

risk-significant systems in U.S. commercial reactors. The data are obtained from licensee event reports, special reports, and monthly operating experience reports. The studies cover the period from 1987 through 1993. A study of the reactor core isolation cooling system was completed in 1997. Studies of the emergency diesel generator (EDG) trains in all plants with EDGs, of the isolation condenser systems of the five U.S. BWRs that have that system, and of the high-pressure coolant injection system in the 23 BWRs with that system were completed in previous years.

System Reliability Studies. AEOD uses operational data to determine the reliability of

Abnormal Occurrences. AEOD administers the Commission's program for reporting abnormal occurrences (AOs) to Congress. AOs are incidents or events that the Commission determines are significant from the standpoint of public health and safety. In its 1997 report to Congress, AEOD

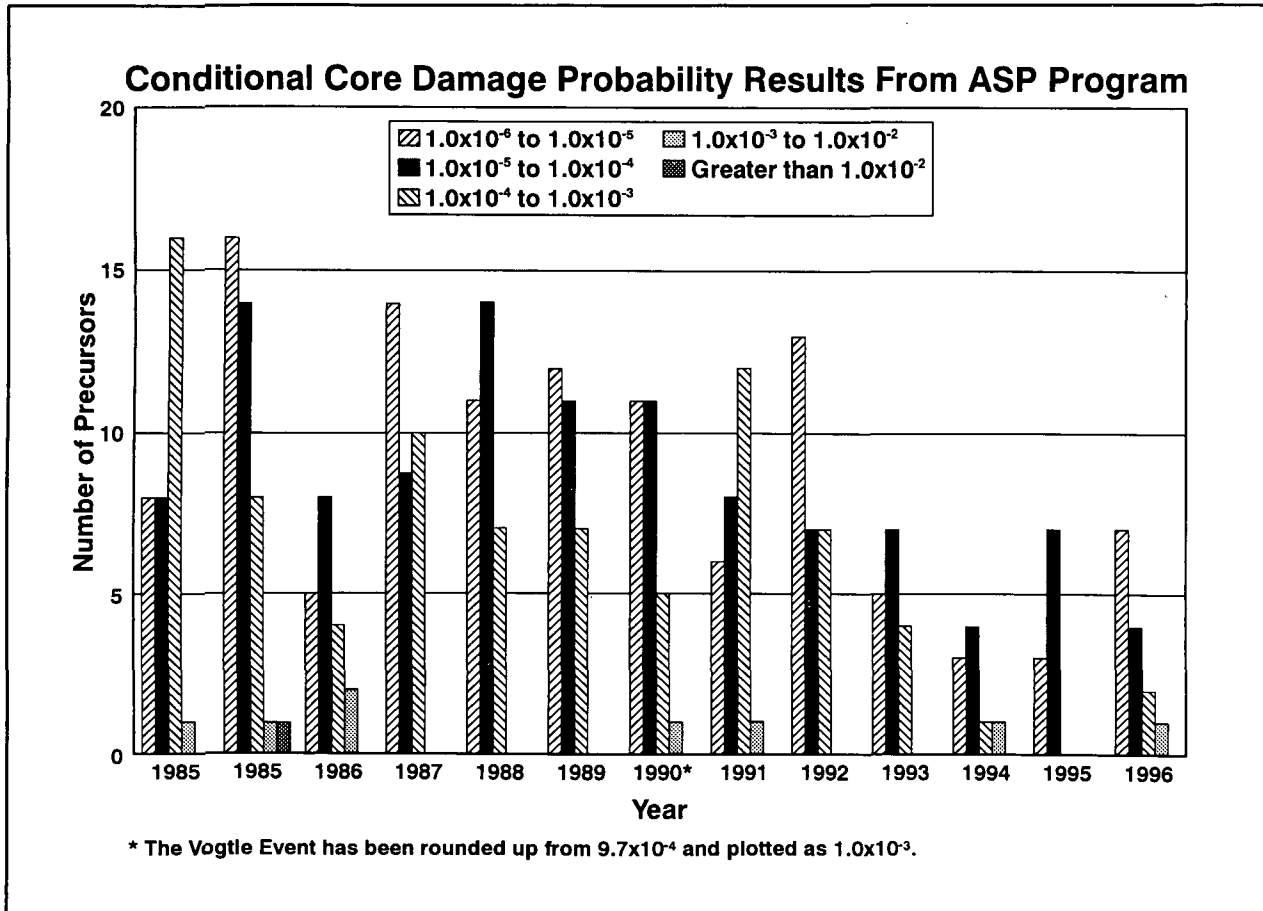


Figure 2.9 Distribution of ASP Conditional Core Damage Probabilities by Calendar Year

described one AO that occurred at a nuclear power plant involving the loss of two of three high-pressure injection pumps at Oconee Nuclear Station Unit 3. A detailed description of this event may be found in NUREG-0090, "Report to Congress on Abnormal Occurrences, Fiscal Year 1997," Vol. 20. The number of AOs at nuclear power plants since 1988 has remained low, averaging two per year. There were no AOs at nuclear power plants in 1997 due to significant radiation exposures.

Radiation Exposures and Overexposures. All NRC licensees are required to monitor employee exposure to radiation and radioactive materials at levels sufficient to demonstrate compliance with the occupational dose limits specified in 10 CFR Part 20. Licensees of power reactors are required by 10 CFR 20.2206 to provide to the NRC annual reports of exposure data for individuals for whom personnel monitoring is required. These data for 1973 and 1991 through 1996 (the latest year for which data are available) are summarized in Table 2.1 by calendar year, and in Table 2.2 the data for 1996 are compared to the classes of nuclear materials licensees that are required to submit annual exposure reports.

Almost all radiation doses from nuclear power plants are occupational doses, that is, doses to nuclear power plant employees and contractors who work at the plant. The economics of

operating a plant creates a strong impetus to reduce exposures and achieve ALARA (as low as reasonably achievable) objectives. As a result, utility violations of NRC limits on personnel exposure are rare, and the vast majority of nuclear power plant personnel have annual exposures far below NRC regulatory limits specified in 10 CFR Part 20. This fact is believed to result primarily from the licensees' extensive dose-reduction efforts. Some measures that reduce collective exposure are an effective maintenance program, experienced and well-trained personnel, a good water chemistry control program, effective decontamination and cleanup practices, good fuel cladding integrity, effective radiation exposure control programs, good housekeeping, and an alert health physics staff.

Although commercial reactor occupational exposures have been maintained at a low level, a few overexposures continue to occur. The number of occupational overexposures in NRC-licensed reactor and nuclear materials facilities for 1991 through 1996 are given in Table 2.2. Radiography activities typically result in the highest cumulative doses and thus provide a reasonable basis for comparison to reactor activities. See Table 3.3 in Chapter 3, "Nuclear Materials Safety." Although the data for 1997 have not yet been compiled, there have been no reports of deaths or significant radiation exposures at civilian nuclear reactors in 1997.

Table 2.1 Annual Occupational Exposure Data for Commercial Reactors, 1973 and 1991 to 1996

Year	No. of Reactors	Collective TEDE (person-cSv [rem])	No. of Workers with Measurable TEDE	Average Measurable TEDE per Worker (cSv [rem])
1973	24	13,962	14,780	0.94
1991	115	28,528	91,085	0.31
1992	114	29,298	94,317	0.31
1993	114	26,365	86,187	0.31
1994	109	21,695	73,780	0.29
1995	109	21,674	70,986	0.31
1996	109	18,874	68,182	0.28

Source: Radiation Exposure Information Reporting System, funded by the Office of Nuclear Regulatory Research. All reactor data are adjusted to account for multiple counting of transient reactor workers.

Table 2.2 Occupational Exposure Data for NRC Licensees in 1996

Category	No. of Licensees Reporting	Collective TEDE (person-cSv [rem])	No. of Workers with Measurable TEDE	Average Measurable TEDE per Worker (cSv [rem])
Reactors	109	18, 874	68,182	0.28
Industrial Radiography	144	1385	2537	0.55
Manufacture & Distribution	36	556	1239	0.45
Fuel Fabrication & Processing	8	878	3061	0.29
Low-Level Waste Disposal	2	8	67	0.12
Independent Spent Fuel Storage	1	54	53	1.02

Source: Radiation Exposure Information Reporting System

Advisory Committee on Reactor Safeguards

The ACRS, established by statute in 1957 by revision of the Atomic Energy Act of 1954, provides advice to the NRC on potential hazards of proposed or existing reactor facilities and the adequacy of proposed safety standards. The Atomic Energy Act also requires that the ACRS advise the Commission with respect to the safety of operating reactors and perform such other duties as the Commission may request. Consistent with the Energy Reorganization Act of 1974, the committee will review any matter related to the safety of nuclear facilities and activities of the DOE that DOE requests. Upon request, the ACRS also provides advice to the Defense Nuclear Facilities Safety Board and the U.S. Navy. In addition, the ACRS, on its own initiative, reviews specific generic matters on nuclear facility safety-related items.

The ACRS reviews requests for preapplication site and standard plant design approvals, as well

as applications for construction permits, operating licenses for power reactors, 10 CFR Part 52 licenses, and certain test reactor facility licenses for construction and operation. With respect to reactors that are already licensed to operate, the ACRS is involved in the review and evaluation of any substantive licensing changes, corrective actions resulting from operating events and incidents, and the resolution of generic safety issues.

Activities of the ACRS are conducted in accordance with the Federal Advisory Committee Act (FACA), which provides for public attendance at and participation in ACRS meetings. Consistent with the charter of the ACRS and FACA requirements, unclassified ACRS reports are made part of the public record. The ACRS Web address is <<http://www.nrc.gov/ACRSACNW/>>.

The ACRS membership is drawn from various scientific and engineering disciplines. Its current membership includes those experienced in the areas of nuclear power plant operations; probabilistic risk analysis; analysis of severe reactor accident phenomena; design of plant structures, systems, and components; material

sciences; mechanical, civil, and electrical engineering; and digital I&C systems.

During FY 1997, the ACRS completed its annual Report to Congress on the NRC Safety Research Program and other closely related matters (ACRSR-1681, 02/21/97: ACRS 1996 Report to Congress on the USNRC's Safety Research Program).

The following reports were among the most significant ACRS contributions during FY 1997:

ACRSR-1666, 11/18/96—Plant-Specific Application of Safety Goals

ACRSR-1669, 11/19/96—Position on Direction-Setting Issue 22—Future Role of NRC Research

ACRSR-1683, 03/17/97—Proposed Standard Review Plan Sections and Regulatory Guides for Risk-Informed, Performance-Based Regulation

ACRSR-1691, 04/08/97—Proposed Regulatory Guidance Related to Implementation of 10 CFR 50.59 (Changes, Tests and Experiments)

ACRSR-1694, 04/11/97—Risk-Based Regulatory Acceptance Criteria for Plant-Specific Application of Safety Goals

ACRSR-1696, 04/18/97—Establishing a Benchmark on Risk During Low-Power and Shutdown Operations

ACRSR-1700, 06/17/97—Proposed Staff Position Regarding Inclusion of a Containment Spray System in the AP600 Design

ACRSR-1701, 06/17/97—Proposed Final Generic Letter, "Assurance of Sufficient Net Positive Suction Head for Emergency Core Cooling and Containment Heat Removal Pumps"

ACRSR-1707, 06/23/97—Regulatory Guidance for Implementation of Digital Instrumentation and Control Systems

ACRSR-1709, 07/14/97—Proposed Regulatory Guide and Standard Review Plan Chapter for Risk-Informed, Performance-Based Inservice Inspection

ACRSR-1716, 09/10/97—Proposed Rulemaking for Shutdown and Fuel Storage Pool Operations at Nuclear Power Plants

ACRSR-1717, 09/10/97—Staff Action Plan to Improve the Senior Management Meeting Process

ACRSR-1719, 09/10/97—Boiling Water Reactor Pressure Vessel Shell Weld Inspection Recommendations (BWRVIP-05)

ACRSR-1723, 09/19/97—Site-to-Site Variation in Risk-Based Regulatory Acceptance Criteria for Plant-Specific Application of Safety Goals

In performing the reviews and preparing the reports cited, the ACRS holds subcommittee meetings as needed, and 10 full committee meetings throughout the year.

Enforcement and Investigative Actions

SIGNIFICANT COMMISSION ADJUDICATORY DECISIONS

The Commission exercises its appellate adjudicatory authority when a party to an NRC adjudicatory proceeding seeks Commission review of an Atomic Safety and Licensing Board decision. In addition, the Commission on its own motion may choose to review a Licensing Board decision, or the Board may refer novel legal issues directly to the Commission for the Commission's guidance. The Office of Commission Appellate Adjudication, in consultation with the Office of the General Counsel, assists the Commission in exercising these adjudicatory or related matters. The following summaries provide a brief description of the most significant decisions issued by the Commission in FY 1997.

Cleveland Electric Illuminating Co. (Perry Nuclear Power Plant) CLI-96-13, 44 NRC 315 (1996)

This Commission order clarified that not all agency approvals granted by the NRC staff to a licensee constitute a license amendment and trigger a right to a hearing under section 189a of the Atomic Energy Act. Specifically, the

Commission reversed a Licensing Board order that had declared that all changes made to the withdrawal schedule for reactor vessel material specimens must be treated as a license amendment simply because such changes required prior NRC approval. Under the Commission decision, the need for a license amendment depends upon whether an NRC staff approval grants the licensee any greater operating authority than that already provided under the terms of the existing operating license. The Commission thus emphasized that where an NRC approval does not permit the licensee to operate in any greater capacity than originally prescribed, and all relevant regulations and license terms remain applicable, the NRC authorization does not amend the license. The Commission's ruling assists licensees and the NRC staff in distinguishing between those licensee changes that require a license amendment and those that do not.

Ralph L. Tetrick (Denial of Application for Reactor Operator License) CLI-97-10, 46 NRC 26 (1997)

In this decision, the Commission made clear that it is impermissible for a presiding officer to round up a near-passing score on a reactor operator examination, and by doing so transform the final score into a passing grade. Accordingly, the Commission reversed a presiding officer's decision that had rounded up an examination score and then ordered the NRC staff to issue the operator a senior reactor operator license. The Commission deferred to the NRC staff's policy judgment that the required 80-percent threshold score for passing the examination is an absolute minimum passing grade, which should not be eroded by the rounding up of an otherwise failing score.

ADJUDICATORY HEARINGS

Adjudicatory hearings at the NRC are conducted by three-member licensing boards or single presiding officers drawn from the Atomic Safety and Licensing Board Panel. Panel licensing boards consist of three administrative judges, usually one legal member and two technical members, assigned to cases in which their specific knowledge and expertise will assist in resolving the technical

and legal matters at issue in the proceeding. Single presiding officer proceedings are usually assigned to legal judges. However, the Panel's policy in such proceedings is to assign a scientific administrative judge to assist the presiding officer on technical matters, thereby providing the scientific expertise so important in traditional three-member licensing board cases.

Panel judges are lawyers or technical members with expertise in a wide variety of disciplines. Their appointment to the Panel is based upon recognized experience, achievement, and independence in the appointee's field of expertise. During FY 1997, the Panel comprised 33 administrative judges (12 full-time and 21 part time). By profession, they included 7 lawyers, 10 public health and environmental scientists, 13 engineers or physicists, and 3 medical doctors.

Panel judges hear and decide a variety of cases at the NRC. The most significant to the licensing process concern reactor licensing where, as provided by the Atomic Energy Act of 1954, as amended by the Energy Reorganization Act of 1974 and the Energy Policy Act of 1992, a hearing is required on every application for a combined construction permit and operating license for a nuclear facility that produces electric power; *reactor license amendments* that allow affected parties to challenge proposed license amendments for nuclear reactors; *materials licensing* that allows affected persons to contest NRC licensing actions involving the commercial use of nuclear materials; and *enforcement hearings* that allow individuals, employees, licensees, contractors, subcontractors, and vendors to contest fines or sanctions imposed by the NRC staff for alleged infractions of NRC regulations. Other hearings concern *antitrust* cases that allow affected parties to challenge the licensing of nuclear reactors if the operation of such reactors would create or maintain a situation inconsistent with the antitrust laws; *special proceedings* that can be ordered by the Commission for any nuclear-related matter; *personnel-related disputes* in which NRC employees are allowed to bring grievance cases and Equal Employment Opportunity cases before Panel judges or other forums; and *Program Fraud Civil Remedies* hearings that allow NRC employees and other individuals to contest NRC action against them for alleged fraudulent claims they made to the NRC.

These hearings may be either formal or informal. The formal proceedings usually are conducted by three-member licensing boards and consist of procedures similar to those used in non-jury Federal court cases, including pre-trial discovery between the parties and formal trial procedures at the hearing. Informal hearings utilize a single administrative judge acting as presiding officer and usually utilize written submittals by the parties instead of a formal oral evidentiary hearing on the record. The NRC uses formal hearings for cases involving reactor licensing and for enforcement proceedings brought by the agency against individuals, while informal hearings are used in materials licensing cases.

Utilizing New Technologies. The Panel has pioneered the use of computer support systems and other technologies for almost two decades. These systems have proven to be particularly important for expediting adjudicatory proceedings, managing the Panel's voluminous and complex hearing records, and dealing with administrative tasks. Panel innovations for expediting hearings have included the creation of full-text searchable computerized records in these large, complex cases. To assist in decision writing, the judges can now access these full-text records and other documents from their computers while simultaneously performing legal research through external systems such as LEXIS and WESTLAW.

Electronic Docket. The Panel's electronic docket has considerably enhanced document availability and case management techniques. For selected complex hearings, the full text of significant documents such as pre-filed testimony and hearing transcripts is indexed and entered into an electronic database containing indexing, companion search, and retrieval capabilities. Case management also has been aided by Panel utilization of the NRC's local area network (LAN) system. This new system, which is PC LAN based using Personal Librarian Software that can be maintained on a stand-alone personal computer, has proven to be much less costly and more efficient than the Panel's 1980's INQUIRE system, a full-text database manager for document storage.

Hearing Room Innovations. The Panel has also pioneered cost-saving technology in its Headquarters Hearing Room, innovations that

judges and court administrators from the United States and abroad have come to examine. These innovations include a voice-activated video court reporting system in the Panel Hearing Room at Two White Flint North that eliminates the need for more costly court reporters and that also serves as a platform for a video conferencing system. Courtroom technology also has been enhanced by installation of a courtroom LAN system which, through laptop computers, allows the presiding officer, counsel, and witnesses to locate and view electronic text of or imaged versions of exhibits and record materials, perform word processing or spreadsheet functions, and research legal issues using LEXIS/NEXIS, WESTLAW, or CD-ROM library material via outside computer databases. Other innovations include a new speaker phone system in the hearing room that permits conference calls between the presiding officer and offsite parties.

Information concerning the foregoing innovations, together with the Panel's 1996 and 1997 decisions, its rules of procedure, and brief profiles of its judges, are available to the public on its home page at <<http://nrc.gov/NRC/ASLBP/homepage.html>>. These courtroom innovations are particularly cost-effective, paying for themselves through transcript and travel savings to all parties in the first year and returning like savings in ensuing years.

PANEL CASELOAD

In FY 1997, the Panel's caseload primarily involved enforcement actions against licensees, contested license amendment proceedings for power reactors, and nuclear materials licensing proceedings. Over the next several years, the Panel expects an infusion of new proceedings involving license renewals for existing reactors and the storage and disposal of high-level waste.

In FY 1997, the Panel's caseload comprised a total of 27 cases. Of these cases, 11 involved nuclear power plants or related facilities, and 16 involved other Commission licensees. During the year, 15 new contested cases were docketed, and 16 cases were closed by Panel licensing boards and presiding officers. Of these 16 closed cases, the (1) Louisiana Energy Services (LES), (2) Georgia Institute of Technology, and (3) Sequoyah Fuels Corporation proceedings were particularly significant.

The first case, the **Louisiana Energy Services (LES)** proceeding, concerned an application for a combined construction permit-operating license for a gas centrifuge enrichment plant by LES proposed to be built near Homer, Louisiana. The application was opposed by a local public interest group, Citizens Against Nuclear Trash (CANT). Three partial initial board decisions were issued during FY 1997. (The first partial initial decision, LBP-96-7, was issued in FY 1996.)

In the first FY 1997 partial LES decision issued on December 3, 1996, the licensing board resolved certain of CANT's environmental and financial qualification contentions. CANT's environmental contentions had alleged that the staff's Environmental Report (ER) and Final Environmental Impact Statement (FEIS) for the facility had not adequately treated the "no-action" alternative (that is, the alternative of not issuing the license) required for the FEIS. The board sustained this contention, in part, agreeing with CANT that the facility was not needed and that the staff's treatment of this issue in the FEIS was inadequate. In so concluding, the board found that the applicant would merely be a fifth producer whose total costs of production were comparable to a number of other competitors in an already highly competitive market and that the proposed plant would have little, if any, effect on price competition. The board also found that the staff's treatment in the FEIS of the "no-action alternative" and the cost-benefit analysis was not detailed enough and included improper factors such as job-creation benefits from plant construction. CANT contended that LES had not demonstrated that it was financially qualified to construct the facility. In sustaining this contention, the board concluded that LES had neither the required assets for construction funds nor commitments from its general or limited partners to provide necessary funding. This finding was without prejudice to LES's acting to amend its financial plan to conform to the requirements of the Commission's regulations. *Louisiana Energy Services, L.P.* (Claiborne Enrichment Center), LBP-96-25, 44 NRC 331 (1996).

The second LES decision during the fiscal year was issued on March 7, 1997. This decision resolved CANT's decommissioning funding contention challenging the adequacy of the treatment in the FEIS of the economic costs of

disposing of uranium tails from the enrichment facility. The staff and LES had asserted that the tails disposal strategy and cost estimates for such disposal were reasonable while CANT claimed that this disposal would cost at least 10 times more than the estimate. The board found that the tails disposal strategy and cost estimates were reasonable except for that part of the disposal plan in which depleted UF₆ would be converted to U₃O₈. According to the board, the cost for that disposal phase had not included the substantial cost of neutralizing the byproduct, hydrofluoric acid. On the basis of a significant cost discrepancy caused by this omission, the board sustained CANT's contention. *Louisiana Energy Services, L.P.* (Claiborne Enrichment Center), LBP-97-3, 45 NRC 99 (1997).

The final LES decision was issued on May 1, 1997, and dealt with CANT's environmental justice claim that the project would discriminate against minorities residing near the facility. This contention was based on Executive Order 12898 that directs Federal agencies to identify actions taken by them that have disproportionately high and adverse health or environmental effects on minority and low-income populations and to ensure that these actions do not discriminate against persons because of race, color, or national origin. Emphasizing the difficulties frequently encountered in ferreting out race discrimination, the board concluded that the criteria of this Executive Order had not been met and that a more thorough staff investigation of the facility site selection process for the Claiborne facility was required. In addition, the board specifically found that the staff's FEIS failed to adequately assess the impacts of relocating the parish road connecting the African American communities of Forest Grove and Center Springs, Louisiana, and the economic impacts of the facility on properties in those communities. *Louisiana Energy Services, L.P.* (Claiborne Enrichment Center), LBP-97-8, 45 NRC 367 (1997). In light of the findings in these partial initial decisions, the board denied LES's requested authorization for a license.

The second case, the **Georgia Institute of Technology** proceeding, concerned the license renewal of this university's on-campus research reactor in Atlanta, Georgia. A local public interest group had initially claimed that security for the reactor was inadequate to prevent sabotage during the Olympic Games held in Atlanta in 1996.

Before the hearing, that particular issue became moot following voluntary removal by the university of fuel from the reactor during the pendency of the games. LBP-95-19, 42 NRC 191 (1995). The case ultimately went to hearing on the issue of the adequacy of the reactor's management. To support the charge of management incompetence and bad faith, the intervenor presented numerous witnesses, including several former radiation safety officers who had been fired or transferred to other parts of the university by current managers. In an April 3, 1997, decision, the board determined that the university had alleviated the managerial deficiencies that occurred earlier and that its record with respect to violations had improved. The board accordingly found that the current management regime for the reactor was acceptable. *Georgia Institute of Technology* (Georgia Tech Research Reactor), LBP-97-7, 45 NRC 265 (1997).

The third case, the **Sequoyah Fuels** proceeding, involved an order by the NRC to Sequoyah and its parent corporation, General Atomics, holding both companies responsible for decommissioning funding of Sequoyah's licensed facilities in Gore, Oklahoma. During the hearing, the staff and General Atomics submitted a settlement agreement for approval by the board which, among other things, released General Atomics from liability for the decommissioning in exchange for a decommissioning payment ranging from \$9 million to \$5 million, depending upon tax treatment allocated to it. The board had previously approved a settlement agreement submitted by the staff and Sequoyah. The intervenors and the State of Oklahoma asserted that the settlement was not in the public interest and did not meet financial assurance regulatory requirements for decommissioning. The board, however, accepted the settlement on the grounds that neither the State nor the intervenors had propounded any evidence that the settlement's terms would adversely affect public health and safety. The board explained that it was required under 10 CFR 2.203 to accord "due weight to the position of the Staff" for negotiated settlements and that the question in this case was not whether the best settlement possible had been obtained but whether the agreement was in the public interest. The board emphasized that the staff's settlement was a calculated risk and that if the staff's unique legal theory of holding General Atomics liable as

a *de facto* licensee did not prevail during litigation, then no money would become available from General Atomics for the Sequoyah decommissioning. *Sequoyah Fuels Corporation and General Atomics*, LBP-96-24, 44 NRC 249 (1996).

Other cases closed by licensing boards and presiding officers during FY 1997 included the following:

***Juan Guzman*, LBP-96-20, 44 NRC 128 (1996).**

This proceeding, involving a staff enforcement order barring Mr. Guzman from any involvement in NRC-licensed activities for five years, was concluded on October 16, 1996, following a settlement agreement between Mr. Guzman and the staff.

***Washington Public Power Supply System (WPPSS Nuclear Project No. 3)*, LBP-96-21, 44 NRC 134 (1996).**

This proceeding, concerning the application for a reactor operating license for WPPSS 3, was terminated on October 6, 1996, following WPPSS's motion to withdraw its application.

