STATEMENT SUBMITTED

BY THE

UNITED STATES NUCLEAR REGULATORY COMMISSION

TO THE

SUBCOMMITTEE ON CLEAN AIR, WETLANDS, PRIVATE PROPERTY

AND NUCLEAR SAFETY

COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS

UNITED STATES SENATE

FOR THE

OVERSIGHT HEARING

SUBMITTED BY
RICHARD A. MESERVE
CHAIRMAN

Submitted: May 8, 2001

U.S. NUCLEAR REGULATORY COMMISSION

OVERSIGHT HEARING

Introduction

Mr. Chairman, members of the Subcommittee, it is a pleasure to appear before you today with my fellow Commissioners. I would like to take this opportunity to acknowledge the strong support this Subcommittee provided in the 106th Congress in enacting legislation which addresses the long-standing fairness in funding issue. We also appreciate the Subcommittee's and full Committee's efforts in support of the Nuclear Regulatory Commission's (NRC's) other legislative proposals in the 106th Congress, most of which were included in S. 1627 which passed the Senate. We look forward to working constructively with you in the new Congress.

As you know, the NRC's mission is to ensure the adequate protection of public health and safety, the common defense and security, and the environment in the application of nuclear technology for civilian use. The Commission does not have a promotional role - - rather, the agency seeks to ensure the safe application of nuclear technology if society elects to pursue the nuclear energy option.

The Commission recognizes, however, that its regulatory system should not establish inappropriate impediments to the application of nuclear technology. Many of the Commission's initiatives over the past several years have sought to maintain or enhance safety while simultaneously improving the efficiency and effectiveness of our regulatory system. We believe the Commission's most recent legislative proposals would enhance safety and improve our regulatory system even further and are pleased to see that many of our proposals have been incorporated into the bills before this Congress. The Commission also recognizes that its decisions and actions as a regulator influence the public's perception of the NRC and ultimately the public's perception of the safety of nuclear technology. For this reason, the Commission's primary performance goals also include increasing public confidence.

Background

Currently there are 104 nuclear power plants licensed by the Commission to operate in the United States in 31 different states. As a group, they are operating at high levels of safety and reliability. (See Charts on Attachments 1 and 2.)

These plants have produced approximately 20% of our nation's electricity for the past several years and are operated by about 40 different companies. In 2000, these nuclear power plants produced a record 755 thousand gigawatt-hours of electricity. (See Graph on Attachment 3.)

Improved Licensee Efficiencies (Increased Capacity Factors)

The Nation's nuclear electricity generators have worked over the past 10 years to improve nuclear power plant performance, reliability, and efficiency. According to the Nuclear Energy Institute, the improved performance of the U.S. nuclear power plants since 1990 is equivalent to placing 23 new 1000 MWe power plants on line. The average capacity factor for U.S. light water reactors was 88 percent in 2000, up from 63 percent in 1989.[1] (See Table on Attachment 3.) The Commission has focused on ensuring that safety is not compromised as a result of these industry efforts. The Commission seeks to carry out its regulatory responsibilities in an effective and efficient manner so as not to impede industry initiatives inappropriately.

Electric Industry Restructuring

As you are aware, the nuclear industry is undergoing a period of remarkable change. The industry is in a period of transition in several dimensions, probably experiencing more rapid change than in any other period in the history of civilian nuclear power. As deregulation of electricity generation proceeds, the Commission is seeing significant restructuring among the licensees and the start of the consolidation of nuclear generating capacity among a smaller group of operating companies. This change is due, in part, to an industry that has achieved

[1] Capacity factor is the ratio of electricity generated, for the period of time considered, to the amount of energy that could have been generated at continuous full-power operation during the same period.

gains in both economic and safety performance over the past decade and thus is able to take advantage of the opportunities presented by industry restructuring.

Initiatives in the Area of Current Reactor and Materials Regulation

License Transfers

One of the more immediate results of the economic deregulation of the electric power industry has been the development of a market for nuclear power plants as capital assets. As a result, the Commission has seen a significant increase in the number of requests for approval of license transfers. These requests have increased from a historical average of about two or three per year, to 20 - 25 in the past two years.

The Commission seeks to ensure that our reviews of license transfer applications, which focus on adequate protection of public health and safety, are conducted efficiently. These reviews sometimes require a significant expenditure of staff resources to ensure a high quality and timely result. Our legislative proposal to eliminate foreign ownership review could help to further streamline the process. To date, the Commission believes that it has been timely in these transfers. For example, in CY 2000, the staff reviewed and approved transfers in periods ranging from four to eight months, depending on the complexity of the applications. The Commission will strive to continue to perform at this level of proficiency even in the face of continued demand.

