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BUDGET ESTIMATES FISCAL YEARS 1992 - 1993

February 1991

U.S. Nuclear Regulatory Commission



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Volume 7

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ESTIMATES
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1992 - 1993**

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U.S. Nuclear Regulatory Commission



BUDGET ESTIMATES FOR THE
 U.S. NUCLEAR REGULATORY COMMISSION
 FISCAL YEARS 1992-1993

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SUMMARY

MISSION AND REGULATORY PHILOSOPHY

MISSION

The U.S. Congress has determined that the safe use of nuclear materials for peaceful purposes is a legitimate and important national goal. It has entrusted the NRC with the primary Federal responsibility for achieving that goal. The NRC's mission, therefore, is to ensure adequate protection for the public health and safety, the common defense and security, and the environment in the use of nuclear materials in the United States.

The NRC's scope of responsibility includes regulation of commercial nuclear power plants; research, test, and training reactors; fuel cycle facilities; medical, academic, and industrial uses of nuclear materials; and the transport, storage, and disposal of nuclear materials and wastes. The NRC carries out its mission by setting standards and requirements licensees must meet to design, construct, and operate safe facilities, in the form of rules, license conditions, and regulatory guidance; inspecting facilities and taking enforcement action, as necessary, to ensure that such standards are followed; and conducting research to support, confirm, or refine judgments used in regulatory decisions. The technologies involved in the use of nuclear energy are relatively new and complex. Regulatory decisions often require conservatism to account for technical uncertainty. Conservatism should be modified appropriately as increased understanding of physical phenomena and interactions is achieved. Further, essential functions must be maintained through appropriate combinations of high component and system reliability, redundancy, and diversity to provide multiple barriers to the release of radiation (defense-in-depth).

REGULATORY PRINCIPLES

The NRC and its licensees share a common responsibility to protect the public health and safety. Federal regulations and the NRC regulatory program are important elements in the protection of the public. However, the Commission recognizes that safe use of nuclear materials is a primary responsibility of NRC licensees. Strong, vigilant management and a desire to improve performance are prerequisites for success, for both regulators and the regulated industry. The NRC adheres to the following Principles of Good Regulation to encourage consistently high performance and address inadequate performance.

Good regulation identifies the conditions necessary to ensure safety and creates an environment which insists on compliance with established standards while allowing and encouraging licensees to take the lead in maintaining excellence and to exercise initiative in identifying and solving potential, as well as actual, problems. Good regulation encourages sound and effective practices, discourages unsound practices, and identifies questionable practices.

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It must, therefore, establish standards by which to judge practices and the means to encourage the sound and discourage the unsound. To accomplish this, regulation must be:

INDEPENDENT. Nothing but the highest possible standards of ethical performance and professionalism should influence regulation. However, independence does not imply isolation. All available facts and opinions must be sought openly from licensees and other interested members of the public. The many, and possibly conflicting, public interests involved must be considered. Final decisions must be based on objective, unbiased assessments of all information and must be documented with reasons explicitly stated.

OPEN. Nuclear regulation is the public's business; it must be transacted publicly and candidly. The public must be informed about and have the opportunity to participate in the regulatory processes, as required by law. Open channels of communication must be maintained with Congress, other government agencies, licensees, and the public, as well as with the international nuclear community.

EFFICIENT. The American taxpayer, the rate-paying consumer, and licensees are all entitled to the best possible management and administration of regulatory activities. The highest technical and managerial competence is required and must be a constant agency goal. The NRC must establish means to evaluate and continually upgrade its regulatory capabilities. Regulatory activities should be consistent with the degree of risk reduction they achieve. Where several effective alternatives are available, the option which minimizes the use of resources should be adopted. Regulatory decisions should be made without undue delay.

CLEAR. Regulations should be coherent, logical, and practical. There should be a clear nexus between regulations and agency goals and objectives, whether explicitly or implicitly stated. Agency positions should be readily understood and easily applied.

RELIABLE. Regulations should be based on the best available knowledge from research and operational experience. Systems interactions, technological uncertainties, and the diversity of licensees and regulatory activities must all be taken into account so that risks are maintained at an acceptably low level. Once established, regulation should be perceived to be reliable and not unjustifiably in a state of transition. Regulatory actions should always be fully consistent with written regulations and should be promptly, fairly, and decisively administered so as to lend stability to the nuclear operational and planning processes.

The effective regulation of users of nuclear materials requires constant vigilance and faithful adherence to these basic principles.

Summary

OVERALL GOALS

The overall goals that will enable the agency to meet the congressional mandate in a manner that is consistent with its regulatory philosophy are:

- Ensure that nuclear power plants and other licensed facilities are operated safely and that licensees are adequately prepared to respond to accidents.
- Ensure that nuclear power plants under construction are designed and constructed properly and are ready for safe operation.
- Prepare for future reactor licensing activities, including reactor license renewal.
- Ensure that research provides the technical bases for timely and sound rulemaking and regulatory decisions in support of NRC licensing and inspection activities.
- Ensure that current and future uses and transportation of nuclear and radioactive materials are safe and have adequate safeguards.
- Ensure that high-level and low-level nuclear waste and uranium mill tailings are safely managed and disposed.
- Continue to maintain special and independent reviews and investigations of the NRC's activities.
- Allocate NRC's human and capital resources and direct the agency's affairs so that they contribute most effectively to the mission of protecting the public health and safety.
- Ensure that the NRC has effective external communications and relations with outside organizations.

PROGRAM SUMMARY

The NRC's FY 1992 budget request is \$512,500,000. This request is based on continued emphasis on safety first and foremost. The budget request provides for additional oversight for operating reactor and material licensee facilities to ensure their continued improvement in safety performance and supports the conduct of a regulatory program responsive to the nation's future energy needs and industry initiatives. A brief summary of the NRC principal programs follows.

Reactor Safety and Safeguards Regulation

The principal focus of this program is on operational safety of nuclear reactor facilities. It provides for the evaluation of reactor and licensee performance through a variety of onsite inspections and safety reviews.

As part of the NRC's inspection programs, at least two resident inspectors are assigned to each reactor site to observe, evaluate, and report on the adequacy of licensee nuclear safety activities on a day-to-day basis. The NRC will continue to augment its resident inspectors with region-based inspectors and specialized, technical-contractor support. These complementary resources help the NRC to gain an in-depth perspective on operational safety at power reactors. The NRC's reactor inspection programs are designed to allow regional and headquarters managers to focus inspections on special safety problems and on plants requiring additional attention. This flexibility helps to ensure that resources are allocated effectively to enhance reactor safety.

As part of its reactor safety reviews, the NRC evaluates safety improvements at operating reactors to ensure that licensees maintain adequate levels of protection of the public health and safety. For example, the NRC is in the process of working with licensees to convert existing reactor technical specifications to new standard technical specifications. The NRC believes this will improve operational safety and reduce the industry's regulatory burden. The NRC also ensures that each nuclear power plant is staffed with trained and qualified reactor operators. To accomplish this objective, the NRC issues licenses to all personnel authorized to operate reactors and administers requalification examinations to verify the continued proficiency of these licensed operators.

The FY 1992 resource increase for this program will allow the NRC to conduct additional inspections at nuclear power plants, including assigning additional resident inspectors at reactor sites, and continue to reduce the volume and complexity of the technical specifications. These efforts will provide increased confidence that plants are operated safely. This increase will also help the NRC prepare to carry out its licensing activities to meet the nation's future energy needs. These activities involve reactor license renewal and standard reactor designs. The NRC's reactor operating license renewal efforts must be expanded significantly to provide the regulatory stability needed by

Summary

energy planners to make decisions on new plant purchases. During FY 1992-1993, the NRC will have completed the technical and regulatory criteria needed to evaluate license renewal applications and will be involved in the reviews of the two lead applications to renew nuclear power plant operating licenses.

The standardization of nuclear power plant designs can significantly increase the safety, reliability, and availability of future nuclear power plants. Standardization will allow for a more expeditious and efficient review process and a more thorough understanding of the designs by the NRC. In FY 1992, the NRC will complete its review of the Electric Power Research Institute's advanced-light-water reactor requirements document for both evolutionary and passive reactor designs and will continue its design approval reviews for General Electric's advanced-boiling-water reactor design and for Combustion Engineering's advanced-pressurized-water reactor design. Also in FY 1992, the NRC expects to receive applications for full-design approval and certification for two passive-light-water reactors and to begin reviews of two advanced-nonlight-water reactor designs.

The Office of Management and Budget, NRC, and Department of Energy will meet in FY 1991 to discuss and review appropriate schedules in the license renewal and standardized reactor licensing areas.

Nuclear Safety Research

The NRC's nuclear safety research program improves its regulation through better definition of reactor safety margins; increased understanding of the causes and effects of a severe reactor accident, including mitigating actions; and development of new analytical tools needed to evaluate new safety issues, as they arise. The research program provides the independent expertise and information needed to make timely regulatory judgments, anticipates problems of potential safety significance so that new or expanded knowledge can assist the NRC in fulfilling its responsibilities, and develops the regulations and guides necessary to implement Commission policy or technical requirements.

The NRC believes that a stable safety research program is essential to provide a foundation for the strong and credible regulation needed to maintain and improve the nation's current civilian nuclear safety record. A moderate increase in funding is critical for the success of long-range research, the stability of the program, and the retention of the best people to carry out the research work and apply the research results to important safety issues for current and future operations.

The FY 1992 program provides resource increases primarily in the following areas. Research will be accelerated on radiation embrittlement of the reactor pressure vessel and related piping and on the aging of safety-related equipment. This work is needed to provide the technical basis for regulatory decisions regarding continued safe operation of nuclear power plants as they age and for renewal of nuclear power plant operating licenses beyond their current, 40-year license term. The FY 1992 resource increase will also expand human-factors

Summary

research in such areas as use of advanced digital-control systems and other human-systems interfaces, development of personnel subsystems for advanced reactor designs, and integration of human reliability assessment and probabilistic risk assessment. Increases in FY 1992 will be used to resolve safety issues and perform risk assessments to support certification reviews for advanced standard reactor designs, to conduct tests of small-scaled facilities simulating such new designs, and resolve issues related to the reviews of Power Reactor Inherently Safe Module and modular high-temperature gas-cooled reactor. Increases in FY 1992 will also help resolve the technical issues to support regulatory decisions on reactor safety systems and containments for operating plants to further enhance the protection of the public in the event of a severe accident, generic safety issues, and radiation protection research as recommended by the National Academy of Sciences.

Nuclear Material and Low-Level Waste Safety and Safeguards Regulation

The NRC regulates a wide variety of nuclear materials licensees across the United States. For instance, there are about 24,000 licensed medical, academic, and industrial users of nuclear materials subject to regulation. Of these, approximately 8,000 are licensed directly by the NRC and about 16,000 are regulated by the 29 States that participate in the NRC's State Agreement Program. Nuclear materials are used in large industrial operations, such as the manufacturing of reactor fuel and the production of medical radiopharmaceuticals; fabrication of commercial products, such as smoke detectors; and operations using small quantities of radioisotopes in over seven million medical diagnosis and treatment procedures annually. Given the large and varied use of nuclear materials throughout this country, the overall safety record has been very good. However, the NRC will continue to increase the emphasis on improving licensee performance, particularly that of fuel cycle facilities, radiographers, and medical-use licensees, since the average citizen is most likely to come in contact with nuclear materials through the medical and industrial applications of such materials.

The FY 1992 resource increase will allow the NRC to conduct 200 additional inspections of materials licensees and continue the review of approximately 18,000 materials and fuel cycle licenses terminated since 1965 to ensure that sites were adequately decontaminated. This increase is also necessary to ensure that decommissioning activities at existing contaminated sites move forward without delay. It will also help the NRC to continue to place significant emphasis on implementing its responsibilities under the Low-Level Radioactive Waste Policy Amendments Act of 1985. This includes providing siting and design technical assistance to compact-affiliated and independent Agreement States as they proceed to develop and implement plans to construct low-level waste disposal facilities. One Agreement State application for such a facility is expected in each of FY 1991 and 1992. In addition, NRC expects a low-level waste disposal facility application for its review from a non-Agreement State in each of FY 1992 and 1993.

Summary

High-Level Nuclear Waste Regulation

The Nuclear Waste Policy Act of 1982, as amended, specifies a detailed approach for the long-range undertaking of high-level waste disposal, with the Department of Energy having operational responsibility and the NRC having regulatory responsibility for the transportation, storage, and geologic disposal of the waste. The safe disposal of high-level radioactive waste requires the protection of the public health, safety, and environment over thousands of years.

During FY 1992, the NRC will continue to implement its responsibilities under the Nuclear Waste Policy Act. The NRC will continue to develop and provide guidance to the Department of Energy, to resolve regulatory and technical uncertainties in our current regulations, and to develop criteria for reviewing the Department of Energy's site characterization program and license application. The FY 1992 resource increase will augment NRC's performance assessment capability to address potential geologic hazards (e.g., potential volcanic activity) and for the treatment of any possible changes in the climate at the site, which may affect the quantity of water passing through the repository. The NRC will require this enhanced capability to evaluate the Department of Energy's site characterization activities at Yucca Mountain.

Special and Independent Reviews, Investigations, and Enforcement

The areas of major emphasis in this program include: evaluating safety concerns involving reactor and nonreactor facilities, assessing operational events and experience, providing technical training to NRC staff, investigating wrongdoing by NRC licensees, conducting independent adjudicatory reviews, and implementing a comprehensive enforcement program. The NRC Operations Center will continue to be staffed (24-hours-a-day, every day) for direct communication with licensed nuclear power plants and major fuel cycle facilities to maintain the capability to receive reports of significant events and determine the appropriate level of response. There are currently three reactors connected to the Emergency Response Data System. Beginning in FY 1991, approximately 35 reactors are expected to be connected each year until completion in FY 1993. The FY 1992 funding increase will allow the NRC to develop and implement entry-level training programs for health physics and nuclear engineering in response to increased difficulty in hiring experienced personnel.

Nuclear Safety Management and Support

The areas of major emphasis in this program include: providing NRC central policy direction and operating guidance, overseeing day-to-day operations, and providing administrative and logistical support. The NRC will continue to foster growing cooperation with other countries, particularly the U.S.S.R. and Eastern Europe, in the areas of nuclear reactor and materials safety. Funding increases in FY 1992 are for the consolidation of the remaining NRC headquarters offices.

Summary

Inspector General

The Inspector General Act Amendments of 1988 (Public Law 100-504) established a statutory Office of the Inspector General within the NRC. The act placed some significant new responsibilities on the office, which its predecessor the Office of Inspector and Auditor did not have. Additionally, the Chief Financial Officers Act of 1990 created new responsibilities. These responsibilities include: additional reporting requirements; legislation and regulation review responsibility; oversight for audits performed by outside organizations; significant, new administrative authorities; and ensuring that audits of the agency's financial statements are performed. The FY 1992 staff increase will enable the Office of the Inspector General to carry out its contract audit responsibilities and to comply with the provisions of the Chief Financial Officers Act of 1990.

APPROPRIATIONS AND FINANCIAL SUMMARY

The NRC's FY 1992 budget requests new budget authority of \$512,500,000, to be funded by two appropriations -- one is NRC's Salaries and Expenses appropriation for \$508,810,000 and the other is NRC's Office of the Inspector General appropriation for \$3,690,000. Of the funds appropriated to the NRC's Salaries and Expenses, \$19,962,000, shall be derived from the Nuclear Waste Fund. The sums appropriated to the NRC's Salaries and Expenses and NRC's Office of the Inspector General shall be reduced by the amount of revenues received during FY 1992 from licensing fees, inspection services, and other services and collections, so as to result in final FY 1992 appropriations for the NRC at an estimated \$19,962,000 -- the amount appropriated from the Nuclear Waste Fund. Revenues derived from enforcement actions will be deposited to miscellaneous receipts of the Treasury.

The NRC's proposed FY 1992 appropriation legislation and its accompanying analysis is provided on pages 10 through 18 of this section. This section also provides the summary of obligations by mission area and by function, the summary of financing these obligations, and the analysis of outlays. The summaries of obligations indicate the total obligations for direct and reimbursable programs for FY 1990-1993. The detailed justifications for direct program activities are presented on pages 27 through 148. It should be noted that the obligations related to the reimbursable program are not financed by NRC's appropriated funds, but solely through reimbursable agreements with other Federal agencies and non-Federal entities.

Summary

PROPOSED FY 1992 APPROPRIATION LEGISLATION

The proposed appropriation legislation is as follows:

Salaries and Expenses

For necessary expenses of the Commission in carrying out the purposes of the Energy Reorganization Act of 1974, as amended, and the Atomic Energy Act of 1954, as amended, including the employment of aliens; services authorized by section 3109 of title 5, United States Code; publication and dissemination of atomic information; purchase, repair, and cleaning of uniforms; official representation expenses (not to exceed \$20,000); reimbursements to the General Services Administration for security guard services; hire of passenger motor vehicles and aircraft, \$508,810,000, to remain available until expended, of which \$19,962,000 shall be derived from the Nuclear Waste Fund: Provided, That from this appropriation, transfers of sums may be made to other agencies of the Government for the performance of the work for which this appropriation is made, and in such cases the sums so transferred may be merged with the appropriation to which transferred: Provided further, That moneys received by the Commission for the cooperative nuclear safety research program, services rendered to foreign governments and international organizations, and the material and information access authorization programs, including criminal history checks under section 149 of the Atomic Energy Act of 1954, as amended, may be retained and used for salaries and expenses associated with those activities, notwithstanding the provisions of section 3302 of title 31, United States Code, and shall remain available until expended: Provided further, That revenues from licensing fees, inspection services, and other services and collections shall be retained and used for necessary salaries and expenses in this account, notwithstanding the provisions of section 3302 of title 31, United States Code, and shall remain available until expended: Provided further, That the sum herein appropriated shall be reduced by the amount of revenues received during fiscal year 1992 from licensing fees, inspection services, and other services and collections, excluding those moneys received for the cooperative nuclear safety research program, services rendered to foreign governments and international organizations, and the material and information access authorization programs, so as to result in a final fiscal year 1992 appropriation estimate at not more than \$19,962,000.

Office of the Inspector General

For necessary expenses of the Office of the Inspector General in carrying out the provisions of the Inspector General Act of 1978, as amended, including services authorized by section 3109 of title 5, United States Code, \$3,690,000, to remain available until expended; and in addition, an amount not to exceed 5 percent of this sum may be transferred from Salaries and Expenses, Nuclear Regulatory Commission: Provided, That notice of such transfers shall be given to the Committees on Appropriations of the House and Senate: Provided further, That from this appropriation, transfers of sums may be made to other agencies of the Government for the performance of work for which this appropriation is

Summary

made, and in such cases the sums so transferred may be merged with the appropriate inspection services, and other services and collections shall be retained and used for necessary salaries and expenses in this account, notwithstanding the provisions of section 3302 of title 31, United States Code, and shall remain available until expended: Provided further, that the sum herein appropriated shall be reduced by the amount of revenues received during fiscal year 1992 from licensing fees, inspection services, and other services and collections, so as to result in a final fiscal year 1992 appropriation estimated at not more than \$0.

Analysis of Proposed FY 1992 Appropriations Legislation

The analysis of the proposed appropriation legislation is as follows:

Salaries and Expenses

1. FOR NECESSARY EXPENSES OF THE COMMISSION IN CARRYING OUT THE PURPOSES OF THE ENERGY REORGANIZATION ACT OF 1974, AS AMENDED, AND THE ATOMIC ENERGY ACT OF 1954, AS AMENDED:

42 U.S.C. 5841 et. seq.

42 U.S.C. 5841 et. seq., the Energy Reorganization Act of 1974, established the NRC to perform all the licensing and related regulatory functions of the Atomic Safety and Licensing Board Panel, the Atomic Safety and Licensing Appeal Panel, and the Advisory Committee on Reactor Safeguards, and to carry out the performance of other functions, including research for the purpose of confirmatory assessment related to licensing and other regulation, and other activities, including research related to nuclear material safety and regulation under the provisions of the Atomic Energy Act of 1954, as amended (42 U.S.C. 2011 et. seq.).

2. EMPLOYMENT OF ALIENS:

42 U.S.C. 2201(d)

42 U.S.C. 2201(d) of the Atomic Energy Act of 1954, as amended, authorizes the Commission to employ persons and fix their compensation without regard to civil service laws.

3. SERVICES AUTHORIZED BY 5 U.S.C. 3109:

5 U.S.C. 3109 provides in part that the head of an agency may procure by contract the temporary or intermittent services of experts or consultants when authorized by an appropriation.

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4. PUBLICATION AND DISSEMINATION OF ATOMIC INFORMATION:

42 U.S.C. 2161(b)

42 U.S.C. 2161(b) directs that the Commission shall be guided by the principle that the dissemination of scientific and technical information related to atomic energy should be permitted and encouraged so as to provide that interchange of ideas and criticism which is essential to scientific and industrial progress and public understanding and to enlarge the fund of technical information.

5. PURCHASE, REPAIR, AND CLEANING OF UNIFORMS:

5 U.S.C. 5901

5 U.S.C. 5901 authorizes the annual appropriation of funds to each agency of the Government as a uniform allowance.

6. OFFICIAL REPRESENTATION EXPENSES:

47 Comp. Gen. 657

43 Comp. Gen. 305

This language is required because of the established rule restricting an agency from charging appropriations with the cost of official representation unless the appropriations involved are specifically available therefor. Congress has appropriated funds for official representation expenses to the NRC and NRC's predecessor, the Atomic Energy Commission, each year since FY 1950.

7. REIMBURSEMENTS TO THE GENERAL SERVICES ADMINISTRATION FOR SECURITY GUARD SERVICES:

34 Comp Gen. 42

This language is required because, under the provisions of the Federal Property and Administrative Services Act of 1949, specific appropriation is made to the General Services Administration for carrying out the function of protecting public buildings and property and, therefore, NRC appropriations not specifically made available therefor may not be used to reimburse the General Services Administration for security guard services.

Summary

8. HIRE OF PASSENGER MOTOR VEHICLES AND AIRCRAFT:

31 U.S.C. 1343

31 U.S.C. 1343 provides in effect that unless specifically authorized by the appropriation concerned or other law, no appropriation shall be expended to purchase or hire passenger motor vehicles for any branch of the Government.

9. TO REMAIN AVAILABLE UNTIL EXPENDED:

31 U.S.C. 1301

31 U.S.C. 1301 provides in part that no regular, annual appropriation shall be construed to be permanent or available continuously unless the appropriation expressly provides that it is available after the fiscal year covered by the law in which it appears.

10. SHALL BE DERIVED FROM THE NUCLEAR WASTE FUND:

41 U.S.C. 10131(b)(4)

42 U.S.C. 10222(a)(4)

41 U.S.C. 10131(b)(4) provides for the establishment of a Nuclear Waste Fund to ensure that the costs of carrying out activities relating to the disposal of high-level radioactive waste and spent nuclear fuel will be borne by the persons responsible for generating such waste and spent fuel.

42 U.S.C. 10222(a)(4) provides that the amounts paid by generators and owners of these materials into the fund is reviewed annually to determine if any fee adjustment is needed to insure full cost recovery.

42 U.S.C. 10134

42 U.S.C. 10133

42 U.S.C. 10134 specifically requires the NRC to license a repository for the disposal of high-level radioactive waste and spent nuclear fuel and sets forth certain licensing procedures. 42 U.S.C. 10133 also assigns review responsibilities to the NRC in the steps leading to submission of the license application. Thus, the Nuclear Waste Policy Act of 1982, as amended, establishes NRC's responsibility throughout the repository siting process, culminating in the requirement for NRC licensing as a prerequisite to construction and operation of the repository.

Summary

42 U.S.C. 10222(d)

42 U.S.C. 10222(d) specifies that expenditures from the Nuclear Waste Fund can be used for purposes of radioactive waste disposal activities, including identification, development, licensing, construction, operation, decommissioning, and post-decommissioning maintenance and monitoring of any repository constructed under the Nuclear Waste Policy Act of 1982, and administrative cost of the radioactive waste disposal program.

11. FROM THIS APPROPRIATION, TRANSFERS OF SUMS MAY BE MADE TO OTHER AGENCIES OF THE GOVERNMENT FOR THE PERFORMANCE OF WORK FOR WHICH THIS APPROPRIATION IS MADE, AND IN SUCH CASES THE SUMS SO TRANSFERRED MAY BE MERGED WITH THE APPROPRIATION TO WHICH TRANSFERRED.

31 U.S.C. 1532

31 U.S.C. 1532 permits the transfer of appropriated funds from one account to another or to a working fund only when authorized by law.

12. MONEYS RECEIVED BY THE COMMISSION FOR THE COOPERATIVE NUCLEAR SAFETY RESEARCH PROGRAM, SERVICES RENDERED TO FOREIGN GOVERNMENTS AND INTERNATIONAL ORGANIZATIONS, AND THE MATERIAL AND INFORMATION ACCESS AUTHORIZATION PROGRAMS, INCLUDING CRIMINAL HISTORY CHECKS UNDER SECTION 149 OF THE ATOMIC ENERGY ACT OF 1954, AS AMENDED, MAY BE RETAINED AND USED FOR SALARIES AND EXPENSES ASSOCIATED WITH THOSE ACTIVITIES, NOTWITHSTANDING THE PROVISIONS OF SECTION 3302 OF TITLE 31, UNITED STATES CODE, AND SHALL REMAIN AVAILABLE UNTIL EXPENDED:

31 U.S.C. 3302

2 Comp. Gen. 775

Appropriated funds may not be augmented with funds from other sources unless specifically authorized by law. Under the cooperative nuclear safety research program, funds are received from domestic entities foreign governments, and international organizations for their participation in NRC's reactor safety research experiments. The NRC is authorized to receive directly, compensation from foreign governments and international organizations for providing safety assistance and other services related to promoting the public health and safety. Funds are also received in the form of fees from licensees for the cost of security investigations and related processing associated with access to formula quantities of special nuclear material. These funds will be used to pay the related NRC processing costs and the agency performing the security investigations. Pursuant to P.L. 99-399, section 606, funds will be received in the form of fees from licensees for the cost of fingerprint examinations and criminal history checks of each individual granted access to safeguards information or unescorted access to a nuclear power plant. These funds will be used to pay for processing and performing the fingerprint

Summary

examinations and criminal history checks. NRC will also use the money currently collected under 10 CFR Part 25 to pay the NRC processing costs and the Office of Personnel Management for conducting background investigations used as a basis for NRC security clearances for designated licensee representatives and other personnel requiring access to classified information.

13. REVENUES FROM LICENSING FEES, INSPECTION SERVICES, AND OTHER SERVICES AND COLLECTIONS SHALL BE RETAINED AND USED FOR NECESSARY SALARIES AND EXPENSES IN THIS ACCOUNT, NOTWITHSTANDING THE PROVISIONS OF SECTION 3302 OF TITLE 31, UNITED STATES CODE, AND SHALL REMAIN AVAILABLE UNTIL EXPENDED.

31 U.S.C. 9701

The NRC is authorized under Title V of the Independent Offices Appropriation Act of 1952 to collect license fees. Pursuant to 31 U.S.C. 9701, any person who receives a service or thing of value from the Commission shall pay fees to cover the NRC's cost in providing such service or thing of value.

42 U.S.C. 2213

P.L. 101-508 (Omnibus Budget Reconciliation Act of 1990)

Pursuant to 42 U.S.C. 2213, the NRC shall assess and collect annual charges from persons licensed by the Commission. Title VI, Subtitle B, of the Omnibus Budget Reconciliation Act of 1990 requires the Commission to assess and collect annual charges from persons licensed by the Commission that approximate 100 percent of the Commission's budget authority, less any amount appropriated to the Commission from the Nuclear Waste Fund, for each year of FY 1991-1995.

31 U.S.C. 3302

The NRC is required to deposit all revenues collected to miscellaneous receipts of the Treasury unless specifically authorized by an appropriation to retain and use such revenue.

14. THE SUM HEREIN APPROPRIATED SHALL BE REDUCED BY THE AMOUNT OF REVENUES RECEIVED FROM LICENSING FEES, INSPECTION SERVICES, AND OTHER SERVICES AND COLLECTIONS, EXCLUDING THOSE MONEYS RECEIVED FOR THE COOPERATIVE NUCLEAR SAFETY RESEARCH PROGRAM, SERVICES RENDERED TO FOREIGN GOVERNMENTS AND INTERNATIONAL ORGANIZATIONS, AND THE MATERIAL AND INFORMATION ACCESS AUTHORIZATION PROGRAMS.

P.L. 101-508 (Omnibus Budget Reconciliation Act of 1990)

The total fees to be collected in FY 1992 are to approximate 100 percent of the Commission's budget authority. Pursuant to P.L. 101-508, Title VI,

Summary

Subtitle B, section 6101(c)(2), the aggregate amount of the annual charge collected from all licensees shall equal an amount that approximates 100 percent of the budget authority of the Commission in the fiscal year in which such charge is collected, less any amount appropriated to the Commission from the Nuclear Waste Fund and the amount of fees collected under the Independent Offices Appropriation Act of 1952 (31 U.S.C. 9701), in such fiscal year.

Office of the Inspector General

15. FOR NECESSARY EXPENSES OF THE OFFICE OF THE INSPECTOR GENERAL IN CARRYING OUT THE PROVISIONS OF THE INSPECTOR GENERAL ACT OF 1978, AS AMENDED:

P.L. 95-452

P.L. 100-504

P.L. 100-504 amended P.L. 95-452 to establish the Office of the Inspector General within the NRC effective April 17, 1989, and to require the establishment of a separate appropriation account to fund the Office of the Inspector General.

16. SERVICES AUTHORIZED BY 5 U.S.C. 3109:

5 U.S.C. 3109 provides in part that the head of an agency may procure by contract the temporary or intermittent services of experts or consultants when authorized by an appropriation.

17. TO REMAIN AVAILABLE UNTIL EXPENDED:

31 U.S.C. 1301

31 U.S.C. 1301 provides in part that no regular, annual appropriation shall be construed to be permanent or available continuously unless the appropriation expressly provides that it is available after the fiscal year covered by the law in which it appears.

18. AN AMOUNT NOT TO EXCEED 5 PERCENT OF THIS SUM MAY BE TRANSFERRED FROM SALARIES AND EXPENSES, NUCLEAR REGULATORY COMMISSION; PROVIDED, THAT NOTICE OF SUCH TRANSFERS SHALL BE GIVEN TO THE COMMITTEES ON APPROPRIATIONS OF THE HOUSE AND SENATE.

31 U.S.C. 1301

31 U.S.C. 1301 prohibits the transfer of funds between appropriations without specific statutory authority. This language provides for limited transfer authority from NRC's Salaries and Expenses appropriation to its Office of the Inspector General appropriation. This will permit the NRC to augment the Office of the Inspector General appropriation on a limited

Summary

basis, if it becomes necessary, without seeking additional appropriations for that fiscal year.

19. FROM THIS APPROPRIATION, TRANSFERS OF SUMS MAY BE MADE TO OTHER AGENCIES OF THE GOVERNMENT FOR THE PERFORMANCE OF WORK FOR WHICH THIS APPROPRIATION IS MADE, AND IN SUCH CASES THE SUMS SO TRANSFERRED MAY BE MERGED WITH THE APPROPRIATION TO WHICH TRANSFERRED.

31 U.S.C. 1532

31 U.S.C. 1532 permits the transfer of appropriated funds from one account to another or to a working fund only when authorized by law.

20. REVENUES FROM LICENSING FEES, INSPECTION SERVICES, AND OTHER SERVICES AND COLLECTIONS SHALL BE RETAINED AND USED FOR NECESSARY SALARIES AND EXPENSES IN THIS ACCOUNT, NOTWITHSTANDING THE PROVISION OF SECTION 3302 OF TITLE 31, UNITED STATES CODE, AND SHALL REMAIN AVAILABLE UNTIL EXPENDED.

31 U.S.C. 9701

The NRC is authorized under Title V of the Independent Offices Appropriations Act of 1952 to collect license fees. Pursuant to 31 U.S.C. 9701, any person who receives a service or thing of value from the Commission shall pay fees to cover the NRC's cost in providing such service or thing of value.

42 U.S.C. 2213

P.L. 101-508 (Omnibus Budget Reconciliation Act of 1990)

Pursuant to 42 U.S.C. 2213, the NRC shall assess and collect annual charges from persons licensed by the Commission. Title VI, Subtitle B, of the Omnibus Budget Reconciliation Act of 1990 requires the Commission to assess and collect annual charges from persons licensed by the Commission that approximate 100 percent of the Commission's budget authority, less any amount appropriated to the Commission from the Nuclear Waste Fund, for each year of FY 1991-1995.

31 U.S.C. 3302

The NRC is required to deposit all revenues collected to miscellaneous receipts of the Treasury unless specifically authorized by an appropriation to retain and use such revenue.

21. THE SUM HEREIN APPROPRIATED SHALL BE REDUCED BY THE AMOUNT OF REVENUES RECEIVED FROM LICENSING FEES, INSPECTION SERVICES, AND OTHER SERVICES AND COLLECTIONS.

Summary

P.L. 101-508 (Omnibus Budget Reconciliation Act of 1990)

The total fees to be collected in FY 1992 are to approximate 100 percent of the Commission's budget authority. Pursuant to P.L. 101-508, Title VI, Subtitle B, section 6101(c)(2), the aggregate amount of the annual charge collected from all licensees shall equal an amount that approximates 100 percent of the budget authority of the Commission in the fiscal year in which such charge is collected, less any amount appropriated to the Commission from the Nuclear Waste Fund and the amount of fees collected under the Independent Offices Appropriation Act of 1952 (31 U.S.C. 9701), in such fiscal year.

Summary

SUMMARY OF OBLIGATIONS BY MISSION AREA

	FY 1990 <u>Actual</u>	FY 1991 <u>Estimate</u>	FY 1992 <u>Estimate</u>	FY 1993 <u>Estimate</u>
<u>NRC Appropriation: Salaries and Expenses</u>				
Direct Program:				
Reactor Safety and Safeguards Regulation.....	\$168,735	\$188,805	\$199,955	\$199,955
Nuclear Safety Research.....	103,404	110,013	120,266	120,266
Nuclear Material and Low-Level Waste Safety and Safeguards Regulation.....	39,835	48,515	49,798	49,798
High-Level Nuclear Waste Regulation.	21,498	19,160	19,962	19,962
Special and Independent Reviews, Investigations, and Enforcement...	32,898	38,196	39,293	39,293
Nuclear Safety Management and Support.....	<u>67,253</u>	<u>75,488</u>	<u>79,536</u>	<u>79,536</u>
Total Obligations - Direct Program.....	\$433,623	\$480,177	\$508,810	\$508,810
Reimbursable Program.....	<u>558</u>	<u>2,000</u>	<u>1,500</u>	<u>1,500</u>
Total Obligations.....	\$434,181	\$482,177	\$510,310	\$510,310
Offsetting Collections from Federal funds.....	-80	-2,000	-1,500	-1,500
Recovery of prior year obligations....	-4,361	0	0	0
Unobligated balance, start of year....	-12,826	-18,857	0	0
Unobligated balance transferred, net..	140			
Unobligated balance, end of year.....	<u>18,857</u>	<u>0</u>	<u>0</u>	<u>0</u>
Budget Authority (S&E).....	\$435,911	\$461,320	\$508,810	\$508,810

Summary

SUMMARY OF OBLIGATIONS BY MISSION AREA

	<u>FY 1990</u> <u>Actual</u>	<u>FY 1991</u> <u>Estimate</u>	<u>FY 1992</u> <u>Estimate</u>	<u>FY 1993</u> <u>Estimate</u>
<u>NRC Appropriation: Office of the Inspector General</u>				
Direct Program:				
Total Obligations.....	\$ 2,657	\$ 4,022	\$ 3,690	\$ 3,690
Recovery of prior year obligations....	0	0	0	0
Unobligated balance, start of year....	0	-342	0	0
Unobligated balance transferred, net..	-140			
Unobligated balance, end of year.....	<u>342</u>	<u>0</u>	<u>0</u>	<u>0</u>
Budget Authority (IG).....	\$ 2,859	\$ 3,680	\$ 3,690	\$ 3,690

TOTAL NRC BUDGET AUTHORITY

S&E.....	\$435,911	\$461,320	\$508,810	\$508,810
IG.....	<u>2,859</u>	<u>3,680</u>	<u>3,690</u>	<u>3,690</u>
Total NRC.....	<u>\$438,770</u>	<u>\$465,000</u>	<u>\$512,500</u>	<u>\$512,500</u>

Summary

SUMMARY OF OBLIGATIONS BY FUNCTION

	<u>FY 1990</u> <u>Actual</u>	<u>FY 1991</u> <u>Estimate</u>	<u>FY 1992</u> <u>Estimate</u>	<u>FY 1993</u> <u>Estimate</u>
<u>NRC Appropriation: Salaries and Expenses</u>				
Direct Program:				
Salaries and Benefits.....	\$197,307	\$228,496	\$241,225	\$241,225
Program Support.....	146,238	157,611	166,325	166,325
Administrative Support.....	77,862	81,470	87,750	87,750
Travel.....	<u>12,216</u>	<u>12,600</u>	<u>13,510</u>	<u>13,510</u>
Total Obligations - Direct Program.....	\$433,623	\$480,177	\$508,810	\$508,810
Reimbursable Program.....	<u>558</u>	<u>2,000</u>	<u>1,500</u>	<u>1,500</u>
Total Obligations (S&E).....	\$434,181	\$482,177	\$510,310	\$510,310

NRC Appropriation: Office of the Inspector General

Direct Program:				
Salaries and Benefits.....	\$ 1,831	\$ 2,842	\$ 3,200	\$ 3,200
Program Support.....	237	290	390	390
Administrative Support.....	510	790	0	0
Travel.....	<u>79</u>	<u>100</u>	<u>100</u>	<u>100</u>
Total Obligations (IG).....	\$ 2,657	4,022	3,690	3,690

TOTAL NRC OBLIGATIONS BY FUNCTION

Salaries and Benefits.....	\$199,138	\$231,338	\$244,425	\$244,425
Program Support.....	146,475	157,901	166,715	166,715
Administrative Support.....	78,372	82,260	87,750	87,750
Travel.....	<u>12,295</u>	<u>12,700</u>	<u>13,610</u>	<u>13,610</u>
Total NRC.....	<u>\$436,280</u>	<u>\$484,199</u>	<u>\$512,500</u>	<u>\$512,500</u>

Summary

FINANCING OF OBLIGATIONS

	<u>FY 1990</u> <u>Actual</u>	<u>FY 1991</u> <u>Estimate</u>	<u>FY 1992</u> <u>Estimate</u>	<u>FY 1993</u> <u>Estimate</u>
<u>NRC Appropriation: Salaries and Expenses</u>				
Sources of Funds Available for Obligations:				
Recovery of prior year obligations..	\$ 4,361	\$ 0	\$ 0	\$ 0
Unobligated balance, start of year..	12,826	18,857	0	0
Unobligated balance transferred, net.....	-140	0	0	0
Spending authority from offsetting collections.....	80	2,000	1,500	1,500
Appropriated to NRC.....	<u>435,911</u>	<u>461,320</u>	<u>508,810</u>	<u>508,810</u>
Subtotal.....	\$453,038	\$482,177	\$510,310	\$510,310
Less: Unobligated balance, end of year.....	<u>-18,857</u>	<u>0</u>	<u>0</u>	<u>0</u>
Total Obligations.....	\$434,181	\$482,177	\$510,310	\$510,310

NRC Appropriation: Office of the Inspector General

Sources of Funds Available for Obligations:				
Recovery of prior year obligations..	\$ 0	\$ 0	\$ 0	\$ 0
Unobligated balance, start of year..	0	342	0	0
Unobligated balance transferred, net.....	140	0	0	0
Appropriated to NRC.....	<u>2,859</u>	<u>3,680</u>	<u>3,690</u>	<u>3,690</u>
Subtotal.....	\$ 2,999	\$ 4,022	\$ 3,690	\$ 3,690
Less: Unobligated balance, end of year.....	<u>-342</u>	<u>0</u>	<u>0</u>	<u>0</u>
Total Obligations.....	\$ 2,657	\$ 4,022	\$ 3,690	\$ 3,690

Summary

SUMMARY OF OUTLAYS

	<u>FY 1990</u> <u>Actual</u>	<u>FY 1991</u> <u>Estimate</u>	<u>FY 1992</u> <u>Estimate</u>	<u>FY 1993</u> <u>Estimate</u>
<u>NRC Appropriation: Salaries and Expenses</u>				
Unexpended balance, start of year:				
Obligated.....	\$139,348	\$177,750	\$199,046	\$199,046
Unobligated.....	12,826	18,857	0	0
Unobligated transferred.....	-140	0	0	0
Appropriation to NRC.....	<u>435,911</u>	<u>461,320</u>	<u>508,810</u>	<u>508,810</u>
Total Funds Available for Outlays.....	\$587,945	\$657,927	\$707,856	\$707,856
Unexpended balance, end of year:				
Obligated.....	-177,750	-199,046	-211,461	-211,461
Unobligated.....	<u>-18,857</u>	<u>0</u>	<u>0</u>	<u>0</u>
Total Outlays.....	\$391,338	\$458,881	\$496,395	\$496,395