***General Public Utilities Nuclear Corp. (Oyster Creek Nuclear Generating Station)*, LBP-97-1, 45 NRC 7 (1997).** This proceeding, concerning opposition by two intervenors to a license amendment that would have allowed movement of a dry shielded canister plug in Oyster Creek's spent fuel pool, was terminated by summary disposition on January 31, 1997, after the board concluded that nothing in "Control of Heavy Loads at Nuclear Power Plants" (NUREG-0612; July 1980), or subsequent staff generic letters seeking licensee implementation of that document's guidance, precluded issuance of the requested amendment.

***Ralph N. Tetrick*, LBP-97-11, 45 NRC 441 (1997).**

This proceeding concerned whether Mr. Tetrick had passed a Reactor Operator's License examination. Although the presiding officer determined that one of the questions on the examination was ambiguous and should be disallowed, Mr. Tetrick had still not achieved a passing score.

***University of Cincinnati*, LBP-97-5, 45 NRC 128 (1997).** This proceeding, initiated by the university after the staff had refused to grant its license amendment request that would have allowed

visitors of radiation therapy patients at the university's hospital to receive higher radiation doses, was terminated after the staff reconsidered its denial and granted the requested amendment.

Atlas Corporation (Moab, Utah, facility), LBP-97-9, 45 NRC 414 (1997). This proceeding, involving a challenged license amendment request from a *pro se* petitioner that would have allowed Atlas to extend the time by which it was to place a final radon barrier on its mill tailings pile at the facility, was terminated on May 16, 1997, when the petitioner failed to submit an adequate explanation of his standing to intervene.

Frank J. Calabrese, LBP-97-16, 46 NRC 66 (1997). This proceeding, concerning review by a presiding officer of a staff denial of a senior operator's license, was terminated on September 26, 1997, following a determination by the presiding officer that the staff's denial was justified

International Uranium (USA) Corporation (White Mesa Uranium Mill), LBP 97-14, 45 NRC 55 (1997). This proceeding, involving a challenge from several Native American petitioners to a license amendment permitting the licensee to receive and process alternated feed material at its mill, was terminated on September 4, 1997, after a finding by the presiding officer that petitioners had not demonstrated standing by showing potential injury to their members.

Northern States Power Company (Prairie Island Nuclear Facility), LBP 97-13, 46 NRC 11 (1997). This proceeding, involving a challenge to a proposed license amendment that would have allowed the licensee to store spent fuel at an offsite location away from the nuclear reactor site, was terminated after State court litigation resolved the issues in the NRC proceeding.

James L. Shelton and TESTCO, INC., LBP-96-16, 44 NRC 12 (1996). This proceeding, concerning a staff action seeking to preclude Mr. Shelton from nuclear-related activities for three years and a monetary penalty levied against TESTCO, was terminated on October 1, 1996, following a settlement by the parties.

Illinois Power Company and Salient Power Cooperative (Clinton Power Station, Unit No. 1), LBP-97-4, 45 NRC 125 (1997). This proceeding

was terminated on March 11, 1997, following a decision by a competitor of Salient Power Cooperative to withdraw its intervention petition.

Investigations

The information in this FY 97 NRC Annual Report is taken from the Office of Investigation's (OI's) annual report to the Commission of its activities and actions. The FY 1997 OI Annual Report (14 pages, including attachments and graphs) was completed in January 1998. A copy is available for your information upon request to e-mail address: <BSB@nrc.gov>.

OI conducts investigations of alleged wrongdoing by individuals or organizations who

- are licensed by the NRC,
- are applicants for licenses, or
- are licensee contractors or vendors.¹

The NRC received over 1,200 allegations regarding potential violations of its rules, regulations, or requirements during FY 1997. Of these allegations, 16 percent involved potential wrongdoing. OI responded to these wrongdoing allegations by opening 206 investigations in FY 1997. In addition, OI continued work on over 128 investigations, which were begun in FY 1996 or prior years, thereby creating a total inventory of 334 investigations conducted in FY 1997. Of these investigations, OI completed 238, which is 71 percent of the total inventory. Approximately 10 percent of these cases involved multiple suspected wrongdoing violations.

OI surpassed its performance goal to complete each case within 12 months, on average. The FY 1997 average for completing a case was 7 months. In addition, the active inventory of cases open longer than 12 months was decreased by 44 percent from the FY 1996 inventory. Only 8 percent of the cases in the current OI open case inventory have been open for over 12 months.

The cases that OI fully investigates to reach a conclusion either substantiating or not

¹Note that allegations involving NRC employees or contractors to the NRC come under the purview of the NRC's Office of the Inspector General, and not under the purview of OI.

substantiating an allegation of wrongdoing are the cases that generally have the greatest impact on the NRC regulatory process. These cases represented 81 percent of the investigations closed in FY 1997.

Of the 238 cases closed, 72 cases were referred to the Department of Justice (DOJ) for prosecutorial review. During FY 1997, OI supported five Federal grand juries; this support was not necessarily associated with cases referred to the DOJ in FY 1997.

NRC took 242 escalated enforcement actions in FY 1997. In 68, or 28 percent, of these actions, the OI investigative findings were factored into the decision to take escalated enforcement action. OI's findings contributed to enforcement decisions for civil penalties in this fiscal year totaling over \$1 million dollars, a 28-percent increase over the penalty amount for FY 1996.

Enforcement

The Commission has developed an enforcement program and an Enforcement Policy to support the NRC's overall safety mission in protecting the public and the environment. Consistent with that purpose, enforcement action is used as a deterrent to emphasize the importance of compliance with regulatory requirements and to encourage prompt identification and prompt, comprehensive correction of violations. The Office of Enforcement (OE) is responsible for managing the Commission's enforcement program. The NRC's enforcement program is addressed in the agency's Enforcement Policy, NUREG-1600, Rev. 1, "General Statement of Policy and Procedure for NRC Enforcement Actions."

ESCALATED ENFORCEMENT ACTIVITIES

All violations identified through inspections and investigations are subject to civil enforcement action and may also be subject to criminal prosecution. After an apparent violation is identified, the severity is evaluated in order to determine the appropriate enforcement sanction. Severity levels range from Level I for the most

significant violations to Level IV for those of more than minor concern. Minor violations are not subject to formal enforcement action. The NRC considers violations categorized at Severity Level I and II to be very significant, as well as enforcement actions consisting of multiple Severity Level III violations. During FY 1997, the agency issued one Severity Level I violation, 12 Severity Level II violations, and 10 multiple Severity Level III violation actions to reactor licensees.

The NRC uses three primary enforcement sanctions: Notices of Violation (NOVs), civil penalties, and orders. The NRC considers civil penalties, orders, and NOVs that include Severity Level I, II, and III violations, as escalated enforcement actions.

An NOV sets forth one or more violations of a legally binding requirement and normally requires a response from the licensee describing the reasons for the violation, the corrective steps taken or planned, and the date when actions will be complete. During FY 1997, the agency issued 41 escalated NOVs to reactor licensees.

A civil penalty is a monetary fine considered for Severity Level III violations and normally assessed for Severity Level I and II violations and knowing and conscious violations of reporting requirements of Section 206 of the Energy Reorganization Act. Section 234 of the Atomic Energy Act provides for penalties of up to \$100,000 per violation per day, but that amount was adjusted by the Debt Collection Improvement Act of 1996 to \$110,000. During FY 1997, the agency proposed 70 individual civil penalties to reactor licensees. Table 2.3 includes additional civil penalty information.

In addition to NOVs and civil penalties, orders may be used as enforcement sanctions to modify, suspend, or revoke licenses. Orders may require additional corrective actions, such as removing specified individuals from licensed activities or requiring additional controls or outside audits. Persons adversely affected by orders that modify, suspend, or revoke a license, or that take other actions may request a hearing. During FY 1997, the agency issued one order to a reactor licensee.

Table 2.3 Civil Penalty Information

	FY 97
Number of Proposed Civil Penalties	70
Amount of Proposed Civil Penalties	\$6,146,003
Number of Imposed Civil Penalties	3
Amount of Imposed Civil Penalties	\$250,000

In addition, three civil penalty imposition orders were issued.

A predecisional enforcement conference is normally conducted if the NRC concludes that it is necessary or the licensee or the individual requests it. During FY 1997, the agency conducted

a total of 181 conferences for reactor and material licensees.

The NRC issues a press release with a proposed civil penalty or order. All orders are published in the *Federal Register*.

Additional information on the NRC's enforcement program and enforcement activities is available in the OE's Fiscal Year 1997 Annual Report. This document is available in the Public Document Room and on NRC's Web site. The address for OE's home page is <www.nrc.gov/OE/>. This page also includes copies of significant enforcement actions that the agency has issued arranged by reactor, materials, and individual actions.

Nuclear Materials Safety

Chapter 3

Nuclear materials safety encompasses U. S. Nuclear Regulatory Commission (NRC) activities to ensure that all NRC-regulated aspects of nuclear fuel cycle facilities and nuclear materials activities are handled in a manner that provides adequate protection of public health and safety. These activities include licensing, inspection, and related regulatory activities for fuel cycle facilities and nuclear materials users, transportation of nuclear materials, and uranium recovery.

In Fiscal Year (FY) 1997, NRC achieved its goals for licensed nuclear material, having no radiation deaths and no incidents of accidental criticality involving licensed material. Specific activities and proceedings contributing to attaining these performance goals are discussed in this chapter.

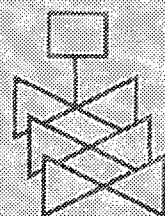
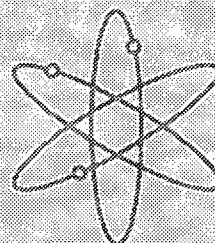
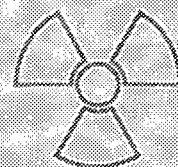
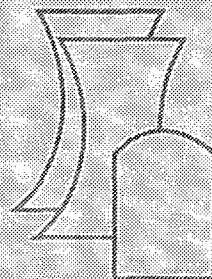
The NRC's Office of Nuclear Material Safety and Safeguards (NMSS) and the NRC's four Regional Offices regulate the safe use of nuclear materials under several broad programs. Thirty States have formal agreements with the NRC under which they have assumed regulatory authority over approximately 15,000 radioactive materials licensees. Material safety, fuel facility safety and safeguards, and storage and transport of nuclear fuel are discussed in this chapter, and waste management activities are discussed in Chapter 4.

Activities covered in this chapter include licensing, certification, inspection, and other regulatory actions concerned with production and use of reactor-produced radioisotopes (byproduct material). Nuclear materials regulation during FY 1997 comprised—

- more than 3,500 licensing actions. Of this total, 304 were for new licenses, 2,961 were for amendments, 153 were for license renewals, and 157 were sealed source and device reviews;
- approximately 2,200 materials licensee inspections; and
- review of 10 Agreement State and 4 NRC Regional Programs.

Generic Materials Licensing and Inspection Activities

The materials program is designed to ensure that activities involving uses of radionuclides do not endanger public health and safety. As of September 30, 1997, the NRC administered approximately 5,900 licenses for the possession and use of nuclear materials in medical and industrial



applications. This administration represents a reduction of about 500 licenses in the past year, largely as a result of the transfer of licenses to Massachusetts, which became an Agreement State. Table 3.1 shows the distribution of licenses by region. The 30 Agreement States administer about another 15,000 licenses.

The NRC regional staff completed 2,193 inspections of materials facilities in FY 1997. The NRC Regional Offices administer almost all materials licensees, with the exception of exempt distribution licenses and sealed source and device design reviews.

The NRC completed 3,575 licensing actions during the fiscal year. Of this total, 304 were for new licenses, 2,961 were for amendments, 153 were for license renewals, and 157 were sealed source and device reviews.

A significant NRC staff initiative involved rulemaking to extend, on a one-time basis, the expiration date of about 90 percent of materials licenses by 5 years. This extension saved considerable NRC resources to be used for improvements to the licensing process and priority licensing actions.

In FY 1997, the staff issued three draft reports (various volumes of NUREG-1556) of revised program-specific guidance for licensees and reviewers that were developed using business process redesign techniques. These reports consolidate guidance from a number of different sources and will help to streamline the licensing process. When issued in final form, they are intended for use by applicants, licensees, NRC license reviewers, and other NRC personnel. They take a risk-informed, performance-based

Region I	1,818
Region II	833
Region III	2,179
Region IV	868
Headquarters	212
Total:	5,910

approach to regulation. (See also Risk-Informed Regulatory Approaches in Chapter 2, "Nuclear Reactor Safety," of this report.)

Petition for Enforcement Action. A Director's Decision (DD-97-22) was issued by the Director, NMSS, in accordance with the "Rules of Practice for Domestic Licensing Proceedings and Issuance of Orders," Part 2, Section 2.206 of Title 10 of the *Code of Federal Regulations* (10 CFR 2.206), on September 17, 1997, with regard to the National Institutes of Health (NIH). The Petitioners had requested in their Petition, dated October 10, 1995, that NRC suspend or revoke the materials license of NIH pending resolution of the issues raised by the Petition, and that the NRC take other appropriate enforcement action, including the imposition of civil penalties against NIH for violations of "Standards for Protection Against Radiation," 10 CFR Part 20.

NMSS granted and denied various portions of the Petitioners' request. The following requests for enforcement action against NIH were granted for violations of—

- NRC requirements related to security and control;
- radiation safety training;
- ordering radioactive materials;
- inventory control of radioactive materials;
- monitoring; and
- the issuance, use, and collection of dosimetry.

Requests for enforcement action against NIH concerning the following matters were denied:

- the exposure of one of the Petitioners beyond regulatory limits;
- the exposure of the Petitioner's fetus;
- the contamination of the water cooler;
- notification to one of the Petitioners of her level of contamination;
- the Petitioner's declaration of pregnancy;
- the conduct of surveys after the Petitioner's contamination; and

- the failure to accurately calculate the Petitioner's occupational radiation dose.

Finally, Petitioners' request to suspend or revoke the NIH license was denied.

Medical Use of Byproduct Material. NRC is proposing a revision of its regulations governing the medical use of byproduct material. The overall goal of the proposed revision is to focus NRC's regulations on those medical procedures that pose the highest risk and to structure its regulations to be risk informed and performance based. The NRC anticipates publishing the proposed rule in the summer of 1998 and the final rule in the summer of 1999.

In FY 1997, the NRC completed 89 safety-related source and special nuclear material (S&SNM) license amendments and 5 S&SNM license renewals.

Agreement States Program

A total of 30 States have formal agreements with the NRC, by which those States have assumed regulatory responsibility over byproduct, source, and small quantities of special nuclear material (SNM). Approximately 15,000 radioactive materials licenses are regulated by the Agreement States, which are shown in Figure 3.1, representing about 70 percent of all radioactive materials licenses issued in the United States. NRC's agreement with Massachusetts became effective on March 21, 1997, and the States of Ohio, Oklahoma, and Pennsylvania continue to actively work toward becoming Agreement States.

Cooperation With States. NRC continued activities to ensure early and substantial involvement of Agreement States in NRC rulemaking and other regulatory issues. These activities included early opportunity to comment on draft rulemaking plans and the use of electronic communication, via e-mail and bulletin boards, to facilitate the transfer of information. Joint NRC/Agreement State Working Groups have also continued to be effectively used to address common issues and to evaluate improvements in the regulation of radioactive material.

NRC Technical Assistance to States. The NRC continued to provide technical assistance to Agreement States by responding to requests for licensing and inspection information, reviewing and commenting on proposed changes to State regulations, and dealing with specific or unusual radiation applications requiring specialized expertise and knowledge.

Training Offered State Personnel by the NRC.

The NRC sponsors training courses and workshops for Agreement State and NRC staff to assist State radiation control personnel in their goal of maintaining high-quality regulatory programs. Course subjects are diverse, covering health physics, industrial radiography safety, well-logging, environmental monitoring, irradiator technology, transportation of radioactive nuclear materials, site decommissioning characterization, nuclear medicine, inspection procedures, and materials licensing. In addition, special workshops on specific areas are held, as needed. The NRC sponsored 24 training courses and workshops attended by 175 State radiation control personnel during the fiscal year. The sessions were also attended by NRC staff, military personnel, and officials from foreign countries.

Review of State and NRC Regional Regulatory Programs

The Atomic Energy Act of 1954, as amended, requires NRC to periodically review Agreement State radiation control programs. The Integrated Materials Performance Evaluation Program (IMPEP) is used in the evaluation of NRC Regional Office and Agreement State materials licensing and inspection programs in an integrated manner to ensure that public health and safety are being adequately protected and that Agreement State programs are compatible with NRC's program.

The IMPEP uses five common performance indicators:

1. status of materials inspection program;
2. technical staffing and training;
3. technical quality of licensing;

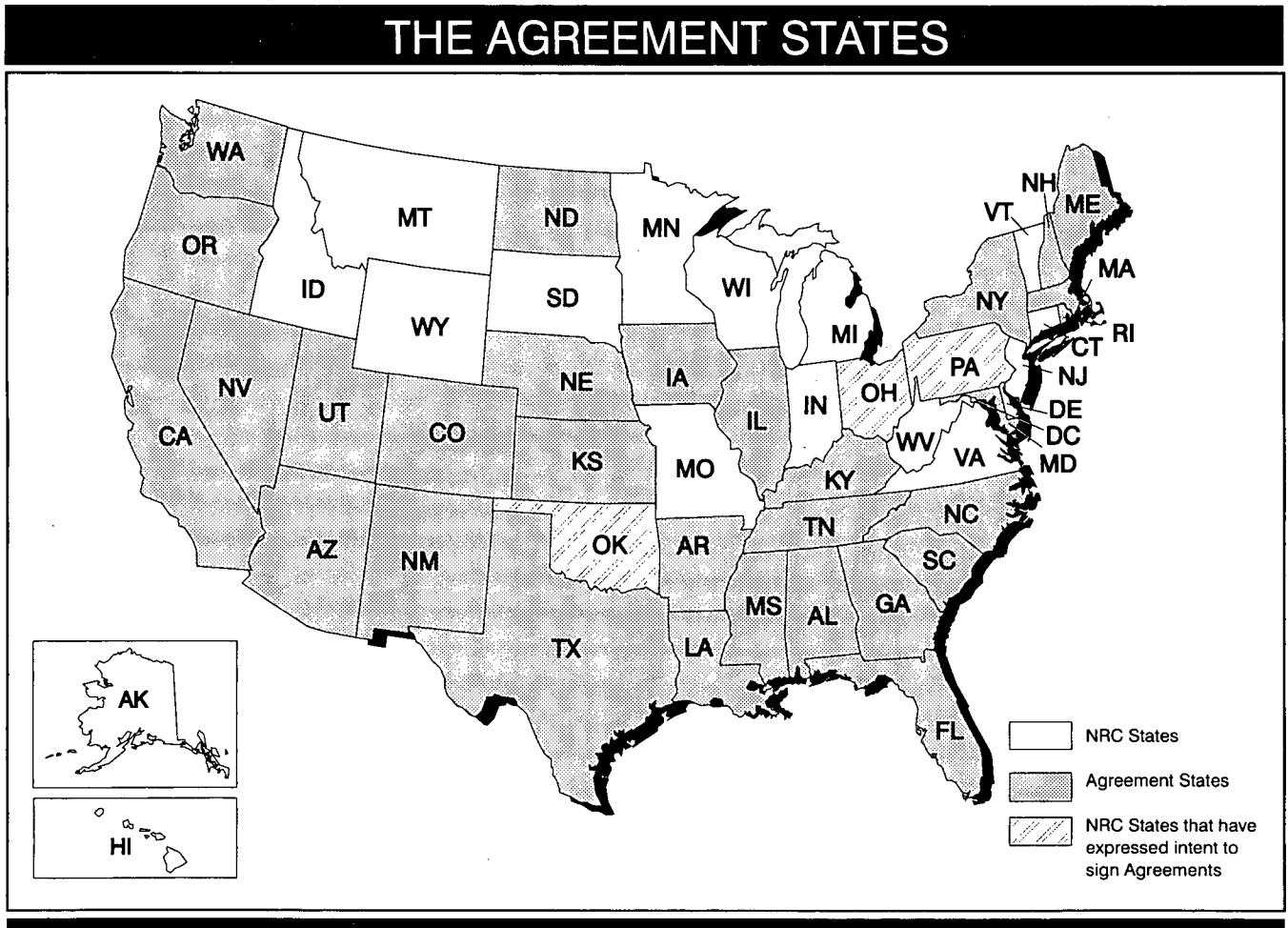


Figure 3.1 Map Showing the NRC Agreement States

4. technical quality of inspection; and
5. response to incidents and allegations.

Program areas unique to NRC Regions and Agreement States are reviewed as non-common indicators. The NRC conducted these reviews, using interdisciplinary teams. Members of the teams were from the Offices of NMSS and State Programs (OSP), the NRC Regions, and the Agreement States. A Management Review Board (MRB) senior panel reviews the IMPEP teams' recommendations and issues the official NRC findings to the Region or the Agreement State. An Agreement State liaison representative serves on the MRB.

The IMPEP has proved to be effective both in terms of evaluating the adequacy and compatibility of the materials programs and in improving the technical and programmatic exchange of information between NRC and the Agreement States. Followup or special reviews are also conducted, as needed.

During FY 1997, NRC continued implementation of the IMPEP to evaluate Agreement State and NRC Regional Materials programs. With the issuance of two policy statements, "Statement of Principles and Policy for the Agreement State Program" and "Policy Statement on the Adequacy and Compatibility of Agreement State Programs," and the final approval of these policy statements on September 3, 1997, NRC has begun final implementation of the IMPEP procedures. NRC performed 10 IMPEP reviews of Agreement States and 1 followup review. Nine of the Agreement State IMPEP reviews found the programs were adequate and compatible. One State's program was found adequate but needs improvement and compatibility with NRC's regulatory program to ensure protection of public health and safety. NRC also performed two Regional IMPEP reviews and found those programs adequate.

Policy Statements and Agreement State Program Policy Decisions. One of the policy statements that became effective September 3, 1997, "Statement of Principles and Policy for the Agreement State Program," describes the respective roles and responsibilities of the NRC and the States in the administration of programs

carried out under Section 274 of the Atomic Energy Act of 1954, as amended. The document provides broad guidance in delineating the NRC's and the States' respective responsibilities and expectations in the administration of a regulatory program for the protection of public health and safety in the industrial, medical, and research uses of nuclear materials.

The other, "Policy Statement on the Adequacy and Compatibility of Agreement State Programs," establishes a basis for NRC determinations that an Agreement State program is adequate to protect public health and safety and is compatible with NRC's regulatory program. It strikes a balance between the extent of uniformity required in a State program and the extent of flexibility allowed to a State in tailoring its program to the individual circumstances within that particular State. The underlying philosophy of this approach is that the State program must be adequate to protect public health and safety within the State and must be compatible by incorporating those elements of the NRC program necessary to achieve the national interest in radiation protection. The elements of an adequate program have been developed to reflect those that are essential to ensuring protection of the public health and safety, and to be consistent with the elements that will be evaluated as common and non-common performance indicators under IMPEP.

Operational Events in Agreement States.

Information on events that have occurred in Agreement States involving the use of radioactive byproduct material is routinely exchanged with the NRC and incorporated into the Nuclear Materials Events Database (NMED). Safety-significant Agreement State and NRC operational events are discussed at periodic NRC staff meetings, with an emphasis on identifying the cause of each event. During the past year, Agreement State personnel investigated material events involving overexposures, unplanned contamination, leaking sources, industrial radiography, well-logging, lost or stolen equipment, and equipment failure, as well as incidents involving the administration of radioactive byproduct material to individuals for medical diagnosis and therapy. When these studies lead to effective generic remedies that reduce the likelihood of event recurrence, the information is disseminated to the appropriate regulatory agencies and users.

The Conference of Radiation Control Program Directors, Inc. The NRC, through OSP, continues to be a Federal liaison to the Board of Directors of the Conference of Radiation Control Program Directors, Inc. (CRCPD), to help ensure that State and Commission programs for protection against the hazards of radiation are coordinated. The CRCPD was formed in 1968 to provide a forum in which Federal, State, and local radiation control program officials could address governmental radiation protection issues, mainly through working groups and committees. An example is the working group established to assess NRC and Agreement State roles in responding to incidents, which will identify more effective and efficient methods to ensure public health and safety. As many as 11 NRC resource persons are represented on approximately 18 committees and working groups that meet throughout the year. The NRC contributed \$110,000 in FY 1997 to the CRCPD.

Fuel Cycle Facilities

In FY 1997, the NRC completed 89 safety-related source and special nuclear material (S&SNM) license amendments and 5 S&SNM license renewals. On November 26, 1996, NRC issued the first certificate to the U.S. Enrichment Corporation (USEC) for the operation of the Gaseous Diffusion Plants (GDPs). The NRC began regulatory jurisdiction over the GDPs on March 3, 1997. During FY 1997, NRC performed 165 inspections at 8 fuel cycle licensee facilities and 65 inspections at the 2 GDPs.

The NRC maintained two full-time Resident Inspectors at each GDP and a Resident Inspector at one highly enriched uranium (HEU) fuel fabrication facility. A Resident Inspector was added at a second HEU fuel fabrication facility in the summer of 1997. The staff also analyzed the requested proposed changes to "Domestic Licensing of Special Nuclear Material," 10 CFR Part 70, presented in petition PRM-70-7 and the public comments received on this petition before continuing to develop a regulation for increasing confidence in the safety margin of fuel cycle facilities. Additionally, the NRC developed fuel facility guidance documents, such as "Chemical Process Safety at Fuel Cycle Facilities"

(NUREG-1601), which was published in August 1997.

During FY 1997, inventory differences between book and measured inventories of SNM reported by licensees to the NRC were all attributed to measurement uncertainties. NRC investigated two separate incidents in which licensees inadvertently shipped SNM of low strategic significance (low-enriched uranium) to a destination other than the original intended recipient. All of the materials involved in those shipments were retrieved and accounted for.

During FY 1997, NRC renewed three SNM licenses that included specific review of the criticality safety functions and 18 nuclear criticality safety-related license amendments. Using a risk-informed and performance-based approach, NRC inspection staff confirmed that criticality safety was adequate at each fuel licensee and the GDPs.

