

No. S-20-94

REMARKS BY IVAN SELIN
CHAIRMAN, U.S. NUCLEAR REGULATORY COMMISSION
BEFORE THE
ANNUAL ESKOM CONFERENCE ON NUCLEAR SAFETY
CAPETOWN, SOUTH AFRICA
SEPTEMBER 28, 1994

INTERNATIONAL NUCLEAR SAFETY COOPERATION

INTRODUCTION

I am very pleased to be here today to inaugurate a new era of nuclear safety cooperation between South Africa and the United States of America. Just yesterday, the U.S. Nuclear Regulatory Commission (USNRC) and the South African Council for Nuclear Safety (CNS) entered into a formal cooperative arrangement for the exchange of technical information and cooperation in nuclear safety matters. The two agencies began their cooperation a year ago on a limited, informal basis. The signing of this agreement not only provides an avenue for increased cooperation; it also signals a recognition of the benefits to be realized by both countries through formal cooperation. On behalf of the USNRC, I'd like to express my warmest greetings and hopes for a long and mutually productive relationship.

Since ESKOM has been involved in the international nuclear community through membership in the World Association of Nuclear Operators, I'd like to share with you my perspective on the future of nuclear power and on international nuclear safety efforts. But before getting into either of these, let me first relate to you some information about the U.S. nuclear program.

THE U.S. NUCLEAR PROGRAM

Nuclear power in the U.S. is alive and well. The U.S. has not abandoned nuclear power as a viable option for future energy needs as some would suggest. On the contrary, 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 -- almost one-third of the world's total. And with 2,000 reactor-years of experience, the U.S. has more nuclear

experience than any other country. New baseload plant construction -- both nuclear and non-nuclear -- is relatively quiet in the U.S. because we have already undergone significant growth within the past few decades and do not yet have an increased need for baseload power.

The U.S. will continue to reap the full benefits of existing nuclear plants through our plant life extension program. This should extend the life of nuclear power plants well beyond the original 40-year licensing period, while continuing to meet rigorous safety standards. We believe that our existing nuclear capacity will continue to be utilized effectively to meet the U.S.'s future electrical energy needs.

As for new reactors, the USNRC now has a streamlined licensing process which allows a licensee to obtain a construction and operating license simultaneously. This should reduce licensee's uncertainties once commitments to expensive construction are made. And our standardized design certification process has yielded results. The USNRC has issued the design approval for one evolutionary standard reactor design -- the General Electric Advanced Boiling Water Reactor -- and is about to issue another -- for the ABB-Combustion Engineering System 80+. Our review of the even newer generation of nuclear power plants is also well along. These novel designs -- the Westinghouse AP600 and the General Electric Simplified Boiling Water Reactor -- employ passive safety features and modular construction. These features should make the reactors easier to construct and to operate, while retaining economic competitiveness. NRC-certification for the passive reactors, will require an exhaustive analytic and experimental review process; nevertheless certification should be available later this decade, well in time for programs which are considering using these designs.

The overall outlook for nuclear power in the U.S. will depend primarily on timing of future baseload demand and on the nuclear industry's ability to remain competitive in the marketplace. The issue is essentially one of economics -- there are no insuperable safety, regulatory, political, or environmental obstacles to new nuclear power plants in the U.S. We believe that this is as it should be -- that economics should determine the choices.

FUTURE OF NUCLEAR POWER

There is an increased awareness among most nuclear economies that the future of nuclear power depends collectively on all of us. Nuclear technology is no longer produced by autonomous and separate national industries, but has evolved into almost a single international network of science and technology, with

national variations. And the impact of nuclear events in one country extends well beyond its transboundary borders. As one can see from the effects that Chernobyl had on nuclear development in places as far away as the Asian Pacific Rim, the long-term viability of nuclear power depends on its safe operation in all corners of the globe.

The face of energy demand is also changing. Worldwide, energy consumption is expected to double over the next 30 years. More electrical capacity will be built over the next 25 years than was built during the previous century. And the lion's share of this increase will occur in developing countries. By 2010, it is estimated that the share of total energy consumption accounted for by developing countries will climb from 27% to 40%, while the share of rich countries will fall below 50% for the first time in the industrial era. By 2020, energy use in the developing countries will account for as much as 60% of the world total, compared with 30% in the Organization for Economic Cooperation and Development countries.

Given that nuclear power will not only continue to hold its own in terms of world energy share, but is actually expected to increase, it is of vital interest to all of us that this development occur safely from the start. The world has learned from the Three Mile Island and the Chernobyl accidents that it is both cheaper and safer to build the necessary safety infrastructure from the beginning. The international community has a clear self-interest to cooperate with other countries to ensure that nuclear power is developed safely from the start. And the foundation of any safe nuclear program is a nuclear safety culture in which safety is a high priority in the decision-making process. Accordingly, much of our cooperation and assistance efforts have focused on establishing a nuclear safety culture to provide a firm foundation for development and operations.

ELEMENTS OF NUCLEAR SAFETY

Nuclear safety is like a three-legged chair. If all three legs hold up, the chair will be very stable. But if one leg buckles or wobbles, the chair will tip over.

The first leg is technical and operational safety, which is the usual focus of safety and regulatory programs. Technical safety is important, but it is only one of the three legs.

