NRC NEWS

U.S. NUCLEAR REGULATORY COMMISSION

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S-08-001

Remarks of Dr. Peter B. Lyons
Commissioner, U.S. Nuclear Regulatory Commission

at the

Nuclear Energy Arena Conference

Stratejik Teknik Ekonomik Araştirmalar Merkez (STEAM)
Strategic, Technical, Economic Research Center

Istanbul, Turkey
January 18, 2008

Introduction

Günaydın. Good morning. I thank you for the opportunity to offer some thoughts that I hope you will find useful as Turkey begins its journey toward the construction and utilization of nuclear power plants. In particular, I want to thank the Minister of Energy and Natural Resources and S-T-E-A-M for inviting me to speak today. Although I represent the U.S. Nuclear Regulatory Commission (NRC) today, my comments do not necessarily reflect the views of the full Commission. However, having been a Commissioner now for 3 years, I have developed some personal insights that I would like to share.

I enjoy visiting beautiful cities such as Istanbul, and in preparing for this visit I came across a quote attributed to Turkey's first president, Mustafa Kemal Atatürk**,** that I found to be appropriate for my remarks today. The saying is: "The most genuine guide in life is science." For our discussion today, I might re-phrase it slightly and say: "The most genuine guide on the road to nuclear energy is an independent and technically strong regulatory body." These two attributes are the first two key points in my remarks today. A civilian nuclear program's regulatory body should be independent from the owners and operators of the nuclear plants and from government agencies whose mission is the development of nuclear technologies. In addition, it should be strong in technical competence.

A third key point is that a regulatory body should engage and involve the public that it serves and protects, as well as the industry that it regulates. Fourth, it should strive to collaborate and share knowledge with its international counterparts. In fact, the entire global community should continue sharing the fruits of science and knowledge that are so important in our increasingly interconnected global society. Conferences such as this are a vital component of such collaboration.

The choice of any country to build civilian nuclear power plants carries with it a great responsibility for safety, for güvenlik, not only to its own citizens but also to the citizens of the world. I congratulate the Turkish government for recognizing the importance of this choice and proceeding in a way that emphasizes safety. I encourage you to consider the recent recommendations and opinions of the International Nuclear Safety Group (INSAG) forwarded to International Atomic Energy Agency (IAEA) Director General ElBaradei by letter of August 28, 2007. The INSAG is chaired by Dr. Richard Meserve, a former Chairman of the NRC. His letter touches on important emerging issues of current interest to us all.

I would like to summarize some of issues I see with respect to my four points – independence, technical competence, public engagement and international cooperation – starting with independence.

Independence

The Nuclear Energy Law passed in 2007 by the Turkish legislature established a high level legal mandate and framework. However, I believe that the toughest work for Turkey is yet to come. That work will be to design and establish a strong and independent regulatory infrastructure to oversee the licensing and operation of nuclear power plants. By independent I mean that the regulatory body should have clear authority to shut down an operating nuclear plant – based on sound scientific judgment – if it determines that there is an unacceptable level of safety or security and to permit restart only when it is satisfied that acceptability has been restored. In judging acceptability, Turkey has the advantage of access to many years of international study and research devoted to safety and security, including tools such as operating experience databases, probabilistic and deterministic analysis methods, national and international codes, consensus standards, and regulatory guidance. Internationally endorsed safety standards are an excellent starting point in developing a new regulatory framework.

The organizational structure of the regulatory body and its place within the government should support its independent role. Clear separation between the regulatory body and the nuclear development organization is crucial. With respect to organization, I would point to the Commission-style approaches adopted by the U.S., France, and others. One benefit of the five - member Commission adopted in the U.S. is that it helps maintain more stable regulatory standards as political persuasions change within the government, although governmental views may appropriately have an influence on what is expected of the regulatory body. In the U.S., the NRC answers to the public through our elected officials and we ensure that those officials are kept informed of our activities.

One last point on independence is that independence may even be necessary internally within the structure of the regulatory body itself. In the oversight of reactors, the NRC focus is first on maintaining the safety of operating reactors. We do not allow that focus to be diverted by advanced reactor design reviews or new license applications. An entirely separate office was created within NRC to review new power reactor designs and license applications. This Office of New Reactors is currently reviewing 3 design applications. In 2007 we also received four applications for construction and operating licenses, called Combined Licenses (COLs), for seven new reactors. In 2008, we are expecting up to 15 additional COL applications for up to 22 new reactors. For budget purposes we estimate that each design certification review will require roughly 160,000 hours over about 42 months. A COL application is initially expected to require approximately 88,000 hours over about 30 months of review and 12 months of public hearings. In addition, our current preliminary estimate for inspections during an anticipated four-year

construction phase of a single reactor plant is 35,000 inspection hours. As you can see, the level of regulatory effort is substantial and, for the NRC, must not divert attention from the safe and secure operation of existing reactors.