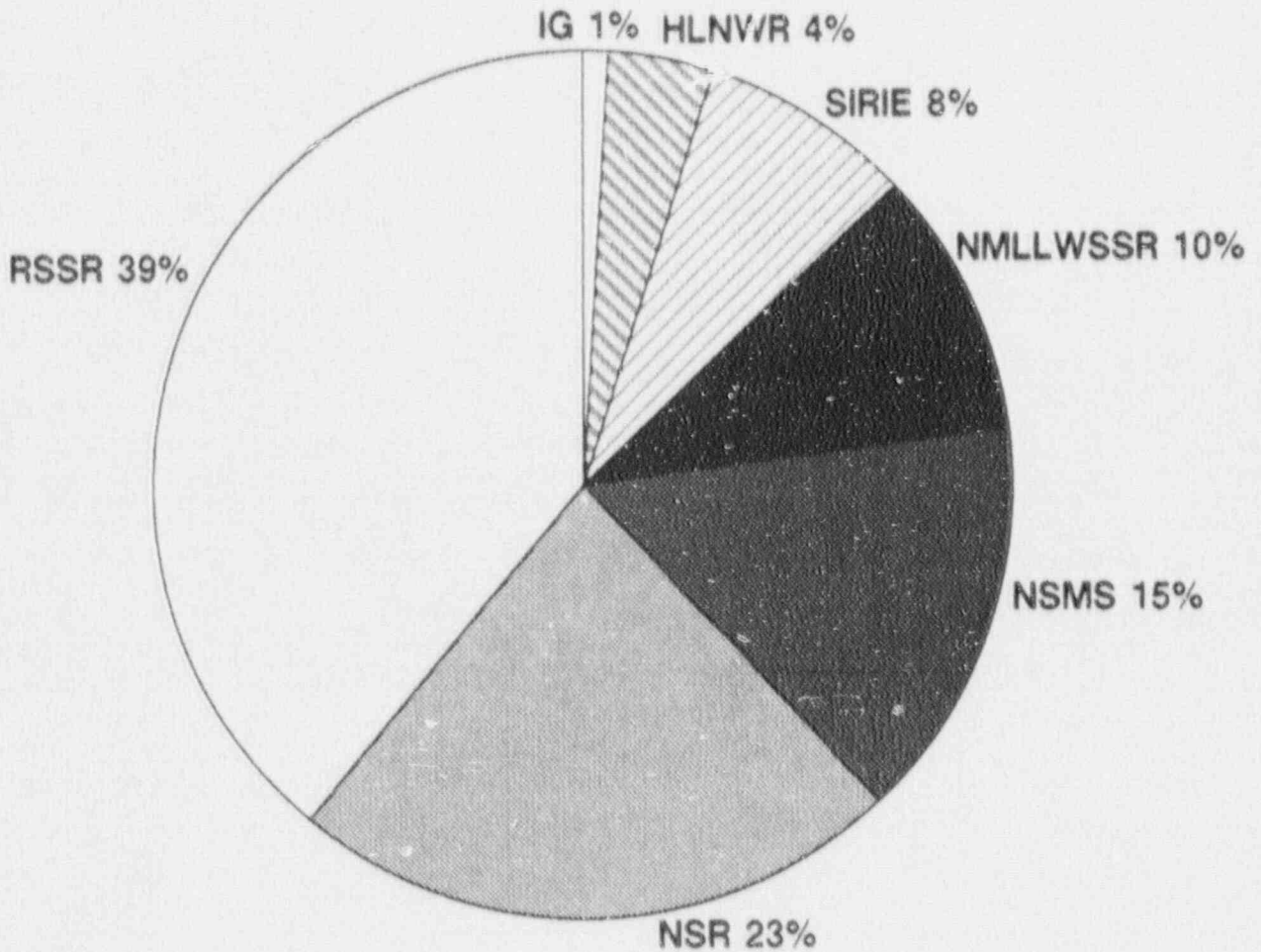
NRC Appropriation: Office of the Inspector General

Unexpended balance, start of year:				
Obligated.....	\$ 0	\$ 763	\$ 1,244	\$ 1,244
Unobligated.....	0	342	0	0
Unobligated transferred.....	140			
Appropriation to NRC.....	<u>2,859</u>	<u>3,680</u>	<u>3,690</u>	<u>3,690</u>
Total Funds Available for Outlays.....	\$ 2,999	\$ 4,785	\$ 4,934	\$ 4,934
Unexpended balance, end of year:				
Obligated.....	-763	-1,244	-1,329	-1,329
Unobligated.....	<u>-342</u>	<u>0</u>	<u>0</u>	<u>0</u>
Total Outlays.....	\$ 1,894	\$ 3,541	\$ 3,605	\$ 3,605

TOTAL NRC OUTLAYS

S&E.....	\$391,338	\$458,881	\$496,395	\$496,395
IG.....	<u>1,894</u>	<u>3,541</u>	<u>3,605</u>	<u>3,605</u>
Total NRC.....	<u>\$393,232</u>	<u>\$462,422</u>	<u>\$500,000</u>	<u>\$500,000</u>

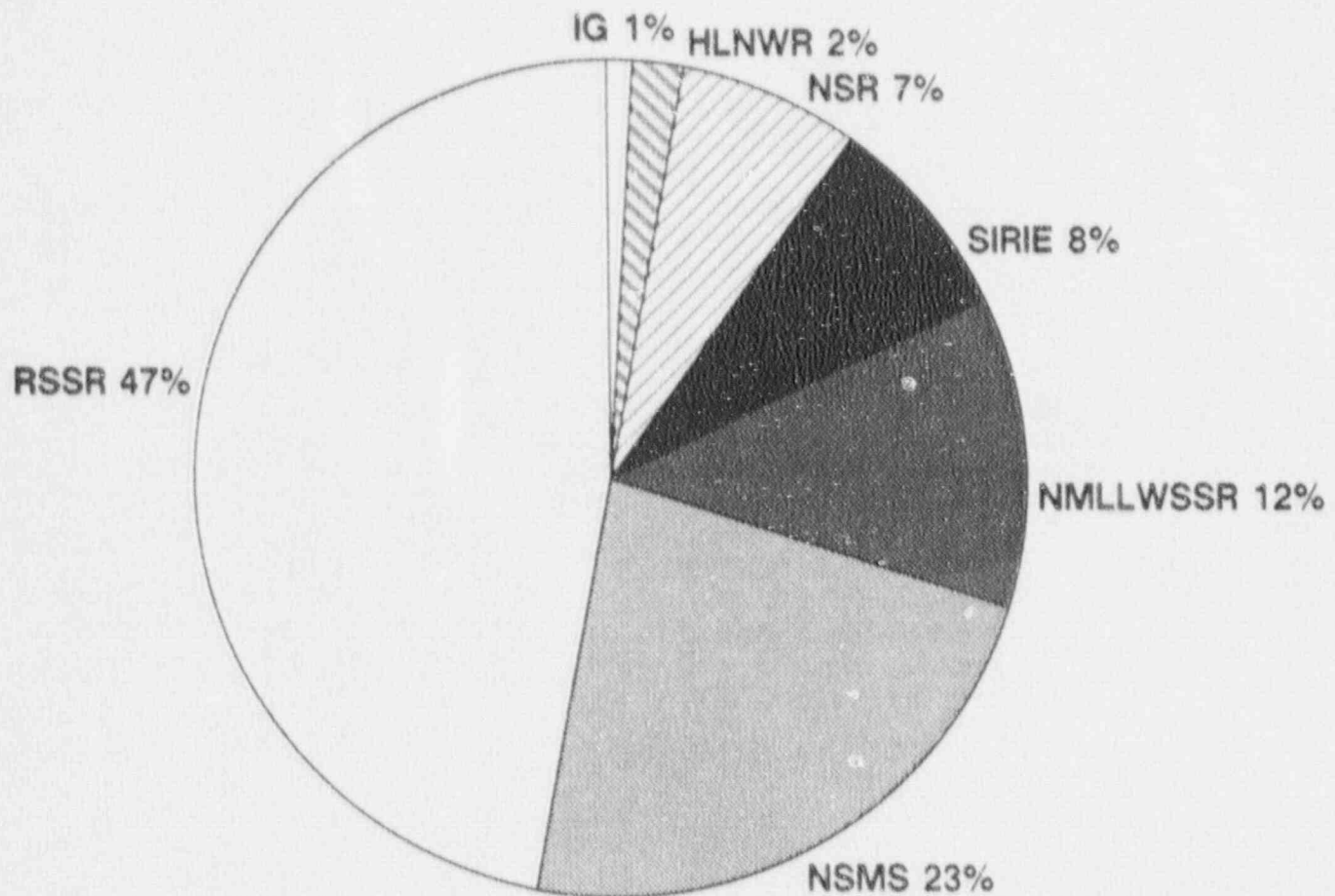
FY 1992 AND FY 1993 DOLLAR DISTRIBUTION BY MISSION AREA



LEGEND

- RSSR — REACTOR SAFETY AND SAFEGUARDS REGULATION
- NSR — NUCLEAR SAFETY RESEARCH
- NMLLWSSR — NUCLEAR MATERIAL AND LOW-LEVEL WASTE SAFETY AND SAFEGUARDS REGULATION
- HLNVR — HIGH-LEVEL NUCLEAR WASTE REGULATION
- SIRIE — SPECIAL AND INDEPENDENT REVIEWS, INVESTIGATIONS, AND ENFORCEMENT
- NSMS — NUCLEAR SAFETY MANAGEMENT AND SUPPORT
- IG — INSPECTOR GENERAL

FY 1992 AND FY 1993 STAFF DISTRIBUTION BY MISSION AREA



LEGEND

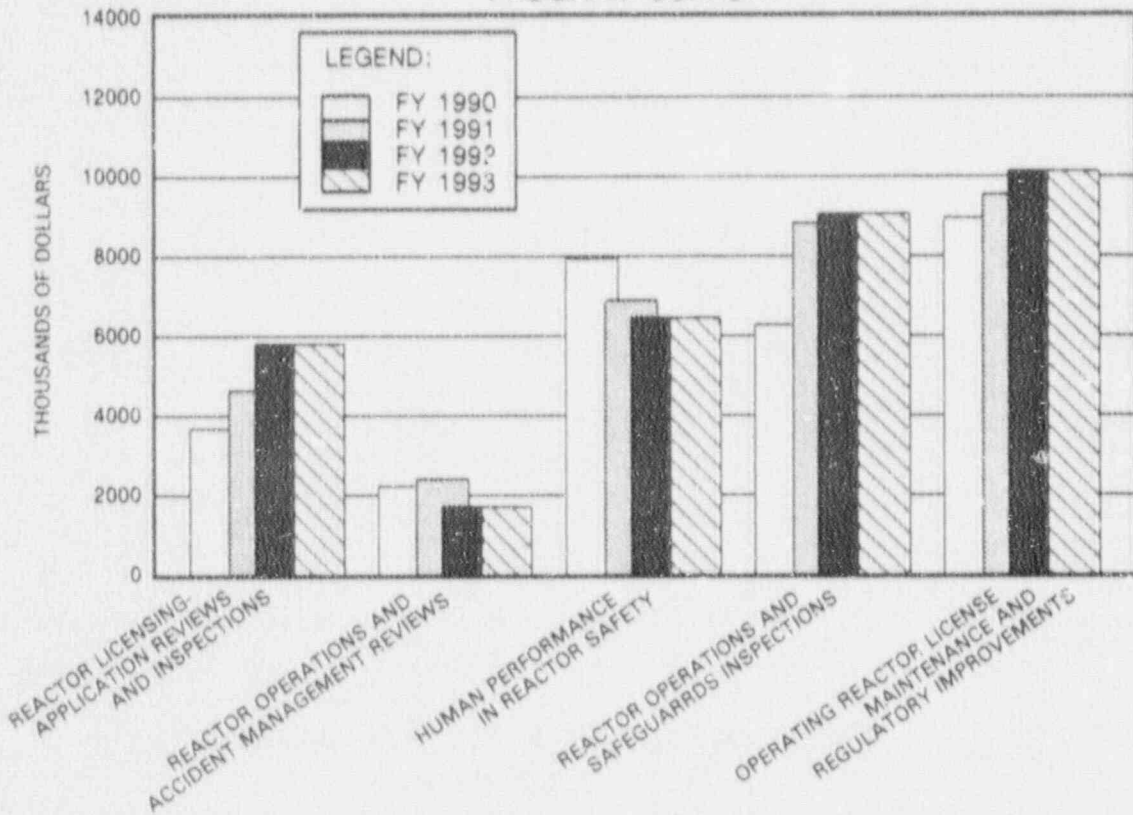
- RSSR — REACTOR SAFETY AND SAFEGUARDS REGULATION
- NSR — NUCLEAR SAFETY RESEARCH
- NMLLWSSR — NUCLEAR MATERIAL AND LOW-LEVEL WASTE SAFETY AND SAFEGUARDS REGULATION
- HLNWR — HIGH-LEVEL NUCLEAR WASTE REGULATION
- SIRIE — SPECIAL AND INDEPENDENT REVIEWS, INVESTIGATIONS, AND ENFORCEMENT
- NSMS — NUCLEAR SAFETY MANAGEMENT AND SUPPORT
- IG — INSPECTOR GENERAL

**REACTOR SAFETY AND SAFEGUARDS
REGULATION**

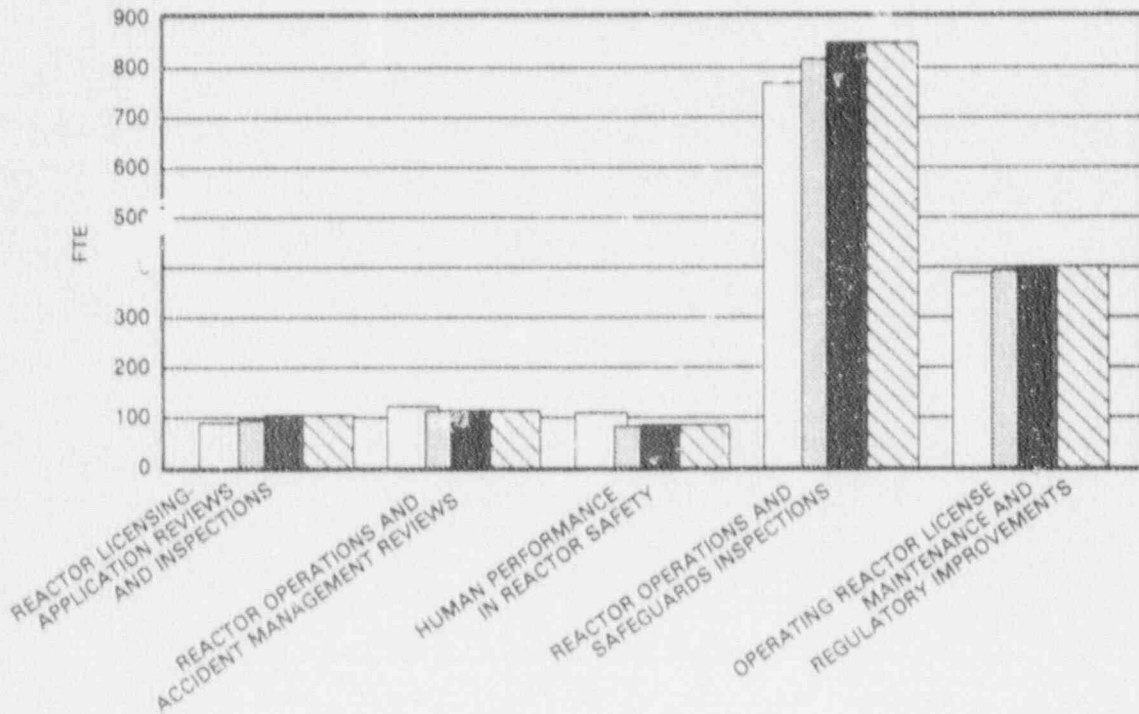


REACTOR SAFETY AND SAFEGUARDS REGULATION

PROGRAM SUPPORT



STAFF



REACTOR SAFETY AND SAFEGUARDS REGULATION

(Dollars are in thousands, except in text, where whole dollars are used; staff numbers are in full-time equivalents.)

Total FY 1992 estimated obligations \$199,955

	<u>FY 1990</u> <u>Actual</u>	<u>FY 1991</u> <u>Estimate</u>	<u>FY 1992</u> <u>Estimate</u>	<u>FY 1993</u> <u>Estimate</u>
Salaries and Benefits	\$ 92,245	\$106,912	\$113,592	\$113,592
Program Support	29,104	32,317	33,145	33,145
Administrative Support	39,897	41,760	44,579	44,579
Travel	<u>7,489</u>	<u>7,816</u>	<u>8,639</u>	<u>8,639</u>
Total Obligations	<u>\$168,735</u>	<u>\$188,805</u>	<u>\$199,955</u>	<u>\$199,955</u>
(Staff)	(1,480)	(1,501)	(1,553)	(1,553)

Program Support Funds and Staff

The Reactor Safety and Safeguards Regulation program support funds and staff are allocated to programs as shown below. The program support funds are allocated primarily for work done by Department of Energy (DOE) laboratories and commercial contractors. The narrative that follows describes these programs and the reasons they are needed.

	<u>FY 1990</u> <u>Actual</u>		<u>FY 1991</u> <u>Estimate</u>		<u>FY 1992</u> <u>Estimate</u>		<u>FY 1993</u> <u>Estimate</u>	
	<u>Funds</u>	<u>Staff</u>	<u>Funds</u>	<u>Staff</u>	<u>Funds</u>	<u>Staff</u>	<u>Funds</u>	<u>Staff</u>
Reactor Licensing - Application Reviews and Inspections	\$ 3,682	90	\$ 4,631	95	\$ 5,801	104	\$ 5,801	104
Reactor Operations and Accident Manage- ment Reviews	2,239	123	2,418	114	1,718	114	1,718	114
Human Performance in Reactor Safety	7,946	110	6,900	82	6,450	85	6,450	85
Reactor Operations and Safeguards Inspections	6,275	768	8,825	817	9,055	849	9,055	849
Operating Reactor License Maintenance and Regulatory Improvements	<u>8,962</u>	<u>389</u>	<u>9,543</u>	<u>393</u>	<u>10,121</u>	<u>401</u>	<u>10,121</u>	<u>401</u>
TOTALS	\$29,104	1,480	\$32,317	1,501	\$33,145	1,553	\$33,145	1,553

Reactor Safety and Safeguards Regulation

DESCRIPTION OF MISSION AREA

Reactor Safety and Safeguards Regulation encompasses all NRC licensing and inspection of reactor facilities and designs, as required by the Atomic Energy Act of 1954, as amended. This includes responsibility for evaluating the public health effects, safety, environmental, safeguards, and antitrust aspects of reactor facilities and ensuring that civilian reactor facilities are designed, constructed, and operated safely and are in compliance with agency regulations. This mission area is composed of the following five major programs: Reactor Licensing - Application, Reviews and Inspections, Reactor Operations and Accident Management Reviews, Human Performance in Reactor Safety, Reactor Operations and Safeguards Inspections, and Operating Reactor License Maintenance and Regulatory Improvements.

These five programs, conducted by the NRC's Office of Nuclear Reactor Regulation at NRC headquarters and in the regions, ensure that: licensees operate nuclear power plants safely and are adequately prepared to respond, in the event of an accident; nuclear power plants are designed and constructed properly and are ready for safe operation; licensees possess the capability to protect against sabotage and theft of nuclear materials at reactors; and, in coordination with the Office of Nuclear Regulatory Research, the agency is prepared to review reactor license renewal applications.

Reactor Safety and Safeguards Regulation

REACTOR LICENSING -
APPLICATION REVIEWS AND INSPECTIONS

	<u>FY 1990</u> <u>Actual</u>	<u>FY 1991</u> <u>Estimate</u>	<u>FY 1992</u> <u>Estimate</u>	<u>FY 1993</u> <u>Estimate</u>
Funds (Staff)	\$ 3,682 (90)	\$ 4,631 (95)	\$ 5,801 (104)	\$ 5,801 (104)

This program is conducted to ensure that nuclear power plants and nonpower reactors are designed and constructed properly and are ready for safe operation. To achieve this objective, the NRC relies on reviews and inspections, and on experience from similar plants and previous probabilistic risk assessments. Additionally, this program is conducted to prepare for future licensing activities associated with existing sites, new sites, and reactor license renewal. The program consists of four major elements: Power Reactor Applications and Inspections, Standardized Reactor Design Applications, Reactor License Renewal Applications, and Other-Than-Power-Reactor Applications.

In FY 1992, the resource increases will enable NRC to prepare for and review reactor license renewal applications, and conduct design approval and certification reviews for standardized advanced-light-water and nonlight-water reactors.

POWER REACTOR APPLICATIONS AND INSPECTIONS

The NRC reviews applications for reactor construction permits and reactor operating licenses to evaluate their safety, environmental, and safeguards aspects, as well as their antitrust implications. It is anticipated that three operating license applications will be under active review in FY 1991 and FY 1992 and two in FY 1993, and that one reactor operating license will be issued in FY 1992 and one in FY 1993. The NRC conducts these license reviews on a schedule that will not unnecessarily disrupt reactor startup and operation. There are no construction permit applications pending NRC review at the present time.

The NRC inspects reactors under construction to audit licensee compliance with NRC rules and regulations and to ensure compliance with the construction permit that was issued. These inspections are conducted by NRC resident inspectors, stationed at the reactor site, and by NRC region-based inspectors and are augmented by headquarters staff. NRC resident inspectors ensure that equipment and structures are installed in accordance with design requirements and quality assurance procedures by reviewing procedures, direct observation, and audits of licensee quality control. Resident inspectors may also participate in agency hearings, licensing meetings, and public discussions.

Reactor Safety and Safeguards Regulation

The majority of NRC inspections at reactors under construction are conducted as part of the routine inspection program designed to assess licensee conformance with construction standards. Other inspection effort concentrates on evaluating the corrective measures taken by licensees to resolve previously identified problems. To augment these inspections, the NRC assesses the operational readiness of the applicant through the use of team inspections. This is an additional step to ensure that a plant is ready for and capable of safe power operation before a license is issued. The NRC will continue to inspect licensee activities to resolve employee concerns and/or allegations and other technical issues to ensure that the applicant can safely operate the plant.

The NRC has incorporated into its resource assumptions that one license application to reactivate a deferred plant is expected to be received in FY 1992 and that an early site permit application is expected to be submitted for review by FY 1993, with preliminary interactions among the NRC, DOE, and private entities beginning in FY 1991. In order to be prepared to handle new power reactor applications, the NRC will update siting and environmental guidance.

STANDARDIZED REACTOR DESIGN APPLICATIONS

The standardization of nuclear power plant designs can significantly increase the safety, reliability, and availability of nuclear power plants. The use of standardized designs can benefit the public health and safety. Standardization will allow for a more expeditious and efficient review process and a more thorough understanding of the designs by the NRC. Therefore, the Commission strongly endorses regulatory actions that will encourage industry to pursue standardization of nuclear power plant designs.

In support of the Commission's goals pertaining to future standardization of reactor designs, the agency expects to complete its phased review of the Electric Power Research Institute's advanced-light-water reactor requirements document for evolutionary and passive designs in FY 1992. The NRC will continue to conduct design approval reviews, including those of technical specifications, for the General Electric Advanced Boiling Water Reactor design and the Combustion Engineering Advanced Pressurized Water Reactor design. In addition, the NRC expects to receive applications for full-design approval and certification of two passive LWRs--the Westinghouse AP-600 design and the General Electric Simplified Boiling Water Reactor design. The NRC will also identify technical issues, develop regulatory policy related to licensability, and begin an initial review of the Atomic Energy of Canada Limited's CANDU 3 and the ASEA Brown Boveri's Process Inherent Ultimate Safety (PIUS) advanced-nonlight-water reactor designs.

The Office of Management and Budget, NRC, and DOE will meet in FY 1991 to discuss and review appropriate schedules in the license renewal and standardized reactor licensing areas.

REACTOR LICENSE RENEWAL APPLICATIONS

The NRC must be prepared to evaluate licensee applications to renew reactor operating licenses beyond their expiration dates. This preparation involves determining technical and policy issues, resolving licensing issues, and defining the criteria and process to review such renewal applications. This preliminary work is conducted jointly by the NRC's Office of Nuclear Reactor Regulation and the Office of Nuclear Regulatory Research. Based on research findings, the staff will evaluate the safety and environmental aspects of the generic technical reports submitted by industry and each license renewal application. The NRC will establish technical acceptance criteria for evaluating requests for reactor license renewal.

The NRC has begun its review of sections of the two lead applications for reactor license renewal. The remaining sections of the renewal applications are scheduled to be submitted in June 1991 and December 1991, with the NRC review being completed 2 years after receipt of the complete applications. This effort will contribute to the development of license renewal regulatory guidance, enable the NRC to gain experience that will be essential in developing the program to conduct reviews for the remainder of the currently licensed plants, and serve to demonstrate the license renewal process to the industry and the public.

OTHER-THAN-POWER-REACTOR APPLICATIONS

The NRC reviews new and renewal license applications and license amendments for nonpower reactors to evaluate their safety, environmental, and safeguards aspects. The agency plans to have approximately 30 renewal applications and other license amendments for nonpower reactor licenses under review each year during FY 1991-1993.

The NRC will continue to evaluate the required conversion from the use of high-enriched uranium fuel in domestic nonpower reactors to the use of low-enriched uranium (LEU) fuel. Of the remaining 18 reactors affected, it is expected that approximately 13 will convert to LEU fuel at the rate of 2 to 3 each year over the next 5 to 7 years.

Additionally, the NRC will continue to review and comment on proposed Department of Defense and DOE reactor projects and facilities, as requested.

Reactor Safety and Safeguards Regulation

REACTOR OPERATIONS AND ACCIDENT MANAGEMENT REVIEWS

	<u>FY 1990</u> <u>Actual</u>	<u>FY 1991</u> <u>Estimate</u>	<u>FY 1992</u> <u>Estimate</u>	<u>FY 1993</u> <u>Estimate</u>
Funds (Staff)	\$ 2,239 (123)	\$ 2,418 (114)	\$ 1,718 (114)	\$ 1,718 (114)

This program evaluates both reactor and licensee performance, including accident management capabilities, and places its principal focus on operational safety. Major revisions have occurred in NRC's approach to evaluate reactor and licensee performance. Inspection programs have been initiated to assess the effectiveness of maintenance at operating reactors and to review emergency operating procedures. Senior agency managers are focusing additional attention on plants that have received low Systematic Assessment of Licensee Performance (SALP) scores. The program consists of three major elements: Reactor Performance Evaluation, Evaluation of Licensee Performance and Maintenance, and Reactor Accident Management Evaluation. The funding decrease in FY 1992 reflects a reduction in efforts to develop and issue guidance for managing reactor operations during a severe accident. The reduction is also based on increased reliance on industry (Nuclear Management and Resources Council) efforts to develop generic guidance.

REACTOR PERFORMANCE EVALUATION

Experience has shown that safety issues will continue to arise as a result of events at operating reactors. This program element includes the efforts used by the NRC to respond effectively to unanticipated events as they occur and to identify actions that would help to prevent significant events. This work supports the NRC's accident prevention goal of having an effective regulatory program for achieving a low frequency of safety system challenges, a high availability of equipment, effective operating personnel, and the timely sharing of operating experience. To accomplish these objectives, the NRC analyzes different aspects of reactor performance and disseminates the findings to licensees via generic communications.

The NRC conducts prompt technical assessments of approximately 5,000 reactor event reports and 15 augmented inspection team reports each year to determine the immediate safety implications for a facility, the applicability to other operating reactors, and the immediate regulatory actions that must be taken. Event reports include telephone notifications of significant events at licensed reactor facilities as well as additional event and follow-up reports submitted through the NRC's five regions. Each year, approximately 500 event reports

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require follow-up effort by the NRC to ensure that affected facilities take appropriate corrective action. In addition, approximately 200 event reports require guidance on immediate corrective actions in the form of orders and confirmatory action letters. For these significant events, the NRC issues temporary instructions to enable the regions to verify licensee implementation of appropriate corrective actions.

Each year NRC's regional offices will submit approximately 50 potential generic safety questions and associated reports to the NRC headquarters staff for assessment. These questions are reviewed, the reports analyzed, and the results considered for dissemination to the licensees. In addition to the reports submitted by NRC regional personnel, approximately 350 reports of defects and/or noncompliance (10 CFR Part 21) and construction deficiency (10 CFR 50.55(e)) are expected to be submitted annually by licensees and permit holders.

The NRC will also continue to support and expand the Incident Investigation program by providing resources for approximately 15 augmented inspection teams and incident investigation teams each year during FY 1991-1993 in response to significant operating events.

Based on the results of NRC's analysis of a reactor operating event, licensee or vendor deficiency report, or a study or report issued by NRC's Office for Analysis and Evaluation of Operational Data, the NRC may determine that a potential safety problem exists and recommend or require that corrective action be taken. In a case that warrants prompt notification of licensees, vendors, and the agency staff of the existence of a potential safety-related problem, the NRC will prepare and issue a generic communication (i.e., a generic letter, information note, or bulletin) that will recommend or require corrective action. The NRC expects to prepare and issue approximately 110 generic communications each year.

EVALUATION OF LICENSEE PERFORMANCE AND MAINTENANCE

This program element encompasses various activities designed to analyze data on the overall performance of licensees, quality assurance, and plant performance. The overall performance is integrated and reviewed periodically by senior agency management. Plants that require increased attention are identified and appropriate action is taken, in concert, with licensees.

The SALP program is designed to improve both NRC's regulatory efforts and licensee performance during the construction and operation of nuclear power plants. This effort involves collecting and assessing data to evaluate overall licensee performance on a periodic basis. Emphasis is placed on understanding the reasons for a licensee's performance, sharing this knowledge with the licensee, and then focusing agency inspection efforts accordingly. The NRC's SALP methodology places special emphasis on licensee performance in the areas of operations, maintenance, and management. The NRC will conduct SALP reviews for approximately 70 sites each year during FY 1991-1993. In addition, the NRC

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will issue a draft policy statement in FY 1991 that provides guidance on public safety issues associated with economic incentive regulation by State regulatory commissions.

Quality assurance is another effort that enables the NRC to ensure continued improvement in operational safety at nuclear power plants by determining the underlying causes of major operations-related problems and ensuring their timely detection and correction. The NRC will continue to focus its attention on commercial-grade procurement and computer software quality assurance. To ensure that proper checks and balances exist in these areas, the NRC plans to develop and implement methodology, procedures, guidance, and training for NRC inspectors. In addition, the NRC will continue to support industry initiatives to perform critical self-assessments, which are designed to heighten licensee awareness and to enhance licensee ability to predict plant performance trends and resolve associated problems as early as possible. The NRC will use a combination of resident, region-based, headquarters, and team inspections to assess licensee performance. During FY 1991-1993, the NRC will develop and revise policy guidance for evaluating industry programs. The NRC will conduct 35 technical reviews of new and revised licensee quality assurance programs and topical reports each year through FY 1993.

Through the use of data collected from inspections, performance indicators, analyses of operational data trends, and event evaluations, the NRC can compare one plant's performance with that of others and can also compare current operational characteristics with historical patterns. During FY 1991-1993, the NRC will continue to use this data to evaluate operating performance at nuclear power plants to identify plants that exhibit declining, marginal, or unacceptable operating performance and determine appropriate corrective action. If operating performance is found to be declining, then the integrated performance evaluation will include identification of the root cause(s) contributing to the decline.

The NRC assesses the effectiveness of existing maintenance practices and their impact on safety and evaluates proposed industry initiatives concerning maintenance of equipment in nuclear power plants. Based on experience, the NRC has concluded that inadequate maintenance can be a significant contributor to plant reliability problems that result in safety challenges. A policy statement, issued in December 1989, underscores the Commission's belief that safety can be enhanced by improving nuclear power plant maintenance across the nuclear industry and that effective maintenance must be achieved and maintained over the life of each facility. The NRC has incorporated comprehensive maintenance inspections into its inspection program. The staff plans to conduct approximately nine maintenance inspections in FY 1991. Also in FY 1991, the NRC will assess the need for a maintenance rule. This decision will be based on a number of factors including re-inspections at approximately 15 sites to follow up on previous findings. During FY 1992-1993, the NRC will continue to evaluate industry maintenance programs.

REACTOR ACCIDENT MANAGEMENT EVALUATION

The NRC has taken an active role in reviewing the procedures that licensees maintain for coping with accident conditions (emergency operating procedures) and for implementing offsite protective measures (offsite emergency plans). Upgrades to the emergency operating procedures are intended to improve their technical content and enhance their usefulness by applying human factors principles in their development.

There is currently a need for guidance in developing more robust and comprehensive accident management capabilities to reduce the probability of a severe accident and to mitigate offsite releases, if such an accident were to occur. Under the accident management evaluation program, the NRC develops and issues guidance applicable to the conduct of reactor operations during a severe accident. This includes guidance on the structure of accident management organizations, items to be addressed in procedures, and the training and qualification of personnel. In FY 1991, guidance on accident management capabilities will be developed, based on severe accident information, and will be evaluated on a pilot basis, as part of an industry initiative sponsored by the Nuclear Management and Resources Council. During FY 1992-1993, the NRC will issue a generic letter on accident management that will provide guidance on the accident management framework incorporating industry-developed guidelines in establishing appropriate accident management capabilities. During FY 1993, the NRC will begin to develop guidance and criteria for evaluating licensee accident management capabilities and perform evaluations of utility capabilities, as part of emergency preparedness exercises and training program reviews.

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HUMAN PERFORMANCE IN REACTOR SAFETY

	<u>FY 1990</u> <u>Actual</u>	<u>FY 1991</u> <u>Estimate</u>	<u>FY 1992</u> <u>Estimate</u>	<u>FY 1993</u> <u>Estimate</u>
Funds (Staff)	\$ 7,946 (110)	\$ 6,900 (82)	\$ 6,450 (85)	\$ 6,450 (85)

This program is designed to ensure that trained and qualified operating and technical support personnel interact in an environment that ensures that their ability to prevent or cope with accidents is not compromised. The program consists of two major elements: Human Performance Evaluation, and Licensing and Examination of Reactor Operators.

The overall resource level in FY 1992 is nearly equal to that of FY 1991 and reflects the new approach to administering requalification examinations to licensed reactor operators (within the context of existing regulations) and the efficiencies expected as the NRC gains experience in the formulation and administration of requalification examinations. The program will be carefully monitored to ensure continuing effectiveness.

HUMAN PERFORMANCE EVALUATION

The plant personnel training and man-machine interaction activities included in this program element are conducted to evaluate the ability of nuclear power plant personnel to meet job performance requirements; to ensure that an effective mechanism exists to assess and improve, where necessary, the quality and effectiveness of licensee training programs; and to ensure that nuclear power plant operational events involving human performance receive a detailed analysis that will enable the root cause(s) to be determined and corrections to be made.

In compliance with the April 1990 decision by the U.S. Court of Appeals for the District of Columbia, the NRC will promulgate appropriate regulatory guidance to establish requirements for training and qualification of civilian nuclear power plant personnel. These regulations will be consistent with the NRC's current Policy Statement on Training and Qualification of Nuclear Power Plant Personnel and will replace the current Policy Statement when promulgated. In the interim, the NRC will continue to endorse the Institute of Nuclear Power Operations-managed (INPO) Training Accreditation Program which directs the NRC staff to monitor and evaluate the effectiveness of the INPO-managed accreditation program by various methods including participating in INPO's accreditation team visits and performing post-accreditation reviews consisting of performance-based reviews by NRC teams and assessments by lead licensing examiners and/or training and assessment specialists. The NRC senior staff also observes the

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discussions of the INPO team representatives and the utilities before the National Nuclear Accrediting Board and participates in meetings of the Training Manager Association. To conduct the evaluations and determine adherence to the current policy statement, the NRC will participate in INPO Training Accreditation team visits to approximately two sites each year through FY 1993. This participation is based on INPO's 4-year renewal of accreditation cycle and is consistent with the NRC's current policy statement. The NRC also plans to complete approximately eight training program inspections each year to assess program effectiveness.

The NRC staff continues to evaluate the human factors aspects of man-machine interfaces to minimize design-induced errors at nuclear power plants. As part of this effort, the NRC has developed a methodology to assess the effect of plant management on human reliability and its associated risk, and to evaluate human performance as a principal contributor to operational events. This methodology will be linked with probabilistic risk assessment-based sensitivity studies to illustrate the influence of organization and management factors on plant risk.

Beginning in FY 1991 and continuing in FY 1992, the NRC will develop a program to assess the root cause of human error in reportable events and improve human performance by identifying the cause of the error and requiring that it be corrected by the licensee.

LICENSING AND EXAMINATION OF REACTOR OPERATORS

The NRC must license all personnel authorized to operate reactors. The NRC currently administers initial and requalification examinations to evaluate an operator's understanding of the facility design and familiarity with the controls and operating procedures. These examinations consist of both written tests and tests conducted under operating conditions.

Initial examinations are administered to new operators at existing power and nonpower facilities to ensure that operating plants are staffed by qualified operators. The NRC plans to conduct approximately 900 initial reactor operator examinations each year during FY 1991-1993.

The NRC is required to administer requalification examinations to currently licensed reactor operators prior to renewal of their licenses to verify their continued proficiency. There are currently approximately 5,200 licensed power and nonpower reactor operators. The NRC plans to conduct approximately 1,150 examinations each year during FY 1991-1993.

Also included in this program element are efforts relating to resolving generic problems associated with operator licensing, maintaining an examination question bank, reviewing appeals pertaining to license denials, and improving the

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proficiency of examiners. During FY 1991-1993, various aspects of examination program implementation (including the newly-developed examiner training syllabus, upgraded refresher training for examiners, and improved guidance for preparing and conducting examinations) will be evaluated, and improved criteria designed to maintain a high level of examiner proficiency will be developed.

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REACTOR OPERATIONS AND SAFEGUARDS INSPECTIONS

	<u>FY 1990</u> <u>Actual</u>	<u>FY 1991</u> <u>Estimate</u>	<u>FY 1992</u> <u>Estimate</u>	<u>FY 1993</u> <u>Estimate</u>
Funds (Staff)	\$ 6,275 (768)	\$ 8,825 (817)	\$ 9,055 (849)	\$ 9,055 (849)

This program is designed to assess the safe operation of nuclear power plants by licensees in accordance with NRC regulations. The primary focus of this program is on plant operations and maintenance. The activities under this program are performed by NRC resident, region-based, and headquarters inspectors. The program consists of three major program elements: Resident Inspections, Region-Based Inspections, and Specialized Inspections.

The program defines a minimum level of inspection effort for each reactor and gives regional managers significant flexibility to focus inspections on safety problems and on plants that exhibit declining, marginal, or unacceptable operating performance. This flexibility helps to ensure that resources are allocated effectively to enhance reactor safety.

Resource increases in FY 1992 are attributable to the assignment of additional resident inspectors at reactor sites, increased inspection efforts resulting from the expected issuance of an operating license to Watts Bar 1, slight increases in the overall inspection effort conducted by the regions at power reactor facilities, and changes to the number and scope of team inspections that evaluate operational safety concerns identified by NRC senior management.

RESIDENT INSPECTIONS

Resident inspectors serve as NRC representatives in a variety of inspection functions. Their primary job is to observe, evaluate, and report on the adequacy of licensee nuclear safety activities. These inspectors concentrate on day-to-day licensee operations, events followup, and licensee staff and management performance. In addition, they coordinate onsite activities of the various agency offices and participate in emergency exercises. At least two resident inspectors are assigned to each operating reactor site. The NRC is gradually expanding resident inspector staffing until the total complement of resident inspectors at each operating reactor site will be equivalent to the total number of units on site plus one. Additional onsite inspection increases the NRC's confidence that plants are being operated safely and in accordance with regulations. Further coverage by resident inspectors increases the likelihood of discovering areas that require corrective action and enhances the NRC's capability to effectively monitor licensee performance.

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REGION-BASED INSPECTIONS

Region-based and headquarters inspectors supplement the basic activities carried out by resident inspectors through a variety of program and technical inspections that afford an indepth look at licensee operations. Most of these specialized technical inspections are carried out in the areas of instrumentation, quality assurance, plant operations, systems surveillance, maintenance, modifications, inservice inspection, fire protection, training, refueling, radiation protection, environmental protection, safeguards, and emergency preparedness.

Region-based inspectors conduct reactor inspections and evaluate the corrective measures taken by the utilities to resolve identified problems. To augment the efforts of the region-based inspectors, the NRC contracts for highly-specialized technical assistance that includes expertise in areas such as electrical and mechanical engineering, metallurgy, and instrumentation for inspection of power reactors; aerial radiological surveys and environmental monitoring at reactor sites; and other independent, confirmatory measurements. Headquarters staff inspect nuclear facilities to supplement the regional inspections in selected technical areas and to provide a broader perspective for safety assessments of licensee performance and a mechanism for evaluating the effectiveness of regional inspections. In addition, region-based inspectors and headquarters staff respond to allegations of safety and safeguards violations at nuclear facilities and provide technical support to investigations personnel.

The NRC will conduct operations inspections, including emergency preparedness and safeguards inspections, at an estimated 111 operating reactors in FY 1991 and 113 in FY 1992-1993. The NRC will also inspect approximately 40 nonpower reactors each year during FY 1991-1993. The agency will continue to use fixed and mobile laboratories (e.g., the nondestructive examination van) in conducting some of these inspections.