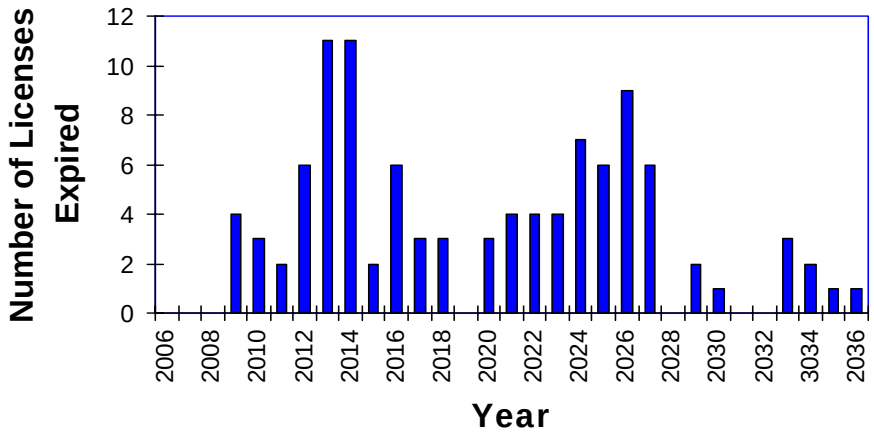
License Renewals

Another result of the new economic conditions is an increasing interest in license renewal that would allow plants to operate beyond the original 40-year term. That maximum original operating term, which for many plants were established in the Atomic Energy Act (AEA), did not reflect a limitation that was determined by engineering or scientific considerations, but rather was based on financial and antitrust concerns. The Commission now has the technical bases and experience on which to make judgments about the potential useful life and safe operation of facilities and is addressing the question of extensions beyond the original 40-year term.

The focus of the Commission's review of applications is on maintaining plant safety, with the primary concern directed at the effects of aging on important systems, structures, and components. Applicants must demonstrate that they have identified and can manage the effects of aging so as to maintain an acceptable level of safety during the period of extended operation.

The Commission has now renewed the licenses of plants at two sites for an additional 20 years: Calvert Cliffs in Maryland, and Oconee in South Carolina, comprising a total of five units. The thorough reviews of these applications were completed ahead of schedule, which is indicative of the care exercised by licensees in the preparation of the applications and the planning and dedication of the Commission staff. Applications for units from three additional sites -- Hatch in Georgia, ANO-1 in Arkansas, and Turkey Point in Florida -- are currently under review. As indicated by our licensees, many more applications for renewal are anticipated in the coming years.

Although the Commission has met or exceeded the projected schedules for the first reviews, it would like the renewal process to become as effective and efficient as possible. The extent to which the Commission is able to sustain or improve on our performance depends on the rate at which applications are actually received, the quality of the applications, and the staff resources available to complete the review effort. The Commission recognizes the importance of license renewal and is committed to providing high-priority attention to this effort. As you know, the Commission encourages early notification by licensees of their intent to submit license renewal applications in order to allow adequate planning of demands on staff resources. The Commission is committed to maintaining the quality of its safety reviews.



Reactor Plant Power Uprates

In recent years, the Commission has approved numerous license amendments that permit licensees to make relatively small power increases or uprates. Typically, these increases have been approximately 2% to 7%. These uprates, in the aggregate, resulted in adding approximately 2000 MWe or two new 1000 MWe power plants.

The NRC is now reviewing five license amendment requests for larger power uprates. These requests are for Boiling Water Reactors (BWR's) and are for uprates of 15% to 20%. (There are two primary designs for operating light water reactors: Boiling Water Reactors and Pressurized Water Reactors.) While the staff has not received requests for additional uprates beyond these five, some estimates indicate that as many as 22 BWR'S may request uprates in the 15% to 20% range. These uprates, if allowed, could add approximately 3,000 to 4,500 MWe to the grid.

Approvals for uprates are granted only after a thorough evaluation by NRC staff to ensure safe operation of the plants at the higher power. Plant changes and modifications are necessary to support a large power uprate, and thus require significant financial investment by the licensee. While the NRC does not know the number of uprate requests that will be received, the staff is evaluating ways to streamline the review and approval process. As with license renewals, the

Commission encourages early notification by licensees, in advance of their applications for uprates, in order to allow adequate planning of demands on staff resources.

