

Appropriateness of the “Plutonium Utilization Plans (FY2010)” Announced by Electric Utilities and the JAEA

23rd March 2010
Atomic Energy Commission

Each of ten electric utilities made public their “Plutonium Utilization Plan in FY2010” on 15th March 2010 in accordance with “Concerning the Basic Position on e of Plutonium” decided by Atomic Energy Commission (AEC) on 5th August 2003.

According to their Plan, they will recover about 0.5 ton fissile plutonium at the Rokkasho Reprocessing Plant (RRP) of Japan Nuclear Fuel Limited (JNFL) in FY2010, and the plutonium will be fabricated into uranium-plutonium mixed oxide (MOX) fuel after FY 2015, which will be used at their nuclear power stations. Each utility’s plutonium holdings estimated for the end of FY2010 is equivalent to the MOX fuel used for 0.1 to 1.0 years’ operation of their plants.

Each utility plans to keep its plutonium at RRP until fabricated into MOX fuels. They plans to transfer some of their plutonium kept at RRP to both The Japan Atomic Energy Agency (JAEA) and The Electric Power Development Co., Limited (J-Power) in the future. JAEA will use the plutonium for research and development purposes and J-Power will use the plutonium in the Ohma Nuclear Power Plant currently under construction. Some utilities store their plutonium recovered at Tokai Reprocess Plant (TRP) owned by JAEA in the plant. They say that they will transfer it to JAEA who will use it either in experimental FBR “JOYO” or in prototype FBR “MONJU”.

At the same time each utility made public the amount of plutonium recovered and stored at oversea reprocessing plants. They had already announced that they would fabricate it into MOX fuel and use it in sixteen to eighteen nuclear power stations by FY2015. Kyushu Electric Power Company started operation of Genkai unit-3 loaded with MOX fuel in last November, and Shikoku EPC started the same type of operation of Ikata unit-3 this March. It is expected that several nuclear stations will start the same type of operation in coming FY2010. Several electric utilities have disclosed the names of the plant that will use the MOX fuel made of the plutonium when they finalized the contract to fabricate it. Table 1 lists the announcement made so far.

JAEA also made public its “Plan to Use Plutonium for Research Purposes in FY2010”. According to JAEA, it plans to restart operation of TRP and to recover plutonium in FY2010 after it completed the work to improve the resistance to earthquakes started in 2008. According to the JAEA, JAEA’s plutonium holdings estimated for the end of FY2010 will be equivalent to the 7 years of MOX fuel for “MONJU” and the 2 years of MOX fuel for “JOYO”. The JAEA said that the plutonium would be fabricated into MOX fuel in its Tokai Research and Development Centre and will be used in “MONJU” and “JOYO” after FY2011.

The JAEA explained that, as for “JOYO”, they were considering measures to repair the failure that had caused the partial loss of refueling capabilities reported in November 2007, and that, taking account of the results of the consideration, they would determine an operational plan and when to start using plutonium. As for “MONJU”, they get into the final stage to restart its operation.

Considering these explanations, the Commission judges that the contents of the “Plutonium Utilization Plans” recently announced by the electric utilities and the JAEA are appropriate at this time, in light of the goal of improving the transparency of plutonium utilization in Japan. The Commission expects that the utilities and the JAEA will explain the plan in more detail to further improve the transparency as they make progress in these efforts.

The utilities handling MOX fuel should understand the high level of attention from the international community toward Japan’s policy for plutonium use. With this in mind, they are required to make sure that the IAEA safeguards measures will be rigorously implemented, and are required to continue to carry out necessary and sufficient protection measures for nuclear security. In this process, they must ensure that every member of their organizations will be aware of the necessity of the strict control of information on nuclear security. They must also keep striving to gain public understanding of the principle that nuclear activities should basically be open to the public, with the exception that the disclosure of information on nuclear security should be limited.

Table 1 The announcement of MOX fuel fabrication in foreign facility
(Since August 2003)

Utility	Nuclear Power Station	The announcement related to the MOX fuel fabrication	
Chubu Electric	Hamaoka Unit-4	MAR 2006	Conclusion of fabrication contract
		MAR 2008	Application of fuel inspection ; fabrication of 48 MOX fuels in Melox plant in France
		SEP 2008	Alteration of application of fuel inspection ; Change of the number of MOX fuels to be fabricated from 48 to 28
Kansai Electric	Takahama Unit-3/4	MAR 2008	Conclusion of fabrication contract
		NOV 2008	Application of fuel inspection ; fabrication of 16 MOX fuels in Melox plant in France
		NOV 2008	Conclusion of fabrication contract
		SEP 2009	Alteration of Application of fuel inspection ; Change of the number of MOX fuels to be fabricated from 16 to 12
JAN 2010		JAN 2010	Application of fuel inspection ; fabrication of 36 MOX fuels in Melox plant in France
Chugoku Electric	Shimane Unit-2	SEP 2009	Conclusion of fabrication contract
Shikoku Electric	Ikata Unit-3	NOV 2006	Conclusion of fabrication contract
		SEP 2007	Application of fuel inspection ; fabrication of 21 MOX fuels in Melox plant in France
Kyushu Electric	Genkai Unit-3	SEP 2006	Conclusion of fabrication contract
		SEP 2007	Application of fuel inspection ; fabrication of 16 MOX fuels in Melox plant in France
		SEP 2008	Application of fuel inspection ; fabrication of 20 MOX fuels in Melox plant in France
J-Power	Ohma	APR 2009	Conclusion of fabrication contract
		NOV 2009	Conclusion of Plutonium transfer contract ; 7 electric utilities (Tohoku, Tokyo, Chubu, Hokuriku, Chugoku, Shikoku and Kyushu electric) will transfer about 1.3 ton of Plutonium-fissile to J-Power

