Welcoming Address[1]

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Good morning ladies and gentlemen!

It is a great pleasure and honor for me to express my sincere gratitude and a hearty welcome to you and, in particular those who have come from abroad to attend this Global conference.

At the outset, I would like to thank the Atomic Energy Society of Japan and the Japan Atomic Energy Agency for organizing and hosting this conference in this extraordinary difficult situation after March 11.

I would like also to extend my hearty thanks to American Nuclear Society, Canadian Nuclear Society, Chinese Nuclear Society, European Nuclear Society, French Nuclear Society, Indian Nuclear Society, Korea Nuclear Society, International Atomic Energy Agency (IAEA) and OECD/Nuclear Energy Agency (NEA) for sponsoring and supporting this conference in various ways.

The Great East-Japan Earthquake and the resulting tsunamis struck the Fukushima Daiichi Nuclear Power Plant operated by the TEPCO on March 11, this year, and caused a serious nuclear accident that included severe core damages in three reactor units, hydrogen explosions of three reactor buildings, and large scale releases of radioactive materials leaked out from containment vessel seals degraded due to over-temperature and over pressure. The fact that this accident has raised concerns around the world about the safety of nuclear power generation is a matter we take with the utmost seriousness and remorse.

Since right after the event, Japan has received support and expressions of solidarity from around the world. I would like to express Japan's sincere gratitude to you all from abroad. Japan profoundly felt the deepness of the bond we have with countries around the world.

When we deliberated after March 11 what to do with the Global Conference we had

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been preparing to hold in Nagoya, we talked each other about how we were encouraged by warm words and support from various nuclear experts in the global community. Recognizing the importance of appreciating the bond and solidarity with you in this situation, we decided to have this conference within this year as an opportunity to reconfirm the bond among peoples in many parts of the world who are devoting to research, development and utilization of nuclear science and technology for solving problems our society is faced with.

At present the nuclear community in Japan is in the midst of credibility crisis. On the top of overcoming the crisis, however, we must make every effort to stabilize the situation at the Fukushima plants and recover the life of people in Fukushima, where, with my regret and remorse, many people have been traumatized by the relocation, the breakdown in social contacts, fear and anxiety about what health effects might result from the exposure to radiation due to the contamination of their environment caused by the accident. And we should also analyze the root causes of the occurrence of the event and improve the nuclear safety management system in Japan based on the lessons learned and recover the trust of our society on the system.

As for the first task of stabilizing the situation at the site, we will soon complete the Step 2 of the roadmap towards restoration from the accident, of which target is to put the release of radioactive material under control and significantly hold down the radiation dose around the site.

After the completion of Step 2, cleanup activities at the damaged plants should be started as a mid- and long-term program at the site. The objectives of the program are, to maintain the reactors in a safe condition, remove the spent fuel from spent fuel pools, identify the location and configuration of the damaged fuel cores and remove and dispose them and collect and dispose the radioactive materials resultant from the accident and the disassembling of the reactors. Currently TEPCO is developing a roadmap for the cleanup program including scenarios of decontamination and defueling and R&D needs for promoting them. Its noteworthy milestones are the initiation of defueling from spent fuel pool in three years and the initiation of removal of core debris in ten years.

As the area around the site was contaminated due to the large release of radioactive materials, Government has been pursuing to limit the radiation exposure of a people by means of a) restriction of inhabiting in the area where expected annual additional dose is larger than 20 mSv, b) strict shipping control for agricultural products, animal products and marine products through comprehensive radiological surveys and c) step-by-step decontamination of the land.

The strategy for decontaminating peoples environment is firstly to reduce the annual additional exposure to 1 mSv by steady decontamination activities in inhabitation area where it is currently below 20 mSv but above 1 mSv and secondly to reduce the area where estimated annual additional exposure is larger than 20 mSv and residents have been evacuated, through step by step decontamination activities.

In the inhabitation area, municipal governments are leading the execution of such decontamination activities. Based on the decontamination guidelines established by asking experts for advice, they are promoting regional decontamination in highly contaminated areas and localized decontamination in relatively low contamination areas, identifying hot spots such as those locations where sludge in the drains or gutters has collected. Special attention has been paid for the decontamination of schools so as to reduce the exposure of children as low as practicable.

