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The Honorable Nils J. Diaz
Chairman
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at the

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Design Certification Across Borders

Good morning. I join Dr. Paperiello in welcoming you today. I'd like to discuss my thoughts on how regulators, such as the U.S. Nuclear Regulatory Commission (NRC), should further *enable* the safe and secure civilian use of nuclear energy and materials today and in the future. My remarks represent my personal views and are not intended to represent the Commission's views.

Before I continue, I must admit that I struggled over what I wanted to talk about today, especially since there are so many interesting topics available. For instance, I had considered discussing materials aging and degradation issues, or issues in developing and applying computer codes to analyze reactor systems. I also contemplated discussing radiation protection, emergency preparedness, or nuclear fuel issues for the next forty-five minutes. You may be glad to hear that one topic I did not consider discussing was nuclear security. Finally, I decided that I needed to use this forum to discuss a solution to one of the critical interfaces between regulators: the regulatory acceptability of reactor designs across borders prior to their full licensing, a solution that can foster regulatory cooperation and predictability.

I have said on several occasions that regulations should keep pace with technology. When nuclear technology was in its infancy, the regulations dealt with the various uncertainties by being prescriptive and conservative, usually *overly* prescriptive and *overly* conservative. Now, given the advances in technology, coupled with more than 10,000 reactor-years of operational experience internationally and the billions of dollars spent globally on research and development, we now know better where to focus our efforts and requirements. Uncertainty has been significantly reduced and both regulators and owners need to use the lessons learned. Therefore, the NRC is developing, and using as we develop,

integrated and realistically conservative regulations that are both risk-informed and performance-based, and that are consistent and upgradable to the present level of knowledge and capabilities.

We, the regulators, also need to deal better with one of the realities of nuclear power -- its ever increasing "internationalization." Vendors all around the world supply the thousands of components and ideas that comprise a nuclear power plant, such as advanced reactor designs from the U.S. and Europe, steam generators from Spain, reactor vessels from Japan, and turbines from Germany. Given these circumstances, I believe that it is time for regulators around the world to *multilaterally* adopt a common safety framework for reactor designs.

There is no doubt that the right thing to do is to keep national licensing and regulatory authorities strong and responsible for making the decisions, but there are key parts of regulations that are amenable to "internationalization." We are familiar with the IAEA's Safety Standards, an internationally usable product, but I propose working toward a more specific regulatory product, maybe to the point that it could be considered a "commodity." Safety will be better served when certified designs can be accepted across borders as a commodity, fully respecting property rights. Therefore, I am convinced that regulators should seek to develop the tools needed to *certify* new reactor designs, as well as to certify the related research programs used to validate these designs, using multilateral agreements. The bottom line is that safety and regulatory decisions would be facilitated globally.

Earlier this year, I was asked by the Generation IV International Forum (GIF) and the Department of Energy (DOE) to talk about improving the regulatory framework for new generation reactors, and during the GIF meeting in Paris, I proposed that the development and international adoption of a regulatory framework to utilize safety assessments, compatible with the ongoing evolutionary nature of today's nuclear technologies, should include the certification of new reactor designs. This internationally-acceptable framework could establish a consistent set of appropriate requirements that nuclear vendors and regulators could utilize in designing and reviewing new power plants. Specifically, I offered the NRC's design certification process as a usable model.

We do not need to wait for Generation IV reactors. For already certified designs, the NRC would facilitate adoption of these certifications by other regulators by making a broad range of expertise, research results, and other resources available. For future design certification efforts, the NRC would encourage international participation by other regulators, in both the technical reviews and the related research efforts that support the certification, at the front end. It would be expected that other countries would do likewise, and regulatory consortia would be formed.

I am not advocating international licensing; licensing should remain each country's responsibility. I am advocating certifying reactor designs in a manner that *facilitates* their licensing. I believe that it is time for the world's nuclear regulators to begin building an internationally-acceptable regulatory reactor design certification to facilitate reactor licensing and regulatory decisions by individual countries.

The NRC developed a design certification process that provides a *stable* and *predictable* safety review for new nuclear power plant designs. This certification process resolves safety and environmental issues before authorizing construction, thus reducing licensees' financial risk while allowing for timely and meaningful public participation. Further, by placing the approved designs under a restrictive change process which applies to both the regulator and the applicant for design

certification, we have reduced licensing uncertainty by ensuring that the safety issues already resolved will not be *needlessly* reconsidered during the plant licensing process. It should be noted that, when necessary, changes *can* be made by a *disciplined* certification amendment process.

The certification process examines:

(1) an essentially complete design, thus facilitating standardization;
(2) the final design information, which is equivalent to the information in a Final Safety Analysis Review (FSAR);
(3) the postulated site parameters;
(4) interface requirements; and,
(5) inspections, tests, analyses, and acceptance criteria (ITAAC).

To be clear, the certification process does not review site-specific safety issues, like seismology, environmental impact issues, operational programs, site-specific design features, or selected design areas. Site-specific issues are bounded to allow for separation of siting reviews from the design reviews. If a globally-acceptable certification process is developed based on a model similar to the NRC's, each country's regulatory authority should then have the bases for more efficient and effective licensing decision-making and greater resources for the resolution of country-specific issues in accordance with its own regulatory framework.

I have confidence in the design certification process; it has been tested and has been proven to be effective. Using it, the NRC has issued rules certifying three standard designs -- the Advanced Boiling Water Reactor (ABWR), the System 80+, and the AP-600. The AP-1000 design, which has received a safety evaluation report and final design approval, is now in the rulemaking phase of the certification process.

I mentioned earlier that acceptability could extend beyond new reactor designs. This concept can be used also used for major research projects used to validate those designs, or other significant research and development (R&D) issues. The NRC's Office of Nuclear Regulatory Research (RES) has been actively involved in seeking out opportunities to collaborate internationally on research activities. In fact, almost one hundred bilateral and multilateral agreements are in place to conduct research into activities as diverse as fuel issues, materials degradation, code development, and new reactor designs. In fact, this list looks suspiciously like the agenda for this conference. This is an area which could be more formalized, such that the participating regulators could take either the data from this collaborative research and make use of it in an individual way, much as is done today, or they could jointly analyze the data and produce a peer-reviewed report to support regulatory positions. This would provide greater regulatory consistency globally, while conserving the regulators' resources.

Let me be clear - I am *not* suggesting that this is the *only* way that various international nuclear regulatory authorities can successfully cooperate in developing an acceptable regulatory framework. Nor am I suggesting that this framework could, or even should, supplant any national regulations. I am proposing the establishment of an international framework for regulatory cooperation that will allow for resolving major regulatory issues, with common safety objectives, to better serve our countries.

Conclusion

The future contribution of nuclear power generation to the global energy mix depends on a variety of factors; technological developments, business judgments, and regulatory actions all play a role. Experience has clearly shown that nuclear power generation -- when well designed, constructed, operated, and regulated -- can be a valuable asset and an important component in a nation's energy mix and can contribute to environmental stewardship.

An important component of the nuclear energy business is its international activities. Regulatory activities need to keep pace with international developments. I am advocating another step in that direction by offering the U.S. NRC's design certification process as a model for cross-border regulatory cooperation. By doing so, we can substantially increase the regulators' ability to consistently address safety matters and contribute to the assurance of the safety of reactor designs for a variety of nations around the world.

As I said a week ago during an IAEA international conference, it is time to move forward from "a nuclear accident anywhere is a nuclear accident everywhere," to "a nuclear safety improvement anywhere is a nuclear safety improvement everywhere."

Have a great and fruitful conference. Thank you.