



NRC NEWS

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“Nuclear Regulation and the Nuclear Renaissance”

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United States Nuclear Regulatory Commission

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Introduction

Good morning. I am delighted to have this opportunity to participate in this conference on “Powering the Future 2010.” Access to reliable energy is essential to the quality of life in our society. The debates on energy are indeed challenging, with many important issues to consider, such as those related to the security of our energy supply, financial subsidies and loan guarantees, carbon emissions, and the contribution of renewables and nuclear. The energy policy of the United States is determined, in part, through coordination and cooperation among federal, state and local public entities, and the private sector. You all represent an important voice in how our country’s energy policy takes shape.

I understand that this is the first time that the Emerging Issues Policy Forum has had a member of the U.S. Nuclear Regulatory Commission (NRC) participate in one of its events. Therefore, what I would like to do this morning is to provide you with an overview of what the NRC is and does, and to share with you a few perspectives on what is happening in the nuclear energy sector and the so-called “nuclear renaissance.” Let me clearly state up front that I am speaking only on my behalf. These views are solely my own and may not necessarily represent that of the entire Commission.

To view slides accompanying Commissioner Ostendorff’s speech [click here](#).

Role of the NRC

Like the Federal Energy Regulatory Commission, which you are all familiar with, the NRC is an independent regulatory agency created by Congress. The NRC’s mission is to license and regulate the nation's civilian use of nuclear materials to ensure adequate protection of public health

and safety, to promote the common defense and security, and to protect the environment. I should emphasize that it is not the NRC's role to promote the use of nuclear and radiation technologies. That role was assigned to the Department of Energy and its predecessor, the Energy Research and Development Administration (ERDA) in the 1970s. Rather, our role is focused on making sure the use of these technologies is safe and secure.

Our regulatory mission covers three main areas:

- reactors – commercial reactors for generating electric power and research and test reactors used for research, testing, and training;
- materials – uses of nuclear materials in medical, industrial and academic settings, and facilities that produce nuclear fuel; and
- waste – transportation, storage, and disposal of nuclear materials and waste, and decommissioning of nuclear facilities from service.

The NRC carries out its operations with an annual budget of about \$1 billion and approximately 4,000 people located in five primary locations in the United States – our headquarters office in Rockville, Md. (just outside Washington D.C.); our Region 1 office in King of Prussia, Pa.; our Region 2 office in Atlanta, Ga.; our Region 3 office in Lisle, Ill.; and our Region 4 office in Arlington, Tx. We also have a Technical Training Center in Chattanooga, Tenn.

We fulfill our responsibilities through regulatory activities that include:

- establishing and enforcing safety and security regulations, under the framework of the Administrative Procedures Act;
- licensing the construction and operation of nuclear facilities;
- licensing the operators of nuclear facilities;
- licensing the use of nuclear materials, for instance in the medical arena;
- inspection of nuclear facility operations, for example by our on-site resident inspectors;
- conducting independent safety research and analysis;
- investigating nuclear incidents;
- working effectively with other federal agencies, state, local, and tribal governments; and
- providing opportunities for public involvement.

In carrying out our regulatory mission, the NRC strives to adhere to its principles of good regulation – independence, openness, efficiency, clarity, and reliability. I find that these principles help to keep us focused on safety and security, while appropriately balancing the needs and interests of our stakeholders.

Let me address a few of these principles in some more detail. I have found in my six months on the Commission that the level of openness at the NRC is unparalleled in my experience with the Federal government. I find that being open and transparent helps to enhance our credibility, which is an important factor in building public trust of a regulator. I will touch upon this point later in my discussion.

I believe that clarity and reliability are also of particular importance. As a Commissioner, I find it essential for the Commission to: provide clear, unambiguous direction to the NRC staff; promulgate clear rules for the regulated community to implement; and communicate clearly both inside and outside the NRC. With respect to reliability, our regulations should be based on the best available knowledge from experience and research. Our regulatory actions should be fully consistent with our regulations and should be administered in a fair and timely manner to lend stability and predictability to the operational and planning processes in the nuclear sector.

The nuclear renaissance

Let me now shift gears to what is happening in the nuclear energy sector. Again, these are my perspectives as a single Commissioner. Today, we find ourselves facing increasing energy demands, concerns with the environment and climate change, and dependence on fossil fuels. Ensuring the supply of reliable energy is a national priority for most countries all over the world. These factors, in part, have contributed to this so-called “nuclear renaissance,” or a time of renewed interest in nuclear power.