The Regional staffs have continued to be active in improving the inspection focus on identification of criticality safety issues in fuel facilities. Specifically, NRC's Region II, which is responsible for inspecting a majority of the fuel cycle facilities, has worked with NMSS to ensure that the inspection planning process is based on licensee performance and that all inspections are integrated and coordinated. As an example, the staff significantly improved the safety margin by preoperational and startup inspections for Nuclear Fuel Services' receipt and processing of material. The staff continued to meet with Department of Energy representatives to plan for proper oversight and inspection activities for the U.S. Government pilot program at Watts Bar for tritium production. A fuel inspection is shown in Figure 3.2.

Analysis and Evaluation of Operational Materials Data

The NRC's Office for Analysis and Evaluation of Operational Data (AEOD) analyzes information collected through the regulation of nuclear materials. Nuclear materials licensees are required by NRC regulations, comparable

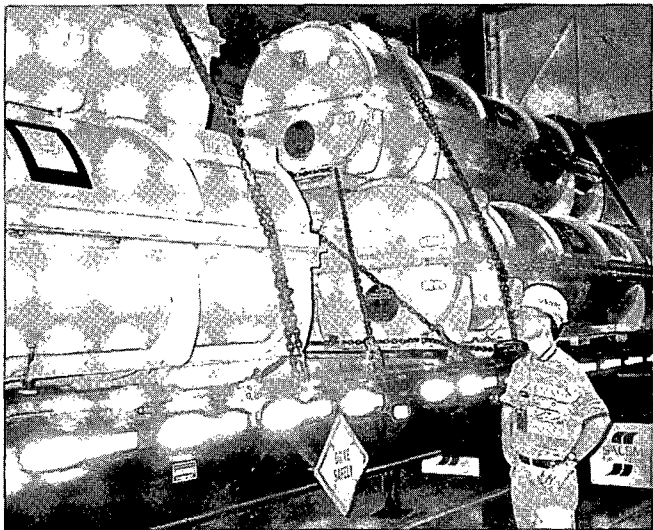


Figure 3.2 A Region II Inspector Inspecting Fuel at the Watts Bar Nuclear Plant

Agreement State regulations, or license conditions to submit reports of events that meet established criteria. Reportable nuclear materials events include—

- medical misadministrations of radiation or radiopharmaceuticals to patients,
- radiation overexposures,
- loss of control of licensed material,
- problems with equipment that uses licensed material or is otherwise associated with the use of licensed material,
- releases of material or contamination,
- leaking radioactive sources,
- problems during the transportation of licensed material,
- problems in fuel cycle facilities, and
- problems in nonpower reactors.

AEOD collects, reviews, and codes nuclear materials event information reported by NRC licensees and Agreement States. NRC licensees submit reports directly to the NRC Regional or Headquarters' offices. Agreement State licensees submit reports to the States, which, in turn, voluntarily transmit summary reports to the NRC

under an informal information-sharing agreement. On September 3, 1997, the Commission changed the Agreement State voluntary submittal of materials events to the NRC to a matter of compatibility, that is, mandatory reporting to ensure that the event data base is representative of the nation and useful for analyzing trends. The NRC staff maintains this information in the NMED. In 1997, 591 reports of events involving nuclear materials licensees were required to be reported to the NRC, as shown in Table 3.2. None of these events resulted in radiation-related deaths.

Radiation Exposures and Overexposures. All NRC licensees are required to monitor employee exposure to radiation and radioactive materials at levels sufficient to demonstrate compliance with the occupational dose limits specified in 10 CFR Part 20. Licensees of power reactors, and those involved in industrial radiography, the manufacture and distribution of radioactive materials, fuel fabrication and processing, low-level radioactive waste disposal, and independent spent fuel storage, are required by 10 CFR 20.2206 to provide to the NRC annual reports of exposure data for individuals for whom personnel monitoring is required. These data for 1991 through 1996 (the latest year for which data are available) are summarized in Tables 3.3 and 3.4.

Table 3.2 Materials Reportable Events Submitted to the NRC and to Agreement States in 1997 by Event Type

Type of Event	Number
Misadministrations	27
Radiation overexposures	8
Loss of control of licensed material	248
Leaking sources	15
Release of material	38
Transportation	53
Equipment problems	145
Fuel cycle facility problems	53
Test, research, and training reactors	4
Total	591

Note: Not all Agreement State reports had been received as of the end of FY 1997 at the time this table was prepared.

**Table 3.3 Annual Occupational Overexposure Rate
at NRC Reactor and Radiography Licensees, 1991 to 1996**

Year	Reactors			Radiography		
	No. of Workers with Measurable TEDE	No. of Workers Overexposed	Over-exposures per 1,000 Workers	No. of Workers with Measurable TEDE	No. of Workers Overexposed	Over-exposures per 1,000 Workers
1991	91,085	0	0.00	4,649	2	0.43
1992	94,317	5	0.05	4,265	1	0.23
1993	86,187	0	0.00	3,007	1	0.33
1994	73,780	1	0.01	2,351	2	0.85
1995	70,986	0	0.00	2,465	1	0.41
1996	68,182	1	0.015	2,537	1	0.39

Source: Radiation Exposure Information Reporting System

**Table 3.4 Annual Exposure Data for NRC
Fuel Fabrication and Processing Licensees, 1991 to 1996**

Year	No. of Licensees	No. of Monitored Individuals	No. of Workers With Measurable TEDE	Collective TEDE Person-cSv (rem)	Average Individual TEDE-cSv (rem)	Average Measurable TEDE per Worker-cSv (rem)
1991	11	11,702	3929	378	0.03	0.10
1992	11	8,439	5061	545	0.06	0.11
1993	8	9,649	2611	339	0.04	0.13
1994	8	3,596	2847	1147	0.32	0.40
1995	8	4,106	2959	1217	0.31	0.41
1996	8	4,369	3061	878	0.20	0.29

Table 3.3 provides a comparison of overexposures at reactor facilities with those of radiography licensees. Although the total number of individuals overexposed in a given year is relatively small, the number of individuals overexposed in nuclear materials applications typically exceeds the number overexposed at reactor sites. The nonreactor licensees of most concern for overexposures are radiographers. The special radiological problems of industrial radiography have been known for some time, and AEOD has provided guidance, a training document, and a videotape to address those problems. Although the data for 1997 have not yet

been compiled, there have been no reports of deaths and three reports of significant radiation exposures attributed to the civilian use of source, byproduct, and special nuclear materials in 1997.

Abnormal Occurrences (AOs). In its 1997 report to Congress (see NUREG-0090, "Report to Congress on Abnormal Occurrences, Fiscal Year 1996," Vol. 19), AEOD described five AOs that were reported by nuclear materials licensees. Three of these AOs were occupational overexposures, and two were misadministrations. No accidental criticalities or AOs were due to loss of material in 1997.

Research Supporting Nuclear Materials Safety

Rulemakings promulgated by the NRC in FY 1997 contributed in a significant way to NRC's success in achieving its performance goals. These rulemakings provided unnecessary burden relief to licensees and led to improvements in the regulatory framework.

REDUCTION OF UNNECESSARY LICENSEE BURDEN

The following rulemakings were promulgated to reduce unnecessary burden on licensees. For final rules, this, in turn, allowed licensees to redirect their limited resources to activities that have greater safety significance.

- A proposed rule to provide criteria that would allow qualifying non-profit entities and non-bond-issuing business corporations to use self-guarantee as an additional mechanism for financial assurance.
- A final rule establishing a constraint level for air emissions of radionuclides for licensees other than power reactor licensees, thus enabling the Environmental Protection Agency (EPA) to rescind its duplicative regulations, which eliminated the dual regulation of air emissions by NRC and EPA, along with a significant licensee reporting burden under the EPA rule.
- A final rule revising the criteria for release of patients contained in 10 CFR 35.75 to a dose-based rule, which removes the burden that had existed with the old activity-based limit and results in a significant cost savings by no longer confining patients in the hospital when there was no medical reason for their hospitalization.

IMPROVEMENTS IN THE REGULATORY FRAMEWORK

The following actions were taken to improve the regulatory framework.

- A proposed rule to extend the requirements of the deliberate misconduct rule to apply to the applicants for NRC licenses, certificates of compliance, and reciprocity.
- A final rule addressing radiation safety requirements for industrial radiography (10 CFR Part 34), which provides uniformity in the licensing of this technology by making NRC regulations more compatible with requirements already adopted by many States.
- A final rule to amend the regulations with regard to shipment of exempt quantities of fissile material and of fissile material under a general license (10 CFR Part 71). This rule restricts the use of beryllium and other special moderating materials in shipping fissile materials and consigns quantity limits on fissile-exempt shipments.

Enforcement and Investigative Actions

Refer to Chapter 2 of this report, "Nuclear Reactor Safety," for information about investigative actions and adjudicatory hearings affecting licensees.

Significant Commission Adjudicatory Decisions

The Commission exercises its appellate adjudicatory authority when a party to an NRC adjudicatory proceeding seeks Commission review of an Atomic Safety and Licensing Board decision. In addition, the Commission on its own motion may choose to review a Licensing Board decision, or the Board may refer novel legal issues directly to the Commission for the Commission's guidance. The Office of Commission Appellate Adjudication (OCAA), in consultation with the Office of the General Counsel (OGC), assists the Commission in exercising these adjudicatory or related matters. The following summaries provide a brief description of the most significant decisions issued by the Commission in FY 1997 associated with nuclear materials cases.

Louisiana Energy Services, L.P. (Claiborne Enrichment Center) CLI-96-8, 44 NRC 107 (1996)

In this decision, the Commission found that the Licensing Board inappropriately had referred to the NRC staff particular questions on emergency planning which were material to the Board's basic findings on the adequacy of the applicant's emergency plan. The Commission made clear that a Licensing Board may not refer to the NRC staff those issues that are material to the requisite Board findings on whether a license should be issued. Such material questions may not be resolved outside of the adjudicatory process, the Commission held, but instead must be answered prior to issuance of the requested license. The Commission clarified that the Board properly may refer matters to the NRC staff for post-hearing resolution or verification, as long as those matters are not material to the findings necessary for licensing. The Commission also clarified that NRC rules under Part 70 require only a "brief description" of the responsibilities of the licensee's emergency personnel and of the licensee's emergency training program.

U.S. Enrichment Corp. (Paducah, Kentucky, and Piketon, Ohio) CLI-96-10, 44 NRC 114 (1996)

The Commission denied four petitions seeking review of an initial Director's decision approving certificates of compliance for the U.S. Enrichment Corporation's gaseous diffusion plants in Piketon, Ohio, and Paducah, Kentucky. In this order, the Commission made clear that only those parties that participate in the initial comment stage may petition for review of a Director's decision on the certification of a gaseous diffusion plant. Accordingly, to petition for review, an interested party must have either submitted a written comment in response to a prior *Federal Register* notice, or must have provided oral comments at an NRC meeting held on the application or compliance plan. The Commission also stressed that Part 76 contemplates relatively prompt Commission rulings—within 60 days—on petitions for review of certification decisions. Given that a relatively short and expeditious review period is contemplated, the Part 76 petition deadline should not be extended in the absence of a compelling reason.

U.S. Enrichment Corp. (Paducah, Kentucky, and Piketon, Ohio) CLI-96-12, 44 NRC 231 (1996)

The Commission in this order clarified several points relating to the certification of a gaseous diffusion plant. First, the Commission made clear that those individuals who wish to petition for review of an initial Director's decision on plant certification must explain how their "interest" may be affected by the certification. The Commission noted that if petitioners seek guidance in describing their "interest," they may look to the NRC adjudicatory decisions on standing. The Commission also clarified that Part 76 does not require an environmental assessment or environmental impact statement for the issuance, amendment, modification, or renewal of a certificate of compliance for gaseous diffusion enrichment facilities, but does require an environmental assessment of the impacts of the compliance plan. The Commission also ruled that Part 76 requires an analysis of potential accidents and consequences, and that this analysis should include any relevant plant operating history.

ENFORCEMENT

The Commission has developed an enforcement program and an Enforcement Policy to support the NRC's overall safety mission in protecting the public and the environment. Consistent with that purpose, enforcement action is used as a deterrent to emphasize the importance of compliance with regulatory requirements and to encourage prompt identification and prompt, comprehensive correction of violations. The Office of Enforcement (OE) is responsible for managing the Commission's enforcement program. The NRC's enforcement program is addressed in the agency's Enforcement Policy, NUREG-1600, Rev. 1, "General Statement of Policy and Procedures for NRC Enforcement Actions."

Escalated Enforcement Activities

All violations identified through inspections and investigations are subject to civil enforcement action and may also be subject to criminal prosecution. After an apparent violation is identified, the severity is evaluated in order to determine the appropriate enforcement sanction. Severity levels range from Level I for the most significant violations to Level IV for those of

more than minor concern. Minor violations are not subject to formal enforcement action. The NRC considers violations categorized at Severity Level I and II to be very significant, as well as enforcement actions consisting of multiple Severity Level III violations. During FY 1997, the agency issued 3 Severity Level I violations, 13 Severity Level II violations, and 3 multiple Severity Level III actions to materials licensees.

The NRC uses three primary enforcement sanctions: Notices of Violation (NOVs), civil penalties, and orders. The NRC considers civil penalties, orders, and NOVs, including Severity Level I, II, and III violations, as escalated enforcement actions.

An NOV sets forth one or more violations of a legally binding requirement and normally requires a response from the licensee describing the reasons for the violation, the corrective steps taken or planned, and the date when actions will be complete. During FY 1997, the agency issued 63 escalated NOVs to materials licensees.

A civil penalty is a monetary fine considered for Severity Level III violations and normally assessed for Severity Level I and II violations and knowing and conscious violations of reporting requirements of Section 206 of the Energy Reorganization Act. Section 234 of the Atomic Energy Act provides for penalties of up to \$100,000 per violation per day, but that amount was adjusted by the Debt Collection Improvement Act of 1996 to be \$110,000. During FY 1997, the agency proposed 41 individual civil penalties to materials licensees. Table 3.5 includes additional civil penalty information.

In addition to NOVs and civil penalties, orders may be used to modify, suspend, or revoke licenses. Orders may require additional corrective actions, such as removing specified individuals

from licensed activities or requiring additional controls or outside audits. Persons adversely affected by orders that modify, suspend, or revoke a license, or that take other actions, may request a hearing. During FY 1997, the agency issued seven orders to materials licensees. In addition, seven civil penalty imposition orders were issued.

A predecisional enforcement conference is normally conducted with a licensee or an individual before making an enforcement decision if escalated enforcement action appears to be warranted, and if the NRC concludes that it is necessary or the licensee or the individual requests it. During FY 1997, the agency conducted a total of 181 conferences for reactor and material licensees.

The NRC issues a press release with a proposed civil penalty or order. All orders are published in the *Federal Register*.

Additional information on the NRC's enforcement program and enforcement activities is available in the OE's Fiscal Year 1997 Annual Report. This document is available in the Public Document Room and on NRC's Web site. The address for OE's home page is <www.nrc.gov/OE/>. This page also includes copies of significant enforcement actions that the agency has issued arranged by reactor, materials, and individual actions.

Table 3.5 Civil Penalty Information

	FY 97
Number of Proposed Civil Penalties	41
Amount of Proposed Civil Penalties	\$376,300
Number of Imposed Civil Penalties	7
Amount of Imposed Civil Penalties	\$35,250

Nuclear Waste Safety

Nuclear waste is a byproduct of the use of radioactive materials. High-level radioactive waste results primarily from the fuel used by reactors to produce energy. Low-level radioactive waste results from reactor operations, from medical, academic, industrial, and other commercial uses, and this waste generally contains relatively limited concentrations of radioactivity.

The U.S. Nuclear Regulatory Commission's (NRC's) high-level waste regulatory activities are mandated by the Nuclear Waste Policy Act of 1982 (NWPA), the Nuclear Waste Policy Amendments Act (NWPAA) of 1987, and the Energy Policy Act of 1992 (EnPA). The Congress, through the Low-Level Radioactive Waste Policy Act of 1980, amended in 1985, made States responsible for providing for the disposal of commercial low-level waste generated within their borders.

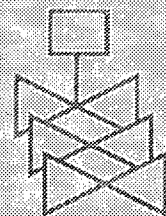
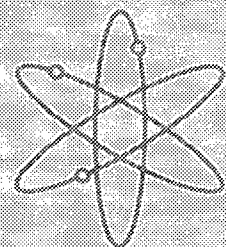
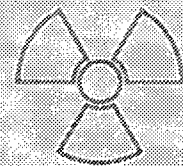
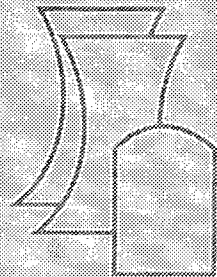
In Fiscal Year (FY) 1997, NRC achieved its goals in the regulation of nuclear waste, having no releases of radioactive material from the storage and transportation of high-level or low-level waste and no offsite releases of radioactivity beyond regulatory limits from low-level waste disposal sites. Specific activities contributing to attaining these performance goals are discussed in this chapter in addition to the progress made in establishing the regulatory framework for disposal of high-level waste.

Spent Fuel

The Spent Fuel Project Office (SFPO) in the NRC's Office of Nuclear Material Safety and Safeguards (NMSS) was created in April 1995 primarily to review the Department of Energy (DOE) design for a multipurpose canister (MPC) for the transportation, storage, and disposal of spent nuclear fuel. After the creation of the SFPO, the MPC program was cancelled, and DOE replaced its MPC program with a policy that relied on private-sector development of these canisters. Thus, instead of the review of the technology for a single MPC, the NRC staff is now reviewing technologies for several canisters used for transportation and storage. Staff reviews of applications for licenses for dry cask storage are increasing because practically all of the Nation's nuclear power plants are now seeking (or will seek) licenses for dry cask storage. As nuclear plant spent fuel pools grow full, the licensee's capability to offload a full core of fuel rods is reduced.

In addition to reviewing technologies for MPCs and applications for dry cask storage, SFPO is responsible for—

- the licensing and certification of facilities and technologies associated with the safe storage and transportation of spent fuel from the Nation's nuclear utilities;



- the certification of transportation packages for other nuclear materials;
- safety inspections of dry storage and transport package licensees;
- inspection of certificate holders, applicants, designers, and fabricators; and
- the review of quality assurance programs for the fabrication and use of transportation packages.

Thus far, the NRC has certified 13 cask designs for the storage of spent fuel that are being used as authorized by either a general license or as part of a site-specific license, and the NRC has certified two cask designs to be fabricated for the transport of spent nuclear fuel. Figure 4.1 shows the location of the currently operating independent spent fuel storage installations (ISFSIs) and the spent fuel storage technologies associated with each facility, while Figure 4.2 shows the location of the potential near-term ISFSI sites. In general, the staff maintains oversight of its licensed and certified entities through licensing reviews and safety inspections.

The NRC received 26 applications for storage and transportation of spent fuel in FY 1997. The NRC staff completed approximately 30 applications for storage and transportation of spent fuel and approximately 75 applications for transportation packages for other radioactive materials in FY 1997.

In addition to reviewing the applications for certification of dry cask storage and transportation of spent fuel, the licensing of ISFSIs, and conducting safety inspections, the NRC staff also approves spent fuel transportation routes, interacts with the International Atomic Energy Agency on safety issues, and, where required, develops environmental assessments and environmental impact statements.

A proposed rule for the siting and design of dry cask ISFSIs was promulgated that will use site characterization and level of investigation identical to that recently published for nuclear power plants.

The NRC is involved with DOE in various licensing, certification, and inspection-related

activities. For example, the NRC's DOE-related licensing, certification, or inspection-related projects included—

- Three Mile Island Unit 2 (TMI-2) fuel debris ISFSI licensing review;
- the Fort St. Vrain ISFSI license transfer review;
- the dry transfer system topical safety analysis report review;
- high burn-up fuel topical report review; and
- the non-site-specific central interim storage facility topical safety analysis report review.

Moreover, during this fiscal year, the staff continued its involvement with DOE in the return of foreign research reactor spent nuclear fuel, including transportation package certification, route approvals, and inspection of shipments.

To augment its licensing and certification reviews, the staff maintained a parallel inspection focus. It continued to follow the industry actions associated with NRC Bulletin 96-04, "Chemical, Galvanic, or Other Reactions in Spent Fuel Storage and Transportation Casks." This bulletin was issued as a result of the May 28, 1996, hydrogen ignition event during storage cask loading operations of the Sierra Nuclear Corporation's (SNC's) VSC-24 cask system at the Point Beach Nuclear Plant. Moreover, in early 1997, NRC became aware that, on four separate occasions, utilities using the VSC-24 cask system had experienced cracking while making closure welds. Consequently, the NRC issued Confirmatory Action Letters to SNC and these utilities using the VSC-24 cask system to discontinue loading until corrective actions were implemented. As a result of identified problems with welds, the SFPO staff formed a weld review team to follow the industry actions. Furthermore, as a result of significant inspection findings related to the NUHOMS cask system, the SFPO staff issued a "Demand for Information" to Vectra Technologies, Incorporated, and increased its oversight of this cask designer. The NRC issued NRC Bulletin 97-02, "Puncture Testing of Shipping Packages Under 10 CFR Part 71," to address inadequate

Prairie Island
TN-40 (7)

GE Morris
**

Point Beach
VSC-24 (2)

Palisades
VSC-24 (13)

Davis Besse
NUHOMS-24 P (3)

North Anna
TN-32

Calvert Cliffs
NUHOMS-24P (18)

Surry
Castor V/21 (25)
Castor X/33 (1)
MC-10 (1)
NAC-128 (2)
TN-32 (6)

H.B. Roison
NUHOMS-7P

Ocone
NUHOMS-24P (40)

Arkansas
VSC-24 (4)

Fort St. Vrain
MVDS (244)

- △ = Site-Specific License
- = General License
- (#) = Number of Loaded Casks

MVDS - Modular Vault Dry Storage
TN - Trans Nuclear
VSC - Ventilated Storage Cask
NAC - Nuclear Assurance Corp.
NUHOMS - Nutech Horizontal Modular Storage System
WNP - Washington Nuclear Power Plant

**GE Morris uses wet storage

Information as of July 16, 1998

Figure 4.1 Operating Spent Fuel Storage Sites

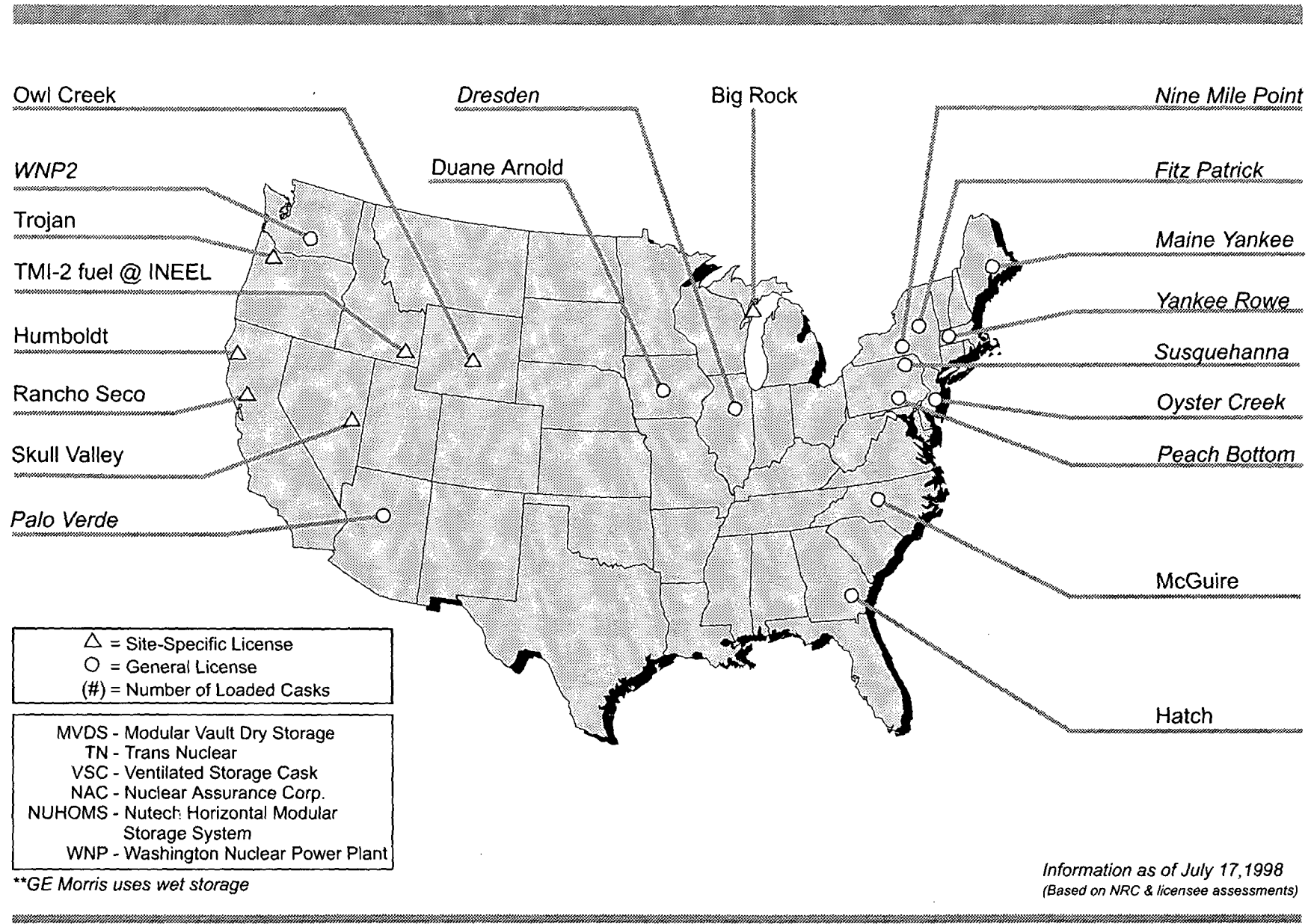


Figure 4.2 Potential Near-Term, New Spent Fuel Storage Sites

transportation package puncture testing. At the close of the fiscal year, the SFPO staff was preparing to follow and assess the industry responses. (NRC bulletins are available by accessing the Reference Library icon and then NRC Bulletins from the Home Page at NRC's Web site <<http://www.nrc.gov>>.) Finally, the inspection staff completed numerous inspections and reviews related to quality assurance, some of which involved significant inspection findings.