As for the evacuated area, Government is currently promoting a set of large- scale demonstration projects to test the effectiveness of various decontamination approaches in order to prepare guides for safe, effective and efficient decontamination activities. Utilizing such guides, Government will promote a full-scale decontamination activity from the beginning of the next year so that more than 100, 000 displaced persons can return home as soon as possible.

In the planning and execution of these activities, we have been helped by the experts dispatched from the IAEA, OCED NEA, USA, France and so on. Taking this opportunity I would like to express our deep appreciation to these peoples and those organizations and countries that dispatched them. As several sessions are devoted to on-site and off-site remediation and decontamination activities. We hope that you will have opportunity to exchange your view on these matters in this conference

The direct cause of the accident was obviously the losses of emergency diesel generators, power centers, and ultimate heat sink due to the flooding of the site by tsunami, of which height was significantly higher than the design basis. Why had all the units essentially no mitigating features against such flooding events? The reason was that the operators and regulators have failed to let the experts in external events and tsunami, in particular, know the necessity of having information about a tsunami that has a frequency of exceedance of less than 1 in 10,000 years. Before 2000 or so the experts of tsunami have been interested in estimating the evidence-based historical maximum tsunami height at a given site within limited research funds available to them. The nuclear safety people has utilized the result of such activities as a design basis with paying little attention to such situation in tsunami study community, however.

In addition, nuclear regulator and operator failed to recognize the emerging need for

defense-in-depth features that would prevent a disproportionate increase in radiological consequences from an appropriate range of events that are more severe than the design basis event. Therefore they lost the opportunity to identify the need for severe accident mitigation features that should prevent large releases of iodine and cesium even in prolonged station blackout cases caused by severe external events.

Thinking over such situation that has come to light, Government has decided in August to establish "The Nuclear Safety and Security Agency" as an external agency of the Ministry of Environment around April of next year, by separating off the Nuclear and Industrial Safety Agency (NISA) from the Ministry of Economy, Trade and Industry, with a view to centralizing the regulatory authority and ensuring a thorough safety culture in the regulatory organization.

Another important and urgent task for the Government has been to ensure that adequate funds would be available for TEPCO to satisfy liability claims of members of the public for damage. Japanese law governing nuclear third party liability says that plant operator liability is exclusive and unlimited, though the government may relieve the operator of liability if it determines that damage results from “a grave natural disaster of an exceptional character”.

Judging the Fukushima accident was a man-made disaster (to be precise, TEPCO asked the Government to postpone the legal decision of the applicability of the relief clause related with a grave natural disaster to expedite the damage compensation), Government set up Nuclear Damage Liability Facilitation Fund; a new state-backed institution to expedite payments to those affected. The Fund receives financial contributions from electric power companies with nuclear power plants in Japan, and from the government through special bonds that total JPY 5 trillion ($62 billion). The provision for contributions from other nuclear operators is similar to that in the USA. The TEPCO will pay a special annual fee for the government support, maintaining adequate power supplies, ensuring plant safety and decreasing fixed assets for cash as the need arises.

The impact of the accident at Fukushima was limited only to Japan. Global nuclear community has taken immediate actions to assess the capability of existing reactors to handle beyond design basis severe accident through stress test or similar activities. The IAEA Director General has called Ministerial-level meeting on 20-24 June, which resulted in the adoption of an action plan on nuclear safety. In the 12-point action plan, we all agreed to work hard for stronger international safety standards among others. As a key lesson learned at Fukushima is that it is important to assure enough thickness of defense-in-depth in design and operation of nuclear facilities, however, a key issue is, from my viewpoint, how to and how quickly to achieve a harmonization of technical

safety standards among member states and apply the highest requirements to everybody on all continents.

Ladies and gentlemen, if my memory is correct, it was also in the midst of a crisis after Chernobyl, though its nature was different from the present one, when this series of Global conference was initiated in Seattle in 1993. A keynote speaker of that conference, Dr. Wolf Haefele, who was called the father of German fast breeder program, argued in his speech that the first wave of nuclear power deployments with an open fuel cycle was destined to saturate at the share under 20% of global electricity production, because nuclear power was put into an existing technical and institutional infrastructure characterized by the use of oil, coal and gas. And he urged us to prepare ourselves for evolution or even revolution in the future, tentatively storing spent fuel internationally, as one cannot treat nuclear power like chemical power, uranium like yellow coal.

