The 2003 TECRO-AIT JSC Meeting on Civil Nuclear Cooperation

Keynote Address at Opening Plenary

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Overview of Nuclear Activities in Taiwan

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Mr. Chairman, Distinguished Guests, Fellow Colleagues, Ladies and Gentlemen: It is a great pleasure for me to address the participants and guests here at the opening plenary of the 2003 TECRO-AIT Joint Standing Committee Meeting on Civil Nuclear Cooperation. I would take this opportunity to give you an update of nuclear activities in Taiwan, with emphasis on the role of the Atomic Energy Council.

In the next 20 minutes, I will start with the latest rule-making development in atomic energy related laws and regulations. I will then share with you some observations on enforcement effectiveness regarding reactor safety of existing plants, followed by regulatory activities being carried out at the Lungmen site in cooperation with the USNRC, and a case study on the loss of beach sand outside the Lungmen site. I will also introduce to you what's being done at AEC to enhance transparency of nuclear safety information, as well as the latest of R&D efforts being made at AEC's research arm, INER. And to wrap up, I will touch on the issue of referendum on the Lungmen Project.

Laws and Regulations

The first law governing atomic energy in Taiwan, the Atomic Energy Act, is now 35 years old. In the past four years, AEC has been heavily involved in a vigorous "rule-overhaul" process for regulating atomic energy related matters. As a result, three separate laws were enacted: the Ionizing Radiation Protection Act, the Nuclear Materials and Radioactive Waste Management Act, and the Nuclear Reactor Facilities Regulation Act; the former two were passed last year, and the latter early this year. Since then, a great number of daughter regulations have also been promulgated, and many other rules and guidance are also in the works.

For the Ionizing Radiation Protection Act, the front-runner, nineteen (19) daughter rules, including the Enforcement Rules for the Act and Safety Standards for Protection against Ionizing Radiation have already been promulgated, and all radiation users are learning to cope with the new stipulations. For example, a person violating this act may be subject to jail terms up to three years, and/or a fine of up to three million NTDs. So far three (3) hospitals and one university have been fined for their unauthorized radiation practice, without objections.

The Nuclear Materials and Radioactive Waste Management Act replaced all administrative orders that had been enforced upon licensees over the past decades. In the last two years, AEC has been communicating with stakeholders in developing 14 sets of regulations for the implementation of this law. Four of them have been promulgated, and remaining ten (10) are now in draft form and being posted for public comment.

As for the Nuclear Reactor Facilities Regulation Act, four of its implementing rules/guidance, including detailed enforcement rules, fees for regulating the facilities, quality assurance criteria for the facilities, and criteria for restarting the facilities, have been promulgated into effect. There are still ten (10) other implementing regs and guides in the rule-making process for future implementation.

An emergency response system is the last line of defense for nuclear safety. Last week, the Legislative Yuan passed the first reading of the draft Nuclear Emergency Response Act. With the enactment of this law, expected to take place by end of this Legislative session, all emergency response programs that have been in practice for years will all have their explicit mandates in the law.

In addition, a new law on site selection for a low-level radioactive waste repository has been drafted and submitted early this year to the Legislative Yuan for enactment. According to the bill, the Ministry of Economic Affairs and also Taipower are responsible for selecting a disposal site within five years, which shall be submitted to the Executive Yuan for approval. The enforcement of the law, when passed, is expected to expedite the ongoing siting process.

Regulatory Activities for Reactor Safety

Next, let me brief you with some regulatory activities for reactor safety. For existing plants, regulatory efforts in the past decade have been rewarded by performance improvement of the plants. For example, the average capacity factor for all six units has increased steadily from 75% to over 85%, and reached as high as 88% last year. The annual average number of abnormal events per unit dropped from over 20 to below 5, and the average number of automatic scrams per unit per year decreased from over 2 to well below 1. So far this year, there have been only two scrams among all six units.

As for the Lungmen Project, in order to enhance the audit mechanism so as to upgrade the construction quality, a task force was established to increase the frequency of on-site and augmented inspections. Experts involved in the audit program for the construction of TEPCO KK-6/7 units were invited to join the auditing taskforce, so were the experts from USNRC in the field of digital instrument and control systems. Domestic experts and representatives of the local communities were also invited to take part in the various auditing activities.

Now, a few words on the cooperation between AEC and NRC in digital I&C systems. A long-term cooperative program was set up between the two agencies six years ago, under which, NRC would provide technical support for regulatory review of the digital I&C systems by reviewing the design documentation supporting the software development life cycle; and sending representatives as observers to participate in any technical meeting concerning the Lungmen digital I&C systems. Over the past few years, several auditing activities associated with digital I&C systems have been proceeded successfully with NRC's technical support. In addition, NRC continued to lend us support on other regulatory activities.

