

STATEMENT SUBMITTED  
BY THE  
UNITED STATES NUCLEAR REGULATORY COMMISSION  
TO THE  
COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS  
SUBCOMMITTEE ON CLEAN AIR, CLIMATE CHANGE,  
AND NUCLEAR SAFETY  
UNITED STATES SENATE

CONCERNING  
NRC OVERSIGHT

PRESENTED BY  
DR. NILS J. DIAZ  
CHAIRMAN

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## Introduction

Mr. Chairman and Members of the Committee, it is a pleasure to appear before you today to discuss the Nuclear Regulatory Commission's progress on implementing the provisions of the Energy Policy Act of 2005 (the Act), programs for new reactor regulation, and the current state of the Reactor Oversight Process (ROP). We appreciate the support that we have received from the Committee on these matters. On a personal note, Mr. Chairman, I am grateful for the opportunity to serve this great country of ours for almost 10 years, first as a Commissioner and then as Chairman of the best nuclear regulatory agency in the world. It has been my privilege to have worked with you during extraordinary times, to better serve the well-being of this nation.

The NRC is dedicated to the mission mandated by Congress - - to ensure adequate protection of public health and safety, promote the common defense and security, and protect the environment - - in the application of nuclear technology for civilian use. We are committed to exercise this mandate with a regulatory framework that is effective, predictable, and that continues to meet the changing demands of the country. To achieve this goal, we have made preparations and continue to put in place the infrastructure needed to conduct all the activities needed for the announced new reactor licensing and design certification work, including the 17 expected combined operating license (COL) applications beginning in 2007. We would like to highlight our current and anticipated new reactor regulatory activities, a new system for licensing reviews, and new human capital and space planning initiatives designed to meet the new challenges posed by the dynamic nature of today's nuclear arena, which include the effects of the Act. The NRC has continued to make significant progress implementing the provisions of the Act, and we would like to discuss them. In addition, we would like to share

where we are today and the improvements we have made and continue to make to the ROP. The continued safe and secure operation of the current fleet of operating nuclear power plants remains the Agency's top priority; therefore, the new activities are being carefully planned to ensure the continued safe operation of these facilities.

### **Energy Policy Act of 2005**

Since we last spoke to you in March, the Commission has completed additional actions to implement provisions of the Energy Policy Act of 2005. To date we have completed the following significant milestones:

- Final rule to implement revised Price-Anderson Act and eliminate NRC antitrust reviews;
- Final rule on import/export controls;
- Proposed rule on Design Basis Threat;
- Confirmatory Order for emergency notification system backup power at Indian Point;
- Final rule on National Source Tracking System;
- Grant awarded to National Academy of Sciences for a study of industrial, research, and commercial uses of radiation sources;
- Draft proposed rule broadening the definition of byproduct material submitted to the Commission; and
- Draft proposed rule for protection of safeguards information submitted to the Commission.

To prepare for the next generation nuclear plant (NGNP) project, the Commission has

begun working with the Department of Energy (DOE) to define the responsibilities of each agency and how NRC resources will be reimbursed. These cooperative interactions and the reimbursement process will be incorporated in a Memorandum of Understanding (MOU), consistent with the Act, that is being developed.

As discussed above, many actions and key milestones relevant to provisions contained in the Act have been completed and many more are on schedule to be completed over the next several years. However, a few of the milestones in the Act will be challenging, and difficult to meet on schedule, although we are making, and have made, every effort to meet them.

As I previously described in a letter to the Subcommittee dated June 15, 2006, one that is particularly challenging is related to Section 656 of the Act, "Secure Transfer of Materials." This section of the Act requires the Commission to establish a system such that all non-exempt byproduct material, source material, special nuclear material, high-level radioactive waste, spent nuclear fuel, transuranic waste, and low-level radioactive waste, when transferred or received in the United States by a party pursuant to an import or export license issued by the NRC, are accompanied by a manifest describing the type and amount of materials being transferred or received. This section requires that each individual receiving or accompanying the transfer of such material be subject to a security background check conducted by an appropriate Federal entity. The NRC has focused most of its efforts on this second requirement since it can rely on the Department of Transportation's manifest requirements to address the first requirement. This section also directs the Commission to issue regulations within one year of the Act, identifying radioactive materials or classes of individuals to be given exceptions to these requirements. The staff has been coordinating its rulemaking activities with other Federal agencies, the States, and other stakeholders and continues to work on resolving several

significant issues associated with implementation of the requirement. We discussed this provision at a recent Commission meeting in which the States and other stakeholders, particularly from the medical community, participated. As a result, the NRC will not meet the August 2006 date for issuing a final rule, but anticipates issuing a final rule before the end of this year.

