

STATEMENT SUBMITTED
BY THE
UNITED STATES NUCLEAR REGULATORY COMMISSION
TO THE
SUBCOMMITTEE ON ENERGY AND AIR QUALITY
OF THE
COMMITTEE ON ENERGY AND COMMERCE
U.S. HOUSE OF REPRESENTATIVES

CONCERNING
THE U.S. NATIONAL ENERGY POLICY: NUCLEAR ENERGY

SUBMITTED BY
DR. WILLIAM D. TRAVERS
EXECUTIVE DIRECTOR FOR
OPERATIONS

Submitted: March 27, 2001

U.S. NUCLEAR REGULATORY COMMISSION
TESTIMONY ON THE U.S. NATIONAL ENERGY POLICY:
NUCLEAR ENERGY

Introduction

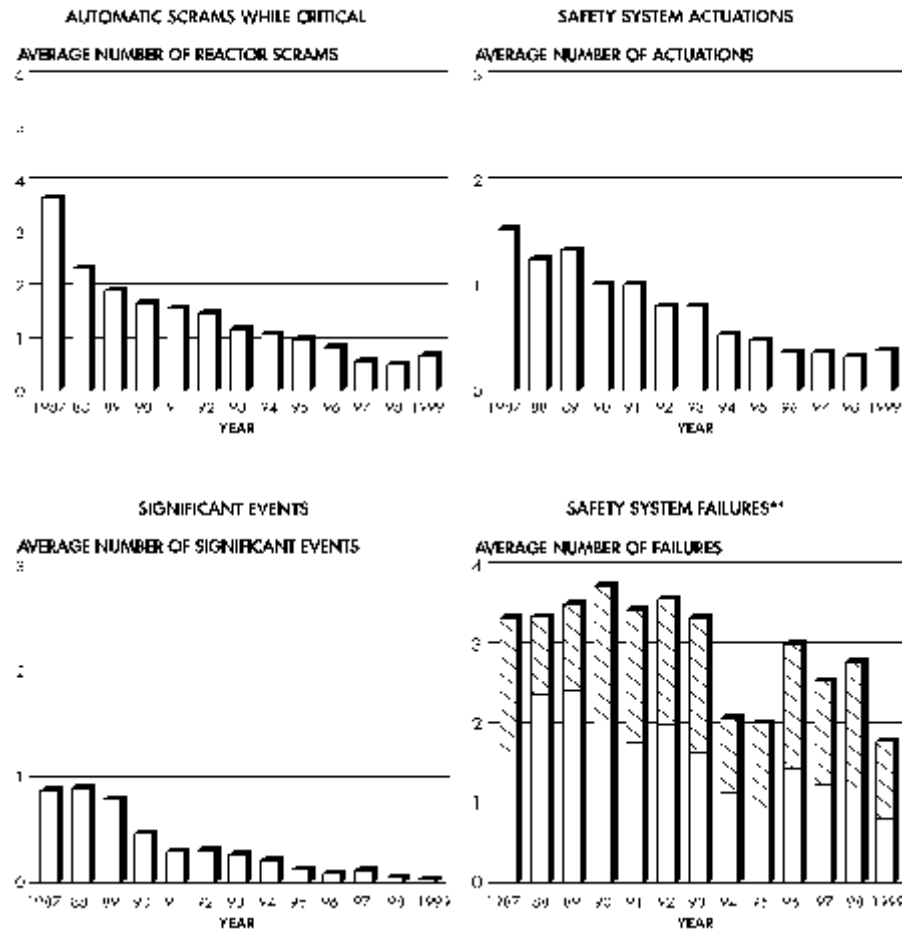
Mr. Chairman, members of the Subcommittee, I am pleased to submit this testimony on behalf of the U.S. Nuclear Regulatory Commission (NRC) regarding the NRC's perspective on how nuclear energy fits into the U.S. National Energy Policy. As the Subcommittee knows, the Commission's mission is to ensure 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 - - the agency's role is 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. 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.

The Commission's primary focus is on safety. The Commission nonetheless recognizes that the quality, predictability, and timeliness of its regulatory actions bear on licensee decisions related to construction and operation of nuclear power plants.

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.