Debate on an Environmental Issue Related to Construction at Lungmen

Next, I would like to present a case study on the loss of beach sand outside the Lungmen Site. Early this year, a local anti-nuclear group appealed to the Executive Yuan that the erosion of the coast along Fulong Beach and Yenliao Beach was likely due to the construction of a nearby loading pier, designed to accommodate heavy equipment on its way to the Lungmen

Nuclear Power Plant. An "Investigation Committee", composed of officials from Central Government agencies, experts from academics, and representatives of environmental groups and local residents, was formed to look into this issue.

The investigation concluded that cyclic erosion and deposition of beach sand are part of the natural process along the coast in the area. Even so, Taipower was advised to replenish new sand to help regain some thickness at the two beaches. Before Taipower was ready to do so, interesting enough, the beach sand returned after Typhoon Dujuan attacked the region in early September.

Measures to Enhance Transparency of Nuclear Safety Information

Communication is a very important mechanism for effective regulation. AEC holds periodic regulatory meetings with the operator to enhance reactor safety. We also hold meetings with stakeholders whenever new laws are enacted, regulations promulgated or policies announced. For public outreach, we have press conferences every two weeks to inform the general public, through media, of major activities such as regulatory decisions, inspection results, etc. We also post information that is of interest to the public on our website.

To demonstrate openness and to enhance transparency of nuclear safety information, we are now taking one step further by making selected real-time date available on the web. Beginning early next year, several types of information will become available to the general public at AEC's website: first, real-time color-coded data of selected parameters from the Safety Parameter Display System (SPDS), with reader-friendly presentation of operational status at each nuclear power plant; secondly, real-time environmental radiation monitoring data, such as HPIC readings updated every hour at site boundaries of all nuclear plants; and area exposure rates of gamma radiation at dozens of sampling stations in the entire Taiwan Area—currently such data are on line but only updated twice a day. In addition, we may post real-time image of the nuclear power plants: cameras would be installed at selected location(s), such as top of the reactor building or turbine building at each plant, to provide real-time images to the general public. Images of the control room may also be provided during emergencies or drills.

INER's R&D Efforts in Protecting the Environment

Finally, a quick overview on the latest development of our research institute, INER. INER is now under a re-engineering transformation in order to fulfill its long-term development goals as well as to conform to the government re-structuring policy. This transformation encourages INER utilizing its nuclear energy technology more broadly to the environmental protection and civilian applications. Under its new structure, there are three research centers, operated with 11 existing functional divisions in a matrix manner. There is also a marketing center focusing on technology transfer and business promotion.

I would mention briefly two of INER's current research projects as examples of their latest R&D efforts in the environmental protection area. They are decommissioning of nuclear facilities and development of clean energy technology.

Decommissioning: There are more than 40 nuclear installations at INER. 19 of them have been scheduled for dismantling in the next ten years. Five of these installations are in the process of being decontaminated and dismantled. Considering the characteristics of various

installations, the decommissioning strategy being taken is two-fold: “step-by-step dismantling” of the nuclear equipment and facilities, and “re-use” of the buildings for other research activities.

Clean energy technology: This is a five-year research program starting this year. It covers the development of fuel cell systems, solar cell (Ⅲ-Ⅴ compound) system, and hydrogen storage material (i.e. carbon nanotubes).

Two types of fuel cell systems will be explored. The Direct Methanol Fuel Cell (DMFC) system in general has small power density, and is aiming to the portable applications. The Solid Oxide Fuel Cell（SOFC）modular system with a power range of 1~5 KWe will be developed , which can be used to serve as the power unit for the auxiliary power and distributed stationary application. So far there have been some encouraging results accomplished for this program, details of which will be introduced in a later presentation.

Referendum on the Lungmen Project

Before I close, just a few words on the issue of possible referendum on the Lungmen project. I would take this opportunity to say that we respect Government’s decisions on any energy development program or policy. As a safety regulator, AEC would abide firmly by its mandate, and take full responsibility for ensuring nuclear safety and radiation protection, so the public can have a peace of mind to benefit from the peaceful applications of atomic energy.

Conclusion

To summarize, I would like to make two final points. First, it is critically important that we keep up with our competency and maintain a high level of confidence, especially in such time of difficulties for nuclear energy professionals in Taiwan. This is the one and only means for us to keep our morale high and continue regaining the trust of the public.

Secondly, we continue to believe that nuclear technology is of international nature. To us, the TECRO-AIT Joint Standing Committee on Civil Nuclear Cooperation remains to be one of the best vehicles for international collaboration. Continued cooperation between AIT and TECRO, with frequent exchange of visits between higher management as well as technical experts, would not only enhance our confidence but bring about substantive value to our nuclear programs.

This concludes my presentation. I wish this Meeting a great success, and each one of you a very pleasant stay in Taichung. Thank you.