WRITTEN TESTIMONY
OF DALE E. KLEIN, CHAIRMAN
UNITED STATES NUCLEAR REGULATORY COMMISSION
TO THE
SENATE COMMITTEE ON ENERGY AND NATURAL RESOURCES

MARCH 18, 2009

Mr. Chairman, Senator Murkowski, and Members of the Committee, I am pleased to appear before you today to discuss the Nuclear Regulatory Commission's new reactor licensing processes.

Let me begin by noting that just last week the NRC hosted our annual Regulatory Information Conference, which was attended by nearly three thousand individuals, including regulators, members of industry, stakeholders, and representatives from 31 other nations. Our annual conference is part of the NRC's ongoing efforts to share information, best practices and lessons learned to enhance nuclear safety and security both domestically and abroad.

Mr. Chairman, my testimony will explain the current licensing process for new reactor applications; contrast this with the agency's older, less efficient, two-step process; and discuss the current status of new reactor applications.

Congress has provided the NRC with the resources needed to meet the growing renewed interest in additional commercial nuclear power in the United States. These resources have enabled the NRC to successfully complete, on schedule, significant new reactor licensing activities. Over a number of years, NRC has taken steps to improve the licensing process. These actions have served to increase the effectiveness, efficiency and predictability of licensing a new reactor while maintaining our focus on safety and security. All currently operating commercial nuclear power plants in the United States were licensed under a two-step process for approval of construction and later for operation. But, all of the new reactor license applications have been submitted under a new combined license application approach (also known as "COL"), which essentially takes the previous two-step review process down to one

step. To date, the NRC has received 17 COL applications for 26 new nuclear reactors. A map depicting the locations and types of proposed reactors is attached. Based on industry information submitted to the NRC, we could see up to five more COL applications for seven more reactors by the end of 2010.

In the simplest terms, under the original two-step licensing approach the NRC would first issue a construction permit, based on evaluation of preliminary safety and design information, to allow construction of a nuclear power plant, and then later issue an operating license upon completion of construction. The applicant was not required to submit a complete design at the construction permit phase. Before the scheduled completion of construction, (typically when the plant was 50% completed), the applicant filed an application for an operating license. At this point, the applicant had to provide the complete design bases and other information related to the safe operation of the plant, technical specifications for operation of the plant, and description of operational programs.

Criticism of the two-step process centered on a design-as-you-go approach to constructing the plant, which deferred resolution of important safety issues until plant construction was well underway. The deferral of design details until after construction was authorized allowed commercial reactors to be built with an unusual degree of variability and diversity – in effect, a set of custom-designed and custom-built plants. Other criticisms included regulatory requirements that kept changing, and a seemingly inefficient and duplicative review and hearing process.

To address these problems, the process set forth in Part 52 of the NRC's regulations allows an applicant to seek a combined license, which authorizes construction based on a complete design and provides conditional authority to operate the plant, subject to verification that the plant has been constructed in accordance with the license, design, and the Commission's regulations. Part 52 maintains significant public participation throughout the licensing application process. A graphic depiction of the licensing process is attached.

Part 52 provides two other significant procedures: (1) review and approval of standardized designs through a Design Certification rulemaking, and (2) review and approval of a site's suitability, prior to a decision whether to build a particular plant, through an Early Site Permit (ESP). The applicant may also request a Limited Work Authorization (LWA), which allows applicants to perform limited work activities to prepare the site before approval of the COL.

So far, only one of the five designs currently being referenced in COL applications -- the Advanced Boiling Water Reactor -- has completed the certification process and is only referenced in one COL application. It should be noted that although the Westinghouse AP1000 is also a certified reactor design, the design that was approved in 2006 has two revisions under review by the NRC. A final decision on the design changes is expected in 2010.

In addition, the design certification applications and some COL applications received to date initially lacked information that the staff needs to complete its review. Staff reviews have been further complicated because some applicants are revising submission dates and submitting modifications to their applications, often with late notice to the staff, which is disruptive to the work planning process. The result is that the early COL applications are unlikely to achieve the full benefits of the Part 52 process. The NRC is working with stakeholders to overcome these challenges and is confident that the agency will be prepared to make timely regulatory decisions. As this process matures, the Commission will seek the continued support of Congress to sustain these efforts.

I would like to focus my comments briefly on improvements we have made to date, and what we expect down the road in new reactor licensing.

