

An Overview of Japan's Nuclear Energy Policy¹

KONDO Shunsuke

Chairman, Atomic Energy Commission of Japan

Thank you, Mr. Chairman, distinguished guests, ladies and gentlemen, on behalf of the participants from Japan to this conference, I would like to express my heartfelt congratulation to Australian Nuclear Association and Engineers Australia for successfully organizing 15th Pacific Basin Nuclear Conference in this beautiful city, Sydney.

It is a great pleasure and honor for me to present an overview of Japan's nuclear energy policy and related activities. My talk this morning will focus, after a brief introduction of basic policy objectives, on these activities across three different time frames; near-term, mid-term, and long-term.

The basic objectives of nuclear energy policy in Japan are;

- to maintain the trust of the people in regulators and operators to assure safe operation of nuclear facilities and safe disposal of radioactive wastes, while limiting the nuclear activities to strictly peaceful purposes;
- to further enhance the characteristics of radiation sources and their application technologies, so that they could play a larger role in the areas of academia, industry, agriculture, and medicine.
- to increase the contribution of nuclear energy to the stable supply of energy as well as to the reduction in carbon dioxide emissions nationally and globally.

Basic goal for attaining the third objective in Japan is to make the share of nuclear power in electricity generation after the year 2030 similar to or greater than the current level of 30 to 40%, by continuing to utilize light water reactors while replacing the old ones with advanced ones in the first half of this century, and, from 2050 onwards, switching to fast breeder reactor systems.

We believe it important for attaining these objectives to pursue carefully planned yet highly aggressive actions across three different time frames; near-term, mid-term, and long-term.

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Major near-term actions for the policy objectives are;

- To maintain the public confidence in plant operator's safety management as well as regulator's activities of maintaining the safety and security of nuclear energy generation.
- To improve the availability of operating plants through continuous innovation in maintenance and regulation area.
- To start the use of plutonium recovered by the reprocessing of spent fuel in LWRs.
- To make sure the safe disposal of radioactive wastes, and pursue steady progress in the activities to determine the site for high-level radioactive waste disposal.

Japan has increased the share of nuclear energy in primary energy supply since oil-crisis in 1970's and currently there are 55 operating units that are producing about one-third of electricity generated in Japan. They are contributing to the increase in Japan's degree of self-sufficiency in primary energy supply from 4% to 16% and to the stability of electricity price in spite of recent jumps in crude oil prices, as well as to the significant reduction of carbon dioxide emissions from the electricity generating sector.

Needless to say, public confidence in the nuclear plant operator's safety management as well as regulator's activities of maintaining the safety and security of nuclear power generation is a prerequisite for enjoying such benefit. From this viewpoint, the operators are requested to reconfirm safety first principle unremittingly and actively maintain both a mechanism to prevent misconduct and organizational culture to deter them, while making the most of lessons learned from diverse experiences in the world.

Regulators are also expected to make efforts in this respect, maintaining the transparency and accountability of regulatory activities by assuring the public involvement in regulatory decision processes.

It is also important for operators and regulators to facilitate risk communication with local communities, giving priority to the understanding of what the people really wants to know.

At the same time, operators are encouraged, from the viewpoint of using existing assets as efficiently as possible, to make efforts to improve and expand

the performance of existing plants and fuel cycle facilities through continuous innovation, by applying a broad range of technologies that can enhance their long-term performances, increase their capacity, and resolve the problems of material ageing, while paying close attention to detail.

As for the fuel cycle strategy, Japan is pursuing the recycling of nuclear fuel materials through reprocessing of spent fuel because Japan, as a great energy consumption nation with little energy resource, want to utilize nuclear power as a long-term and major method of power generation on a scale of more than 50 GWe, while minimizing the number of high level radioactive waste disposal sites.

Although most of the spent fuels generated in the past were reprocessed in Europe, those generated in this century are to be reprocessed in Rokkasho reprocessing plant, which is now in the final stage of commissioning test. The plutonium recovered from spent fuel is to be mainly used in LWRs till the introduction of fast breeder reactors.

As the redundancy in the Japanese fuel cycle system is slim, we are asking the entities to cautiously promote these activities based on rigorous business risk assessment and management, considering that the occurrence of a single failure in the recycling activities might have a significant negative impact on the stability of nuclear power generation in Japan.

By the same token, we are encouraging various local communities to apply for review of suitability of the area for locating a high-level radioactive waste disposal site.

Mr. Chairman, the use of nuclear energy needs to be promoted in a manner that fully takes into account various elements of nuclear non-proliferation, in addition to safety and security. Japan has utilized nuclear energy only for peaceful purposes, fully ensuring international confidence and maintaining high transparency through faithful implementation of its IAEA safeguards agreement for nearly 30 years.

