



NRC NEWS

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The Value of Regulation in the Quest for Safe and Secure Nuclear Energy

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Introduction

Good morning. I'm very pleased to join you today and to offer some thoughts from the perspective of a nuclear regulator. My principal message is that a strong regulatory authority is not only necessary but valuable for any country that utilizes nuclear energy in its quest for energy diversity and security. Specifically, I would like to discuss the value of the independent role played by the U.S. Nuclear Regulatory Commission (NRC), the current status of our new reactor licensing work, some of our current challenges, and what the future may hold for us. My remarks today are my own personal views, and I must note that they may not represent the collective view of the Commission.

The History of NRC Independence

To understand the value of the independent role of the NRC, one needs to first understand a little history. The birth of commercial nuclear power in the United States fell under the oversight of the U.S. Atomic Energy Commission (AEC) starting in 1954. At that time, the AEC's regulatory programs sought to ensure public health and safety without imposing excessive requirements that would inhibit the growth of the industry. This was a difficult balance to achieve for a single agency in an industry giving birth to a radically new technology. During the 1960s, an increasing number of critics charged that the AEC's regulations were insufficiently rigorous in several important areas.

By the early 1970s, the AEC's regulatory programs had come under such strong attack that Congress decided to abolish the agency. Supporters and critics of nuclear power agreed that the promotional and regulatory duties of the AEC should be separated and assigned to different

agencies. In 1974, Congress did just that and assigned the regulatory function to the NRC. Not only did the NRC become the nuclear power regulator, but the regulator of all civilian use of radioactive materials, including fuel enrichment facilities, industrial and medical materials, and waste disposal facilities.

The point of telling you this history is to emphasize that Congress understood the need for an independent regulatory authority. In addition, Congress chose a Commission to lead the NRC, even as it created a promotional agency with a single administrator, appointed through the traditional political routes and serving at the pleasure of the President. This latter agency, of course, eventually became the Department of Energy. Thus, Congress also understood the advantage of a regulatory authority whose policy-making is improved through a collegial process with each Commissioner serving a fixed term of office. Such a process results in policies that have generally greater support and stability over time. Today, the NRC is a strong and technically competent regulatory authority, highly regarded within the international community of regulators. However, we do not rest there, and we are constantly looking for ways to improve.

The Value of Regulatory Independence

I believe, through my discussions with senior executives of the nuclear power industry, that they understand and appreciate the value that an independent and technically strong regulator brings to assuring the public that nuclear plants are being operated safely and securely. I further believe that the level of public assurance depends on the NRC being a tough regulator – our job is to ask the tough questions and make the tough calls. We are a fair regulator as well, in that we listen to and carefully evaluate issues that affect our regulatory decisions. We also make significant efforts to open our regulatory processes to public scrutiny and participation wherever appropriate. The nuclear industry recognizes that any possibility of construction of new nuclear power plants in the U.S. depends directly on continued public assurance of safe and secure operations of existing power reactors in operation today. The NRC is a valuable contributor to that assurance.

The value added by effective regulation isn't free. Congress approves and funds our budget. However, it also has mandated that we recover most of our budget, except for certain waste fund and homeland security activities, from the fees paid by licensees by returning them to the U.S. Treasury General Fund. The NRC strives to be a fiscally responsible and efficient regulator and to impose necessary regulatory burdens on our licensees. As we pursue our strategic mission to ensure that licensees continue to maintain safety and security, we also pursue our strategic goal of management excellence to ensure that our regulatory actions are effective, efficient, realistic, and timely.

Current New Reactor Licensing Activities

The NRC's commitment to safety must extend beyond the currently operating reactors to further include certifying and licensing the advanced reactor designs that may become the foundation for new reactor construction. The U.S. nuclear industry has announced that over 20 Combined Construction and Operating License, or "COL," applications may be submitted to the NRC over the next few years, representing a potential total of over 30 new nuclear power reactors in 14 different states.

This process has already begun. In 2007 the NRC received four COL applications: one for two GE Advanced Boiling Water Reactors (ABWRs) at the South Texas Project site, one for two Westinghouse AP1000 reactors at the Bellefonte site in Alabama, one for a GE Economic Simplified Boiling Water Reactor (ESBWR) at the North Anna site, and one for an AP1000 at a new site in South Carolina. In addition, a partial COL application has been received for an AREVA Evolutionary Pressurized Reactor (EPR) at the Calvert Cliffs site in Maryland.