Nuclear Materials Program

I also want to highlight our nuclear materials program for you. We have a very large number of materials-related initiatives underway. As with our reactor program, we are working on making our nuclear materials regulation more risk-informed and flexible. For example, we are in the final steps of totally revising our regulations governing the medical use of byproduct material using risk insights, together with other factors, to establish requirements that better focus licensee and regulatory attention on issues commensurate with their importance to health and safety. We are also revising our regulations governing the licensing of fuel cycle facilities to introduce the use of an integrated safety assessment, thereby incorporating risk insights into the regulation of these facilities. We are also working with the international community to learn about problems associated with facilities and materials programs abroad, most recently illustrated by events in Japan and Thailand.

We are currently reviewing the Construction Application Request for a mixed-oxide fuel fabrication facility at the Department of Energy's (DOE's) Savannah River site in South Carolina. In coordination with that effort, we also are conducting scoping meetings with stakeholders for the development of the Environmental Impact Statement to support NRC's licensing reviews of a MOX facility.

We continue to decommission various complex materials sites around the country. We are working to finalize our policy statement on the cleanup criteria to be applied at DOE's West Valley site in New York and we continue to provide technical assistance to DOE on related technical matters, including cleanup of the high-level waste tanks at the Savannah River site.

We are also revising our requirements for the transportation of spent fuel and radioactive material to make them more risk-informed and consistent with international standards. We are doing this in partnership with the Department of Transportation, which will simultaneously revise its own rule in this area. Finally, we are working to address the complex issues associated with regulating the

uranium recovery industry at a time when uranium prices remain at historic lows. Let me now move on to the storage and disposal of high-level waste and spent fuel.

High-Level Waste Storage/Disposal (Spent Fuel Storage)

In the past several years, the Commission has responded to numerous requests to approve spent fuel cask designs and independent spent fuel storage installations for onsite dry storage of spent fuel. These actions have provided an interim approach pending implementation of a program for the long-term disposition of spent fuel. The ability of the Commission to review and approve these requests has provided the needed additional onsite storage of spent nuclear fuel, thereby avoiding plant shutdowns as spent fuel pools reach their capacity. The Commission anticipates that the current lack of a final disposal site will result in a large increase in on-site dry storage capacity during this decade.

The Commission is currently reviewing an application for an Independent Spent Fuel Storage Installation on the reservation of the Skull Valley Band of Goshute Indians in Utah.

Certain matters also need to be resolved in order to make progress on a deep geologic repository for disposal of spent nuclear fuel. The Energy Policy Act of 1992 requires the Environmental Protection Agency (EPA) to promulgate general standards to govern the site, while the Commission has the obligation to implement those standards through its licensing and regulatory process. The Commission has concerns about certain aspects of EPA's proposed approach and is working with EPA to resolve these issues. Some of our legislative proposals would eliminate these issues.

We continue to prepare for a potential license application from DOE for the proposed high-level waste geologic repository at Yucca Mountain. These efforts include periodic technical exchange meetings between NRC and DOE staff which are open to the public.

Risk-Informing the Commission's Regulatory Framework

The Commission also is in a period of dynamic change as the agency moves from a prescriptive, deterministic approach toward a more risk-informed and performance-based regulatory paradigm.

Improved probabilistic risk assessment techniques combined with more than four decades of accumulated experience with operating nuclear power reactors has led the Commission to recognize that some regulations may not serve their intended safety purpose and may not be necessary to provide adequate protection of public health and safety. Where that is the case, the Commission has determined it should revise or eliminate the requirements. On the other hand, the Commission is prepared to strengthen our regulatory system where risk considerations reveal the need.

Perhaps the most visible aspect of the Commission's efforts to risk-inform its regulatory framework is the new reactor oversight process. The process was initiated on a pilot basis in 1999 and fully implemented in April 2000. The new process was developed to focus inspection effort on those areas involving greater risk to the plant and thus to workers and the public, while simultaneously providing a more objective and transparent process. Although the Commission continues to work with its stakeholders to assess the effectiveness of the revised oversight process, the feedback received from industry and the public is favorable.

Future Activities

Scheduling and Organizational Assumptions Associated with New Reactor Designs

While improved performance of operating nuclear power plants has resulted in significant increases in electrical output, significant increased demands for electricity will need to be addressed by construction of new generating capacity of some type. Serious industry interest in new construction of nuclear power plants in the U.S. has only recently emerged. As you know, the Commission has already certified three new reactor designs pursuant to 10 CFR Part 52. These designs include General Electric's advanced boiling water reactor, Westinghouse's AP-600 and Combustion Engineering's System 80+. Because the Commission has certified these designs, a new plant order may include one of these approved designs. However, the staff is also conducting a preliminary review associated with other new designs. Licensees have also indicated to the NRC that applications for early site permits could be submitted in the near future. These permits would allow pre-certification of sites for possible construction of nuclear power plants.

