Provisional Translation

Japan Atomic Energy Commission's Views on Plutonium Utilization Plans Announced by Electric Power Companies and the Japan Atomic Energy Agency

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Japan Atomic Energy Commission
Cabinet Office, Government of Japan

Regarding the use of nuclear energy, Japan has been upholding the principle of not possessing plutonium without specific purposes. Under this principle and from the viewpoint of enhancing transparency concerning peaceful use of nuclear energy, Japan Atomic Energy Commission (hereinafter referred to as "the Commission") has declared the policy to reduce the amount of Japan's plutonium stockpile in "The Basic Principles on Japan's Utilization of Plutonium" (hereinafter referred to as the "Basic Principles") published in July 2018. The Basic principle has also requested the electric power companies and Japan Atomic Energy Agency (hereinafter referred to as "JAEA") to make public the plutonium utilization plan (hereinafter referred to as the "Utilization Plan") every fiscal year.

Under these circumstances, Japan Nuclear Fuel Limited (hereinafter referred to as "JNFL") announced the provisional operation plans of the Rokkasho Reprocessing Plant and MOX Fuel Fabrication Plant (for FY2023-FY2027) in February, this year, and the electric power companies and JAEA announced the Utilization Plan (for FY2023-FY2025) subsequently.

In response to these announcements and based on the Basic Principles, the Commission hereby presents its views on the Utilization Plan, taking into account the efforts and ideas of these companies and JAEA.

1. Utilization Plan for FY2023

(1) Japan's plutonium stockpile at the end of FY2022

As of February 2023, the following four units are in operation as pluthermal[1] reactors, i.e., Units 3 and 4 of Takahama Power Station (Kansai Electric Power Company), Unit 3 of Ikata Power Station (Shikoku Electric Power Company) and Unit 3 of Genkai Nuclear Power Station (Kyushu Electric Power Company). In FY2022, since approx. 0.6 tons of plutonium was consumed at Unit 4 of Takahama Power Station and no additional plutonium was recovered in Japan, the total amount of plutonium stockpile at the end of FY2022 (March 31, 2023) will be approx. 45.2 tons[2].

[1] The term "pluthermal" stands for the use of MOX fuel assemblies containing plutonium in thermal reactors.
[2] The estimated amount of stockpile obtained by subtracting approx. 0.6 tons consumed at Kansai Electric Power's Takahama Power Station Unit 4 at the end of FY2022 from the total Japanese stockpile of approx. 45.8 tons at the end of FY2021.

(2) Expected consumption and recovery of plutonium in FY2023

With respect to electric power companies, four pluthermal reactors will be in operation during FY2023. Among these, approx. 0.7 tons of plutonium will be consumed at the Unit 3 of Takahama Power Station (Kansai Electric Power Company). Since the rest of the three pluthermal reactors do not possess MOX fuel assemblies, they will not consume plutonium.

Although the construction of Rokkasho Reprocessing Plant will be completed in the first half of FY 2024 (as early as possible), no additional plutonium is expected to be recovered in Japan as the plant will not be in operation during FY2023.

As for JAEA, the plutonium will neither be consumed nor recovered in FY2023 since the Experimental Fast Reactor "Joyo" is currently under review by the Nuclear Regulation Authority to confirm its compliance with the new regulatory standards, and the Tokai Reprocessing Plant owned by JAEA is in decommissioning process.

(3) Validity of Utilization Plan for FY2023

Based on the above, the total plutonium stockpile of Japan in FY2023 will be approx. 44.5 tons[3], since no additional plutonium will be recovered and approx. 0.7 tons of plutonium will be consumed.

The Commission believes that the Utilization Plan for FY2023 is appropriate at this point, based on the operation plan of pluthermal reactors, the operational outlook for the Rokkasho Reprocessing Plant as well as other related facilities, and the status of efforts toward MOX fuel fabrication by using plutonium held abroad.

2. Utilization Plans for FY2024 and FY2025

The Commission makes provisional comments on the Utilization Plan for FY2024 and FY2025 based on the information currently available, as the situation may change significantly depending on the progress of various measures taken in the future.

(1) Expected consumption and recovery of plutonium by the electric power companies

According to the Utilization Plan of the electric power companies, the Kansai Electric Power Company's Takahama Power Station Unit 3 and Unit 4 plan to consume approx. 1.4 tons of plutonium in FY2025, by fabricating plutonium held abroad into MOX fuel and loading it at the power station.

On the other hand, according to JNFL, the maximum amount of plutonium separated and recovered at the Rokkasho Reprocessing Plant during the same period is assumed to be approx. 0.6 tons in FY2025.

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[3] The estimated amount of stockpiles calculated by subtracting the amount expected to be consumed at the Kansai Electric Power Company's Takahama Power Station Unit 3 in FY2023 (approx. 0.7 tons) from the total estimated stockpile in Japan as of the end of FY2022 (approx. 45.2 tons).

(2) Expected consumption and recovery of plutonium by JAEA

In JAEA's Utilization Plan, both plutonium consumption and recovery during the same period will be zero since the outlook for the review of the Experimental Fast Reactor "Joyo" by the regulatory body is unclear.

(3) Utilization Plans for FY2024 and FY2025

According to the Utilization Plan of the electric power companies and JAEA, the total amount of Japan's plutonium stockpile in FY2024 and FY2025 will be approx. 44.5 tons[4] and approx. 43.7 tons[5] at maximum, respectively.

According to the electric power companies, the plutonium to be recovered at the JNFL's Rokkasho Reprocessing Plant will not be consumed immediately in pluthermal reactors. Subsequently, approx. 0.6 tons of plutonium recovered in FY2025 will be fabricated into MOX fuel at the MOX Fuel Fabrication Plant (hereinafter referred to as "J-MOX") and fully consumed in pluthermal reactors after FY2027, and MOX loading reactors will be specified hereafter.

Thus, taking account of the operational status of the pluthermal reactors after FY2027, there are many uncertainties in order to verify the details of the Utilization Plans for FY2024 and FY2025 and to evaluate their validity. It is necessary to keep a close watch to ensure that the amount of plutonium held by Japan will not increase with the start of reprocessing at the Rokkasho Reprocessing Plant in FY2025 and thereafter.

The Commission, therefore, strongly requests operators and other parties concerned to continuously make their utmost efforts based on The Basic Principles to steadily consume the plutonium recovered at home and operate the reprocessing plant and J-MOX properly taking account of the balance between demand and supply of plutonium.

At the same time, the Commission also strongly requests electric power companies to redouble their efforts to consume plutonium at home and to reduce stockpile stored abroad to comply with the Basic Principles.

JAEA is expected, in cooperation with the relevant parties, to continuously investigate the various ways being considered now, to further explore every possible way that will contribute to reducing its plutonium stockpile and to ensure transparency.

Lastly, in order to enhance the transparency of the use of plutonium in Japan, the Commission requests forcefully the electric power companies and JAEA to make revised reports, of the Utilization Plans, in a timely and appropriate manner, in accordance with the progress made in specific initiatives.

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[4] The estimated amount of stockpile at the end of FY2024 will equal to that at the end of FY2023, since neither consumption nor recovery will be estimated during this period.

[5] The estimated amount of stockpile calculated by adding the maximum amount recoverable in FY2025 (approx. 0.6 tons) to the estimated total stockpile in Japan of approx. 44.5 tons at the end of FY2024 and subtracting the estimated consumption at the Kansai Electric Power Company's Takahama Power Station (approx. 1.4 tons).