SPECIALIZED INSPECTIONS

In addition to the inspections conducted by NRC resident inspectors, region-based inspectors, and headquarters staff, the NRC conducts several types of specialized inspections. These include safety-system functional inspections, safety-system outage modification inspections, operational-safety team inspections, vendor inspections, and special inspections relating to restart of shutdown plants.

A safety-system functional inspection is an indepth engineering review of the design, configuration, maintenance, testing, and operation of reactor systems, their components, and their supporting systems. A safety-system outage modification inspection is also an indepth engineering examination of system functionality, but it is oriented toward the effect on safety of modifications made to safety systems during a reactor outage. This inspection focuses on how the modification has altered the original design considerations and safety margins, the quality of the modified as-installed systems, and the adequacy of

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full-functional testing of the modified systems. Both safety-system functional inspections and safety-system outage modification inspections will be conducted to provide information on the effectiveness of industry-sponsored evaluation programs and regional inspections. These inspections are conducted by a team of specialists that includes operations, design, and installation-oriented personnel. The NRC will conduct 10 safety-system functional inspections and/or safety-system outage modification inspections each year during FY 1991-1993. These inspections are important in ensuring that licensees maintain the required design safety margins, as they modify and maintain reactor(s) over a period of years.

An operational-safety team inspection is an indepth review of plant operational programs including maintenance, operations, surveillance testing, corrective action, management oversight, and safety review. These inspections provide NRC senior management with a national perspective on plant performance, in cases where significant safety issues have been identified, as a result of the licensee performance evaluation process. The NRC will conduct approximately five multidisciplinary operational-safety team inspections each year during FY 1991-1993.

Vendor inspections are conducted to ensure that suppliers of materials, components, and services used in nuclear power plants provide quality products that adhere to the safety standards to which a plant was originally designed. These inspections are intended to improve reactor safety by focusing on operational reactor safety issues, assessing the potential generic implications of vendor deficiencies, and emphasizing licensee responsibilities for their vendor suppliers. The NRC will conduct approximately 60 vendor/contractor inspections each year during FY 1991-1993. Suppliers of nuclear components, materials, and services will be inspected in response to specific hardware failures, or regulatory concerns, or allegations. These inspections will focus on vendor quality program implementation and will include NRC examinations of materials, equipment, and services provided to nuclear power plants. Some inspections also will be conducted at reactor sites, in response to concerns about equipment qualification, procurement, dedications, and licensee/vendor interaction. In instances of suspected counterfeiting or misrepresentation by vendors of equipment or materials furnished to nuclear power plants, the staff will aggressively support NRC's Office of Investigations and the Department of Justice reviews of vendors suspected of wrongdoing and will promptly inform licensees of the suspected misrepresentation to ensure that they take appropriate action.

To improve the inspection process, the NRC will continue to develop and implement guidance for assessing licensees' engineering support for design and modification activities, evaluating regional inspection performance, applying lessons learned from events and inspection and enforcement findings to the inspection process, and improving the application of probabilistic risk assessment in the inspection process.

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OPERATING REACTOR LICENSE MAINTENANCE AND REGULATORY IMPROVEMENTS

	<u>FY 1990 Actual</u>	<u>FY 1991 Estimate</u>	<u>FY 1992 Estimate</u>	<u>FY 1993 Estimate</u>
Funds (Staff)	\$ 8,962 (389)	\$ 9,543 (393)	\$ 10,121 (401)	\$ 10,121 (401)

This program is designed to ensure that operating facilities maintain adequate levels of protection of public health and safety in their daily operation, in the event of a radiological emergency, and in the event of theft of nuclear materials or sabotage. This is accomplished by identifying inadequacies in plant design and operation, through the use of probabilistic risk assessments; evaluation of operating experience and unanticipated events; and resolution of safety issues, inspection findings, licensee proposals, and NRC-sponsored safety research. In addition, this program is designed to ensure that licensees adequately deter, detect, and protect against threats, radiological sabotage, and theft or diversion of special nuclear materials at reactors. This program consists of three major elements: Project Management, Safety Evaluations of Licensing Actions, and Regulatory Improvements.

The increase in resources in FY 1992 allows for the conversion of existing technical specifications to new standard technical specifications at a rate of about 10 reactors each year. Based on prior NRC experience with technical specification improvements, this effort has proven to be extremely labor intensive. The NRC believes that conversion to new, standard technical specifications will improve operational safety; provide for more reliable and efficient plant operation; and enable both the NRC and licensees to achieve long-term resource savings.

PROJECT MANAGEMENT

The NRC project managers perform the overall management activities pertaining to the regulation of nuclear power plants and serve as the focal point for maintaining contact with licensees, other NRC staff, and the public on safety matters concerning specific plants. They assign priorities to safety issues and manage the review and issuance of license amendments, that result from safety and environmental modifications made to operating plants. These modifications include actions that are directed by the NRC as a result of safety, environmental, and safeguards assessments, as well as actions that are initiated by the licensees. Through these modifications, the NRC ensures that operating facilities achieve and maintain adequate protection of the public health and safety. The project managers also consult with State and local officials and

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prepare correspondence replying to public and congressional inquiries. Additionally, project managers conduct certain technical reviews, evaluate overall licensee performance, and assist the regions in developing inspection plans. The NRC will continue to perform project management activities for an estimated 111 operating reactors in FY 1991, 112 in FY 1992, and 113 in FY 1993.

SAFETY EVALUATIONS OF LICENSING ACTIONS

Many safety-significant licensing actions require detailed technical review to ensure that the safety of the plant is not compromised. These licensing actions are especially important in the area of operational safety and also include reactor accident and safeguards considerations. Both actions affecting only one plant (plant-specific) and those affecting several plants (multiplant) will be addressed and resolved.

A number of improved procedures have been implemented to increase the NRC's efficiency in evaluating operating reactor licensing actions. Project managers are assigned technical review responsibility for most license amendment applications that are classified as "containing no significant hazards" considerations. This effort has proven to decrease the time required to complete the reviews and allows the technical staff to concentrate on areas of greater safety significance. Another initiative is aimed at investing in up-front reviews and in the development of licensing criteria and inspection guidance to promote more efficient completion of multiplant licensing actions. These efforts, coupled with assigning priorities to licensing actions, will ensure that actions having the most safety significance are resolved first. Approximately 2,850 operating reactor licensing actions will be completed in FY 1991, 2,925 in FY 1992, and 2,970 in FY 1993. Included in these licensing actions are the conversions of existing technical specifications to standard technical specifications -- an effort which is expected to improve the safety of nuclear power plants. Technical specifications, which are an integral part of a reactor's operating license, have become cumbersome over the years and, in many instances, address matters not related to safety. The NRC is currently incorporating specific improvements in existing specifications to make them more understandable to operations personnel. The NRC expects to complete 4 to 5 conversions to standard technical specifications in FY 1991 and to complete 10 conversions per year beginning in FY 1992 until 70 to 80 plants have been completed.

REGULATORY IMPROVEMENTS

The NRC's Office of Nuclear Reactor Regulation will continue to provide technical input to the research staff for the resolution of generic safety issues to ensure that requirements are imposed on the appropriate licensees. The NRC will also continue to monitor the status of technical resolutions of generic safety issues to ensure that imposed requirements are implemented by licensees in a timely and effective manner.

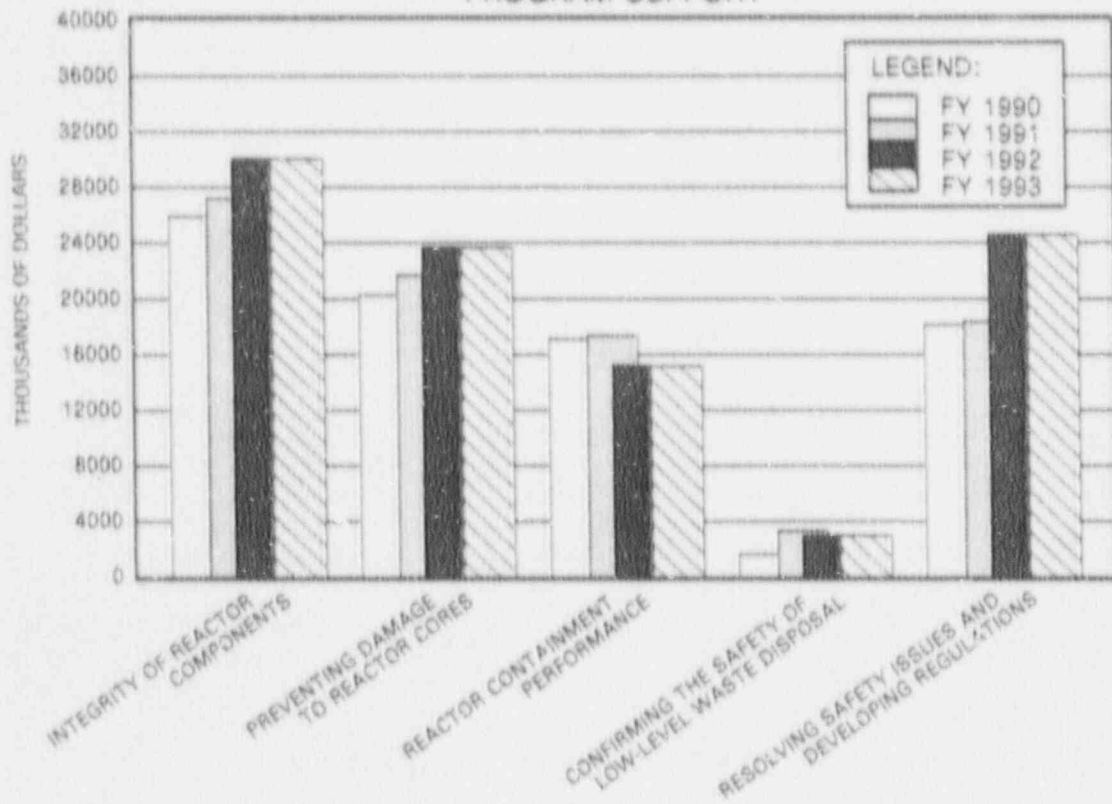
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The NRC's Severe Accident Policy Statement calls for a systematic examination of all operating reactors to identify and remedy plant-specific features that are dominant risk contributors. A joint Office of Nuclear Reactor Regulation and Office of Nuclear Regulatory Research task force will review individual plant examination (IPE) submittals for operating reactors. The majority of IPEs will be completed by licensees by the end of FY 1992. Some licensees that have multiple units are completing new probabilistic risk assessments to support their IPEs; this will delay completion of their IPEs until mid-1994. Joint NRC-office review efforts will be completed within 1 year after the final submittals are received.

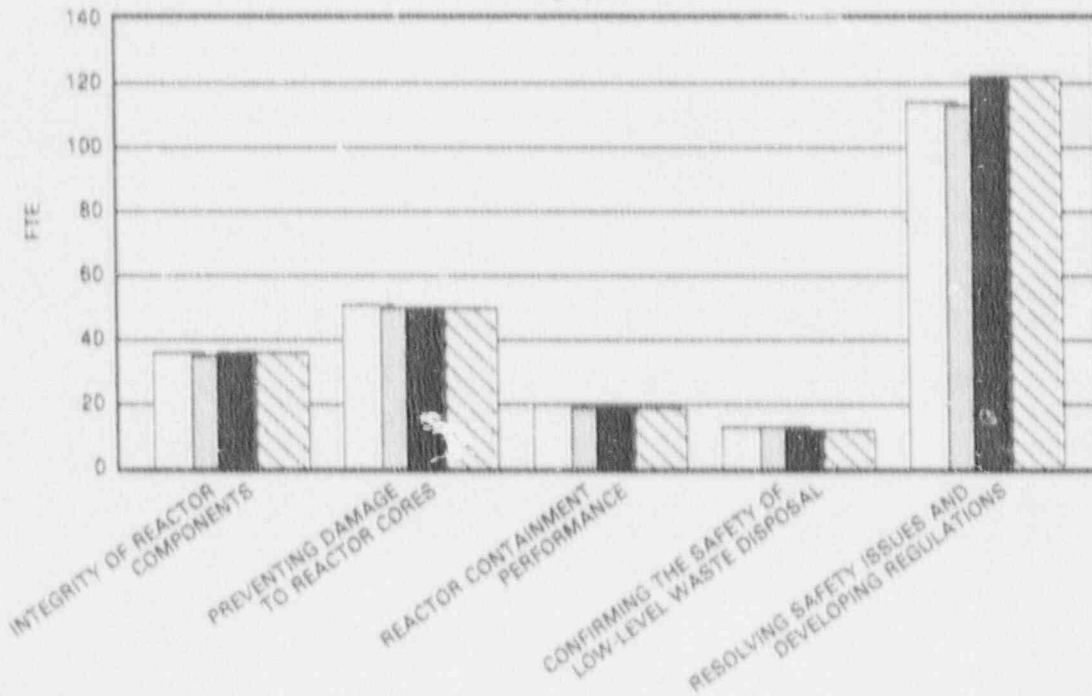
NUCLEAR SAFETY RESEARCH

NUCLEAR SAFETY RESEARCH

PROGRAM SUPPORT



STAFF



NUCLEAR SAFETY RESEARCH

(Dollars are in thousands, except in text, where whole dollars are used; staff numbers are in full-time equivalents.)

Total FY 1992 estimated obligations \$120,266

	<u>FY 1990</u> <u>Actual</u>	<u>FY 1991</u> <u>Estimate</u>	<u>FY 1992</u> <u>Estimate</u>	<u>FY 1993</u> <u>Estimate</u>
Salaries and Benefits	\$ 14,585	\$ 16,382	\$ 17,481	\$ 17,481
Program Support	83,075	87,900	96,450	96,450
Administrative Support	5,122	5,138	5,707	5,707
Travel	<u>622</u>	<u>593</u>	<u>628</u>	<u>628</u>
Total Obligations	<u>\$103,404</u>	<u>\$110,013</u>	<u>\$120,266</u>	<u>\$120,266</u>
(Staff)	(234)	(230)	(239)	(239)

Program Support, Funds and Staff

The Nuclear Safety Research program support funds and staff are allocated to programs as shown below. The program support funds are allocated primarily for work done by Department of Energy (DOE) laboratories, commercial contractors, nonprofit organizations (universities, foundations, etc.), and grantees. The narrative that follows describes the programs and the reasons they are needed.

	<u>FY 1990</u>		<u>FY 1991</u>		<u>FY 1992</u>		<u>FY 1993</u>	
	<u>Actual</u>		<u>Estimate</u>		<u>Estimate</u>		<u>Estimate</u>	
	<u>Funds</u>	<u>Staff</u>	<u>Funds</u>	<u>Staff</u>	<u>Funds</u>	<u>Staff</u>	<u>Funds</u>	<u>Staff</u>
Integrity of Reactor Components	\$25,929	36	\$27,230	35	\$30,050	36	\$30,050	36
Preventing Damage to Reactor Cores	20,277	51	21,675	50	23,695	50	23,695	50
Reactor Containment Performance	17,112	20	17,330	19	15,132	19	15,132	19
Confirming the Safety of Low-Level Waste Disposal	1,639	13	3,301	13	3,000	12	3,000	12
Resolving Safety Issues and Developing Regulations	<u>18,118</u>	<u>114</u>	<u>18,364</u>	<u>113</u>	<u>24,573</u>	<u>122</u>	<u>24,573</u>	<u>122</u>
TOTALS	\$83,075	234	\$87,900	230	\$96,450	239	\$96,450	239

NUCLEAR SAFETY RESEARCH

DESCRIPTION OF MISSION AREA

The NRC's mission is to ensure the safe design, construction, and operation of the nuclear facilities and activities it regulates. The technologies employed are relatively new and highly complex and it is often necessary to make regulatory judgments on matters related to safety that are well beyond normal experience-based engineering practice. The NRC requires a high-confidence level in order to avoid undue risk to the health and safety of the public, especially when these matters involve high-consequence accidents or disposal of radioactive waste. Thus, it is essential to do research and develop knowledge that gives confidence in these judgments and provides the technical basis for writing safety regulations and evaluating licensee performance. Furthermore, unforeseen safety problems continue to arise from operating experience. The NRC must have readily available sources of expertise in order to solve these problems promptly. The best way, to develop and retain such people, is to carry out a stable program of research that requires the continuing presence of experts in the NRC and independent-contractor organizations who understand the state of the art in pertinent areas of technology.

The primary benefits of research for the NRC should be improved regulation, through better definition and refinement of safety margins; anticipation of operational problems; and tools to deal with safety issues as they arise. The knowledge that makes this possible can be expected to have side benefits leading to improved operation and maintenance and, eventually, to improved designs.

The NRC nuclear regulatory research program has three main purposes. The first is to provide independent expertise and information for making timely regulatory judgments. The information should be independent, in the sense that it is not derived solely from information provided by licensees and that it has received peer review by experts who did not perform the research. Research required for this purpose is mostly oriented toward problems that are foreseeable in the near term. The second purpose is to anticipate problems of potential safety significance so that new or expanded knowledge can assist the NRC in pursuing its mission. To this end, exploratory research is frequently required to provide new knowledge. The expansion of knowledge can help to recognize unforeseen situations and to prepare for dealing with them. Research for this purpose is generally long term, requiring effort over a period of 5 to 10 years. The third purpose is to develop the regulations and guides necessary to implement Commission policy or technical requirements.

In all cases, the knowledge required from NRC-sponsored research must be clearly related to the regulatory mandate. There are cases where research can serve objectives that are of interest to industry, as well as the regulatory mandate. Where mutually beneficial, cooperative research between the NRC and industry should be pursued. In general, the NRC role should be to identify and scope problems associated with operation of components and systems and, we believe, industry should undertake to provide the necessary specific solutions.

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To carry out its mission, the NRC requires excellence in safety research. Maintaining excellence demands continuing attention to the intellectual quality of the enterprise. This is reflected in hiring the best professionals to carry out the work, maintaining the quality through professional development and recognition, and sustaining cohesive research teams. These are attained by ensuring a stable organizational structure and a stable funding program. Stable funding, in particular, is critical for the success of long-range research. At the same time, careful periodic review of long-range research is needed as work proceeds in order to ensure relevance to changing regulatory needs and to feed new information back into the planning and conduct of future work. Such review helps to keep long-range efforts vital.

In an effort to make use of all available sources of nuclear safety research information, the NRC is engaged in broad international programs to exchange nuclear safety-related information and to conduct joint research projects of mutual interest. The NRC policy of cooperating with foreign groups is designed to accomplish the following objectives: (1) exchange information to expand NRC's technical base; (2) encourage foreign safety research programs, in order to make optimum use of NRC resources and enhance our research capabilities; (3) participate in cooperative projects to share in the experimental and analytical results generated by foreign research groups; (4) provide safety information to countries using, or contemplating the use of, U.S. nuclear technology; and (5) interact with international organizations concerned with nuclear safety to present our research results and obtain expert review.

Nuclear safety research provides an essential contribution to the agency's mission and is vital for implementing a large number of the agency's programs. Research provides the bases for timely rulemaking and related licensing and inspection activities that are based on the NRC's longstanding philosophy of defense-in-depth. This philosophy provides a clear and logical structure for the Nuclear Safety Research mission area, which consists of five major programs: Integrity of Reactor Components, Preventing Damage to Reactor Cores, Reactor Containment Performance, Confirming the Safety of Low-Level Waste Disposal, and Resolving Safety Issues and Developing Regulations.

NUCLEAR SAFETY RESEARCH

INTEGRITY OF REACTOR COMPONENTS

	<u>FY 1990</u> <u>Actual</u>	<u>FY 1991</u> <u>Estimate</u>	<u>FY 1992</u> <u>Estimate</u>	<u>FY 1993</u> <u>Estimate</u>
Funds	\$25,929	\$ 27,230	\$ 30,050	\$ 30,050
(Staff)	(36)	(35)	(36)	(36)

This program is designed to ensure that reactor plant systems and related components perform as designed and that their functional integrity and operability are maintained over the life of the plant. Maintaining the reactor system pressure boundary undamaged and leaktight is a critical factor in ensuring reactor safety. Failure to maintain pressure boundary integrity could compromise the ability to cool the reactor core and could lead to a loss-of-coolant accident that may be followed by release of hazardous fission products.

This program consists of four major elements: Reactor Vessel and Piping Integrity, Aging of Reactor Components, Engineering Standards Support, and Seismic and Structural Research.

The increased funding in FY 1992 is for analyses and conduct of large-scale pressure-vessel fracture benchmark experiments, pressure-vessel safety irradiation tests, vessel annealing studies, and for use of materials from decommissioned reactors to validate laboratory-scale experiments; and for development of technical bases for the management of aging and support for license renewal.

REACTOR VESSEL AND PIPING INTEGRITY

This program element consists of activities associated with improving NRC's understanding of the basic factors causing degradation mechanisms such as cracking, embrittlement, or corrosion, that could lead to failures of light-water reactor primary system components, especially the pressure vessel and related piping. The principles of ensuring the structural integrity of the reactor pressure vessel and related piping are embodied in the elements of fracture mechanics procedure. These elements are: (1) knowledge of the material properties (strength, toughness, embrittlement, etc.), especially the changes in those properties that can occur as a consequence of nuclear operations; (2) knowledge of the pressure and other stress loadings that can be applied to the components either from normal operations or from accidents; and (3) knowledge of the presence and size of cracks or other flaws in the components. The regulations, regulatory guides, and codes that pertain to the structural integrity of light-water reactors are focused to ensure that possible combinations of material properties, loads, and flaws will yield adequate margins

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against failure of the reactor pressure vessel and related piping. Efforts in this program element will ensure that the appropriate analytical procedures exist for assessing the safety of components, during normal service and postulated accident conditions, and that sufficient, critical experiments are conducted to validate those procedures.

Pressure Vessel Safety

Brittle fracture of the reactor pressure vessel, which could result in a core-melt accident, must be prevented by ensuring adequate safety margins. Experimental and analytical research on the effects of temperature, stress, irradiation, and flaws on the reactor's primary-system pressure boundary is necessary to confirm the NRC's current regulatory approach to assuring that pressure vessels will not fail by brittle fracture during service or in the event of an accident.

The integrity of reactor pressure vessels is demonstrated by fracture-mechanics analyses. As new challenges to pressure-vessel integrity have been discovered, new analysis methods have been devised to fully evaluate the situation. Over the last several years, a number of large-scale experiments have been conducted in the U.S. and abroad for the purpose of validating these analysis methods. The results indicated that the methods have not consistently provided acceptably conservative predictions of the experiments. While the NRC's safety margins are still considered to be sufficient to assure continued safe operation, it has become apparent that improvements in these analysis methods are needed. During FY 1991-1993, the NRC expects to implement an aggressive program to revise the analysis methods and to plan new benchmark experiments (one or two pressurized-thermal-shock experiments or similar experiments using foreign facilities) to provide blind-test cases for the revised analysis methods.

The effect of neutron radiation on reactor vessels has continued to be very important because the vessel can become brittle and could fail in an accident such as pressurized-thermal shock. Embrittlement is monitored through material surveillance programs, the results of which are used in evaluating the fracture toughness of the pressure vessel using a reference fracture toughness curve in the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel code. Because radiation will adversely alter the material properties, it is necessary to ensure that the code reference curve accurately represents behavior of the materials. The NRC developed a detailed test plan for weld material obtained from the cancelled Midland Unit 1 plant. In FY 1991, the NRC will begin irradiations of the weld material and in FY 1992 will complete the irradiations. Testing of the irradiated material will begin in FY 1992 and will be completed in FY 1993. Additional low-upper shelf welds will be procured in FY 1992 and both unirradiated testing and specimen irradiations will begin in FY 1993.

During FY 1991-1993, the NRC will conduct an irradiation damage test program to provide the basic data for development of an analytical model leading to the revision of Regulatory Guide 1.99, Effects of Residual Elements on Predicted Radiation Damage of Reactor Vessel Materials, which serves as a basis for

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determining radiation embrittlement for renewal of nuclear power plant operating licenses. This revision will include the effect of phosphorus, irradiation temperature, and drop in upper-shelf energy.

If embrittlement becomes too high for continued safe reactor operation, embrittlement may be significantly reduced by a post-irradiation heat treatment process called "annealing." During FY 1991-1993, the NRC will conduct a study to experimentally determine the effect of annealing on test specimen size, thickness, and constraint. The feasibility of conducting a full-scale demonstration anneal, in partnership with industry, will be explored in FY 1991, for conduct during FY 1992-1993. During FY 1991-1993, the NRC will support the Joint Coordinating Committee on Civilian Nuclear Reactor Safety (JCCNRS) working groups on activities, such as primary reactor system-integrity studies using Soviet reactor components to validate annealing response prediction codes, irradiation embrittlement testing of Soviet reactor vessel steels, and acquisition and analysis of data pertaining to Soviet plant performance and component reliability. During FY 1991-1993, materials will continue to be obtained from reactors taken out of service to validate laboratory scale studies.

In response to the results of a study on the fracture behavior of selected irradiated reactor pressure-vessel supports, the NRC began in FY 1990 to evaluate the actual neutron energy spectrum and flux in the cavity, at the support location, and evaluated the neutron attenuation and spectrum changes as a function of distance into the concrete biological shield wall. The NRC will conduct test reactor irradiations of typical support materials and will report the results in FY 1991. Evaluation of the embrittlement of reactor pressure vessel supports from a decommissioned foreign reactor will begin in FY 1992 and will end in FY 1993.

During FY 1991-1993, the NRC will continue to develop: (1) an experimentally-validated mechanistic model defining environmentally-assisted fatigue crack growth under light-water reactor conditions, and (2) an effective cumulative damage or usage factor for environmentally-assisted fatigue crack growth under light-water reactor conditions. The NRC will use the results to assess the adequacy of the ASME Code Section XI fatigue crack-growth design curves for plain-carbon and low-alloy steels in light-water reactor environments and will make appropriate recommendations to the ASME.

During FY 1991-1993, the NRC will provide data to support the revision of the ASME Code Section III curves used to predict component-fatigue life. The present curves are based on smooth-specimen, room temperature air tests. The revised codes must consider the effects of as-fabricated surfaces, notches, operating temperature, loading history, fabrication, and a water environment. Under such conditions, component fatigue life could be much shorter than expected.

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Piping Integrity

In numerous instances, piping in nuclear power plants has cracked. Most operating nuclear plants were designed to protect against an accident involving a double-ended guillotine break in the large coolant piping. This approach affected the plant design in many areas, including the installation of numerous pipe-whip restraints and jet-impingement barriers. Past and ongoing research has shown that, for many piping systems, the double-ended guillotine break is a low-probability event and that the steps taken to implement the requirement can actually reduce safety, rather than increase it. With the elimination of the double-ended guillotine break criterion, research has focused on validating analytical predictions of pipe fracture under various loads.

During FY 1991-1993, the NRC will continue a piping component study of the effects of short-length cracks and different types of welds (including dissimilar metal welds) on the fracture behavior of cracked pipes. The short-length crack results will be used to assess the applicability of the fracture analysis methodology developed on long-length crack pipe tests to the analysis of crack lengths typically considered in regulatory applications. In FY 1991, the International Piping Integrity Research Group (a consortium including NRC representation) will complete tests on large carbon and stainless steel pipes under seismic and dynamic conditions. The tests will assess the margins of safety for fracture of piping subjected to realistic seismic loadings, which will contribute to the final validation of the leak-before-break principle. In FY 1991, the NRC organized the Second International Piping Integrity Research Group to conduct additional tests on large diameter pipes and pipe components, such as elbows and tees. This research will continue through FY 1993.

Studies on the effect of environment (impurities, dissolved oxygen, temperature, and flow rate), loading conditions, and thermal aging on stress-corrosion cracking of Type 316 NG stainless steel for boiling-water reactor environments will be completed in FY 1991. These studies will validate the technical basis for material selection and processing guidelines for boiling-water reactor coolant pressure boundary piping. During FY 1991-1993, the NRC will conduct studies on the effects of water chemistry and radiation-induced processes on the stress corrosion cracking and the mechanical behavior of irradiated austenitic stainless steel and other materials (Alloys 600 and 182) used in high-radiation areas in the reactor. During FY 1991-1993, the NRC will conduct a study of whether revisions are necessary in the ASME cyclic-stress fatigue design rules for nuclear-grade stainless steels used for piping in light-water reactor environments.

Inspection Procedures and Techniques

Some methods used for detecting and characterizing flaws are not always consistent, reproducible, or reliable. Nevertheless, preservice and inservice inspections are relied on to reveal and characterize flaws in reactor pressure-boundary components, such as vessels, pipes, and steam generator tubes. For safety considerations, it is important for the inspection techniques to reliably

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detect and characterize those flaws that could lead to failure of pressure-boundary components under accident conditions, as well as those flaws that could grow to unacceptable size during the next operating interval.

Round-robin testing will be conducted during FY 1991-1992 on the reliability of flaw detection in austenitic stainless steel pipe components, as part of the international Program for the Inspection of Steel Components sponsored by the Commission of European Communities and the Organization for Economic Cooperation and Development. Through these tests, current ASME and advanced-nondestructive examination methods will be evaluated. In FY 1991, the NRC will complete recommendations for new, inservice inspection criteria, including sampling requirements, frequency of inspections, and inspection reliability, based on material properties; service environment; and the importance of components to safety.

Under certain conditions of component geometry, accessibility, material type, and degradation mechanisms, conventional inspection techniques are inadequate for proper detection and characterization of flaws. Alternative techniques have been developed. One such technique is acoustic emission, which has the advantage of allowing online component monitoring to assess overall component integrity on a continuous, rather than periodic basis, as is the case with current inservice inspections. Growing cracks produce acoustic signals that can be monitored to allow the detection, location, and evaluation of flaw severity for cracks growing during reactor operation. Leaks also produce acoustic signals that enable leak sources to be located and the leak rate to be determined. These signals also enable inspectors to discriminate between leakage resulting from stress corrosion cracks and leakage from other sources, such as valve packings.

In FY 1991, flaw-characterization inspections will be conducted on the flawed pressure-vessel at MPA Stuttgart, West Germany, for further validation of the recently developed advanced-synthetic aperture-focusing technique for ultrasonic testing (SAFT-UT). Acoustic emission monitoring at the Limerick plant, during FY 1991-1992, will continue to provide field validation of the technology.

In FY 1991, the NRC will complete validation of the advanced-multifrequency-eddy current inspection technique for steam-generator tubing using conventional probes. In FY 1992, the NRC will complete the evaluation of advanced-eddy current probe designs. During FY 1992-1993, the NRC will continue further evaluation with the advanced probes, including signal processing and flaw imaging techniques for eddy current inservice inspection of steam-generator tubing.

In FY 1991, the NRC will begin an assessment of the need for reinspections of nuclear power plant components and will continue this work through FY 1993.

AGING OF REACTOR COMPONENTS

This program element consists of activities associated with improving NRC's understanding of the effect of aging on the continued safe operation of nuclear

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power plants, developing technical bases for license renewal, and reliability assessment of evolutionary and advanced designs. As nuclear power plants age, there is a need to ensure that critical plant components and safety systems continue to provide an adequate level of reliability and continue to perform their intended safety functions. Aging could result in degradation of physical barriers or redundant components, making them vulnerable to simultaneous failure, in the event of a transient or accident. This program element is designed to systematically evaluate the age-related degradation mechanisms by which electrical and mechanical components can and have failed in use, as well as the risk significance of the aging of structures, systems, and components. Research will identify the age-related deterioration mechanisms of equipment, such as pressure vessels, piping, cables, circuit breakers, relays, valves, pumps, and motors in their operating environment. The results of this research will provide the basis for establishing timely and effective maintenance, test, and replacement requirements to mitigate the effects of aging and procedures for validating continued operation of plants beyond the current-licensed period of 40 years.

During FY 1992-1993, the NRC will continue to develop criteria and generate guidelines for inspection, maintenance, and replacement of the following: cables inside the containment, heat exchangers, High Pressure-Emergency Core Cooling System (HP-ECCS), Component Cooling Water System, Standby Liquid Control System, Class 1E Distribution System, Low Pressure-Residual Heat Removal Emergency Core Cooling System (LP-RHR ECCS), service water system, auxiliary feedwater system, main steam isolation valves, turbine drives, and governors. In FY 1992, the NRC will complete the determination of the susceptibility to fire of aged insulating materials. During FY 1992-1993, the NRC will continue to evaluate the risk significance of age-related component failures, which can challenge the functions of the safety-related components and will prioritize components and structures, based on their aging risk significance. In FY 1992, the NRC will publish regulatory guidelines for technical information for license renewal consideration. In FY 1992, the NRC will initiate a cooperative research program for in situ aging assessments, post-service examinations, and tests of naturally-aged equipment and will develop interactions with the National Aeronautics and Space Agency. Also in FY 1992, the NRC will continue a cooperative research program on cable aging with the French Commissariat a l'Energie Atomique. During FY 1992-1993, the NRC will continue the evaluation of the applicability of aging research results to built-in diagnostics for the proposed evolutionary- and advanced-light-water-reactor designs.

ENGINEERING STANDARDS SUPPORT

This program element consists of activities associated with improving NRC's understanding of the bases used by the nuclear industry for designing, inspecting, and maintaining equipment important to plant safety. Establishing and upgrading, where necessary, the performance requirements for safety-related nuclear components and systems is an important part of the regulatory process. As new and improved guidance and methods are developed for assuring equipment

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performance under normal and abnormal conditions, the new information is incorporated into appropriate standards, codes, and NRC regulatory documents that are used to establish the minimum performance level for specific equipment. This provides a mechanism by which the NRC informs the industry of its position on rules for assuring plant safety. Work conducted under this program element is focused on developing and confirming modifications, for incorporation in appropriate codes and standards, and NRC regulatory documents.

In FY 1992, the NRC will continue the evaluation of the effectiveness of current ASME construction and inservice inspection programs. The purpose of this effort is to ensure the adequacy of these programs and to incorporate, by reference, the new ASME codes into NRC regulations. In particular, the NRC will determine the need for revising inservice inspection rules to ensure early detection of cracking in reactor-coolant pressure boundary piping and vessels. During FY 1992-1993, the NRC will evaluate utility responses to the regulatory form of the resolution of Generic Safety Issue 87 (Failure of High-Pressure Coolant Injection Steam Line Without Isolation) and Generic Safety Issue II.E.6.1 (In Situ Testing of Valves).

SEISMIC AND STRUCTURAL RESEARCH

This program element consists of activities associated with improving the NRC's evaluation of the effects of potential earthquakes on nuclear power plant operations. These activities affect the implementation of current seismic licensing criteria, plus new review programs such as Unresolved Safety Issue A-46 (Seismic Qualification of Equipment in Operating Plants) and the earthquake-related part of the individual plant examinations. A major thrust of this effort has been to assess behavior for seismic events more severe, but less probable, than those considered in design. There is also research aimed at improving the evaluation of earthquake input and plant response required by current regulations. In recent years, the NRC has supported seismic testing and the collection of earthquake-experience data in order to improve and gain confidence in the use of seismic probabilistic risk assessments and seismic margins studies for severe accident policy implementation. These data are also being used to support proposed improvements to seismic design criteria. Two major research programs the -- Seismic Category I Structures Program and the Seismic Component Fragility and Ruggedness Program -- were completed in FY 1991. Results from these programs and other previously completed programs are indicating that the earthquake resistance of structures, equipment, and piping is, in general, higher than previously thought. Related research and standards development during FY 1991-1993 will be directed at integration of these major program results into the rules and regulations and at efforts to revise the existing seismic probabilistic risk assessments and seismic margins methodologies to incorporate lessons learned from plant seismic reviews and any new and significantly different information about seismic hazards, component capacities, and system behavior.

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During FY 1991-1993, major activities in seismic engineering application will be concentrated in the following areas: (1) evolutionary and advanced reactors, (2) review of probabilistic risk assessments and individual plant examinations external events submittals, (3) development of external event methodology, (4) development of standards and regulatory guidance, (5) operating reactor support, and (6) waste management support.

As a part of the overall effort to delineate seismic hazard and risks, the NRC has been funding the operation of seismographic networks in the Central and Eastern United States and related geological and geophysical research in seismically active locations. The NRC has signed an interagency agreement with the U.S. Geological Survey (USGS) to replace the NRC-supported networks in the Central and Eastern United States. The NRC will fund the purchase of the needed permanent equipment during a 6-year period, and the USGS will provide personnel support and assume responsibility for the new network. During FY 1991-1992, additional USGS stations will be added to the National Seismographic Network and the NRC will close some of the stations it now supports. By the end of FY 1992, the USGS-network will be complete and the NRC will no longer provide operational support for regional seismographic networks on a routine basis. The NRC will continue to support USGS and other research activities that address geological and seismological issues of regulatory significance during FY 1991-1993.

Additionally, NRC research is being conducted to determine the risk significance of the failure level of concrete structures and of critical components (such as electrical equipment) to supplement the existing data base that is being gathered in cooperation with the Electric Power Research Institute. During FY 1991-1992, the NRC will integrate efforts to form new regulatory positions on seismic instrumentation, specification of what constitutes an exceedance of the Operating Basis Earthquake, criteria for plant actions following earthquakes, and the appropriate ratio of two earthquake scenarios used in plant design (the ratio of Operating Basis Earthquake groundmotion to Safe Shutdown Earthquake groundmotion) for advanced reactors. The NRC will initiate a systematic reevaluation of past seismic probabilistic risk assessments in light of new data and insights that have been gained and will reassess the adequacy of seismic margins and individual plant examination-external events review procedures in light of the findings in FY 1992. During FY 1991-1993, the NRC will develop specific guidelines for external event (i.e., seismic, wind) probabilistic risk assessments for advanced and standard reactor designs.

New procedures for estimating the capability of nuclear power plants to withstand earthquakes larger than their original design bases are being developed on the basis of recent research results. Before the procedures can be used with a high degree of confidence, they must be further validated by data bases that reflect new experience and experiments. In a joint venture with the Electric Power Research Institute and the Taiwan Power Company, a model structure will be built in a seismically active area of Taiwan and surrounding soil will be instrumented during FY 1991-1992. Data recording and analytical effort will be performed during FY 1991-1993. During FY 1991-1993, the NRC will review and participate in the ASME's revision of the pipe damping criteria in their boiler- and

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pressure-vessel code. The NRC will complete the evaluation of how structural damping values for major plant structures should be modified to improve the results of analytical methods to predict the response of the structure in FY 1991. During FY 1991-1993, the NRC will revise a regulatory guide to incorporate the new pipe damping and structural damping criteria.

Efforts continue in the structural aging program to develop methods and bases for assessing aging effects on safety-related structures. In FY 1990, a report describing the Materials Properties Data Bases was issued, material samples were obtained and tested, a draft report on component classification system and degradation factor descriptions was issued, condition assessment models and reliability-based life prediction tools were begun, and the evaluation of service history effects was begun. During FY 1991-1993, necessary materials tests will be identified, developed and performed, and the Materials Properties Data Bases will be made available for use.

NUCLEAR SAFETY RESEARCH

PREVENTING DAMAGE TO REACTOR CORES

	<u>FY 1990</u> <u>Actual</u>	<u>FY 1991</u> <u>Estimate</u>	<u>FY 1992</u> <u>Estimate</u>	<u>FY 1993</u> <u>Estimate</u>
Funds (Staff)	\$20,277 (51)	\$ 21,675 (50)	\$ 23,695 (50)	\$ 23,695 (50)

This program is designed to prevent core damage and to address those events that are beyond the design basis of both operating plants and new plants of advanced design. The emphasis of this research is on prevention of severe core damage through understanding of both plant and human behavior. The research covers both normal and abnormal conditions of operation, including accidents (such as a pipe break, loss-of-coolant accident in which emergency systems are called upon to provide cooling water) and severe core-damage events. Research is being conducted to help understand the regulatory implications of these events and to assure that the lessons learned from their analysis help to prevent damage to the reactor core in future events. This information is used to revise regulatory requirements to suitably ensure that plant equipment, operational procedures, and training of plant personnel are adequate to deal with operating events and to prevent serious accidents.

This program encompasses research pertaining to the operations of the reactor as a system, including controlling power level, maintaining water in the reactor system, maintaining core cooling and heat removal, and maintaining proper coolant temperatures and pressures. It also includes consideration of operator actions as an integral part of the reactor system. A complete knowledge of the reactor operating as a system makes it possible to define the conditions of operation that prevent core damage and, hence, to maintain safety and also to define actions to minimize the consequences of a core-damage event, should one occur.

This program consists of six major elements: Plant Performance, Reactor Applications, Human Factors, Reliability Assessment, Accident Management, and Reactor Accident Risk Analysis.

The increased funding in FY 1992 is for: the initiation of testing of composite human and hardware models; expansion of human factors activities on human-systems interfaces, particularly as applied to advanced-digital-control systems; development of personnel subsystems for advanced reactor designs; integration of human-reliability assessment and probabilistic risk assessment; initiation of testing of small-scaled facilities simulating the new advanced-light-water reactor designs; and assessment of complex mitigative strategies as Severe Accident Research Program information becomes available.