During this same time, NRC published a major revision to the inspection program for dry storage of spent fuel to improve inspector accountability and inspection planning and scheduling. In this area, NRC also published a final "Standard Review Plan for Dry Cask Storage Systems" (NUREG-1536) and a draft "Standard Review Plan for Spent Fuel Dry Storage Facilities" (NUREG-1567) to assist its technical staff in reviewing applications.

As a result of these NRC licensing, certification, and inspection activities, no releases of radioactive material occurred from storage or transportation of high-level waste in FY 1997.

High-Level Waste Regulation

Of the several statutes mandating the NRC's high-level waste regulatory program, the NWPA specifies a detailed approach for the long-range undertaking of high-level waste disposal, giving the DOE operational responsibility and the NRC regulatory responsibility for high-level waste disposal. The NWPA directs DOE to characterize only one candidate site, the Yucca Mountain site in the State of Nevada. Accordingly, NRC's activities are focused on Yucca Mountain. In the EnPA, Congress directed the Environmental Protection Agency (EPA) to issue final environmental standards that are "based on and consistent with" the 1995 findings and recommendations of the National Academy of Sciences. Once final EPA standards are established, NRC must modify its technical requirements and criteria under Section 121(b) of the NWPA (i.e., 10 CFR Part 60, "Disposal of High-Level Radioactive Wastes in Geologic Repositories") to be consistent with the new EPA

standards. To issue final regulations within the short time allotted by EnPA, NRC developed a strategy for rulemaking in parallel with the ongoing development of EPA's new standards for Yucca Mountain. This strategy encompasses plans to complete an NRC site-specific rule in FY 1999 and will ensure the progress of the national program for disposal of high-level waste and will ensure that DOE will have the necessary regulation when it is needed to prepare its license application for a high-level waste repository.

In FY 1997, the NRC continued its refocused high-level waste program to resolve the Key Technical Issues (KTIs) most important to repository performance and to give DOE feedback before the publication of its Viability Assessment for the Yucca Mountain site. Eventually, the KTIs will be used to develop the Yucca Mountain Review Plan. Continued discussion of the KTIs and the issue resolution process with DOE and others resulted in agreement with DOE on a performance-based program and on the potential significance of the 10 KTIs. However, budget reductions in FY 1997 resulted in the elimination of contractor support for the KTIs in (1) Radionuclide Transport, (2) Container Life and Source Term, and (3) Repository Design and Thermal Mechanical Effects. Thus, only limited progress toward issue resolution was made in these three areas. On June 30, 1997, the new issue resolution process was demonstrated in the issuance of a pilot issue resolution status report (IRSR) on climate change and associated effects. The IRSRs are the primary mechanism for documenting issue resolution and for including acceptance criteria that are the basis for determining resolution. In FY 1997, the staff began development of five IRSRs for—

1. Unsaturated and Saturated Flow Under Isothermal Conditions;
2. Thermal Effects on Flow;
3. Evolution of the Near-Field Environment;
4. Structural Deformation and Seismicity of the Yucca Mountain Site; and
5. Repository Design and Thermomechanical Effects.

In addition to preparing the IRSRs, NRC technical exchanges and feedback to DOE in FY

1997 also contributed to issue resolution in the following ways; they—

- defined areas of agreement on performance assessment methodology;
- narrowed the range of viable tectonic models at Yucca Mountain;
- achieved resolution on identification of faults that may significantly affect repository design or performance;
- reached agreement on the scope of DOE's thermal testing program;
- monitored implementation of DOE's Quality Assurance Program; and
- resolved differences with DOE on the upper bound for the direct disruption of the repository by an extrusive volcanic event.

Finally, for performance assessment, NRC focused on improving the Total System Performance Assessment code in preparation for completion of a programmatic sensitivity analysis to assess the relative importance of technical issues to performance. Improving this code will allow the staff to have a quantitative, risk-informed basis with which it can prioritize issues, allocate resources, and improve the technical basis for review.

Low-Level Waste Regulation

Nuclear waste is a byproduct of the use of radioactive materials. Low-level radioactive waste results from reactor operations, from medical, academic, industrial, and other commercial uses, and this waste generally contains relatively limited concentrations of radioactivity. The Low-Level Radioactive Waste Policy Act of 1980, amended in 1985, made States responsible for providing for the disposal of commercial low-level waste generated within their borders.

The act encouraged States to enter into compacts that would allow several States to dispose of waste at a regional disposal facility. Most of the States

have entered into compacts, and several States are proceeding with plans to construct and operate as many as 12 new disposal facilities. Although some compact disposal facilities have been planned, none have been opened with the exception of the Envirocare facility in Clive, Utah, which accepts only certain categories of low-level waste. Regulatory responsibility for special nuclear material at the Barnwell and Hanford disposal sites was transferred to the States of South Carolina and Washington. The NRC continues to provide support to the Agreement States. During FY 1997, NRC continued to reduce its Low-Level Waste Program as a result of decreasing program needs, higher budget priorities, and strategic rebaselining of agency programs. NRC activities in this program were limited to consultation with States, technical assistance to State regulatory agencies, and limited development of regulatory guidance.

In FY 1997, the NRC issued a final staff technical position to ensure sufficient protection while reducing the regulatory burden associated with disposal of a specific type of mixed waste. Mixed waste is a waste that is not only radioactive but is classified as hazardous waste under the Resource Conservation and Recovery Act (RCRA). The specific mixed waste addressed in this position is emission control dust from electric arc furnaces or foundries contaminated with cesium-137 (Cs-137). The contamination results from the inadvertent melting of a Cs-137 source that (1) has been improperly disposed of by an NRC or an Agreement State licensee; (2) has been commingled with the steel scrap supply; (3) had not been detected as it progresses to the steel-producing process; or (4) had been volatilized in the production process so that it contaminated large amounts of emission control dust and control systems at steel-producing facilities. The position was coordinated with EPA and provides a public health protective, environmentally sound, and cost-effective alternative for the disposal of a large part of this mixed waste, mostly Cs-137, in concentrations that frequently occur in the environment. The position provides the bases that allow disposal of stabilized waste at hazardous waste disposal facilities permitted under RCRA.

During FY 1997, consistent with NRC goals, NRC had no significant accidental releases of

radioactive material from low-level waste disposal facilities.

Research Supporting Nuclear Waste Safety

Research in the area of nuclear waste safety is focused on improving the regulatory framework and reducing burden on licensees in the area of assessing the performance of waste disposal, contaminated site cleanup, and decommissioning activities. Some current assessment techniques use overly simplistic or conservative assumptions to account for uncertainties and to ensure that dose estimates are conservative in order to adequately protect public health and safety. Research is focused on improving supporting data, reducing uncertainties, and providing more realistic models of natural processes that control the movement of radionuclides in the environment. The results of this research will be applied most effectively at complex sites with large radionuclide inventories where the simpler approaches dictate extraordinary actions to achieve compliance with regulatory standards. In 1997, the most significant accomplishments of this program included—

- Completion of research on flow and transport through fractured tuff at the Apache Leap Research Site. This research conducted by the University of Arizona provided significant insights into the processes that will be important for the high-level waste repository site at Yucca Mountain, Nevada.
- Interagency cooperative agreements with the Agricultural Research Service (ARS), the U.S. Geological Survey (USGS), and the National Institute of Standards and Technology (NIST), and an intergovernmental agreement with the Johns Hopkins University (JHU) to combine and share resources and improve the efficiency of NRC research in specific areas. Activities associated with these agreements have resulted in a significant increase in staff research activities as direct contract funds have decreased.
- Initiation of work to verify and test 4SIGHT, a computer code developed by NIST to predict degradation of concrete barriers over disposal facility life. Reliance on the performance of these barriers in a performance assessment to demonstrate long-term compliance with applicable standards requires supporting data on the reliability of the performance estimates over time.
- Continued research on (1) remediation of in situ leach uranium mines to determine “pore volumes” necessary to achieve cleanup standards; (2) field testing of infiltration instrumentation, methods, and analyses in cooperation with the ARS; (3) determination of the degradation rates for radioactive slags found at decommissioning conducted through an intergovernmental personnel assistance agreement with JHU.
- Continued work on a systematic assessment of mechanistic models of sorption processes to provide a technical basis for a more realistic treatment of these processes in performance assessments. This work included initiation of a demonstration project at a uranium-contaminated field site with complex chemistry in cooperation with the USGS and a feasibility assessment, including complex sorption models with the performance assessment computational framework being developed at a national laboratory (the SANDIA Environmental Decision Support System) in cooperation with the DOE and the EPA.
- Several studies to characterize source terms from contaminated waste streams, including activated metals (completed), solidified wastes buried in field lysimeters (completed), carbon-14 pathways in the environment (completed in cooperation with the Chalk River Nuclear Laboratory), and solubilities of radionuclides found in decommissioning wastes (continuing).
- The organization or co-sponsoring of several important workshops or scientific meetings to enhance transfer of information to potential users. These meetings included (1) an international workshop (200 participants from 25 countries) at the University of California, Riverside, on the characterization

and measurement of hydraulic properties of unsaturated porous media and (2) a public workshop on dose modeling methods for demonstrating compliance with radiological criteria for license termination (NUREG/CP-0163).

UNNECESSARY LICENSEE BURDEN REDUCTION

The following rulemakings were promulgated to reduce burden on licensees, which, in turn, allowed licensees to redirect their limited resources to activities that have greater safety significance.

A final rule establishes dose-based criteria for license terminations. This rule provides regulatory consistency in that prior to promulgation of this rule, licensees' termination decisions were all on a case-by-case basis. By developing dose criteria, and by providing an option whereby licenses can be terminated with restrictions, additional flexibility has been provided to licensees that was not readily available under the case-by-case approach.

A final rule adds different procedural requirements to change the way uranium enrichment facilities are licensed. This rule contains several new or revised licensing and certification requirements specific to the Uranium Enrichment Corporation and its successor's operation of uranium enrichment facilities.

A final rule, 10 CFR 51.60, eliminates the environmental report requirements for terminating a uranium milling license.

A proposed rule to exempt canisters containing vitrified plutonium waste from the packaging requirement for double containment (10 CFR Part 71) is being proposed in response to a petition for rulemaking (PRM-71-11).

Advisory Committee on Nuclear Waste

The NRC established the Advisory Committee on Nuclear Waste (ACNW) in 1988. The ACNW

reports to and advises the NRC on nuclear waste disposal facilities as directed by the Commission; "Disposal of High-Level Radioactive Wastes in Geologic Repositories" (10 CFR Part 60) and "Licensing Requirements for Land Disposal of Radioactive Waste" (10 CFR Part 61), and other applicable regulations; and legislative mandates such as the NWPA, the Low-Level Radioactive Waste Policy Act, and the Uranium Mill Tailings Radiation Control Act, as amended. The primary emphasis is on disposal facilities. In performing its work, the committee will examine and report on those areas of concern referred to it by the Commission or its designated representatives and will undertake other studies and activities related to those issues as directed by the Commission.

ACNW reports, other than those that may contain classified material, are made part of the public record. The ACNW Web address is <<http://www.nrc.gov/acrsacnw>>. Activities of the committee are conducted in accordance with the Federal Advisory Committee Act, which provides for the public to attend and participate in committee meetings. The ACNW membership is drawn from scientific and engineering disciplines and includes individuals experienced in geosciences, risk assessment, radioactive waste treatment, environmental engineering, and nuclear engineering.

The following reports were among the most important ACNW contributions during FY 1997:

ACNWR-0118, 11/08/96—Comments on Coupled Processes in the NRC High-Level Waste Prelicensing Program

ACNWR-0122, 01/30/97—Comments on Selected Direction-Setting Issues Identified in NRC's Strategic Assessment of Regulatory Activities

ACNWR-0124, 02/13/97—Comments on Flow and Radionuclide Transport at Yucca Mountain

ACNWR-0128, 10/31/97—Recommendations Regarding the Implementation of the Defense-In-Depth Concept in the Revised 10 CFR Part 60

ACNWR-0129, 10/31/97—Application of Probabilistic Risk Assessment Methods to Performance Assessment in the NRC High-Level Waste Program

In performing the reviews and preparing the reports cited, the ACNW holds working group

meetings as needed and full committee meetings regularly throughout the year.

Common Defense and Security and International Involvement

The U. S. Nuclear Regulatory Commission (NRC) performs international activities, some of which support the agency's domestic mission and many of which support broader U.S. national interests. These activities include international policy and priority formulation, export-import licensing for nuclear materials and equipment, treaty implementation, international information exchange activities, and international safety and safeguards assistance. Our domestic safeguards responsibility involves the control of and accounting for nuclear materials, the protection of nuclear materials to prevent theft or diversion, and contingency plans for responding to threatening situations. The primary foundation for these activities other than the principal acts establishing the NRC are the Nuclear Non-Proliferation Act of 1978, Executive Orders, and various treaties and conventions.

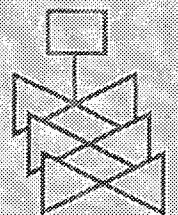
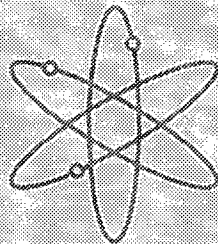
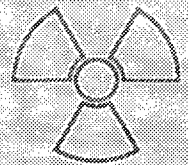
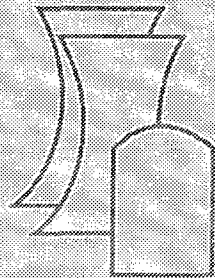
In Fiscal Year (FY) 1997, NRC achieved its performance goals in the protection of nuclear materials, having no incidents of loss or theft of special nuclear materials regulated by NRC, no substantiated cases of attempted theft or diversion of formula quantities of strategic special nuclear material or the breakdown of physical security or control protecting this material. Specific activities contributing to attaining these performance goals are discussed in this chapter, in addition to the progress made in strengthening international nuclear safety and safeguards.

Generic International Participation

The NRC participates in a broad program of international activities, based on statutory requirements, U.S. Government obligations and commitments, international treaties and agreements, Executive Orders and Presidential Decision Directives, and Commission policy and guidance. These activities contribute to improving the safety and security of NRC-licensed facilities in the United States, enhancing U.S. national security, supporting U.S. foreign policy objectives, and supporting U.S. reliability as a supplier of goods and services.

In support of these efforts, NRC—

- licenses imports and exports of nuclear facilities, equipment, material, and related commodities and provides technical support for U.S. nuclear nonproliferation activities;
- assists in the formulation of U.S. Government international policy by developing legal instruments in the nuclear field that address



such vital issues as nuclear nonproliferation, safety, spent fuel and waste management, and liability and assigns priorities to these policy issues;

- contributes to the implementation of the national nuclear policy by supporting Presidential summits, Vice Presidential commissions, and interagency nuclear safety and nonproliferation activities directed by the Executive Branch;
- supports activities of the International Nuclear Regulators Association, an organization of senior regulators that provides a high-level policy focus for international efforts to enhance nuclear safety (see Figure 5.1);
- maintains some 34 arrangements or letters of agreement signed with counterpart foreign national regulatory organizations that ensure prompt notification of safety problems warranting action or investigation and that provide limited bilateral cooperation and personnel exchanges on nuclear safety, safeguards, waste management, and radiological protection;
- improves understanding by informing foreign and international organizations of NRC's most recent regulatory policies and practices through visits, information exchanges, and assignments of foreign regulatory personnel to the NRC, and by obtaining information on foreign regulatory approaches and operational experience that helps to improve NRC's domestic nuclear regulation;
- participates and takes a leadership role in standing committees and senior advisory groups of the International Atomic Energy Agency (IAEA) and the Organization for Economic Cooperation and Development's Nuclear Energy Agency (OECD/NEA) on issues such as safeguards application, standards development, training, technical assistance, physical protection of nuclear materials, reactor safety research and regulatory matters, radiation protection, risk assessment, waste management, and transportation;
- implements IAEA safeguards at NRC-licensed nuclear facilities, involving the control of and accounting for nuclear materials, the protection of nuclear materials to prevent theft or diversion, and contingency plans for responding to threatening situations; and
- participates in more than 60 joint international safety research agreements through which technical information is exchanged, and funding, technical support, and results of specific joint projects and programs are shared.



Figure 5.1 First Meeting of the International Nuclear Regulators Association, Paris, France (May 1997)

Export Licensing and Nonproliferation

In FY 1997, the NRC completed 95 export license cases. Most of the new casework involved exports of low-enriched uranium to Japan, South Korea, Taiwan, and Western Europe for use as fuel in nuclear power reactors. In addition, there was one export authorization to supply low-enriched uranium research reactor fuel to the IAN-R1 reactor in Colombia. Other notable actions included export authorizations for six nuclear power reactors: two 1300-MWe boiling-water reactors (BWRs) to Taiwan and four 1000-MWe pressurized-water reactors (PWRs) to South Korea.

Retransfer approvals were given to ship—

- U.S.-supplied reactor components from Germany to Brazil and from Argentina to Canada;
- low-enriched uranium from France to Indonesia and from Canada to South Korea; and
- heavy water from Switzerland to Canada.

In addition, U.S. approval was given to Taiwan to carry out post-irradiation examination of irradiated fuel elements. Finally, NRC worked with the Department of Energy on a proposed transfer of PWR fuel technology to Armenia.

NRC participated in interagency preparations for the May 1997 Nuclear Suppliers Group (NSG) Plenary Committee in Canada, where a working group was established to formulate steps to promote transparency in export controls consistent with the "Principles and Objectives for Nuclear Nonproliferation and Disarmament" that was accepted by the states that were parties to the Nuclear Nonproliferation Treaty (NPT). NRC also participated in the May 1997 meeting of the NPT Exporters Committee, where the United States presented information on adding uranium conversion equipment to the Committee's safeguards "Trigger List," requiring the application of international safeguards as a condition of supply of such technology to non-nuclear weapon states.

In FY 1997, the Commission was consulted, and it gave its formal views to the President and the Department of State on proposed nuclear trade and cooperation agreements with Brazil, China, and Kazakhstan. The NRC staff also provided technical assistance to U.S. policy makers in connection with the Fissile Material Cutoff Treaty; the U.S.-Russia agreement to make permanent the cessation of plutonium production for nuclear weapons; and the U.S.-Russia International Atomic Energy Agency Trilateral Verification Initiative on excess weapons material. NRC is also represented on the Nonproliferation Steering Committee, which coordinates and shapes U.S. government-wide activities.

The NRC participates in a range of interagency and international nuclear nonproliferation activities. Perhaps most important are the contributions NRC makes toward aiding the

United States to meet its obligations under Article IV of the Nuclear Nonproliferation Treaty, including support for bilateral and IAEA-sponsored exchanges of equipment, materials, and scientific and technological information on the peaceful uses of nuclear energy (see Figure 5.2).



Figure 5.2 International Atomic Energy Agency Deputy Director General for Nuclear Energy Victor Mourogov Visits Chairman Jackson at NRC

DEVELOPMENT OF INTERNATIONAL LEGAL INSTRUMENTS

In FY 1997, efforts to establish and enhance a global nuclear safety culture were aided by concrete developments on three multilateral legal agreements: the Convention on Nuclear Safety; the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management; and the Convention on Supplementary Compensation for Nuclear Damage.

NRC played a leading role in resolving implementation issues for the international Convention on Nuclear Safety, which entered into force in October 1996. The Preparatory Meeting of Contracting Parties to the Convention took place in April 1997, at which decisions were made on documents setting forth guidelines for the preparation of National Reports, the peer review process, and the organizational and financial schema. When the Senate gives its advice and consent to ratification, the NRC will be the lead Federal agency in implementation activities related to U.S. obligations under the Convention, including the development of the U.S. National Report. NRC also participated in three technical

Groups of Experts meetings to negotiate a text on the safety of radioactive waste management and participated in the September 1997 Diplomatic Conference to finish the text of the Convention. Also in September 1997, final negotiations to conclude texts on a supplemental funding convention and a protocol to amend the Vienna Convention on Liability took place at a Diplomatic Conference. The supplemental funding convention will enable the United States to participate in an international liability regime in the event of a nuclear accident.

IMPLEMENTATION OF U.S. NATIONAL NUCLEAR POLICY

At the eighth and ninth meetings of the U.S./Russian Joint Commission on Economic and Technological Cooperation (known as the Gore-Chernomyrdin Commission (GCC)), both countries reaffirmed their view that safe nuclear power is a key component of global nuclear safety and security, and stressed the importance of a strong, independent nuclear regulatory authority as a means of promoting and maintaining nuclear safety. NRC works closely with its counterpart Russian regulatory authority, Gosatomnadzor (GAN), and accomplishments such as the development of a regulatory training center, an emergency response capability, and review of regulatory standards and criteria were cited at the GCC meetings. Of particular nuclear safety and nonproliferation significance was the continuing bilateral effort to convert Russia's three operating plutonium production reactors to district electricity and heat uses while developing a design that would not produce weapons-grade plutonium. In support of formal U.S.-Russian Government agreements to begin implementation of this initiative, NRC Chairman Jackson and GAN Chairman Vishnevsky signed a Joint Statement Concerning Enhancement of Regulatory Oversight of Core Conversion Activities to ensure that safety remains at the heart of the project. NRC and GAN will focus on such areas as the verification of design and accident analysis codes, quality assurance, design requirements for criticality control systems, and probabilistic risk analysis.

NRC continued its active involvement in support of the three nuclear safety institutions that have emerged from the annual Group of Seven (G-7)

economic summits: the G-7 Nuclear Safety Working Group (NSWG), the Group of Twenty-four Nuclear Safety Coordination mechanism (G-24 NUSAC), and the Nuclear Safety Account (NSA) at the European Bank for Reconstruction and Development (EBRD). In each of these groups, NRC provides important technical advice and policy guidance in framing U.S. nuclear safety proposals and evaluating those of other governments, especially activities involving regulatory assistance.

In FY 1997, the NSWG worked to effectively implement the Memorandum of Understanding (MOU) with Ukraine, which provides for closure by the year 2000 of the four-unit Chernobyl nuclear power plant. A key element in the MOU has been the development of alternative solutions for the deteriorating sarcophagus entombing Unit 4, with a goal of transforming the sarcophagus to a safer and more environmentally stable condition. At a cost of \$750 million and covering 22 integrated tasks, work under the Shelter Implementation Plan began in the fall of 1997 and will be completed in 2005. The Ukrainian Nuclear Regulatory Authority (NRA) will play a key role in the realization of this plan, most notably in the creation of criteria to implement shelter improvements. NRC is working with NRA in such areas as radioactive risk evaluation methodology and preparation of licensing documents covering construction and operation of the shelter.

Since 1992, the G-24 NUSAC has coordinated safety assistance programs worldwide for the countries of the former Soviet Union (FSU) and Central and Eastern Europe (CEE). In February and July 1997, NRC attended G-24 NUSAC Steering and Plenary Committee meetings. NRC has also been actively involved in efforts to restructure the G-24 NUSAC coordination process so as to incorporate the maturity and experience that has been gained since 1992.

The EBRD/NSA is a supplementary multilateral mechanism to address immediate operational safety and technical safety improvement measures at the least safe Soviet-designed reactors not covered by bilateral programs. Administered by a steering body of representatives from the 15 donor countries, the NSA coordinates issues and is assisted by the G-24 NUSAC and is managed by the EBRD. In FY 1997, the NSA and the Government of Ukraine successfully concluded a

grant agreement for approximately \$125 million in assistance to support the Chernobyl plant closure initiative. Other NSA projects include \$30 million for safety upgrades and improvements at the Bulgarian Kozloduy nuclear power plant; approximately \$50 million for safety upgrades and improvements and the conduct of a safety assessment at the Lithuanian Ignalina plant; and approximately \$70 million for safety upgrades and improvements at the Russian Kola and Novovoronezh plants and the support for licensing of these activities by GAN. Key to most of these projects is the strengthening of the national nuclear regulatory authorities, in which NRC has had a substantial role. NRC has also provided technical assistance in other bilateral and multilateral EBRD/NSA projects.

INTERNATIONAL NUCLEAR REGULATORS ASSOCIATION

In January 1997, Chairman Jackson convened a working group that included the heads of seven other national regulatory bodies (Canada, France, Germany, Japan, Spain, Sweden, and the United Kingdom) to discuss the creation of an International Nuclear Regulators Association (INRA). Following national government review, the group convened in Paris in May 1997 and formally constituted the INRA. The purpose of the INRA is to enable its members to influence and enhance nuclear safety worldwide from the regulatory perspective. The group's objectives are to—

- exchange views on broad regulatory policy issues;
- build a global nuclear safety culture;
- encourage the most efficient use of resources in areas of common interest;
- work to enhance the stature of nuclear regulatory organizations worldwide;
- seek consensus on how regulatory issues can be approached and implemented to facilitate international cooperation in regulation;
- work to advance nuclear safety through cooperation among its members, cooperation with relevant existing intergovernmental

organizations (e.g., IAEA, OECD/NEA), with other national nuclear regulatory organizations, and others as appropriate; and

- identify emerging nuclear regulatory challenges.

Chairman Jackson was elected the first INRA Chairman and will serve a term of 2 years. The May 1997 meeting discussed two broad topics: (1) national trends in electric generation and their effect on nuclear safety and (2) an assessment of effectiveness of nuclear regulatory and safety assistance. The group met again in January 1998 and will meet twice a year thereafter (see Figure 5.3).



Figure 5.3 The Working Group on International Nuclear Regulator Coordination Meet With the NRC Commission, January 1997

ARRANGEMENTS AND LETTERS OF AGREEMENT

NRC currently participates in 34 arrangements with foreign national regulatory authorities. During FY 1997, NRC entered into a new information exchange and cooperation arrangement with Armenia and renewed expiring arrangements with Mexico and Switzerland. In October 1997, NRC also renewed its arrangements with The Netherlands and Japan; most of the negotiations for these arrangements had been completed before the end of FY 1997. Intellectual Property Rights issues continued to delay the formal renewal of NRC's arrangement with France. NRC also implements an on-the-job training program for assignees from other countries, usually from their regulatory organizations, operating under the aegis of the

bilateral information exchange arrangements. During FY 1997, 14 people from the countries of Brazil, Bulgaria, China, France, Hungary, the Republic of Korea, Mexico, and Spain participated in the program (see Figure 5.4).

