NRC NEWS

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No. S-04-014

Remarks of Chairman Nils J. Diaz
Prepared for the
Americas Nuclear Energy Symposium (ANES)
Miami Beach, Florida
October 5, 2004

Thank you, Mr. White, for your kind introduction. It is my great pleasure and privilege to be able to address this third bi-annual Americas Nuclear Energy Symposium. I had the honor of speaking with you at the first ANES in 2000, and again two years ago during the second ANES. During the 2000 ANES, I spoke about safety and economics, and then in 2002 about energy security and national security. Today, I'd like to talk with you about some of the lessons the U.S. Nuclear Regulatory Commission (NRC) has learned, what we are doing today to ensure safety and security, and my thoughts on what else should we do. Of course, I didn't come here to just talk about the NRC, but also about the many common points of interest there are among the various countries who are here at this symposium.

Over the past two days, we have been engaged in discussing a variety of issues facing the safe and secure usage of radioactive materials and nucleo-electric power across the Americas. In particular, the Opening Plenary's panel discussion on major nuclear policy initiatives for the various countries in this hemisphere was especially noteworthy. It appears that several of the policy initiatives, as well as their associated implementation, that I have worked both as an NRC Commissioner and now as Chairman, fit in neatly with those discussed.

I am sure that everyone in this audience agrees that all of us -- the regulatory authorities, the regulated industries, the various vendors, and academia -- must continue to work effectively to ensure the safety and security of radioactive materials and nucleo-electric power. As I have often stated, our actions, both those of the regulators and the regulated, must be consistent, predictable, realistic, and *appropriately* conservative, with an unconditional commitment to safety, security, and preparedness. This, after all, is the nuclear business.

While the need for safety and security is certainly obvious, I believe that everyone here will also agree that we must stay adequately prepared for *credible* emergencies in order to continue to protect the public health and safety and the environment. In fact, being prepared isn't just the hallmark of the Boy Scouts, it is what conscientious scientists and engineers strive for when they thoughtfully and *realistically* analyze likely outcomes of their experiments and designs, including potential consequences, and then build in *appropriate* safety margins to mitigate and manage these scenarios.

However, counter-intuitive as it may initially sound, designing and regulating for highly *improbable* possibilities does not necessarily get you to the desired end state of increased safety and security. In some cases, designing and building to counter Murphy's axiom of "whatever can go wrong, will," may even shift the focus away from a more timely response to issues that have greater probabilities of being truly safety significant, like the early focus on fairly implausible large-break loss-of-coolant-accidents (LOCAs) over what we now know are the much more credible small-break LOCAs.

This can be demonstrated by examining a bit of history of the commercial nuclear power industry. Early on, the state of nuclear knowledge was quite limited by today's standards, especially the science of integrated risk assessments. As such, in order to deal with the many uncertainties that are inherent with any new technology, both the industry and first the Atomic Energy Commission (AEC), and then its successor the NRC, relied heavily on large engineering safety margins and what we now know were very unlikely design-basis-accidents (DBAs). This prescriptive, deterministic approach gave the U.S. and the world decades of safe and secure electric power generation performance, without injury to the public, with the exception of Chernobyl. It did not incorporate the state-of-the-art know-how into everyday regulation or even everyday operation.

This merits the question, what do the regulator and the regulated industry need to do to make things better? Shouldn't we be prepared, with the right tools, to face the challenges of a more technologically advanced and a more energy demanding world?

I would be remiss if I do not briefly address the issue of security by describing some of the key actions we have taken since 9-11.

The NRC has further strengthened security requirements at nuclear power plants and enhanced our coordination with federal, state, and local organizations.

We have ordered plants to take into account a more challenging adversarial threat; we are requiring tighter access controls and vehicle checks at greater stand-off distances; we have significantly improved force-on-force exercises to test the capabilities of plant defenders; we are demanding better readiness by plant security forces; and we have enhanced liaison with the intelligence community, and federal, state and local authorities responsible for protecting the national critical infrastructure through integrated response training.

In addition, the NRC has conducted research-based studies which concluded that a significant radiological release affecting public health and safety is unlikely from a terrorist attack, including a large commercial aircraft. And those studies show that time is available to protect the public in the unlikely event of a radiation release. Nuclear power plants have been and are even more so now among the most well protected elements of our national civilian infrastructure.