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PLANT PERFORMANCE

This program element consists of activities to produce information on the processes of heat transfer and fluid flow (the thermal-hydraulic response) of the reactor coolant system for the range of plant transients that may occur. Plant transients include design-basis accidents, required to be analyzed in license applications, as well as nondesign-basis events, such as multiple failures, common mode failures, and/or operator errors that have been revealed through probabilistic risk assessments and operating experience. The principal products of thermal-hydraulic research are analytical tools (computer codes) used to understand and predict the plant response to deviations from normal operating conditions.

Experiments

Long-term research plans in experimentation fall into three areas: (1) experimental facilities at universities and other laboratories, (2) fundamental testing, and (3) cooperative testing in international facilities. A fourth area, cooperative testing with domestic industry, has been successful in the past and may occur in the future.

During FY 1991-1993, the NRC will continue a program of experiments and analyses at universities. This program will improve the state of the art with respect to understanding certain basic thermal-hydraulic phenomena of importance to safety and will study reactor-design configurations, not previously evaluated experimentally, such as those associated with new, standardized-plant designs. This effort will be conducted at universities in cooperation with a national laboratory, to promote maintenance of expertise in the field of thermal-hydraulics.

During FY 1991-1993, the NRC will fund new experiments in the area of natural circulation of reactor fluid (predominately hot gases) during pressurized-water reactor severe accidents as core-coolant inventory is depleted and fuel rod heat-up ensues. The net result of this natural circulation flow is to transport heat from the reactor core and deposit it in the upper plenum internals, hot leg pipe, and steam generator tubes. Ultimately, this could cause a failure of ex-vessel components prior to the time of lower head failure. Lower head failure could cause direct containment heating and possible containment failure.

Modeling

Analytical models (i.e., computer codes) are the regulatory tools used to evaluate full-scale plant behavior under accident conditions. The major regulatory issue surrounding the use of such computer codes relates to the codes' applicability, scalability, and uncertainty when applied to plant analyses. To resolve this regulatory issue, experimental data most relevant to the geometry and scenario being analyzed are used to verify the computer codes and to improve the modeling of thermal-hydraulic phenomena.

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The principal codes developed and used by the NRC are TRAC-PWR and RELAP5, for the analysis of pressurized-water reactor transients, and TRAC-BWR, for the analysis of boiling-water reactor transients. Beginning in FY 1992, the NRC will contribute to a joint, international program among the code users to support their maintenance. During FY 1992-1993, the NRC will evaluate the applicability of current codes to analyze the different geometries and flow conditions for advanced-light-water reactors and other designs, principally those designs selected for further development by DOE.

REACTOR APPLICATIONS

This program element consists of activities associated with maintaining existing analytical tools and utilizing technical expertise to support the NRC staff during the safety evaluation of both operating reactors and new reactors of advanced design. In some cases, these evaluations may require additional experimental data or improved analysis capability, but most evaluations will utilize existing data, computer codes, and technical expertise. Complex transients have occurred in operating reactors and are expected to continue in the future. These transients lead to concerns that similar transients under different conditions (e.g., core damage in different reactor designs, with additional system malfunctions or with operator errors) could lead to unsafe conditions (e.g., core damage and release of fission products to the containment and to the environment).

Operating Reactors

The Thermal-Hydraulic Research Center assists the NRC in resolving safety issues and in incorporating completed research into the regulatory process. By conducting a baseline program of thermal-hydraulic research, the center ensures the NRC flexibility to respond quickly to priority issues. In FY 1992, studies will be completed on the thermal-hydraulic aspects of loss of cooling events occurring at shutdown and low power.

Plant-specific simulators provide a capability to model normal plant operation and transients in an environment closely resembling the control room of the plant itself. To the extent that these simulators accurately model plant behavior, they are an outstanding system for training operators and evaluating procedures, for both anticipated transients and unusual events, without putting the plant at risk. However, for severe transients, the simulators may produce an incorrect response or simply stop the transient simulation because of an inability to model the response. The best available tools for modeling these events are systems codes. For accidents up to and somewhat beyond design-basis events, the codes used are RELAP5 and TRAC. In FY 1992, the NRC will perform an independent evaluation of the capabilities of the NRC Technical Training Center simulator upgrades. The RELAP5 and TRAC-BWR models of the simulators will be constructed and several transient analyses will be performed for each simulator. These will

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be compared with actual simulator response to establish the improvements provided by upgrading and the areas where the simulator still reproduces the unexpected plant response.

Light-Water Reactor Systems Studies

During FY 1992-1993, the NRC will continue a comparative review to highlight design differences that result in different response of advanced-light-water reactors to initiating transients, as compared to current, operating light-water reactors. The NRC will also continue an analysis of the plant response to determine phenomenological differences in plant response. The goal of these efforts is to establish the accuracy and reliability of the current light-water reactor systems codes for the new plant designs.

HUMAN FACTORS

This program element consists of activities associated with providing the technical basis for regulatory actions taken to ensure nuclear safety and to explore human performance to identify potential problem areas. Human factors research is a multidisciplinary endeavor relying heavily on the behavioral sciences and involving a variety of engineering disciplines. The research is mainly in support of regulatory needs and includes some base research that anticipates future regulatory needs and the incorporation of human reliability analysis in probabilistic risk assessments.

In order to improve the NRC's understanding of the influences on personnel performance in nuclear operations and maintenance, it is necessary to develop enhanced methods for collecting and managing personnel performance data. In FY 1991, the NRC began to develop and pilot test an improved method that reflects the current state of the art for investigating human performance and expects to complete development of a training program for NRC inspectors. Beginning in FY 1993, the NRC will evaluate and upgrade the method, as necessary. Lack of a standardized investigation protocol tool could result in differing investigations of human performance and the unavailability of standardized causal information.

Operating staff utilization and coordination is increasingly important to regulatory actions. The NRC held a workshop in FY 1991 to identify possible methods for evaluating the effectiveness of a performance-based training program at nuclear power plants. In FY 1991, the NRC anticipates continuing research to identify environmental factors that may impact on human performance at nuclear power plants and, beginning in FY 1992, will develop criteria and review guidelines for those factors with a negative impact. In FY 1992, the NRC expects to complete research to identify physiological, social, and environmental influences on operator alertness and turnover rates.

The U.S. utilities are already utilizing expert systems in nonsafety-related tasks and are expected to utilize expert systems in safety-related tasks. During

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FY 1991-1993, the NRC will continue research to address the safety concerns associated with the nuclear power industry's current and planned use of artificial intelligence, expert systems, and computers and will develop and pilot test an objective technical basis to provide guidance and criteria for the qualification of computer systems utilized in both safety and nonsafety applications. In FY 1993, the NRC will complete a cooperative effort with the Electric Power Research Institute to develop the technical basis for the verification and validation of expert systems. In FY 1993, the NRC will also complete an effort to establish a baseline of operator performance in current control rooms. During FY 1991-1993, the NRC is expected to continue its support of the ongoing Organization for Economic Cooperation and Development Halden Reactor Project research effort on advanced human-system interfaces, computer-based operator support systems, integrated surveillance and control rooms, and the verification and validation of computer software.

In FY 1992, the NRC will develop data gathering techniques for use in descriptive models of the operating characteristics of nuclear power plant organizations. During FY 1991-1993, the NRC will continue to develop and validate technical support program and organizational indicators of plant performance. During FY 1992-1993, the NRC anticipates assessing the feasibility, practicality, and advisability of developing performance-based regulations of organizational factors.

RELIABILITY ASSESSMENT

This program element consists of activities associated with multidisciplinary research fully integrating human and hardware reliability analysis data and methods into probabilistic risk assessments and licensing, inspections, and regulatory decisionmaking. More specifically, reliability-assessment research is directed toward probabilistic data, data-management systems, analysis methods, and integrating procedures for: (1) doing quantitative and qualitative human and system reliability analyses and integrating their results into probabilistic risk assessments, (2) monitoring programmatic and risk-based performance trends, (3) establishing reliability-based and risk-based guidelines for implementing and monitoring the effectiveness of plant reliability programs, and (4) systematically employing probabilistic risk assessments processes to address safety issues of concern to regulators.

During FY 1992-1993, the NRC will develop and evaluate methods and criteria for acquiring probabilistic data on human and hardware failures and combinations thereof from sources inside and outside the nuclear industry to support reliability and risk assessments. During FY 1991-1992, the NRC will continue the development of methods for estimating human and hardware failure rates.

During FY 1992-1993, the NRC will extend the Nuclear Computerized Library for Assessing Reactor Reliability (NUCLARR) to store and process common cause failure data to interface directly with other data systems.

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During FY 1991-1993, the NRC expects to continue the development and field testing of procedures for fully integrating human performance, probabilistic data, quantification tools, and event-sequence analysis methods into the probabilistic risk assessment process.

During FY 1992-1993, the NRC will continue the development of feasible methods for normalizing and applying human reliability assessment/probabilistic risk assessment quantitative and qualitative results in the regulatory decisionmaking process, including the development of risk-based indicators of safety-system and nonsafety-system trends.

ACCIDENT MANAGEMENT

This program element consists of activities associated with improving the NRC's understanding of ways to prevent or mitigate the consequences of severe accidents in nuclear power plants. Accident management encompasses those actions taken during the course of an accident by the plant operating and technical staff to: (1) prevent core damage; (2) terminate the progress of core damage, if it begins, and retain the core within the reactor vessel; (3) maintain containment integrity, as long as possible; and (4) minimize offsite releases. The NRC staff has concluded, based upon probabilistic risk assessments and severe accident analyses, that the risk associated with severe core-damage accidents can be further reduced through effective accident management. Accordingly, accident management is considered to be an essential element of the severe accident closure process.

The fundamental objective of the NRC Accident Management Program is to have each NRC licensee implement, for each nuclear plant, an "Accident Management Plan" which provides a framework for evaluating information on severe accidents, including that developed through conduct of the individual plant examinations, for preparing and implementing severe-accident procedures, and for training operators and managers in these procedures. With the strong initiative displayed by industry to date, the role of the NRC in accident management will be to articulate the overall principles of accident management and to evaluate the industry products and implementation. In late FY 1992, an NRC generic letter on accident management will be issued addressing the role of the industry products (e.g., Nuclear Management and Resources Council accident management guidelines) in the development of utility accident management capabilities.

During FY 1991-1992, the NRC will continue the assessments of accident management information needs of boiling-water reactors, with Mark I and Mark II containments, and of a pressurized-water reactor ice-condenser plant.

In FY 1992, the NRC will complete the depressurization studies on representative reactor designs. During FY 1991-1993, efforts on ex-vessel strategies will continue and will focus on flooding of the reactor cavity (pressurized-water reactors) and drywell (boiling-water reactors). During FY 1992-1993, work on identification and assessment of in-vessel strategies will be continued.

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REACTOR ACCIDENT RISK ANALYSIS

This program element consists of activities associated with improving the NRC's understanding of risk and ways to reduce risk associated with nuclear power plant operation. Probabilistic risk assessment has been shown to be a systematic and comprehensive method for identifying and evaluating the effectiveness of safety improvements proposed to reduce the likelihood and consequences of accidents. Information being developed under this program element is, or will be, applied in evaluating the level of safety at selected operating plants and advanced-light-water reactor designs, in monitoring plant performance, and in identifying and evaluating potential improvements in equipment or operator reliability. Supporting efforts are also underway to improve staff capabilities in analyzing severe accident risks.

Review of licensee and/or applicant probabilistic risk assessments are expected to continue through FY 1993. In FY 1991, the NRC expects to complete the review of the probabilistic risk assessment for the General Electric advanced-boiling-water reactor (GE-ABWR) and, in FY 1992, the review of the probabilistic risk assessment for the Combustion Engineering System 80+. The review of the General Electric simplified-boiling-water reactor (GE-SBWR) and the Westinghouse AP600 probabilistic risk assessments is anticipated to begin in FY 1993.

In FY 1990, the NRC completed the peer review of the second draft of NUREG-1150 on severe-accident risk analysis of the five commercial nuclear power plants (Surry, Zion, Sequoyah, Peach Bottom, and Grand Gulf), including the effects of externally-initiated accidents at Surry and Peach Bottom, along with all supporting contractor reports. In FY 1991, the final version of NUREG-1150 will be completed and the NRC will complete and publish the staff severe-accident risk analyses of the LaSalle plant, including the effect of externally-initiated accidents. In FY 1991, the risk analyses of two NUREG-1150 plants will be extended to include a screening assessment of the frequencies and risks of accidents initiated while the plants are presumed to be in nonfull-power operational modes. In FY 1992, a detailed assessment of the most important modes will be completed. During FY 1991-1993, the NRC expects to initiate development and demonstration of methods for the probabilistic risk assessment application of advanced human reliability analysis models and operational events data, as guided by the reviews of NUREG-1150. Substantial research will also be performed on advanced reactor design and operational issues.

REACTOR CONTAINMENT PERFORMANCE

	FY 1990 <u>Actual</u>	FY 1991 <u>Estimate</u>	FY 1992 <u>Estimate</u>	FY 1993 <u>Estimate</u>
Funds (Staff)	\$17,112 (20)	\$ 17,330 (19)	\$ 15,132 (19)	\$ 15,132 (19)

This program is designed to protect the public in the unlikely event of a very severe (core-melt) reactor accident by requiring design and operating strategies for dealing with such accidents. These strategies include: containment structures designed for very low leakage, systems to reduce the pressure loads on containment structures, and systems to reduce the amount of radioactive fission products that might be available for release to the environment. The public is also protected by a policy that limits the siting of a reactor in proximity to population centers. Finally, the Commission requires each operating plant to have an emergency plan which establishes a framework for minimizing radiation exposure to the public, in the event of any release of radioactivity from an accident.

The basic criteria for licensing nuclear power plants for construction and operation are judged to have provided a considerable safety margin, affording the public protection from radiation even under severe-accident conditions, such as those that occurred in 1979 at Three Mile Island Unit 2. The physical possibility of even more severe accidents than that at Three Mile Island is, however, recognized. Considerable progress has been made in recent years in understanding the underlying physical and chemical phenomena that can occur in a severe accident. Such information is essential as a basis for developing potential safety improvements and for making decisions on whether or not particular improvements are warranted. As pointed out in the Commission's Severe Accident Policy, such decisions should be based on a combination of engineering judgment (i.e., a deterministic method of setting and assessing safety margins) and the application of probabilistic risk assessment techniques based on up-to-date experimental information to evaluate the likelihood of the occurrence of rare events.

In similar fashion, the same underlying science and decisionmaking process can be applied to reevaluations of existing safety systems and regulatory requirements to determine if particular conservative assumptions have been warranted in terms of risk reduction. The underlying science includes: studies of the behavior of fission products released from melting fuel, the temperature and pressure loadings of the containment produced during a range of core-melt events, and the ability of containment buildings (or secondary or reactor buildings) to retain and mitigate releases of radioactive materials during such events. The NRC will continue to emphasize research on containment performance

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during a severe accident. Understanding the behavior of radioactive materials released to the environment is also important in protecting the public from severe accidents.

This research program consists of three major elements: Core Melt and Reactor Coolant System Failure, Reactor Containment Safety, and Reactor Containment Structural Integrity.

The decreased funding in FY 1992 reflects a reduction in efforts to lessen uncertainties in modeling and assessing severe-accident phenomena and a delay in testing the structural integrity of a steel boiling-water reactor containment model and a prestressed concrete pressurized-water reactor containment model.

CORE MELT AND REACTOR COOLANT SYSTEM FAILURE

This program element consists of activities associated with: (1) the heatup and meltdown of the core materials, (2) hydrogen generation; (3) in-vessel fission product release and transport; (4) fuel-coolant interactions that occur as molten debris falls into the water-filled reactor pressure vessel lower-head or as water is added to degraded or molten core debris; (5) the amount, composition, morphology, and temperature of core debris at the time of vessel (or reactor coolant system) failure; and (6) the mode and timing of vessel failure. The major uncertainties attendant to estimates of the probability of early containment failure and subsequent releases of radioactive material appear to be significantly related to our limited understanding of the detailed core-melt phenomena and whether or not the molten core material remains in the reactor pressure vessel. The ability to judge the efficacy of some accident management strategies is restricted by our current understanding of core-melt phenomena covered in this program element.

In FY 1991, the final boiling-water reactor test of the core-melt process will be conducted in the Canadian NRU test reactor and the data will be used to supplement results from out-of-reactor tests. Post-test examination, analysis, and results will be completed in FY 1993. During FY 1991-1992, one test each year will be performed in the Annular Core Research Reactor on the key late-phase melt progression phenomena of debris-melting, melt-relocation, crust formation, and crust failure. During FY 1991-1992, the NRC will participate in a cooperative program to examine and evaluate specimens from the lower-head of the Three Mile Island Unit 2 reactor pressure vessel for information on early- and late-phase melt progression in that accident. During FY 1992-1993, the NRC will perform a series of ex-reactor tests on metallic-melt relocation and drainage of blockage formation in the geometries of boiling-water reactor cores and core plates, and of pressurized-water reactor cores. During FY 1991-1992, the NRC will conduct selective, confirmatory research and experiments to test the predictive capability of the models that will be used to evaluate the dynamics of molten fuel-coolant interaction in-vessel and in various containment configurations. During FY 1991-1993, the NRC will complete out-of-reactor experiments on the release of fission products from fuel (BR-3 and U.S. fuel) and will conduct

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small studies of the high-temperature chemistry of fission products. In FY 1991, the NRC will initiate research to determine the consequences of reflooding degraded cores and the effectiveness of debris cooling. The research results will be used in the review and evaluation of accident management strategies, containment performance improvements, and individual plant examinations. In FY 1992, the NRC will complete the assessment of the fission product release and transport code, VICTORIA. During FY 1991-1993, the NRC will use the code to perform pre- and post-test analyses of the PHEBUS tests.

REACTOR CONTAINMENT SAFETY

This program element consists of activities associated with providing information on assessing containment performance under severe accident conditions and is constructed to enable as definitive a judgment as possible to be made about the likelihood of early containment failure in the event of severe accidents. It is known from previous risk studies and from the experiences at Chernobyl and Three Mile Island Unit 2, that containment survival or even delayed failure has an all-important effect on the release of radioactivity to the environment. The phenomena most likely to produce high pressure and temperatures that could potentially threaten containment integrity are: (1) the high-pressure ejection from the pressure vessel of finely-fragmented particles of molten-core debris, (2) the generation of noncondensable and flammable gases from the decomposition of concrete by molten-core debris, (3) the direct thermal and chemical attack by molten-core debris on structures, and (4) the burning or detonation of hydrogen and other gases, produced in the vessel or in the containment. The NRC is conducting research in all of these areas to provide reliable estimates of the loads that could potentially challenge containment.

Experiments investigating the interaction of the molten core with the concrete containment will continue during FY 1991-1992. These experiments will involve the study of aerosol production; out-of-reactor transient phenomena, including the spreading of debris and the attack on structures; concrete erosion; mixing of phases; effects of crusts; heat transfer; and other thermal-hydraulic effects. During FY 1991-1992, the NRC will continue to support the Advanced Containment Experiments program to obtain data on concrete erosion and aerosol production. Also during FY 1991-1992, the NRC will also contribute to the Melt Attack and Coolability Experiments which are an extension of the Advanced Containment Experiments program. These experiments are designed to investigate the coolability of corium-concrete mixtures using prototypic materials.

During FY 1991-1993, the NRC will conduct large-scale tests of prototypical high-temperature materials driven by steam. Also during FY 1991-1993, the NRC will develop separate effects tests to quantify the entrainment and de-entrainment rates in the reactor cavity, instrument tunnel, and lower sub-compartments, as well as particle-size distributions. These are essential parameters necessary to quantify the magnitude of direct containment heating load.

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In FY 1991, the NRC will release updated versions of the hydrogen transport and mixing models in current codes. During FY 1991-1993, the NRC will continue code validation, application, and maintenance. In FY 1991, the NRC will enter into a bilateral agreement with Japan to construct and perform high-temperature hydrogen combustion experiments intended to explore the increased detonability of hydrogen mixtures at elevated temperatures which might exist during a severe accident. The agreement is expected to continue through FY 1993.

Integrated codes are being improved and validated to account for important phenomena that affect reactor containment safety. In FY 1992, the NRC will begin to use direct containment heating models to assess the individual plant examination submittals. During FY 1991-1992, the NRC will review each mechanistic deterministic code to assess the magnitude of uncertainties remaining and whether an alternative approach might be appropriate for dealing with some severe accident phenomena. In FY 1991, the NRC will initiate studies of potential technical issues that may be important to the licensing reviews of the advanced reactors. To ascertain that these new reactor designs achieve the desired levels of safety, during FY 1991-1993, the NRC will assess the methodologies used in developing the unique features of these reactors that are related to plant performance during severe accidents and will develop modifications to NRC-developed, integrated accident evaluation codes to accommodate these new designs.

REACTOR CONTAINMENT STRUCTURAL INTEGRITY

This program element consists of activities associated with providing information on the ability of the containment to withstand pressure and temperature loads generated in a severe accident. The threshold of failure, the mode of failure, and related leak rates must be known in order to complete an estimate of plant releases and offsite consequences. The NRC conducts experimental and analytical research in this area, including the testing of large models of containment structures, structural elements that are parts of containment structures, and penetration assemblies.

Tests of the mode and timing of containment failure resulting from excessive seismic loads or over pressurization during a severe accident have a major impact on the consequences of a severe accident. Containment model separate effects tests will be conducted during FY 1991-1992 to permit projections of the lessons learned from the large-model tests to the large number of actual containment designs. During FY 1992-1993, the NRC will participate with Japan in confirmatory tests of models of a boiling-water reactor containment and a pressurized-water reactor prestressed concrete containment to quantify the margins inherent in these containment designs. These tests to failure, resulting from over pressurization, will be conducted at Sandia National Laboratories.

NUCLEAR SAFETY RESEARCH

CONFIRMING THE SAFETY OF LOW-LEVEL WASTE DISPOSAL

	<u>FY 1990</u> <u>Actual</u>	<u>FY 1991</u> <u>Estimate</u>	<u>FY 1992</u> <u>Estimate</u>	<u>FY 1993</u> <u>Estimate</u>
Funds (Staff)	\$ 1,639 (13)	\$ 3,301 (13)	\$ 3,000 (12)	\$ 3,000 (12)

This program is designed to confirm the current understanding of the processes and phenomena that may affect the safety of low-level waste disposal and to ensure that the regulatory framework for low-level waste disposal is adequate for the long-term protection of the public health and safety and the environment. These activities are necessary to support the discharge of NRC's responsibilities with regard to the disposal of low-level radioactive waste and uranium mill tailings under the Atomic Energy Act of 1954, as amended, the Energy Reorganization Act of 1974, the Uranium Mill Tailings Radiation Control Act (UMTRCA) of 1978, the Low-Level Radioactive Waste Policy Act (LLRWPA) of 1980, and the Low-Level Radioactive Waste Policy Amendments Act (LLRWPA) of 1985.

Research is required to provide data and computational tools to: (1) support development of regulatory criteria for use in the licensing process, (2) permit sound evaluation of proposals for disposal facilities, and (3) assess compliance with regulatory requirements, particularly those on radionuclide release limits. The need to establish these criteria and develop these licensing tools in a timely manner is made more urgent and complex by two factors. First, the LLRWPA set a tight time schedule for establishing new low-level waste disposal facilities. Second, the States and State compacts are pursuing alternative disposal methods to conventional shallow-land burial. Certain of these alternatives must be critically examined by tightly-focused research to determine their net benefit and to give guidance to the States. This research effort will, by necessity, maintain a national safety perspective and will provide a uniform technical basis for efforts by the States and State compacts to dispose of low-level waste safely. The LLRWPA requires that each State provide for the disposal of its own low-level waste. This is expected to result in approximately 12 new, low-level waste disposal facilities as States form compacts to dispose of waste.

The direction of low-level waste has changed from an earlier focus on shallow-land burial of wastes to the current focus on engineered low-level waste disposal methods, as experience, knowledge, and public awareness have grown. In particular, in response to the LLRWPA, the NRC expanded the scope of its low-level waste research to accelerate the development of sound technical bases for regulatory decisionmaking regarding engineered low-level waste disposal methods, the so-called alternatives to shallow-land burial.

NUCLEAR SAFETY RESEARCH

Materials and Engineering

The objective of materials and engineering research is to independently confirm the technical basis to estimate releases from low-level waste disposal facilities, in support of licensing new disposal facilities. The States are developing disposal facilities, whose performance relies more heavily on engineered materials, such as concrete and bitumen, than the present generation of disposal facilities. Increased knowledge of the long-term performance of these materials is necessary.

During FY 1991-1993, the NRC will continue studies to confirm the technical bases and will revise regulatory guidance, if necessary, on low-level waste form characteristics and stability. Also during FY 1991-1993, the NRC will continue studies of solidified low-level waste. Emphasis will be given to evaporator concentrates from nuclear power stations and decontamination wastes. Actual solidified low-level waste from nuclear power plants will be analyzed to ensure that it complies with 10 CFR Part 61 requirements. During FY 1991-1993, the NRC will continue research on: (1) long-lived and hard-to-measure radionuclides and the chemical content of low-level waste; (2) the role of chelating agents in enhancing mobility of radionuclides released from decontamination low-level waste; (3) leaching of radionuclides, chelating agents, and chemicals in cement solidified-decontamination waste collected from nuclear power facilities; and (4) the effects of irradiation, biodegradation, and chemical effects on stabilized low-level waste. In FY 1992, the NRC will begin research on the service lives of barrier coatings and joint sealants in concrete and the durability of super plasticizers and epoxy-coated reinforcing bar used in concrete.

Hydrology and Geochemistry

The objective of hydrology and geochemistry research is to refine the understanding of the geochemical, biologic, and hydrologic processes that control environmental transport of radionuclides, particularly in groundwater. Efforts in this area are necessary to develop sufficient understanding of these processes to support licensing decisions for new NRC and Agreement State low-level waste disposal facilities during FY 1992-1993.

During FY 1991-1993, the NRC will investigate carbon-14 transfer and uptake coefficients in plants for the soil-to-root and air-to-leaves pathways for radionuclide exposure at low-level waste disposal sites. Also during FY 1991-1993, the NRC will: (1) continue work on modeling and model validation for assessment of groundwater flow and radionuclide transport at low-level waste disposal sites; (2) continue field and laboratory studies of unsaturated flow and transport in heterogeneous media; and (3) continue an assessment of the role played by organic complexants, microparticulates, and biotic processes in enhancing radionuclide movement.

NUCLEAR SAFETY RESEARCH

Compliance, Assessment, and Modeling

The objective of compliance, assessment, and modeling research is to confirm the technical basis for estimates of the release and transport of radionuclides used to demonstrate that low-level waste disposal facilities will adequately protect human health and the environment, in accordance with NRC requirements. These research efforts are inherently coupled with the materials and engineering, and the hydrology and geochemistry activities.

In FY 1992, the NRC will complete development of a simplified source-term model for licensing purposes by using the Breach, Leach, Transport, a stand-alone code. During FY 1991-1993, the NRC will continue the international cooperative program on validation of geosphere transport codes (INTRAVAI).

Support of Rulemaking

In FY 1992, the NRC will issue: (1) the final Regulatory Guide on low-level waste form stability and characteristics; (2) the final Regulatory Guide 1.21 on Measuring, Evaluating, and Reporting Radioactivity in Solid Waste and Releases of Radioactive Materials in Liquid and Gaseous Effluents from Light-Water Reactors; and (3) the final rule on Low-Level Waste Manifest Information and Reporting.

NUCLEAR SAFETY RESEARCH

RESOLVING SAFETY ISSUES AND DEVELOPING REGULATIONS

	<u>FY 1990</u> <u>Actual</u>	<u>FY 1991</u> <u>Estimate</u>	<u>FY 1992</u> <u>Estimate</u>	<u>FY 1993</u> <u>Estimate</u>
Funds	\$18,118	\$ 18,364	\$ 24,573	\$ 24,573
(Staff)	(114)	(113)	(122)	(122)

This program is designed to utilize the research results in the development of NRC's regulatory framework. This framework is needed to protect the health and safety of the public from the risk due to generation of electricity by nuclear power plants and the risk from the manufacture, use, transport, and storage of nuclear fuel and other radioactive materials. Two key elements of NRC's regulatory framework are: (1) regulations in Title 10 of the Code of Federal Regulations, that set forth requirements that must be met by NRC licensees, and (2) regulatory guides that describe acceptable methods of implementing specific portions of the regulations. These regulatory guides are used to provide guidance to applicants concerning the information needed by the staff in its review of applications for permits and licenses and to describe an acceptable technique that can be used by the licensee to meet a specific regulation or portion of the regulation.

This program consists of six major elements: Generic and Unresolved Safety Issues; Standardized and Advanced Reactors; Fuel Cycle, Transportation, and Safeguards; Developing and Improving Regulations; Severe Accident Policy Implementation; and Radiation Protection and Health Effects.

The resource increases in FY 1992 are to: resolve current high- and medium-priority generic safety issues and to prioritize new issues; support the review of advanced-light-water reactor standard designs; implement a regulatory policy on levels of radiation risk, which are below regulatory concern; support an increased number of rulemaking efforts; and expand radiation protection research, as recommended by the National Academy of Sciences.

GENERIC AND UNRESOLVED SAFETY ISSUES

This program element consists of activities associated with the resolution of generic and unresolved safety issues related to reactor and plant system design, and to plant operations. Generic issues being resolved include those pertaining to engineering, reactor systems, human factors, and severe accidents. This program element prioritizes proposed generic issues and assesses the safety benefits and effects of research programs and activities so that resources can be allocated for their maximum utility.

NUCLEAR SAFETY RESEARCH

Management of the resolution of safety issues that span the technical and organizational responsibilities of NRC offices ensures that a viable and up-to-date generic issues program is maintained. Toward this end, during FY 1991-1993, the identified generic safety issues will continue to be prioritized and an annual report and/or briefing will be provided to the Commission on the status of the resolution of generic issues. The agency's Safety Issue Management System will be updated monthly, the Generic Issue Management Control System will be updated quarterly, and supplements to NUREG-0933, Prioritization of Generic Safety Issues, will be updated semiannually.

Most of the current backlog of generic and unresolved safety issues (those identified prior to FY 1987) are expected to be resolved by the end of FY 1992. However, continuing efforts in FY 1993 and beyond are required to resolve the few remaining current issues and to resolve new issues (identified since FY 1987). In FY 1991, 12 generic safety issues will be resolved and, in FY 1992, 9 generic safety issues will be resolved.

During FY 1991-1993, the implications of the accident at Chernobyl for the safety regulation of commercial power plants will continue to be assessed as detailed in the Chernobyl Follow-Up Research Plan.

STANDARDIZED AND ADVANCED REACTORS

This program element consists of activities associated with identifying, reviewing, and resolving advanced reactor safety and policy issues associated with the licensability prospects of various advanced reactor proposals. In-depth independent analysis will be performed to verify the safety of advanced reactor designs and that appropriate means will be used to ensure their safety function. This program element also focuses on developing, reviewing, and resolving issues associated with the reactor standardization policy and overseeing its implementation; establishing licensing criteria for advanced reactor designs, for plant standardization, and for Severe Accident Policy implementation; supporting the Office of Nuclear Reactor Regulation in their review of the evolutionary and advanced reactors and the Electric Power Research Institute Requirements Document; and coordinating quality assurance activities for rulemaking and standards development.

During FY 1991-1992, the NRC will continue the resolution of severe accident issues for evolutionary- and advanced-light-water reactor designs in support of licensing reviews of standard reactor plant applications and will continue the review of the Electric Power Research Institute's Requirements Document. Also during FY 1991-1993, the NRC will continue review of the resolution of standardization issues associated with evolutionary reactors (GE-ABWR, RESAR SP/90, and CE System 80+) and will develop guidance, as necessary, for the resolution of generic issues associated with the implementation of the Standardization Policy.

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The final safety evaluation reports for the liquid-metal reactor, Power Reactor Inherently Safe Module (PRISM), and the modular high-temperature gas-cooled reactor (MHTGR) will be completed in FY 1991, after resolution of the major policy issues associated with these designs and as required to support DOE's program. The resolution of open items resulting from the review of the MHTGR and PRISM and the monitoring and evaluating of ongoing DOE technology programs and design activities associated with these designs will continue during FY 1991-1993 consistent with DOE's needs. The development and refinement of independent analytical tools needed to support the licensing of advanced reactor designs will continue. During FY 1992-1993, the NRC will begin development of a program of confirmatory and exploratory research on potential safety concerns.

During FY 1991-1993, the Office of Nuclear Regulatory Research will support the Office of Nuclear Reactor Regulation's review of the Electric Power Research Institute's Requirements Document and advanced reactor license applications. During FY 1991-1992, the NRC will review the Advanced Liquid Metal Reactor fuel cycle to identify safety and licensing issues. During FY 1992-1993, the Office of Nuclear Regulatory Research will support the Office of Nuclear Reactor Regulation in the design certification review of the ASEA Brown Boveri's Process Inherent Ultimate Safety (PIUS) and the Atomic Energy of Canada Limited's CANDU 3 advanced reactor designs. During FY 1991-1993, the NRC will continue computer modeling and analysis of the simplified-boiling-water reactor and the AP-600 advanced-passive reactor designs. Work will be initiated on experimental programs, if necessary, to support these analyses. During FY 1991-1993, the NRC will continue to participate in quality assurance standards committee activities and the Office of Nuclear Regulatory Research will support other NRC offices in the resolution of generic quality assurance issues. In FY 1991, the NRC will develop proposed revisions to Regulatory Guide 1.28, Quality Assurance Program Requirements (Design & Construction); Regulatory Guide 1.33, Quality Assurance Program Requirements (Operation); and will develop proposed new regulatory guides endorsing the ASME/NQA 2 and 3 quality-assurance standards. The final regulatory guides will be issued during FY 1992-1993. These guides are being revised to endorse industry standards (ASME/NQA and ANS 3.2) and to make them consistent with current guidance for operating reactors.

During FY 1991-1992, the Office of Nuclear Regulatory Research will develop a regulatory guide on the content, format, and uses of probabilistic risk assessments for new applications filed under 10 CFR Part 52. During FY 1991-1993, the standardization work and resolution of severe-accident issues will continue in support of the Office of Nuclear Reactor Regulation licensing activities. During FY 1991-1993, the Office of Nuclear Regulatory Research will continue to assess the need for and may develop rulemaking for Advanced Reactor Licensing Framework to address unique design characteristics associated with advanced reactor designs. The Office of Nuclear Regulatory Research will also consider development of additional guidance or regulatory requirements for Advanced Reactor Design Criteria to resist sabotage.

NUCLEAR SAFETY RESEARCH

FUEL CYCLE, TRANSPORTATION, AND SAFEGUARDS

This program element consists of activities associated with the development or modification and promulgation of regulatory requirements and guidance for fuel cycle activities, for transporting radioactive materials to ensure adequate protection, and for safeguarding strategic special nuclear material and protecting nuclear facilities.

During FY 1991-1992, the NRC will complete the decommissioning of the ice-condenser decontamination factor test facility. During FY 1991-1992, the NRC will complete the evaluation of the impact on storage casks of the heat generated by the spent fuel. During FY 1991-1993, the NRC will investigate the low-temperature oxidation of spent fuel in order to evaluate the acceptability of spent fuel storage in air and will complete the revision to Regulatory Guide 3.54, Spent Fuel Heat Generation in an Independent Spent Fuel Storage Installation. During FY 1991-1993, the NRC will continue to examine the emerging technologies for uranium enrichment as they are developed by DOE and will investigate potential radiological and chemical safety concerns.

During FY 1991-1992, the NRC will complete an effort to determine if the continued use of Department of Transportation-defined specification packages is appropriate. During FY 1991-1993, the NRC will assist in the development of international standards for the safe transportation of radioactive materials. These international standards will be used as a basis for domestic regulations, if needed. During FY 1991-1993, the NRC will continue to identify and revise, as needed, regulatory guides associated with safeguards guidance for nuclear reactors or fuel facilities possessing strategic special nuclear material. The proposed and final regulatory guides will be completed, as needed, during FY 1991-1993.

During FY 1991-1993, the NRC will issue proposed and final rules on: (1) day firing qualifications and physical fitness programs for security personnel at Category I fuel cycle facilities, (2) minor amendments to physical protection requirements, and (3) material control and accounting requirements for commercial gas centrifuge uranium enrichment plants. Also during FY 1991-1993, the NRC will assess the need and may develop rulemaking for: (1) Origin Swap of Nuclear Materials, (2) Licensee Announcement of Inspections at Materials Facilities, (3) Use of Deadly Force, (4) Regulations for Uranium Enrichment, and (5) Protection of Generic Safeguards Information.

DEVELOPING AND IMPROVING REGULATIONS

This program element consists of activities associated with: (1) managing and coordinating the reviews of NRC rulemaking activities and monitoring the scheduling of such rulemakings to ensure rules are developed in a timely manner; (2) supporting NRC regulatory impact analysis requirements through the research and development of generic methodology and guidance; and (3) developing regulatory products (e.g., regulations, policy statements, and guides) based on

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the results of NRC and other research. This program element also includes activities associated with Safety Goals Implementation, the development of a rule for license renewal (10 CFR Part 54), as well as a rule addressing the environmental effects of license renewal (10 CFR Part 51).

In FY 1991, the proposed rule on Fitness for Duty for Category I Facilities and Shipments will be initiated. During FY 1991-1992, the NRC will initiate a proposed rule on Dose Criteria for Postulated Accidents in High-Level Waste Geologic Repositories to address the issues of public protection following a postulated radionuclide release and structures, systems, and components important to safety. During FY 1991-1993, the NRC will assess the need and may develop rulemakings for: (1) nonpower reactor issues; (2) removal of generic exemptions for licenses; (3) training for medical licensees; (4) reasserting NRC sole authority for approving onsite low-level waste disposal in Agreement States; and (5) use and preparation of radiopharmaceuticals for diagnosis, therapy, or medical research.

During FY 1991-1993, the NRC will: coordinate and implement ongoing rulemaking efforts, will produce the Regulatory Agenda quarterly, provide the report on the status and control of rulemaking efforts to the Executive Director for Operations on a semiannual basis, maintain information systems for rulemaking and regulatory guides, and develop or perform approximately 16 regulatory impact analyses each year to support rulemaking and other generic requirements, as required by the backfit rule.

In FY 1991, the NRC will complete a review of the existing regulations and regulatory requirements to identify potential candidates that can be eliminated or modified without compromising safety. During FY 1992-1993, the NRC will initiate the implementation of changes in regulatory requirements identified by this review. This ongoing effort may be particularly fruitful in narrowing requirements to those of greatest safety significance and applicability to NRC's licensing reform initiatives.

Rule for License Renewal

The NRC has been considering what requirements should be placed on nuclear power plants in granting licenses to operate beyond the initial 40-year license term. In response to comments on NUREG-1317, Regulatory Options for Nuclear Plant License Renewal, and based on the discussion and comments from a November 1989 workshop, the staff issued a proposed rule and supporting documentation on Requirements for Renewal of Operating Licenses for Nuclear Power Plants for comment in FY 1990. After consideration of all comments, the staff will propose a final rule, 10 CFR Part 54, for Commission consideration for issuance in FY 1991. In parallel with the license renewal rule, the staff is developing a Generic Environmental Impact Statement that will comprehensively address the environmental effects of license renewal. In FY 1991, the NRC will issue for comment a proposed rule supported by the environmental impact statement. The final rule change to 10 CFR Part 51 will be issued in FY 1992.

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A regulatory guide, on format and content of license renewal applications and the associated standard review plan were published in draft form in FY 1991 and are scheduled to be published in final form in FY 1992.

Safety Goals Implementation

In FY 1989, the staff, in coordination with the Advisory Committee on Reactor Safeguards, proposed to the Commission a plan for implementing the Safety Goals Policy. The staff began to implement the safety goals in selected areas of regulatory practice in FY 1991. In FY 1992, a systematic review of the risk importance and the effectiveness of NRC regulations and regulatory practices will begin. Potential improvements are expected through review of the existing probabilistic risk assessment information base.

Research Educational Grants and Small Business Innovation Research

Pursuant to sections 31(a) and 141(b) of the Atomic Energy Act of 1954, as amended, the NRC is authorized to award grants and cooperative agreements to educational institutions, nonprofit institutions, State and local governments, and professional societies. The NRC grant program is administered in accordance with the Federal Grant and Cooperative Act of 1977, Office of Management and Budget guidance, and NRC policies and procedures. The purposes of this program are to increase public understanding of nuclear safety, enlarge the body of knowledge and technical information, and enhance the protection of the public health and safety. Such support to educational institutions is limited to no more than one percent of the total annual budget for the Office of Nuclear Regulatory Research, NRC. The current NRC grant program supports a variety of professional meetings and university-based research projects.

The Small Business Innovation Research Program (SBIR) is required by Public Law 97-219 to stimulate technological innovation by small businesses. The law requires that Federal agencies establish SBIR programs if their extramural research budget exceeds \$100 million. The NRC has participated in the program since it was established in 1982, notwithstanding the fact that the research budget has been less than \$100 million. The NRC's SBIR program supports high-quality and cutting-edge research of interest to the NRC. The program also seeks to couple this research with follow-on, private funding to pursue commercial applications and to increase technological innovation. About 110 to 130 SBIR proposals are reviewed each year and about 10 to 12 contracts are awarded.

SEVERE ACCIDENT IMPLEMENTATION

This program element consists of activities associated with applying the results of severe accident research directly to the regulatory process. Modification of the Commission's rules or policies regarding siting, emergency planning, containment design, and closure of severe accident issues are examples of areas where the results of severe accident research may effect future changes.

