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BEFORE THE
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IN TAIWAN
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BUILDING PUBLIC CONFIDENCE IN NUCLEAR ENERGY

INTRODUCTION

I am very pleased to have the opportunity to discuss with you today the vital role that nuclear safety currently plays and will continue to play in advanced nuclear economies, such as Taiwan's. Nuclear energy already provides over one-third of Taiwan's total electricity. The rate of economic growth in Taiwan is very large when compared with other countries and, on several occasions the demand for electrical energy has already exceeded the supply. As the demand for electricity continues to grow, Taiwan will be making critical decisions on the best possible mix of sources for producing this additional electrical energy.

The mix of Taiwan's future energy sources is clearly Taiwan's decision, a decision in which the U.S. NRC has no vested interest. However, as Taiwan's nuclear energy program continues to grow, we do have an interest in the success and safety of this expansion. Success is possible only if careful and coordinated development and strong regulation move forward together. Perhaps the experience of the U.S. program is instructive.

THE U.S. NUCLEAR PROGRAM

The U.S. has certainly not abandoned nuclear power as a viable option for future energy needs as some would suggest. On the contrary, the U.S. nuclear program is progressing on schedule. New construction in the U.S. is quiet while construction in Asia is so vibrant precisely because the U.S. has already undergone this type of growth within the past few decades and we don't at present have an increased need for baseload power. During the

past ten years, forty new reactors began commercial operation and seven plants currently have active construction permits. Nuclear power now generates about 22% of our domestic electricity -- more than double the contribution from nuclear power in 1975. The U.S. produces more nuclear-generated electricity than anyone else in the world -- in fact, the U.S. generates almost one-third of the world's nuclear electricity. With 2000 reactor-years of experience, the U.S. has the most nuclear experience. And it appears that our plant life extension program will help the U.S. continue to benefit fully from existing nuclear plants beyond their original license period of 40 years.

As for new reactors, the NRC is about to issue the design approvals for two evolutionary standard reactor designs -- making these designs attractive for use abroad. In another two years, after the American public has had the opportunity to review and comment on the designs, the rulemaking certification of these designs should be completed, making them available for use in the U.S.

Our review of the even more advanced generation of nuclear power plants is also well along. These novel designs employ passive safety features and modular construction, which should make the reactors easier to construct and operate while retaining strong economic competitiveness. NRC-certified designs for the passive reactors, achieved after an exhaustive analytic and experimental review process, should be available later in this decade, well in time for those programs in the U.S. and abroad which are considering using these designs.

LESSONS LEARNED BY THE U.S.

One of the lessons the U.S. has learned after almost 2,000 reactor years of experience is that the safe use of nuclear energy depends on many conditions. One of the most important is a nuclear safety culture derived from four fundamental principles which are applicable worldwide.

First, every nuclear nation must provide a firm legal foundation for a strong and independent regulatory authority to monitor and enforce high levels of safety. Where regulators have not traditionally had the independence or political authority to carry out their job effectively, when there is no effective oversight body with the power to close down nuclear power plants for safety violations, there is a tendency to cut corners in order to produce needed power as efficiently and as cheaply as possible.

Second, no amount of regulatory authority is going to be effective if the regulator does not have the resources at its disposal to get inside the nuclear power program. This means a well-trained and adequately paid staff to perform on-site

inspections, review plants at all stages from design to decommissioning, and analyze errors to improve operations in the future. It also means a confirmatory research capability.

Third, both the industry and the regulators must apply rigorous nuclear standards such as the principles developed for the International Nuclear Safety Convention, which we expect will be completed at the International Atomic Energy Agency in Vienna next month.

Fourth, by national law or international commitment, a state must put into place legal liability and financial protection arrangements to provide adequate compensation for damage in the event of a nuclear accident, while setting appropriate limits on third party liability. Such protection holds both the nation and the power plant operators accountable for protecting the public health and safety.

Where these principles have been adhered to, a culture of safety has informed both operations and management, and this has produced a successful nuclear industry. Where these principles have *not* been followed, the goal of electricity production has led operators to override safety objectives when the two came into conflict.