The NRC has sought to position itself strategically to be ready to respond to the new reactor licensing workload. The Commission created the Office of New Reactors, or NRO, to lead the agency effort to establish the regulatory and organizational foundation necessary to

address the new reactor licensing demand. Staffing the new office was given high priority, and today NRO has over 475 highly competent and qualified employees.

The NRC has made great strides in addressing the new reactor licensing challenge:

- The NRC published a revised 10 CFR Part 52 (titled, "Licenses, Certifications, and Approvals for Nuclear Power Plants") in August 2007 to clarify the applicability of various requirements and to enhance regulatory effectiveness and efficiency in implementing the licensing and approval processes. The rule also incorporated lessons learned from the reviews of the first design certification and early site permit applications.
- Similarly, the NRC published a final rule on Limited Work Authorizations, or LWAs, which supplements the final rule on 10 CFR Part 52. This rule allows certain early construction activities to commence before a construction permit or combined license is issued. The rule specifies the scope of construction activities that may be performed under an LWA, and specifies activities that no longer require NRC approval. Like the Part 52 revision, these changes were adopted to enhance the efficiency of the licensing and approval process and to reflect more clearly NRC's authority.
- In March 2007, the NRC completed the first comprehensive update to the NRC's Standard Review Plan (SRP), which provides guidance to the staff on how to perform technical reviews. The update brought the SRP into conformance with the Part 52 revision, and extends the applicability of the SRP to the Part 52 licensing process.
- The NRC issued a new regulatory guide, RG 1.206 (titled, "Combined License Applications for Nuclear Power Plants"), which provides guidance to potential applicants on standard format and content of new reactor combined license

applications, and also recently issued guidance for applicants on complying with the LWA rule.

- The NRC has implemented a computer-based project management system that significantly enhances the staff's ability to plan and schedule work.
- In 2004, the NRC promulgated substantially revised rules of practice intended to streamline and make the hearing process more effective.
- The NRC promulgated an electronic filing rule that is further increasing the efficiency of the hearing process.
- The NRC created a new reactor construction inspection organization in the Region II Office in Atlanta, Georgia. To prepare for the commencement of construction activities, the staff has observed ongoing new construction activities in China, Finland, France, Japan, Korea, and inspected the refurbishment and startup of the Tennessee Valley Authority (TVA) Browns Ferry Unit 1, which has been idle since 1975, and is currently inspecting the completion of TVA's Watts Bar Unit 2, which had been in a suspended state since 1985.
- Finally, the NRC conducted an efficient review of project management using the Six Sigma problem-solving methodology to streamline the design certification rulemaking process.

With these activities, I believe that the NRC has established a strong regulatory foundation for the review of new reactor license applications.

I should also mention that the agency has made a consistent effort to improve our coordination with other Federal agencies involved in new reactor licensing. For example, consistent with its lead responsibility for off-site nuclear emergency planning and response, the Federal Emergency Management Agency (FEMA) supports the NRC's COL application reviews by providing input to ensure that the off-site emergency plans are adequate.

In addition to COLs, the NRC staff has completed the review of three early site permit applications and is proceeding with the review of the fourth application. With respect to design certifications, the staff is continuing its review of General Electric's Economic Simplified Boiling Water Reactor, commonly referred to as the ESBWR; Areva Nuclear Power's U.S. Evolutionary Power Reactor, or U.S. EPR; Mitsubishi's U.S. Advanced Pressurized Water Reactor, or US-APWR; and amendments to Westinghouse's AP1000 design certification.

The NRC has completed preliminary work for the licensing of the Next Generation Nuclear Plant, or NGNP. In August 2008, the NRC and DOE delivered a licensing strategy to the Congress, as required by the Energy Policy Act of 2005.

I would like to touch briefly on the GAO's 2007 audit of the NRC's readiness to conduct reviews of COL applications. In general, the GAO's findings were positive assessments, acknowledging the NRC's extensive preparations and the quality of plans. The NRC continues to believe that the GAO assessments provide useful insights to the agency's management. The GAO identified four recommendations:

- Fully develop and implement criteria for setting priorities to allocate resources across applications by January 2008.
- Provide the resources for implementing reviewer and management tools needed to ensure that the most important tools will be available as soon as is practicable, but no later than March 2008.
- Clarify the responsibilities of Office of New Reactor's Resource Management Board in facilitating the coordination and communication of resource allocation decisions.
- Enhance the process for requesting additional information by (1) providing more specific guidance to staff on the development and resolution of requests for additional information within and across design centers and (2) explaining

forthcoming workflow and electronic process revisions to combined license applicants in a timely manner.