Global perspective

I would like to give you a global perspective first and then talk about the renewed interest in nuclear power within the United States. Despite the global financial crisis over the last two years, there still appears to be great interest in nuclear power worldwide. In September, the International Atomic Energy Agency (IAEA) released its annual nuclear power projections. In these projections, the IAEA estimates that up to 10.4% of global electricity will come from nuclear reactors by the year 2030. This estimate is higher than last year’s estimate, which was up to 9% from nuclear power by 2030. The IAEA also made projections out to the year 2050, which estimated a maximum share of 11.9% from nuclear reactors. As a point of reference, the 372 gigawatts of nuclear energy produced last year accounted for 7.6% of global electric energy production.

The map you are looking at is from the IAEA’s 2008 nuclear power projections and is intended to give you a general idea of historical and projected growth in nuclear power throughout the world. Currently, there are 60 nuclear power reactors under construction in 15 countries worldwide. This figure has nearly doubled in the last two and a half years. Since the 2008 timeframe, the number of countries interested in the introduction of nuclear power has risen from 43 to about 65. Most of these countries are in Asia and Africa. At the same time, the number of countries planning to phase out their reactors has dropped. For example, you may have read that the German government decided last month to extend the life spans of its nuclear plants while alternative energy sources are developed.

The rising interest in new and expanding nuclear power programs presents both challenges and opportunities for the global nuclear regulatory community. A nuclear power program is a venture that can have a lifetime of up to 100 years or more. Therefore, a major challenge is the development of an effective and sustainable national infrastructure for nuclear safety and security. By infrastructure, I am referring to government and legal frameworks, organizational competence and technical capability of the operating utilities, and associated human resource and development activities. In this context, a key challenge is the establishment of an effective and independent regulatory body. In my view, regulatory effectiveness involves those principles I mentioned earlier – independence, openness, efficiency, clarity, and reliability in how the regulator conducts its business. With respect to regulatory

independence, I believe that the regulator must be independent from the utility license holder and other entities so that it is free from undue pressure from interested parties.

The interest in new and expanding nuclear power programs provides a great opportunity to build upon and enhance international cooperation within the global nuclear community. I think it is well understood that a major nuclear power plant accident anywhere in the world would present a major challenge for nuclear regulators throughout the world. Collectively, the world has over 50 years of combined experience with commercial nuclear power. There are many insights and lessons learned to be shared in nuclear safety and security. There are ongoing international efforts, bilateral and multilateral, aimed at supporting the safe and secure introduction and expansion of nuclear power. The NRC is a key player in many of these efforts. I believe that continued international cooperation is vital to ensure that plans for nuclear program development do not move faster than plans for establishing the necessary safety infrastructure and capacity. Furthermore, the international community can continue its collaborative efforts to consider various other key issues, such as spent fuel and radioactive waste management, electrical grid reliability, and technological developments in advanced nuclear reactor designs and in the nuclear fuel cycle.

Nuclear renaissance in the United States

Let me now turn to the nuclear renaissance in the United States. For background, there are 104 commercial nuclear power reactors operating in the United States today. The NRC has received 18 applications for combined operating licenses (or what we call a COL) for 28 new nuclear power plants. If approved, a COL allows the licensee to construct and operate a nuclear power plant at a specific site. The COL offers a more efficient review and approval process when compared to the two-step process used in the past for separate construction and operating licenses. Of these 18 COL applications, 13 are under active review, representing 22 new reactor units. Five of the 18 applications have been suspended or deferred by the applicants for reasons outside of the NRC's regulatory process. In addition to these 22 potential new reactors, the Tennessee Valley Authority (TVA) has resumed construction of Watts Bar Unit 2, which was started in the 1970s but was suspended in 1985. As an aside, I should mention that I have had the opportunity to visit those sites in the U.S. with ongoing work activities – the V.C. Summer site in South Carolina (for 2 new units), the Vogtle site in Georgia (another 2 new units), and the Watts Bar Unit 2 site in Tennessee. The Summer and Vogtle sites are actively engaged in preconstruction activities such as soil excavation and site preparation. Watts Bar Unit 2 has ongoing construction work, and TVA estimates that the unit will be online in 2013. If all activities proceed as planned and the NRC grants TVA an operating license, Watts Bar Unit 2 would be the first new nuclear power plant to come online in over a decade.