We should recognize, though, that the nuclear non-proliferation regime remains under strain with challenges such as the nuclear issues of Iran and North Korea. The alleged nuclear test by North Korea is absolutely unacceptable as it gives a blow to the international communities' efforts for nuclear non-proliferation. The Japan Atomic Energy Commission strongly urges North Korea to immediately

abandon its nuclear testing and nuclear development program and to promptly return to the international nuclear non-proliferation regime.

Various proposals have been made to contribute to the debate initiated by IAEA Director General Dr. Elbaradai on the Multilateral Approaches for Nuclear Fuel Cycle. Japan welcomes these proposals and is determined to take part in, and contribute to international discussions at the IAEA and other forums in a constructive manner. One such example is Japan's proposal to establish an "IAEA Standby Arrangements System for Nuclear Fuel Supply," with a view to complementing the concept proposed by six nations with a large scale enrichment capability to establish a multilateral mechanism for reliable access to nuclear fuel and enrichment services.

Major elements of mid-term actions are 1) to construct new nuclear power plants, 2) to pursue the innovation of nuclear power plant designs that can make the nuclear power competitive in the social and economic conditions in 20-30 years, and 3) to assist developing countries to develop infrastructure needed to introduce nuclear power.

As for construction of new plants, Japanese utilities are currently constructing two units, PWR and ABWR, applying for construction license review of four units, two APWRs and two ABWRs, and preparing for the construction permit application of several units within ten years to come.

As for new designs, Japanese manufacturers are expected, while maintaining the expertise in plant design and construction through these construction projects, to strengthen the business structure and to achieve the scale and competitiveness to be better able to compete internationally by developing unique and innovative technologies that surpass APWR and ABWR before a new wave of construction will begin in 20 years or so.

Peaceful uses of nuclear energy, including radioactive sources, are beneficial for the socio-economic development. As Japan want to contribute to the improvement of welfare of human society, Japan attaches significance to the IAEA technical cooperation activities and is making a considerable contribution to its activities in the framework of Regional Cooperative Agreement. Japan also has directly assisted developing countries to develop infrastructure, including human resources and safety and security framework, needed to introduce nuclear power.

Japan has also been playing a leading role in the Forum for Nuclear Cooperation in Asia (FNCA), which is a framework that has promoted peaceful uses of nuclear energy in Asia, through voluntary cooperation among participating countries including Australia.

Long-term actions are those to explore new products and processes that will open new market, or restructure old ones, in future.

One of the most important actions in this category is the development of fast breeder reactor and its fuel cycle technology. The Japan Atomic Energy Agency, a unique R&D organization for this purpose, is expected to prepare a design of fast breeder reactors and their fuel cycle system that have enhanced safety and security performance, consistent with the requirement of neighbor friendliness and proliferation resistance, and can attain both effective fuel utilization and minimization of the volume of high-level heat generating radioactive wastes.

At present, a prototype fast breeder reactor MONJU is right in the middle of improvement works, expecting to restart its operation in 2008. The JAEA is promoting a R&D program that will make it possible to initiate the construction project of a demonstration plant in 2015, which plant should start operation in 2025-2030.

It is also important as a long-term action to explore engineering concepts of innovative ideas of nuclear science and technology, such as fusion, nuclear hydrogen, and so on. For those purposes, Japan has constructed large scale research facilities such as JT-60, a large-scale Tokamak fusion plasma research and development facility, HTTR, a high temperature test reactor that produces helium gas of 950°C, HIMAC, a heavy-ion accelerator for medical application including cancer therapy, and so on.

We are still constructing various facilities in this category, including J-PARC, an accelerator complex that consists of a linear accelerator, a 3GeV rapid cycle synchrotron, and a 50 GeV synchrotron, each of which provides the experimental facilities with a high intensity beam for materials and life science, hadron and neutrinos physics, and nuclear energy technology such as transmutation of radioactive nuclides.

In this connection, I would like to mention here that we are encouraging active co-ordination of similar activities in many countries as in the case of ITER, GIF and GNEP. This is based on our recognition that the social rate of return of the

investment into long-term nuclear energy R&D efforts to the world as a whole is higher than to the individual countries. We hope world nuclear community will continue to pursue coordination of long-term R&D efforts that explore the possibility of technological innovation for future generation.

In conclusion, Mr. Chairman, Japan will continue the efforts to expand the use of nuclear energy by rectifying the weakness and improving the competitiveness of the technologies, as we are definitely required to increase carbon-free energy supply to stabilize atmospheric CO₂ concentration. We will pursue a thoughtful mix of near-term, mid-term and long-term actions for sustainable development of nuclear energy utilization, while making these actions transparent to the public so as to get its feedback on their direction incessantly.

Japan will also positively promote nuclear non-proliferation and actively participate in the co-ordination of long term R&D activities among various countries, as has been done so in the cases of universalization of Additional Protocol, multilateral approaches to the nuclear fuel cycles, on the one hand and GIF and ITER, on the other for the benefit of global community as well as of Japan.

Thank you for your attention.