In addition to the three already certified advanced reactor designs, there are new nuclear power plant technologies, such as the Pebble Bed Modular Reactor, which some believe can provide enhanced safety, improved efficiency, and lower costs, as well as other benefits. To ensure that the Commission staff is prepared to evaluate any applications to introduce these advanced nuclear reactors, the Commission recently directed the staff to assess the technical, licensing, and inspection capabilities that would be necessary to review an application for an early site permit, a license application, or construction permit for a new reactor unit. This will include the capability to review the designs for Generation III+ or Generation IV light water reactors, including the Westinghouse AP-1000, the Pebble Bed Modular Reactor, General Atomics' Gas Turbine Modular Helium Reactor, and the International Reactor Innovative and Secure (IRIS) designs. In addition to assessing its capability to review the new designs, the Commission will also examine its regulations relating to license applications, such as 10 CFR Parts 50 and 52, in order to identify whether any enhancements are necessary. We also recently established the Future Licensing Project Organization in order to prepare for and manage future reactor and site licensing applications.

In order to confirm the safety of new reactor designs and technology, the Commission believes that a strong nuclear research program should be maintained. A comprehensive evaluation of the Commission's research program is underway with assistance from a group of outside experts and from the Advisory Committee on Reactor Safeguards. With the benefit of these insights, the Commission expects to undertake measures to strengthen our research program over the coming months.

Human Capital

Linked to these technical and regulatory assessments, the Commission is reviewing its human capital to ensure that the appropriate professional staff is available for the Commission to fulfill its traditional safety mission, as well as any new regulatory responsibilities in the area of licensing new reactor designs.

In some mission critical offices within the Commission, nearly 25 percent of the staff are eligible to retire today. In fact, the Commission has six times as many staff over the age of 60 as it has staff under 30.

And, as with many Federal agencies, it is becoming increasingly difficult for the Commission to hire personnel with the knowledge, skills, and abilities to conduct the safety reviews, licensing, research, and oversight actions that are essential to our safety mission. Moreover, the number of individuals with the technical skills critical to the achievement of the Commission's safety mission is rapidly declining in the Nation, and the educational system is not replacing them. The Commission's staff has taken initial steps to address this situation, and as a result, is now seeking systematically to identify future staffing needs and to develop strategies to address the gaps. It is apparent, however, that the maintenance of a technically competent staff will require substantial effort for an extended time. The various Senate energy bills properly give attention to such matters. The Commission would be pleased to offer some further suggestions in the same vein.

Budget

The NRC is proposing a Fiscal Year 2002 budget of $513.1 million. This represents approximately a 5.3 percent ($25.8 million) increase over the Fiscal Year 2001 budget. Our budget proposal will allow the NRC to continue adequately to protect the public health and safety, promote the common defense and security, and protect the environment, while providing sufficient resources to address increasing personnel costs and increasing workloads. Approximately 60 percent of the budget growth is for increasing personnel costs, primarily the pay raise that the President has authorized for Federal employees. The remaining increase is required for several purposes: to continue preparing for the review of a potential Department of Energy application to build a high-level radioactive waste geologic repository; to review four additional reactor license renewal applications; to develop environmental assessments for decommissioning or terminated license requests; to sustain important reactor and waste safety research; and to pay for increased operating costs associated with rent and transit subsidies. At the same time, the number of employees at the agency continues to reflect almost a 20 percent reduction in staff since Fiscal Year 1993. Two charts reflecting a summary of our budget since Fiscal Year 1993 are Attachments 4 and 5 to this testimony.

The NRC recently submitted a proposed bill for authorization of appropriations for Fiscal Year 2002. We respectfully request the Committee's support for our budget request. However, as I mentioned earlier, serious industry interest in new construction of nuclear power plants has only recently emerged. Therefore, our budget proposal does not include resources to prepare for this initiative.

Legislative Proposals

The Commission has identified in its legislative proposals areas where new legislation would be helpful to eliminate artificial restrictions and to reduce the uncertainty in the licensing process. These changes would maintain safety while increasing flexibility in decision-making. Although those changes would have little or no immediate impact on electrical supply, they would help establish the context for consideration of nuclear power by the private sector without any compromise of public health and safety or protection of the environment.

Legislation will be needed to extend the Price-Anderson Act. The Act, which expires on August 1, 2002, establishes a framework that provides assurance that adequate funds are available in the event of a nuclear accident and sets out the process for consideration of nuclear claims. Without the framework provided by the Act, private-sector participation in nuclear power would be discouraged by the risk of large liabilities.