We believe that Taiwan has laid the proper groundwork to meet these safety principles. Its regulatory program is strong because it has the ingredients needed for an effective program: highly-trained and competent personnel resources, legal regulatory authority, and an excellent confirmatory research capability. We have also discussed with Taiwan's energy authorities their plan for a clearer separation of organizational responsibility for the **development** of nuclear power and the **regulation** of nuclear power. This separation should further the goal of nuclear safety, increase the regulator's independence, and thus provide additional public reassurance that regulation is guided only by safety principles, not by other considerations.

THE ROLE OF AN INTERNATIONAL NUCLEAR SAFETY CONVENTION

In addition to strong national regulation, the NRC has supported placing the principal elements of nuclear safety regulation into the draft International Nuclear Safety Convention.

Many Pacific Rim states have actively participated for the past two years in the development of this important Convention. Just as the international nuclear nonproliferation regime has helped to inhibit the spread of nuclear arsenals, we believe an international nuclear safety regime will help ensure a safer global environment.

Each party to the convention is to establish or designate a regulatory body which is, quoting from the draft, *". . . provided with adequate authority, competence and financial and human resources to fulfil its assigned responsibilities."* Moreover, each party commits itself to "ensure an effective separation between the functions of the regulatory body and those of any other body or organization concerned with the promotion or utilization of nuclear energy."

Finally, it is the public, as citizens of the land, who ultimately ensure the safety of their nuclear power program by demanding a strong and independent regulatory program.

U.S. REGULATORY COOPERATION WITH TAIWAN

All legal systems, no matter how different, should be able to accommodate the basic principles prescribed in the draft nuclear safety convention. Accordingly, the NRC has long provided its support to other entities seeking to set up or improve their nuclear regulatory structures and practices. Pursuant to that goal, the NRC has established some thirty regulatory information and technical exchange arrangements around the world.

During the past five years, much of our effort has been concentrated on the countries of Eastern Europe and the former Soviet Union, we have responded to revelations, in the wake of Chernobyl, about the lack of adequate safety cultures in these countries. Much of our effort has been focused on establishing a nuclear safety philosophy based on a strong and independent regulator. Parallel with this activity, we have also continued our active cooperation with the Pacific Rim nuclear power programs, including, of course, a vigorous program of safety cooperation with Taiwan.

Through our agreement on Civil Nuclear Cooperation with Taiwan, the NRC and Taiwan's Atomic Energy Council (AEC) have carried out an extensive and very active exchange program. Each year, Taiwan AEC experts accept temporary assignments at NRC for periods of three to six months to gain hands-on-experience with their NRC counterparts in regulatory and safety research programs. In addition, NRC's technical staff visit Taiwan to share safety information in areas such as, research into accidents which exceed the design basis, instrumentation and controls, seismic research, regulatory inspection techniques, and waste management. Taiwan has made extensive use of NRC's analytical computer codes and risk methodologies to identify areas of vulnerability, thereby allowing them to implement measures to improve reactor safety and reliability. On the other hand, Taiwan has made significant contributions to seismic knowledge by conducting an experimental program using scale models of reactor components. We believe that this cooperation, which also includes several trips to Taipei by

me and other NRC Commissioners, has been beneficial to both the U.S. and Taiwan.

CONCLUSION

In conclusion, I wish to emphasize that the decision on how to meet Taiwan's growing electrical energy needs belongs to Taiwan alone. As Taiwan continues its extensive nuclear energy program, whether or not this program is expanded, the NRC stands ready to share our accumulated experience in helping further develop a safety culture in which Taiwan's energy needs can be met safely, efficiently, and economically. This must be done in an environment that builds the public's confidence in nuclear energy. To this end, the people need access to timely information from an independent regulator they can fully support and a nuclear program they participate in and applaud. The Atomic Energy Council has established a safety culture in which such an environment can exist; we offer our support to make this safety culture even stronger and more open to the public.