Strategy on Supply Assurance: The Perspective of Japanese Nuclear Industry

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Utility/buyer perspectives

(1) Introduction

Thank you, Mr. Chairman.

Distinguished delegates and experts, ladies and gentlemen. It is my great honor and pleasure to have the opportunity today of presenting to you the views of the Japanese nuclear industry concerning the international framework of supply assurance. The Japan Atomic Industrial Forum (JAIF), established in 1956 -- making it about as old as the IAEA -- is an industrial organization consisting of more than four hundred (400) organizations and companies, and includes electric utilities, manufacturers, research institutes, local governments, and members of the media. It functions as a forum for those entities to discuss and consolidate policies on nuclear research, development and utilization from the industrial point of view. Today, I would like to present the views of the Japanese nuclear industry, which now maintains a full nuclear fuel cycle capability: from enrichment to reprocessing.

At the current IAEA General Conference, the Japanese Government has proposed the “IAEA Standby Arrangement System for Nuclear Fuel Supply,” to which we give our full support. It is a flexible network of supply-guarantee agreements that can be concluded between the IAEA and its member states. Under the proposed system, member states that have the capability of uranium ore supply, conversion, enrichment, fuel fabrication, and fuel stockpiling, are to register with the Agency on a voluntary basis. Because it is a voluntary and virtual arrangement, it would minimize cost and management complications. Taking this opportunity, we would like to state our full support of the proposal by the Japanese Government.

We support the idea of establishing an international supply assurance framework. Also, we understand the need to restrict the spread of sensitive nuclear technologies, such as uranium enrichment and reprocessing, while allowing nations to enjoy the benefits of nuclear energy. Developing countries that plan to introduce nuclear power in the near future may benefit most from such a framework, because that would free them of

having to develop nuclear fuel cycle technology while getting an assured nuclear fuel supply. During the early years of Japan's nuclear power program, the availability of nuclear fuel in the international market was a critical factor. A supply assurance framework may further improve the availability of nuclear fuel for those countries that are newly introducing nuclear power.

The Japanese nuclear industry would like to contribute to the establishment of the framework by helping to build the system. We can serve as a supplier of nuclear fuel fabrication services, for example: a topic being discussed this morning. In the near future, we will also become a potential supplier of enrichment services. We would be more than happy to take part in discussions of such a framework to be created by IAEA or other entities.

(2) Japan's nuclear power and nuclear fuel cycle programs

Japanese utilities now operate fifty-five (55) nuclear power plants, with a total output of 49.58 GWe, giving Japan the third largest nuclear power capacity in the world after the United States and France. Three new plants, including the fast breeder reactor (FBR) Monju, are now under construction. Eleven additional plants, with a capacity of 14.95 GWe, are being planned. Nuclear power is a crucial source of electricity in our country, supplying over 30% of the total electricity supply. Nuclear power will continue to be a vital source of electricity in the long term; in 2030, the share of nuclear power generation is expected to be 30% to 40% or more of total electricity generation.

Because of the importance of nuclear power as an energy source, as well as the huge size of the country's nuclear power program, the Japanese Government and Japan's nuclear industry have invested a significant amount of resources in nuclear fuel cycle technologies. Those include the development of uranium enrichment technology since the 1960s as part of an effort to secure fuel supply, as well as the development of spent fuel reprocessing technology. Indigenous R&D efforts to develop centrifuge technology resulted in the commencement of the commercial operation of an enrichment facility in 1992, with a capacity of 1,050 tons SWU per year. The Rokkasho Reprocessing Facility, with a capacity of 800 tons per year, is currently undergoing final commissioning tests, with commercial operation scheduled to start in mid-2007.

Since 2000, furthermore, the Japan Nuclear Fuel Ltd. (JNFL) -- the operator of the Rokkasho enrichment plant -- has been developing an advanced centrifuge technology with improved performance and better economy. Those efforts are expected to result in new centrifuge machines in Rokkasho Village, with the beginning of installation planned for 2010. The full capacity of the new facility will be 1,500 tons SWU per year.

(3) Supply assurance strategy of Japanese utilities

Next, let me touch on the strategy of Japanese utilities in controlling the risk of fuel supply interruption. There are three main components in their strategy, as follows: (a) the use of long-term contracts, (b) the use of diversified suppliers, and (c) stockpiles in fuel cycle facilities and reactor cores.

(a) Risk control through long-term contracts

Japan's power utilities employ long-term contracts for the purchase of uranium ore as well as for various fuel-cycle services, such as conversion and uranium enrichment. They also purchase those goods and services in spot markets. However, long-term contracts, for about ten years, are the basis of their purchase strategy, providing them with a stable supply of fuel and services at stable prices.

