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Achieving Effective Regulation through the Application of Universal Principles

presented by
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INTRODUCTION

Good afternoon, ladies and gentlemen. I feel very honored and pleased to speak to you today at this 27th annual conference of the Japan Atomic Industrial Forum. After spending thirty years in academe as a physics professor and administrator, for the past seven years I have been a Commissioner at the Nuclear Regulatory Commission and, in that capacity, have been intimately involved in ensuring that nuclear energy in the United States is developed and utilized in a safe manner. I have brought to my work on the Commission my personal commitment to learn and generalize from experience and to distill the essence of that experience into general principles.

The basic theme of this conference, "Toward a Nuclear-Weapons-Free World — the Role of Peaceful Utilization of Nuclear Energy," is most appropriate now with the ending of the Cold War and the start of dismantlement of the world's arsenal of nuclear weapons. For the purpose of this talk, when I refer to utilization of nuclear energy, I will be restricting myself to the employment of nuclear reactors for power generation. There are myriad other peaceful medical and industrial applications of nuclear materials but these are more appropriately the subject of another forum. Before further peaceful use of nuclear energy can be realized in the United States and, I venture to say, in many other countries of the world, there are four primary conditions that must be satisfied, namely:

1. The continued safe operation of existing nuclear power plants.

2. Resolution of the issue of how to dispose of spent nuclear fuel elements.

3. A regulatory process that provides a clear set of ground rules for evaluating future nuclear power applications.

4. The ability of nuclear power plants to compete economically with other available forms of power generation. Clearly, this will be dependent, to a large extent, on particular situations in each individual country.

Unless all of these conditions are met, I seriously believe that there will be no near term viable nuclear power option. The nuclear regulatory process can have a significant influence on the likelihood that the four conditions are met.

I will devote the rest of my talk to describing to you how we at the NRC have learned to improve the effectiveness of our regulatory process, the universal principles that we believe should guide and support improved regulatory practices, and the practices that have developed from application of the principles.

EFFECTIVE REGULATION

While national regulations can influence nuclear safety, no amount of regulation can ensure safety if those who run the nuclear plants do not take it upon themselves to operate as safely as possible. It is not possible, nor is it desirable, for a regulatory agency to have ultimate responsibility for the safety of nuclear power generation. There must exist in the nuclear plants a safety culture which recognizes that the primary responsibility for safety lies with the operators of the plants. Thus, effective regulation should promote an environment that fosters self-assessment and a quest for excellence among those regulated.

REGULATORY PRINCIPLES

At the NRC we have identified a number of universal principles that we are using to guide us in our decision making and in our behavior as individuals and which we find help lead to effective regulatory processes. We refer to them as the Principles of Good Regulation and have made a commitment to adhere to these principles because we believe they promote consistently high performance and address inadequate performance.

Good regulation identifies the conditions necessary to ensure safety and creates an environment which insists on compliance

with established standards while allowing and encouraging licensees to take the lead in maintaining excellence and to exercise initiative in identifying and solving potential as well as actual problems. Good regulation encourages sound and effective practices, discourages unsound practices, and identifies questionable practices. It must, therefore, establish both standards by which to judge practices and the means to encourage the sound and discourage the unsound. To accomplish this, regulation must be:

INDEPENDENT. Nothing but the highest possible standards of ethical performance and professionalism should influence regulation. However, independence does not imply isolation. All available facts and opinions must be sought openly from licensees and other interested members of the public. The many and possibly conflicting public interests involved must be considered. Final decisions must be based on objective, unbiased assessments of all information, and must be documented with reasons explicitly stated.

OPEN. Nuclear regulation is the public's business, and it must be transacted publicly and candidly. The public must be informed about and have the opportunity to participate in the regulatory processes as required by law. Open channels of communication must be maintained with legislators, other government agencies, licensees, and the public, as well as with the international nuclear community.

EFFICIENT. The public, the rate-paying consumer, and licensees are all entitled to the best possible management and administration of regulatory activities. The highest technical and managerial competence is required, and must be a constant regulatory agency goal. The regulatory agency must establish means to evaluate and continually upgrade its regulatory capabilities. Regulatory activities should be consistent with the degree of risk reduction they achieve. Where several effective alternatives are available, the option which minimizes the use of resources should be adopted. Regulatory decisions should be made without undue delay.

CLEAR. Regulations should be coherent, logical, and practical. There should be a clear nexus between regulations and agency goals and objectives whether explicitly or implicitly stated. Agency positions should be readily understood and easily applied.

RELIABLE. Regulations should be based on the best available knowledge from research and operational experience. Systems interactions, technological uncertainties, and the diversity of licensees and regulatory activities must all be taken

into account so that risks are maintained at an acceptably low level. Once established, regulation should be perceived to be reliable and not unjustifiably in a state of transition. Regulatory actions should always be fully consistent with written regulations and should be promptly, fairly, and decisively administered so as to lend stability to the nuclear operational and planning processes.