Reorganization Plan No. 3 of 1970 could be revised to provide the Commission with the sole responsibility to establish all generally applicable standards related to Atomic Energy Act (AEA) materials, thereby avoiding dual regulation of such matters by other agencies. Along these same lines, the Nuclear Waste Policy Act of 1982 could be amended to provide the Commission with the sole authority to establish standards for high-level radioactive waste disposal. These changes would serve to provide full protection of public health and safety, provide consistency, and avoid needless and duplicative regulatory burden.

Commission antitrust reviews of new reactor licenses could also be eliminated. As a result of the growth of Federal antitrust law since the passage of the AEA, the

Commission's antitrust reviews are redundant of the reviews of other agencies. The requirement for Commission review of such matters, which are distant from the Commission's central expertise, should be eliminated.

Elimination of the ban on foreign ownership of U.S. nuclear plants would be an enhancement since many of the entities that are involved in electrical generation have foreign participants, thereby making the ban on foreign ownership increasingly problematic. The Commission has authority to deny a license that would be inimical to the common defense and security, and thus an outright ban on all foreign ownership is unnecessary.

With the strong Congressional interest in examining energy policy, the Commission is optimistic that there will be a legislative vehicle for making these changes and thereby for updating the AEA. Indeed, we note that certain of these matters are included in bills now before this Committee.

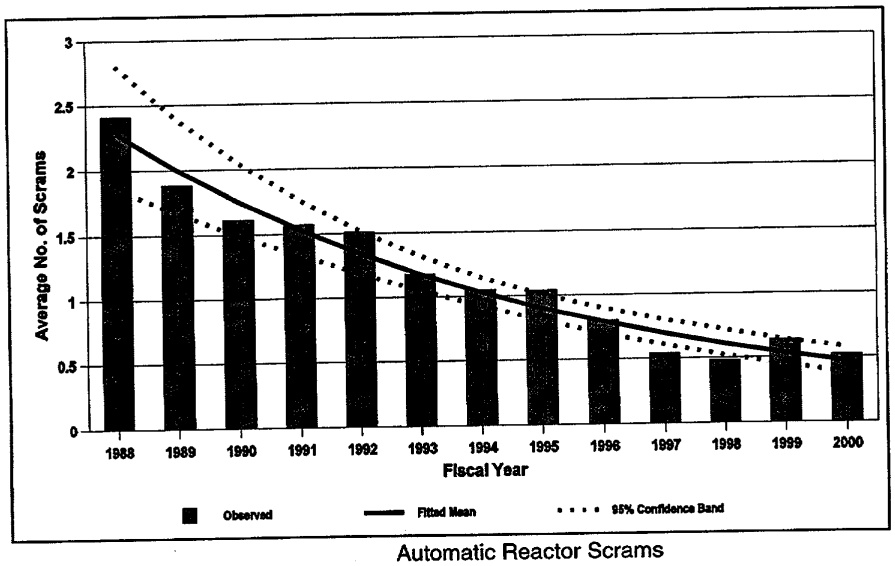
Summary

The Commission has long been, and will continue to be, active in concentrating its staffs' efforts on ensuring the adequate protection of public health and safety, the common defense and security, and the environment in the application of nuclear technology for civilian use. Those statutory mandates notwithstanding, the Commission is mindful of the need: (1) to reduce unnecessary burdens, so as not to inappropriately inhibit any renewed interest in nuclear power; (2) to maintain open communications with all of its stakeholders, in order to seek to ensure the full, fair, and timely consideration of issues that are brought to our attention; and (3) to continue to encourage its highly qualified staff to strive for increased efficiency and effectiveness, both internally and in our dealings with all of the Commission's stakeholders.

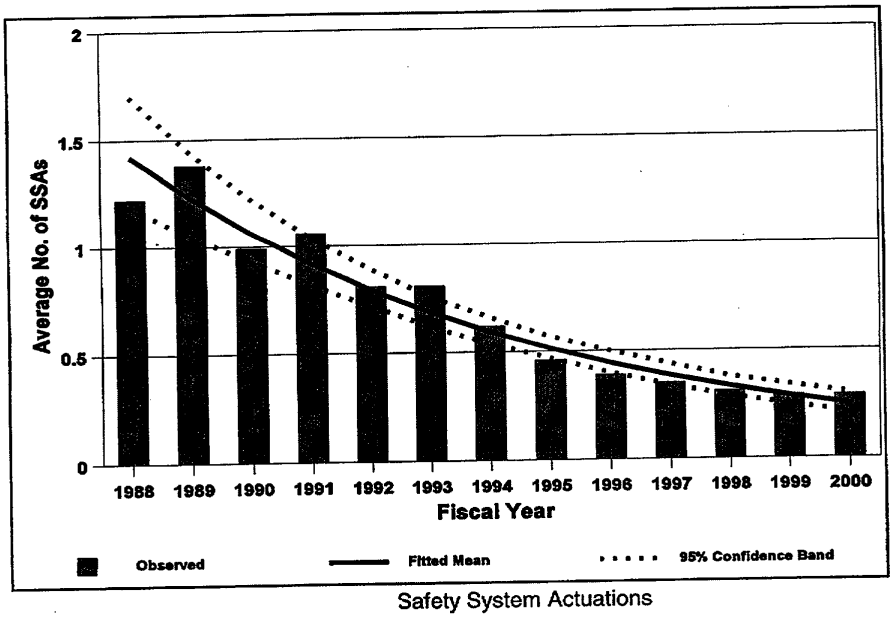
Thank you Mr. Chairman, I welcome your comments and questions.