The issues that require resolution prior to issuing the proposed rule for comment are as follows:

- Coordination with other Federal agencies responsible for transportation security and background checks;
- Coordination with States over the regulatory basis and rule language;
- Defining the classes of individuals subject to background checks; and
- Defining acceptance criteria for background checks.

The other action that may potentially be challenging is implementation of Section 651(d)(1), "Radiation Source Protection, National Academy of Sciences [NAS] Study." This action required the Commission to enter into an arrangement with the NAS within 60 days to conduct a study of industrial, research, and commercial uses for radiation sources, as defined in the Act. The Act defines radiation sources as Category 2 and above controlled under the 2002 IAEA Code of Conduct on Safety and Security of Radiation Sources. The study must identify if there are other processes which either can replace Category 1 and 2 sources with economically and technically appropriate alternatives, or can use Category 1 and 2 sources that pose a lower risk to the public. The NRC is required to submit the results of the study to Congress by August 7, 2007. On January 11, 2006, the staff awarded a grant to NAS and on February 15, 2006, held an initial meeting with NAS for conduct of the study. However, NAS

has not yet begun work on this study. The staff has requested a draft report from NAS by Spring 2007 in order to meet the August 2007 due date, but it appears that NAS may not have a draft report available at that time.

Several provisions of the Act relate to the export or import of Atomic Energy Act material and equipment. On April 20, 2006, the NRC issued a final rule to, among other things, revise the regulations regarding the export of HEU for medical isotope production, and add radium-226 to our export and import regulations.

### **New Plant Applications**

As a result of the passage of the Energy Policy Act of 2005 and concurrent developments in U.S. energy demands, the NRC is preparing for an increased number of potential early site permit (ESP), design certification (DC), and COL applications. The Energy Policy Act incentives for new reactor construction established an environment in which new nuclear power plants are being seriously considered to meet future generation capacity, the need for which is expected to increase by the year 2015. Last year at this time, the NRC had been notified of three potential COL applications in the next few years. Today, the number of expected COL applications is 17 for up to 25 units, and the number of applications is expected to increase in the future. Some of these applications are expected to reference reactor designs already certified by the NRC, such as the Westinghouse AP1000 and General Electric's Advanced Boiling Water Reactor (ABWR), while others are expected to reference designs that are currently under NRC review, such as the General Electric Economic Simplified Boiling Water Reactor (ESBWR) and AREVA's U.S. Evolutionary Power Reactor (EPR) which is at the

pre-application stage. We also expect to conduct reviews of additional ESP applications. We are preparing to review and act on the many applications anticipated to be submitted in the 2007-2008 time frame, and are organizing accordingly. We continue to assess our resource needs, which have increased significantly, in light of the very substantial increase in the number of anticipated COL applications and related work. The attached graphs show the anticipated work schedule based on industry submittals, public announcements, and expected, but as yet unannounced applications, separated by reactor design.

### **Preparing for the Future**

We are undertaking major initiatives to ensure that NRC is ready to process the new reactor applications inspired by the Energy Policy Act. We are:

- Developing guidance on preparation and review of COL applications to help ensure high quality applications from industry and to streamline staff review.
- Revising Part 52 to make our review and licensing processes more effective and efficient.
- Revising our Part 73 security regulations in three separate rulemakings to provide clear and stable security regulations to new applicants.
- Creating a Design-Centered-Approach to facilitate effective, efficient, and timely reviews of multiple COL applications. This approach is founded on the concept of “one issue –

one review – one position, for multiple applications” to optimize the review effort and resources needed to perform the reviews.

- Developing a new construction inspection program to prepare for the construction phase of new reactors. This new program will build on the lessons learned from the construction of the existing fleet of new reactors.
- Optimizing our human capital to prepare for an increased workload while accounting for possible increased attrition.
- Enhancing our office space and infrastructure by working with the General Services Administration to acquire additional office space as close as possible to NRC Headquarters.
- Developing a Multi-National Design Approval Program with international regulators to leverage world-wide nuclear safety, licensing, and operating experience.

### **Current New Reactor Licensing Activities**

NRC’s licensing reviews are supported by regulatory guides and standard review plan (SRP). The NRC staff is reviewing and revising the regulatory guidance documents associated with new reactor licensing. These guidance documents include a planned COL application regulatory guide which contains the information that COL applicants need to provide in their applications, and an update of pertinent SRPs for use by NRC staff reviewing COL applications.