In addition to these new reactor licensing and construction activities, there is also active interest in advanced reactor designs. The NRC currently has three design certification applications under review (GE-Hitachi's Economic Simplified Boiling-Water Reactor (ESBWR), AREVA's U.S. Evolutionary Power Reactor (U.S. EPR), and Mitsubishi's U.S. Advanced Pressurized-Water Reactor (US-APWR)), and two amendments to already approved design certifications (Westinghouse's AP1000 and GE's Advanced Boiling Water Reactor (ABWR)). By issuing a design certification, the NRC approves a nuclear power plant design, independent of an application to construct or operate a plant.

Another current design initiative is with small modular reactors (or SMRs). While the SMR concept is not new, the development and potential deployment of commercial SMRs has captured the interest of the industry and lawmakers. For the industry, SMRs may be an alternative option for the high capital costs of larger commercial reactors and may provide better flexibility for certain electrical grid systems. For lawmakers, SMRs could offer another alternative to help meet our future energy needs in a balanced manner.

I would be remiss if I did not touch upon the NRC's and the industry's activities related to nuclear reactor license renewals and power uprates. Since 2000, the NRC has renewed the license for 59 units, each for an additional 20 years beyond the 40-year initial licensing period. The NRC is currently reviewing the license renewal applications for 20 units, and we expect that almost all the licensees for currently operating units will eventually apply to renew their licenses. With respect to power uprates, the NRC reviews applications to allow licensees to safely increase the power output of their plants. Increased power output can be safely achieved by a number of different means, including modifications to plant instrumentation systems and balance-of-plant equipment, such as pumps, turbines, and generators. The cumulative additional electric power from all power uprates approved since 1977 is about 5,700 megawatts, which is the equivalent of more than five large new reactors added to the grid. The NRC currently has 16 power uprate applications under review, comprising a total of about 1,145 megawatts of electric power. We expect to receive 39 new power uprate applications in the next five years for a total of about 2,400 megawatts of additional electric power output.

Challenges and opportunities

Looking forward, I see a number of potential challenges and opportunities. While the overall safety performance of the nuclear industry has significantly improved since the era of the 1979 Three Mile Island accident, I think it is critically important that the industry and the regulator keep their eyes on the ball with regard to safety. We all are aware of events this year in the energy sector that have had tragic consequences – the oil spill in the Gulf of Mexico, the coal mine disaster in West Virginia, and the massive natural gas explosion in San Bruno, Calif. In the wake of such events, some have called for the nation to reconsider nuclear expansion, while others have looked to the NRC and the nuclear industry for an opportunity to learn from our good practices in safety.

This brings me to another challenge we face in our respective sectors – risk communications and outreach with the public. As professionals in a highly technical field, we tend to be more comfortable communicating in our technical lexicon and jargon. However, that is usually not the best way to get our messages across to the public. I think the regulator and the nuclear industry have different but complementary responsibilities for effective communications with laypersons and outreach with the general public.

As a regulator, our communications goal is to promote the understanding of risks associated with this technology and the bases for our regulatory actions. In doing so, the regulator needs to ensure that the public, who may not have a technical background, easily understands the messages in the context of other risks accepted every day. Industry has a similar responsibility. I see this as an important opportunity to build a relationship with the public we serve.

I want to touch on one more subject before I close. I believe that it is important for the public to have trust and confidence in a strong regulator. A recent report from the Organization for Economic Co-operation and Development (OECD) Nuclear Energy Agency (NEA) compared nuclear accident risks with those from other energy sources. What caught my attention was the impressive safety record of the nuclear industry compared to other energy sectors. I believe that a strong and independent regulator is a vitally important factor in laying the foundation for a strong safety record in any industry. The NEA report also showed a significant correlation between the trust in regulators and the belief that nuclear power plants can be operated safely, as well as a strong correlation between public trust of the nuclear industry and public trust in the regulator. This should be intuitively obvious. The collective focus by the industry and a strong regulator on safety, good communications, and meaningful outreach can help to build and maintain public confidence in the safe operation of nuclear power facilities.

Conclusion

Let me close. I hope that I have helped you gain an understanding of what the NRC is about, what is happening globally and at home in the nuclear energy sector, and some of the associated challenges and opportunities. I thank you for your attention and I look forward to your questions and comments.