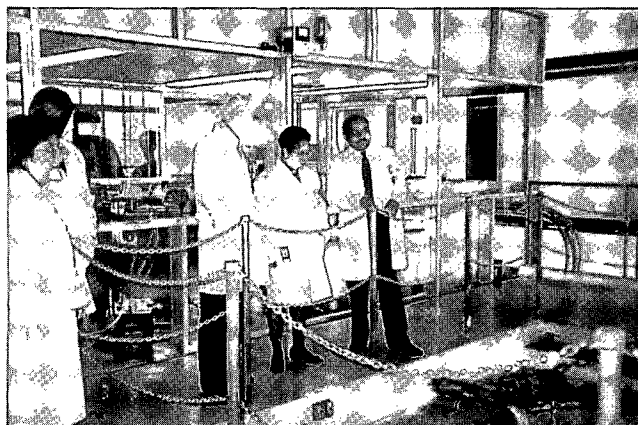


Figure 5.4 Chairman Jackson Visits the Triga Mark III Nuclear Research Reactor in Salazar, Mexico

BILATERAL COOPERATIVE AND ASSISTANCE ACTIVITIES

In FY 1997, NRC completed its fifth year of providing assistance in nuclear safety and safeguards to Russia and Ukraine. On the basis of the fundamental nuclear laws each country passed 2 years ago, regulatory agencies prepared implementing legal and technical documentation, which they gave to NRC for comment. NRC sponsored approximately 40 training missions to the United States, involving about 120 people, and approximately 50 training-related trips to Russia and Ukraine, involving NRC staff and contractors, primarily in the areas of licensing and inspection. Under the Joint Coordination Committee on Civilian Nuclear Reactor Safety, NRC supports severe accident research by the Russian Research Center at Kurchatov and the Russian Academy of Sciences. Commissioner Dicus represents the NRC on the Joint Coordinating Committee for Radiation Health Effects Research (JCCRER), a bilateral body that coordinates research in radiation health effects conducted jointly by Russia and the United States. NRC has also initiated limited activities with regulatory authorities in Armenia and Kazakhstan.

The NRC has continued its extensive assistance program to the countries of Central and Eastern Europe, drawing on funds provided by the Agency for International Development (AID) (see Figure 5.5). The goal of the NRC program is the transfer of Western safety principles and NRC safety review and licensing methodology to local regulators. The combined efforts of Western donor countries has brought about a noticeable increase in safety culture and awareness in the CEE countries to the point that many of them are now capable of nuclear safety assistance to other CEE countries. The NRC also continued its close cooperation with the IAEA on a range of CEE activities, including participation in IAEA-initiated Technical Cooperation Program review meetings to help monitor ongoing assistance activities and to assist in defining future assistance efforts.

In October 1996, the JCCRER met in Moscow. Prior to this meeting, the United States delegation, headed by DOE Assistant Secretary Tara O'Toole, and including Commissioner Dicus, visited the former secret city of Ozyorsk and Chelyabinsk. The visit to Ozyorsk was the first by high level United States officials. The visit enabled the United States JCCRER members to meet Russian scientists engaged in radiation health effects studies and tour their facilities. During FY 1997, Commissioner Dicus also participated in peer discussions on regulatory approaches in member States of the IAEA and visited nuclear facilities in France and the United Kingdom.



Figure 5.5 From left to right: Slovak Nuclear Regulatory Authority (SNRA) Chairman Jozef Misak; Chairman Jackson; and Stephen Rohar, Chief Inspector, SNRA

The Commission has placed a high priority on safety cooperation with Pacific Rim countries. NRC conducts an active bilateral safety program with Japan, Taiwan, and South Korea (see Figure 5.6). During FY 1997, there was an active exchange of safety information between the NRC and the China National Nuclear Safety Administration, including four NRC-sponsored workshops in Beijing. Under the NRC-Indonesian National Atomic Energy Agency (Badan Tenaga Atom Nasional; BATAN) arrangement, four BATAN staff completed year-long on-the-job training assignments at NRC.



Figure 5.6 Chairman Jackson Visits the Ohi Nuclear Power Plant in Ohi, Japan

The NRC has traditionally maintained strong ties with the countries of Western Europe and Canada, and many of these countries have active and mature nuclear programs. Visits by the NRC Chairman, the Commissioners, and the staff to France, Germany, Italy, Spain, and the United Kingdom advanced knowledge of important new technical developments, both for operating facilities and new designs, and aided in harmonization of regulatory approaches (see Figure 5.7).

Chairman Jackson participated in the United States/South Africa Binational Commission meetings, reporting on the status of nuclear safety initiatives that NRC has underway with the South African Department of Minerals and Energy and with the Council for Nuclear Safety (see Figure 5.8). In addition to Commissioner Diaz's visits to Argentina and Brazil during FY 1997, NRC reviewed and supported the proposed 30-year U.S.-Brazil Agreement for Peaceful Uses of

Nuclear Energy Cooperation, which will permit the transfer of technology, materials, equipment, and components for nuclear research and power production.

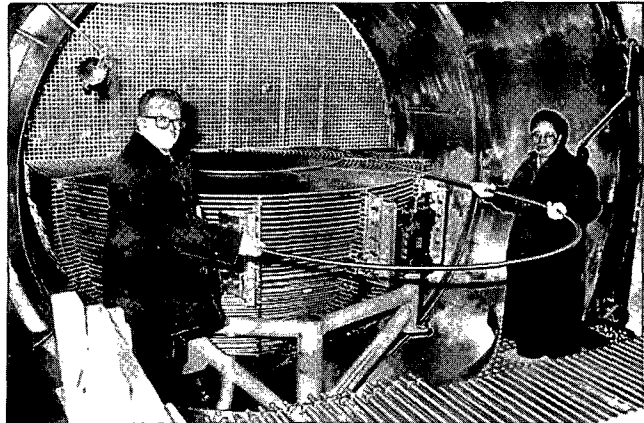


Figure 5.7 Chairman Jackson Views Steam Generator in the Framatome Facility in Chalon, France, December 1997



Figure 5.8 Chairman Jackson and NRC's Director of International Programs Carl Stoiber Meet with Managers at the Koenberg Nuclear Power Station in Melkbosstrand Cape, South Africa, October 1996

COOPERATION WITH MULTILATERAL ORGANIZATIONS

NRC works closely in the area of nuclear safety with the IAEA and the OECD/NEA. NRC participates in a wide range of IAEA activities, including periodic peer reviews of the IAEA safety program and contributions to the drafting of the IAEA's Nuclear Safety Review. NRC is represented on the standing Advisory Commission

on Safety Standards, which is organizing the development of consistent and compatible Safety Series documents, and on the International Nuclear Safety Advisory Group, which advises the IAEA on underlying nuclear reactor safety principles and generic safety matters. In FY 1997, the staff participated in 28 IAEA advisory group, technical committee, and consultants' meetings on a range of topics in reactor, waste, and radiation safety. On the average, one staff person per week participated throughout the year. NRC also funds a nuclear safety attache position at the U.S. Mission to International Organizations in Vienna, Austria, to provide expert advice on nuclear safety, radiation and waste management issues, and programmatic and policy oversight to the U.S. Government on the IAEA's nuclear safety program.

The NRC is actively involved in the OECD/NEA budget formulation and the development of its program of work through such varied means as—

- participation in technical Standing Committees such as the Committee on the Safety of Nuclear Installations and the Committee on Nuclear Regulatory Activities;
- serving on working groups;
- serving on the U.S. delegation to Steering Committee meetings; and
- the appointment of Commissioner Rogers to the High-Level Advisory Group on the Future Role of the OECD Nuclear Energy Agency.

A large share of the NEA's technical work is related to NRC domestic nuclear safety priorities, particularly operational safety. Cooperative international research on high-priority safety areas, under the auspices of the NEA, complements and expands NRC's research program in a cost-effective manner.

IAEA SAFEGUARDS AT NRC-LICENSED NUCLEAR FACILITIES

The NRC provides support for IAEA-sponsored international safeguards activities for deterring nuclear proliferation and for strengthening and implementing IAEA safeguards. Through Cooperative Threat Reduction and Lisbon

Initiative program funding, NRC assists the regulatory authorities of Russia, Ukraine, and Kazakhstan to establish national regulatory systems for materials control and accounting and physical protection. The NRC staff contributes to the U.S. Program of Technical Assistance to IAEA Safeguards, and the U.S. provides the largest share of voluntary technical support of any IAEA member state. In support of its review of physical protection arrangements for U.S.-controlled materials in other countries, the NRC participates jointly with other U.S. Government agencies in information exchange trips for the purpose of discussing national physical protection programs. During FY 1997, visits were made to Belgium, Sweden, Australia, Japan, South Korea, and South Africa.

INTERNATIONAL SAFETY RESEARCH AGREEMENTS

The NRC conducts confirmatory regulatory research in partnership with nuclear safety agencies and institutes in more than 20 countries. Much of this activity is concentrated in four major subject areas: severe accident research, thermal/hydraulic code maintenance and assessment, probabilistic risk assessment, and steam generator tube integrity. These international research agreements provide for shared use of facilities, joint funding arrangements, prompt exchange of experimental results, coordinated analyses, and other forms of cooperation to yield confirmatory safety data of mutual benefit in a timely and cost-effective manner.

During FY 1997, NRC reviewed 110 export applications to confirm that appropriate IAEA safeguards and physical protection measures would be applied in the receiving country. Activities in FY 1997 for strengthening international and foreign safeguards programs are listed in Table 5.1.

Interagency Safeguards Participation

During FY 1997, NRC reviewed 6 physical protection and 25 material control and accounting plan submittals. The NRC staff visited all licensees required to have such plans to ensure

Table 5.1 International and Foreign Safeguards and Safety Strengthening Activities

<i>Activity</i>	<i>Other entities involved</i>	<i>NRC participation</i>
Review of Foreign Physical Protection Arrangements and Application of IAEA Safeguards		
Information exchange meetings to discuss national physical protection programs with countries with Peaceful-Use Nuclear Cooperation Agreements with U.S.	During 1997 meetings held with Belgium, Sweden, Japan, South Korea, and Australia	NRC staff serves as technical member on U.S. interagency team
IAEA International Physical Protection Advisory Service evaluation of national physical protection programs	IAEA and selected Member States	NRC staff serves as technical member on IAEA-led teams
Working group meetings to enhance IAEA physical protection guidance (INFCIRC-225)	IAEA and selected Member States	NRC manager led or participated on topical working groups
International Safeguards Technical Bilateral Meetings	IAEA, EURATOM, Japan	NRC staff serves as technical member on U.S. interagency team
Participation on IAEA-convened topical committees and meetings	IAEA and selected Member States	NRC staff serves as U.S. participant at selected meetings
Assistance to Foreign Safety and Safeguards Programs		
Conduct safeguards and safety workshops and training courses for foreign regulators on fuel cycle technology, regulatory programs, and licensing and inspection and provide direct support to the regulators in the development of regulations and the implementation of licensing and inspection programs.	Russia, Kazakhstan, and Ukraine	NRC plans and conducts support activities in response to recipient needs
Implementation of IAEA Safeguards in U.S.		
Facilitate implementation of IAEA safeguards at NRC-licensee facilities	IAEA and BWX Technologies	NRC obligation under Atomic Energy Act
Oversight and management of the U.S. Nuclear Materials Management and Safeguards System (NMMSS)	DOE, Lawrence Livermore National Laboratory, and NAC, Inc.	NMMSS is co-funded by NRC and DOE. NRC staff serves as member of NMMSS Steering Committee
Provision of prescribed information as obligated under treaties and international agreements	State Department, IAEA, EURATOM, and foreign countries	NRC obligation under treaties and agreements
Coordination of U.S. Government activities as Chair of the U.S. interagency Subgroup on Implementation of Safeguards in the U.S. (SISUS)	State Department, DOE, Arms Control and Disarmament Agency, and Defense Department	NRC manager serves as Chair of SISUS Committee; staff serves as technical participants

Table 5.1 International and Foreign Safeguards and Safety Strengthening Activities (Cont.)

<i>Activity</i>	<i>Other entities involved</i>	<i>NRC participation</i>
Strengthening IAEA Safeguards		
Development of U.S. Government coordinated positions on IAEA safeguards issues	State Department, ACDA, DOE, Defense Department	NRC manager serves as member of Subcommittee on International Safeguards and Monitoring and staff serves on its subgroups; staff provided direct support to interagency teams negotiating model protocol to safeguards agreements
Development of advice on safeguards implementation to the Director General of the IAEA	IAEA and selected Member States	NRC manager serves as U.S. participant on IAEA's Standing Advisory Group on Safeguards Implementation
Development of technical IAEA safeguards approaches through participation in international technical working groups and review of safeguards approaches under development to assure that they could be effectively applied at licensee facilities with minimal impact on licensee operations.	IAEA and selected Member States	NRC staff serves as Chair of international technical coordinating committee for Programme on Safeguards for the Final Disposal of Spent Fuel in Geologic Repositories and as participant on international working group on Alternate Nuclear Materials
Development of U.S. Government coordinated positions on fissile material disposition, excess weapons material transparency, and Trilateral Initiative	IAEA, Russia, State Department, ACDA, DOE, Defense Department	Technical member on U.S. interagency team

that licensees were adequately implementing their plans. The NRC/Department of Energy Communicated Threat Credibility Assessment Team was called on periodically in FY 1997 to assess concerns involving NRC-regulated activities. NRC continued to work with other

Federal agencies to monitor intelligence community information on potential threats to NRC-regulated activities. NRC published in July 1997 the annual revision to its "Safeguards Summary Event List" (NUREG-0525).

Protecting the Environment

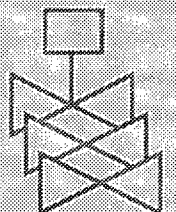
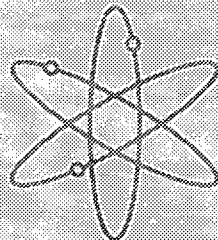
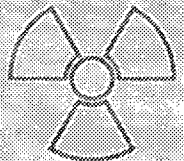
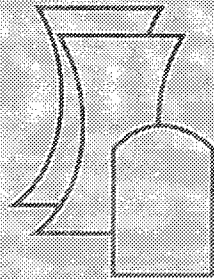
The U. S. Nuclear Regulatory Commission (NRC) recognizes a continuing obligation to conduct its civilian licensing and related regulatory functions in a manner that is both responsive to environmental concerns and consistent with the Commission's responsibility as an independent regulatory agency for protecting the radiological health and safety of the public. The primary foundation for these activities, other than the principal acts governing NRC activities, are the National Environmental Policy Act (NEPA) and other environmental legislation.

Protection of the environment from potential hazards associated with the civilian use of source, byproduct, and special nuclear materials involves actions to mitigate environmental impacts during licensed activities. Before authorizing licensed activities, the NRC ensures that potential environmental impacts of such activities are assessed consistent with the requirements of NEPA as implemented by applicable NRC regulations such as Part 51, "Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions," of Title 10, "Energy," of the *Code of Federal Regulations*.

In Fiscal Year (FY) 1997, NRC achieved its goal in protecting the environment, having no significant offsite releases from operating facilities or facilities in a decommissioning status. Table 6.1 gives the number of offsite releases from operating facilities of radioactive material that exceeded limits in 10 CFR Part 20, "Standards for Protection Against Radiation," from 1993 to 1997. Specific activities contributing to attaining these performance goals are discussed in this chapter. In addition, progress made reviewing (1) data collected through the NEPA process before NRC regulatory actions were taken and (2) data about sites released but subsequently discovered to have not met NRC's remediation release criteria in FY 1997 are discussed in this chapter.

Table 6.1 Number of Offsite Releases From Operating Facilities of Radioactive Material that Exceed 10 CFR Part 20 Limits

YEAR	NRC	AGREEMENT STATES
1993	0	0
1994	0	1
1995	0	2
1996	0	0
1997	0	0
TOTAL	0	3
5-YEAR AVERAGE	0	0.6



During FY 1997, NRC performed five environmental reviews; prepared five Environmental Assessments (EAs), resulting in no Environmental Impact Statements; and prepared five Findings of No Significant Impact for activities related to fuel cycle licensees. NRC prepared EAs for the renewal of five fuel cycle licenses. The EAs demonstrated that normal operations of the licensed facilities would result in public doses that are far below the limits of "Radiation Dose Limits for Individual Members of the Public," Subpart D of 10 CFR Part 20.

Unprecedented Multi-Agency Drill

In the fall of 1997, the NRC staff helped organize and participated in an unprecedented drill designed to test the ability of multiple agencies to work together in retrieving "orphaned" radioactive material that winds up in the public domain. This drill, known as *The Lost Source Exercise*, was staged in two parts in Pennsylvania and was, by all accounts, a success.

In the first part, the nearly one dozen Federal, State, and county agencies taking part were given initial information pertaining to the drill's scenario—the discovery of an unshielded radiography source in a trash truck at a commercial landfill—and explored the most effective ways to communicate and coordinate activities.

Then, on October 22, 1997, in the second part of the drill, the participants successfully planned and carried out the recovery of the hypothetical, highly radioactive source. Specialized equipment used included a helicopter outfitted with sophisticated radiation-measuring instruments, mobile laboratories, advanced communications tools, portable shielding, remote cameras, and radioactive source-manipulating devices.

Among the agencies taking part were—

- NRC: Region I;

- the Environmental Protection Agency: Regions II and III;
- the Department of Energy;
- Pennsylvania and Delaware emergency management agencies;
- Pennsylvania, New Jersey, and Maryland environmental protection agencies; and
- Pennsylvania's Chester County emergency services organization.

In addition, private industry played a role: BFI Corporation participated as the landfill operator and waste-hauling representative, and PECO Energy Company provided the meeting facilities and logistical support. Figure 6.1 shows participants in this exercise.

Regulation of Reactor and Site Decommissioning

The Decommissioning Program encompasses the regulation of decontamination and the decommissioning of power reactor, fuel cycle facility, and materials licensees. This program includes the—

- development of associated regulations and guidance;
- review of site characterization plans for complex cases;
- review and approval of decontamination and decommissioning plans;
- development of environmental assessments and environmental impact statements associated with these reviews;
- regulatory oversight of decommissioning actions;
- review of final survey reports;
- conduct of selected confirmatory surveys;



Figure 6.1 Participants in *The Lost Source Exercise*

- termination of licenses; and
- development of policy to ensure efficient and consistent licensing actions.

Research Supporting Protection of the Environment

Rulemakings promulgated by the NRC in FY 1997 contributed in a significant way to NRC's success in achieving its performance goals. These rulemakings were promulgated to reduce unnecessary burden on licensees. For final rules, this led to improvements in the regulatory framework.

REDUCTION OF UNNECESSARY LICENSEE BURDEN

The following rulemakings were promulgated to reduce unnecessary burden on licensees, which, in turn, allowed licensees to redirect their limited resources to activities that have greater safety

significance. (See also "Research Supporting Nuclear Materials Safety" in Chapter 3.)

During FY 1997, a final rule was issued on "Radiological Criteria for License Termination of Nuclear Facilities (Parts 20, 30, 40, 50, 51, 70, and 72)." It established dose-based criteria for license terminations to provide regulatory consistency in that before promulgation of this rule, licensees' termination decisions were all on a case-by-case basis. By developing dose criteria, and by providing an option whereby licenses can be terminated with restrictions, additional flexibility has been provided to licensees that was not readily available under the case-by-case approach.

A final rule to add different procedural requirements and to change the way uranium enrichment facilities are licensed contains several new or revised licensing and certification requirements specific to the Uranium Enrichment Corporation and its successor's operation of uranium enrichment facilities.

A final rule, 10 CFR 51.60, eliminates the environmental report requirements for terminating a uranium milling license.

A proposed rule to exempt canisters containing vitrified plutonium waste from the packaging

requirement for double containment (10 CFR Part 71) is being proposed in response to a petition for rulemaking (PRM-71-11).

A proposed rule provides criteria that would allow qualifying non-profit entities and non-bond-issuing business corporations to use self-guarantee as an additional mechanism for financial assurance.

Each year, the NRC evaluates requests, mainly from materials licensees, to discontinue licensed operations at certain sites. The majority of these sites are remediated, if necessary, and released for unrestricted use. However, termination of licenses at some sites is considerably more complex because soils and structures contain elevated levels and volumes of radiological contamination. These sites have buildings, former waste disposal areas, large piles of tailings, ground water, or soil contaminated with low levels of uranium, thorium, or other radionuclides. Sites that warrant special NRC oversight to ensure timely decommissioning are placed in the Site Decommissioning Management Plan (SDMP). In FY 1997, the SDMP list had 47 sites; of these, 8 were removed in the same fiscal year. The remediation was completed for four sites: Babcock & Wilcox (Apollo, Pennsylvania); RTI, Inc.; Texas Instruments; and Curtis Bay. A fifth site was removed from the SDMP on the basis of the Department of Army's determination that depleted uranium was not significantly impacting the environment at the Aberdeen Proving Ground, Maryland. Three sites were transferred to Massachusetts when Massachusetts became an Agreement State in March 1997. In addition, the remediation plan for the Chemetron, Bert Avenue, site was approved, and the license for the Fort St. Vrain Nuclear Power Plant was terminated.

During FY 1997, consistent with NRC goals, there were no offsite releases in excess of limits from facilities in a decommissioning status.

Uranium Recovery Licensing and Inspection

NRC's uranium recovery regulatory activities are mandated by the Uranium Mill Tailings Control Act of 1978 (UMTRCA), as amended. Title I of UMTRCA directs the DOE to remediate surface contamination at 24 abandoned uranium mill tailings sites that NRC will then license to the Department of Energy (DOE) for long-term care. UMTRCA also requires that NRC be actively involved in this process by requiring that NRC review and evaluate DOE's remedial action plans for these sites and that NRC concur that DOE has completed each remedial action project in such a way that it meets the Environmental Protection Agency standards set for such facilities. Congress mandated that the surface remediation and licensing of the 24 sites be completed by September 30, 1998.

Uranium mill tailings are the wastes that result from the processing of uranium-bearing ores to extract or concentrate the uranium so that it can be further processed into fuel for nuclear reactors or into a form that is needed for medical, academic, industrial, or commercial purposes. The tailings contain hazardous and radioactive substances that must be properly contained and controlled for periods up to 1,000 years in order to protect public health and safety.

One of NRC's uranium recovery performance measures for FY 1997 was to support DOE in the UMTRCA Title I reviews to fulfill the congressionally mandated UMTRCA program completion date. During FY 1997, NRC concurred in construction completion at seven of the DOE sites, and licensed five sites to DOE for long-term care. This meant that by the end of FY 1997, the required actions were completed at 19 of the 24 sites, leaving a remainder of 5 sites for DOE to reclaim in order to finish the surface reclamation of the abandoned mills. Activities for the ground water remediation phase also continued in FY 1997 and will continue beyond the 1998 deadline for the surface remediations. Additionally, NRC reviewed four of DOE's plans for ground water

remediation of the sites (these reviews have no statutory deadline). Figures 6.2–6.5 show various areas of the White Mesa Uranium Mill in Utah.

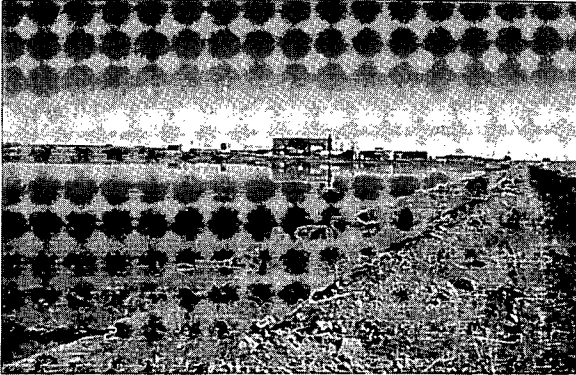


Figure 6.2 White Mesa Mill Near Blanding, Utah

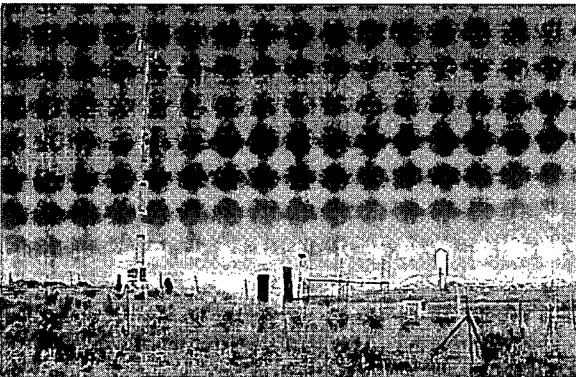


Figure 6.3 Meteorological Monitoring Tower

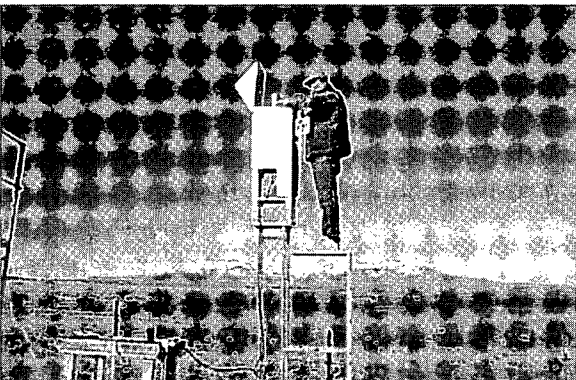


Figure 6.4 Calibration of BHV-1 Particulate Air Sampler

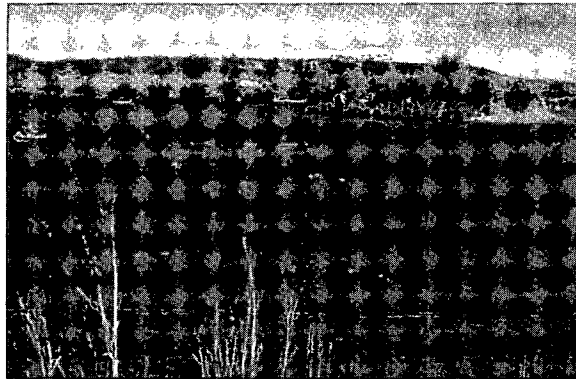


Figure 6.5 Wildlife Pond on Owner-Controlled Property

Under Title II of UMTRCA, NRC's uranium recovery program includes responsibility for the—

- licensing and regulation of commercial uranium mills (that extract uranium from ore);
- commercial in situ leach (ISL) or solution mining operations;
- the disposal and reclamation of mill tailings; and
- the decommissioning of uranium recovery facilities.