A draft regulatory guide, which has been the subject of numerous public meetings and workshops, will be published for comment in July 2006. The NRC staff expects to issue the final regulatory guide by December 2006. This will support prospective applicants who are planning to submit COL applications in late 2007 and 2008. This schedule is consistent with the schedule for the promulgation of the revised Part 52 rule. The NRC staff is also updating SRPs and regulatory guides that are important to support the anticipated new site and reactor licensing applications. This work is being conducted in a manner that complements the COL regulatory guide. The staff intends to complete the high priority SRP and regulatory guide updates by the Spring of 2007.

The agency's work on new reactor standardized design certification has also intensified. Three designs were previously certified: General Electric's ABWR, Westinghouse's AP600, and Combustion Engineering's System 80+ designs. The NRC recently certified the Westinghouse AP1000 reactor and codified it in the NRC's regulations, as Appendix D to 10 CFR Part 52. The NRC is currently reviewing the General Electric ESBWR design certification application and is on schedule with respect to its review. The NRC is conducting pre-application activities for AREVA's U.S. EPR design. This design certification application is expected in 2007. The NRC is also conducting very limited pre-application work for the Pebble Bed Modular Reactor (PBMR) and the Westinghouse International Reactor Innovative and Secure (IRIS), and is expecting additional design certification applications in the future.

To effectively review multiple COL applications in parallel, the staff is planning to implement a design-centered review approach. We believe this approach is crucial to achieving effective, efficient, and timely reviews for multiple applications. This approach is founded on the concept of "one issue-one review-one position for multiple applications" to optimize the

review effort and resources needed to perform these reviews. The NRC staff would use a single technical evaluation for each reactor design to support reviews of multiple COL applications for the same technical area of review, assuming that the relevant components of the applications are standardized. The design-centered approach will focus its reviews by: 1) using standardization and coordination of approaches and applications; 2) requiring complete and high-quality applications; 3) increasing the use of the DC rulemaking to codify issue closure; and 4) using single technical evaluations to support multiple COL applications to the extent practicable. In addition, to achieve consistency among the staff reviews, the process for implementing the design-centered review program will require a multi-layered project management team for each design, and will use dedicated technical review resources. The plans and schedules of these reviews include an increased level of detail and integration to achieve the requisite level of control and documentation. The benefits of this approach would be enhanced by the full participation of multiple entities in ensuring that pertinent components of the applications are standardized to the extent practicable. A schematic representation of the sequencing and use of the design-centered review approach is shown in an attached graph. Significant efficiencies in the staff's drafting of its safety evaluation reports for each COL applicant are expected to be gained through the use of the design-centered approach.

### **New Reactor Construction Oversight**

To prepare for the construction of new reactors licensed in accordance with 10 CFR Part 52, a new construction inspection program (CIP) is being developed. The new CIP builds on the lessons learned from the construction of the existing fleet of operating reactors. The CIP comprises four different parts: early site permit inspections; pre-combined license (pre-COL) inspections; inspections, tests, analyses and acceptance criteria (ITAAC) inspections after issuance of a COL; and non-ITAAC inspections. These inspections will cover all aspects of

new plant construction and operation from early site preparation work through construction. They will also facilitate the transition to inspections under the reactor oversight process (ROP) for operating reactors. Associated inspection procedures for half of the program are in place and the remaining procedures are under development and are scheduled to be in place well before the start of approved on-site construction activities.

Successful implementation of the CIP will require four main functions: 1) day-to-day inspections at the construction site by resident construction inspectors; 2) on-site inspections by specialist inspectors; 3) off-site inspections (e.g., vendor inspections); and 4) documentation of inspection results and public notification of the successful completion of the ITAAC. ITAAC are part of the combined license and define specific requirements to be met prior to full-power operation. To gain staff efficiencies and facilitate knowledge transfer, all construction inspection management and resources will initially be located in a single region which will schedule all construction inspections nationwide.

The NRC performed an initial assessment of the existing ROP for use with new reactor designs which confirmed that the overall ROP framework could be used, including utilizing performance indicators and the significance determination process for evaluating inspection findings. The Construction Inspection Program will specifically address each new reactor to be built, detailing the steps that will be employed to integrate that plant into the ROP as it transitions from the construction phase into the startup and operations phase.