I am pleased to report to you that the NRC has completed its work in response to these recommendations.

The NRC is also working with its international partners on many areas of common interest. One program that we have initiated is the Multi National Design Evaluation Program (MDEP) in order to take advantage of international experience in licensing and constructing two EPR plants in Europe to assist the NRC in its review of the US EPR application. The NRC also has recently established interactions with regulatory counterparts in China, Canada and the United Kingdom to exchange information on the licensing review of proposed AP1000 reactors in the United States.

In addition to focusing on completing licensing reviews, the NRC is working on the development and implementation of a new Construction and Vendor Inspection Program. The program is building upon prior experience, including lessons learned during the construction of the 104 currently operating reactors. Numerous historical lessons provide insights related to quality and oversight problems during the previous period of construction in the United States, and abroad. The most important of these lessons is that a commitment to quality, instilled early in a nuclear construction project, is vital to ensuring that the facility is constructed and will operate in conformance with its license and the regulations.

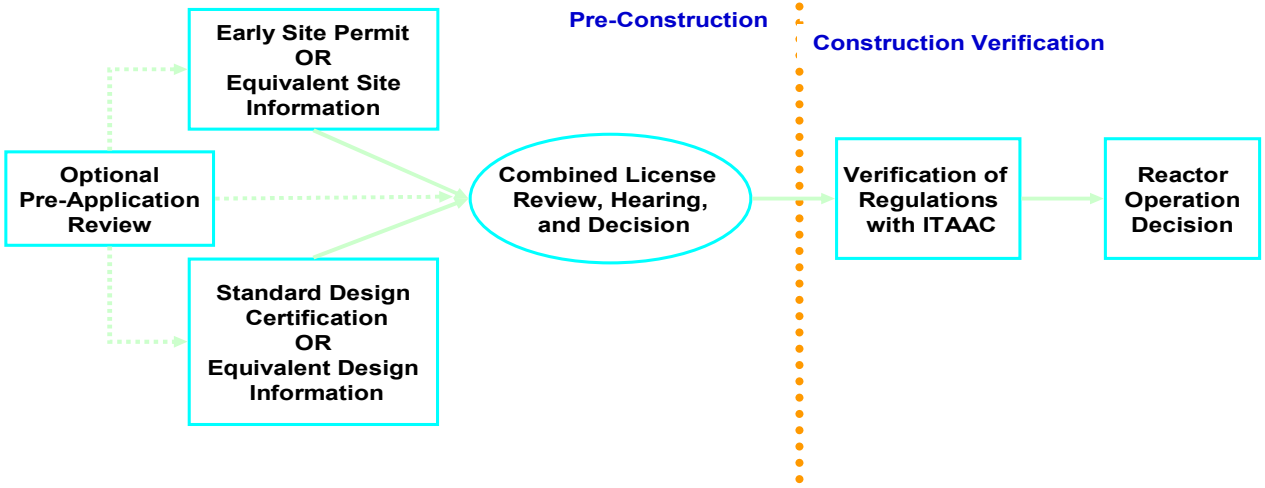
The NRC staff is working with the industry to ensure that a strong commitment to quality is part of the foundation of every new reactor project in the United States. Many of the components that will be used in the construction of possible new reactors in the U.S. will be manufactured abroad, so NRC inspectors are also visiting manufacturing facilities and working with our regulatory counterparts in other countries to ensure the quality of the manufactured components. Quality assurance (QA) inspections of engineering and site activities are contributing to the conduct of effective and efficient reviews of design certifications, COLs, and

early site permit applications. The agency has also sought stakeholder involvement in an effort to make construction and vendor inspection a timely, accurate and transparent process.

While the Commission is satisfied that we have in place an effective regulatory process, we are always looking for ways to improve. Just as industry can become more efficient, the NRC is constantly working to improve its efficiency with no compromise in safety.

Mr. Chairman and Members of the Committee, this concludes my overview of the NRC's licensing process for new reactor applications, and the current status of license applications. I would be pleased to respond to any questions you may have.

New Licensing Process – 10 CFR Part 52 -



- Licensing decisions finalized before major construction begins
- Inspections to verify construction
- Limited work may be authorized before license is issued

U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

New Reactors

Location of Projected New Nuclear Power Reactors