Attachment 1

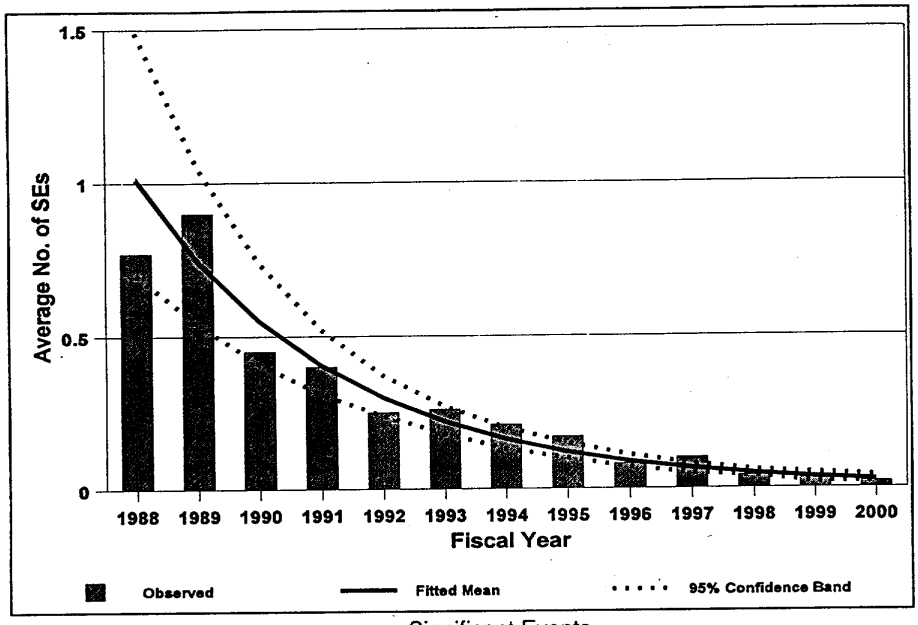
NRC Performance Indicators; Annual Industry Averages, 1988-2000