### **Multinational Design Approval Program (MDAP)**

The NRC is working with international regulators on a multinational design approval program intended to leverage world-wide nuclear safety, licensing and operating experience in a cooperative effort to review reactor designs that have been or are being reviewed and approved in other countries. Key goals of this cooperative effort are to improve safety with standard designs, and improve the effectiveness and efficiency of the regulatory reviews of new reactor designs. The first stage of the MDAP has already begun. It involves enhanced cooperation with the regulatory authorities in Finland and France to assist NRC's future design certification review of the US EPR. The anticipated cooperation under the first stage would include the sharing of pertinent regulatory information, the exchange of technical personnel consistent with the applicable laws of each country, participation in inspection activities, peer review activities, and other activities that would seek to leverage the safety expertise of each of the national regulatory bodies. Follow-on stages of the MDAP could foster the safety of reactors in participating nations through convergence on safety codes and standards, and other technical matters while maintaining full national sovereignty over regulatory decisions. Preliminary work to more fully develop the framework to expand and better define MDAP is underway at the NRC and the Organization for Economic Co-operation and Development's Nuclear Energy Agency.

### **Challenges**

The NRC recognizes that many challenges for new reactor licensing activities continue to exist. Key challenges include effective communication between the NRC and the applicants, and the interrelationship between the technical review and the associated adjudicatory process. To successfully complete the reviews within the anticipated schedule, continuous clear,

effective, and timely communication between the NRC and the applicant must occur. Delays in providing or responding to requests for information must be avoided, and any modifications to the application need to be conveyed immediately so that reviews can be appropriately coordinated. In addition, the technical review and adjudicatory process for the application are interrelated and for ESPs and COLs both are required for the final decision making process. Multiple products are needed on schedule to maximize the early resolution of issues leading to a final determination, including issuance of an ESP, DC and/or COL. An applicant may decide to submit a license application in a manner different from the originally contemplated sequence, such as choosing not to apply for an ESP prior to applying for a COL. In such cases, the technical and environmental reviews and the adjudicatory review that would ordinarily be performed at the ESP stage will need to be included in the COL review and could challenge the application review schedule. To meet these challenges, we are implementing organizational changes in our legal and technical organizations, recruiting personnel, and developing an integrated planning tool to assist in coordinating the applicant schedules.

Some challenges to success are beyond NRC's control. A new contract for spent fuel needs to be agreed upon. The Department of Homeland Security must prepare for its responsibilities in emergency preparedness and security (as described in Section 657 of the Act) and budget resources for those roles. Industry must submit high-quality applications that address and eventually resolve issues over which State and local governments have a statutory role.

The NRC has completed substantial preparation activities and executed reviews of supporting elements for COL applications (e.g., ESPs and DCs). We continue to incorporate the lessons learned from past and current reviews to create a stable and predictable regulatory process. As such, the NRC is preparing to conduct thorough and timely reviews of COL

applications and of inspections, tests, analyses and acceptance criteria (ITAAC). This should minimize the potential for dependence on the use of the Energy Policy Act Risk Insurance Program. As noted previously, when COL applications are submitted, they should be high quality, standardized applications that contain the safety analysis and other required components in the level of detail that will not just allow docketing, but also will allow the NRC to complete staff review and the adjudicatory process in a timely manner.

The NRC is cognizant and is prepared to discharge its responsibilities in new reactor licensing, the success of which depends on many factors, including the submittal of high quality applications by the industry. With the continued support of Congress, we will carry out our responsibilities and meet the challenges ahead.

### **Human Capital and Space Planning**

As you know, the NRC has been aggressively recruiting a mixture of recent college graduates and experienced professionals to meet the agency's emergent work activities. As we told you in March, we expect that an additional 400 FTEs will be devoted to new reactor work by FY 2008. I am pleased to report that we have already exceeded our goal of hiring approximately 350 new employees in FY 2006. We are in the process of training our new recruits and we are seeking to improve our training programs. We are also putting very high priority on knowledge management, since we expect to lose about 200 employees per year for the next several years, including many of our most senior managers and professional staff. Our aggressive efforts to recruit, hire, and develop staff will continue throughout Fiscal Year 2007 as we prepare for receipt of the first COL applications.

To solve NRC's immediate need for additional office space, we requested that GSA

expedite the acquisition of interim office space to enable NRC occupancy this fall. NRC's long term space needs are more problematic. We are working with GSA to address our long-term space needs through the established portfolio acquisition process for Congressional approval. However, the established process will not result in occupancy of additional permanent space until FY 2009, at the earliest, which may deprive NRC of an opportunity to acquire space adjacent to our headquarters campus. Therefore, as noted in our letter to you dated April 5, 2006, the Committee's assistance in two specific areas would be of great value to the NRC: legislative authority for the General Services Administration (GSA) to immediately acquire space as close as possible to the NRC headquarters location and legislative relief to accelerate the space acquisition process.

