



# NRC NEWS

## U.S. NUCLEAR REGULATORY COMMISSION

Office of Public Affairs      Telephone: 301/415-8200

Washington, DC 20555-001      E-mail: opa@nrc.gov

Web Site: <http://www.nrc.gov/OPA>

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**REMARKS OF CHAIRMAN NILS J. DIAZ**  
**UNITED STATES NUCLEAR REGULATORY COMMISSION**  
**before the**  
**GENERATION IV INTERNATIONAL FORUM**  
**Toronto, Canada**  
**September 26, 2003**

Good morning. It is indeed my pleasure to address this important international forum. I want to thank the U.S. Department of Energy, and especially Dr. Magwood, for their invitation. I would also like to thank our Canadian hosts for hosting this meeting. At the outset, I want you to know that I am expressing my individual views, rather than the views of the Nuclear Regulatory Commission unless I state otherwise.

I have the privilege today to speak after my fellow regulators have made their remarks. It will be obvious by the end of my remarks that we talk the same language and we walk the talk. I believe the industry should realize the commonality of purpose and principles, and the many valuable lessons available.

Today, all the nations represented here need to have assurance of supply of many commodities, and one of the most important is energy supply. It is obvious to me that real solutions to this global problem can be found in democratic systems of government, where the pursuit of happiness and free enterprise are rights and not gifts. Education and technology in action, working synergistically to improve the survival and the standard of living of unprecedented multitudes, are enabling solutions, particularly when anchored in democracy and free enterprise.

Advances in technology are continuing and accelerating mankind's progress. The value of technical knowledge and experience is increasing. Wealth, as measured by physical resources, is

declining while the value of technological capabilities and innovation is increasing. Undoubtedly, the Generation IV International Forum is an activity, where knowledge, learning, and technology work together with the potential to improve the standard of living of multitudes, by seeking and implementing solutions.

Energy is one of the enabling solutions to the pressing needs of the world. It is a fact that without abundant, reliable, safe energy our basic standard of living would be much poorer than what we enjoy today. Energy is one of the indispensable and enabling components of the know-how era. And, obscured by many other achievements and electronic gadgets, we have the working atom. The energy from the nucleus is an integral and critical component of this day and age. Unheralded, nuclear energy serves the needs of millions and millions of people worldwide, providing safe, clean, and reliable energy. From an overall energy and economical perspective, nuclear electricity supply can be a major stabilizing force in energy markets, and I believe especially so if coupled with hydrogen production.

This forum is responding to the need to bring state-of-the-art know-how to nuclear technology and energy production, and to develop even newer and better techniques and applications. I am sure that almost everyone here agrees that there is a need for better, more functional and even more inherently safe nuclear processes, although we might not agree fully on their relative priorities. If time keeps passing without nuclear energy development, less favorable technologies than nuclear will fill the voids, with difficult-to-achieve claims of efficiency and economics -- but once they are in place, they will be difficult to replace because possession is 9/10ths of the law.

I believe there are many positive factors converging to make possible a renaissance of nuclear power, based on the real and better communicated facts of its safety and reliability. One of these factors in the United States is license renewal which is an important stabilization factor for energy generation, as well as a safety and economic driver.

I want to focus my remaining comments for this special occasion on improving the safety and reliability of nuclear power plants, viewed from the perspective of a regulator and former nuclear technologist. These comments are applicable to Generation IV, but they are as important to Generation 3+, and probably even Generation 3.

Allow me the use of a simple non-linear equation.

Nuclear Power Success equals A plus B plus C plus D plus or minus  
Nuclear Regulation, each raised to its respective Nth power, particularly  
the regulatory factor. Where: A equals technical development; B equals  
reliability; C equals economics; and D equals socio-political factors.  
There are other factors that could obviously be added to the equation.

The equation needs no explanation in this forum; I will emphasize its meaning by re-stating the obvious: "Regulation must result in a benefit or it will result in a loss."

The viability, and the probable growth, of nuclear power is inextricably linked to its regulation. There is no way, presently and in the foreseeable future, to maintain and to advance the use of nuclear power without strong, predictable, and credible regulators. Therefore, it is essential that regulatory infrastructures be all that they can be: safety-focused, with state-of-the-art know-how in every

important safety aspect. Regulators should make independent safety-based decisions -- we must listen to and respect different views, but maintain a regulatory environment free from undue external political influence. We also have the obligation of communicating our decisions fully and effectively. We must be willing to risk criticism for communicating both the good and the not-so-good safety performance, as well as assessing and explaining potential risks with realistically conservative analysis, based on our mandate to provide reasonable assurances to protect the public health and safety, the environment, and the common defense and security.