Though global nuclear community at that time could not agree to create such international storage, they agreed finally to create the Generation IV International Forum (GIF) that is a cooperative international endeavor organized to carry out the research and development (R&D) needed to establish the feasibility and performance capabilities of the next generation nuclear energy systems in preparation for a large expansion of nuclear energy.

The rationales for establishing the GIF were:

a) Prospects for energy needs show the possibility of a strongly increasing demand for nuclear power. In such a hypothesis, sustainability becomes a predominant concern, which means that preservation of natural resources, waste minimization and proliferation resistance are criteria as important as economy and safety:

b) Other applications of nuclear energy than electricity production are to be considered, in particular, hydrogen production, industrial use of heat or desalination: and

c) The development of new systems will take time and require validation and demonstration. Therefore, the target for industrial scale applications was 2030 or later.

The goals adopted by the GIF provided the basis for identifying and selecting six nuclear energy systems for further development. The six selected systems employ a variety of reactor, energy conversion and fuel cycle technologies. Their designs feature thermal and fast neutron spectra, closed and open fuel cycles and a wide range of reactor sizes from very small to very large. Depending on their respective degrees of technical maturity, the Generation IV systems are expected to become available for commercial introduction by 2030 or beyond.

The simultaneous establishment of the International Project on Innovative Nuclear Reactors and Fuel Cycles (INPRO) in 2000 was based on more general interest: bringing together nuclear technology holders and users to consider jointly international and national actions that would result in required innovations in nuclear reactors, fuel cycles or institutional approaches. It has attained a remarkable success in bringing about the understanding of the future development of nuclear energy systems from a national, regional and global perspective.

Today, we are witnessing current energy and CO_2 trends run directly counter to the repeated warnings sent by the United Nations Intergovernmental Panel on Climate Change (IPCC), which concludes that reductions of at least 50% in global CO_2 emissions compared to 2000 levels will need to be achieved by 2050 to limit the long-term global average temperature rise to between 2.0 C and 2.4 C.

Therefore the IEA introduced in the Energy Technology Perspectives 2010 (ETP 2010) the BLUE Map scenario that sets the goal of halving global energy-related CO_2 emissions by 2050 compared to 2005 levels and examines the least-cost means of achieving that goal, through the deployment of existing and new low-carbon technologies. As you know well, the nuclear power is expected in the scenario to contribute to 6 % of the reduction of CO_2 emissions from 53Gt in business as usual case in 2050 to a desirable level of 14 Gt. This means that nuclear power supply should be higher than NEA's high scenario projection in 2050.

I feel therefore it our obligation to train young generation of nuclear scientists and engineers who are to sustain the development and utilization of nuclear energy toward the future and to promote carefully planned yet highly aggressive long-term research and development programs that exploit a nuclear energy's innate feature, namely, its economically harvestable resource base good for a millennium of world energy supply by closing the fuel cycle.

I hope that GIF and INPRO will cooperate to pursue the realization of sustainable nuclear energy technology with such characteristics, producing a conceptual design of a fast reactor and its fuel cycle system that can satisfy the performance goals of safety, economy, sustainability, and proliferation resistance and operate its prototype system before 2030. It is important in this endeavor to explore advanced reprocessing technology that can efficiently recover miner actinides (MAs) as well as plutonium from spent fuel and advanced fuel technology to fabricate fuel to burn such materials in fast neutron systems.

Ladies and gentlemen, after the tragedy in March, the reconfirmation of importance or preciousness of the bond among peoples and between sufferers and those who live

outside of the stricken area in particular has become very popular in Japan. They talk each other and through conversation and joint activities, they find meaning and joy, and even discover a greater wisdom that reveals their path forward. A certain anthropologist commented that crises reawaken our deep species memory of two fundamental facts about human life. First we humans want to talk together about things that matter to us and such talk gives us satisfaction and meaning to life. Second, as we talk together, we are able to access a greater wisdom that is found only in the collective.

Welcome to GLOBAL 2011! I sincerely hope that this conference will provide you diverse opportunities for talking together and give you satisfaction and new meaning to your life, in addition to exchanging ideas and information among you for pursuing the realization of sustainable nuclear energy technology.