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In May 1988, the staff presented to the Commission an Integration Plan for Closure of Severe Accident Issues that consists of six major elements: (1) individual plant examinations, (2) containment performance improvements, (3) improved plant operations, (4) a Severe Accident Research Program, (5) external events, and (6) accident management. This program element also includes activities to investigate regulatory applications of new source-term information that have resulted from research on severe accidents.

During FY 1991-1993, the NRC will receive and review licensee evaluations of NRC containment performance-improvement recommendations as part of the individual plant examination program.

During FY 1991-1993, the NRC will continue to identify areas of regulatory activities that may be subject to change, as a result of source-term and severe-accident research. During FY 1991-1993, the NRC will implement changes to siting policy, regulations, and other regulatory activities.

During FY 1991-1993, the NRC will complete reviews of approximately 90 individual plant examination submittals. Insights gained from the individual plant examination reviews will be provided to the industry.

During FY 1991-1993, the NRC will review the individual plant examination-external event submittals provided by licensees, in response to the generic letter to be issued in final form in FY 1991.

During FY 1992-1993, the NRC will complete a technical update of the TID-14844 source term document, including issuance of revised Regulatory Guides 1.3, Assumptions Used for Evaluating the Potential Radiological Consequences of a Loss-of-Coolant Accident for Boiling-Water Reactors, and 1.4, Assumptions Used for Evaluating the Potential Radiological Consequences of a Loss-of-Coolant Accident for Pressurized-Water Reactors, and associated sections of the Standard Review Plan.

During FY 1992-1993, the NRC will initiate rulemaking to decouple reactor siting from plant-design aspects.

RADIATION PROTECTION AND HEALTH EFFECTS

This program element consists of activities associated with developing radiation protection standards and guidelines for implementing them; and for planning, developing, and directing safety research studies to provide the radiation protection information necessary for licensing decisions, inspection activities, and the standards development process. Two of the principal activities are the implementation of the revised standards for protection against radiation (10 CFR Part 20) and implementation of the below regulatory concern policy statement. The program element also includes analyzing the relationship between human exposure to ionizing radiation and radioactive material and the potential occurrence of both late- and early-radiogenic health effects, including the

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radiation risk to workers and the public, and estimates of the probability of increased incidence of cancer and genetic effects. These analyses are used to provide bases for severe accident consequence analysis, probabilistic risk assessment, the development of safety goals and emergency plans, the identification of radiation protection problems, the allocation of priorities for regulatory action, and environmental impact assessments. Recommendations of such organizations as the International Commission on Radiological Protection, the National Council on Radiation Protection and Measurements, Presidential guidance to Federal agencies, consensus standards, licensee performance indicators, cost and feasibility data, and available technical information also provide bases for developing regulatory and technical documents related to radiation protection for workers and the public.

Radiation Protection Issues

During FY 1991-1993, the NRC will develop and implement testing and accreditation criteria for in vivo bioassay assessment and extremity dosimetry. During FY 1991-1992, the NRC will complete the development of performance criteria and guidance for air sampling for internal dose control and will establish criteria for performing the alpha self-absorption correction in air sampling filters. During FY 1991-1993, the NRC will continue surveillance of industry and DOE research and development on dose reduction at nuclear power plants focusing on high-dose worker groups. In FY 1992, the NRC will: begin to develop a general quality assurance program for radiation protection measurements, review radiation protection regulatory requirements for need and consistency, determine the need to establish a computer-based radiation protection data base for NRC and licensee use, and develop detailed ALARA assessment methods. During FY 1992-1993, the NRC will: (1) continue a program for verifying health physics measurements, (2) develop computer codes for bioassay calculations, and (3) develop guidance for criteria to specify accurate breathing zones used in air sampling.

Health Effects Research

In FY 1991, research will be completed on placental transfer fractions for selected radionuclides to permit calculation of embryo/fetus dose from maternal intake in order to implement dose limits for pregnant workers. During FY 1991-1992, a regulatory position will be developed for calculating fetal doses from intake of the most critical radionuclides. During FY 1991-1993, the NRC will develop a regulatory position and consideration will be given to expanding the research to include other radionuclides.

During FY 1991-1993, the NRC will continue to support the review and analysis of health effects information and will provide research and operational support funds for the working groups of the International Commission on Radiological Protection, the National Council on Radiation Protection and Measurements, the Committee on Interagency Radiation Research and Policy Coordination, and the National Academy of Sciences.

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During FY 1991-1992, a feasibility study will be conducted to determine if a research program on the molecular and cellular effects of radiation can reduce the uncertainty in health risk estimates. The actual laboratory studies would be jointly funded by the NRC and other Federal agencies and would continue during FY 1992-1993. During FY 1991-1992, the uncertainty ranges for low-level radiation effects estimates will be better defined. During FY 1991-1993, the NRC will attempt to develop a consensus on the correlation of upper and lower limits to the uncertainty associated with health risk estimators.

During FY 1991-1993, the NRC will complete the development of health effects models for reactor accidents for "high" linear energy transfer radiation, including incorporation of the new consensus risk coefficients. During FY 1991-1992, the NRC will continue a review of the adequacy of present neutron dose limits. During FY 1992-1993, the NRC will develop appropriate regulatory guidance based on the results of a survey of existing research results on radiosensitive target cells for respiratory, gastrointestinal, and bone cancer. During FY 1991-1993, the NRC will continue an effort to establish a scientific consensus position on acceptable levels of radiogenetic risk. This effort will focus on all of the contributors to radiogenetic risk, including mortality, morbidity, genetic effects, teratogenic effects, and effects on embryo/fetus to develop a more comprehensive index of harm. In FY 1992, the NRC will begin development of the technical bases for including in NRC standards consideration of nonfatal cancer and genetic effects and will complete the research in FY 1993. During FY 1992-1993, the NRC will perform selected studies on the metabolism of radionuclide chemical forms to obtain data that can be used to improve internal dosimetry models.

Radiation Rules and Regulatory Guidance

During FY 1991-1993, the NRC will continue to monitor licensee performance by using the Radiation Exposure Information Reporting System. Processing of termination reports will continue and statistical summaries of worker doses will be issued annually. The NRC will also continue to work with the National Cancer Institute and other organizations to develop and implement a national worker dose data base to support health effects studies.

The development and revision of regulatory guides supporting the comprehensive revision of 10 CFR Part 20 will continue during FY 1991-1992. The guides will be completed on a schedule consistent with the effective implementation date of the final Part 20 rule.

Investigation of the potential buildup of radioactive materials at the liquid effluent outlets of selected operating reactors will be completed in FY 1992 and effluent release limits will be reviewed. During FY 1991-1992, investigation will continue on the threshold concentration to develop a standard for uranium toxicity and will be jointly funded by the NRC and DOE.

During FY 1991-1993, the NRC will perform a study of chemical radioprotectors and a study to determine the potential individual and population exposures from

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combined-exempt and deregulated quantities of radioactive material. During FY 1991-1992, the NRC will begin studies on the efficiency of new chelating agents to remove internally-deposited radionuclides and to evaluate the impact on nuclear power plant doses and on dose monitoring needs and analysis of changing the relative biological effectiveness ratio (10 versus 20) for neutrons.

During FY 1991-1993, the NRC will assess the need and will develop rulemaking for: (1) Extremity Dosimetry Accreditation, (2) Comprehensive Review of Part 21 for Nonreactor Facilities, (3) Import and Export of Radioactive Wastes, and (4) Rulemaking for use of Monoclonal Antibodies.

Environmental Policy and Decommissioning

During FY 1991-1992, based on specific petitions from biomedical licensees, the NRC anticipates completion of a feasibility analysis of a generic rulemaking on Radioactive Waste Below Regulatory Concern. If technically justified, the proposed rule will be issued in FY 1993. During FY 1991-1992, in response to the Low-Level Radioactive Waste Policy Amendments Act, the NRC expects to receive petitions from industry identifying specific waste streams that are below regulatory concern, and during FY 1991-1993, the NRC expects to receive petitions affecting the disposal of short half-life and low-specific activity material. These petitions will be evaluated and a rulemaking will be recommended if the petitions comply with the recently issued below regulatory concern policy. During FY 1991-1993, the NRC will periodically evaluate the effectiveness of exemption decisions in limiting potential public exposures.

During FY 1991-1993, the NRC will continue implementation efforts directed at decontamination/decommissioning activities. In FY 1991, the NRC will issue interim guidance that will define surface and volumetric levels of radioactive contamination below which facilities and lands can be released for unrestricted public use. This action will be paralleled during FY 1991-1992 by a rulemaking to codify the interim guidance into Commission regulations. In FY 1991, the NRC will complete a systematic assessment of the past exemption decisions to determine their consistency with below regulatory concern policy provisions. Any required, corrective rulemaking activities will be initiated during FY 1991-1993.

During FY 1991-1993, research will be conducted and the need for rulemaking on the licensing of neutron irradiated gemstones and their distribution as exempted products will be evaluated, consistent with the below regulatory concern policy. During FY 1991-1992, the NRC will continue efforts to examine the potential pathways and doses from reconcentration of radioactive materials released into sanitary sewers and the consequences of the release of such materials to the environment. In FY 1993, the NRC will begin to modify regulations and regulatory guidance, as appropriate, based on the results of these findings.

During FY 1991-1992, the NRC will assess the need and initiate other related rulemakings, as appropriate, which will require licensees to keep appropriate records; to submit appropriate reports documenting decommissioning and

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decontamination efforts; and to submit all verification surveys, including those conducted after license termination. In FY 1993, the NRC will determine if rulemaking is needed to update requirements for financial assurance for decommissioning and to modify requirements, based upon license extension activities. The Environmental Protection Agency and its interagency task group will prepare Federal guidance on public exposure resulting from residual radioactivity limits. During FY 1991-1992, the NRC will participate in establishing limits consistent with national and international recommendations and will establish limits that are practical for implementation of NRC responsibilities.

During FY 1992-1993, the NRC will initiate development of residual radioactivity criteria for tools and equipment similar to the guidance previously developed for facilities and lands and will examine the appropriateness of criteria for release of areas containing buried radioactive materials. During FY 1991-1992, the NRC will develop regulatory guidance for implementing the financial criteria and assurance provisions of the decommissioning rule and, beginning in FY 1993, will reexamine the validity of the criteria and certification amounts based upon inflation and changes in the costs of decommissioning and disposal of wastes.

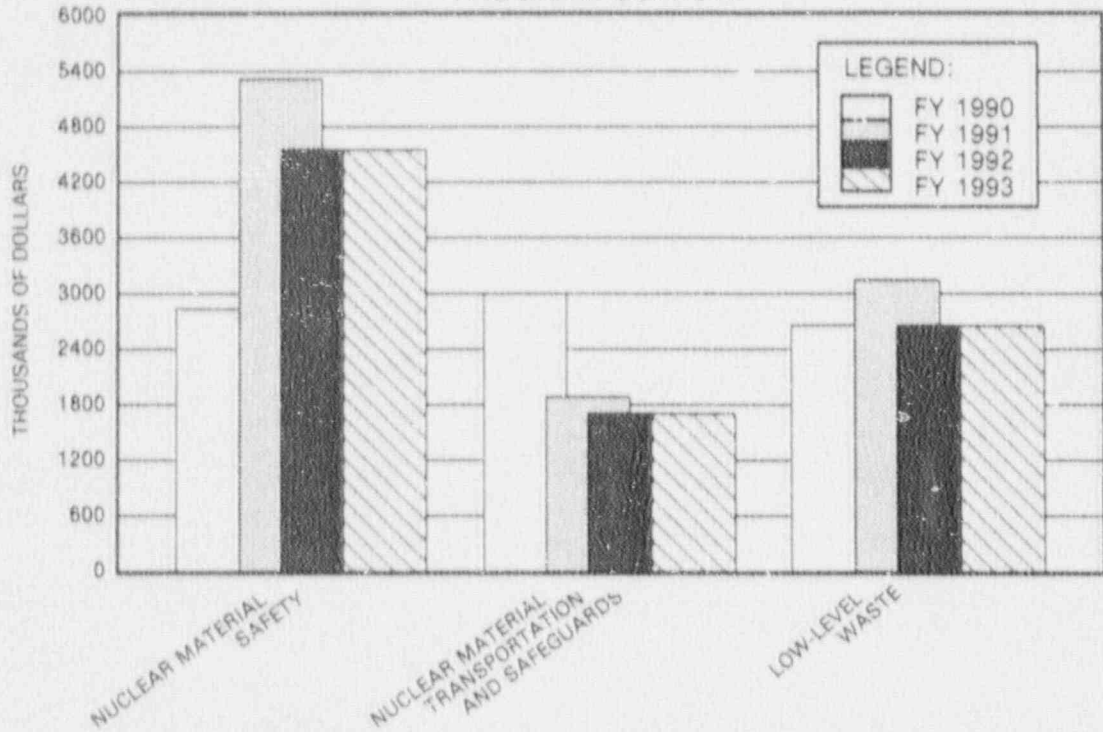
During FY 1991-1993, the NRC will: complete the analyses of the decommissioning data from the Shippingport reactor; continue the collection of data on the decommissioning of other reactors; and update the evaluations of the technology, safety, and costs for decommissioning reactors. During FY 1991-1993, the NRC will complete research on the effect on onsite reactor-waste solution solidification of repeated decontamination on dose reduction and on the impact of decontamination solutions used for maintenance and for decommissioning.

**NUCLEAR MATERIAL AND LOW-LEVEL WASTE
SAFETY AND SAFEGUARDS REGULATION**

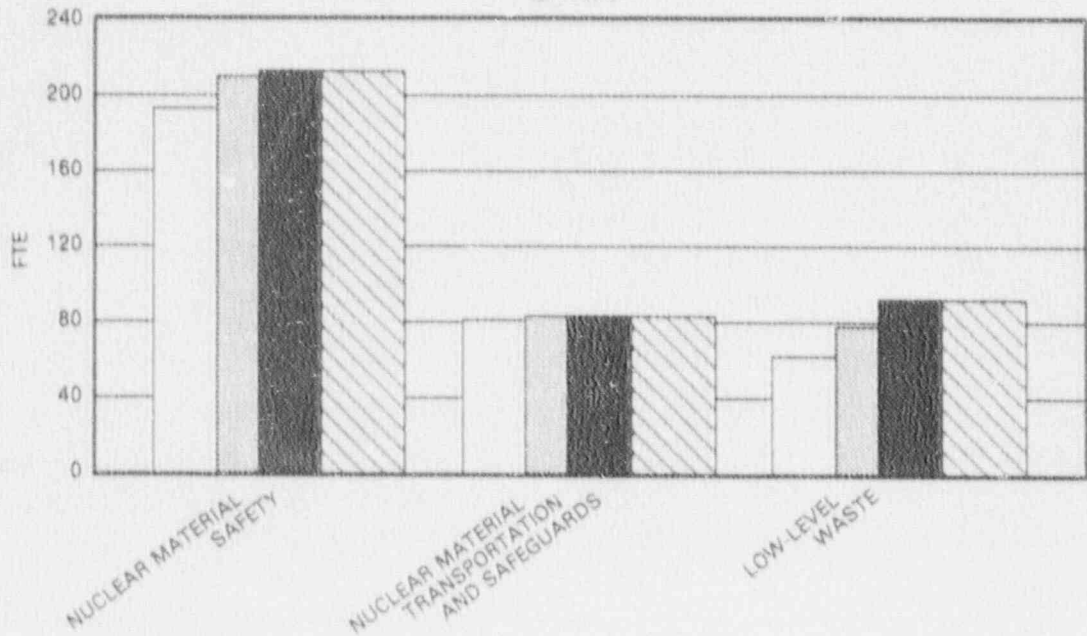


NUCLEAR MATERIAL AND LOW-LEVEL WASTE SAFETY AND SAFEGUARDS REGULATION

PROGRAM SUPPORT



STAFF



NUCLEAR MATERIAL AND LOW-LEVEL WASTE SAFETY AND
SAFEGUARDS REGULATION

(Dollars are in thousands, except in text, where whole dollars are used; staff numbers are in full-time equivalents.)

Total FY 1992 estimated obligations.....\$49,798

	<u>FY 1990 Actual</u>	<u>FY 1991 Estimate</u>	<u>FY 1992 Estimate</u>	<u>FY 1993 Estimate</u>
Salaries and Benefits	\$ 20,942	\$ 26,425	\$ 28,379	\$ 28,379
Program Support	8,478	10,341	8,900	8,900
Administrative Support	8,605	9,865	10,768	10,768
Travel	<u>1,610</u>	<u>1,884</u>	<u>1,751</u>	<u>1,751</u>
Total Obligations	<u>\$ 39,835</u>	<u>\$ 48,515</u>	<u>\$ 49,798</u>	<u>\$ 49,798</u>
(Staff)	(336)	(371)	(388)	(388)

Program Support Funds and Staff

The Nuclear Material and Low-Level Waste Safety and Safeguards Regulation program support funds and staff are allocated to programs as shown below. The program support funds are allocated for work performed by Department of Energy (DOE) laboratories and commercial contractors for the NRC. The narrative that follows describes these programs and the reasons they are needed.

	<u>FY 1990 Actual</u>		<u>FY 1991 Estimate</u>		<u>FY 1992 Estimate</u>		<u>FY 1993 Estimate</u>	
	<u>Funds</u>	<u>Staff</u>	<u>Funds</u>	<u>Staff</u>	<u>Funds</u>	<u>Staff</u>	<u>Funds</u>	<u>Staff</u>
Nuclear Material Safety	\$2,827	193	\$ 5,312	210	\$4,550	213	\$4,550	213
Nuclear Material Transportation and Safeguards	2,999	81	1,885	83	1,700	83	1,700	83
Low-Level Waste	<u>2,652</u>	<u>62</u>	<u>3,144</u>	<u>78</u>	<u>2,650</u>	<u>92</u>	<u>2,650</u>	<u>92</u>
TOTALS	\$8,478	336	\$10,341	371	\$8,900	388	\$8,900	388

DESCRIPTION OF MISSION AREA

Nuclear Material and Low-Level Waste Safety and Safeguards Regulation encompasses all NRC public health and safety, safeguards, and environmental activities related to the licensing and inspection of nuclear fuel cycle facilities, users

Nuclear Material and Low-Level Waste Safety and Safeguards Regulation

of nuclear materials, the transportation of nuclear materials, the safe management and disposal of low-level radioactive wastes, the safe interim storage of spent fuel and high-level waste at a monitored retrievable storage (MRS) facility, and uranium recovery activities and related remedial actions. In addition, it includes an integrated agency program to oversee decontamination and decommissioning of facilities and sites associated with NRC-licensed activities. It also includes an assessment of the domestic safeguards environment and safeguards reviews for all licensing activities involving the export of special nuclear material.

Nuclear Material and Low-Level Waste Safety and Safeguards Regulation consists of three major programs: Nuclear Material Safety, Nuclear Material Transportation and Safeguards, and Low-Level Waste. The Nuclear Material Safety program is designed to ensure that licensees protect the public health and safety, worker safety, and the environment during the handling and use of radioactive material during both normal operations and abnormal events. The Nuclear Material Transportation and Safeguards program is designed to ensure that licensees transport nuclear materials in packages that provide a high degree of safety in the event of a transportation accident and they deter, detect, and protect against radiological sabotage, theft, or diversion of special nuclear material at licensed nuclear fuel cycle facilities and in transport. The Low-Level Waste activities in this mission area are mandated by the Low-Level Radioactive Waste Policy Act (LLRWPA) of 1980, the Low-Level Radioactive Waste Policy Amendments Act (LLRWPA) of 1985, the Uranium Mill Tailings Radiation Control Act (UMTRCA) of 1978, and portions of the West Valley Demonstration Project Act of 1980.

The LLRWPA makes each State responsible for providing for the disposal of low-level waste generated within its borders. The LLRWPA gives the NRC responsibility for: defining low-level waste, licensing the Federal disposal of commercial low-level waste greater than Class C (as defined in 10 CFR Part 61), granting individual waste generators emergency access to non-Federal disposal facilities, providing regulatory guidance on alternatives to conventional shallow land burial, ensuring that license reviews can be completed within 15 months, and expeditiously addressing petitions to declare wastes as below regulatory concern.

The UMTRCA directs the NRC to develop regulations and to license the disposal of mill tailings from licensed uranium mills. Congressional action also directed that the NRC regulations be amended to conform to the Environmental Protection Agency (EPA) standards for both radiation and groundwater protection. UMTRCA directs the NRC to approve licensee mill tailings disposal plans, to review and concur in the site-by-site implementation of the DOE program for mill tailings remedial actions, and to license DOE possession of these sites.

Nuclear Material and Low-Level Waste Safety and Safeguards Regulation

NUCLEAR MATERIAL SAFETY

	<u>FY 1990</u> <u>Actual</u>	<u>FY 1991</u> <u>Estimate</u>	<u>FY 1992</u> <u>Estimate</u>	<u>FY 1993</u> <u>Estimate</u>
Funds (Staff)	\$ 2,827 (193)	\$ 5,312 (210)	\$ 4,550 (213)	\$ 4,550 (213)

This program is designed to ensure that licensees protect the public health and safety, worker safety, and the environment during the handling and use of radioactive material during both normal operations and abnormal events. It consists of three major elements: Fuel Facility and Spent Fuel Storage Licensing and Inspection, Licensing and Inspection of Nuclear Material Users, and Event Evaluation.

The staff increase in FY 1992 is to conduct approximately 200 additional inspections per year for a total of 3,300 routine health and safety inspections of (approximately 8,000) materials licensees. The program support decrease in FY 1992 is a result of the completion of medical quality assurance projects.

FUEL FACILITY AND SPENT FUEL STORAGE LICENSING AND INSPECTION

This program element comprises NRC licensing and inspection of the nuclear fuel cycle after milling, the interim storage of spent fuel outside of reactor spent fuel pools, and the safe interim storage of spent fuel and high-level waste at an MRS facility. It includes the processing of uranium ore concentrates (yellowcake) into a suitable form for fuel; the development and fabrication of reactor fuel; the NRC licensing and inspection of spent fuel storage activities; and the safe storage of fresh fuel at reactor sites, until the reactor core is initially loaded with fuel. This requires detailed health, safety, and environmental reviews and inspections of licensee procedures and facilities to ensure safe operations. This program element includes the safety overview of the DOE's high-level waste solidification activities and decontamination and decommissioning activities at the former reprocessing facility in West Valley, New York. Also, this program element includes staff actions necessary to conduct health and safety licensing reviews and inspections for the construction and operation of a centrifuge uranium enrichment facility.

The NRC will complete the review and evaluation of approximately 100 license applications (new, amendment, and renewal) and topical reports for nuclear fuel cycle facilities each year during FY 1991-1993. This will include the review of an application for a license to construct the first commercial centrifuge uranium enrichment plant in the United States. The application is expected to be submitted in FY 1991. The NRC has recently increased the license term for

Nuclear Material and Low-Level Waste Safety and Safeguards Regulation

major operating fuel cycle licensees from a 5-year period to a 10-year period. The NRC will also review safety demonstration submittals prepared by the major nuclear fuel cycle licensees biennially and amend the licenses accordingly. The NRC will conduct routine, scheduled health and safety inspections of approximately 30 fuel cycle facilities or sites each year during FY 1991-1993 to provide reasonable assurance that unsafe conditions, involving unnecessary and harmful radiation exposure to employees and the public, do not develop and that radioactive materials are properly controlled to prevent a nuclear criticality accident.

In addition to the normal inspections, approximately five enhanced operational safety assessments or special team inspections will be conducted each year in FY 1991-1993 at various nonreactor facilities. These safety assessments are coordinated with the EPA and the Occupational Safety and Health Administration, as appropriate. During FY 1991-1993, enhanced operational safety assessments will be conducted at selected fuel facilities and large materials licensees approximately 1 year before the license is renewed. The assessment will help to identify important safety issues that need to be resolved while the license is being renewed. As required, specialized expert advice will be provided for licensees that have experienced problems. The implementation of lessons learned from routine inspections, enhanced fuel facility safety assessments, and the identification of radiological and nonradiological risks will continue. New requirements will be incorporated into licenses through amendments and license renewals.

As required by the West Valley Demonstration Project Act of 1980, the NRC will continue to consult with DOE on the planning and safety analyses for the high-level waste solidification demonstration project at West Valley, New York. The NRC will also respond to DOE requests for consultation, as DOE initiates analysis of alternatives for decontamination and decommissioning and eventual site closure. The NRC's close consultation with DOE is important to ensure that the resulting solidified high-level waste will be acceptable for disposal in the national high-level waste repository and to provide any necessary guidance to ensure the safety of the West Valley facility.

The DOE system for inventory and forecast of spent fuel and high-level radioactive waste generation will continue to be monitored closely to enable timely and adequate waste management and early warning of capacity problems. The NRC will continue to maintain awareness of any potential delays in the DOE waste disposal program. In FY 1991-1993, the NRC will conduct inspections of the implementation of quality assurance programs by dry storage vendors.

Under the Nuclear Waste Policy Amendments Act of 1987, the NRC is responsible for licensing any MRS facility. During FY 1991-1993, the NRC will interact with DOE, as a potential license applicant for an MRS facility and with other parties, as appropriate. The MRS involves the receipt, handling, packaging, and storage of spent fuel and high-level waste in a facility that permits continuous monitoring and ready retrieval for subsequent shipment to a permanent repository.

Nuclear Material and Low-Level Waste Safety and Safeguards Regulation

LICENSING AND INSPECTION OF NUCLEAR MATERIAL USERS

This program element comprises NRC licensing and inspection of approximately 8,000 medical, academic, industrial, and commercial users of nuclear and other radioactive material. These uses include: medical diagnosis and therapy, medical and biological research, academic training and research, industrial gauging and nondestructive testing, production of radiopharmaceuticals, fabrication of commercial products such as smoke detectors, and evaluation of sealed sources and devices. Detailed health and safety reviews and inspections of licensee procedures and facilities are performed to provide reasonable assurance of safe operations and safe product development.

The NRC will complete the review and evaluation of approximately 5,200 to 5,300 applications for new licenses, license amendments, license renewals, and sealed source and device designs for the use of radioactive material each year during FY 1991-1993. The agency will conduct approximately 3,100 routine health and safety inspections and closeout inspections of materials licensees in FY 1991. These inspections are designed to ensure that conditions that could cause unnecessary radiation exposure to employees, the public, and the environment are promptly identified and to ensure prompt enforcement actions. On the basis of lessons learned from recent events, the frequency of routine inspections for selected categories of materials licensees will increase to an annual level of approximately 3,300 in FY 1992-1993.

Under a general, nuclear-materials license, a person may use certain devices, containing radioactive materials, without obtaining a specific NRC license, but the person must comply with applicable NRC rules. Several contamination incidents, such as the detection of radioactive contamination from certain static eliminator devices, have raised questions about the effectiveness of current, general-license regulations and prompted the NRC to conduct a general-license study. Improvements cited in this study include: changes to the general-license regulations; testing safety features of sealed source and device designs to ensure devices are built, as designed, and to determine the risk of exposure if safety features fail; and improving the accounting of approximately 200,000 generally-licensed devices. During FY 1991-1993, the NRC will implement the recommendations of the general-license study on a priority basis.

To improve quality assurance at medical licensees, the NRC will perform a study in FY 1991 to identify the quality assurance standards that have been established by various professional health care organizations and also review the use of those standards by NRC medical-use licensees. In FY 1992, the NRC will begin to conduct onsite inspections of medical licensees to ensure prompt and appropriate implementation of the basic quality assurance rule. This effort will entail inspection of licensee quality assurance programs and review of proposed alternative measures to ensure quality. Based in part on these efforts, in FY 1993 the NRC will analyze the benefits and impacts of the basic quality assurance rule and evaluate the need for a comprehensive quality assurance rule.

Nuclear Material and Low-Level Waste Safety and Safeguards Regulation

In FY 1991-1993, the NRC will continue working with the American Society of Non-destructive Testing, the State of Texas, and others to improve radiography safety. Also, the NRC will continue to conduct inspections at temporary and field radiography job sites, where actual operations are being performed. Industrial radiography causes the largest number of overexposure of employees to radiation. The NRC has endorsed certification of radiographers, in addition to promulgating new safety standards for equipment, in an effort to reduce these unnecessary exposures and to improve radiography safety. The NRC will develop a certification regulation for requiring third-party certification of radiographers, if deemed necessary, based on the voluntary American Society of Nondestructive Testing program.

EVENT EVALUATION

This program element comprises the review of licensee operational data, and incident response coordination and training for safety events involving nuclear materials and fuel cycle facilities. The NRC will maintain the ability to respond to and evaluate safety events involving nuclear materials. Based on past licensee performance and the associated levels of perceived risk, the NRC will increase regulatory oversight of licensees that have experienced problems. Recent events include: contamination from static eliminator devices, lost and damaged radioactive gauges, and medical misadministrations of nuclear materials.

The NRC will continue to maintain its capabilities to respond to unusual nuclear emergencies by training emergency response staff, which includes the preparation for and participation in exercises involving various accident scenarios at the NRC Operations Center. Radiological contingency planning, including coordination with the Federal Emergency Management Agency (FEMA) and the Agreement States, will also continue.

The NRC will continue the review and analysis of operational safety data received from nuclear fuel cycle facilities and radioactive materials licensees. In FY 1991 and continuing through FY 1993, the project to evaluate the operational performance of fuel cycle and material licensees will move into the implementation stage. The focus will shift from developing performance measures; to the evaluation and tracking of licensees or categories of licensees; and the assessment of the accuracy, consistency, and appropriateness of the performance measures.

Nuclear Material and Low-Level Waste Safety and Safeguards Regulation

NUCLEAR MATERIAL TRANSPORTATION AND SAFEGUARDS

	<u>FY 1990</u> <u>Actual</u>	<u>FY 1991</u> <u>Estimate</u>	<u>FY 1992</u> <u>Estimate</u>	<u>FY 1993</u> <u>Estimate</u>
Funds (Staff)	\$ 2,999 (81)	\$ 1,885 (83)	\$ 1,700 (83)	\$ 1,700 (83)

This program is designed to ensure that licensees transport nuclear materials in packages that will provide a high degree of safety, in the event of a transportation accident, and that they deter, detect, and protect against the radiological sabotage, theft, or diversion of special nuclear materials at licensed nuclear fuel cycle facilities and in transport. This program also is designed to assist in meeting NRC's international safeguards responsibilities. This program consists of three major elements: Regulating the Transport of Nuclear Materials, Safeguards Licensing and Inspection, and Threat and Event Assessment and International Safeguards.

REGULATING THE TRANSPORT OF NUCLEAR MATERIALS

This program element consists of the NRC activities associated with the transportation of radioactive materials, such as special nuclear materials; industrial radiography devices; and low-level and high-level radioactive wastes. These activities include review and evaluation of transport package applications and issuance of package certifications, inspection of licensees' quality assurance and control programs for fabrication, packaging and shipping these materials, and inspections of physical security measures during shipments of special nuclear material. The NRC transportation programs are closely coordinated with those of the Department of Transportation and, as appropriate, with DOE and FEMA.

The NRC will complete the review and evaluation of approximately 100 container design applications (new, amendment, and renewal) each year during FY 1991-1993. Such applications are submitted by commercial vendors for transport of large quantities of radioactive material and by the DOE for shipment of naval reactor fuel and other radioactive materials.

The NRC will also review and evaluate new transportation container designs required to ship high-level waste under the Nuclear Waste Policy Act of 1982. Technical guidance will be provided to DOE during the design, engineering, certification, and fabrication of a prototypical family of truck and rail/barge transport container designs. The Commission will continue to emphasize the importance of compatibility among storage, transportation, and disposal designs to minimize handling of spent fuel and high-level waste. The NRC expects to

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receive approximately two applications for certification of transportation container designs each year beginning in FY 1992.

In addition to certifying container designs, the NRC will complete the review and evaluation of approximately 45 transport safeguards plans for shipments of special nuclear material each year during FY 1991-1993 and will also perform surveys of routes proposed for shipments of nuclear material. In FY 1992, the NRC will publish a proposed rule to strengthen regulatory requirements of strategic special nuclear material, based on the results of the NRC/DOE comparability review of transport protection requirements for Category I and Category II materials.

As part of inspections focused on other regulatory program areas, the NRC will review transportation-related safety requirements at approximately one-third of the nuclear material licensees and at most, if not all, of the fuel and reactor facility licensees. In addition, approximately 5 inspections of the implementation of quality assurance programs by suppliers and fabricators of NRC-certified transport packages and approximately 20 transport physical security inspections of carriers and shippers will be conducted each year during FY 1991-1993.

SAFEGUARDS LICENSING AND INSPECTION

This program element consists of the NRC activities required to license and inspect safeguards programs covering the fabrication, use, and export of enriched uranium and plutonium. Licensing activities include the evaluation of detailed plans, procedures, and operational systems submitted by applicants for maintaining accountability of material and for deterring and responding to threats, theft, or diversion of nuclear material and acts of radiological sabotage. The NRC's safeguards inspections are directed at ensuring that licensees comply with NRC requirements, such as area access control, sophisticated detection and alarm systems, barriers, material control and accounting systems, process monitoring systems, contingency plans for responding to threatening situations, and trained armed response personnel.

The NRC conducts safeguards licensing reviews and inspections for fuel cycle facilities used for the fabrication of enriched uranium fuel, nuclear fuel research and development, the storage of irradiated reactor fuel, and the enrichment of fissile isotopes. In FY 1991-1993, the NRC will complete the review and evaluation of approximately 120 new and amended safeguards plans for fuel cycle facilities and approximately 140 export license applications each year. It will also conduct approximately 45 safeguards inspections at 11 nuclear fuel cycle and other nonreactor facilities, subject to safeguards requirements. During FY 1991-1993, the NRC will upgrade its programs for assessing the effectiveness of licensee protection against theft or diversion of strategic special nuclear materials. This will be accomplished through the development and implementation of a performance-oriented inspection program for Category I facilities, providing an in-depth review of security system operation, maintenance, and human integration. In addition, the NRC will develop a program

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and conduct diversion path analyses at Category I facilities to assure that process waste streams (solid, liquid, and gaseous) cannot be used as diversion paths for nuclear materials.

In FY 1991, the NRC will amend 10 CFR Part 74 to cover commercial uranium enrichment plant material control and accounting and, in FY 1991-1993, will develop safeguards guidance for licensing such a facility. The NRC will conduct the required safeguards licensing reviews, when an application for a centrifuge uranium enrichment facility is received. The application is expected to be submitted in FY 1991.

THREAT AND EVENT ASSESSMENT AND INTERNATIONAL SAFEGUARDS

This program element consists of activities to support the evaluation of the "threat environment" to ensure the continued validity of the NRC regulatory design-basis threat of theft and radiological sabotage. This program element also includes: safeguards incident response training, joint NRC/DOE operation of the national data base and information support system (Nuclear Materials Management and Safeguards System), strengthening International Atomic Energy Agency (IAEA) safeguards, and implementation of the Safeguards Agreement between the United States and the IAEA.

The threat environment comprises all reported information on potential or actual threats; adversary characteristics, intentions, and capabilities of terrorist group activities; and any real domestic or foreign events of a nuclear or non-nuclear nature. On the basis of a continuing evaluation of the threat environment, the validity of the NRC design-basis threat statements will be documented formally on a semiannual basis. Assessments of threats will provide the basis for an appropriate response to threats as they are received and evaluated by the NRC information assessment team.

The NRC will provide training in response procedures to the incident response teams for transportation or safeguards-related events at fuel cycle facilities. The NRC also will continue its liaison with other Federal and State agencies in support of incident response responsibilities.

Another basic component of this element is the continual review and analysis of safeguards operational data. The review and evaluation of threat information, safeguards operational data, and the analysis of trends will continue each year during FY 1991-1993. The NRC will publish annually revisions to the Safeguards Summary Event List.

During FY 1991-1993, the NRC will continue to participate with other Federal agencies in the development of bilateral agreements governing the export and import of nuclear equipment and materials. During FY 1991-1993, the NRC will continue to participate as a member of the interagency U.S. Physical Protection Review Team to conduct technical information exchanges with representatives of foreign governments on matters of physical protection procedures and practices

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and to host reciprocal visits to the U.S. During FY 1991-1993, the NRC will continue to support IAEA-sponsored international safeguards activities concerned with nuclear non-proliferation.

The U.S./IAEA Safeguards Agreement places selected U.S. nuclear facilities under IAEA safeguards. During FY 1991-1993, the NRC will continue to issue license amendments, review and approve compilation of data on nuclear materials transactions, and inventory data for these facilities. The NRC will assist the IAEA in inspection activities at selected U.S. nuclear facilities, as required. The NRC will also continue to participate in the management and direction of the Technical Support Coordination Committee, U.S. Interagency Action Plan Working Group, and other efforts associated with IAEA safeguards.

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LOW-LEVEL WASTE

	<u>FY 1990</u> <u>Actual</u>	<u>FY 1991</u> <u>Estimate</u>	<u>FY 1992</u> <u>Estimate</u>	<u>FY 1993</u> <u>Estimate</u>
Funds (Staff)	\$ 2,652 (62)	\$ 3,144 (78)	\$ 2,650 (92)	\$ 2,650 (92)

This program is designed to ensure the effective and efficient discharge of NRC responsibilities under LLRWPA, LLRWPA, UMTRCA, and portions of the West Valley Demonstration Project Act of 1980. This program consists of three major elements: Low-level Waste Disposal Licensing and Inspection, Uranium Recovery Licensing and Inspection, and Decommissioning.

The staff increase in FY 1992 is to conduct low-level waste licensing reviews for new low-level waste disposal facilities and to ensure that material, fuel facility, and reactor sites are decontaminated and decommissioned, in accordance with NRC criteria. The program support decrease in FY 1992 is due to the reduction in NRC reviews of DOE's remedial actions to be taken at mill tailings sites. This does not keep DOE from proceeding with its remedial actions.

LOW-LEVEL WASTE DISPOSAL LICENSING AND INSPECTION

This program element comprises the NRC's licensing and inspection effort for those facilities under NRC jurisdiction that are engaged in near-surface, land disposal. Regulatory responsibilities are implemented through detailed health, safety, and environmental reviews and inspections of licensee procedures and facilities to ensure safe operations.

During FY 1991-1992, the NRC will develop specific licensing criteria for a low-level waste disposal facility to include a financial surety arrangement for decontamination, decommissioning, and cleanup, including long-term maintenance and monitoring. In FY 1991, the NRC will, if needed, develop regulatory guidance on low-level waste custody and title transfer to States.

The NRC also will provide limited technical assistance to the Agreement States; the low-level waste compacts; State regulatory bodies; and the States of Nevada, South Carolina, and Washington, where the existing low-level waste disposal sites are located. The NRC will provide technical assistance to approximately five Agreement States that are developing and implementing plans to construct low-level waste disposal facilities. One Agreement State license application is expected in FY 1991 and one in FY 1992.

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In FY 1991-1993 the NRC will continue to provide prelicensing guidance to potential new applicants for low-level waste disposal facility licenses as they proceed to meet the January 1, 1993, deadline to arrange for disposal of their waste. The NRC expects to receive two low-level waste disposal facility applications from non-Agreement States. The NRC is required by the LLRWPA to complete its review of each application within 15 months after formal receipt, excluding the public hearing process. In FY 1992, NRC staff, supplemented by contractual support, will initiate the NRC license review for an application. In FY 1993, the NRC will complete the review of the first application, begin the review of another license application, and prepare for any hearings.

During FY 1991-1993, the NRC will develop a performance assessment modeling capability in the area of source-term evaluation to be able to conduct license reviews in the 15 months mandated by law and to provide guidance to potential licensees and Agreement States on low-level waste disposal. The integrated methodology will be refined to address routine and accidental releases during the operational and post-closure periods. In-house capabilities will be enhanced by development of a data base on performance assessment and by review and prequalification of computer codes used in evaluating overall site suitability and facility performance. Performance assessment products will be made available to States and potential licensees.

The NRC will review petitions to exempt, from NRC jurisdiction, certain low-level waste streams that are below regulatory concern. One petition is expected to be submitted each year during FY 1991-1993. The NRC will review six topical reports on waste solidification processes, waste classification systems, and improved disposal containers in FY 1991 and three each year during FY 1992-1993. In FY 1991-1993, the NRC will continue to regulate the disposal of special nuclear material at the two NRC-licensed low-level waste disposal sites at Hanford, Washington, and Barnwell, South Carolina. In FY 1992-1993, the NRC will review the site Closure Plan for the special nuclear material license at Barnwell.

During FY 1991-1993, the NRC will begin to implement an enhanced inspection program at waste generator facilities and operating and developing low-level waste disposal facilities. This program will address disposal facility construction, operation, and radiation protection and environmental surveillance and update inspection procedures applied in assessing generator compliance with 10 CFR Part 61 waste form requirements. During FY 1991-1993, low-level waste inspections for special nuclear material will continue at reactor sites and at Hanford and Barnwell.