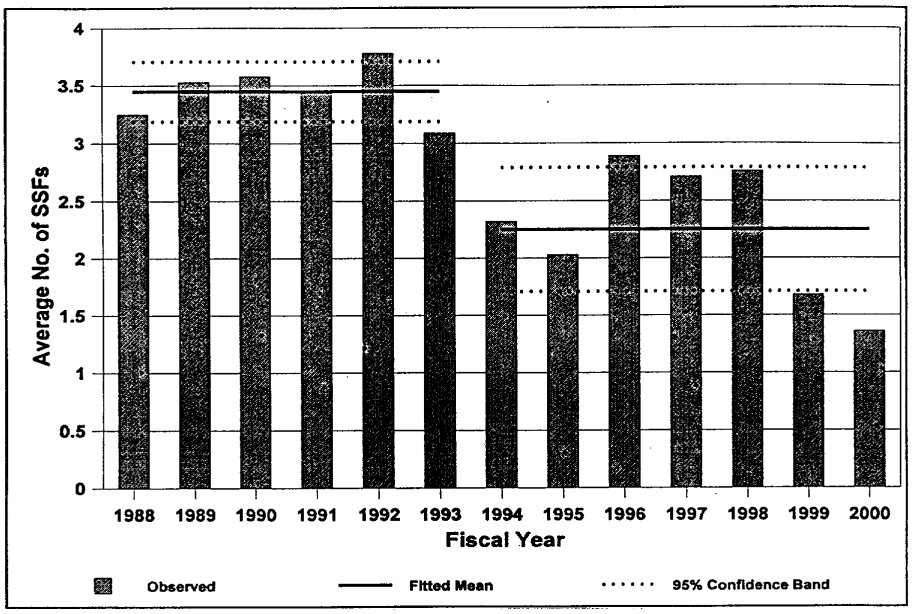
Automatic Reactor Scrams



Safety System Actuations

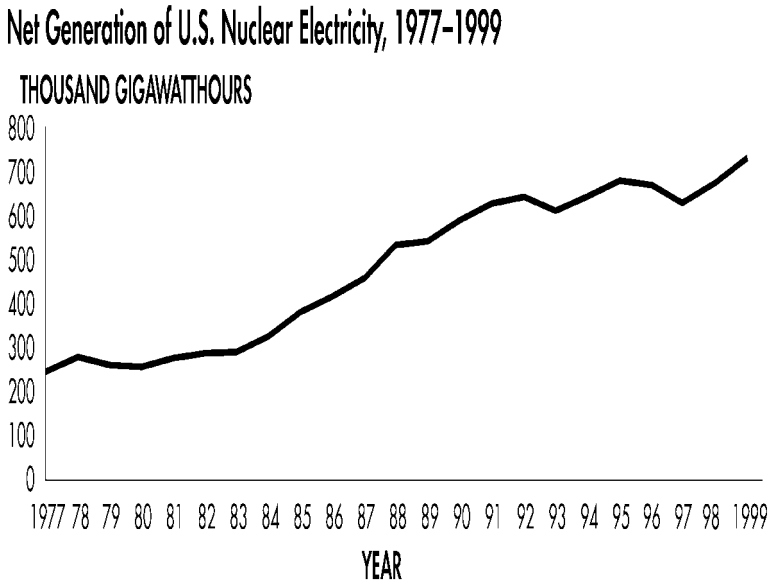


Significant Events



Safety System Failures

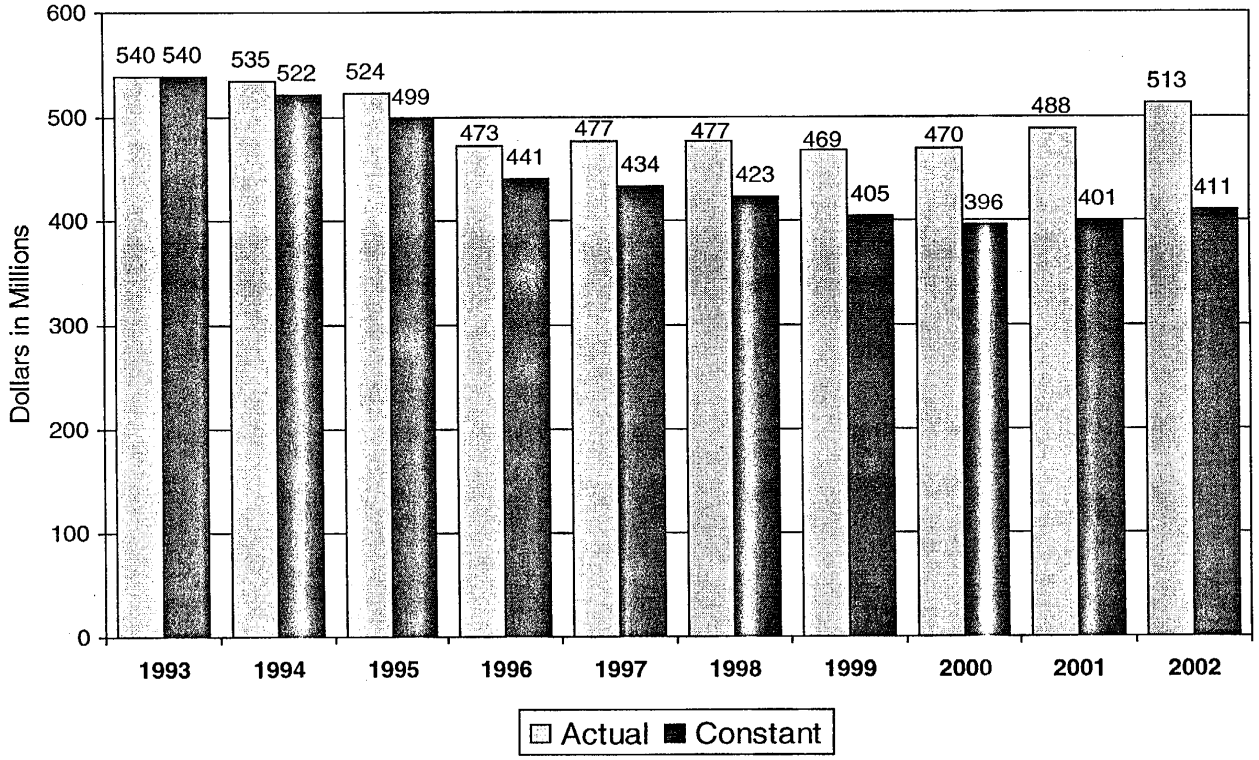
Attachment 3



U.S. Commercial Nuclear Power Reactor Average Capacity Factor

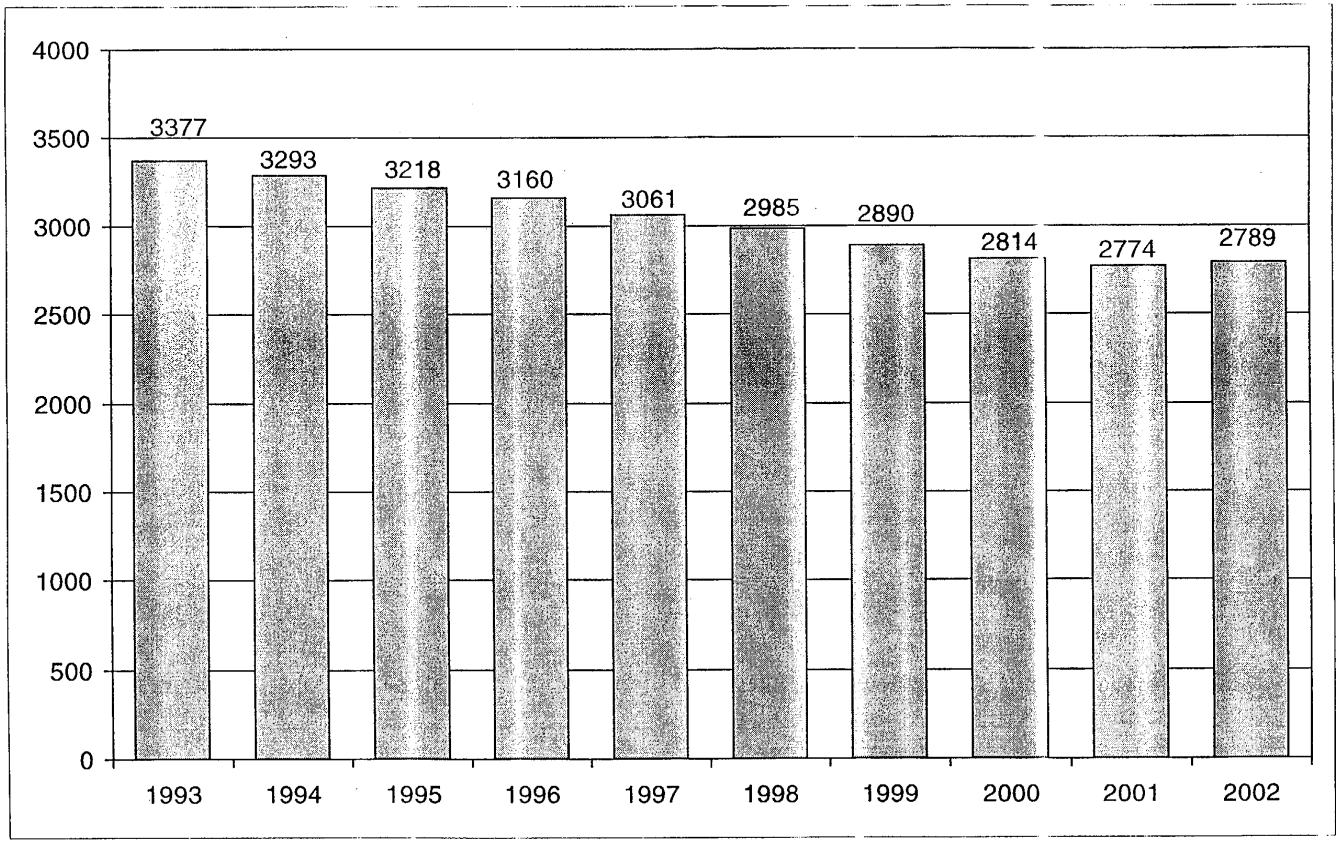
Year	Number of Reactors Licensed to Operate	Average Annual Capacity Factor	Percent of Total U.S.
1989	109	63	19.0
1990	111	68	20.5
1991	111	71	21.7
1992	110	71	22.2
1993	109	73	21.2
1994	109	75	22.1
1995	109	79	22.5
1996	110	77	21.9
1997	104	74	20.1
1998	104	78	22.6
1999	104	86	22.9
2000	104	88	23.4

FY 1993 – 2002 BUDGET SUMMARY



Attachment 4

FY 1993 – 2002 FTE SUMMARY



Fiscal Year

Note: FYs 1998-2002 include reimbursable business-like FTE.

Attachment 5