In 1997, out of 26 NRC-licensed uranium recovery facilities, 18 were conventional uranium mills in various stages of decommissioning and reclamation; 5 were commercial ISLs; 1 was an ion-exchange facility; 1 was a heap leach facility; and 1 was a disposal facility for tailings received from off site. During FY 1997, NRC reviewed the operating history and the safety and environmental aspects of several operating uranium recovery facilities and issued three performance-based renewed licenses. Figures 6.6 and 6.7 are examples of a uranium mill tailings site before and after remediation.

During FY 1997, consistent with NRC goals, there were—

- no significant accidental releases of radioactive materials from the NRC-licensed uranium recovery facilities and their associated operations;

- no offsite releases of radioactive materials from the facilities;
- no releases that caused significant adverse impacts to the environment.
- no significant exposures to the public or the workers; and

Finally, NRC's uranium recovery reviews of environmental and safety information served to identify and resolve adverse situations or impacts as part of the regulatory process.

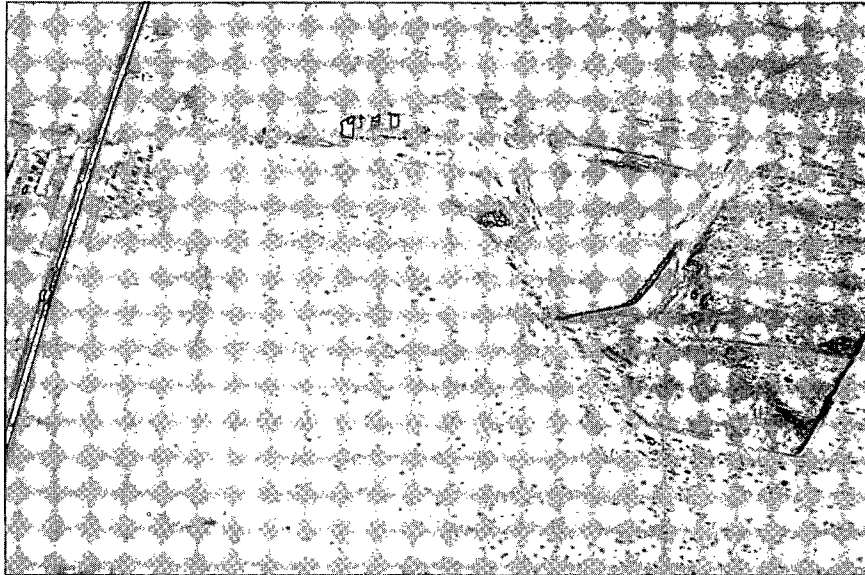


Figure 6.6 Uranium Mill Tailings Site at Tuba City, Arizona, Before Remediation

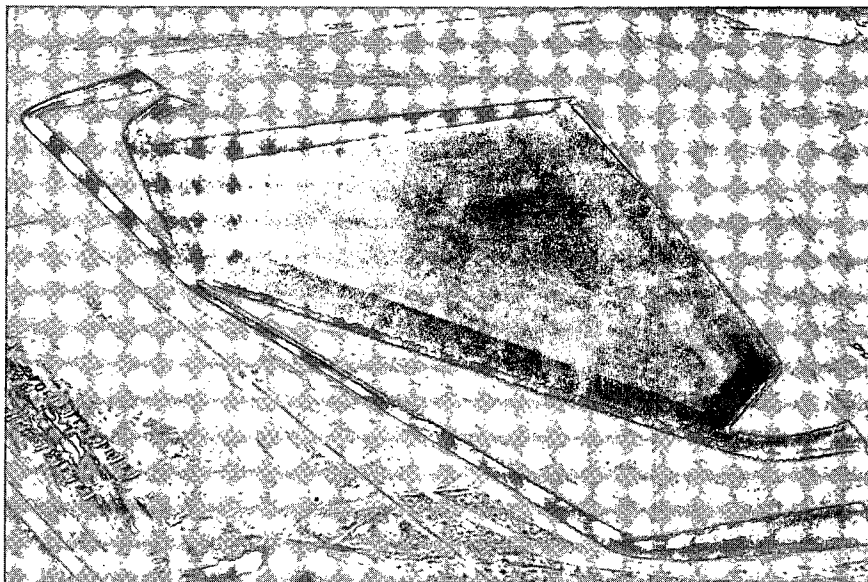


Figure 6.7 Uranium Mill Tailings Site at Tuba City, Arizona, After Remediation

Public Confidence

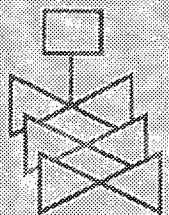
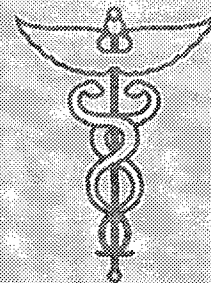
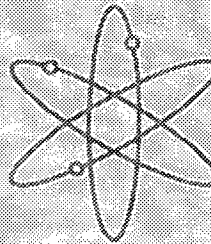
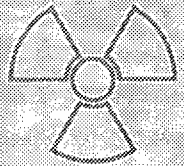
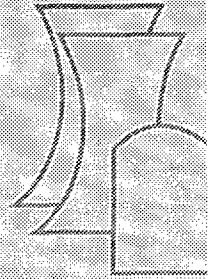
Building and maintaining public trust is critical to carrying out the U.S. Nuclear Regulatory Commission's (NRC's) mission and vision. To be an effective steward for nuclear safety, the public, those we regulate, and other stakeholders in the national and international community must have respect for and confidence in NRC's regulatory actions. NRC assigns a high priority to earning public trust and confidence through early identification of public concerns and facilitating interaction with the public and participation by the public in regulatory decisions of substantial interest to the public and NRC stakeholders.

In Fiscal Year (FY) 1997, the NRC Executive Council established a coordinating group that is developing a plan to improve how NRC informs and involves the public, those we regulate, and other stakeholders in NRC's regulatory program. This chapter describes progress made in developing this plan and other NRC involvement with these interested parties.

Public Information

The NRC's mission of protecting the public health and safety emphasizes the need to provide to everyone who is interested full and fair access to our decisionmaking process. To foster greater understanding of and confidence in the agency's regulatory oversight over the nuclear power industry and the licensed uses of radioactive material, the NRC is committed to providing complete, clear, and accurate information about the agency's programs, policy decisions, and activities. This commitment is accomplished primarily through news releases, pamphlets, fact sheets, and other published materials. Much of this information is available electronically on our web page at <<http://www.nrc.gov>>. Additionally, NRC closely follows news coverage of the agency and responds to press and public inquiries in a timely, courteous, and professional manner. The agency also administers a cooperative program with schools to educate students and teachers about the agency's responsibilities.

In the spring of 1997, the Commission directed the Executive Council to create a special coordinating group to propose recommendations to further the Commission's objective of improving public communications with all stakeholders, and particularly with the public at large. The resulting plan recommended ways to improve the quality, clarity, and credibility of agency communications, emphasizing the need for plain English when dealing with the necessarily technical matters involved in nuclear oversight. The plan additionally recommended that the NRC identify public concerns earlier, provide clearer oral and written communications, commit to earlier involvement of the public in NRC



activities, respond more effectively to public concerns, and improve public access to information.

Media Workshop

In April 1997, the NRC held a two-day workshop for reporters that covered current issues facing nuclear utilities across the Nation. At the workshop, senior managers and staff specialists spoke to over a dozen reporters from all over the country about deregulation of the electric industry, reactor and materials decommissioning, the integrated nuclear power plant assessment program, spent fuel storage, nuclear plant license renewal, and other current issues reporters may write about. Reporters took the opportunity to interview staff on particular issues of interest and toured the NRC Operations Center. The reporters expressed enthusiasm about the workshop and said it should help them better understand and report on events at nuclear facilities in their communities.

Published Information

During FY 1997, NRC updated a fact sheet on the Price-Anderson Act (nuclear plant insurance) and published brochures containing information of interest to the public, such as "Reporting Safety Concerns to the NRC" (NUREG/BR-0240), "The Nuclear Regulatory Commission Fact Sheet" (NUREG/BR-0099, Rev. 8), and "The Regulation and Use of Radioisotopes in Today's World" (NUREG/BR-0217, a reprint). The NRC also produced a 20-minute video, intended primarily for high school audiences but also for the general public, which challenges some misconceptions about nuclear safety and provides a general overview of the agency. Many students viewed the new video at schools nationwide.

The NRC also continued to expand its information on the internet with a new graphical look that loads quickly and provides links to the principal

areas of interest to the public on its Web site. New navigational aids and a search engine help users move easily around the site. Additionally, a link has been added to access the latest updates. A reference library was added to provide access to significant documents, including the full text of NRC regulations—Title 10, "Energy," of the *Code of Federal Regulations*. Plant status reports and event reports provided by NRC licensees are updated daily. A school programs page was also added, featuring information useful to students, parents, and teachers. The NRC continues to offer current information on our regulatory program, including press releases and speeches, reports on regulatory oversight of specific licensees having high public interest, and updates on current information affecting the nuclear industry. The agency continues to provide press releases and speeches of senior officials electronically to about 1,000 worldwide subscribers free of charge.

News Conferences

Chairman Jackson held a number of news conferences both at headquarters and at nuclear plant sites around the country after her visits to those facilities. In January, she toured the Turkey Point plant in Florida and held a news conference afterwards (Figure 7.1). In March, Chairman Jackson toured Commonwealth Edison's LaSalle nuclear plant and their Bulk Power Operations Center, both in Illinois. In August, she visited the Clinton plant in Illinois, and then held a press conference. She also toured the Hanford site in Washington and held a news conference there in March. The Chairman wanted to better understand Department of Energy (DOE) activities at Hanford, one of the several DOE facilities at which some operations may be regulated by the NRC.

In January 1997, Commissioner Diaz toured the St. Lucie Plant in Florida with Chairman Jackson, who held a news conference after the tour (Figures 7.2 and 7.3). In August, he toured the Dresden plant in Illinois and held a press conference at the plant's training center afterwards.

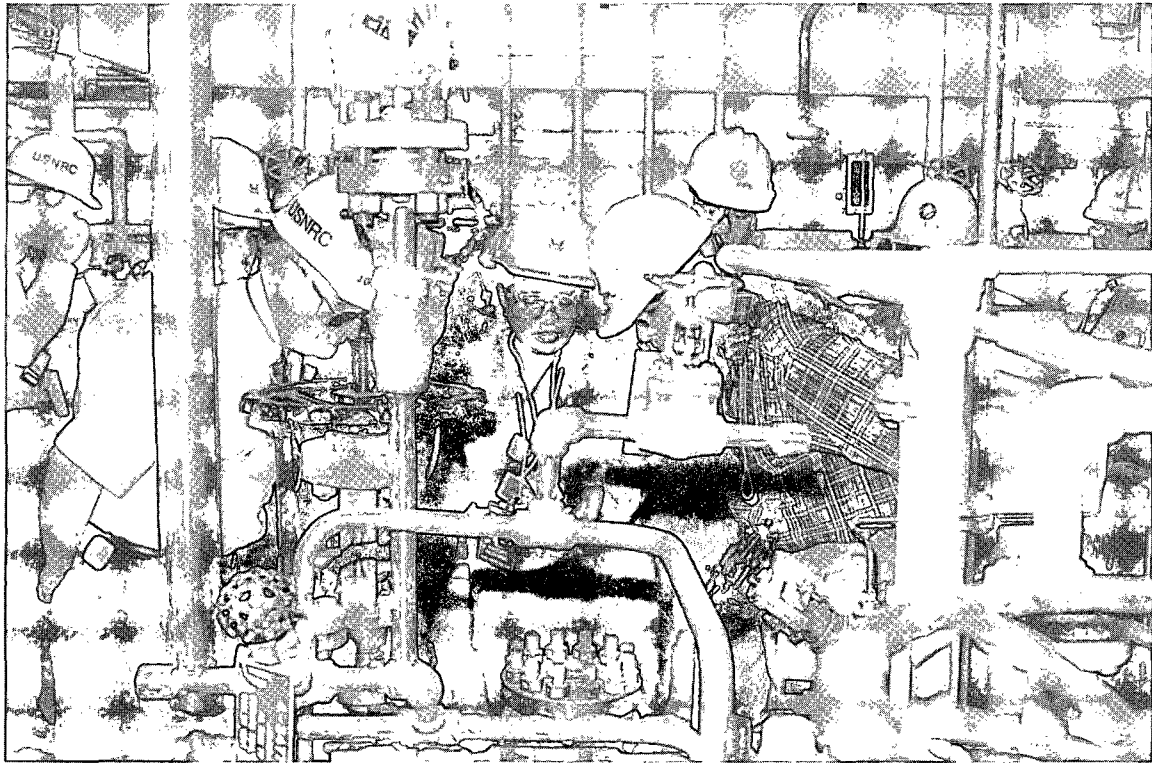


Figure 7.1 Chairman Jackson Tours Turkey Point Nuclear Power Plant, Florida, in January 1997

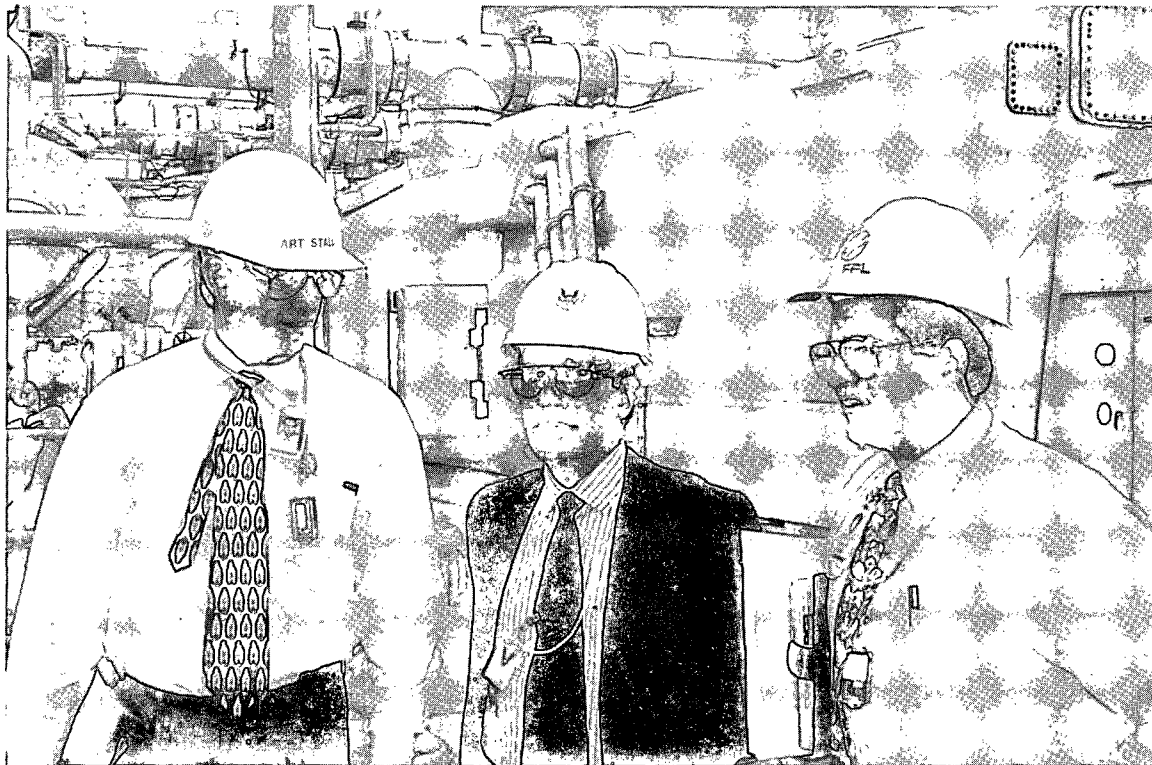


Figure 7.2 Commissioner Diaz at St. Lucie Nuclear Power Plant, Florida, in January 1997

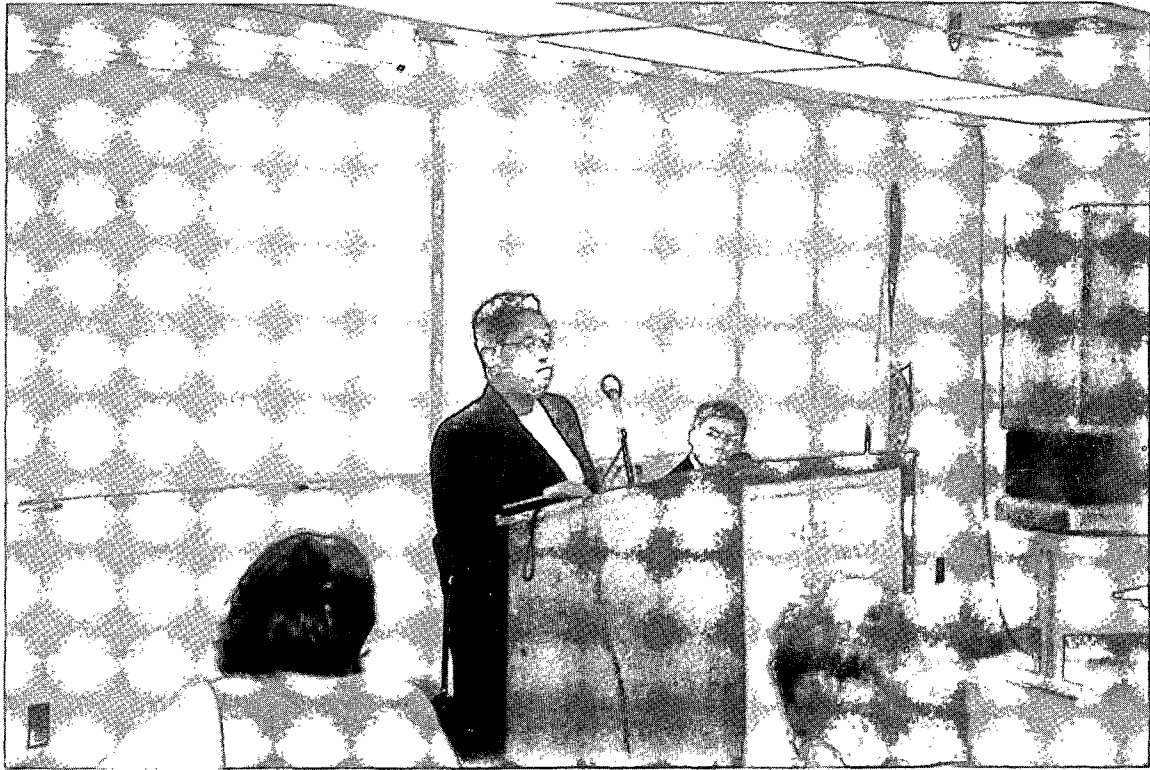


Figure 7.3 Chairman Jackson Holding a News Conference at St. Lucie Nuclear Power Plant

Each of the NRC's four Regional Administrators conducted periodic news briefings during the year. Sessions were held at the Salem plant in New Jersey, the Crystal River and Turkey Point plants in Florida, and the Shearon Harris and Brunswick plants in North Carolina. News conferences were also held at Point Beach in Wisconsin, Zion and Clinton in Illinois, D.C. Cook in Michigan, Wolf Creek in Kansas, and Waterford in Louisiana. News conferences generally focused on particular issues at the plants, emergency response, waste issues, dry cask storage of spent fuel, and enforcement actions. Decommissioning meetings were held regarding the Big Rock Point plant (Michigan), Haddam Neck (Connecticut), Maine Yankee, and the Saxton research and training reactor in Pennsylvania. NRC requirements and licensees' plans for decommissioning their plants were discussed with those in the community living near the plant and with the local media and other interested citizens.

School Volunteer Program

NRC employees continued their commitment to their communities by volunteering in area schools through the School Volunteers Program. This year, approximately 100 employees visited area schools near headquarters and the regional offices to judge science fairs, tutor students, and participate in career days (Figure 7.4).

NRC provided judges for the Montgomery Area Science Fair in Gaithersburg, Maryland, and invited special award winners to explain their winning projects before the Commission and other employees at headquarters.

NRC also hosted Montgomery County teachers for a one-day workshop at headquarters, focusing on agency employees' careers and skills, fundamentals of radioactivity, and basic reactor operations.

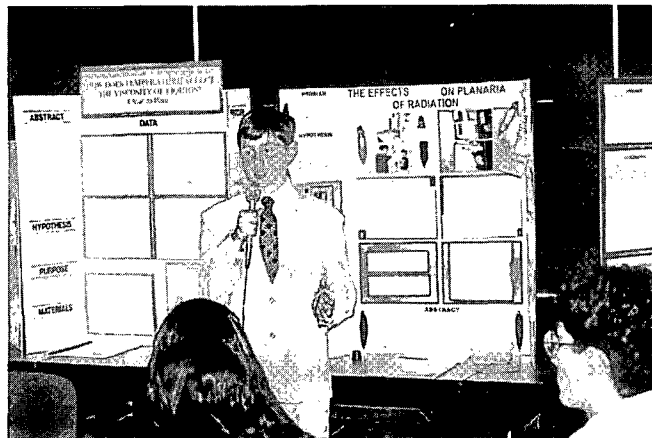


Figure 7.4 The Chairman, the Commissioners, and the Staff Welcome Winners of the NRC Science Fair Awards

State and Local Governments and American Indian Tribes

One of NRC's priorities is to maintain open lines of communication and close liaison with State and local government officials and their organizational representatives, as well as with Native Americans and organizations representing American Indian Tribes. These relationships are developed in an effort to foster public confidence by fully addressing concerns and to promote increased understanding of issues related to NRC regulation, inspection, and oversight activities to protect the public health and safety.

The NRC continued to pursue cooperative activities with the States and their national organizations in 1997. In addition to routine interaction with State and local government and Indian Tribe officials, NRC representatives participated in a number of State-related events, including the activities of the National Association of Regulatory Utility Commissioners, as they relate to nuclear issues and spent fuel disposal and storage. NRC staff met with State and local officials throughout the year to discuss the results of systematic assessments of licensee performance at nuclear power plants and outreach activities related to emergency response planning. The NRC also maintained cognizance of the activities of other State-related organizations, such as the National Governors' Association, the Western Governors' Association, and the National Conference of State Legislatures.

The NRC also implements a policy allowing State officials to observe or participate in NRC inspections at reactors, pursuant to the policy statement on "Cooperation With States at Nuclear Power Plants and Other Nuclear Production or Utilization Facilities" (57 FR 6462). In some cases, States may observe special inspections as well. The NRC policy statement on Cooperation With States identifies the governor-appointed State Liaison Officer (SLO) as the primary State contact for all requests involving observation of NRC inspections of plants or facilities. The SLOs are also the NRC's primary point of contact with the States regarding all relevant NRC decisions and actions. The NRC hosted a National SLO meeting on October 8 and 9, 1996. National SLO meetings are held once every 3 years and regional

SLO meetings are held on an as-needed basis in the off years. Topics for discussion during the national SLO meeting included—

- Current Nuclear Power Plant Issues;
- NRC's Strategic Assessment and Rebaselining Effort;
- Electric Utility Restructuring and Economic Deregulation;
- External Regulation of DOE;
- National Academy of Sciences Report on Radiation in Medicine;
- NRC Enforcement Policy; and
- the Federal Radiological Emergency Response Plan: Status of Potassium Iodide—Ingestion Pathway Planning.

The NRC maintains communications with those American Indian Tribes, and with their national organizations, potentially affected by or otherwise interested in NRC regulatory activities. Tribal interest in nuclear-related activities, including those of the Navajo and Mescalero Apache in New Mexico, the Prairie Island Dakota Indian Community in Minnesota, and the Goshute Tribes of Utah, has provided a number of government-to-government exchanges of information related to NRC's regulatory authority in the areas of high- and low-level radioactive waste storage, disposal, emergency response, transportation, and reclamation.

Communications With the Congress

The Office of Congressional Affairs is responsible for developing, managing, and coordinating relations with the Congress and is the principal point of contact between the agency and Congress. The office—

- coordinates the appearances and testimony of all NRC officials at hearings,
- monitors and tracks bills relevant to the NRC,

- keeps the Congress informed of current agency activities, and
- keeps the NRC apprised of congressional concerns and interests.

During FY 1997, the NRC submitted testimony regarding the agency's FY 1998 budget to the House Appropriations Committee's Subcommittee on Energy and Water Development (April 9, 1997), and the NRC testified about high-level radioactive waste legislation before the House Commerce Committee's Subcommittee on Energy and Power on April 29, 1997.

The Congressional Affairs staff attended and prepared summaries and reports for approximately 70 hearings and legislative markups (i.e., legislation marked for revision) and coordinated numerous briefings for Members of Congress and their staffs.

Commission Meetings

The NRC Commissioners meet to discuss agency business in the Conference Room of the NRC Headquarters building located at One White Flint North, 11555 Rockville Pike, Rockville, Maryland. Members of the public are welcome to attend most Commission meetings as observers. During FY 1997, the Commission held 71 meetings that were open to public observance.

Members of the public may not actively participate in these open meetings unless specifically requested to do so by the Commission. In general, a Commission meeting may be closed to members of the public if it is convened to deal with one or more of certain subjects specified in the Government in the Sunshine Act; this act added Section 552b, "Open Meetings," to the Administrative Procedure Act. Specifically, the Sunshine Act allows the closing of meetings involving classified documents, information deemed confidential by statute, trade secrets, investigations, certain adjudicatory matters, internal personnel matters, matters involving personal privacy, or similar information.