Advanced reactor Design Certification reviews are also in progress. We are reviewing a substantial design amendment for the Westinghouse AP1000 and three applications for new design certifications (ESBWR, EPR, and Mitsubishi US Advanced Pressurized Water Reactor (US-APWR)). Over a year ago the NRC created the Office of New Reactors (NRO) to accommodate the expected extraordinary workload increase in regulatory licensing and construction oversight, without losing focus on operating reactor safety. Operating reactor oversight remains under the existing Office of Nuclear Reactor Regulation or NRR. I will also note that the NRR will complete licensing of Watts Bar Unit 2, after the Tennessee Valley Authority's decision to complete the plant.

In 2008, we are expecting up to 15 additional COL applications for up to 22 new reactors. For budget purposes, we estimate that each Design Certification Review will require roughly 160,000 hours over about 42 months. A COL application is initially expected to require approximately 88,000 hours over about 30 months of review and 12 months of public hearings. In addition, our current preliminary estimate for inspections during an anticipated 4-year construction phase of a single reactor plant is 35,000 inspection hours. As you can see, the level of regulatory effort is substantial and, for the NRC, must not divert attention from the safe and secure operation of existing reactors.

All new reactors that may be built in the U.S. are expected to utilize a digitized, integrated control room and digital safety systems and controls. This technology holds the promise of significant improvements in safety and human-machine interface, but brings new complexities that must be thoroughly understood and accounted for in the safety analysis and design of the plant. Such a rapidly evolving technology presents continuing challenges for the NRC to maintain stable regulatory requirements that address the new technical issues. We are working closely with experts in this field, with our applicants, and with the industry to ensure that our safety requirements are adequate and understood.

To achieve timely NRC reviews of multiple standardized COL applications, the NRC staff is planning to implement a "design-centered" approach. It is based on the principle of "one issue, one review, one position" for multiple COL applications under parallel review. The benefits of a design-centered licensing review will be achieved only to the extent that COL applicants standardize their applications for a particular reactor design, and review schedules will be longer if industry does not follow this model. In addition, reactor vendors and COL applicants must submit applications that are complete and meet very high-quality, technical standards. We will not compromise our standards to expedite approvals. NRC staff has developed guidance to assist COL applicants in meeting our standards, and future applicants should be paying close attention and learning from the NRC's assessment of the first applications.

In addition, both the NRC and the U.S. nuclear industry have a lot of work ahead of us in preparing for new construction under the new licensing and approval process in Part 52 of our regulations. The NRC has been developing and will be implementing its new Construction

Inspection Program out of our Atlanta Regional Office. Here also, much of the efficiency and timeliness of our inspection activities will depend on how well industry adheres to the necessary high-quality standards required for a nuclear plant. As NRC continues to develop our inspection program and train our inspectors, we are working to learn from our regulatory partners in other countries, such as Finland and Japan, who have very current experience. We are also exploring ways to test construction inspection methods at Watts Bar 2.

Let me turn now to a few of the important challenges that face the NRC.

Global Cooperation

The globalization of the nuclear supply chain has created an unprecedented diversity of global sources for nuclear components. This makes it increasingly important for regulatory bodies, as well as industry consensus standards organizations, to carefully coordinate to ensure both consistency and satisfaction of the standards. This isn't an academic or hypothetical point. The NRC has previously identified counterfeit and deficient parts and continues to seek better ways of monitoring the increasing globalization of the nuclear supply chain through our international collaborations. Quality control issues in the 1970s contributed to halting several nuclear plants under construction. In today's global manufacturing economy, global collaboration will be imperative to the nuclear industry.

The global economy has also produced new reactor designs that are being marketed internationally, and this has created challenges and opportunities for greater cooperation among regulatory authorities. The NRC is actively engaged in a variety of international organizations and initiatives, including those involving research agreements, operating experience exchanges, and improving regulatory practices and consistency of standards. As global nuclear power plant licensing and construction activities expand using new globally standardized reactor designs, we should also find new ways to expand our global regulatory exchanges.

Safety – Security Interface

Another challenge is that increasing security threats have given rise to many new requirements to enhance the security of nuclear power plants in the U.S. Substantial improvements have been made. The NRC is confident in the adequacy of security at operating reactors today and that new reactor designs will achieve this level of security with less reliance on operator actions. In addition, the NRC continues to collaborate and strengthen our communications with other federal, state, and local agencies to monitor and assess the threat. Our open regulatory processes are continuing to provide for further dialogue with the public on security requirements.

