UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

January 8, 2010

The Honorable Jeff Bingaman
Chairman, Committee on Energy and Natural
Resources
United States Senate
Washington, DC 20510

Dear Mr. Chairman:

The U.S. Nuclear Regulatory Commission appeared before the Committee on Energy and Natural Resources on December 15, 2009. From that hearing, you forwarded questions for the hearing record. The responses to those questions are enclosed. If I can be of further assistance, please do not hesitate to contact me.

Sincerely,

/RA/

Rebecca L. Schmidt, Director
Office of Congressional Affairs

Enclosures:
As stated

cc: Senator Lisa Murkowski

QUESTION 1. Your testimony at the bottom of page 4 indicates that in general small reactors that are based on light water designs that are "in a relatively good position to undertake licensing reviews". Can you clarify that statement relative to the other designs out there?

ANSWER.

The U.S. Nuclear Regulatory Commission (NRC), including the work of its predecessor agency, the Atomic Energy Commission (AEC), has been conducting licensing reviews for light water reactors (LWRs) for over 50 years and has substantial experience and an established regulatory structure for performing reviews of these types of nuclear reactors. In fact, the NRC based its regulations and review guidance on LWR technology. The new small modular LWR designs being proposed are a variation of the existing large scale LWRs. They will use the same fuel and same coolant, and will implement some of the same or similar design features as the existing large scale LWRs. For these reasons, the NRC does not expect the new small modular LWR designs to require substantial changes to the current regulatory framework. The NRC staff believes that it is therefore relatively well positioned to undertake licensing reviews for the new small modular LWR designs in the near term.

The NRC has conducted a limited number of licensing reviews in the past for both high temperature gas reactors (HTGRs) and liquid metal reactors (LMRs). However, those designs are significantly different from the ones being proposed today. Unlike LWRs, these technologies employ different coolants, new fuel types, and new design features. Because of these significant differences, the NRC must conduct extensive research to support development of the regulatory framework to conduct licensing reviews.

QUESTION 2. About how many inquiries for licensing "New Reactors" has your office received or expects to receive?

ANSWER.

In characterizing new reactor licensing, it is important to draw a distinction between applications submitted by reactor vendors for certification of a reactor design versus combined license applications submitted by utilities. For small modular reactors, the NRC has been approached by reactor vendors proposing as many as nine different designs spanning three separate technologies (LWRs, HTGRs, and LMRs). Based on letters the NRC has received from small modular reactor vendors, we could receive a design certification application as early as fiscal year (FY) 2011, with others following in FY 2012. The exact number of anticipated design certification applications is not known due to uncertainty in the vendors' business plans. Additionally, the Next Generation Nuclear Plant (NGNP) program is expected to provide a design certification application to the NRC in FY 2013.

The NRC has not been approached by any utility to indicate specific plans to submit a combined license application that would rely upon small modular designs. Therefore, at this stage, it is too early to predict how many combined license applications for small modular reactors may be submitted to the NRC.

QUESTION 3. The NRC is obviously under a tremendous work load, maintaining the safety and security of the 104 existing reactors and reviewing upwards of 18 combined operating licenses. Can your office support the work load it expects to receive with the volume of small reactors that might be coming in – some of which are not traditional light water reactors?

ANSWER.

In anticipation of the workload in performing the licensing reviews of new reactors, the NRC established the Office of New Reactors -- separate from the Office of Nuclear Reactor Regulation -- to focus on these licensing reviews, thereby limiting the impact on the oversight of the safety and security of the 104 existing reactors. Similarly, in anticipation of the workload for small modular reactors, we have established the Advanced Reactor Program within the Office of New Reactors to focus on reviews for these smaller designs.

The NRC is currently developing resource estimates required to support review of the design certification applications that the reactor vendors have indicated will be submitted for small modular reactors. The NRC staff will continue to work through the budgeting process with the Commission regarding appropriate resource allocations.

QUESTION 1. As you look to establish regulations and guidance for high-temperature gas-cooled and liquid metal reactors, do you anticipate that the regulations will be based on existing light-water reactor regulations with changes to accommodate differences in technology, or will they be newly developed regulations?

ANSWER.

Changes will need to be made to the specific analysis methods used, and the criteria that are to be satisfied in demonstrating compliance with those regulations. Significant research will be needed to develop and evaluate these new or revised analysis methods and criteria. It is possible that changes to the existing regulations will be warranted but that will be evaluated on a case-by-case basis.

QUESTION 2. You expressed a desire that the regulatory framework for small modular reactors be developed at the same time as the technology itself. What level of cooperation have you received from industry to help understand some of the innovative technology that is being proposed?

ANSWER.

The NRC is coordinating with the Department of Energy on the NGNP to identify and resolve challenges associated with HTGRs. In addition, the NRC has held pre-application meetings with several of the potential vendors to discuss some of the innovative design approaches being proposed. For example, NRC recently held a public workshop to discuss licensing issues for small and medium sized nuclear reactors that included industry, the Department of Energy and other stakeholders. As the industry's plans continue to materialize throughout FY 2010 and FY 2011, the NRC will increase its pre-application meetings such that we maintain our effectiveness in keeping abreast of new and innovative design approaches.

QUESTION 3. Since some small reactors have much less nuclear material than conventional large-scale nuclear power plant and hence pose less safety concern, would the NRC modify its requirements for emergency planning zones around a reactor site to be consistent with the size of the reactor?

ANSWER.

NRC's regulations currently allow for the review and approval of different sized emergency planning zones (EPZs) on a case-by-case basis for reactors below 250 megawatts thermal or for gas-cooled reactors. Therefore, the NRC does not currently anticipate the need to modify its regulations in this regard. The applicants for these small reactors would need to develop a risk basis and detailed justification for a proposed change in EPZ size that would be significantly different from current LWRs. Then, the NRC will review that justification and reach a finding on its adequacy in supporting a revision to the EPZ for a specific design.