Technical Competence

Let me now turn to the area of maintaining technical competence. Achieving and maintaining technical competence involves several specific challenges. These challenges include maintaining a technical support infrastructure, attracting a skilled and competent workforce, implementing a strong safety culture, and continuously learning from experience. These challenges are as significant for the nuclear industry as they are for the regulatory body. It is important to maintain a technical support infrastructure that serves the needs of the regulatory body to confirm the technical bases for licensing and other regulatory decisions, resolve safety issues, and anticipate future safety concerns. We must capture the knowledge that research brings, share it with others, and incorporate it into regulation.

The NRC maintains strong technical research expertise within our Office of Nuclear Regulatory Research and utilizes many other research and technical support organizations as well, including national laboratories, universities, private companies, and international research facilities. This diversity allows us to quickly shift our priorities and to select the best organization capable of producing the research we need. Other countries, notably a number of European nations, have chosen to establish a separate Technical Support Organization, upon which the regulatory body relies for technical answers to licensing and safety questions. This approach allows the development of a stable and well-established center of technical knowledge and experience directly related to the nuclear safety issues of regulatory concern. Both approaches, and their various hybrids, can work well. The choice for any one country depends largely on what technical resources are available and most accessible.

One of the great advantages of maintaining a strong international collaboration through organizations such as the NEA is the ability to participate in multi-lateral research efforts where the costs are shared and the knowledge gained is distributed among all participants. I highly encourage such efforts and other similar bilateral and multi-lateral research projects for the same reasons. Any regulatory body's credibility is directly linked to its technical capability. Active participation within international technical and research projects will certainly help a new regulatory body gain credibility with its citizens.

The next challenge is to focus on attracting well-qualified and technically competent people, including management, to the regulatory body and then retaining them. Every nation using nuclear technology faces the challenge of long-term workforce development. I actively support efforts to help students develop an interest in science, technology, and regulatory careers, and I encourage each of you to do likewise. Compensation is also an important element, and a regulatory body should have the financial resources to attract well-qualified employees who seek meaningful careers in public service.

In addition, a regulatory organization staffed with qualified people must then develop a strong institutional culture of safety. Nuclear plant safety performance cannot be judged only by numerical measures. Even when such measures reflect good performance, the regulator and the plant operator should not relax their continuous commitment to safety over production and the technical competence to achieve it. Commitment to safety should be reflected in the vision of the most senior managers in the regulatory body. Management at all levels should actively ensure that every employee feels free to express his or her views and concerns regarding safety, without

fear of reprisal. For the regulatory body, this has an enormous benefit in helping to ensure that all aspects of an issue are fully explored before making regulatory decisions.

A technically competent regulatory organization with a strong safety culture should then ensure that it continuously improves itself by gathering, assessing, and utilizing operating experience and incorporating lessons and insights from this experience. The NRC has learned lessons throughout its history, some from our successes and some from our failures. Every regulatory body, as well as the regulated industry, should be deeply committed to learning from experience and should actively engage the international nuclear community to accomplish it. It is for this reason that I strongly encourage participation in nuclear reporting and operating experience networks sponsored by the IAEA, NEA, WANO, and others.

Finally, security concerns have given rise to greater regulatory consideration of the relationship between safety and security. For example, a regulatory body may determine that it is necessary to improve security by installing more and better locks on doors leading to certain safety equipment. However, such barriers may slow or prevent access during a non-security event. This is a simple example of a much larger set of important considerations that together should ensure that both safety and security are achieved in harmony with each other. This challenge is magnified enormously when the regulatory body for safety is different from the governmental agency for security. The bottom line is that a very strong and effective collaboration is needed between the organization responsible for safety and the one for security.

Public Engagement

The third major important area is public engagement in regulatory processes. Proactive effort to keep the public informed, as a routine matter, can help ensure public understanding of emerging issues. In addition, open and public regulatory processes, to the extent possible, are essential to regulatory credibility. In the U.S., both the nuclear industry and individual members of the public have an opportunity to comment on regulations the Commission proposes to issue, and the NRC addresses their comments in a public process. In addition, our democratic principles and laws provide opportunities for public hearings in connection with the licensing of new reactors and amendments to existing reactor licenses.