[Background Information]

Improvement in the Transparency of Plutonium Use in JAPAN

Japan has limited the promotion of research, development and utilization of nuclear energy only to peaceful purposes by the Atomic Energy Basic Law and joined the Treaty on the Non-Proliferation of Nuclear Weapons (NPT) as a non-nuclear-weapon State. Japan has accepted the International Atomic Energy Agency (IAEA) safeguards for all its nuclear-related activities, concluding the comprehensive safeguards agreement and its additional protocol with the IAEA. Simultaneously, the Government of Japan has established and implemented its own safeguards system to ensure that domestic nuclear activities are only for peaceful purposes.

In specific terms, licensees of nuclear facilities are asked to regularly submit to the Government an inventory change report and a material balance report on the nuclear fuel material in the facility based on the material accounting rules approved by the Government. In addition, strategic points of the facilities are sealed and put under camera surveillance, and inventory changes and the integrity of the seals are inspected by the government inspectors regularly as well as irregularly without prior notice. In the case of the RRP, government inspectors are permanently residing at the site and performing their duty. Moreover, the information about material accounting activities at the facilities, including the inspection result, is reported to the IAEA, which conducts independent inspections by themselves.

It is commonly recognized in the international community that establishment and strict operation of such systems will prevent plutonium, which is brought into the country or separated and recovered through domestic reprocessing, from being diverted to purposes other than peaceful ones. Needless to say, the system currently in place at the Rokkasho reprocessing plant is also one that is internationally accepted as appropriate from this viewpoint.

There is a call for enhanced nuclear security measures in the international community. Responding to this call, Japan has partially revised the Act on Regulation of Nuclear Source Materials, Nuclear Fuel Materials and Reactors, and has taken various steps to appropriately enforce regulations for physical protection of nuclear materials, which include: safeguard measures according to

the design basis threat (DBT) standards set by the Government; the inspection conducted by the Government to assess compliance with the physical protection rules; and the security regulations for information on physical protection.

The peaceful use of plutonium in Japan has been strictly observed and secured under the aforementioned international safeguards regime. However, international shipments of plutonium occurred more frequently during the 1990s as civilian plutonium utilization activities, such as “Pu-Thermal operations” in various countries, became more active worldwide. In light of this, based on the recognition that it was desirable to increase the transparency of use of plutonium internationally, nine nations (Belgium, China, France, Germany, Japan, Russia, Switzerland, the U.K. and the U.S.) started discussions on the way to improve the transparency of civilian use of plutonium. As a result, the “Guidelines for the Management of Plutonium” were adopted in December 1997 for the responsible management by the governments of plutonium in all peaceful nuclear activities. These included guidelines for the publication of information on the national holdings of civil plutonium and national strategies for the nuclear fuel cycle, and general plans for managing them. Each country has reported such information to the IAEA and the IAEA released them to public every year since then.

Japanese electric utilities have contracted to reprocess spent fuel with European reprocessing companies and in order to use plutonium in their light water reactors or promote “Pu-Thermal operations” plans, let European contractors start to fabricate MOX fuel since 1997, using the plutonium recovered and stored there. In addition, a considerable amount of plutonium will be recovered in Japan and used annually by these utilities after the completion of the construction of Rokkasho reprocessing plant, Japan’s first commercial reprocessing plant.

In light of the expectation that the time would soon come for these private companies to recover and use plutonium in Japan, the AEC decided to strengthen management and disclosure of information on plutonium inventory, in order to improve both national and international understanding of and credibility regarding the principle of not possessing plutonium reserves for which the purpose of utilization is unspecified as well as Japan’s strict adherence to the peaceful use of plutonium. The AEC thus announced a decision of position in a paper entitled “Concerning the Basic Position on Japan’s Use of Plutonium” (hereinafter referred to as “the Position”) in August 2003. The Position stipulates that a plutonium utilization plan, which specifies how to use

the plutonium in addition to the owner and the holding of it, shall be announced, as Japan's original measure, by private companies each year before the start of plutonium recovery operations at the Rokkasho reprocessing plant, in addition to the disclosure by the Government about the current state of plutonium management in the context of nuclear safeguards. The Position also specifies that private companies when using plutonium stored abroad for fabrication of fuels and national R&D institutes when using plutonium for R&D purposes shall observe the Position. Based on the Position, the utilities and the JAEA have made their "Plutonium utilization plans" public since FY2005.

As seen in the past situation in Japan as well as in abroad, plutonium may have been stored for a considerable period when the place and time for the utilization of plutonium recovered in the reprocessing plant are determined in detail. Given the issues surrounding plutonium as a sensitive material, the AEC still considers it appropriate for private companies to clarify a plutonium utilization plan every year, including information on the plutonium to be recovered in the coming year, from the viewpoint of maintaining the transparency of the plutonium utilization, even if the details of such a plan have yet to be worked out, since the plans are always updated and the details are gradually made available by such activities.