These principles have not merely been drafted and then forgotten. They have served as the framework for the development of standards of performance and professionalism within the NRC. Each NRC employee has received a copy of the Principles. Each technical staff member has also been given a set of performance expectations, based on the Principles, for different types of work responsibilities.

FEATURES OF AN EFFECTIVE REGULATORY PROCESS

We have developed a self-consistent set of regulatory processes that derive from the Principles of Good Regulation. From application of the Principles, we have found that an effective nuclear regulatory process must include certain essential features:

- Development and maintenance of a broad base of knowledge

  Regulation of the operation of nuclear power plants to protect the public health and safety requires a technically well informed and skilled staff capable of employing relevant technical knowledge in its decision making. To be fully effective, this staff must be supported by a body of technical information readily available to it in a useable form. The NRC is a knowledge-based organization whose vitality rests upon its ability to transform scientific and technical knowledge into sound regulatory practice.

- Establishment of an early and active dialogue with all the interested parties, particularly the public.

  In order to ensure that all impacts and aspects of a particular regulation are appropriately considered, it is essential that all those entities that may be affected by the regulation have ample opportunity to express their views. The regulated community will generally offer their views in the early stages of the regulatory process with very little solicitation needed. However, special efforts are needed to obtain the views of the general public during the early stages of the formulation of a new regulation. If the public does not have the opportunity to actively participate early in the process, it is very difficult to gain its acceptance of the eventual regulatory decisions

that are made. To move forward toward greater utilization of nuclear energy, it is necessary to convince the public that this can be done with no adverse safety impact.

- Consideration of the resource requirements and impacts associated with regulation.

  While the primary thrust of nuclear regulation must always be that safety considerations are paramount, regulators cannot simply add conservatism upon conservatism. The resources of both the regulators and the regulated are limited. Unreasonably burdensome requirements, with no significant safety improvement, can dilute the available human and financial resources and result in an emphasis on relatively unimportant issues. This can lead to reduction in safety and, very likely, eventual elimination of the nuclear option on both safety and economic considerations.

- Ensurance of the timeliness of regulation.

  For a regulatory system to be effective, it must be able to quickly respond to the perceived need for a particular regulation. Thus, when new operational experience or research indicates that a new or revised regulatory position is appropriate, the regulatory process must facilitate the prompt achievement of a soundly based decision.

- Frequent assessment of the regulatory infrastructure, and revision as necessary.

  The regulator must continuously monitor the effectiveness of the regulatory process and revise it in response to changing conditions. As the nuclear industry changes and matures, new operational experience is gained, or new performance trends and patterns develop, it may be necessary to adjust the basic regulatory infrastructure.

EXAMPLES OF NRC REGULATORY ACTIONS THAT REFLECT THE PRINCIPLES

- Enhanced Participatory Rulemaking

  Since early 1992, the NRC has been engaged in a rulemaking process to establish the radiological criteria for the decommissioning and decontamination of licensed nuclear facilities. In accord with the principle of openness and the desire to provide for early and comprehensive input from affected interests on important public health and safety issues, the NRC decided to follow a process that would include enhanced participation by the affected interests. The objective was to obtain input on the rulemaking issues

from the affected interests before the NRC developed even a provisional regulatory position.

This early participation was accomplished through a series of seven public workshops, held in various locations throughout the United States. The workshop format was selected to provide the affected interests with an opportunity to discuss the issues with each other and to question each other about respective positions and concerns. The workshops were open to the public and the public was given the opportunity to comment on the issues. The workshops utilized the services of trained facilitators who were experts in setting up and conducting these types of meetings thus improving the likelihood that all the issues, positions and concerns of the parties were considered. Participants were invited from many diverse groups including state, local and Native American tribal governments, federal agencies (including NRC), citizens groups, professional societies, and the affected nuclear industry. Selected participants who would not otherwise be able to participate in the workshops were provided with financial assistance for their travel expenses.

The Commission is very pleased with the progress being made on this rulemaking. A draft of the resulting proposed regulation is being circulated to all the workshop participants and to other interested parties, and we expect that a proposed regulation will be published for public comment in the near future. During the course of the workshops, there was a significant change in the attitudes of citizen group representatives. From expressions of distrust and lack of credibility of the NRC, there was a shift toward the view that NRC was taking an important first step in re-establishing the trust and credibility needed to accept its regulatory decisions. NRC understands that it is important to demonstrate that the public comments at the workshops were heard and seriously considered in arriving at the final regulatory proposal. We at NRC have been so pleased with this new regulatory approach that we are seriously considering it for additional purposes.

- Cost Beneficial Licensing Actions (CBLAs)

  The NRC has encouraged its nuclear power plant licensees to identify both a) regulatory requirements that provide little or no safety benefit yet incur significant costs to implement, and b) instances where licensee commitments to the NRC exceed what is necessary to meet the regulatory requirements and where cost savings can result if the commitment is revised. Licensees have requested relief from these requirements and commitments that are viewed to be

marginal to safety. They are referred to as cost beneficial licensing actions or CBLAs. In many cases, after due consideration of all the factors, the NRC has granted the requested relief. For example, in 1993, out of about 34 requests the NRC approved 14 and has another 15 under review. In 1994, we already have 25 new submittals under review.