With Congress' help, the Commission is poised to meet the challenge of maintaining adequate infrastructure and the personnel needed to accomplish its mission successfully. This will be accomplished through the ongoing human capital planning, implementation, and assessment process, the space planning program, and the various tools provided by the Energy Policy Act of 2005.

### **Reactor Oversight Process**

The NRC first implemented the reactor oversight process (ROP) in April 2000 to provide a more disciplined and objective approach to the oversight of operating nuclear reactors. The ROP is a mostly risk-informed process that focuses inspections on those activities or areas that are risk significant (i.e., important to plant safety based on each plant's design) and that increases the level of scrutiny on elements of a licensee's performance that appear to be declining. The ROP requires that inspections be performed in seven fundamental areas to

measure plant performance and maintain safe plant operation. For example, we recently undertook a substantial effort to strengthen its engineering inspection procedures to increase the scrutiny of operator actions and risk significant components. In addition to the component design bases inspection, the NRC dedicates a significant amount of the ROP baseline inspection to the evaluation of other plant activities such as evaluation of changes and tests, fire protection, plant modifications, and maintenance effectiveness, among others.

Over the past 6 years, the ROP has focused on stakeholder involvement and has matured into a more consistent, established risk-informed process. The Commission agrees with the feedback from both internal and external stakeholders that the ROP is a significant improvement over the previous, more subjective oversight process. The ROP continues to meet its established objectives and intended outcomes as demonstrated annually through its self-assessment process. The NRC appropriately monitors operating nuclear power plant activities, focuses agency resources on significant performance issues, and maintains a level of oversight commensurate with licensee performance. The results of NRC oversight activities, including performance indicators, inspection findings, and the current assessment of overall performance for each reactor, are publicly available on the NRC's web site.

The NRC has made numerous improvements to the ROP since its initial implementation, including many as a result of independent program evaluations and feedback from internal and external stakeholders. The inspection program and associated resources have been adjusted to better focus on risk-significant issues, with significant enhancements in the areas of problem identification and resolution, fire protection, safety culture, design engineering, and in-service inspections. Many of these changes were based on lessons learned from the Davis-Besse event. The timeliness and consistency of determining inspection finding significance have notably improved over the past several years due to program enhancements and an increased

management focus. The plant assessment process has been modified to further improve its predictability, particularly in the treatment of cross-cutting issues, old design issues, and plants with significant performance deficiencies. The staff and industry have developed and implemented a new performance indicator, the mitigating systems performance index (MSPI), to address known problems with the safety system unavailability indicators and to utilize important risk insights.

The MSPI combines safety component reliability and availability with plant-specific probabilistic risk assessment (PRA) information to arrive at a single performance index for each monitored system. Since the MSPI pilot ended in 2003, the staff finalized the technical guidance needed for implementing MSPI, defined and addressed a minimum level of PRA quality, and resolved issues identified throughout the development and review processes. At the beginning of April 2006, the staff implemented MSPI, and licensees are scheduled to submit their initial data sets in July 2006. The staff expects a number of changes to overall plant assessments due to MSPI implementation. The NRC has conducted training for our inspectors and plans to perform inspections at each site to verify the proper initial implementation of MSPI by the end of 2006.

Finally, the NRC is implementing safety culture initiatives to enhance the ROP. The NRC, with the participation of stakeholders, enhanced the ROP to better align the three cross-cutting areas to those aspects of performance that are important to safety culture. We have adjusted selected baseline, event response, and supplemental inspection procedures and inspection manual chapters. Computer-based training and training at regional counterpart meetings were provided. The NRC is incorporating appropriate aspects of safety culture into initial training for new inspectors and continuing training for existing inspectors. The modified ROP will be implemented by July 1.

**Conclusion**

The Commission is dedicated to ensuring that our agency is ready to meet the expected demand for new reactor licensing. NRC's Part 52 processes are safety focused and are efficient and predictable. We have taken action to clarify Part 52, to ensure a clear regulatory and oversight framework; to reorganize the Agency and put in place the processes to ensure timely review; to meet the NRC's human capital and office space needs, and to seek additional funding as necessary. The Agency is prepared to meet the challenge associated with new reactors while maintaining strong oversight of the current operating reactors. We are convinced that the Agency has the technical and legal know-how to make the right decisions in a timely manner.

We appreciate the opportunity to appear before you today, and the Commission looks forward to continuing to work with the Committee. We welcome your comments and questions.