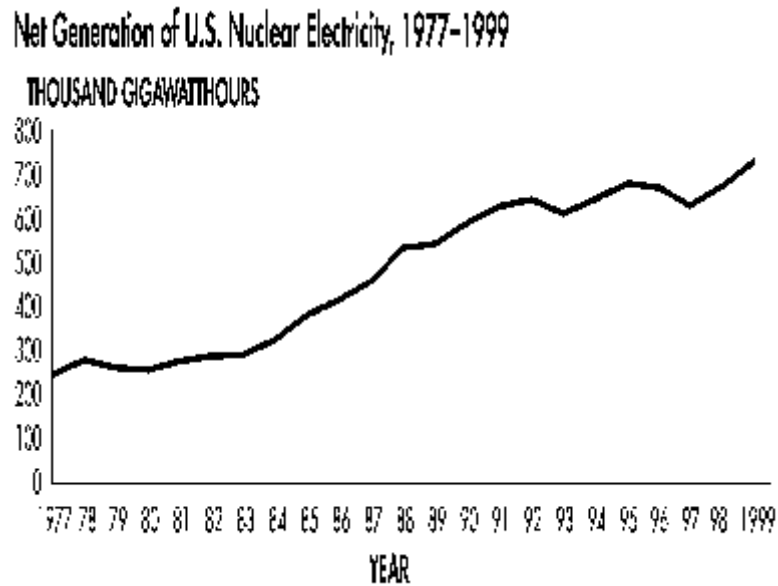
NRC Performance Indicators; Annual Industry Averages, 1987-1999*



*Calendar year values used for 1986 through 1995. Fiscal year values are used beginning in 1996.

**The hatched areas represent additional data that resulted from reclassification of safety system failures.

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.



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 factor¹ for U.S. light water reactors was 86 percent in 1999, up from 63 percent just 10 years ago. The Commission has focused on ensuring that safety has not been compromised as a result of these industry efforts. The Commission will continue to carry out its regulatory responsibilities in an effective and efficient manner so as not to impede industry initiatives inappropriately.

¹Capacity 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.

U.S. Commercial Nuclear Power Reactor Average Capacity Factor and Net Generation

Year	Number of Reactors Licensed to Operate	Average Annual Capacity Factor (Percent)	Net Generation of Electricity	
			Thousands of Gigawatthours	Percent of Total U.S.
1989	109	63	528	19.0
1990	111	68	576	20.5
1991	111	71	613	21.7
1992	110	71	620	22.2
1993	109	73	611	21.2
1994	109	75	640	22.1
1995	109	79	674	22.5
1996	110	77	670	21.9
1997	104	74	628	20.1
1998	104	78	673	22.6
1999	104	86	727	19.8

Electric Industry Restructuring

As the Subcommittee is aware, the nuclear industry has undergone 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. In part, this change is due to an industry that has achieved gains in both economic and safety performance over the past decade and thus has been able to take advantage of the opportunities presented by industry restructuring. The Commission has established a regulatory system that is technically sound, that is fair, predictable, and reaches decisions with reasonable dispatch.

Initiatives in the Area of Current Reactor 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 themselves. As a result, the Commission has seen a significant increase in the number of requests for approval of license transfers. These requests increased from a historical average of about two or three per year, to 20 - 25 in the past two years.

The Commission has assured 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 talent and energy by our staff 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 has 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

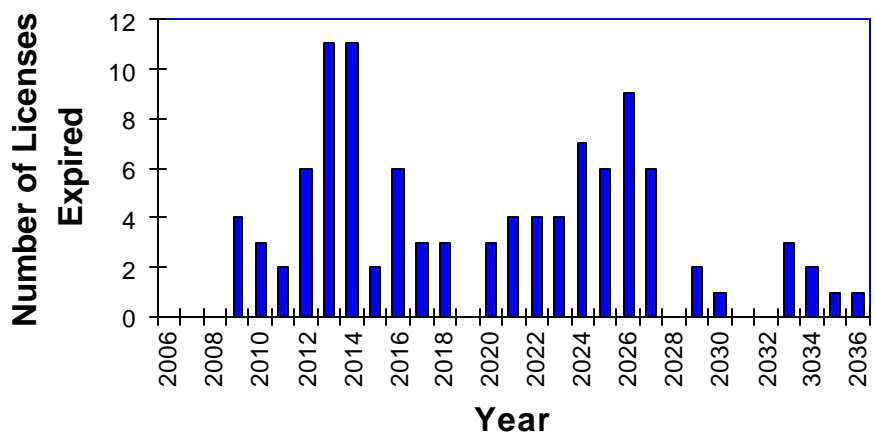
Another result of the new economic conditions is an increasing interest in license renewal that would allow plants to operate beyond the original 40-year term. That term, which was established in the Atomic Energy Act (AEA), did not reflect a limitation that was determined by engineering or scientific considerations, but rather was based on financial and antitrust concerns. The Commission now has the technical bases and experience on which to base 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 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 ability to staff 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, in advance of their intentions to seek renewals, in order to allow adequate

planning so as not to create unmanageable demands on staff resources.