The NRC has undertaken several significant safety initiatives to make its regulatory activities more risk-informed and performance-based, as opposed to being prescriptive. A salient and functioning example of this is the transformation of the Inspection and Enforcement program into the risk-informed Reactor Oversight Process (ROP) and Significance Determination Process (SDP). The ROP, which is continuing to evolve as we gain experience, aims for objectivity over subjectivity, performance over prescription, and risk insights over design basis concerns. The objectives in

developing and implementing this new oversight process were to provide the tools for inspecting and assessing licensee performance in a manner that was more risk-informed, objective, predictable, and understandable than the previous oversight processes, and that ensures the agency's performance goals are being met.

I am championing risk-informing the NRC's regulations to ensure that these requirements continue to make sense and that they are effective in focusing our programs, practices, and resources -- as well as the industry's -- on those activities that are most important to the public's safety. Specifically, the flexibility inherent in risk-informed regulations enables us to implement requirements that are appropriate to the risk presented by postulated hazards, and to do so with the use of state-of-the-art technology.

Let me reemphasize what I mean when I refer to "realistic conservatism," which is a term that I've been using for over a year now to describe my regulatory philosophy. Simply put, technical and regulatory decisions are informed by the *real world* -- utilizing advancing scientific knowledge, improving technological capabilities, and the lessons that have been learned through decades of operating experience -- in order to preserve *appropriate* and *prudent* safety margins. This allows regulatory authorities, such as the NRC, to provide oversight in a manner that corresponds to the *actual* risk presented, and not to an aphysical set of assumptions. I am confident that risk-informed and performance-based regulations can provide the quantitative edge to make realistically conservative decisions.

With over 10,000 reactor-years of operational experience internationally, and billions of dollars spent globally on research and development, we now know much more than we did early on, and thus do not need to continue to add <u>excessive</u> conservatism to nuclear power plant designs in order to ensure their safety. As such, we are developing an integrated, coordinated, and realistically conservative risk-informed and performance-based set of regulations.

I have covered a bit of the past and the present; let me touch on the future. There is an increasing need for energy security through diverse energy sources to continue the improvements in life brought out by economic development; this is especially true in the Americas. The future contribution of nuclear power generation depends on a complex of factors -- technological developments, business judgments, and regulatory actions all play a role. Experience has clearly shown, however, that nuclear power generation can be a valuable asset and an important component in a nation's energy mix. It can contribute to energy supply, improved energy security and environmental stewardship, year after year, now and in the future. The NRC, as a regulator, is ready to do its part in ensuring that nuclear technology continues to be a safe and reliable source of power that contributes significantly to the well-being of the people it serves.

Looking ahead to the new technologies that may be employed for nuclear power generation, I recognize that some, perhaps many, of our current regulations may not be directly applicable. This implies that there will need to be a regulatory framework to adequately address design and operational issues associated with future reactors that may be distinctly different from current light water reactor (LWR) designs. The NRC's present regulations were originally written for LWRs. However, I believe that, in the long-term, future reactors will be a mixture of evolutionary, or even revolutionary, LWRs and non-LWR technologies, such as the high-temperature gas-cooled reactor (HTGR) and others. I am convinced that improvements in efficiency are needed and, for generating power, efficiency depends on

temperature. Reliable high-temperature reactors will eventually be developed which will provide these greater efficiencies.

To address the regulatory infrastructure of the future, the NRC has developed a performance-based, risk-informed, technology-neutral, design certification process under 10 CFR Part 52 that allows for enhanced safety and the early resolution of licensing issues, irrespective of the type of reactor. It provides a more stable and predictable licensing process, and resolves safety and environmental issues before authorizing construction.

I have advocated that nations that share common interests, like, for example, those involved in the development of Generation IV reactors, establish an internationally acceptable regulatory framework certifying the reactor design and safety analysis such that participating nuclear vendors and utilities could utilize this in designing and building new power plants. By doing so, we can substantially increase our ability to address safety and security matters in an international context, and increase the acceptability of these reactor designs to a variety of nations around the world.

I believe that ensuring the safety of nuclear power generation, making it more reliable, and potentially increasing its global availability -- and the benefits of improved energy security -- are issues we all need to address. We need the industry, vendors, and academia to continue to collaborate in ensuring that thoughtful consideration of safety, security, and preparedness is ingrained into everything we do.

And what do we want to achieve? Let me quote from the NRC's new Strategic Plan:

> Enable the use and management of radioactive materials and nuclear fuels for beneficial civilian purposes in a manner that protects public health and safety and the environment, promotes the security of our nation, and provides for regulatory actions that are open, effective, efficient, realistic, and timely.

This statement embodies the principles of regulation that the agency believes are needed to be responsive to the needs of our society. I hope that you find them useful and I wish you well.