The Commission endeavors to provide meaningful public observation and understanding of open

meetings. To this end, the Commission's Headquarters Conference Room is equipped with multiple overhead speakers and a closed-circuit television system to ensure that every person desiring to attend a meeting can see and hear the proceeding. Additional information is available in several publications. A pamphlet entitled "Guide to NRC Open Meetings" (NUREG/BR-0128) describes the normal seating arrangement for participants at the conference table, the general functional responsibilities of these participants, Commission procedures for voting on agenda items, general rules for public conduct at Commission meetings, and sources of additional information on the Commission and its meetings. A handbook, "NRC Collection of Abbreviations" (NUREG-0544, Rev. 4), defines and explains the many technical abbreviations used in Commission meetings and papers. Both are available in the Conference Room and in the Public Document Room (PDR), located at 2120 L Street, N.W., Washington, D.C.

Copies of viewgraphs and the principal staff papers to be considered at open meetings are usually available at the entrance to the Conference Room before the meeting. At the conclusion of each open meeting, a transcript of the meeting is placed in the PDR for inspection and copying, along with any publicly available papers from the meeting. A copy of each transcript is also posted to NRC's World Wide Web site <<http://www.nrc.gov/NRC/TRANSCRIPTS/index.html>>. The public is permitted to tape record Commission discussions at open meetings. Commission practice also allows, without prior notification, camera and television coverage of open meetings and briefings. In addition, copies of video tapes of open Commission meetings are available for reviewing and copying in the PDR.

In all cases, the Commission attempts to provide notice at least one week in advance of a Commission meeting. To give the public additional advance information about its meeting dates and topics, the Commission posts a forecast of meetings to the NRC Web site <<http://www.nrc.gov/SECY/smj/schedule.htm>> and publishes weekly in the *Federal Register* a list of Commission meetings planned for the next four weeks. Copies of advance schedules are also distributed by e-mail. Notice of meetings is given to the press through the wire services and by mailings to

individuals who have requested such notice. The Commission's schedule of meetings is regularly announced on a recorded telephone message (301-415-1292) that gives upcoming Commission meetings and voting sessions. An additional announcement is displayed on a television monitor in the lobby of NRC Headquarters and is posted in the PDR. This announcement (1) gives the time, place, and subject matter of the meeting; (2) states whether it is an open or closed meeting; and (3) gives the name and telephone number of an official designated to respond to requests for information about the meeting.

Commission Decisionmaking Documents

The primary decisionmaking tool of the collegial Commission is the written issue paper submitted by the staff, commonly called a SECY paper. Policy, rulemaking, and certain adjudicatory matters, as well as general information, are sent to the Commission for consideration in these papers. As a general policy, these papers will be released to the public unless they contain specific, limited types of information (adjudicatory, enforcement or investigatory, lawyer-client or legal work, classified or proprietary, and personal privacy) that the Commission has specifically agreed should be withheld. During FY 1997, the Commission released 229 papers to the public. Along with the paper, the Commission also releases the staff requirements memorandum (SRM) and the Commission Voting Record (CVR) associated with each paper. The SRM includes—

- a concise statement of the Commission's decision on the recommendation of the SECY paper and
- a clear statement of any additional requirements or tasks to be performed by the staff.

The CVR contains—

- a clear indication of the individual votes of the Commissioners,
- a copy of each Commissioner's vote sheet, and
- a comment resolution section indicating the extent to which differing views, if any, were expressed in the individual vote sheets and were accommodated, resolved, and reflected in the final decision.

SECY papers, SRMs, and CVRs are publicly available through the NRC's PDR or may be downloaded from the NRC Web site:
<<http://www.nrc.gov/NRC/COMMISSION/SECYS/index.html>>.

Commission History Program

Through the Commission History Program, the origins and evolution of NRC regulatory policies are explored and set forth in their historical context. Research on the evolution of these policies is drawn from the archives of a number of Government agencies, the personal papers of former Government officials and others involved in regulatory issues, and personal interviews. The History Office is currently conducting research for the third volume of a detailed, scholarly history of nuclear regulation. The first volume, *Controlling the Atom: the Beginnings of Nuclear Regulation, 1946-1962*, was published in 1984. The second volume, *Containing the Atom: Nuclear Regulation in a Changing Environment, 1963-1971*, was published in 1992. Both were published by the University of California Press. The volumes are intended to serve as historical references for the agency staff and the general public. A brief summary of the books and the period after 1971 is available in "A Short History of Nuclear Regulation, 1946-1990" (NUREG/BR-0175), which is available from the Government Printing Office or by sending an e-mail request to <jsw@nrc.gov>. The Short History may also be found at <<http://www.nrc.gov/SECY/smj/shorthis.htm>>.

PROCEEDINGS AND LITIGATION

The Secretary of the Commission manages the official NRC adjudicatory dockets for the Commission. The adjudicatory dockets contain the filings of all parties to the Commission's licensing and enforcement proceedings that are initiated by a party's request for a hearing or petition to intervene. For a description of significant Commission adjudicatory decisions made in FY 1997, refer to Chapter 2, "Nuclear Reactor Safety," and Chapter 3, "Nuclear Materials Safety," in this report. The hearing docket also contains transcripts of the hearings held in each case, exhibits, and all orders and decisions issued in such proceedings by the Commission or its Atomic Safety and Licensing Boards (ASLBs). For a description of the hearing process and significant hearings for FY 1997, refer to Chapter 2. The Secretary also serves Orders of the Commission and the ASLBs on the parties to proceedings and certifies docket indexes to the United States Courts in agency litigation.

Currently, filings in Commission adjudications are available to the public by ordering them on-line, by telephone, or by visiting the Commission's PDR. Case documents are also available in local public document rooms (LPDRs), usually established in community or university libraries located in the areas where licensees' plants or facilities are located. For a list of these LPDRs, from NRC's Home Page at NRC's Web site <<http://www.nrc.gov>>, access the Public Participation and School Programs icon and then the Local Public Document Room Program. The Commission also publishes Commission and Atomic and Safety Licensing Board Panel orders in the Nuclear Regulatory Commission Issuances (NUREG-0750), a case law publication available to the public through Federal and State and local

law libraries and some general public libraries. Certain decisions of the Commission are posted on the NRC Web site. In the future, all case file documents will be available to the public through a Commission's document management system or on the NRC Web site.

ADVISORY COMMITTEES

The NRC engages the expertise and experience of a wide segment of the public through their service on the Commission's standing advisory committees and on its *ad hoc* committees. Members of NRC committees are drawn from a broad cross-section of the scientific and technical communities, as well as from State and local governmental organizations, the National Congress of American Indians, and private citizens. Committee members give advice and recommendations to NRC on a large range of issues affecting NRC policies and programs.

In accordance with the requirements of the Federal Advisory Committee Act, NRC advisory committees meet in public sessions at Headquarters locations and in venues throughout the United States. Notice of advisory committee meetings is published in the *Federal Register* and in NRC press announcements. Notice of meeting dates and topics is also posted on the NRC Home Web Page and at the NRC PDR. Transcripts or minutes of meetings are also available for inspection and copying at the NRC PDR. Persons interested in committee meetings or the activities of a particular committee may write to the NRC Advisory Committee Management Officer, Office of the Secretary, at mailing address U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001 or at e-mail address <alb@nrc.gov> or may call 301-415-1968.

Support Services

Several U.S. Nuclear Regulatory Commission (NRC) organizations support the program area staffs to execute their regulatory mission activities, providing assistance with personnel and training, security and facilities, and the management and dissemination of information, using current technology. This chapter describes principal support activities achieved in Fiscal Year (FY) 1997.

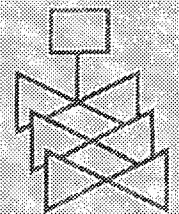
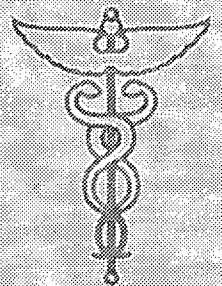
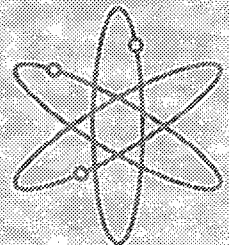
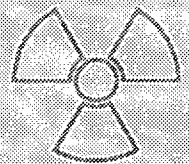
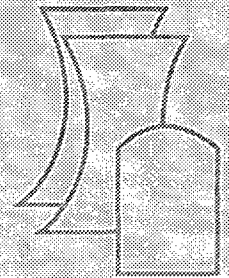
Office of the Chief Financial Officer

In addition to preparing significant agency planning documents discussed in Chapter 1 of this report, the Office of the Chief Financial Officer (OCFO) accomplished the following in support of NRC's goals and mission in FY 1997.

FINANCIAL SYSTEMS. The OCFO, in collaboration with the Office of the Chief Information Officer, is implementing an agencywide integrated resource management system (STARFIRE), which provides for the automation and integration of systems critical to the support of financial management, which, in turn, supports the agency's mission-related programs. The overarching goal is to eliminate multiple, ancillary financial tracking systems within the agency by establishing a single source of financial management data that is commonly available to all managers. The benefits inherent in the implementation of STARFIRE are more than financial. The system will provide the agency with the tools required to meet growing demands for faster and inexpensive management information.

STARFIRE will comprise a core financial system that includes accounts payable and accounts receivable; financial systems, such as budget formulation, funds control, travel, cost accounting, and fee billing; and mixed systems, such as procurement, payroll and personnel, labor cost distribution, performance measurement, and property reporting.

MANAGEMENT CONTROL PROGRAM. A management control program is organized within the context of the National Performance Review and the most recent revision to the Office of Management and Budget (OMB) Circular No. A-123, "Management Accountability and Control." Each year, an annual statement to the President and the Congress is prepared that reports the agency's evaluation of its management control and financial management systems. For FY 1997, the evaluation disclosed no material weaknesses in the NRC's programs or administrative activities and no material nonconformance with government-wide requirements in its financial management systems.



ELECTRONIC PAYMENTS. The percentage of employees paid via electronic funds transfer (EFT) has increased from 96 percent in FY 1994 to 99 percent in FY 1997. The percentage of vendor payments made via EFT has increased from approximately 32 percent in FY 1994 to 73 percent in FY 1997. More emphasis is continuing to be placed on making electronic payments to vendors.

FINANCIAL PERFORMANCE REPORTING. Financial performance reporting is accomplished through the monthly *Budget Execution Report*. This report, designed to allow agency financial managers to consider financial implications routinely in agency discussions and decisions, measures the agency and program office financial performance against established goals and targets.

FINANCIAL TRAINING. Additional training was developed that consists of a four-part series of seminars on financial management and administrative control of funds for all NRC managers and supervisors and for allowance financial managers and funds certifying officials.

Office of the Chief Information Officer

The Information Technology Management Reform Act of 1996 mandated that the NRC appoint a Chief Information Officer responsible, in general, for managing information resources, including equipment and human resources, for the most efficient dissemination of agency information, consistent with the NRC's goals and mission. The Office of the Chief Information Officer accomplished the following in support of NRC's goals and mission in FY 1997.

WORLD WIDE WEB SITE. During FY 1997, the agency continued to expand the information and improve its usability for both the public and the staff on its Web site <<http://www.nrc.gov>> by—

- redesigning the NRC Home Page and the following main secondary pages: *About NRC*, *Radiation Protection*, *Public Participation & School Programs*, and *Reference Library*; and

- adding new areas to the toolbar on the home page: *What's New*, *FedWorld Collection*, *Doing Business with NRC*, *Contacting NRC*, and *Site Disclaimer*.

The NRC created an index of Commission meeting transcripts that covered all public Commission meetings from September 1991 to the present. Each transcript is available in full text at the site.

The NRC established procedures for regularly updating the NRC telephone directory, NRC meetings open to the public, Commission transcripts, and NRC organizational charts. The staff also posts NRC's Weekly Information Reports.

At the direction of the Chairman, a collection of documents for the Strategic Assessment and Rebaselining Initiative was added to the site. This collection included the publicly available direction-setting issue papers, stakeholder meeting information, and background documents.

Information posted to the site about nuclear power reactors included six NUREG-series publications about such diverse topics as standards for operator licensing examinations and inservice testing, in addition to the comprehensive "Information Digest" for 1997 (NUREG-1350, Vol. 9). Other information concerning reactors includes an information notice about strontium-90 eye applicators, individual plant examination data, geospatial plant site locations, a video about a spent fuel cask gas burn at Point Beach Nuclear Plant, and an Office of the Inspector General's report titled "NRC Needs Comprehensive Plan To Resolve Regulatory Issues."

YEAR 2000 AT THE NRC. The NRC, like all Federal agencies, has an active Year 2000 program to address software, hardware, embedded chip, and regulatory issues associated with the Year 2000 computer problem. The OMB developed a strategy and established guidelines and milestones for Federal agencies to follow. The major milestones reflect five distinct program phases: (1) Awareness, (2) Assessment, (3) Renovation, (4) Validation, and (5) Implementation.

Nuclear Power Licensees. The NRC staff has recognized the potential negative impact of the Year 2000 computer problem on continued safe

operation of nuclear power plants for some time. In this regard, the NRC staff has undertaken an approach in conjunction with the nuclear power industry to address the issue. Specifically, the staff first alerted licensees to this issue in Information Notice (IN) 96-70, "Year 2000 Effect on Computer System Software," dated December 24, 1996. Subsequently, to ensure proper focus on this issue by the entire nuclear power industry, the staff met with the Nuclear Energy Institute (NEI) in order to obtain industry support in addressing the concern. NEI agreed to initiate an effort on the Year 2000 computer problem and, working jointly with the Nuclear Utilities Software Management Group (NUSMG), developed a guidance document to assist nuclear power plant licensees in the development of programs to effectively address the Year 2000 problem. The staff met with NEI, NUSMG, and several licensees in September 1997 to discuss the impact of the Year 2000 problem on nuclear power plants and to discuss the NEI/NUSMG guidance document. The staff agreed that the document provided useful guidance on this issue to licensees.

Nuclear Materials Licensees. The NRC staff have also been active in the nuclear materials arena. In FY 1997, the NRC has taken two actions to ensure that the Year 2000 computer problem will be either eliminated or minimized for its materials licensees. NRC sent its materials licensees two major INs on this problem: "Year 2000 Effect on Computer System Software" (IN 96-70) and "U.S. Department of Health and Human Services Letter to Medical Device Manufacturers on the Year 2000 Problem" (IN 97-61).

Additional actions are being planned that will affect both nuclear power and nuclear materials licensees. The staff will continue to be closely involved with this issue through the arrival of the new millennium.

Internal Program. During FY 1997, NRC continued its program of Year 2000 problem awareness through a series of memoranda to senior agency managers and through written announcements and network bulletins to all employees advising them of the problem and describing actions that they would probably be involved in during the months before the year 2000 arrives. One of the memoranda initiated a comprehensive inventory of all internal computer

and embedded chip systems and commercial off-the-shelf software at the NRC.

All identified computer and embedded chip systems were formally assessed to determine the extent of their individual Year 2000 problem. An Assessment Report and an Action Plan were prepared for each system to document findings and recommend corrective actions.

System sponsors were asked to categorize their systems, using the following criteria, in order to establish replacement or repair priorities:

- **Mission-Critical** was assigned to any system that has a high importance related to accomplishing the NRC mission and requires a high level of reliability because any delay in access to the system for any reason could adversely affect the ability of the agency to fulfill its mission of protecting public health and safety, promoting the common defense and security, and protecting the environment.
- **Business-Essential** was assigned to any system that is integral to agency processes that are required to meet agency statutory, programmatic, legal, or financial obligations. Typically, the agency could function without any major impact on its operations if any of these systems malfunctioned and was unavailable for up to 3 or 4 weeks while it was being repaired.
- **Non-Critical** was assigned to any system that is not mission-critical or business-essential and whose unavailability would therefore only represent an inconvenience to the agency. Typically, these systems can be unavailable for extended periods (1 to 2 months or more) while they are being repaired and manual processes can be readily used in place of them if necessary.

Work has begun on repairing or replacing computer applications systems, emphasizing completion of mission-critical and business-essential systems first.

AGENCYWIDE DOCUMENTS ACCESS AND MANAGEMENT SYSTEM. Effective management of information is critical to NRC's performing its mission. Much of this information is in the form of documents. The Commission's policies, decisions, and bases for regulatory action

depend on these documents. Today, the NRC operates in a predominantly paper-based environment with an aging, microfiche-based, legacy document-indexing system of limited functionality to support its needs. To take advantage of current technology and better accommodate the information needs of the licensees, the public, and the staff, the NRC is developing and implementing a modern, fully functional document management capability called ADAMS (Agencywide Documents Access and Management System). The system will be composed of off-the-shelf software.

ADAMS will be an enterprise system in which NRC documents will be captured in electronic form and stored electronically in a central repository, thus ensuring the integrity and completeness of the agency's document collection. It will provide functionality to support electronic concurrence and signatures, version control, and electronic distribution. ADAMS will allow the staff to complete full-text searches and view electronic images of documents at their workstations. It will allow the public to access publicly available documents through the Internet using a standard Web browser.

Agencywide deployment of ADAMS is scheduled for FY 1999. The Cost-Benefit Risk Analysis conducted for the project in FY 1997 indicates that ADAMS has the potential for significant improvements in staff productivity and efficiency and will thus support its mission-related functions. Through implementation of ADAMS, the NRC should achieve a substantial increase in the level of NRC staff, licensee, and public satisfaction with the accuracy and availability of a key category of agency information—the information in agency documents.

VOICE MAIL. The Octel Voice Processing System, also known as Voice Mail, is part of NRC's information technology infrastructure. This state-of-the-art voice mail technology is more than just an answering service system; it includes the—

- NRC Employee Emergency Notification (301-415-4NRC or 1-888-415-4NRC) to obtain information about NRC closings for any reason.
- Personnel Smartline (1-800-952-9678) to obtain current NRC vacancy announcements.
- Public Document Room Fax-on-Demand (1-800-397-4209) to obtain information packets from the Public Document Room.
- AMAP Direction Service (1-888-415-AMAP) to obtain maps and directions to NRC's regional offices, the Technical Training Center, and hotels near these facilities.
- The Fitness Center Hotline (301-415-7070) to obtain information on activities sponsored by the center.
- The NRC Public Meeting Announcement Hotline (1-800-952-9674) to obtain information, dates, locations, and times of all NRC public meetings.

Additional Fax-on-Demand applications will be developed as they are required.

VIDEO TELECONFERENCING. To support its business needs, NRC instituted video teleconferencing. Offices effectively use the technology to support day-to-day business while enhancing meeting capabilities and realizing savings from reduced travel.

Video teleconferencing was first introduced at NRC to provide training to the regional staff from headquarters as part of an Interactive Distance Learning System. Offices that incorporated the technology also found it helpful in dealing with employees in widely separated locations and with other Federal Government agencies, such as the Department of Energy.

The four video teleconferencing systems currently available at NRC headquarters have been supplemented by a fifth system, a portable unit. Facilities at NRC headquarters that have been cabled for video teleconferencing include the Commission Hearing and Conference Rooms and the Two White Flint North Auditorium. Each regional office is equipped with a video teleconferencing system, as is NRC's Technical Training Center in Chattanooga, Tennessee.

To effectively manage the agency video teleconferencing program and to identify requirements for future expansion, the usage and

availability of the video teleconferencing equipment is monitored to provide information on costs savings from travel avoided, the technical benefits accrued, and the business value added as a result of participation by individuals who may not have been able to travel to the conference location for any number of reasons. The program will continue to be administered on the basis of cost and NRC's business needs.

Office of Administration

The Office of Administration (ADM) accomplished the following measures in support of NRC's mission and goals in FY 1997.

RULEMAKING AND DIRECTIVES. The NRC staff completed 227 reviews of NRC rulemaking actions. In FY 1997, the agency received and docketed 2 petitions for rulemaking and published 55 rulemaking documents in the *Federal Register*. The NRC continued to submit 100 percent of general notices in electronic form to the Office of the Federal Register for publication, resulting in a savings of \$93,639 during FY 1997.

Small Business Regulatory Enforcement Fairness Act. On March 29, 1996, President Clinton signed into law the Small Business Regulatory Enforcement Fairness Act (SBREFA). The act is intended to ensure that Congress is notified of "major actions" (as defined by the act) by Federal agencies. In FY 1997, 69 final NRC actions were submitted to OMB for review. One action, NRC's 100 percent fee recovery rule, was determined to be a "major" rule under SBREFA. In FY 1997, all 69 final NRC actions subject to SBREFA were submitted to Congress in accordance with this act.

Improving the Regulatory Framework. The Office of Nuclear Regulatory Research (RES) took the following actions to improve the regulatory framework.

NRC published a regulatory analysis technical evaluation handbook (NUREG/BR-0184) to provide guidance on preparing and to promote the preparation of quality regulatory analyses and to implement the policies of the NRC regulatory analysis guidelines (NUREG/BR-0058).

In addition to operating an electronic rulemaking bulletin board on FedWorld, NRC developed Internet access to rulemakings published for comment, thereby making the *Federal Register* notices, supporting documents, and comments received accessible for viewing and downloading from NRC's Web Site Home Page.

Using existing NRC hardware and software, NRC developed an Intranet-based, agencywide application to facilitate electronic tracking and review of, and concurrence in, RES rulemaking packages. Documentation comprising a rulemaking package is available for viewing and downloading or for concurring electronically.

SECURITY PROGRAM. In support of the Office of Nuclear Material Safety and Safeguards (NMSS), the NRC's security staff conducted classified matter security inspections at the Paducah, Kentucky, and Portsmouth, Ohio, Gaseous Diffusion Plants in May 1997 and September 1997, respectively. The inspections were part of NRC's certification process for the U.S. Enrichment Corporation (USEC). Additionally, the NRC staff participated in two enforcement conferences in support of NMSS and Region III concerning USEC.

With the completion of the perimeter exterior lighting improvements at headquarters in May 1997, which were initiated as part of the Department of Justice (DOJ) facility security upgrades following the Oklahoma City bombing, the security staff assessed the closed-circuit security cameras. As a result of this assessment, tasks were initiated to replace existing black and white cameras with a new generation of color cameras and to install additional cameras. In conjunction with this effort, expected to be completed in late 1998, the headquarters guard central alarm station is undergoing an extensive upgrade, including installation of equipment for monitoring these new cameras. Further increases in perimeter camera coverage may be provided in the future by the General Services Administration under the DOJ initiatives.

CONTRACT MANAGEMENT. During FY 1997, the NRC continued to improve the efficiency of the procurement process through a variety of innovations and streamlining measures under its procurement reinvention laboratory. For example, the NRC staff undertook a survey of 17 Federal agencies to share ideas for streamlining

procurement innovations and to identify "best practices" for possible agency use. NRC also received tentative approval from OMB for its "Electronic Streamlining" procurement innovation. This innovation represents a revolutionary approach to competitive acquisitions using the Internet. NRC will implement this initiative following congressional review and final OMB approval.

Extensive training in the use of streamlining measures has helped NRC program offices and procurement personnel improve processing times for simplified acquisitions, competitive contract awards, and contract closeout activities. Effective implementation of procurement reforms resulted in timely contract awards and obligations totaling \$78,146,175. Implementation of a new contract information system and other information technology upgrades has improved the effectiveness of agency contracting activities.

During FY 1997, the NRC completed 4,461 transactions totaling \$2,524,926 under its BankCard Program for an estimated savings of \$240,000 in administrative expenses.

NRC conducted reviews of Department of Energy (DOE) laboratory agreements to ensure effective oversight for placement and monitoring of NRC work performed under such agreements. The agency also established a more rigorous system for control and accountability of NRC-funded property held by DOE laboratories in FY 1997.

FACILITIES PROGRAM. During FY 1997, NRC's ADM began its One White Flint North Restack Project, which consists of replacing all building furnishings and fixtures that have deteriorated during the 10 years NRC has occupied the building. In addition, several functional improvements are included in the plans, such as adding supplemental air conditioning and exhaust fans to the conference rooms and realigning the traffic patterns to facilitate movement of employees and visitors. Physical security enhancements and modifications to accommodate revised floor configurations are also being made. For example, additional alarms and card readers are being installed and new guard patrol verification stations are being added to each floor. The project consists of 16 phases

and is scheduled to be completed in FY 2000. During FY 1997, four floors were completed.

The NRC successfully worked with the General Services Administration to obtain support to fund two projects for the One White Flint North building totaling more than \$1 million. One of the projects, expected to be completed in FY 1998, replaces deteriorating piping in the secondary condenser loop system and upgrades the fresh air system to meet current design standards. The other project, expected to be completed in FY 1999, repairs damaged concrete in the garage.

A large number of headquarters employees continue to use public transportation and car-pooling for commuting to work. Through onsite surveys, Montgomery County has confirmed that NRC is in compliance with its traffic mitigation agreement. This agreement was signed in 1991 by the NRC, the General Services Administration, Montgomery County, and the White Flint North Limited Partnership (developer of NRC's headquarters building) and establishes specific traffic reduction goals to be met and maintained over a 10-year period.

PROPERTY MANAGEMENT PROGRAM. The NRC implemented a new automated Property Accounting System in FY 1997. This system allows the NRC to establish depreciation schedules for the agency's approximately 30,000 equipment assets, thus providing a more accurate evaluation measure for these assets. The new system also enables NRC to incorporate the computed net book value of capital property directly into NRC's annual financial statement. The NRC trained 70 property custodians at headquarters and in the Regions on the use of this new system.

Executive Order 12999, "Improving Mathematics and Science Education in Support of National Education Goals," directs Federal agencies to identify and transfer excess education-related equipment to elementary and secondary schools, to the maximum extent possible. Under these guidelines, the NRC has established a program for donating used and obsolescent computer equipment to school systems nationwide. In FY 1997, the NRC donated more than 1,514 pieces of computer equipment, including color monitors, system units, and printers.

Office of Small Business and Civil Rights

The Office of Small Business and Civil Rights (SBCR) administers the agency's Affirmative Action, Civil Rights, and Small Business Programs, and the Historically Black Colleges and Universities (HBCU) initiative. During FY 1997, SBCR briefed the Commission biannually on the agency's Equal Employment Opportunity (EEO) Program. During this period, major program activities encompassed—

- recruitment and outreach activities to attract well-qualified candidates from all groups to facilitate a diverse pool of candidates from which selections are made;
- communications to staff on EEO objectives;
- encouragement of the staff's participation in training and career development activities; and
- implementation of a process for managing diversity, which is a long-term initiative designed to create and maintain an environment in which every employee is valued and works cooperatively to do his or her best work.