URANIUM RECOVERY LICENSING AND INSPECTION

This program element includes: the NRC's licensing and inspection of uranium mills; heap-leaching facilities; ore-buying stations; commercial solution mining; uranium extraction research and development projects; and commercial disposal of byproduct material, as defined in section 11e.(2) of the Atomic Energy Act

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of 1954. This requires detailed health, safety, and environmental reviews and inspections of licensee procedures and facilities, to provide reasonable assurance of safe operations; the development of NRC's regulatory guidance to implement the EPA standards for regulating mill tailings; and the site-by-site approval of licensee plans for disposal of mill tailings and other byproduct material, as defined in section 11e.(2) of the Atomic Energy Act of 1954.

The NRC will complete the review and evaluation of approximately 50 license applications (new, amendment, and renewal) for uranium recovery facilities each year during FY 1991-1993. Approximately 135 licensee monitoring and agency inspection reports will be reviewed to assess licensee performance. The NRC will also conduct approximately 35 inspections of uranium recovery facilities each year during FY 1991-1993. These inspections thoroughly review the licensee's program and implementation of license conditions to protect the public health and safety and the environment.

This program element also comprises the NRC's efforts related to the review and evaluation of the remedial actions to be taken by DOE at 24 mill tailings piles at 22 sites as well as at several thousand contaminated properties located near the sites. The NRC reviews remedial action plans and proposed designs for the site and properties in the vicinity of the site and concurs in DOE's plans for long-term control of radiation or radioactive and nonradioactive releases from the site and for the protection and cleanup of groundwater. Once the remedial action has been completed, the NRC is responsible for licensing DOE for long-term care and site maintenance.

The NRC has already concurred in remedial action plans for 9 of the 22 sites. The DOE's current schedule is to complete the construction, in accordance with remedial actions plans, at these nine sites, plus nine additional sites, by FY 1993. During FY 1991-1993, the NRC will continue to review and concur in DOE's proposed remedial action plans and related documents.

During FY 1992-1993, the NRC will implement a new program plan for dam safety for all NRC licenses and coordinate activities with FEMA. This program was developed to improve the effectiveness of NRC's implementation of the Federal Guidelines on Dam Safety.

DECOMMISSIONING

This program element comprises the NRC's integrated requirements for the decontamination and decommissioning of facilities and sites associated with NRC-licensed activities. Decommissioning involves safely removing a facility from service and reducing residual radioactivity to a level that permits release of the property for unrestricted use. This is an action to be taken by a licensee prior to termination of a license.

Decommissioning regulations and guidance will be developed in FY 1992 to identify the level of cleanup of structures, soil, and groundwater necessary to permit

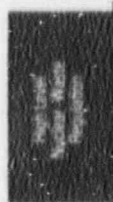
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unrestricted use. This information is needed in developing decommissioning plans. During FY 1991-1993, the Office of Nuclear Material Safety and Safeguards will continue to manage a program for materials facility decommissioning to review submittals resulting from the Decommissioning Rule. The submittals will include financial assurance certifications and decommissioning funding plans for approximately 10 new applications per year, 10 license terminations per year, and approximately 260 reviews of existing licenses each year during FY 1991-1993. Three reviews of decommissioning funding plans for major fuel cycle facilities will be conducted in FY 1991 and two during FY 1992. Beginning in FY 1991 and continuing through FY 1993, the NRC will start the review of approximately 18,000 materials and fuel cycle facilities decommissioned since 1965, to ensure that these sites were adequately decontaminated prior to license termination. The review will begin by screening records to identify whether there are sites where follow-up surveys and more detailed site characterization are appropriate. Based on this review, NRC will take appropriate actions to ensure that the sites have been adequately decontaminated.

During FY 1991-1993, the NRC will continue to conduct licensing reviews and inspections for shutdown power reactors having a license to possess nuclear material. During FY 1991-1992, the NRC will review a decommissioning plan for a reactor.

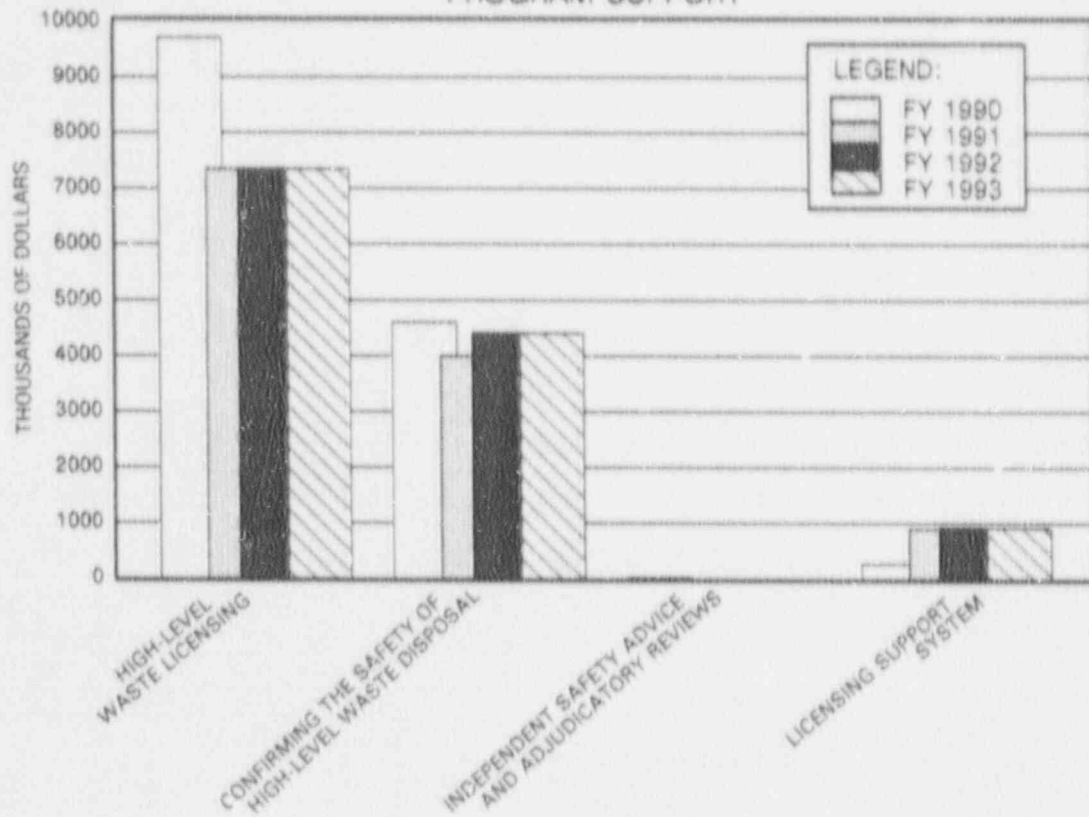
During FY 1991-1993, the NRC will implement the objectives of the Site Decommissioning Management Program for the timely decontamination and decommissioning of material, fuel facility, and reactor sites. This program includes: (1) the timely cleanup of contamination of approximately 40 known sites; (2) the review of formerly decommissioned or shut down prototype reactors with confirmatory surveys; and (3) the development of policy and regulations to ensure efficient and consistent licensing actions, to minimize future contaminated site problems.

**HIGH-LEVEL NUCLEAR WASTE
REGULATION**

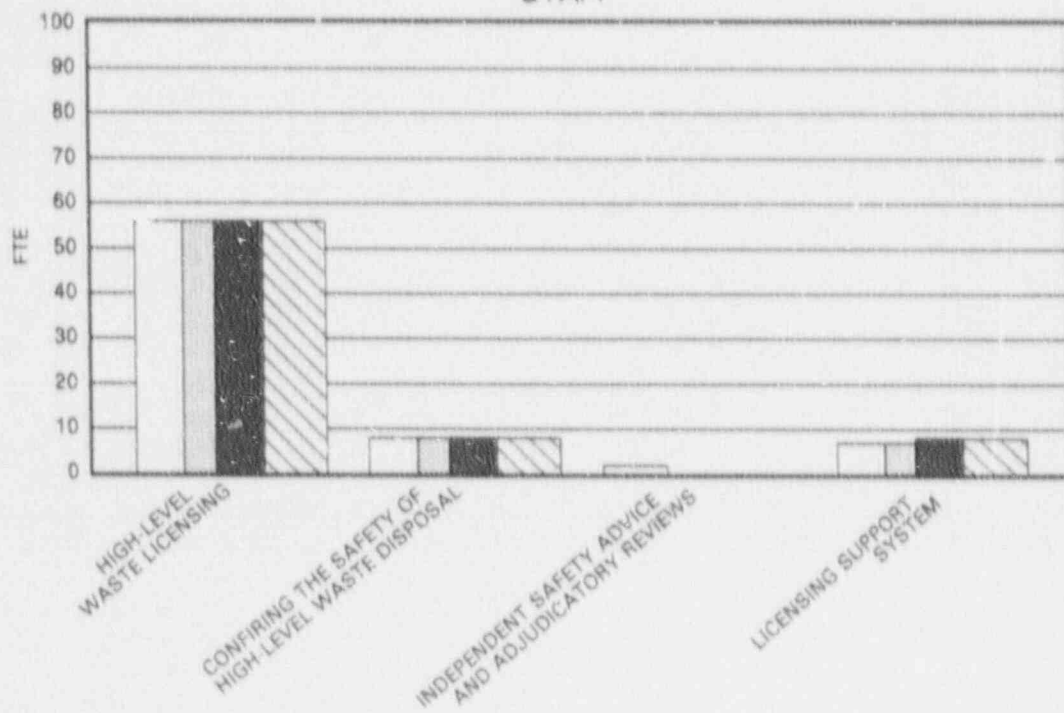


HIGH-LEVEL NUCLEAR WASTE REGULATION

PROGRAM SUPPORT



STAFF



HIGH-LEVEL NUCLEAR WASTE REGULATION

(Dollars are in thousands, except in text, where whole dollars are used; staff numbers are in full-time equivalents.)

Total FY 1992 estimated obligations..... \$19,962

	<u>FY 1990</u> <u>Actual</u>	<u>FY 1991</u> <u>Estimate</u>	<u>FY 1992</u> <u>Estimate</u>	<u>FY 1993</u> <u>Estimate</u>
Salaries and Benefits	\$ 5,026	\$ 5,057	\$ 5,266	\$ 5,266
Program Support	14,597	12,250	12,670	12,670
Administrative Support	1,576	1,586	1,719	1,719
Travel	<u>299</u>	<u>267</u>	<u>307</u>	<u>307</u>
 Total Obligations	 <u>\$ 21,498</u>	 <u>\$ 19,160</u>	 <u>\$ 19,962</u>	 <u>\$ 19,962</u>
 (Staff)	 (73)	 (71)	 (72)	 (72)

Program Support Funds and Staff

The High-Level Nuclear Waste Regulation program support funds and staff are allocated to programs as shown below. The program support funds are allocated primarily for work done by commercial contractors. The narrative that follows describes these programs and the reasons they are needed.

	<u>FY 1990</u> <u>Actual</u>		<u>FY 1991</u> <u>Estimate</u>		<u>FY 1992</u> <u>Estimate</u>		<u>FY 1993</u> <u>Estimate</u>	
	<u>Funds</u>	<u>Staff</u>	<u>Funds</u>	<u>Staff</u>	<u>Funds</u>	<u>Staff</u>	<u>Funds</u>	<u>Staff</u>
High-Level Waste Licensing	\$ 9,705	56	\$ 7,350	56	\$ 7,350	56	\$ 7,350	56
Confirming the Safety of High-Level Waste Disposal	4,600	8	4,000	8	4,400	8	4,400	8
Independent Safety Advice and Adjudicatory Reviews	16	2	0	0	0	0	0	0
Licensing Support System	<u>276</u>	<u>7</u>	<u>900</u>	<u>7</u>	<u>920</u>	<u>8</u>	<u>920</u>	<u>8</u>
 TOTALS	 \$14,597	 73	 \$12,250	 71	 \$12,670	 72	 \$12,670	 72

High-Level Nuclear Waste Regulation

DESCRIPTION OF MISSION AREA

High-Level Nuclear Waste Regulation encompasses all of NRC's public health and safety licensing, inspection, and environmental reviews for the safe management and disposal of high-level radioactive wastes (including spent fuel); research to confirm the safety of high-level waste management, storage, transportation, and disposal; and the use of the Licensing Support System (LSS), for the submission and management of documents in the repository licensing proceeding.

The regulatory activities in this mission area are mandated by the Nuclear Waste Policy Act (NWPA) of 1982 and the Nuclear Waste Policy Amendments Act (NWPAA) of 1987. The NWPA specifies a detailed approach for the long-range undertaking of high-level waste disposal, with the Department of Energy (DOE) having operational responsibility and the NRC having regulatory responsibility. This undertaking involves a complex, integrated system of waste handling, transportation, interim storage, and ultimate deep geologic disposal of high-level radioactive waste, requiring the protection of public health, safety, and the environment over thousands of years. The NWPAA directs DOE to characterize only one candidate site, the Yucca Mountain site in the State of Nevada, and to terminate site-specific activities at all other candidate sites. As a result of the NWPAA requirements, no NRC resources are budgeted for a second repository.

The NRC's high-level waste repository program is proceeding according to the process established by the NWPAA and supports DOE's recent, high-level waste management program changes. The NRC is developing guidance and license review criteria on a priority basis to ensure that all required licensing support and guidance documents are complete and available prior to submission of the license application by DOE. Completion of this guidance is necessary and independent of DOE's site characterization activities. The NRC, however, has planned for conducting prelicensing reviews and monitoring of DOE's site characterization activities beginning in FY 1992.

The Center for Nuclear Waste Regulatory Analysis (CNWRA), a Federally-funded research and development center under contract to the NRC, has been established to provide technical assistance and conduct research for NRC's high-level nuclear waste regulation. The Center provides support, under NRC direction, for NRC activities related to the geologic repository and monitored retrievable storage facility, transportation, environmental, and other activities associated with the storage and disposal of nuclear waste under the NWPA and NWPAA.

This mission area consists of three major programs: High-Level Waste Licensing, Confirming the Safety of High-Level Waste Disposal, and the LSS. Together, these programs are designed to ensure that high-level nuclear waste is safely managed and disposed.

High-Level Nuclear Waste Regulation

HIGH-LEVEL WASTE LICENSING

	<u>FY 1990</u> <u>Actual</u>	<u>FY 1991</u> <u>Estimate</u>	<u>FY 1992</u> <u>Estimate</u>	<u>FY 1993</u> <u>Estimate</u>
Funds (Staff)	\$ 9,705 (56)	\$ 7,350 (56)	\$ 7,350 (56)	\$ 7,350 (56)

This program is designed to ensure the effective, efficient, and timely discharge of NRC's licensing responsibilities under the NWPA and NWPAA.

This program contains the activities required to implement NRC's responsibility to license and inspect the national high-level waste repository. To fulfill this responsibility without causing undue delay or rework in the DOE program, ongoing interaction and prelicensing consultation will be conducted between the NRC and DOE. To provide for an effective and efficient licensing process, the NRC will develop methods for demonstrating compliance to permit the independent determination of the adequacy of DOE licensing information. The NRC will also provide guidance to help ensure that the DOE program develops essential and acceptable data, provide onsite overview of DOE activities, identify and resolve issues, and review and evaluate DOE submittals.

NWPA Regulatory Requirements and Technical Guidance

To provide reasonable assurance that DOE's license application can be reviewed within the 3-year period mandated by the NWPA, the NRC will provide, by FY 1998, appropriate and timely regulatory guidance to DOE to help ensure that potential licensing issues are identified and resolved in a timely manner and that DOE provides complete and high-quality information required by the NRC for licensing. The NRC will conform 10 CFR Part 60 to the revised Environmental Protection Agency (EPA) standard in FY 1991-1992. Work on other rulemakings will continue through FY 1993, based on NRC's identification through systematic regulatory analysis, of repository licensing issues requiring resolution or DOE petitions for rulemakings seeking resolution of issues associated with implementation of 10 CFR Part 60. The NRC also will develop technical positions to clarify the meaning of certain requirements of 10 CFR Part 60, describe what must be proven to demonstrate compliance with the NRC regulations, give criteria for acceptable testing or analysis methods, and resolve potential repository licensing issues. During FY 1991-1993, the NRC will prepare six guidance documents (two each year), which will consist of staff technical positions to the DOE. The contents of these documents will be incorporated into the License Application Review Plan.

The NRC will continue to review and comment on DOE's amendments to the Mission Plan, the Project Decision Schedule, and other programmatic documents to help ensure that NWPA and NWPAA statutory actions are completed and the schedules are

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met. In addition, as required under the NWPAA, the NRC will support the Nuclear Waste Technical Review Board and the Nuclear Waste Negotiator, as requested.

Technical Assessment Capability for Repository Licensing Reviews

During FY 1991-1993, the NRC will develop methods and a capability to independently evaluate performance assessments of the overall high-level waste repository system with modifications to support assessments of the Yucca Mountain site. This performance assessment capability will be used to help prepare rulemakings and regulatory guidance, review DOE's site characterization activities, and to assist in reviewing DOE's license application. The NRC will also continue development of an independent modeling capability for the overall engineered barrier system regulatory requirements in FY 1991-1993 and will begin development of new analysis methods and capability for groundwater travel time/disturbed zone, the specific waste form part of the engineered barrier system, and other topics that will be identified by systematic regulatory analysis in FY 1992-1993.

During FY 1991-1993, the NRC will continue to develop review plans to ensure compliance with NRC regulations and for staff use in reviewing DOE repository-related documents. A License Application Review Strategy will be completed in FY 1991 and preparation of a License Application Review Plan will continue through FY 1993.

Systematic Regulatory Analysis and CNWRA Operations

During FY 1991-1993, the NRC will conduct a systematic regulatory analysis of 10 CFR Part 60 to complete the identification of regulatory and institutional uncertainties, identify technical uncertainties, prepare the technical basis to support reduction of technical uncertainties, and develop the review criteria and methods for reviewing DOE's site characterization program and license application. The results from the systematic regulatory analysis will be the basis for developing regulatory guidance. These systematic regulatory analysis results will be inputs to the License Application Review Plan which will be used by the NRC for reviewing DOE's site characterization reports in addition to the license application. The systematic regulatory analysis will also develop the technical basis for rulemakings, technical positions, or other forms of guidance needed to reduce regulatory and technical uncertainties.

Beginning in FY 1991, the systematic regulatory analysis will become predominantly concerned with the analysis of all 108 regulatory topics contained in 10 CFR Part 60 to identify key technical uncertainties and methods of reduction, together with the prelicense application review and license application review strategy needed for each topic. Compliance demonstration methods, review criteria, and supporting technical bases will be developed during FY 1991-1993. During FY 1992-1993, the systematic regulatory analysis will be updated, based on new information from DOE's site characterization activities and NRC's performance assessment results.

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The NRC will continue to sponsor the CNWRA as a Federally-funded research and development center during FY 1991-1993. This will include providing for the administrative, management, and quality assurance procedures and practices necessary to operate the CNWRA.

Quality Assurance

The NRC will continue to evaluate the DOE quality assurance plans and their implementation through oversight of the DOE waste program and the audit of a sample of DOE and DOE-contractor quality assurance programs for site characterization. During FY 1991-1993, the NRC will conduct three independent audits of DOE's high-level waste repository program and observe eight DOE quality-assurance audits each year. The objective of these audits is to identify and resolve concerns with DOE's program before significant data collection activities are performed during site characterization. The NRC will also conduct onsite quality-assurance visits and surveillances to evaluate, in detail, the implementation of the DOE program in specific technical areas and to better choose the topics for the NRC audits.

Site Characterization Review

During FY 1991-1993, the NRC will review and provide comments on DOE's Site Characterization Plan (SCP) semiannual progress reports. The NRC's review of the semiannual SCP progress reports will focus on: (1) new information about the site and performance estimates, (2) new issues and plans to resolve them, (3) changes to the original plans and schedules, and (4) DOE's progress toward resolving potential licensing issues.

During FY 1991-1993, DOE is expected to issue approximately 90 study plans. These are detailed plans and procedures that implement the SCP. The NRC will conduct a screening review of all study plans issued by DOE and will also conduct technical reviews of a limited number (approximately 20 percent) of selected plans.

Beginning in FY 1993, the NRC will conduct a limited number of onsite reviews of selected DOE surface-based testing activities and data collected by DOE. The NRC-site liaison at the Nevada site will continue during FY 1991-1993 in order to facilitate direct exchange of information with the DOE and the State of Nevada and to provide quality assurance and technical oversight of data, documents, and activities related to site characterization.

High-Level Nuclear Waste Regulation

CONFIRMING THE SAFETY OF HIGH-LEVEL WASTE DISPOSAL

	FY 1990 <u>Actual</u>	FY 1991 <u>Estimate</u>	FY 1992 <u>Estimate</u>	FY 1993 <u>Estimate</u>
Funds	\$ 4,600	\$ 4,000	\$ 4,400	\$ 4,400
(Staff)	(8)	(8)	(8)	(8)

The NRC's high-level waste research provides the technical basis needed by the NRC to independently evaluate the plans and license application being developed by the DOE for the packaging and permanent disposal of high-level radioactive wastes in a geologic repository at the Yucca Mountain site in Nevada. To review this first-of-its-kind undertaking, the NRC must develop a competent methodology to evaluate the adequacy of DOE's activities related to site characterization and facility design. Specifically, NRC's research activities are: (1) providing ongoing support for some prelicensing consultation with DOE, (2) providing guidance to DOE on technical issues to be addressed during site characterization, and (3) developing information specific to NRC's review of DOE's site characterization activities.

The FY 1992 funding increase will augment the performance assessment capability necessary to address geologic hazards analysis, e.g., potential volcanic activity. The increase is also for the assessment of the treatment of any possible changes in the climate at the site, which may affect the quantity of water passing through the repository. The NRC will require this enhanced capability to evaluate the site characterization activities of DOE at Yucca Mountain.

At present, NRC's high-level waste review capability contains substantial uncertainties because of the lack of previous experience with high-level waste disposal; the very long periods of time involved; the previous focus on two other geologic media; the lack of knowledge about the movement of water or radionuclides through fractured, unsaturated geological systems (e.g., the Yucca Mountain site); and a lack of understanding of the regional processes controlling volcanic and seismic activity near the Yucca Mountain site. The technical issues of concern to NRC's high-level waste research program include: assessing the stability of underground structures; assessing the integrity of the waste container; understanding the interaction of the waste container with the environment at the disposal site; understanding the effect of natural geologic processes on long-term performance of barriers on waste migrations; and understanding the movement of particulate, dissolved, or gaseous radioactive material within the disposal facility and through the environment during, and after, the design life of the engineered components of the disposal system. The NRC's high-level waste research program will furnish technical information and independent data and methods for understanding some of the key issues and

High-Level Nuclear Waste Regulation

supporting some of the regulatory needs of the licensing office to ensure effective management and disposal of high-level waste.

The engineered systems research activities are focused on whether DOE's short-term, small-scale tests and experiments on waste packages and other engineered components of the repository system are appropriate and adequate to predict performance on the repository scale over the design lifetime. In FY 1991, the NRC will issue final waste package research reports assessing the predictive models, metallurgical stability of DOE-proposed materials, hydrogen effects, welding effects, and results of small-scale and large-scale tests. In FY 1992, the NRC will issue topical reports assessing: (1) the effects of long-term exposure of DOE-candidate container materials to a simulated repository environment; (2) the capabilities of DOE geochemical models to predict the changes in time of fluid chemistry, tuff mineralogy, and engineered-component stability; and (3) a final report on waste-package-scale unsaturated zone experiments on the effects of heat on fluid flow and contaminant transport.

The geologic systems research activities are examining the uncertainties in the field investigation methods and data analysis techniques used by DOE to characterize the geohydrologic system and chemical interactions sufficiently well to provide both the environmental parameters for engineered system design and the evaluation of its performance. In FY 1991, the NRC will begin a 5-year, large-scale heater field test to assess the effects of heating on flow and transport in unsaturated, fractured tuff. In FY 1992, the NRC will issue topical reports on: (1) possible variations in the site climate which will affect the evaluation of conservatism in DOE groundwater recharge parameters and to establish input ranges for NRC performance assessments; (2) hydrologic field testing in unsaturated, fractured tuff; (3) infiltration and percolation parameter measurement methods; (4) a laboratory study confirming thermodynamic data for two Yucca Mountain zeolite minerals, key data in determining rock stability, and radionuclide mobility; and (5) laboratory studies of a large block of fractured tuff that was used to test models of unsaturated flow and transport. During FY 1991-1993, the NRC will continue research on chemical behavior of geologic systems that are similar to Yucca Mountain with respect to geochemical processes and will test DOE models of radionuclide transport and chemical interactions. Also during FY 1991-1993, the NRC will continue to assess DOE and alternative literature-based approaches to modeling ion exchange and absorption reactions, which could perform as the dominant barrier to the transport of actinide and transuranic elements in actual site performance and in long-term performance assessment calculations.

The performance assessment research activities are focused on the degree of uncertainty and level of completeness in the performance modeling conducted by DOE to demonstrate compliance with NRC and EPA requirements over the 10,000 year (minimum) time period of regulatory concern. In FY 1991, the NRC will issue final reports on: (1) vapor transport in the unsaturated zone, (2) performance assessment modeling of the effects of heat on hydrology in the unsaturated zone, and (3) coupled hydrogeochemical modeling of radionuclide transport and their association with geologic features. In FY 1992, the NRC will issue topical

High-Level Nuclear Waste Regulation

reports on two international studies of radionuclide transport models used for high-level waste performance assessment; the INTRAVAL project and the Alligator Rivers Analogue project. Also in FY 1992, the NRC will issue topical reports needed for evaluation of Yucca Mountain whole-system performance assessment methods for assessing coupled processes.

As part of NRC's efforts to provide guidance to DOE, proposed revisions to 10 CFR Part 60 will be issued during FY 1991-1993 to conform with the EPA high-level waste standard, assuming EPA issues the standard, as scheduled. During FY 1991-1992, a series of proposed and final revisions to 10 CFR Part 60 will be issued to reduce regulatory uncertainties and to furnish early guidance to DOE. In FY 1992, the NRC will publish a proposed rule on emergency planning criteria for the high-level waste repository.

High-Level Nuclear Waste Regulation

LICENSING SUPPORT SYSTEM

	<u>FY 1990</u> <u>Actual</u>	<u>FY 1991</u> <u>Estimate</u>	<u>FY 1992</u> <u>Estimate</u>	<u>FY 1993</u> <u>Estimate</u>
Funds	\$ 276	\$ 900	\$ 920	\$ 920
(Staff)	(7)	(7)	(8)	(8)

This program is designed to ensure effective and efficient discharge of NRC's responsibilities under 10 CFR Part 2, Subpart J, as they pertain to the loading and subsequent use of the LSS prior to and during NRC's high-level waste licensing proceeding.

The staff increase in FY 1992 is for the Office of the Licensing Support System Administrator.

The NWPAA allows the NRC only 3 years to review DOE's application to construct a high-level waste repository. Anticipating an unusually high volume of documentary material and a highly contentious licensing proceeding, the NRC recognized that, to meet this extremely tight license review period, it must revise its procedures for handling and reviewing documents before and during the proceeding. Perceiving the efficiencies inherent in modern information storage and retrieval technology, the NRC and DOE explored the use of an advanced, computerized system, the LSS.

The LSS would provide for the entry of, and access to, potentially relevant licensing information before DOE submits its license application. It would contain, in electronic form, documents generated by DOE, the NRC, and others. Because the LSS would require the identification and submission of documents before the license application is submitted, it would eliminate the most burdensome and time-consuming aspect of the current method of document discovery -- the physical production and distribution of documents after the license application has been filed. It would also reduce the volume of material that would otherwise be provided by DOE and NRC in response to Freedom of Information Act (FOIA) requests. In addition, it would enable the comprehensive and early legal and/or technical review of millions of pages of licensing material through the use of electronic full-text search capability, which would allow the quick identification of relevant documents and issues. The system would also permit earlier submission of better focused contentions, which would result in a substantial saving of time during the proceeding. Finally, the LSS would permit the electronic transmission of all filings during the hearing, thereby eliminating the significant amount of delay associated with normal mailing procedures.

High-Level Nuclear Waste Regulation

The NRC, as an independent agency with licensing responsibility for the high-level waste repository, serves as the LSS administrator. To further contribute to the independence of LSS operations and to facilitate impartial decisionmaking, the Office of the Licensing Support System Administrator was established reporting directly to the Commission. By serving as the LSS administrator, the NRC created two distinct LSS responsibilities for itself -- NRC, the LSS administrator, and NRC, the LSS participant. As the administrator, the NRC is responsible for seeing that the LSS is available when needed and that it functions as intended before, during, and after the licensing proceeding. As an LSS participant, the NRC has certain responsibilities that are basically the same as for other LSS participants, i.e., to properly prepare and submit NRC's documentary material for entry into the LSS and to subsequently verify that it has been correctly entered.

In FY 1992 and 1993, system functional requirements will be further refined, other related activities will be performed, and planning for facility preparation will occur. Actions will be taken to assure compliance with Federal computer security and standardization guidelines. Requirements for security, quality assurance, configuration management, and disaster recovery plans and programs will be established and detailed criteria will be developed for subsequent acceptance of the first LSS node.

In FY 1992 and 1993, requirements for the operation and maintenance of the LSS will be established and procurement documents prepared. Operation and maintenance will include document processing at the first LSS node and will provide users with training and other assistance in using the LSS, as well as hardware maintenance services, software maintenance and/or enhancements, system administration, and facility management. During FY 1991-1992, requirements for user support services will be developed and maintained, as well as broad-based requirements for user training, "on-call" assistance, and end-user feedback programs.

In FY 1991-1992, procedures will be reviewed and approved for processing documents in LSS facilities and using electronic mail and functional requirements for the text processing, image processing, and cataloging interfaces will be established.

During FY 1991-1993, the LSS Administrator will provide staff support to the LSS Advisory Review Panel (LSSARP) and will implement the consensus advice of the panel. The LSSARP, comprised of LSS participants, was established to advise the LSS Administrator and DOE on selected aspects of the LSS. Through the LSSARP, LSS participants will play an active role in resolving the many detailed issues that still exist with regard to LSS design, development, and operation. Many of these issues will be resolved during FY 1991-1993 either through the LSSARP, by individual LSS participants, or by the LSS Administrator. The LSS Administrator will assume a leadership role in the resolution of these issues to see that they are being properly addressed and resolved on a schedule consistent with LSS design, development, and implementation objectives.

High-Level Nuclear Waste Regulation

During FY 1991-1993, the LSS Administrator will serve as a focal point for providing information to LSS participants, other government agencies, and the public on LSS activities, responsibilities, and schedules. In this capacity, the LSS Administrator receives and coordinates the resolution of problems that people may encounter in relation to system development and/or use.

During FY 1991-1993, the LSS Administrator will provide advice and assistance to LSS participants relative to their requirements to collect and prepare documentary material prior to it being forwarded for entry into the LSS. During FY 1991, the LSS Administrator will develop an LSS participant compliance evaluation program, which will include criteria for determining compliance, guidance for document preparation, and a detailed schedule for compliance evaluation.

During FY 1991-1993, a broad range of criteria and/or procedures related to LSS design and operation will be developed and/or evaluated by the LSS Administrator. This will include criteria and/or procedures related to document header design, indexing requirements, thesaurus content, document segmentation standards, cataloging criteria, authority tables, quality-assurance standards for document capture and image capture, document preparation and transmittal requirements for LSS participants, control of access to the LSS, the handling of privileged material, the capture of and access of graphic-oriented material and material not suitable for electronic capture, hardcopy distribution of documentary material, user training and/or assistance, and FOIA coordination. In addition, procedures will be developed to coordinate with NRC's hearing boards and panels, DOE and/or NRC Public Document Rooms, Local Public Document Rooms, NRC's Office of the Secretary on docket file matters, and various other organizations relative to overall document management activities.

During FY 1991-1993, a detailed LSS administrator project management plan will be developed and then maintained to coordinate all LSS schedules and activities to include the high-level waste repository schedule, LSSARP issue resolution schedules, and the schedules established by individual LSS participants for preparing and capturing their documents.

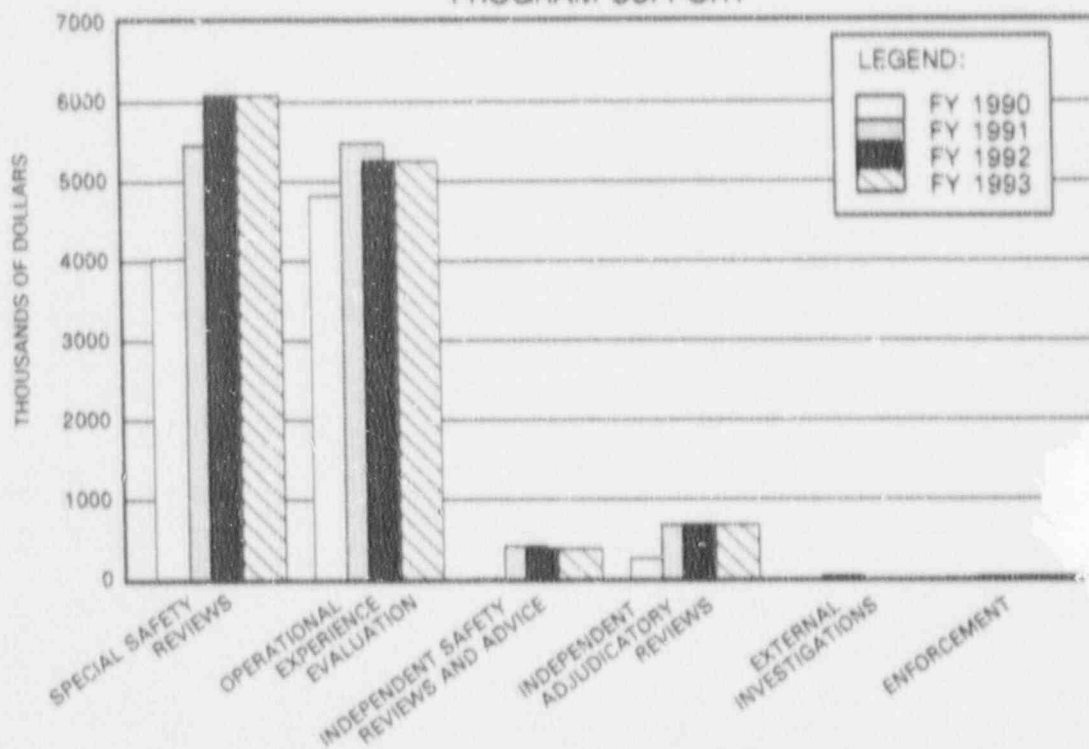
During FY 1991-1993, the LSS Administrator will continue to coordinate the development of a prioritized, document-production schedule for loading the LSS data base with the most important documents first.

**SPECIAL AND INDEPENDENT REVIEWS,
INVESTIGATIONS, AND ENFORCEMENT**

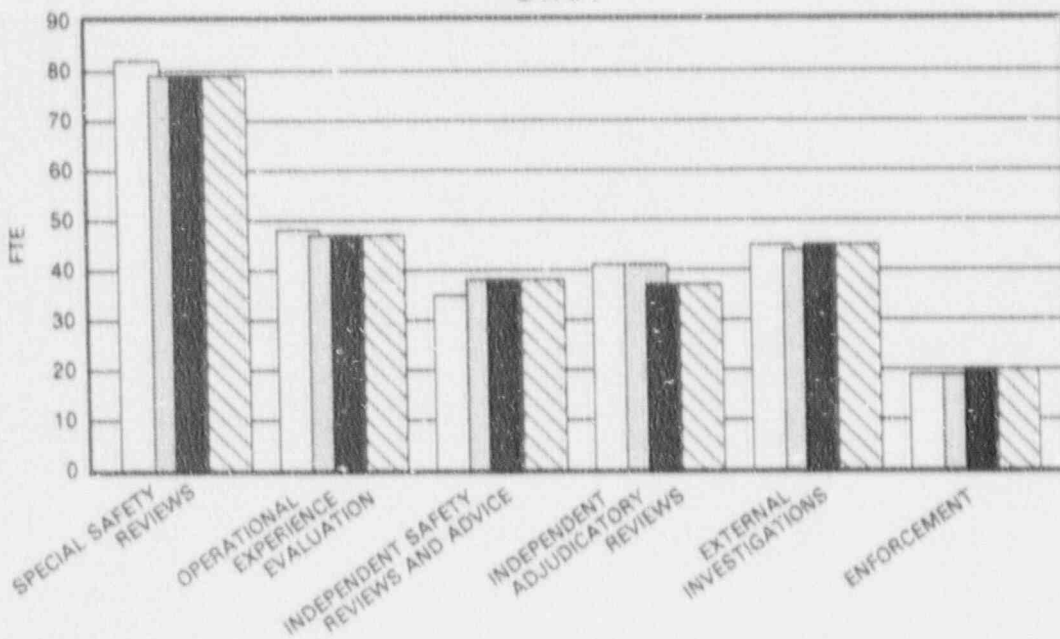
Special & Independent
Reviews, Investigations
& Enforcement

SPECIAL AND INDEPENDENT REVIEWS, INVESTIGATIONS, AND ENFORCEMENT

PROGRAM SUPPORT



STAFF



SPECIAL AND INDEPENDENT REVIEWS, INVESTIGATIONS, AND ENFORCEMENT

(Dollars are in thousands, except in text, where whole dollars are used; staff numbers are in full-time equivalents.)

Total FY 1992 estimated obligations \$ 39,293

	<u>FY 1990</u> <u>Actual</u>	<u>FY 1991</u> <u>Estimate</u>	<u>FY 1992</u> <u>Estimate</u>	<u>FY 1993</u> <u>Estimate</u>
Salaries and Benefits	\$16,828	\$ 19,089	\$ 19,456	\$ 19,456
Program Support	9,109	12,070	12,410	12,410
Administrative Support	5,913	5,987	6,352	6,352
Travel	<u>1,048</u>	<u>1,050</u>	<u>1,075</u>	<u>1,075</u>
Total Obligations	<u>\$32,898</u>	<u>\$ 38,196</u>	<u>\$ 39,293</u>	<u>\$ 39,293</u>
(Staff)	(270)	(268)	(266)	(266)

Program Support Funds and Staff

The Special and Independent Reviews, Investigations, and Enforcement program support funds and staff are allocated to programs as shown below. The program support funds are allocated primarily for work done by Department of Energy (DOE) laboratories and commercial contractors. The narrative that follows describes these programs and the reasons they are needed.

	<u>FY 1990</u> <u>Actual</u>		<u>FY 1991</u> <u>Estimate</u>		<u>FY 1992</u> <u>Estimate</u>		<u>FY 1993</u> <u>Estimate</u>	
	<u>Funds</u>	<u>Staff</u>	<u>Funds</u>	<u>Staff</u>	<u>Funds</u>	<u>Staff</u>	<u>Funds</u>	<u>Staff</u>
Special Safety Reviews	\$4,026	82	\$ 5,450	79	\$ 6,080	79	\$ 6,080	79
Operational Experience Evaluation	4,816	48	5,480	47	5,250	47	5,250	47
Independent Safety Reviews and Advice	6	35	410	38	380	38	380	38
Independent Adjudicatory Reviews	258	41	680	41	680	37	680	37
External Investigations	0	45	30	44	0	45	0	45
Enforcement	<u>3</u>	<u>19</u>	<u>20</u>	<u>19</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>
TOTALS	\$9,109	270	\$12,070	268	\$12,410	266	\$12,410	266

Special and Independent Reviews, Investigations, and Enforcement

DESCRIPTION OF MISSION AREA

Special and Independent Reviews, Investigations, and Enforcement comprises programs to evaluate safety concerns involving reactor and nonreactor facilities, to assess operational events and experience, to provide technical training to NRC staff, to provide review results and advice to the Commission on reactor safety and low-level waste management issues, to conduct adjudicatory reviews, to conduct investigations of wrongdoing by NRC licensees, and to provide a comprehensive enforcement policy in furtherance of the protection of the public health and safety. The mission area is composed of the following six programs: Special Safety Reviews, Operational Experience Evaluation, Independent Safety Reviews and Advice, Independent Adjudicatory Reviews, External Investigations, and Enforcement.

Special and Independent Reviews, Investigations, and Enforcement

SPECIAL SAFETY REVIEWS

	<u>FY 1990</u> <u>Actual</u>	<u>FY 1991</u> <u>Estimate</u>	<u>FY 1992</u> <u>Estimate</u>	<u>FY 1993</u> <u>Estimate</u>
Funds (Staff)	\$ 4,026 (82)	\$ 5,450 (79)	\$ 6,080 (79)	\$ 6,080 (79)

This program is conducted to identify, evaluate, and respond to potentially significant events and safety concerns involving U.S. commercial nuclear power reactors and nonreactor facilities, based on events reported to the NRC by its licensees. This program consists of four major elements: Diagnostic Evaluations, Incident Investigation, NRC Incident Response, and the Technical Training Center. This program also provides support for the agency's Committee to Review Generic Requirements. The committee's activities include review of generic requirements and backfit considerations.

The funding increase in FY 1992 is primarily for developing and implementing entry-level training programs for health physics and nuclear engineering, in response to increased difficulty in hiring experienced personnel.

DIAGNOSTIC EVALUATIONS

Diagnostic evaluations supplement the systematic assessment of licensee performance, performance indicators, and other assessment data in evaluating specific utility programs to enable NRC senior management to make more informed decisions concerning overall nuclear power plant performance. These assessments assist the NRC in taking appropriate regulatory actions.