The second leg is economics -- a nuclear program must be well-funded; profitable enough to permit continued heavy investment, maintenance, and training; and make good business sense. An uneconomical program will lead to cost-cutting measures that can compromise safety.

The third leg is organization and management -- there must be responsible leadership that sets realistic goals and a safety culture that permeates the organization and provides for quality training and staff.

You will note that I have not yet discussed safety regulation -- these three legs are primarily the responsibility of the national planners; of the energy, technology, and finance ministries; and of the utility. But the regulator does play a critical role in keeping the promoters and operators focused on safety. With specific regard to the regulatory dimension, four elements are especially important in establishing and maintaining an adequate nuclear safety culture.

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 to produce needed power as cheaply as possible.

Second, no amount of regulatory authority is going to be effective if the regulator does not have the necessary resources at its disposal. 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 which cover all aspects of the nuclear fuel cycle. One such set of principles has been developed for the international Convention on Nuclear Safety, which was just signed at the International Atomic Energy Agency (IAEA) General Conference last week.

I also think the regulator should have the authority to turn these rigorous standards into the mandatory regulations that all operators must follow.

Fourth, by national law or international commitment, a state must put into place legal and financial protection arrangements which would 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 nuclear power plant operators accountable for protecting the public health and safety, while assuring the public every right to redress any injury it might suffer as a result of negligence or improper operation.

Less obvious but also important, the regulator should have access to an independent, regulatory research program, to support an investigation of risks, accidents, siting, and such everyday items as corrosion, training effectiveness, or vulnerability to fire.

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

THE ROLE OF AN INTERNATIONAL CONVENTION ON NUCLEAR SAFETY

Just as nuclear technology is no longer produced by self-sufficient, separate national industries, nuclear safety also is no longer simply a national concern. Therefore, in addition to strong national regulation, the NRC has supported placing the principal elements of nuclear safety regulation into the international Convention on Nuclear Safety, which both our governments signed last week at the IAEA General Conference.

We believe formal agreement and wide adherence to an international nuclear safety regime will help assure a safer global environment. Safer, not solely because of guiding principles that participants are obliged to follow, but safer also because of the reporting and peer review processes implemented by the Convention. By participating fully and openly in the Convention, newly developing countries can assure that their nuclear programs follow international guidelines.

It may be useful to recall what the Convention requires of each contracting party. The first injunction is to "maintain a legislative and regulatory framework to govern the safety of its nuclear installations." This is to include:

- establishing national safety requirements and regulation;
- a system of licensing nuclear installations and a prohibition on operating a nuclear installation without a license;
- a system of regulatory inspection and assessment to make sure licensees are in compliance with applicable regulations; and,
- enforcement of these regulations, supported by sanctions that could lead to suspension, modification or revocation of the operating license.

Second, each party is required to establish or designate an adequately funded, strong, independent regulatory body. Moreover, the functions of this regulatory body must be effectively separated from those of any other national "body or organization concerned with the promotion or utilization of nuclear energy."

Finally, there is an obligation to inform the public, since 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.

CONCLUSION

This is a country going through an exciting period of political restructuring. I am sure that the new administration will continue to take these principles seriously. Your country has accomplished something unique in history: first developing nuclear weapons of mass destruction and then renouncing this option for the good of the nation, the region and the world. I and my fellow countrymen applaud your decision and the great lengths that you have gone to demonstrate your commitment to a peaceful nuclear future by your support for the IAEA and the Nuclear Non-Proliferation Treaty. The Treaty is coming up for renewal next year and we hope South Africa, as one of the newest important parties, will join us in supporting indefinite extension of the Treaty.

Our two governments have initialed a government-to-government agreement on cooperation in the peaceful uses of atomic energy, in addition to the NRC/CNS formal cooperative arrangement. The USNRC and the South African CNS are beginning technical exchanges under other auspices as well. CNS, with respect toward future cooperation, will join our Code Assessment Maintenance Program (CAMP) which will allow it access to NRC-developed computer codes for the analysis of thermo-hydraulic transients that occur in nuclear reactors. CNS has also expressed interest in safety analysis techniques employed in understanding reactor malfunctions including severe accidents. I believe this cooperation can lead to meaningful benefits for both our countries.

South Africa's nuclear safety cooperation with the IAEA has also increased. Earlier this month, an IAEA team, which included a member from the USNRC, conducted South Africa's first evaluation under the Assessment of Safety Significant Events Team program. This program works with the regulatory authority and reactor personnel to systematically seek root causes of significant events and suggest remedies. And IAEA Operational Safety Assessment Review Teams (OSART) have already conducted

operational reviews of the Koeberg Nuclear Power Plant in recent years.

My visit here this week marks the beginning of an era of increased nuclear safety cooperation between our two countries. I have met many people from government and industry for the first time and have been extremely impressed with the caliber of your country's nuclear program and facilities. You are obviously blessed with a beautiful country, full of great natural and talented human resources, which can play a significant role in anchoring the southern African region's economic development.

To the extent this includes nuclear technology, I would only urge you to remember all the elements of a successful nuclear energy program. Technical and operational safety requires commitment of resources for its long term development and attention to organizational and management excellence. You have already demonstrated your leadership to the world in many ways. I encourage you to continue to lead in the strategically important area of economic development of the region.

#