



Extemporaneous Chairman's Summary

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At Special Symposium for the IAEA 50th Anniversary

"Global Challenges for the Future of Nuclear Energy and the IAEA"

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Thank you. We have come to the end of very interesting day. I have been given the task of providing a brief summary of today's proceedings. Let me note, at the outset, that the task presents a major challenge. We have had a very rich discussion today covering a very broad range of topics. A lot of valuable information was conveyed. As a result, I doubt that anyone would be capable of giving a complete summary of all the very interesting discussion. I will not attempt to cover everything.

It is appropriate on the occasion of a 50th anniversary to both look back and look forward. We did that today.

Looking back, we see a period of tremendous accomplishment by the IAEA. In connection with safety and security, Mr Gürpınar explained how the Agency is steadily strengthening its capability in standards and services. He demonstrated that the Agency has greatly enhanced the world's capacity to ensure safety in the usage of nuclear energy.

We had an interesting presentation from Mr. Omoto from Department of Nuclear Energy as well, showing the various ways which IAEA is helping countries to build for the future, including strong encouragement in making proper and appropriate use of nuclear technology.

Ms. Cooley provided an interesting discussion of proliferation issues, which are a core and central concern of all of us. She showed how the agency is trying to prevent the spread of nuclear weapons. Again we saw a situation in which the Agency has grown stronger over the years as a result of the use of technology and, more recently, the use of integrated safeguard.

As I reflect back on all of those presentations, I am struck at one aspect of the success of the IAEA in each area. We learned about an Agency that from time to time has had to confront very serious challenges. Mr. Gürpınar noted that, in connection with nuclear safety and security, the IAEA had to respond to TMI and Chernobyl. Mr. Hombu referred to Chernobyl as the "dark ages." Out of the confrontation came a system that was much stronger and capable after the experience.

Similarly in proliferation area, both Mr. Waller and Ms. Cooley described the challenges presented by Iraq, Iran, and the DPRK over years. Again, we saw an Agency that has a healthy capacity to respond to difficult circumstances and to improve.

Looking forward is also appropriate for a 50th anniversary. The Agency's demonstrated capability to grow, to change, and to improve provides reassurance that the Agency will play an even more critical role in the future. Because the challenges are great, the Agency's contributions will be needed. We can hope that when a group assembles to discuss the IAEA's 100th Anniversary, they will celebrate the award of further Nobel Prizes.

One common theme from the talks we heard over the course of the day related to the promising future for nuclear power. There are many reasons for the resurgence of interest. We heard discussion of the growing demand for electricity around the world over the next 25 years, including an estimated 50% growth in the developed world and a doubling of demand in the developing world. Mr. Agrawal of

India and Mr. Soentono of Indonesia explained their aspirations to use nuclear power to meet burgeoning energy needs.

As we also discussed today, one of more profound reasons for turning to nuclear power is climate change and need for sustainable development. We need to find energy sources that do not increase the concentrations of greenhouse gases in our atmosphere and the challenge that they present for us and our children.

Economics is also a factor. The natural gas prices are increasing and volatile and coal prices are going up. At the same time, the economic performance of nuclear power plants has improved. Mr. Thayer showed that in the United States the cost of electricity from nuclear plants has declined significantly over time. As a result nuclear energy, in terms of production cost, is cheaper than other sources of electricity, other than hydro.

One final element, which is particularly important in Japan as Mr. Hombu emphasised, is energy security. Difficulties arise if a country is too dependent on foreign sources of energy, particularly given a critical role of energy in providing for the well-being of a country's population, as well as support for economic growth. Hence the interest of many countries in expanding reliance on nuclear power.

So there are many factors that affect the interest in nuclear power: growing energy demand, climate change, economics, and energy security. All reinforce the interest around the world in the application of nuclear technology. No doubt each country gives those factors different weight. But in combination they establish an explanation for the growing interest in nuclear power around the world.

Mr. Thayer told us that there may be applications for construction and operating licences for as many as 33 reactors in the United States over the next few years. The last order in the United States for a plant that was ultimately built was in 1973. We have waited over 30 years without a new order, but now see as many as 33 reactors coming. Mr. Hombu told us about the plants that are planned in Japan. And we heard from Mr. Agrawal about 40,000 MW of new nuclear energy as a goal for the year 2020 in India.

So we see rather remarkable change. Nuclear power construction has been continuing in Asia over recent years, but now we see substantial expansion. And now we are seeing interest elsewhere around the world, including many countries that have not in the past relied on nuclear power. We heard about as many as 104 new plants around the world by 2020, and as many as 200 in the next 25 years.

So there was a common theme from many of the presentations: namely, that nuclear power has a bright future in many places in the world, not just in Asia. Nonetheless, the reality is that there are many issues that must be confronted. Let me mention a few that were highlighted in the presentations.

I think a common element in all the discussions is the reality that safety must be the highest priority. If there is serious incident anywhere in the world, the prospects for nuclear power everywhere would be affected. Complacency with regard to safety is an enemy. Assuring safety is thus a continuing and important task. The Agency has a very important role in reinforcing the obligation to ensure safety.

There are particular issues that must be addressed by the countries that are new entrants to the application of nuclear power. They must establish an infrastructure that provides the capability to build, operate and decommission plants safely. That capability involves multiple elements. Of course, the operator must be competent. Mr. Roche gave the very interesting presentation describing the approach of EdF, the French utility; multiple layers with independent review capabilities are part of the corporate structure for insuring safety. And above and beyond that, there are obligations at the national level. These include the development of the skills and competence of regulators, financial

capability, connectivity to the global safety regime, emergency planning, and wide number of other capabilities.