Approximately four diagnostic evaluations of individual nuclear power plants are expected to be conducted each year during FY 1991-1993, as determined by the Executive Director for Operations. Each evaluation will consist of a formal, independent, indepth assessment conducted by an NRC team for the purpose of providing expert insight into significant aspects of plant operations, plant performance, and safety, with emphasis on root-cause determinations of performance problems.

INCIDENT INVESTIGATION

This program element comprises activities for ensuring that particularly significant operational events, involving nuclear power reactors and nonreactor facilities licensed by the NRC, are investigated in a systematic and technically sound manner and that information is obtained on the causes of the events,

Special and Independent Reviews, Investigations, and Enforcement

including those involving NRC activities, so that the NRC can take timely and effective corrective actions. For events of a potentially major significance, an incident investigation team, independent of the region and the program office, is established. For investigation of less significant operational events, an augmented inspection team is established, consisting of a region-directed team complemented by headquarters personnel, as necessary. The Office for Analysis and Evaluation of Operational Data provides oversight of the agency's incident investigation program to ensure that a unified program is maintained. The staff will continue to participate on incident investigation teams and augmented inspection teams, as necessary, during FY 1991-1993.

NRC INCIDENT RESPONSE

This program element comprises activities to ensure that the NRC is prepared to carry out its role in a radiological emergency at a licensed nuclear facility, that the licensee's response is consistent with its responsibilities, and that the NRC response is coordinated with other Federal response activities. The NRC's responsibilities in this area are to: (1) manage the NRC Operations Center; (2) develop, maintain, and integrate agencywide response plans, procedures, and training of personnel and organizations; (3) conduct exercises to achieve and test readiness objectives; (4) provide operational support and contract management for agency response activities; (5) evaluate and assess headquarters and regional response capabilities; and (6) provide continuous shift staffing of the NRC's Operations Center with qualified systems engineers. These engineers receive reactor and nonreactor event reports, as well as other information, and perform preliminary evaluations to determine which events warrant prompt agency response and notification to the offices of Nuclear Reactor Regulation and Nuclear Material Safety and Safeguards, the regions, senior management, and other Federal agencies and then make that notification.

The NRC will maintain continuous coverage (24-hours-a-day, every day) of the NRC Operations Center for direct communication, through dedicated communication channels, with licensed nuclear power plants and certain fuel cycle facilities to receive reports of, and to deal with, significant events at these facilities. Operations Center computers and other equipment will continue to be maintained to provide the capability for agency response to incidents. Analytical and consequence-assessment tools and procedures necessary for reactor, fuel cycle and material safety evaluations, consequence projections, protective measures evaluations, airborne monitoring following a release, and information management will continue to be developed and refined as needed during FY 1991-1993.

The NRC Operations Center will be relocated as part of the NRC headquarters consolidation in Rockville, Maryland. During FY 1991-1992, advanced planning and procurement necessary for the center's relocation will occur.

The NRC will continue to pursue upgrading of the NRC Operations Center Emergency Telecommunications System.

Special and Independent Reviews, Investigations, and Enforcement

As one of the key Operations Center capabilities, the Emergency Response Data System (ERDS) will provide for licensee-activated, automatic transmission of preselected power plant data from the licensee's emergency response facilities to a computer at the NRC Operations Center and other remote locations. This system is essential for improving the NRC's ability to effectively carry out its role of advising the licensee and offsite officials of actions to protect the public's health and safety during a radiological emergency. The ERDS will provide the NRC with a timely, reliable set of key parameters on which to base such advice or recommendations. The ERDS is currently a voluntary program with 65 plants now committed to its implementation. Currently, three reactors are connected to ERDS. However, a proposed rule was issued in October 1990 that would make the system a requirement for all plants. A final rule is expected to be published in July 1991 that would require that ERDS be implemented within 18 months of publication. Beginning in FY 1991, approximately 35 reactors are expected to be connected to ERDS each year until completion in FY 1993.

The NRC will continue to participate in the U.S. Government's Continuity of Government program during FY 1991-1993. Guidance and training will be provided to the staff in implementing the NRC role and functions in a national emergency.

A standardized training program on the technical and organizational aspects of emergency response has been developed and continues to evolve. This training will be conducted each year during FY 1991-1993 for headquarters and regional response personnel. A limited number of exercises involving various accident scenarios will be conducted to confirm and maintain the capabilities of NRC response personnel. In addition, response personnel will participate in on-site, full-scale licensee emergency preparedness exercises with the NRC regions, to more fully evaluate the agency's emergency preparedness and incident response programs. Federal emergency response programs, including monitoring, assessment, and support services, continue to be updated. More efficient notification and information exchange methods continue to be developed among the Federal response agencies.

In an effort to enhance Federal readiness and training, the Federal Field Exercise 3 will be conducted in FY 1993 as a demonstration of a full Federal emergency response. Resources are allocated in FY 1992 for development of the scenario for the Federal Field Exercise 3.

TECHNICAL TRAINING CENTER

This program element provides for the technical training of NRC technical staff, including resident inspectors, headquarters- and region-based inspectors, reactor operator license examiners, Operations Center duty officers, licensing project managers, and technical reviewers. Training is provided on a space available basis for other Federal, State, and foreign government employees. Courses are offered in reactor technology, system design and operation and in other

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specialized technical areas, such as engineering support, safeguards, materials and fuel cycle safety, reactor health physics, and inspection and examination techniques.

The reactor technology curriculum will continue to be conducted to provide appropriate coverage of the General Electric, Westinghouse, Babcock & Wilcox, and Combustion Engineering reactor vendor designs. Modification of full-scope reactor simulators, under direct control of the NRC, will be made during FY 1991-1993 to improve the hardware configuration, thermal hydraulic modeling, simulation capabilities, and graphic displays.

Initial reactor technology training will be provided each year to NRC inspectors, reactor operator license examiners, and other high-priority NRC personnel and refresher training will be provided to NRC inspectors and reactor operator license examiners. Training of headquarters and regional reactor inspectors, operator licensing examiners, and response staff, on vendor-specific emergency operating procedures, will continue during FY 1991-1993. Major curriculum adjustments to best satisfy the highest priority regional training needs will be made beginning in FY 1991.

The specialized-technical training curriculum will continue to be conducted to provide appropriate coverage. Increased emphasis will be placed on nuclear materials safety and fuel cycle program development and training. The curriculum will be extensively modified in the reactor and nuclear materials/fuel cycle health physics areas through FY 1993. Training in areas, such as reactor and nuclear materials health physics, welding technology, nondestructive examination technology, and safeguards technology, as well as training necessary to support the Incident Investigation program, will continue through FY 1993.

Beginning in FY 1991, NRC will develop and implement entry-level training programs for health physics and nuclear engineering specialties, which are designed to bring interns with scientific degrees into the agency and provide them with the necessary technical training and experience to proceed through existing qualification programs. During FY 1991-1993, the NRC will continue to develop and present training to implement the qualification programs for headquarters technical personnel to address the specific initial, supplemental, and periodic refresher training requirements by job category. Approximately 155 reactor technology course-weeks will be provided each year during FY 1991-1993. Approximately 85 specialized technical training course-weeks will be provided in FY 1991, increasing to approximately 115 course-weeks for FY 1992-1993. This increase in specialized-technical training course-weeks reflects additional training in support of entry-level technical training programs.

Expansion of both the reactor technology curriculum and the specialized technical training curriculum will continue, in order to meet high-priority needs identified by the headquarters' program offices and the regions. Development of new or revised technical training programs will be coordinated with the program offices and regions.

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OPERATIONAL EXPERIENCE EVALUATION

	<u>FY 1990 Actual</u>	<u>FY 1991 Estimate</u>	<u>FY 1992 Estimate</u>	<u>FY 1993 Estimate</u>
Finds (staff)	\$ 4,816 (48)	\$ 5,480 (47)	\$ 5,750 (47)	\$ 5,250 (47)

Under this program, information about operational safety data associated with NRC commercial nuclear power reactor licensees and nonreactor licensees is collected, analyzed, and disseminated. Operational experience from NRC licensees, Agreement States, and foreign sources is reviewed to identify either plant specific or generic safety issues resulting from significant events or situations that warrant detailed evaluation. These issues are further analyzed to assess the root causes of the identified deficiency, the adequacy of corrective actions implemented and planned, and to identify those safety concerns that may warrant regulatory attention. In addition, the trends and patterns of events are analyzed to identify any needs for regulatory attention. This program consists of three major elements: Operational Data Analysis, Performance Indicators, and Operational Data Collection and Dissemination.

OPERATIONAL DATA ANALYSIS

This program element comprises the review of nuclear power reactor licensee event reports, as well as the review of extensive documentation of events, NRC inspection reports, U.S. nuclear power plant industry reports, and foreign reactor reports. In addition, each event reported to the NRC Operations Center by a licensee or regional office is reviewed. Nonreactor operational events, such as overexposure to radioactive materials and medical misadministrations of nuclear material, are included in this review.

Operational data, including licensee event reports, are analyzed to identify potentially safety-significant problems that may be plant specific, or common to specific types of plants, or have generic implications for other facilities. The NRC will complete the review and analysis of approximately 2,500 reactor licensee event reports each year during FY 1991-1993. It will also complete the review of approximately 2,000 nonreactor event and inspection reports annually. These reports are associated with the use, transportation, safeguarding, and disposal of nuclear materials. Additional emphasis will be placed on the review of relevant foreign operating experience.

Those reactor and nonreactor events that are considered to be significant from the standpoint of the public health and safety will be provided to the Commission

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with recommendations that they be considered as "abnormal occurrences." On a quarterly basis, abnormal occurrences will be reported to the Congress and the public.

The NRC will continue to coordinate safety analysis activities with other organizations, such as the Electric Power Research Institute, the Institute of Nuclear Power Operations, and owners' groups and provide results, as appropriate. Component failure data from the Nuclear Plant Reliability Data System, a data base voluntarily supported by the U.S. nuclear power plant industry and maintained by the Institute of Nuclear Power Operations, will continue to be analyzed to identify component attributes that may signify an unrecognized safety concern.

On the basis of the comprehensive and systematic review of all the reactor licensee event reports, significant operating events are identified and selected for further indepth evaluation. The evaluation assesses the root causes of the identified deficiency, the safety significance and generic implications of the deficiency, and the adequacy of corrective actions. Indepth technical evaluations of components, systems, system interactions, dynamic plant response, and human performance will be performed based on operating events. Recommendations are made to prevent recurrence of these events. The results, findings, and recommendations for actions based on these evaluations of operating experience are documented in technical study reports, which are widely disseminated to the nuclear industry and the public on a timely basis. The recommendations from these studies are formally tracked and the follow-up status is periodically reported to the Commission.

The NRC will place additional emphasis on the investigation of root causes, the contribution of human factors, and the determination of risk significance of operational events. By emphasizing the underlying causes of significant operating events and the practices that can prevent recurrence, the lessons of experience can be more effectively communicated to the nuclear power plant industry to improve plant safety. Failure data for key components will be analyzed for evidence of inadequate maintenance and possible aging effects. Enhanced analysis methods will be applied to the data review process to improve the timeliness of feedback to the industry. Quantification of the risk significance of events during power operation and reactor shutdown will be enhanced. Action will be initiated, as appropriate, to resolve any associated safety issues and data will be reviewed to assess the effectiveness of previous actions.

PERFORMANCE INDICATORS

This program element comprises activities aimed at developing and implementing a method of identifying, as early as practicable, those individual nuclear power plants, or groups of plants, whose performance may warrant special (either increased or decreased) regulatory attention. Performance indicators are

Special and Independent Reviews, Investigations, and Enforcement

intended to provide ready information concerning nuclear power plant performance trends and to assist NRC management in identifying poor and/or declining safety performance, as well as in identifying good and/or improving safety performance.

The NRC's performance indicator program utilizes the following indicators: automatic scrams while the reactor is critical, selected safety-system actuations, significant events, safety-system failures, forced-outage rates, equipment-forced outages per 1,000 critical hours, collective radiation exposure and cause codes extracted from licensee event reports. Quarterly reports showing trends in performance and comparisons with appropriate industry averages for each licensed nuclear power plant and each individual indicator will continue to be provided to NRC senior management during FY 1991-1993. These reports are disseminated to NRC management, the Commission, and licensees and are available to the public.

The NRC will continue its review, evaluation, and revision, as needed, of the performance indicator program and new indicators of licensee performance. Development and implementation of risk-based and programmatic indicators will continue. Information obtained from Individual Plant Examinations will be used to provide insights related to risk-based indicators. Indicators associated with management effectiveness will be evaluated in future years. Program revisions will continue to be made, as appropriate. A program to evaluate the operational performance of fuel cycle and materials licensees using quantitative and qualitative measures is carried out under the Nuclear Material and Low-Level Waste Safety and Safeguards Regulation mission area.

OPERATIONAL DATA COLLECTION AND DISSEMINATION

This program element comprises the data bases used to retrieve and analyze incidents for trends and patterns. Activities are designed to detect, through statistical and engineering analysis, trends or patterns that indicate safety concerns; to develop the risk perspective associated with operational experiences; and to generate proposed corrective actions. The information is also used to trend licensee performance.

Domestic operational experience on all NRC-licensed activities is collected, screened, and analyzed. Foreign operational experience is screened and independently analyzed for safety significance and applicability to the U.S. nuclear program. The NRC will continue to provide information on foreign events to U.S. organizations and to report U.S. experience to foreign organizations, through the Nuclear Energy Agency's incident reporting system and bilateral agreements. Increased attention will be focused on the feedback of operating experience by the NRC, the industry, and each licensee in order to use the lessons of experience to prevent serious nuclear incidents from occurring in the future. The NRC will continue the development of improved methods for providing feedback on operating experience during FY 1991-1993, through such means as increased interaction with reactor owners' groups, the highlighting of risk significance, the conduct of workshops, and coordination with industry regarding

Special and Independent Reviews, Investigations, and Enforcement

industry-originated feedback. Special emphasis will be placed on developing and maintaining direct interfaces with major component vendors for the purpose of sharing equipment performance.

The NRC will continue to use operational and reliability data storage and retrieval systems. Information primarily from two commercial power reactor reporting systems is used for the analysis of trends and patterns. The first system is the Licensee Event Reporting System, which is required by NRC regulation (10 CFR 50.73). The licensee event reports are based on certain events of an established significance level at reactor sites. The data from the licensee event reports are coded and entered into data bases to capture the sequence of events, the failures that occurred, the causes of the events, and corrective actions to avoid similar failures in the future. The NRC will continue to review the reporting requirements and agency guidance to identify and implement improvements under 10 CFR 50.73. Using information gained from the 1990 Regulatory Impact Survey and the NRC/Industry workshops, starting in FY 1991 and continuing in FY 1992-1993, NRC will issue clarifying guidelines on current-event reporting requirements and examine the need for additional information regarding human factors and reliability of safety systems. The second reporting system is the Nuclear Plant Reliability Data System, a voluntary reporting system that is maintained by the Institute of Nuclear Power Operations. This system captures events of lesser significance, specifically individual component failures which meet a safety significance threshold. The staff, on an annual basis, reviews the Nuclear Plant Reliability Data System to assess industry's participation in terms of timeliness, completeness, and quality of reporting. Both data bases will continue to be analyzed to detect trends in the safety performance of domestic plants and to identify specific issues and corrective actions to improve or maintain safe operations. As the nuclear plants age throughout their licensed lives, these data bases will grow and continue to be the primary systems to reveal trends in equipment and personnel performance.

Special and Independent Reviews, Investigations, and Enforcement

INDEPENDENT SAFETY REVIEWS AND ADVICE

	<u>FY 1990</u> <u>Actual</u>	<u>FY 1991</u> <u>Estimate</u>	<u>FY 1992</u> <u>Estimate</u>	<u>FY 1993</u> <u>Estimate</u>
Funds (Staff)	\$ 6 (35)	\$ 410 (38)	\$ 380 (38)	\$ 380 (38)

This program is designed to provide the Commission with independent reviews of and advice on the licensing and operation of production and utilization facilities and related safety issues, as well as the management and disposal of low-level nuclear waste and related matters. Such independent reviews and advice are provided by the Advisory Committee on Reactor Safeguards (ACRS) and the Advisory Committee on Nuclear Waste (ACNW). In order to provide objective reviews and advice affecting these issues, the committees rely on highly-qualified members, consultants, and experts.

ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

The ACRS is responsible for providing advice on: the safe operation of licensed nuclear facilities; adequacy of proposed evolutionary and advanced reactor designs; proposed safety-related regulations and regulatory policy, the NRC safety research program, and related matters. In addition, upon request of DOE, the ACRS reviews and advises with regard to hazards of DOE nuclear activities and facilities. The committee has statutory responsibilities as described in the Atomic Energy Act of 1954, as amended, and the Energy Reorganization Act of 1974, as amended.

In executing its responsibilities, the ACRS reviews and provides advice on activities such as: issues associated with the development and implementation of performance indicators; special investigation activities of significant reactor incidents; severe accident policy implementation, including severe accident management; evaluations of reactor operational experience; issues associated with the renewal of licenses for existing plants; the use of probabilistic risk assessment in the evaluation of nuclear plants' effectiveness in meeting the NRC safety goals; Individual Plant Examination submittals; and identification, prioritization, and resolution of generic safety issues and their implementation.

The ACRS reviews and comments on proposed regulatory guides and regulations, including revisions being considered and/or promulgated as the basis for NRC regulatory activities. It also reviews and comments on regulatory issues referred to it by the Commission. Specific examples include: programs and regulatory guidance associated with the implementation of the Commission's Severe

Special and Independent Reviews, Investigations, and Enforcement

Accident Policy and the Safety Goals Policy, matters related to the application of improved source-term methodology to evolutionary and advanced-light-water reactors, and programs associated with containment performance improvement.

In addition, the ACRS, on its own initiative, performs reviews of and provides advice on specific generic matters and nuclear facility safety-related items.

ADVISORY COMMITTEE ON NUCLEAR WASTE

The ACNW provides a focused center of expertise for independent technical review of, and advice on, waste management activities. The ACNW is responsible for reviewing and providing advice on nuclear waste management within the purview of NRC responsibilities, as directed by the Commission.

The committee's activities in the high-level waste area primarily focus on disposal, but it will also be involved with other aspects, such as the handling, processing, transportation, storage, and safeguarding of high-level nuclear wastes.

Specific examples of the work of the ACNW in the area of high-level waste include the following: review proposed rulemakings and technical positions developed to clarify the intent of 10 CFR Part 60; continue to monitor and comment on the revisions being proposed to the Environmental Protection Agency's high-level waste standards, as directed by the Commission; review and comment on selected NRC staff activities associated with the preliminary phase of the proposed high-level waste repository; and review NRC research programs associated with high-level nuclear waste management and disposal.

The committee's activities in the area of low-level nuclear waste primarily focus on disposal, but it will also be involved with other aspects, such as the handling, processing, transportation, storage, and safeguarding of nuclear wastes, including nuclear wastes mixed with other hazardous substances. Specific examples of the work of the ACNW in the area of low-level waste include the following: visits to solidification process vendors and/or disposal sites; review of packaging of low-level waste in high-integrity containers; review of NRC research programs associated with low-level nuclear waste management; and review of proposed criteria for decommissioning.

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INDEPENDENT ADJUDICATORY REVIEWS

	<u>FY 1990</u> <u>Actual</u>	<u>FY 1991</u> <u>Estimate</u>	<u>FY 1992</u> <u>Estimate</u>	<u>FY 1993</u> <u>Estimate</u>
Funds	\$ 258	\$ 680	\$ 680	\$ 680
(Staff)	(41)	(41)	(37)	(37)

Under this program, hearings are conducted pursuant to the Administrative Procedures Act; the Atomic Energy Act of 1954, as amended; and the National Environmental Policy Act and tribunals are provided to review and issue initial and final decisions in statutory-licensing matters and other Commission-assigned proceedings.

The decrease in staff beginning in FY 1992 primarily reflects an anticipated decrease in work load associated with reactor licensing cases.

ATOMIC SAFETY AND LICENSING BOARD PANEL

The Atomic Safety and Licensing Board Panel is the adjudicatory office of the NRC. Administrative judges sitting alone and in three-member boards conduct adjudicatory hearings pursuant to the Administrative Procedures Act, the Atomic Energy Act of 1954, as amended, the Low-Level Radioactive Waste Policy Act of 1980, and the National Environmental Policy Act. The boards hear and decide issues granting, suspending, revoking, or amending licenses to construct and operate nuclear power plants or conduct other licensed activities. Hearings address matters such as health, safety, environmental, and emergency planning issues. Single administrative law judges decide cases in enforcement, civil penalties, and antitrust proceedings. Single presiding officers hear other cases, as directed by the Commission. Work load will continue to shift away from new reactor licensing to issues pertaining to facilities in operation and decommissioning.

ATOMIC SAFETY AND LICENSING APPEAL PANEL¹

The Atomic Safety and Licensing Appeal Panel's three-member Appeals Boards review decisions of administrative law judges, presiding officers, and Atomic Safety and Licensing Boards rendered in licensing, enforcement, and other special proceedings, pursuant to Commission regulations and delegations of authority. In discharging its review functions, the panel is governed by the Administrative Procedures Act, the NRC's rules of practice, and applicable Federal law.

¹On June 29, 1990, the Commission decided to abolish the Atomic Safety and Licensing Appeal Panel and, in its place, establish a mechanism for direct review of Licensing Board decisions by the Commission. The Appeal Panel will be abolished once the rights of the parties to pending appeals have been properly accommodated. To assist in its disposition of appeals, the Commission plans to establish an opinion-writing office that will report directly to the Commission.

Special and Independent Reviews, Investigations, and Enforcement

EXTERNAL INVESTIGATIONS

	<u>FY 1990</u> <u>Actual</u>	<u>FY 1991</u> <u>Estimate</u>	<u>FY 1992</u> <u>Estimate</u>	<u>FY 1993</u> <u>Estimate</u>
Funds	\$ 0	\$ 30	\$ 0	\$ 0
(Staff)	(45)	(44)	(45)	(45)

Under this program, the NRC investigates allegations of wrongdoing by NRC licensees through its Office of Investigations. All findings and conclusions that result from investigations are provided to the Executive Director for Operations, so that the staff can review and consider the issues involved and determine whether enforcement action is warranted. Suspected or alleged criminal violations concerning NRC licensees and others within NRC's regulatory jurisdiction will be referred to the Department of Justice. The Office of Investigations currently has a work load of approximately 55 active cases. Cases meeting the Commission case-opening threshold are expected to range from 60 to 100 cases each year during FY 1992-1993.

Special and Independent Reviews, Investigations, and Enforcement

ENFORCEMENT

	<u>FY 1990</u> <u>Actual</u>	<u>FY 1991</u> <u>Estimate</u>	<u>FY 1992</u> <u>Estimate</u>	<u>FY 1993</u> <u>Estimate</u>
Funds	\$ 3	\$ 20	\$ 20	\$ 20
(Staff)	(19)	(19)	(20)	(20)

This program is designed to ensure compliance with regulations and license conditions, obtain prompt correction in areas of noncompliance, deter further noncompliance, and encourage improvement of licensee performance. The enforcement program uses a series of sanctions that escalate according to the seriousness of the noncompliance and the past history of licensee performance. Notices of violation, civil penalties, and orders are issued, as necessary, to ensure safety and compliance.

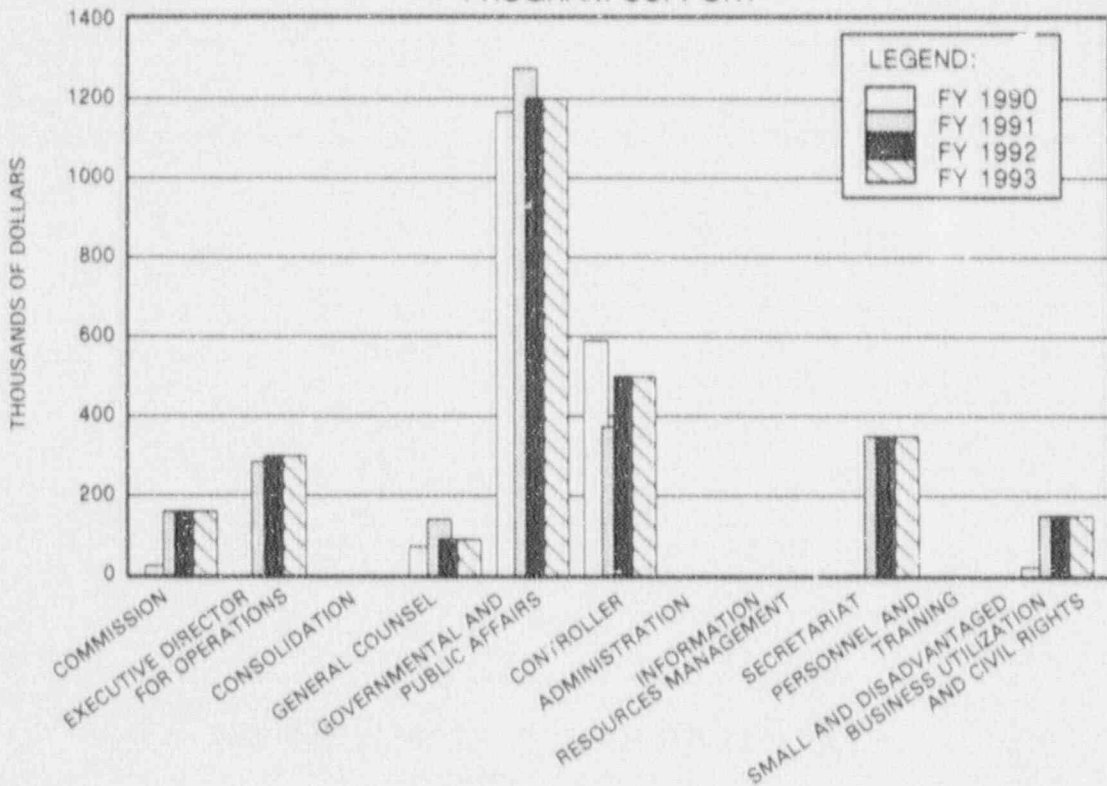
Organizationally, the Office of Enforcement is responsible for implementing the Enforcement program with support from the regional offices. Activities include: overseeing and evaluating regional enforcement efforts; coordinating and developing regional enforcement actions and recommendations; evaluating potential enforcement cases; reviewing inspection and investigation reports and confirmatory action letters; initiating and processing notices of violations, civil monetary penalties, and various orders; and developing and promulgating enforcement policy, including preparation and maintenance of an enforcement manual.

The staff increase in FY 1992 is to improve the timeliness of enforcement actions by permitting more effort to be placed on enforcement actions involving particularly complex cases and investigations performed by the Office of Investigations.

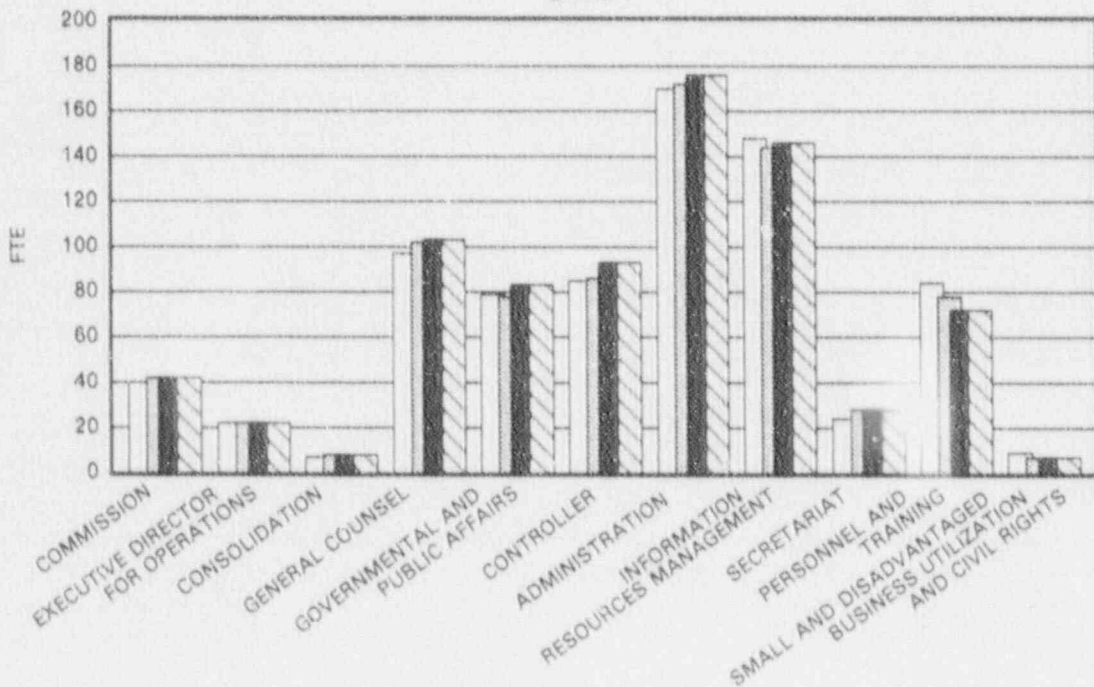
**NUCLEAR SAFETY MANAGEMENT
AND SUPPORT**

NUCLEAR SAFETY MANAGEMENT AND SUPPORT

PROGRAM SUPPORT



STAFF



NUCLEAR SAFETY MANAGEMENT AND SUPPORT

(Dollars are in thousands, except in text, where whole dollars are used; staff numbers are in full-time equivalents.)

Total FY 1992 estimated obligations..... \$79,536

	<u>FY 1990</u> <u>Actual</u>	<u>FY 1991</u> <u>Estimate</u>	<u>FY 1992</u> <u>Estimate</u>	<u>FY 1993</u> <u>Estimate</u>
Salaries and Benefits	\$ 47,681	\$ 54,631	\$ 57,051	\$ 57,051
Program Support	1,875	2,733	2,750	2,750
Administrative Support	16,749	17,134	18,625	18,625
Travel	<u>948</u>	<u>990</u>	<u>1,110</u>	<u>1,110</u>
Total Obligations	<u>\$ 67,253</u>	<u>\$ 75,488</u>	<u>\$ 79,536</u>	<u>\$ 79,536</u>
(Staff)	(765)	(767)	(780)	(780)

Program Support Funds and Staff

The Nuclear Safety Management and Support program support funds and staff are allocated to programs as shown below. The program support funds are allocated primarily for work done by Department of Energy (DOE) laboratories and commercial contractors. The narrative that follows describes these programs and the reasons they are needed.

	<u>FY 1990</u>		<u>FY 1991</u>		<u>FY 1992</u>		<u>FY 1993</u>	
	<u>Actual</u>		<u>Estimate</u>		<u>Estimate</u>		<u>Estimate</u>	
	<u>Funds</u>	<u>Staff</u>	<u>Funds</u>	<u>Staff</u>	<u>Funds</u>	<u>Staff</u>	<u>Funds</u>	<u>Staff</u>
Commission	\$ 23	40	\$ 160	42	\$ 160	42	\$ 160	42
Executive Director								
for Operations	0	22	285	22	300	22	300	22
Consolidation	0	7	0	8	0	8	0	8
General Counsel	73	97	140	102	90	103	90	103
Governmental and								
Public Affairs	1,165	79	1,275	78	1,200	83	1,200	83
Controller	591	85	373	86	500	93	500	93
Administration	0	170	0	172	0	176	0	176
Information Resources								
Management	0	148	0	144	0	146	0	146
Secretariat	1	24	350	28	350	28	350	28
Personnel and								
Training	0	84	0	78	0	72	0	72
Small and Disadvan-								
taged Business								
Utilization and								
Civil Rights	<u>22</u>	<u>9</u>	<u>150</u>	<u>7</u>	<u>150</u>	<u>7</u>	<u>150</u>	<u>7</u>
TOTALS	\$1,875	765	\$2,733	767	\$2,750	780	\$2,750	780

Nuclear Safety Management and Support

DESCRIPTION OF MISSION AREA

Nuclear Safety Management and Support encompasses NRC central policy direction, legal advice for the Commission, liaison with outside constituents and other government agencies, financial management, administrative and logistical support, information resource management, executive management services for the Commission, personnel and training matters, and small and disadvantaged business and civil rights matters. The mission area comprises 11 programs: Commission, Executive Director for Operations, Consolidation, General Counsel, Governmental and Public Affairs, Controller, Administration, Information Resources Management, Secretariat, Personnel and Training, and Small and Disadvantaged Business Utilization and Civil Rights.

Nuclear Safety Management and Support

COMMISSION

	<u>FY 1990</u> <u>Actual</u>	<u>FY 1991</u> <u>Estimate</u>	<u>FY 1992</u> <u>Estimate</u>	<u>FY 1993</u> <u>Estimate</u>
Funds (Staff)	\$ 23 (40)	\$ 160 (42)	\$ 160 (42)	\$ 160 (42)

The Commission is the governing body of the Nuclear Regulatory Commission. It is responsible for providing the fundamental policy guidance to staff offices to ensure that the civilian use of nuclear energy is regulated in a manner consistent with the public health and safety, environmental quality, national security, and antitrust laws.

Nuclear Safety Management and Support

EXECUTIVE DIRECTOR FOR OPERATIONS

	<u>FY 1990</u> <u>Actual</u>	<u>FY 1991</u> <u>Estimate</u>	<u>FY 1992</u> <u>Estimate</u>	<u>FY 1993</u> <u>Estimate</u>
Funds (Staff)	\$ 0 (22)	\$ 285 (22)	\$ 300 (22)	\$ 300 (22)

The Office of the Executive Director for Operations (EDO) supervises and coordinates policy development and operational activities of program and EDO staff offices, and implements the Commission's policy directives pertaining to these offices. The EDO is the chief operations and administrative officer of the Commission and is authorized and directed to discharge such licensing, regulatory, and administrative functions of the NRC and to take actions that are necessary for day-to-day operation of the agency.

CONSOLIDATION

	<u>FY 1990</u> <u>Actual</u>	<u>FY 1991</u> <u>Estimate</u>	<u>FY 1992</u> <u>Estimate</u>	<u>FY 1993</u> <u>Estimate</u>
(Staff)	(7)	(8)	(8)	(8)

The consolidation program provides for the coordinated planning and execution of tasks required to consolidate the NRC headquarters staff in Rockville, Maryland. This two-phased effort will reduce the dispersion of NRC headquarters staff from 11 different buildings in the Washington, D.C., area to a two-building complex. The program is managed by the Office of Consolidation.

In April 1988, the first phase of the two-phased consolidation effort was completed with the move of approximately 1,400 employees into One White Flint North. The second phase of the consolidation effort will involve the move of approximately 1,000 employees into Two White Flint North beginning in 1993. Activities associated with the second phase include: preparing housing plans and office standards for the second building; coordinating the activities of building architects, space planners, the General Services Administration, and NRC staff to develop support and special space requirements to accommodate employees in the second building; modernizing the telecommunications system; performing procurement planning and managing contracts for demountable walls, systems furniture, local area network cabling, furniture, equipment, and supplies; and scheduling and coordinating the moves of NRC staff to the second building.

The NRC's cost for the building includes: facility and space preparation, telecommunications systems and equipment, property and supplies, security, and moving and relocation. These costs are covered by administrative support funds allocated to each of the NRC's mission areas.

GENERAL COUNSEL

	<u>FY 1990</u> <u>Actual</u>	<u>FY 1991</u> <u>Estimate</u>	<u>FY 1992</u> <u>Estimate</u>	<u>FY 1993</u> <u>Estimate</u>
Funds (Staff)	\$ 73 (97)	\$ 140 (102)	\$ 90 (103)	\$ 90 (103)

The General Counsel is the Commission's chief legal advisor. The Office of the General Counsel (OGC) represents the Commission in courts of appeals proceedings to review Commission orders and rules and, in cooperation with the Department of Justice, represents the Commission in court proceedings affecting the NRC's programs in the Federal district courts and the Supreme Court.

The staff increase, beginning in FY 1992, is to provide legal support services to the newly-established Office of the Inspector General.

LICENSING AND REGULATION

The OGC provides legal advice to the Commission in the review of adjudicatory decisions, on the implementation of employee conduct regulations, on external investigations, on internal audits, and on the application of Federal Openness Laws to Commission functions. OGC drafts proposed legislation for Commission consideration and provides advice on the legal and policy implications of legislation sponsored by others, which is referred to the Commission for comment by the Office of Management and Budget or Congress. OGC provides advice to NRC offices that are developing NRC regulations and guides pertinent to the licensing of nuclear facilities, the use of nuclear materials, and disposal of high-level waste. OGC represents the NRC staff in public rulemaking hearings, and provides legal assistance to NRC offices involved in issuing licenses for the use or possession of nuclear materials and disposal of nuclear waste.

HEARINGS, ENFORCEMENT, AND ADMINISTRATION

The OGC develops legal policy and represents the NRC staff in public hearings conducted in conjunction with the licensing of nuclear facilities and the users of nuclear materials and licensing of the high-level waste repository; develops legal policy associated with such licensing; and provides advice and consultation to the staff on health, safety, environmental, and antitrust issues arising from the licensing process.

The OGC provides legal advice and assistance to the Commission, all regional offices, and the offices of Enforcement, Nuclear Material Safety and Safeguards,

Nuclear Safety Management and Support

and Nuclear Reactor Regulation on inspection and enforcement matters. OGC also advises and represents NRC offices in enforcement proceedings against licensees involving imposition of civil penalties and the modification, suspension, or revocation of licenses.

The OGC also provides advice and assistance to NRC offices involved in interagency and international agreements, procurement, intellectual property, budget, security, and administrative functions and represents the NRC in administrative hearings involving procurement, personnel, personnel security, labor relations, and equal employment opportunity matters.

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GOVERNMENTAL AND PUBLIC AFFAIRS

	<u>FY 1990</u> <u>Actual</u>	<u>FY 1991</u> <u>Estimate</u>	<u>FY 1992</u> <u>Estimate</u>	<u>FY 1993</u> <u>Estimate</u>
Funds (Staff)	\$ 1,165 (79)	\$ 1,275 (78)	\$ 1,200 (83)	\$ 1,200 (83)

This program provides for liaison with the Congress; distribution of information to the general public and the news media; participation in international programs; strengthening of intergovernmental activities through improved Federal liaison; and liaison with State and local governments and organizations, and Indian tribes. This program is proactive in its relationship with external constituents by focusing its activities on enhancing awareness and understanding of NRC programs, policies, and initiatives. The program is managed by the Office of Governmental and Public Affairs (GPA) and is composed of four major elements: Congressional Affairs, Public Affairs, International Activities, and State Activities.

The staff increase in FY 1992 provides for strengthened Federal liaison activities; for increased liaison and coordination with the U.S.S.R., DOE, and other agencies as needed by the Joint Coordinating Committee on Civilian Nuclear Reactor Safety (JCCCNRS), particularly for the working group that analyzes the environmental and health effects of the Chernobyl accident; for review of approximately two additional Agreement State applications and amendments; and to provide technical assistance to States for the siting and licensing of low-level waste disposal facilities.

CONGRESSIONAL AFFAIRS

This program element comprises activities that are designed to assist the Chairman, the Commissioners, and senior NRC staff with regard to congressional matters, coordinate relations between the agency and Congress, and provide liaison for the Commission with congressional committees and subcommittees and individual members of Congress.

The primary objective is to ensure that Congress is kept fully and currently informed about agency activities and that congressional requests and inquiries are responded to in a timely manner. Congressional Affairs provides the Chairman, the Commissioners, and senior NRC staff with relevant and current information pertaining to major legislative activities likely to affect the agency. Additionally, Congressional Affairs seeks to ensure that individual members of Congress are kept currently and adequately informed about significant NRC activities that might affect their respective States and districts.

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PUBLIC AFFAIRS

This program element comprises activities that are designed to assist the Chairman, the Commissioners, and senior NRC staff with regard to the NRC's Public Affairs Program. This includes developing and administering agency policies and procedures for informing the public and the news media of NRC policies, programs, and activities; informing NRC management of media coverage of activities of interest to the agency; working with civic groups and administering a cooperative program with public schools; and advising management on providing information on NRC activities to the news media and general public and on conducting public meetings.

INTERNATIONAL ACTIVITIES

This program element comprises activities that provide for developing and administering policy and priority recommendations on international issues; administering the Commission's responsibilities in the areas of nuclear nonproliferation, international safeguards, and nuclear exports and imports; facilitating NRC access to foreign nuclear health and safety-related information and NRC technical cooperation with foreign countries and international organizations; and maintaining liaison with the executive branch, particularly the Department of State and DOE. The NRC will complete action on approximately 180 export license applications and on approximately 125 executive branch consultation cases each year during FY 1991-1993. The agency will renegotiate about 4 international information exchange agreements each year and implement cooperative programs under approximately 25 such agreements, including support of U.S. nuclear safety cooperation with the U.S.S.R. and Eastern Europe. The NRC expects the exchange of information to be extremely beneficial to all parties in terms of the important safety-related information that is being made available.