The NRC's decision process to further strengthen our security requirements, if necessary, is technically thorough, systematic, and fully collaborative with other agencies. Such careful consideration is needed due to the potential impact that security changes could have on safety measures. For example, if it were deemed necessary to improve security by installing locks on doors leading to certain safety equipment, consideration must also be given to the fact that such barriers may slow or prevent access by plant personnel during a non-security event. This is a simple example of a much larger set of important regulatory considerations that together must ensure that both safety and security are achieved in harmony with each other.

Safety Culture

A third and ongoing challenge is to ensure that licensees maintain strong cultures of safety within their organizations. Nuclear plant safety performance should not be judged only by numerical measures. Even when such measures reflect good performance, the plant operator must constantly maintain a continuous commitment to safety that always supersedes production goals. Commitment to safety should be reflected in the vision of the most senior managers at every plant and required of every employee in the organization. Management at all levels should actively ensure that every employee feels free to express his or her views and concerns regarding safety, without fear of reprisal. This has an enormous benefit in helping to ensure that all aspects of an issue are fully explored before making decisions.

The NRC has inspectors permanently posted to every plant site and their inspections continuously monitor safety culture. Any organization that does not have current nuclear experience and is interested in building nuclear plants must accept the need to constantly foster a strong safety culture in its nuclear organization. This is non-negotiable.

The Future

Turning now to the future, reactor technology can be expected to progress, either more or less rapidly depending on marketplace factors, toward new generations of designs with demonstrably greater safety and potentially greater utility, especially for the small modular types. Keeping up with the advancing technology, so as to permit adequate safety reviews, will be a challenge for the NRC – but one that we are starting to prepare for now.

Another area of future challenge is related to spent fuel and waste management in the U.S. We currently still expect, and have been preparing for, a license application from the Department of Energy (DOE) for a deep, geological, permanent repository for high-level waste and spent fuel. The issues related to spent fuel management have precipitated a lot of thinking about the advantages of recycling spent nuclear fuel. Potentially this could significantly reduce the volume and toxicity of waste placed in a repository. Additionally, it could significantly expand the amount of usable fuel that can be extracted from the earth. Finally, it could substantially enhance proliferation resistance over existing recycling technologies. But it will come only with a substantial investment in the necessary research to develop the commercially usable technologies that would be needed.

The DOE's Global Nuclear Energy Partnership (GNEP) is intended to develop the systems, technologies, and policy regimes to provide sufficiently attractive nuclear power options to interested countries without the need for each country to develop and build nuclear enrichment facilities. For countries such as the U.S., it could also achieve the goals of waste reduction, fuel supply growth, and further improved reactor designs. As currently envisioned, NRC would probably be the regulator for these commercial enterprises as well as the preliminary DOE research facilities. Currently, the direction of this program and its level of Congressional support are unclear.

A more near-term challenge for the NRC is the requirement of the Energy Policy Act of 2005 for DOE to develop a Next Generation Nuclear Plant (NGNP) and for the NRC to license it for construction and operation. The NGNP is intended to demonstrate hydrogen production through

high-temperature processes supported by an advanced gas-cooled reactor design. In addition, these new reactor designs can offer additional orders of magnitude of safety improvement over the already improved safety of the latest designs now expected to be built in the U.S. The NRC is working with DOE on developing a licensing framework to meet this unique licensing need. However, it has been many years since the NRC licensed a gas-cooled reactor and, combined with advancing materials science, this means that we must re-learn and focus on the applicable science needed to perform our safety reviews.

NRC staff has already begun to consider a path forward, including modification of existing regulations and possible new rulemaking to address the safety and security requirements needed for these new technologies.

Closing

In closing, I hope I have accomplished three things today.

First, you should recognize that the maintenance of a strong and independent nuclear regulator is not only necessary, but adds significant value to public confidence and assurance.

Second, you should appreciate the amount of new licensing work the NRC is expecting and has started, and our commitment to performing effective safety reviews in an efficient and timely manner.

Third, you should know that the NRC continues to evolve in meeting our mission of protecting public health and safety and the environment. We are learning from experience, preparing for the demands of new licensing work, collaborating internationally in an expanding global environment, ensuring that safety and security measures stay in harmony, and promoting a strong safety culture.

Thank you for your attention.