Reactor Plant Power Uprates

In recent years, the Commission has approved numerous license amendments that permit its licensees to make relatively small power uprates (approximately 2-7 percent increases in the output of a facility). Collectively, these uprates supplied the electricity equivalent to that from two large power plants (approximately 2,000 MWe). The Commission has received applications for several substantial uprates, and anticipates more within the near term. In addition, some nuclear generators have requested Commission safety review of increasing fuel burnup, thereby extending the operating cycle between refueling outages and thus increasing nuclear plant capacity factors. Such approvals are granted only after a thorough evaluation by Commission staff to ensure that safe operation and shutdown can be achieved at the higher power and increased fuel burnup.

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.

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 towards a more risk-informed and performance-based regulatory paradigm. Improved probabilistic risk assessment techniques combined with over four decades of accumulated experience with operating nuclear power reactors have 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. While 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.

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, 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, 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.

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 assure that the appropriate professional staff is available for the Commission to fulfill its

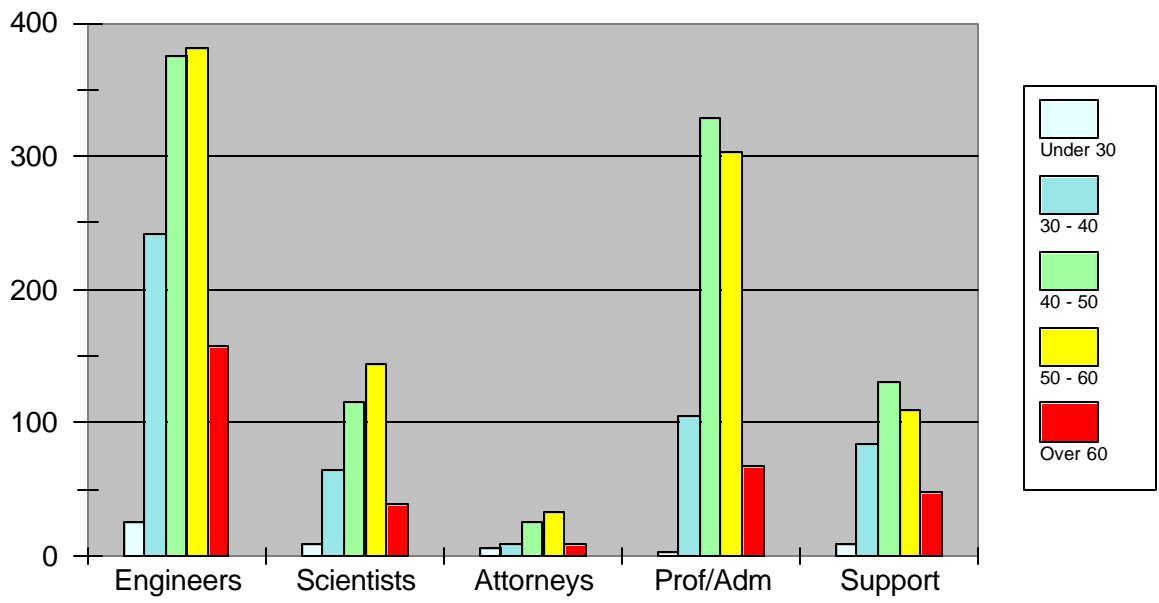
traditional safety mission, as well as any new regulatory responsibilities in the area of licensing new reactor designs.

In some important 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 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.

As the Commission is currently challenged to meet its existing workload with available resources, additional resources would be necessary to respond to increased workload which could result from some of the initiatives discussed in this testimony.

NRC Age Demographics by Category
Data



Implications of a National Energy Policy

The Commission has a stake in a national energy policy and has identified 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.

Several other legislative changes would be helpful. For example, 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 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 anachronistic. 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.

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 to: 1) reduce unnecessary burdens, so as not to inappropriately inhibit any renewed interest in nuclear power; (2) maintain open communications with all its stakeholders, in order to seek to ensure the full, fair, and timely consideration of issues that are brought to our attention; and (3) continue to encourage its highly qualified staff to strive for increased efficiency and effectiveness, both in our dealings with all the Commission's stakeholders and internally within the agency.

I look forward to working with the Committee, and I welcome your comments and questions.