(b) Risk control through diversified suppliers

The use of diversified suppliers is another important strategy, spread across various corporations and national borders. For example, one of the country's largest electric companies purchases uranium ore from ten foreign companies, from North America, Australia, Africa, and Central Asia. For its uranium enrichment service, the utility utilizes five companies: one domestic and four foreign. The company purchases most of its nuclear fabrication service from domestic companies and the rest from abroad, which includes two Japanese companies and two foreign companies.

The use of various suppliers for a single service is intended to promote competition among suppliers so as to lower costs, as well as to prepare in advance for a potential interruption in supply owing to technical or non-technical reasons. Expansion of domestic supply capability, such as one planned for uranium enrichment, will further contribute to the secure supply of nuclear fuel.

(c) The role of stockpiles in fuel cycle facilities and reactors

It takes about two years from when U3O8 is refined until fabricated fuel assemblies are delivered to nuclear power plants. That means there are many different “stockpiles” of nuclear fuel materials in various stages of the front-end fuel cycle, in the form of “goods in progress.” Moreover, a typical nuclear fuel assembly is burned in the reactor over four to five years. We can thus consider that fuel assemblies in the core are

actually “stockpiled” for several years in a usable form. Moreover, Japanese utilities stockpile some fresh fuel assemblies in preparation for contingency.

All such actual and potential stockpiles of fuel in the various fuel cycle processes, reactor cores, and sites add up to six to seven years’ of nuclear fuel, helping the power utilities prepare for a potential interruption in supply.

(4) Comments on multinational approach (MNA)

As I said at the outset of my speech, the Japanese nuclear industry would like to be involved in and to contribute to the international framework on supply assurance. Therefore, we would like to offer some comments for consideration by the delegates and experts at this forum.

(a) Requisites for an international framework of supply assurance

The Nuclear Nonproliferation Treaty (NPT) is the “keystone” for the international non-proliferation regime. Therefore, any complementary initiative, such as the supply assurance framework, must avoid inconsistencies with the NPT. Countries that adhere to their nonproliferation commitments under NPT, including the Additional Protocol, must be allowed to exercise their rights under Article IV of NPT. Restricting the rights of “good” countries may be counterproductive for the nonproliferation regime in the long run.

Dividing NPT countries between those with nuclear fuel cycle facilities and those without may not be productive for the nonproliferation regime, even though we understand the need to control the proliferation of such sensitive technologies as uranium enrichment. We kindly request delegates and experts at this forum to consider more flexible systems to control the sensitive technology. We believe that the proposal by the Japanese Government can be considered as an example of flexible and realistic systems.

(b) Comments on a fuel assembly bank

We understand that a fuel assembly bank is being considered by the IAEA as a part of the framework. While we fully understand that all possibilities should be explored, it is not so practical to stockpile fuel assemblies from the viewpoint of electric utilities. That is because of the great variety of fuel assemblies in the market, dependent on reactor type and user requirements. Quality assurance and regulatory requirements further complicate such an idea. We believe the availability of uranium fuel should be assured at the level of enriched uranium powder in the form of UO2, or “yellow cake”

(U3O8) powder, so that a variety of fuel assemblies can be manufactured in accordance with users' and regulatory requirements.

(c) The availability of recovered uranium

Japanese power utilities possess a significant amount of recovered uranium from reprocessing (about 7,000 tons U), which is stockpiled both in Japan and Europe. Recovered uranium has a higher U-235 content than natural uranium (about 1%), and that can be utilized effectively for the assurance of fuel supply. Japanese utilities are willing to consider offering recovered uranium to a future international fuel bank on a commercial basis, premised on getting the approval and agreement of related governments, including that of Japan.

(5) Conclusion

Mr. Chairman.

While we see the need to reinforce the nuclear nonproliferation regime through limiting the proliferation of sensitive technologies, we also believe the reinforcement should be done in a manner that harmonizes with the NPT regime. The NPT assures countries that comply with non-proliferation obligations, and which are committed to nuclear nonproliferation, the right to utilize nuclear technology for peaceful purposes. Japan is certainly one of those countries, making serious non-proliferation commitments both legally and politically. We should note that the NPT obliges nuclear weapon states to make serious efforts toward nuclear disarmament, which, if made, will be a stabilizing force for the NPT regime.

As a representative of Japan's private nuclear industry, we would like to be involved and contribute to the establishment of a new international framework of supply assurance, not just as a beneficiary of such a framework but also as an active player. Our fuel fabrication capacity, as well as our stockpile of recovered uranium, can be considered for utilization for that purpose in the short term. Moreover, our enrichment capacity may be made available for that purpose in the long term.

Thank you very much for your attention.