There are both direct and indirect safety benefits from these CBLAs. A direct benefit results when the costs averted are applied to safety enhancements in areas that have greater risk significance. An indirect benefit ensues when the reduction in operational and maintenance (O&M) costs results in a more efficient and competitive organization.

- Siting of Nuclear Power Plants

The NRC's siting criteria for nuclear power plants have been essentially unchanged since 1962. As a result of concerns regarding the siting of nuclear power plants near major metropolitan centers and following the Three Mile Island accident, the NRC sought to revise its siting criteria so as to strengthen siting as an added element of defense-in-depth. The intent was to decouple siting considerations from plant design so that plant design could not be made to compensate for unfavorable sites.

A proposed rule was published for comment in late 1992 that would decouple siting from plant design. It had the following major features:

- A minimum distance to the exclusion area boundary of 0.4 miles;

- Offsite population densities averaged over any radial out to 30 miles should not exceed 500 people per square mile.

- Site meteorology was to be eliminated as a factor in determining site suitability.

Well, the response to the proposal was that almost everyone, both within and outside the United States, was emphatically opposed to it for many different reasons. Countries that do not have the United States' luxury of large open spaces felt that if the United States adopted these regulations it would be very difficult for them to justify the siting of plants in their countries. As a result of this groundswell of opinion, we have reconsidered our previous position. The Commission now understands the undesirability of including

rigid numerical criteria in the regulations. Numerical values for exclusion area size and population density will probably not be part of the regulations and may or may not be included in the guidance documents. We are in the process of developing this revised regulatory approach which will in turn be subjected to a full and open public discussion.

My primary motive in discussing this rulemaking is to emphasize that, while we are independent regulators, we cannot create regulations in isolation and must continue to remain open to the ideas and concerns of all interested parties.

- National Performance Review

I would just like to mention a new initiative that we have recently taken as a result of Vice President Gore's National Performance Review (NPR) for Federal Government agencies initiated at the request of President Clinton. The NPR began in March 1993 under the leadership of Vice President Gore as a six-month review study to make government <u>work better</u> and <u>cost less</u>. On September 30, 1993, President Clinton issued an Executive Order on Regulatory Planning and Review that began "a program to reform and make more efficient the regulatory process." One of the objectives of the program is "to make the process more accessible and open to the public." The Order also includes a set of Principles of Regulation that all Federal Agencies are urged to follow and which contain many similarities to the NRC's own Principles of Good Regulation. As a result of the President's Executive Order, our plans to enhance public participation in the regulatory process by giving the public easy access to NRC information of interest to them have been reinforced.

We are now considering a pilot rulemaking project in which the public and other interested parties can directly participate in the development of a regulation by interacting with NRC personnel via an easily accessed computer network. The technical details are now still in the conceptual stage but information and computer technology currently exist to realize this idea. We are now in the process of installing software and hardware, setting up the necessary infrastructure, and exploring the legal implications of the proposed process.

- INPO and NEI

I would like to end my discussion of examples of the use of our regulatory principles with a mention of the fruits of

the process. As I said earlier, effective regulation should result in an environment that fosters self-assessment and a quest for excellence among those regulated. I believe that the United States' nuclear industry provides evidence of the existence of a safety culture that emphasizes self-assessment and strives for excellence. The primary mission of the Institute for Nuclear Power Operations (INPO) is to promote excellence in safety and reliability. There is a strong atmosphere of cooperation and exchange of information through INPO and through other industry associations, including the newly formed Nuclear Energy Institute (NEI). INPO has a very rigorous program of plant evaluations that has contributed to continuing improvements in plant performance as measured by various indicators. The industry is taking upon itself, in many cases, the improvement of safety without NRC prodding. There have been numerous times when plant changes were made as a result of vulnerabilities discovered during a probabilistic risk assessment conducted by the licensee.

CONCLUSION

The initiatives and actions I discussed today reflect a conviction that regulation in the United States must evolve in response to changing conditions. We, as regulators, have been subject to the criticism, whether earned or not, that nuclear regulation has been a major factor in the failure of nuclear power to achieve its full potential. I do not share this view. I believe that we have provided a major impetus to ensure that nuclear power is safe power. This is fundamental if nuclear power is to be a viable option. However, I do believe that there is room for improvement. The defacto moratorium on new plant construction in the United States has provided us the time for reflection and review, and the opportunity to search for a better way to regulate... a way that will ensure safety while not forcing nuclear power to be economically non-competitive... a way that will not stifle entrepreneurial spirit but will ensure that concerns of both the public and the industry will be fairly and honestly considered.

I have tried to describe what I believe are universal principles and the essential features of an effective regulatory process that may be a first step toward improved nuclear regulation. Effective regulation of the users of nuclear materials requires constant and faithful adherence to basic principles. Only then can the safety of nuclear energy be assured, to the satisfaction of the decision makers, the nuclear industry, and the public at large.

I am very pleased to have had this opportunity to be with you this morning and would be happy to respond to any comments or questions you may have.

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