There was also discussion today about the nuclear fuel cycle. Here too opportunities and challenges were described. On the one hand, as discussed by Mr. McDonald, there are challenges associated with the front end of the nuclear fuel cycle. Mr. McDonald pointed out that, in the absence of a guaranty of fuel supply, a country will feel vulnerable. As a result, it has an incentive to develop enrichment capability. But that presents proliferation risks. Mr. McDonald discussed the variety of different proposals to address this problem. Given the burgeoning growth of nuclear power around the globe, we cannot delay on developing an acceptable approach. It's time to move forward.

On the other end of the fuel cycle is the need to handle used fuel. In that connection, there is a worldwide re-examination of recycling. Here we have an even more complex set of objectives to be addressed. Mr. Omoto and Mr. Kondo mentioned the need to extend fuel supply through recycling, reflecting the reality that we do not have infinite resources of uranium available to us. As a result, they argue that we need to make more efficient use of uranium fuel supply through recycling. Another element is the challenge of disposing of radioactive waste. Advanced fuel cycles, which involve recycling and the use of fast reactors, provide a possible means of limiting the volume of waste and reducing the heat load on the waste disposal repository, thereby serving to make waste problems potentially easier to address.

Perhaps the most profound and most difficult problem, however, is finding a way to undertake recycling in a fashion that does not increase proliferation risks. Perhaps there is a room for research and development to advance recycling in ways that do not enhance proliferation risks significantly.

Economics is also important. Nuclear, if it is to prevail, has to be a competitive source of energy supply. Any reengineering of the fuel cycle has to work in a way that meets economic constraints.

And finally, safety and security are important. As in everything else in the nuclear business, safety and security have to come first.

There are many opportunities to optimise the fuel cycle in a way that deals with all of these challenges. This is an area in which Japan is a leader as a result of the Rokkasho facility. There are opportunities in this area as well for international agreements and for multinational facilities. They are important because recycling presents a complicated problem that is inherently international because of the proliferation dimension.

I think it is worth noting that, with the renewed and expanded interest in the nuclear power, there must be a strong system to deal with proliferation. As more and more countries are involved in nuclear activities, there is a corresponding need to ensure protection from the threat of nuclear weapons and nuclear terrorism. In this connection, Mr. Kondo talked about the need to deal more seriously with disarmament issues and with nuclear verification capability.

Mr. Thayer and Mr. Soda made a comment about the threat presented by aging nuclear facilities -- one of the current realities. Because of the great demand of energy and because nuclear power plants are operating very efficiently in many places, there is enormous interest in extending the life of plants as much as possible. That presents challenges because an old plant should not be allowed to continue to operate if adequate safety margins are not maintained. This requires research on aging processes, as well as efforts to improve inspection and maintenance capabilities.

There was also discussion of knowledge management by Mr. Soda and Professor Kang, among others. We face an aging cadre of experts in the nuclear industry. The generation of people who built the existing plants now are moving into retirement. As a result, we need to recruit new people, but

there is a shortage of people being produced by the educational system. This situation is changing in the United States; with the growth of opportunities, we have had a doubling of nuclear engineers in the educational pipeline. But this may not be sufficient if 33 plants are actually constructed. Moreover, there is a challenge in transferring the knowledge from experienced people who have been working in nuclear field for many years to the new recruits. Mr. Roche talked about how his company deals with this issue.

Transparency is an abiding issue. Nuclear power cannot succeed without public confidence. In this connection, several speakers talked about the need for education. Indeed, we heard that a large number of people believe that nuclear power plants are contributors to the climate change, rather than part of the solution. Why is that? Part of reason might be that people see the plumes extending from cooling towers and believe the plumes are smoke rather than water vapour. This experience shows that there is an educational dimension that must be met if we are to arrive at sound energy policies. Beyond that, there is a need to be direct and open when dealing with public and thereby building a foundation of trust that can allow nuclear enterprises to succeed.

There is another theme that I drew from conversation -- that is, the importance of international cooperation. The issues we must confront with regard to nuclear energy are almost inherently international, most obviously in the proliferation area, but also in connection with nuclear safety. We are all in a same boat with each other. We have the opportunity to learn from each other, not only from operational experience, but also in the design area as well. The risks from nuclear technologies are global and the benefits are global. We help each other by working each other. IAEA has an enormously important role in providing a vehicle for international cooperation.

I was given only limited time. I hope that I have mentioned the high points of the remarks made over the course of the day. This was a fascinating experience for me. We discussed many profound issues. We had the benefit of a very knowledgeable group of panellists with deep factual background and great insight and experience. So I benefited from interaction today with the speakers and very much hope that the audience did as well.

I would like to thank the organisers, Mr. Imai and Mr. Kondo. I very much appreciate their willingness to allow this symposium to occur in the middle of the JAIF conference. I would also like to thank our speakers. They were uniformly and excellently informed and provided a very interesting day. I also would like to express appreciation to our secretariat, especially Mr. Yamagata. And finally, I would like to thank the audience for its patience and willingness to give attention to all the speakers.

So, with great appreciation, I now declare this symposium adjourned. Thank you.