I believe that in the U.S. and in many other countries current needs demand the use of a safety construct that embodies the best regulatory practices, from licensing, to rules, and to oversight. A safety construct that interacts with the best design, operation, and maintenance practices of the industry, and utilizes the law, is a two-edged sword: it enables and it corrects according to well established and transparent principles.

We have the know-how, the technology, and the skill to improve nuclear technologies so they can be even more useful to society and, to implement a safety construct that leaves little doubt about requirements and responsibilities, for the regulators and regulated alike. A safety construct, although not a contract, is a working and dynamic instrument that will ensure predictable and credible safety performance, as well as being a vehicle to explain our actions. Its regulatory components will be bound by the rule of law, serve to assure safety, and to avoid the unnecessary intrusion into or disruption of licensed activities without a strong safety reason. It should have only the necessary prescriptive components, with probabilistic risk-insights and performance-based regulation, design, and operation replacing what has become obsolete. It must result in safety being a driver, but also being an enabler. I firmly believe that these are compatible and beneficial to society. A safety construct, including the requisite regulatory components, is much more than a set of "don'ts": it should be a positive force, a roadmap, a pathway to the industry's accomplishment of its proposed uses of nuclear technologies, tempered by the mission to achieve a better, safer and more secure existence for our people.

A safety construct should not be a passive, impassive or a plain set of safety rules and regulations -- especially not in the nuclear arena. It should be an active and interactive set that regulates, which operates, informs, and allows the lawful development of beneficial activities. The outcome of the safety construct is the implementation of the licensed activities, which through oversight become a major feedback to the construct itself. "Where the rubber meets the road," is where safety is most significant.

Allow me again figuratively, to use an equation: the time derivative of the dominant equation I used above contains very necessary information, and analyzing it would make for an interesting discussion. But my point is simple: there should be, at least, a time-dependent alignment of the changes in technology and regulation. In order to effect changes, that old Frank Sinatra song referring to love and marriage said it best: "You can't have one without the other." I know nuclear technology and regulation are not in love nor are they married, but you can't have one without the other.

There are too many examples of failures in the world of nuclear power development and deployment, when there was no alignment between the technology issues and the regulatory requirements. It then becomes easy for political and/or financial considerations to creep in and slow down or stop construction or prevent startup. Nuclear power is then labeled as too costly, too slow, too

unpredictable, too .... whatever, when the fault is elsewhere. An iron-clad technology and project engineering, in-phase with a credible, state-of-the-art regulatory structure would do much toward achieving national objectives, and international recognition.

I believe that, although he did not say so specifically, Dr. Magwood wanted me to express my opinion on how to achieve convergence between the technical development and deployment of advanced reactors and its regulations. Specifically: if there is only a reactor that is going to be deployed internationally, does it have a common regulatory framework? There has been additional discussion and interest has been expressed from several sources, including IAEA, on global nuclear safety standards, including standards for nuclear power plants. You have heard today from Canada, the United Kingdom and the U.S.A. Many are the differences in regulatory implementation but more are the similarities for safety criteria, technical issues, and methodologies. The views from these three countries, with very mature nuclear power programs, each with entirely different regulatory systems, and each quite functional in its own right. My distinguished colleague, Laurence Williams, Chairman of the Commission on Safety Standards, is definitely a world authority on the issue, and I defer to his main points. There is a clear difference between hi-level standards and regulatory requirements. The importance of the standards is of course more important to developing countries. To stimulate discussion, I will offer some important points:

- “Convergence” is achieved by the technical competence of the developers, the operators and the regulators.
- “Globalization” can only be achieved when the key technical issues are clearly identified and mastered, in technical space and in regulatory space. Furthermore, these must be in-phase, not necessarily synchronized, but with only a small phase shift.
- “Realization”: There must be a core of technical and regulatory issues that are addressed by a common framework, with a common philosophy. A single global regulatory structure is not needed, as the present membership of GIF has proved, and it might become more of a distraction than a solution.

In this regard, I am convinced that for our part in the United States of America, the effective and efficient regulatory framework I have described will be risk-informed and performance-based. I am sure this commitment to focus on what really matters to safety, and to reduce or eliminate regulatory control over what does not, is shared by many in the international community and not understood well by others. I believe we need to harmonize the technical safety matters, first and foremost.

Agreement can be reached in standards but it would be difficult to achieve agreement in their implementation. Much work needs to take place to reduce the differences that actually impede internationalization. Work is also needed to accept those differences that are due to national characterizations; differences that are acceptable provided they do not impede the development and deployment of safe nuclear technologies.

I will end with one suggestion for the GIF: after you have down selected to one or two reactor technologies, the path forward should include an “internationalized” certification process, possibly in a

manner similar to the US NRC advanced reactor certification. Such a process should establish safety requirements compatible with the technology and with the advanced international consensus processes.

You have a challenging job. Do not wait too long to bring the regulators into the process.

I wish you well.