STATE ACTIVITIES

This program element comprises activities that provide for cooperation, oversight, and liaison with States, local governments, Indian tribes, and interstate organizations. As a part of these responsibilities, GPA maintains frequent contact with the States by administering agreements with the 29 Agreement States; providing guidance and training; making annual visits and on-site program reviews for adequacy and compatibility with NRC programs; providing assistance to State and local governments in radiation control; coordinating activities of interest to State, local, and Indian tribal governments with other NRC offices; and actively participating in the Conference of Radiation Control Program Directors, Inc., and the All-Agreement States Annual Meeting. In addition, GPA enters into memoranda of understanding with States on various NRC and/or State activities, monitors State legislation, and informs the Commission and staff of significant State actions affecting nuclear regulation. It also regularly consults and conducts meetings with Governor-appointed State Liaison

Nuclear Safety Management and Support

Officers and also maintains liaison with national organizations such as the National Governors' Association, National Association of Regulatory Utility Commissioners, National Congress of American Indians, and the National Conference of State Legislatures to identify NRC regulatory initiatives affecting States and to keep NRC apprised of these organizations' activities that could impact the agency.

Nuclear Safety Management and Support

CONTROLLER

	<u>FY 1990</u> <u>Actual</u>	<u>FY 1991</u> <u>Estimate</u>	<u>FY 1992</u> <u>Estimate</u>	<u>FY 1993</u> <u>Estimate</u>
Funds (Staff)	\$ 591 (85)	\$ 373 (86)	\$ 500 (93)	\$ 500 (93)

This program provides for the overall financial management of the agency. This includes responsibilities for all budget and accounting activities; providing agency senior management with analyses of policy, program, and resource issues; coordinating the development of NRC's Five-Year Plan; preparing information required by Office of Management and Budget circulars and bulletins and preparing budget reports to Congress; managing the agency's administrative control of funds; managing the agency's internal control program; developing authorization and appropriation legislation; developing and administering policies, principles, standards, and procedures for financial and cost accounting; carrying out fiscal functions, including the preparation of financial statements; and administering the NRC's license fee program. The program is managed by the Office of the Controller and is composed of two major elements: Budget and Analysis, and Accounting and Finance.

The staff increase in FY 1992 is due to: (1) beginning to implement the requirements of the Chief Financial Officers Act of 1990; (2) the increased work load to certify the availability of funds, including the additional work load required to administer the new Inspector General's appropriation and allotment; and (3) improving the timeliness of commercial invoice examination, walk-up travel voucher examination, and travel accounting reconciliation.

BUDGET AND ANALYSIS

This program element comprises activities that provide for conducting the NRC's planning and budgeting process and for performing the necessary analyses to propose efficient resource utilization strategies to senior management. Participating in this planning/budget process with the Controller, resource priorities are established; budgets are submitted to the Office of Management and Budget and Congress; and any required adjustments in resource utilization are made, in conjunction with the Commission, senior management, and affected offices. This program element also includes: activities for developing and maintaining policies, procedures, and operations to execute approved NRC budgets; developing and administering NRC authorization and appropriation legislation; and assisting NRC offices in the use of sound statistical practices.

ACCOUNTING AND FINANCE

This program element comprises activities that administer the NRC's official accounting records; implement sound cash management and travel policies; maintain an integrated financial management information system; administer the NRC's license fee program; and implement the requirements of the Chief Financial Officers Act of 1990, as interpreted by the Office of Management and Budget. Debts owed the NRC are billed and collected, as are disbursement functions for payroll, travel, contracts, purchase orders, and amounts owed to other Federal agencies.

Nuclear Safety Management and Support

ADMINISTRATION

	<u>FY 1990</u> <u>Actual</u>	<u>FY 1991</u> <u>Estimate</u>	<u>FY 1992</u> <u>Estimate</u>	<u>FY 1993</u> <u>Estimate</u>
(Staff)	(170)	(172)	(176)	(176)

This program provides for centralized administrative and logistical support services for headquarters, specifically in the areas of procurement, property management, facilities support, transportation, security, publications services, Freedom of Information Act requests, privacy protection, rulemaking support, and local public document rooms, as well as certain support services for the regional offices. The program is managed by the Office of Administration and is composed of three major elements: Contracts and Property Management, Security, and Freedom of Information and Publications Services.

The staff increase in FY 1992 provides for editorial assistance for new initiatives associated with the Technical Specification Improvement Program that was initiated to improve operational safety by reducing the volume and complexity of nuclear power plant technical specifications; increased editorial assistance to the newly-established Office of the Inspector General, which has significantly more responsibilities and reporting requirements than its predecessor; and support for the increased contract work load associated with ADP telecommunications procurements, which requires specialized contract negotiation skills.

CONTRACTS AND PROPERTY MANAGEMENT

This program element comprises activities that develop and implement agencywide contracting policies and procedures; direct and coordinate contracting activities, including selection, negotiation, administration, and closeout; provide advice and assistance to offices on procurement and property regulations and requirements and methods of meeting program objectives consistent with such requirements; execute and modify contracts, grants, cooperative agreements, and interagency actions; settle claims and terminations; and perform other normal duties of a contracting office as specified in the Federal Acquisition Regulation and the Federal Information Resources Management Regulation. It also develops and administers programs for space acquisition and utilization, space renovations, motor vehicle operation, building management, transportation services, property management, supply and warehouse operations, and office and equipment moves.

SECURITY

This program element comprises activities that administer the agency's overall security program, including the safeguarding of restricted data and National Security Information documents or material at headquarters, regional offices, contractor, licensee, and other facilities containing such matter; approving the security requirements for licensing of uranium enrichment facilities; the safeguarding of sensitive intelligence; the operation of the NRC classified communications systems; the NRC Drug Testing Program; the physical protection of personnel and property at headquarters and other agency locations; the NRC Criminal History Check Program; and the processing and maintaining of initial and continuing access authorizations (clearances) for agency employees, consultants, contractors, licensees, and others.

FREEDOM OF INFORMATION AND PUBLICATIONS SERVICES

This program element comprises activities that develop policies, procedures, and rules for implementing the Freedom of Information Act, Privacy Act, Federal Register Act, and Regulatory Flexibility Act; develop and review amendments to agency regulations and petitions for rulemaking; provide advice and assistance to offices and the public for filing petitions for rulemaking; administer the agency's Management Directives System; and direct and coordinate local public document room activities near all reactor sites and certain other fuel cycle and waste sites throughout the United States. It also provides centralized agencywide publication control and processing, technical writing and editing services, and translation services; publishes regulatory and technical reports; provides direction and coordination for agencywide provision of document composition, printing, copy management, photography, and audiovisual and related services; and provides automated reports processing and proofreading services agencywide, including electronic communication with the regional offices and contractors.

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INFORMATION RESOURCES MANAGEMENT

	<u>FY 1990</u> <u>Actual</u>	<u>FY 1991</u> <u>Estimate</u>	<u>FY 1992</u> <u>Estimate</u>	<u>FY 1993</u> <u>Estimate</u>
(Staff)	(148)	(144)	(146)	(146)

This program provides for centralized information resources in the areas of computer, telecommunications, and information support services, including: nationwide telecommunications equipment and services (both routine and emergency); systems development; data administration; office automation; microcomputers; record management and services; library services; document control and management; computer operations; the Information Technology Services Support Center; and graphics. It provides the essential services and technical means for the agency staff to receive, store, retrieve, manipulate, process, and transmit information in support of the agency's health and safety mission. The program is managed by the Office of Information Resources Management and is composed of two major elements: Computer and Telecommunications Services and Information Support Services.

The staff increase in FY 1992 is to improve emergency telecommunications with reactor sites and to provide for project management to upgrade NRC information and word-processing equipment and capabilities.

COMPUTER AND TELECOMMUNICATIONS SERVICES

This program element includes the evaluation, support, maintenance, and purchase of telecommunications equipment and services and the development of the system architecture for the agency's telecommunications network. Additionally, this program element includes: maintenance, support, and improvements to existing NRC automated systems; development of shared data bases and new systems; and office automation planning and the purchase, installation, and maintenance of microcomputers, hardware, software, and local area networks.

INFORMATION SUPPORT SERVICES

This program element provides for the management of the flow of information related to the agency's regulatory, research, inspection, legal, management, and external relations programs and provides technical support for staff in the use of information technology, including computer services, library and records management services, document and drawing management, mail and distribution services, graphics services, scientific code dissemination, commercial data base services, and user training and assistance. Additionally, the program element

Nuclear Safety Management and Support

assures agency compliance with statutory requirements under the Paperwork Reduction Act, the Federal Records Act, and the Computer Security Act.

SECRETARIAT

	<u>FY 1990</u> <u>Actual</u>	<u>FY 1991</u> <u>Estimate</u>	<u>FY 1992</u> <u>Estimate</u>	<u>FY 1993</u> <u>Estimate</u>
Funds	\$ 1	\$ 350	\$ 350	\$ 350
(Staff)	(24)	(28)	(28)	(28)

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, including preparation of internal procedures; prepares the Commission's meeting agenda; codifies Commission decisions in memoranda directing staff action and monitors compliance; manages the Staff Paper and COMSEC systems; 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; processes and controls motions, pleadings, and appeals filed with the Commission and the Licensing Board; issues and serves adjudicatory decisions and orders on behalf of the Commission and Licensing Board; files and distributes public comments in rulemaking proceedings; issues proposed and final rules on behalf of the Commission; directs and administers the NRC Historical Program, NRC Public Document Room, and its Bibliographic Retrieval System; integrates office automation initiatives into the Commission's administrative system; and functions as the NRC Federal Advisory Committee Management Officer.

Nuclear Safety Management and Support

PERSONNEL AND TRAINING

	<u>FY 1990</u> <u>Actual</u>	<u>FY 1991</u> <u>Estimate</u>	<u>FY 1992</u> <u>Estimate</u>	<u>FY 1993</u> <u>Estimate</u>
(Staff)	(84)	(78)	(72)	(72)

This program provides for the effective recruitment organization, utilization, and development of the agency's human resources through an integrated career management system; plans and implements NRC personnel policies, programs, and services; manages agencywide recruitment, staffing, and position evaluation for NRC managers and employees; provides training, benefits administration, employee assistance, and counseling services; provides labor relations policy guidance and negotiates the collective bargaining agreement; and collects, analyzes, and provides data on NRC's work force. The program is managed by the Office of Personnel and is composed of three major elements: Personnel, Training and Development, and NRC-Wide Support.

PERSONNEL

This program element provides for personnel management and organizational activities including recruitment, staffing and placement, position classification and evaluation, personnel policy and program development, Federal labor relations and employee relations services, organizational and management analyses, position management, support to the Executive Resources Board and its subgroups, the occupational health and safety program, the employee assistance program, and health care programs. Beginning in FY 1992 and continuing in FY 1993, the Office of Personnel will continue efforts to establish the NRC's childcare center and wellness/fitness center, as part of the NRC headquarters consolidation in Rockville, Maryland.

TRAINING AND DEVELOPMENT

This program element provides for all education and training (other than reactor technology and associated technical training under the purview of the Technical Training Center. This includes: graduate fellowships; scholastic support of cooperative education program students; retraining of NRC employees; support for the Technical Training Center qualifications training; individual employee, supervisory, management, and executive development and training to improve performance and support equal employment opportunity and affirmative action goals; career development counseling; risk analysis, regulatory processes, personal end-user computing, and project management to improve employee performance; and other training and education programs that respond to emerging

Nuclear Safety Management and Support

agency needs. The program element also provides for organizational development, including management succession activities, team building, and rotational assignments and for agencywide support for improving training delivery, through the development and application of improved or alternative methods, and increased employee training opportunities utilizing the Individual Learning Center.

NRC-WIDE SUPPORT

This program element comprises the secretarial and clerical support to meet short-term needs by headquarters offices through the assignment of Central Support Unit staff or acquisition of private sector temporary services. The Office of Personnel manages this function in response to agency requirements.

Nuclear Safety Management and Support

SMALL AND DISADVANTAGED BUSINESS
UTILIZATION AND CIVIL RIGHTS

	<u>FY 1990 Actual</u>	<u>FY 1991 Estimate</u>	<u>FY 1992 Estimate</u>	<u>FY 1993 Estimate</u>
Funds (Staff)	\$ 22 (9)	\$ 150 (7)	\$ 150 (7)	\$ 150 (7)

This program provides for the implementation and execution of the functions and duties under sections 8 and 15 of the Small Business Investment Act of 1958, as amended, to locate small and disadvantaged businesses capable of performing NRC contractual requirements and to provide information to such firms interested in NRC programs and contracting procedures. The program also includes the functions and duties relating to equal employment opportunity and civil rights matters within the NRC, to increase employment of minorities and women in the agency, and assure a climate for improved employee morale by promoting and maintaining counseling activities and supporting advisory committees made up of special emphasis groups. The program is managed by the Office of Small and Disadvantaged Business Utilization and Civil Rights and is composed of three major elements: the Small and Disadvantaged Business Utilization Program, the Civil Rights Program, and the Federal Women's Program.

SMALL AND DISADVANTAGED BUSINESS UTILIZATION

The Small and Disadvantaged Business Utilization activities are authorized by sections 8 and 15 of the Small Business Investment Act of 1958, as amended. The responsibilities of this activity include: locating and referring small and disadvantaged businesses for procurement awards, negotiating a monetary goals program with the Small Business Administration for awarding NRC contracts to small and disadvantaged businesses and monitoring the results on a quarterly basis, monitoring NRC's procurement list to ensure equitable participation of small and disadvantaged businesses, offering advice and consultation to offices on capabilities of small and disadvantaged business firms, and disseminating information to such firms interested in NRC contracting procedures.

CIVIL RIGHTS

The Civil Rights activities are responsive to the Civil Rights Act of 1964, as amended, and are implemented by 29 CFR Part 1613 of the Equal Employment Opportunity (EEO) Commission regulations. The activities include developing, monitoring, and evaluating the NRC's Affirmative Action Program; advising and assisting the Office of Personnel on recruitment of minorities and women and EEO

Nuclear Safety Management and Support

training for managers and employees; providing advice to senior management on Civil Rights and EEO matters; and developing and administering EEO counseling activities and the EEO complaints process. Activities also include supporting special emphasis and employee advisory groups; annually setting goals for hiring and advancement of minorities and women; tracking agency performance on all affirmative action and EEO matters; and addressing any EEO issues resulting from financial assistance provided under section 274 of the Atomic Energy Act of 1954, as amended.

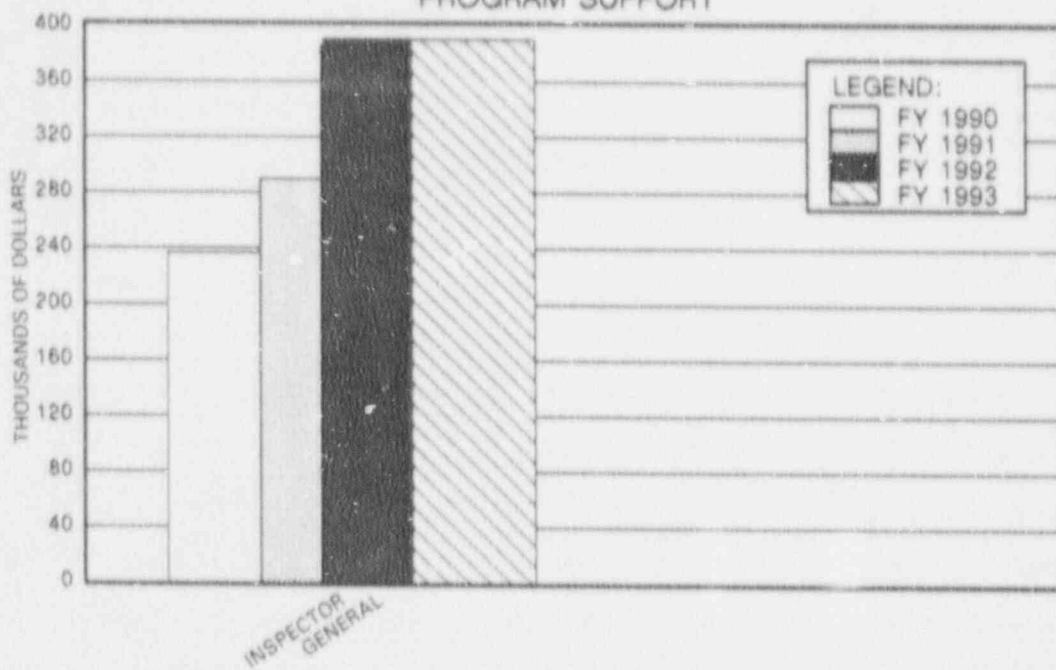
FEDERAL WOMEN'S PROGRAM

The aim of the Federal Women's Program is to expand and enhance opportunities for NRC women employees, advise management of any policies and practices that may serve as barriers in the workplace, assist the Office of Personnel in recruitment actions directed towards women, maintain communication with women's organizations, and coordinate and support the Federal Women's Program Advisory Committee.

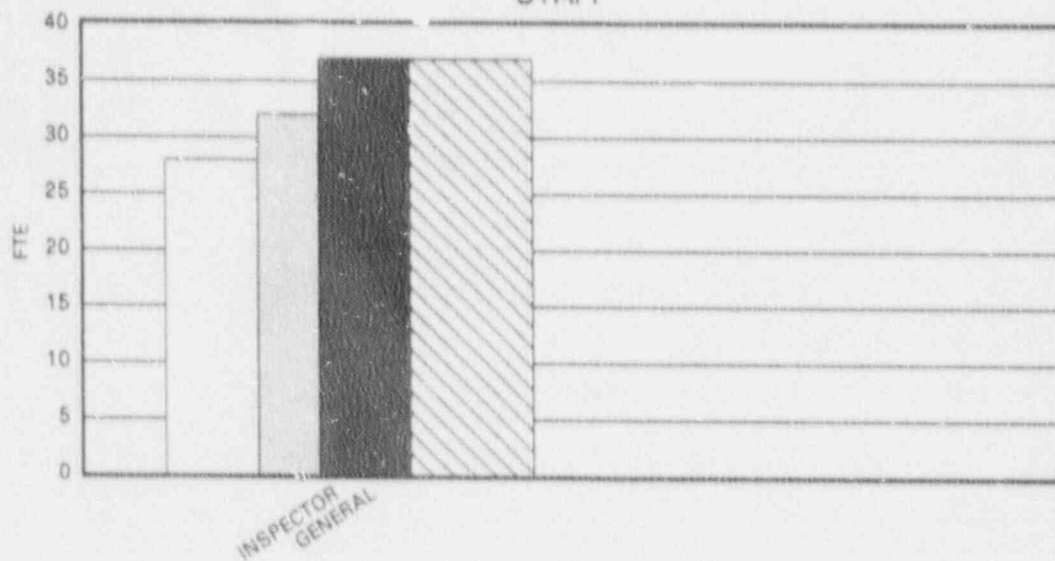
INSPECTOR GENERAL

INSPECTOR GENERAL

PROGRAM SUPPORT



STAFF



INSPECTOR GENERAL

(Dollars are in thousands, except in text, where whole dollars are used; staff numbers are in full-time equivalents.)

Total FY 1992 estimated obligations\$3,690

	<u>FY 1990</u> <u>Actual</u>	<u>FY 1991</u> <u>Estimate</u>	<u>FY 1992</u> <u>Estimate</u>	<u>FY 1993</u> <u>Estimate</u>
Salaries and Benefits	\$ 1,831	\$ 2,842	\$ 3,200	\$ 3,200
Program Support	237	290	390	390
Administrative Support	510	790	0	0
Travel	<u>79</u>	<u>100</u>	<u>100</u>	<u>100</u>
Total Obligations	<u>\$ 2,657</u>	<u>\$ 4,022</u>	<u>\$ 3,690</u>	<u>\$ 3,690</u>
(Staff)	(28)	(32)	(37)	(37)

DESCRIPTION OF MISSION AREA

This mission area is designed to provide the Commission with an independent review and appraisal of NRC programs and operations, to assure their effectiveness, efficiency, and integrity. The organizational responsibility for this mission area rests with the Office of the Inspector General (OIG). The Inspector General Act Amendments of 1988 created a statutory Inspector General at the NRC, effective April 15, 1989. These amendments, along with the Inspector General Act of 1978, placed some significant new responsibilities on the office, which its predecessor the Office of Inspector and Auditor, did not have. Additionally, the Chief Financial Officers Act of 1990 also created new responsibilities. These responsibilities include: additional reporting requirements, legislation and regulation review responsibility, oversight for audits performed by outside organizations, significant new administrative authorities, and ensuring that audits of the agency's financial statements are performed.

The staff increase beginning in FY 1992 is to enable the OIG to carry out its contract audit responsibilities and to comply with the provisions of the Chief Financial Officers Act of 1990, which requires the OIG to audit the agency's financial statements.

The OIG develops the policies and standards that govern NRC's financial and management audit program; plans, directs, and executes the long-range, comprehensive audit program; and has oversight responsibility for preaward and other audits of NRC contracts.

Inspector General

The OIG will conduct investigations and inquiries, as necessary, to ascertain and verify the facts with regard to the integrity of all NRC programs and operations. Suspected or alleged criminal violations will be referred to the Department of Justice.

Existing and proposed legislation and regulations will be reviewed for their impact on the economy and efficiency of the administration of the NRC's programs and operations and recommendations will be made, as appropriate.

The OIG will conduct independent audits of NRC contracts and provide oversight of preaward and postaward audits of NRC contracts performed by the Defense Contract Audit Agency and other outside organizations.

The OIG will ensure that the NRC properly implements the requirements of the Chief Financial Officers Act of 1990 and will perform audits of the agency's financial statements.

The Commission and the Congress will be kept informed about fraud, abuse, and other serious deficiencies in the NRC's programs and operations through semiannual and other reports. The semiannual reports, which are required by the Inspector General Act of 1978, as amended, will include: detailed information regarding significant problems found in NRC programs and OIG's recommendations for corrective actions; unresolved audit recommendations; matters referred to prosecutive authorities, as well as prosecutions and convictions; and statistical tables providing information on the total number of audit reports, the dollar value of OIG-recommended actions, and the dollar value of certain costs questioned during OIG audits.

The NRC's OIG will maintain liaison with other audit and inspector general organizations and law enforcement agencies.

SPECIAL SUPPORTING TABLES

SPECIAL SUPPORTING TABLES

This section contains the following:

Legislative Program Projections which provides a summary of NRC's budget authority and outlays by appropriation for FY 1990-1996.

A summary of NRC's headquarters and regional resources by mission area for FY 1990-1993.

A report on consulting services required by 31 U.S.C. 1114(a), which provides resource estimates and a description of the consulting services used by NRC in FY 1990 and planned for FY 1991-1993.

A report on metrication, required by Public Law 100-418, which describes NRC's actions that have been taken and those planned for FY 1991 to implement the Metric Conversion Act of 1975, as amended.

A report on drug testing required by 31 U.S.C. 1105(a), which describes NRC's drug testing activities conducted in accordance with Executive Order 12564.

A report by the Office of the Inspector General, required by 31 U.S.C. 1114(b), on NRC's progress in establishing effective management controls and improving the accuracy and completeness of information provided to the Federal Procurement Data System on contracts for consulting services.

A report by the Office of the Inspector General on NRC's compliance with, and the effectiveness of, Public Law 101-121 on the use of appropriated funds to influence certain Federal contracting and financial transactions.

LEGISLATIVE PROGRAM PROJECTIONS

(Dollars are in millions)

	<u>FY 1990</u>	<u>FY 1991</u>	<u>FY 1992</u>	<u>FY 1993</u>	<u>FY 1994</u>	<u>FY 1995</u>	<u>FY 1996</u>
	<u>Actual</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>

NRC Appropriation: Salaries and Expenses

Budget Authority	\$ 435.9	\$ 461.3	\$ 508.8	\$ 509	\$ 509	\$ 509	\$ 509
Budget Outlays	\$ 391.3	\$ 458.9	\$ 496.4	\$ 496	\$ 496	\$ 496	\$ 496

NRC Appropriation: Office of the Inspector General

Budget Authority	\$ 2.9	\$ 3.7	\$ 3.7	\$ 4	\$ 4	\$ 4	\$ 4
Budget Outlays	\$ 1.9	\$ 3.5	\$ 3.6	\$ 4	\$ 4	\$ 4	\$ 4

U. S. NUCLEAR REGULATORY COMMISSION
SUMMARY OF HEADQUARTERS AND REGIONAL RESOURCES BY MISSION AREA
(Dollars in thousands, staff in full-time equivalents)

	FY 1990		FY 1991		FY 1992		FY 1993	
	ACTUAL		ESTIMATE		ESTIMATE		ESTIMATE	
	\$	FTE	\$	FTE	\$	FTE	\$	FTE
HEADQUARTERS RESOURCES								
Reactor Safety and Safeguards Regulation	\$86,744	657	\$98,800	684	\$104,841	710	\$104,841	710
Nuclear Safety Research	103,404	234	110,013	230	120,266	239	120,266	239
Nuclear Material & Low-level Waste Safety & Safeguards Regulation	25,663	199	30,810	214	30,633	219	30,633	219
High-Level Nuclear Waste Regulation	21,498	73	19,160	71	19,962	72	19,962	72
Special & Independent Reviews, Investigations, and Enforcement	31,210	250	36,605	251	37,644	249	37,644	249
Nuclear Safety Management and Support	65,988	750	74,085	752	78,081	765	78,081	765
Inspector General	2,657	28	4,022	32	3,690	37	3,690	37
Subtotal	\$337,164	2,191	\$373,495	2,234	\$395,117	2,291	\$395,117	2,291
REGIONAL RESOURCES								
Reactor Safety and Safeguards Regulation	81,991	823	90,005	817	95,114	843	95,114	843
Nuclear Material & Low-level Waste Safety & Safeguards Regulation	14,172	137	17,705	157	19,165	169	19,165	169
Special & Independent Reviews, Investigations, and Enforcement	1,688	20	1,591	17	1,649	17	1,649	17
Nuclear Safety Management and Support	1,265	15	1,403	15	1,455	15	1,455	15
Subtotal	\$99,116	995	\$110,704	1,006	\$117,383	1,044	\$117,383	1,044
TOTAL NRC RESOURCES								
Reactor Safety and Safeguards Regulation	168,735	1,480	188,805	1,501	199,955	1,553	199,955	1,553
Nuclear Safety Research	103,404	234	110,013	230	120,266	239	120,266	239
Nuclear Material & Low-level Waste Safety & Safeguards Regulation	39,835	336	48,515	371	49,798	388	49,798	388
High-Level Nuclear Waste Regulation	21,498	73	19,160	71	19,962	72	19,962	72
Special & Independent Reviews, Investigations, and Enforcement	32,898	270	38,196	268	39,293	266	39,293	266
Nuclear Safety Management and Support	67,253	765	75,488	767	79,536	780	79,536	780
Inspector General	2,657	28	4,022	32	3,690	37	3,690	37
TOTAL NRC	\$436,280	3,186	\$484,199	3,240	\$512,500	3,335	\$512,500	3,335

Consulting Services

CONSULTING SERVICES BY MISSION AREA
(Dollars are in thousands)

Mission Area	Type	FY 1990 Actual	FY 1991 Estimate	FY 1992 Estimate	FY 1993 Estimate
Nuclear Safety Research	Advisory Committee Consultants	\$ 43	\$ 45	\$ 45	\$ 45
	Total	\$ 43	\$ 45	\$ 45	\$ 45
Nuclear Material and Low-Level Waste Safety and Safeguards Regulation	Personnel Appointments	8	10	10	10
	Advisory Committee Consultants	14	15	15	15
	Total	\$ 22	\$ 25	\$ 25	\$ 25
High-Level Nuclear Waste Regulation	Advisory Committee Consultants	84	90	95	95
	Total	\$ 84	\$ 90	\$ 95	\$ 95
Special and Independent Reviews, Inves- tigations, and Enforcement	Contractual Services	73	120	120	120
	Personnel Appointments Advisory Committee Consultants	30	0	0	0
	Total	\$ 202	\$ 225	\$ 235	\$ 235
Nuclear Safety Management and Support	Contractual Services	8	30	30	30
	Personnel Appointments	24	120	120	120
	Total	\$ 32	\$ 150	\$ 150	\$ 150
Total Salaries and Expenses	Contractual Services	81	150	150	150
	Personnel Appointments Advisory Committee Consultants	62	130	130	130
	Total	\$ 383	\$ 535	\$ 550	\$ 550
Inspector General	Contractual Services	44	40	15	15
	Personnel Appointments	6	25	50	50
	Total	\$ 50	\$ 65	\$ 65	\$ 65
Total Nuclear Regulatory Commission	Contractual Services	125	190	165	165
	Personnel Appointments Advisory Committee Consultants	68	155	180	180
	Total	\$ 433	\$ 600	\$ 615	\$ 615

MISSION AREAS

NUCLEAR SAFETY RESEARCH

Advisory committee expenses are for the Nuclear Safety Research Review Committee which provides advice to the Director, Office of Nuclear Regulatory Research, on the agency's program of nuclear safety research.

NUCLEAR MATERIAL AND LOW-LEVEL WASTE SAFETY AND SAFEGUARDS REGULATION

Personnel appointment services are used to provide technical advice and assistance to staff on the review of quality assurance aspects for low-level waste disposal facilities and uranium mill tailings disposal sites. Advisory committee expenses are for the Advisory Committee on Medical Uses of Isotopes, which considers medical questions referred to it by the NRC staff, renders expert opinions regarding medical uses of radioisotopes, and provides advice on matters of policy. In addition, personnel appointment services are used to furnish medical advice pertaining to possible radiation effects upon NRC licensees, their employees, or members of the public.

HIGH-LEVEL NUCLEAR WASTE REGULATION

Contractual services and personnel appointments are used to obtain expertise not otherwise available to the Advisory Committee on Nuclear Waste on matters associated with the management of high-level nuclear waste. Advisory committee expenses also include the Licensing Support System Advisory Review Panel, which was established to provide advice to the Licensing Support System Administrator on selected aspects of the design, development, and operation of the Licensing Support System.

SPECIAL AND INDEPENDENT REVIEWS, INVESTIGATIONS, AND ENFORCEMENT

Contractual services, personnel appointments, and contractual services are used to obtain engineering and scientific advice and expert opinion for the Advisory Committee on Nuclear Waste in areas associated with nuclear waste management. In addition, the services of administrative judges are used to perform statutory functions in evaluating regulatory matters.

NUCLEAR SAFETY MANAGEMENT AND SUPPORT

Contractual services are used to provide third-party evaluations and recommendations for personnel-related hearings. Personnel appointments provide the agency primarily with advice and assistance: (1) on the retrieval and maintenance of documents located in the local public document rooms, (2) in performing technical editorial review of licensing documents and in preparing the NRC's Annual Report to the Congress, (3) in reviewing certain security clearance applications, (4) in performing evaluations and proposals related to

Consulting Services

information collection requirements contained in Title 10 of the Code of Federal Regulations, and (5) on recruitment efforts and planning recruitment strategies to meet projected future agency technical position requirements.

INSPECTOR GENERAL

Contractual services are used to provide expert advice for the development of an administrative manual. Personnel appointments and contractual services are used to provide expert, independent technical advice in support of high-priority investigations and highly technical audits.

FY 1992-1993 CONGRESSIONAL BUDGET
REPORT ON NRC DRUG TESTING ACTIVITIES

The NRC's Drug Testing Plan was approved in August 1988 and all components of the NRC's drug testing program for employees and applicants have been implemented. Drug testing requirements imposed by the NRC upon the nuclear industry through regulations are separate from this program and not covered by this report. The NRC's program for employees and applicants includes random, applicant, voluntary, followup, reasonable suspicion, and accident-related drug testing. Testing was initiated for non-bargaining unit employees in November 1988 and for bargaining unit employees in December 1990, after an agreement was negotiated with the National Treasury Employees Union.

All NRC employees in the following categories are subject to random testing:

- (1) Regional and headquarters employees who have unescorted access to vital areas of nuclear plants (and Category I fuel facilities).
- (2) Employees who have assigned responsibilities or are on call for regional or headquarters incident response centers.
- (3) Employees with access to Sensitive Compartmented Information and/or Foreign Intelligence Information.

Approximately 1,600 NRC employees are now in the random pool. Potential selectees interviewed for positions in these categories are subject to applicant testing.

One thousand one hundred eighty-seven (1,187) tests of all types were conducted between November 1988 and December 31, 1990. The NRC continues to randomly test 12 times a year at a rate of one hundred percent. Since each employee in the random pool has an equal chance of being selected each time, some NRC employees were randomly tested more than once. All testing results have been negative, except for two employees who tested positive under random testing. These employees have successfully completed the outpatient phase of their rehabilitation and are continuing in recovery care and followup testing.

The most significant change to the NRC's Drug Testing Plan since August 1988 was the implementation of split urine sample collections. On October 27, 1988, the Commission formally requested the Department of Health and Human Services to grant a waiver from the "Mandatory Guidelines for Federal Workplace Drug Testing Programs" to allow the NRC to collect split urine samples. The Department approved this request on March 23, 1989, and split urine sample collection procedures were implemented shortly thereafter. This program enhancement contributed significantly to employee confidence in the NRC's Drug Testing Program.

Recently a second change was made to the NRC's plan which permits drug testing of potential selectees and/or applicants from outside the NRC who are interviewed for positions meeting the criteria for random testing. Prior to this change only

Report on Metrication

the tentative selectee was drug tested. The Department of Health and Human Services had no objection to this change.

The NRC's Drug Testing Program is firmly based upon the principles and guidance provided through Executive Order 12564, Public Law 100-71, Department of Health and Human Services' guidelines, and Commission decisions. It has been administered in a fair, confidential, and effective manner.

December 1990

U.S. NUCLEAR REGULATORY COMMISSION
REPORT TO CONGRESS ON METRICATION

This report is in response to Public Law 100-418, section 5164 of the Omnibus Trade and Competitiveness Act of 1988, which requires each Federal Government agency to report to the Congress on its metrication activities for the preceding year and plans for the coming year.

During FY 1990, the NRC continued its commitment to metrication through staff efforts to develop for Commission approval a draft metrication policy implementing the provisions of the act. In addition, the NRC participated in the activities of both the Interagency Council on Metric Policy and the Metrication Operating Committee.

To facilitate both the development of the draft metrication policy and the Commission review of that draft policy, the staff has been examining the metrication experiences and activities of other countries and industries. In particular, the staff has contacted the Canadian nuclear industry, its regulators, the developers of the next generation of nuclear power reactors, and other U.S. agencies with related or overlapping responsibilities in the nuclear area. Contacts were also made with representatives of other industries in the U.S. that deal in metric units, including air and rail carriers.

The NRC's major metrication objectives for FY 1991 will be the issuance of the NRC's metrication policy statement and the continued active participation in the Interagency Council on Metric Policy and Metrication Operating Committee.



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

January 14, 1991

OFFICE OF THE
INSPECTOR GENERAL

MEMORANDUM FOR: Chairman Carr
Commissioner Rogers
Commissioner Curtiss
Commissioner Remick

FROM: *David C. Williams*
David C. Williams
Inspector General

SUBJECT: OIG EVALUATION OF NRC ACTIVITIES IN PROVIDING
INFORMATION TO THE FEDERAL PROCUREMENT DATA
SYSTEM ON CONSULTING SERVICES

Section 1114(b) of Title 31 of the U.S. Code requires the Inspector General or comparable official of each agency to submit to Congress each year, along with the agency's budget justification, an evaluation of the agency's progress in establishing effective management controls and improving the accuracy and completeness of information provided to the Federal Procurement Data System on contracts for consulting services. This memorandum is intended to fulfill the requirements of Title 31 and will be included in the Nuclear Regulatory Commission's (NRC) Fiscal year 1992 budget submission.

The Office of the Inspector General (OIG) completed an audit of NRC's use of consulting services and issued an audit report on March 8, 1990. OIG concluded in the report that NRC had established a system of management controls for the approval of contracts for consulting services and reporting them to the Federal Procurement Data System (FPDS). However, NRC's contracting officials differed with the Office of Management and Budget (OMB) regarding what the definition of consulting services includes. Therefore, NRC was reporting to FPDS some contracts we believed should not have been reported, i.e., certain types of training, and not reporting other contracts which OMB believed fit the definition of consulting services.

We made a number of recommendations to strengthen the area of contracting for consulting services. As a result of a follow-up review, we found that the recommendations had been implemented.

cc: J. Taylor, EDO
S. Chilk, SECY
W. Parler, OGC
R. Scroggins, CON
E. Halman, ADM
J. Blaha, EDO
J. Funches, ICC



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555

January 22, 1991

OFFICE OF THE
INSPECTOR GENERAL

MEMORANDUM FOR: Chairman Carr
Commissioner Rogers
Commissioner Curtiss
Commissioner Remick

FROM: *David C. Williams*
David C. Williams
Inspector General

SUBJECT: SECTION 319 OF PUBLIC LAW 101-121,
ANTI-LOBBYING ACT

Public Law 101-121 requires that the Inspector General provide an annual report to Congress regarding the Nuclear Regulatory Commission's (NRC) compliance with, and the effectiveness of, the requirements of the Act.

During our review, we found that NRC had complied with the requirements of the Act with one exception, which is noted below. The contracts and grants reviewed contained the necessary certifications and contract clauses as required by the Act.

We did note that the NRC was not submitting semi-annual reports on the compilation of disclosure (lobbying with non-appropriated funds) forms received by NRC as required by the Act. The reason given for not submitting the semi-annual reports was that NRC had not received any disclosure forms, and it was thought that a negative report was not required. The Division of Contracts and Property Management has agreed to contact the Office of Procurement Policy in the Office of Management and Budget to determine whether the reports have to be submitted even though they may be negative.

Since we performed the review within the Division of Contracts and Property Management in NRC, it did not afford us an opportunity to judge the effectiveness of the Act. It is our opinion that the only method available to measure the Act's effectiveness would have been to perform the audit work at a contractor's facility. This would entail looking at the duties of the individuals in the company as well as reviewing selected charges in the company's expense system. However, limited audit

resources did not permit on-site visits to contractors' facilities.

There is also a question as to how many contractors would need to be reviewed to be able to provide an opinion on the effectiveness of the Act and to allow us to complete the audit in accordance with generally accepted Government auditing standards. If the Congress intended for this type of detail, there would be a need to examine any physical evidence to show that a violation of the Act occurred.

The Act also requires statistics on the following:

- All alleged violations relating to the NRC's covered Federal actions during the year covered by the report;
- The actions taken by the Chairman in the year covered by the report with respect to those alleged violations and alleged violations in previous years; and
- The amounts of civil penalties imposed by NRC.

There were no alleged violations relating to NRC's covered Federal actions during the year covered by this report. Since there were no alleged violations this year and this was the first year of the Act, no action was required by the Chairman. Therefore, no penalties were imposed by NRC.

This report is to be submitted with NRC's 1992 budget justification.

cc: J. Taylor, EDO
S. Chilk, SECY
W. Parler, OGC
H. Denton, GPA
H. Thompson, EDO
E. Halman, ADM
R. Scroggins, CON
J. Funches, ICC
Financial Management Division, OMB

NRC FORM 336 (2-84) NRCM 1102 3201, 3302 SEE INSTRUCTIONS ON THE REVERSE	U.S. NUCLEAR REGULATORY COMMISSION BIBLIOGRAPHIC DATA SHEET	REPORT NUMBER (Assigned by T/DC add Vol. No. if any) NUREG-1100, Volume 7				
2. TITLE AND SUBTITLE Budget Estimates Fiscal Years 1992-1993	3. LEAVE BLANK					
5. AUTHOR(S)	4. DATE REPORT COMPLETED <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; text-align: center;">MONTH</td> <td style="width: 50%; text-align: center;">YEAR</td> </tr> <tr> <td style="text-align: center;">February</td> <td style="text-align: center;">1991</td> </tr> </table>		MONTH	YEAR	February	1991
MONTH	YEAR					
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7. PERFORMING ORGANIZATION NAME AND MAILING ADDRESS (Include Zip Code) Division of Budget and Analysis Office of the Controller U.S. Nuclear Regulatory Commission Washington, DC 20555	6. DATE REPORT ISSUED <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; text-align: center;">MONTH</td> <td style="width: 50%; text-align: center;">YEAR</td> </tr> <tr> <td style="text-align: center;">February</td> <td style="text-align: center;">1991</td> </tr> </table>		MONTH	YEAR	February	1991
MONTH	YEAR					
February	1991					
10. SPONSORING ORGANIZATION NAME AND MAILING ADDRESS (Include Zip Code) Division of Budget and Analysis Office of the Controller U.S. Nuclear Regulatory Commission Washington, DC 20555	8. PROJECT/TASK/WORK UNIT NUMBER 9. FIN OR GRANT NUMBER 11a. TYPE OF REPORT FY 1992-1993 Congressional Budget Submission b. PERIOD COVERED (Inclusive Dates) 10/1/91 - 9/30/93					
12. SUPPLEMENTARY NOTES						
13. ABSTRACT (200 words or less) <p>This report contains the fiscal year budget justifications to Congress. The budget provides estimates for salaries and expenses and for the Office of the Inspector General for fiscal years 1992 - 1993.</p>						
14. DOCUMENT ANALYSIS - KEYWORDS/DESCRIPTORS Budget Congressional Budget Submittal Fiscal Years 1992 - 1993 15. IDENTIFIERS/OPEN ENDED TERMS		15. AVAILABILITY STATEMENT Unlimited 16. SECURITY CLASSIFICATION <i>(This page)</i> Unclassified <i>(This report)</i> Unclassified 17. NUMBER OF PAGES 18. PRICE				

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