The NRC takes its responsibility for public participation very seriously and strives to effectively communicate our regulatory actions and their bases to interested members of the public, the nuclear industry, and our government. Even more importantly, a regulatory body should listen to, respect, and analyze different views from public and private stakeholders. When the public has an opportunity to provide input to our decision-making processes, nuclear safety can be enhanced and public confidence in the regulatory body as a fair, stable, and strong nuclear regulator is strengthened. Of course, not all regulatory and technical information should be made public, and we must sometimes carefully balance openness with security concerns.

Let me offer one related thought before leaving the topic of public participation. Public confidence in the credibility of the regulatory body is further enhanced when the public knows it is getting first-hand information from regulatory officials, unfiltered by plant operators. For that and many other good reasons, the NRC has found it extraordinarily beneficial to post permanent full-time ‘resident’ inspectors at each of our power reactor sites. I am not suggesting every nation with nuclear power plants needs to do this, but we have found it works well for us, especially when the resident inspectors are rotated on a regular basis, to help assure that they maintain effective regulatory independence and objectivity. Our resident inspectors also keep a close watch on the safety culture at every plant.

International Collaboration

The last major area I would like to address is that of international collaboration. I have already mentioned the significant benefits of sharing the costs of nuclear research through organizations such as the NEA and through specific bi-lateral and multi-lateral agreements. I have also suggested the strong advantage of sharing in the extensive operating experience information available internationally. In fact, access to the most relevant operating experience might be an important factor in Turkey's selection of a plant design. The importance of maintaining cooperation and contacts with international partners is reflected in a saying that I am nearly certain is common to many cultures of the world: "two heads are better than one". In today's world, this has never been more true.

I also want to emphasize the globalization of the nuclear supply chain. The diversity of global sources for nuclear components makes it difficult for any one regulatory body to verify quality when the quality standards vary by point of origin. For this reason, it has become increasingly important for regulatory bodies, as well as industry consensus standards organizations, to carefully coordinate to ensure consistency in the standards and that those standards are satisfied. This isn't an academic or hypothetical point. The NRC has previously identified counterfeit and deficient parts and continues to seek better ways of monitoring the increasing globalization of the nuclear supply chain through our international collaborations.

One very important initiative among regulatory bodies is the Multinational Design Evaluation Program, or MDEP, for which the NEA now serves as Secretariat. Currently, there are 10 countries participating in this effort, with a goal of harmonizing regulatory requirements to allow greater efficiency and effectiveness in safety reviews, to share regulatory review experience, and to encourage the development of more consistent regulatory positions. This program has been extremely valuable to the NRC as we collaborate with Finland and France on our regulatory reviews of the AREVA Evolutionary Pressurized Reactor. We recognize that the final licensing of any plant will always remain a sovereign activity of each associated nation, but the MDEP can improve safety through more effective regulatory collaboration and standardization.

Another example of NRC collaboration on new reactor licensing is our bilateral agreement with China for regular technical exchanges with its nuclear regulator on the licensing and construction of Westinghouse AP1000 reactors. As global nuclear power plant licensing and construction activities expand using new globally standardized reactor designs, we should also find new ways to expand our global regulatory exchanges.

Closing

In closing, I want to emphasize how much the NRC appreciates and welcomes this opportunity for dialogue at the beginning of Turkey's journey down its chosen path to build nuclear power plants. The NRC looks forward to closer bilateral cooperation between our two nations, and to seeing Turkey's participation in other international regulatory forums. And I hope for further exchanges and visits between our two countries following the implementation of the U.S.-Turkey agreement for cooperation concerning peaceful uses of nuclear energy, which should complete U.S. Congressional review by June 2008.

I was pleased to read President Gül's statement following his recent meeting with President Bush last week, in which he noted the longstanding relationship between the U.S. and Turkey, one that continues to be strengthened by sharing a common vision of peace, stability, and prosperity.

Upon this foundation, the NRC looks forward to Turkey's increasing participation with the international regulatory community to improve the means to achieve safe and secure nuclear power plants.

I believe that the many challenges we face as a global community are best solved through global cooperation. The U.S. stands with all countries that hope and work toward a future of stronger economies, greater energy diversity, and democracy. A strong and independent nuclear regulatory body will play a significant and necessary role in achieving this vision for any nation utilizing nuclear energy, and the NRC stands ready to assist Turkey in joining the nuclear energy producing nations of the world. I wish Turkey success as it undertakes this new challenge.
I would be pleased to try and answer any specific questions you might have while I am at the conference and I look forward to those further discussions.

For your kind attention, I will say Tesekkür ederim - Thank you, and I hope you have a very productive conference.