AFFIRMATIVE ACTION PROGRAM. Through the Affirmative Action Program, which includes activities of the Federal Women's Program, the staff develops and oversees the agency's affirmative action employment initiatives related to the utilization of women, minorities, and persons with disabilities. Oversight is provided to the agency's seven EEO Advisory Committees, whose cooperative goal is to identify and provide recommendations on EEO-related issues that affect equal opportunities for all employees. This program also encompasses review and assessment of EEO accomplishments in program and regional offices.

During FY 1997, the advisory committees submitted recommendations on three areas of primary concern: (1) the perception of preselection; (2) the existing monitoring programs that are intended to facilitate EEO; and (3) the

support and implementation of a process for managing diversity.

Activities were continued for achieving a high-quality, culturally diverse applicant pool and for increasing the number of women and minorities in the work force. Agency employees who are representative of protected groups and who serve in professional, technical, and administrative positions participated in focused recruitment activities. The agency continued to recruit for individuals with disabilities through monthly advertisements in the journal *Careers and the Disabled* and to participate in conferences and job fairs targeting persons with disabilities.

The agency's Facilitated Mentoring Program continued to provide opportunities for employees to improve their skills, productivity, and potential for advancement. Through this program, a more experienced employee is paired with another employee who requests career development guidance. In FY 1997, the program included approximately 100 participants. In tandem with these efforts, four career workshops (two on how to manage multiple priorities and two on development of career strategies) were conducted to further enhance the staff's skills development.

A number of special emphasis programs were conducted to highlight the contributions made to this country by Native Americans, Asian-Pacific Americans, Hispanics, Blacks, and Women. The headquarters office and two regional offices sponsored a "Bring your Children to Work Day." Announcements and exhibits marked other events such as Women's Equality Day and Professional Secretaries Week.

CIVIL RIGHTS PROGRAM. The Civil Rights Program provides for the prompt, fair, and impartial processing of discrimination complaints filed against the agency under Titles VI, VII, VIII, and IX of the Civil Rights Act of 1964, as amended; the Age Discrimination in Employment Act of 1967, as amended; the Rehabilitation Act of 1973, as amended; the Equal Pay Act of 1963, as amended; and Title II, Section 401 of the Energy Reorganization Act of 1974, as amended. Collectively, these statutes prohibit discrimination on the basis of race, color, national origin, gender, reprisal for participation in or opposition to activity protected by civil rights statutes, age

(individuals age 40 and over), and mental or physical disabilities.

The agency's EEO Counseling Program continued to serve as an effective means of addressing EEO discrimination concerns. Our cadre of 33 collateral-duty EEO Counselors (20 at headquarters and 13 in the agency's four regional offices) handled 103 informal inquiries. The EEO counselor is responsible for conducting an inquiry into allegations of discrimination raised by employees or applicants for employment in an effort to resolve allegations at the lowest possible level. In the event that the matter is not resolved and a formal complaint is filed, the counselor is responsible for preparing a report documenting the counseling activities, including jurisdictional information and efforts to resolve the matter.

The annual EEO Counselors Training Conference was conducted to provide updated information on discrimination complaint policies and procedures. The conference also provided counselors an opportunity to bring employee concerns to the attention of the agency's Deputy Executive Director for Management Services. Two additional training sessions were conducted for counselors during the year through video conferences.

Seven formal complaints were filed during FY 1997; Tables 8.1, 8.2, and 8.3 summarize complaint activity during this period.

TABLE 8.1 STATUS OF COMPLAINTS	
Total Pending at Beginning of Fiscal Year	9
Filed during fiscal year	7
SUBTOTAL	16
Closed during fiscal year	-8 ¹
Dismissed based on jurisdiction	5
Final agency decision of no discrimination	3
Total Pending at End of Fiscal Year	8
TABLE 8.2 ISSUES RAISED IN COMPLAINTS	
Total Issues Raised in Seven Complaints Filed During Fiscal Year	18
Assignment of duties	4

Evaluations/appraisals	4
Promotions/non-selections	3
Other	3
Awards	2
Reprimand	1
Time and Attendance	1

TABLE 8.3 BASIS FOR COMPLAINTS

Total Bases Cited in Seven Complaints	18
Reprisal	9
Race	5
Asian/Pacific Islander	3
Black	2
Age	3
Gender (Female)	1

¹Average time from filing of complaints to closure: 179 calendar days

SMALL BUSINESS PROGRAM. The NRC established the Small Business Program in accordance with the Small Business Act of 1958, as amended by Public Law 95-507, which requires Federal agencies to assist and support the interest of small businesses. The agency continued its commitment of ensuring that small businesses, Section 8(a) businesses, small disadvantaged businesses, and small women-owned businesses receive full and fair opportunities to participate in its procurement programs, and to integrate these businesses into the base of contractors from which the agency purchases goods and services. At the beginning of the fiscal year, a forecast of procurement opportunities was published that identified anticipated goods and services that might be needed during the year. A copy of this forecast was sent to businesses listed on NRC's Solicitation Mailing List and made available to the public at the agency's Web site <<http://www.nrc.gov>>. To obtain additional information about NRC contracts from NRC's Home Page, access *Doing Business with NRC* under the circle of icons. The Small Business Program staff participated in a number of conferences, workshops, and training seminars, which included discussions with small business

concerns on "How To Do Business With the Federal Government" and procurement opportunities at the NRC.

The agency exceeded its annual procurement preference goals for awarding contracts and subcontracts to businesses in the Small Business Program. Table 8.4 summarizes the NRC's goals and accomplishments for these small businesses.

TABLE 8.4 FY 97 PROCUREMENT PREFERENCE GOALS AND ACHIEVEMENTS		
PRIME CONTRACT AWARDS		
DOLLARS AWARDED		
CATEGORIES	GOALS	ACHIEVEMENTS
Small Business	\$22,387,747	\$38,340,643
Section 8(a)	\$16,284,201	\$16,772,628
Small Disadvantaged	\$202,000	\$647,770
Small Women-Owned	\$6,281,400	\$9,471,505
TOTAL	\$45,155,348	\$65,232,546
SUBCONTRACT AWARDS		
DOLLARS AWARDED		
CATEGORIES	GOALS	ACHIEVEMENTS
Small Business	\$2,645,000	\$4,048,197
Small Disadvantaged	\$617,000	\$693,873
Small Women-Owned	\$517,000	\$796,534
TOTAL	\$3,779,000	\$5,538,604

HISTORICALLY BLACK COLLEGES AND UNIVERSITIES. During FY 1997, the agency continued to carry out the requirements of Presidential Executive Order 12876 on Historically Black Colleges and Universities (HBCUs) through its HBCU Research Participation Program. The principal goals of this program are to enhance academic studies in science, mathematics, and engineering and to

increase the number of available scientists, engineers, and related professionals for future employment with the NRC. The program introduces HBCU faculty and graduate and undergraduate students to the research and development activities of the NRC. The program provides HBCU participants a mechanism with which to (1) become familiar with research areas and needs of the NRC; (2) participate in scientific, engineering, and other research and development activities related to NRC's mission; and (3) gain experience that enhances participants' academic and scientific credentials. The agency's HBCU Program is conducted through a cooperative agreement with the Oak Ridge Institute for Science and Education.

The NRC awarded \$261,470 in research grants to 15 faculty members and 15 students at 13 HBCUs, and thus exceeded its goal of \$200,000 by 31 percent. In conjunction with the agency's program, a total of \$14,620 was contributed by the DOE for NRC-related work performed by HBCU students at the Oak Ridge National Laboratory and the Savannah River site.

Office of Human Resources

NRC STAFF-YEARS EXPENDED

During FY 1997 the NRC expended a total of 3,022 staff-years in carrying out its mission. Total staff-years included permanent full-time staff, permanent part-time staff, temporary workers, and consultants.

RECRUITMENT

During the report period, the NRC continued to provide recruitment services and oversight for a variety of professional, technical and administrative positions. The NRC recruits new employees by conducting recruitment trips to educational institutions, participating in job fairs, and advertising in various news media (e.g., newspapers, trade journals, the Internet). Applications received by the agency are managed and controlled through an automated applicant tracking system.

AWARDS AND RECOGNITION

In FY 1997, the NRC continued to recognize employees for their performance. At the Annual Awards Ceremony, the NRC honored numerous employees through the presentation of awards such as; the Distinguished Service Award, the Meritorious Service Award, Performance Awards, Special Act Awards, High Quality Increases and Distinguished and Meritorious Rank Awards for Senior Executive Service members.

BENEFITS

The NRC provided advice and guidance to numerous employees in many areas including retirement, life and health insurance, the Thrift Savings Plan, leave programs, voluntary early retirement and beneficiaries. Appropriate open seasons were conducted, retirement training was offered, and individual counseling was provided to ensure that employees understood the various benefits afforded Federal employees.

LABOR RELATIONS

On October 1, 1993, the President signed Executive Order 12871 dealing with Labor-Management Partnerships in the Federal Government. The order calls for a more cooperative and less confrontational relationship between labor and management. In accordance with this order, the agency, together with the union, established an agency partnership committee as well as office and regional partnership committees to foster a cooperative relationship and to identify problems and propose solutions.

TRAINING AND DEVELOPMENT

During FY 1997, the NRC provided about 100 different instructor-led onsite courses and more than 350 self-study courses in information technology, management and supervision, equal employment opportunity, regulatory skills, communication skills, acquisition, financial management, and special disciplines. The NRC also sponsored a wide variety of training and developmental programs conducted at colleges and universities, at other Government agencies, and in the private sector.

This year the agency offered two new programs for managers and supervisors. Program and Resource Management training provided managers and supervisors with tools and techniques for improving their skills in this area and taught concepts of performance measurement and results that can be applied to day-to-day work activities. Information Management for Managers and Executives provided participants with information about their roles and responsibilities as managers of information and with a better understanding of the value information technology can bring to their line of business. It provided an overview of the Capital Planning and Investment Control process as well as guidance about managing information technology projects successfully.

The computer applications curriculum continued to be a significant part of the NRC's training program. The demand was high for training in new Windows-based programs, legal research technologies, and database management.

The Individualized Learning Center provided employees with the latest audio/video, computer-based, and multi-media training in project management, communication, management and supervision, computer skills, secretarial skills, and employee assistance.

Televideo equipment was used to provide training to the Regional Offices from the Headquarters training facility.

The agency also sponsored a number of programs to help employees develop the skills necessary to meet the NRC's future clerical, administrative, technical, and management needs. Developmental programs sponsored by the agency included—

- the Certified Professional Secretaries Program,
- the Administrative Skills Enhancement Program,
- the Computer Science Development Program,
- the Women's Executive Leadership Program,
- the Graduate Fellowship Program,
- the Intern Program, and

- the Senior Fellowship Program.

EMPLOYEE ASSISTANCE, HEALTH, AND FITNESS PROGRAMS

During FY 1997, the Employee Assistance Program (EAP) continued to give individual counseling and referral assistance to NRC personnel with such problems as chemical dependency, job stress, chronic illness, sexual harassment, and family issues; as well as guidance and training to supervisors. The agency continued to make EAP services readily accessible to regional and field personnel through contractors. Education and awareness programs on a variety of topics, including Domestic Violence and Smoking Cessation, were presented.

Hummer Associates continued to operate the health center. The staff, consisting of a full-time

physician, two full-time nurses, and a medical receptionist, provided a variety of services to employees. Services included limited treatment for on-the-job illness and injury and referral to community resources; screening for diabetes, glaucoma, high blood pressure, and breast and prostate cancer; immunizations; and health awareness programs on topics such as coronary artery disease, breast cancer, prostate cancer, and skin cancer. The EAP, health center, and fitness center continued publishing a quarterly newsletter to provide information on health, fitness, substance abuse, and mental health issues.

During FY 1997, the NRC continued offering a variety of health and fitness programs in its newly constructed fitness center located in Two White Flint North. About 500 NRC employees participated in these programs offered by professionally trained exercise physiologists and health professionals.

Appendix

NRC Organization

(Current as of September 30, 1997)

COMMISSIONERS

Shirley Ann Jackson, Chairman
 Nils J. Diaz
 Edward McGaffigan
 Greta Joy Dicus

The Commission Staff

Office of Commission Appellate Adjudication—John F. Cordes, Jr., Acting Director
 Office of Congressional Affairs—Dennis K. Rathbun, Director
 Office of the General Counsel—Karen D. Cyr, General Counsel
 Office of the Inspector General—Hubert T. Bell, Inspector General
 Office of International Programs—Carlton R. Stoiber, Director
 Office of Public Affairs—William M. Beecher, Director
 Secretary of the Commission—John C. Hoyle, Secretary

Other Offices

Advisory Committee on Nuclear Waste—B. John Garrick, Chairman
 Advisory Committee on Reactor Safeguards—Robert L. Seale, Chairman
 Atomic Safety and Licensing Board Panel—B. Paul Cotter, Jr., Chief Administrative Judge

CHIEF FINANCIAL OFFICER

Jesse L. Funches

CHIEF INFORMATION OFFICER

Anthony J. Galante

EXECUTIVE DIRECTOR FOR OPERATIONS

Executive Director for Operations—L. Joseph Callan
 Deputy Executive Director for Regulatory Effectiveness—Ashok C. Thadani, Acting Director
 Deputy Executive Director for Regulatory Programs—Hugh L. Thompson, Jr.
 Deputy Executive Director for Management Services—Patricia G. Norry
 Assistant for Operations, James L. Blaha

Program Offices

Office of Nuclear Material Safety and Safeguards—Carl J. Paperiello, Director
 Office of Nuclear Reactor Regulation—Samuel J. Collins, Director
 Office of Nuclear Regulatory Research—Malcolm R. Knapp, Acting Director

NRC Organization (continued)
EXECUTIVE DIRECTOR FOR OPERATIONS
(continued)

Staff Offices

Office of Administration—Edward L. Halman, Director
Office for Analysis and Evaluation of Operational Data—Thomas T. Martin, Director
Office of Enforcement—James Lieberman, Director
Office of Investigations—Guy P. Caputo, Director
Office of Human Resources—Paul E. Bird, Director
Office of Small Business and Civil Rights—Irene P. Little, Director
Office of State Programs—Richard L. Bangart, Director

Regional Offices

Region I, Philadelphia, Pennsylvania—Hubert J. Miller, Regional Administrator
Region II, Atlanta, Georgia—Luis J. Reyes, Regional Administrator
Region III, Chicago, Illinois—James L. Caldwell, Acting Regional Administrator
Region IV, Dallas, Texas—Ellis W. Merschoff, Regional Administrator

RESPONSIBILITIES OF THE EXECUTIVE COUNCIL

The Chief Financial Officer (CFO) oversees the financial management of NRC's programs and operations and provides advice to the Chairman on financial management matters. The CFO establishes financial management policy for the agency and provides policy guidance to senior managers on the budget and all other financial management activities, including systems, personnel, structure and functions, performed by component financial management organizations; oversees the development and maintenance of financial management and accounting systems to provide reliable information for internal and external financial management reporting; establishes agency-wide financial data and reporting format requirements, and provides an agency-wide management control program for financial and program managers that provides for timely corrective actions regarding material weaknesses disclosed through audit findings and reports provided under the Federal Managers' Financial Integrity Act.

The Chief Information Officer (CIO) plans, directs, and oversees the NRC's information resources, including information technology infrastructure and delivery of information management services, to meet the mission and goals of the agency. The CIO provides principal advice to the Chairman to ensure that Information Technology (IT) is acquired and information resources across the agency are managed in a manner consistent with Federal Information Resources Management (IRM) laws and regulations; assists senior management in recognizing where information technology can add value while improving NRC operations and services delivery; directs the implementation of a sound and integrated IT architecture to achieve NRC's strategic and IRM goals; monitors and evaluates the performance of information technology and information management programs based on applicable performance measures and assesses the adequacy of IRM skills of the agency; and provides guidance and oversight for the selection, control, and evaluation of information technology investments.

The Executive Director for Operations (EDO) is the chief operational and administrative officer of the Commission and is authorized and directed to

discharge licensing, regulatory, and administrative functions of the NRC and to take actions as are necessary for day-to-day operations of the agency. The EDO supervises and coordinates policy development and operational activities of EDO staff and program offices and implements Commission policy directives pertaining to these offices.

RESPONSIBILITIES OF THE OFFICES

The Office of Nuclear Material Safety and Safeguards licenses, inspects, and regulates facilities and materials associated with processing, transporting, and handling nuclear materials, as well as disposing of nuclear waste and regulating uranium recovery facilities. The office also regulates related facility decommissioning. The safeguards staff of the office reviews and assesses protection against potential threats, thefts, and sabotage for licensed facilities, working closely with other NRC offices in coordinating safety and safeguards programs and in recommending research, standards, and policy options necessary for their successful operation.

The Office of Nuclear Reactor Regulation ensures the public health and safety through licensing and inspection activities at all nuclear power reactor facilities in the United States. The office oversees all aspects of licensing and inspection of manufacturing, production, and utilization facilities (except for facilities reprocessing fuel and performing isotopic fuel enrichment), and receipt, possession, and ownership of source, byproduct, and special nuclear material used or produced at facilities licensed under 10 CFR Part 50. The office develops policy and inspection guidance for programs assigned to the regional offices and assesses the effectiveness and uniformity of the Regions' implementation of those programs. The office identifies and takes action in coordination with the regional offices regarding conditions and licensee performance at such facilities that may adversely affect public health and safety, the environment, or the safeguarding of nuclear facilities and assesses and recommends or takes action in response to incidents or accidents. The office is responsible for licensing issues and regulatory policy concerning reactor operators, including the initial licensing examination and requalification examinations; emergency preparedness, including participation in emergency drills with Federal,

State, and local agencies; radiation protection; security and safeguards at such facilities, including fitness for duty; and the inspection of nuclear supplier facilities. The office also conducts technical review, certification, and licensing of advanced nuclear reactor facilities and renews current power reactor operating licenses.

The Office of Nuclear Regulatory Research plans, recommends, and implements programs of nuclear regulatory research, standards development, and resolution of safety issues for nuclear power plants and other facilities regulated by the NRC. It develops and promulgates all technical regulations; coordinates research activities within and outside the NRC, including appointment of staff to committees and conferences; and coordinates national volunteer standards efforts, including appointment of staff to committees.

The Regional Offices are under the supervision and direction of the Executive Director for Operations and carry out NRC regulatory programs originating in the various Headquarters offices.

The Commission Staff

The Office of Commission Appellate Adjudication is responsible for monitoring cases pending before presiding officers; for providing the Commission with an analysis of any adjudicatory matter requiring a Commission decision (e.g., petitions for review of Initial Licensing Board decisions, certified questions, interlocutory referrals, stay requests), including available options; for the drafting of any necessary decisions, pursuant to the Commission's guidance, after presentation of options; and for consulting with the Office of the General Counsel in identifying options to be presented to the Commission and in drafting the final decision to be presented to the Commission.

The Office of Congressional Affairs provides advice and assistance to the Chairman, the Commission, and the NRC staff on all NRC relations with Congress and views of Congress toward NRC policies, plans, and activities; maintains liaison with congressional committees and members of Congress on matters of interest to the NRC; serves as primary contact for all NRC

communications with Congress, reviewing and concurring in all outgoing correspondence to members of Congress; coordinates NRC internal activities with Congress; plans and develops NRC's legislative program; and monitors legislative proposals, bills, and hearings.

The Office of the General Counsel directs matters of law and legal policy, providing opinions, advice, and assistance to the Commission and staff with respect to all activities of the agency.

The Office of the Inspector General conducts investigations and audits directed principally toward improving program management, ensuring the integrity of the NRC's regulatory programs, and preventing and identifying fraud, waste, and abuse in the agency's programs and operations.

The Office of International Programs provides advice and assistance to the Chairman, the Commission, and the NRC staff on international issues. The office formulates and recommends policies concerning nuclear exports and imports, international safeguards, international physical security, non-proliferation matters, and international cooperation and assistance in nuclear safety and radiation protection. The office plans, develops, and implements programs to carry out policies established in these areas; plans, develops, and manages international nuclear safety information exchange programs; and coordinates international research agreements. The office obtains, evaluates, and uses pertinent information from other NRC and U.S. Government offices in processing nuclear export and import license applications; establishes and maintains working relationships with individual countries and international nuclear organizations, as well as other U.S. Government agencies; and ensures that all international activities carried out by the Commission and the staff are properly coordinated internally and Government-wide and are consistent with NRC and U.S. policies.

The Office of Public Affairs develops policies, programs, and procedures for informing the public of NRC activities; prepares, clears, and disseminates information to the public and the news media concerning NRC policies, programs, and activities; keeps NRC management informed of media coverage of activities of interest to the agency; plans, directs, and coordinates the activities of public information staffs located at the Regional Offices; conducts a cooperative

program with the schools; and carries out assigned activities in the area of consumer affairs.

The Office of the Secretary of the Commission provides executive management services to support the Commission and to implement Commission decisions; advises and assists the Commission and staff on planning, scheduling, and conducting Commission business; prepares the Commission's meeting agenda; codifies Commission decisions in memoranda directing staff action, monitors staff compliance of pending actions, and tracks commitments through the automated Commission tracking system; manages the staff paper and COMSECY systems; initiates and monitors the status of office automation initiatives into the Commission's administrative system; processes and controls Commission correspondence; maintains the Commission's official records and acts as Freedom of Information coordinator for Commission records; maintains the official adjudicatory and rulemaking dockets of the Commission and serves Commission and Atomic Safety and Licensing Board issuances in all adjudicatory matters and public proceedings; directs and administers the NRC Historical Program; and functions as the Federal Advisory Committee Management Officer.

Support Staff

The Office of Administration directs the agency's programs for contracting and procurement; transportation services; security of personnel and facilities; rulemaking support; management of space and equipment; and other administrative services.

The Office for Analysis and Evaluation of Operational Data provides agency coordination for the collection, storage, and retrieval of operational data associated with licensed activities, analyzes and evaluates such operational experience and feeds back the lessons of that experience to NRC licensing, standards, and inspections activities staff. The office is also responsible for the NRC incident response program and the Technical Training Center, as well as the tracking of licensee performance indicators.

The Office of Enforcement develops policies and programs for the enforcement of NRC requirements, manages major enforcement actions, and assesses the effectiveness and uniformity of regional enforcement actions.

The Office of Human Resources plans and implements NRC policies, programs, and services to provide for the effective organization, recruitment, placement, utilization, and development of the agency's human resources.

The Office of Investigations conducts, supervises, and assures quality control of investigations of licensees, applicants, contractors, or vendors, including the investigation of all allegations of wrongdoing by other than NRC employees and contractors. The office develops policy, procedures, and standards for these activities.

The Office of Small Business and Civil Rights develops and implements the NRC's program in accordance with the Small Business Act, as amended, ensuring that appropriate consideration is given to small business firms, including women-owned and minority businesses. The office develops and recommends NRC policy, providing for equal employment opportunity, and develops, monitors, and evaluates the affirmative action program to ensure compliance with the policy. The office also serves as contact with local and national public and private organizations with related interests and administers the Historically Black Colleges and Universities Program.

The Office of State Programs is responsible for establishing and maintaining good community relations between the NRC, the States, local governments, other Federal agencies, and Indian Tribe organizations; serves as primary contact for policy matters between the NRC and these groups; keeps the agency apprised of activities of these groups as they may affect NRC, and conveys to NRC management the groups' views on NRC policies, plans, and activities; coordinates liaison with other Federal agencies through the Federal Liaison Program; administers the State Agreements Program; provides training and technical assistance to Agreement States; integrates Federal regulatory activities with the States; and maintains cooperative and liaison activities with the States.

NRC Advisory Committees and Licensing Panels

The Advisory Committee on Nuclear Waste was established by the Nuclear Regulatory Commission in 1988 to advise the Commission on nuclear waste disposal facilities, as directed by the Commission.

The Advisory Committee on the Medical Uses of Isotopes, established in 1958, is composed of qualified physicians and scientists, employed under yearly personnel services contracts. The committee considers medical questions referred to it by the NRC staff and gives expert opinions on the medical uses of radioisotopes. The Committee also advises the NRC staff, as required, on matters of policy.

The Advisory Committee on Reactor Safeguards is a statutory committee established to advise the Commission on safety aspects of proposed and existing nuclear facilities and on the adequacy of proposed reactor safety standards and performing such other duties as the Commission may request. The committee conducts a continuing study of

reactor safety research and submits an annual report to the Congress. The committee also administers a fellowship program.

The Atomic Safety and Licensing Board Panel is a panel of lawyers and others with expertise in various technical fields from which three-member Licensing Boards are drawn to conduct public hearings and make such intermediate or final decisions as the Commission may authorize in proceedings to grant, amend, suspend, or revoke NRC licenses.

The Licensing Support System Advisory Review Panel, established in 1989, advises the NRC's Licensing Support System Administrator and the Department of Energy on selected aspects of the design, development, and operation of the support system.

The Nuclear Safety Research Review Committee, established in 1988 on the recommendation of the National Research Council, provides advice to the Director of the Office of Nuclear Regulatory Research regarding the direction of NRC's nuclear safety research programs.

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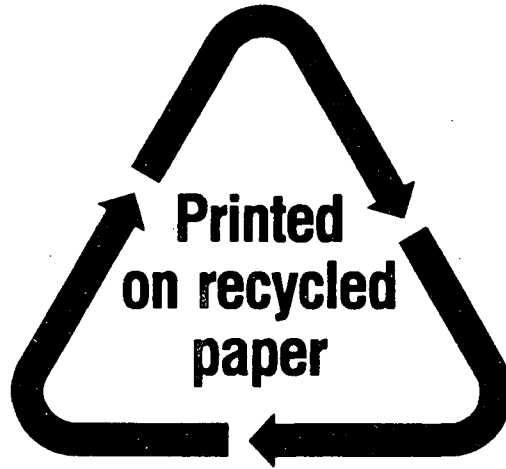
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Federal Recycling Program



