

PLUTONIUM UTILIZATION PLAN OF JAPAN
December 1997

1. Nuclear Fuel Cycle and Plutonium Utilization

(1) Promotion of the nuclear fuel cycle

Japan's basic nuclear energy policy is "the nuclear fuel cycle policy" under which uranium and plutonium are recovered from spent nuclear fuel by reprocessing to allow effective utilization of these materials as fuel in order to ensure a stable energy supply and to reduce the impact of radioactive waste on the environment. Research and development on nuclear fuel cycle technology is steadily promoted for this purpose.

In January 1997, the Atomic Energy Commission of Japan (the AEC) deliberated and took decisions on short-term concrete policies such as plutonium utilization in light water reactors (LWRs) and spent fuel management. The policies were confirmed by the Cabinet in February 1997.

(2) Reprocessing of spent nuclear fuel

Reprocessing service is now available at the Tokai Reprocessing Plant of the Power Reactor and Nuclear Fuel Development Corporation (with a treatment capacity of 0.7 tU/day, halted due to the accident which occurred at the Bituminization Demonstration Facility attached to the Tokai Reprocessing Plant in March 1997) and also through reprocessing contracted to British Nuclear Fuels plc (BNFL) and Compagnie Générale des Matières Nucléaires (COGEMA).

Japan Nuclear Fuel Ltd. (JNFL) is constructing a reprocessing plant in the village of Rokkasho, in Aomori Prefecture, which will be the first commercial reprocessing plant in Japan and will provide an annual treatment capacity of 800 tU. The operation of the plant is planned to start in January 2003.

(3) Plutonium utilization in LWRs

It is supposed that plutonium utilization in LWRs (MOX utilization), which contributes to effective utilization of uranium resources and is at present the most feasible way to utilize plutonium, will be the principal way of utilizing plutonium in Japan over the

next few decades. MOX utilization is an issue common to all electric power utilities possessing nuclear power plants. According to the utilities' plan, the Tokyo Electric Power Company and the Kansai Electric Power Co., Inc. will commence MOX utilization in 1999 at Fukushima Daiichi Nuclear Power Station (Unit No. 3) and Takahama Nuclear Power Station (Unit No. 4) respectively. In the year 2000, MOX utilization will also be started at the Tokyo Electric Power Company's Kashiwazaki-Kariwa Nuclear Power Station (Unit No.3) and the Kansai Electric Power Co., Ltd.'s Takahama Nuclear Power Station (Unit No.3). Around the year 2010, the cumulative number of nuclear power plants loading MOX fuel should be expanded to between 16 and 18. (One of the plants, the Electric Power Development Co., Ltd.'s Oma Nuclear Power Station, which will be an Advanced Boiling Water Reactor (ABWR), shall have a full MOX core and is planned to start operation in 2006.) The Government is making efforts to gain local and general public understanding with regard to the MOX utilization program by actively convening public meetings and forums in local areas where the program is to be implemented.

(4) Fast breeder reactor

With regard to fast breeder reactors (FBRs), the FBR prototype reactor "MONJU" was constructed and various tests such as confirmation tests on electric power generation were conducted. The operation of the reactor was stopped due to the sodium leakage accident in the reactor's secondary system in 1995. A comprehensive safety evaluation of the "MONJU" plant is being performed. After the accident, development strategies for FBRs were broadly discussed by the Special Committee on FBRs established under the AEC.

The report by the committee concluded that it would be appropriate to proceed with research and development of FBRs, based on a flexible plan, in order to pursue the possibility of commercialization of FBRs as one of the most promising non-fossil energy resources for the future. In addition, the report required that the development plan for the commercialization of FBRs, including the schedule for commercialization, be arranged flexibly, taking account of the projection of future energy supplies while pursuing the safety and economy of FBRs.

Research and development on FBRs, including "MONJU", will be conducted according to the strategy which was determined by the AEC based on the above report.

2. Enhancing the Transparency of the Nuclear Fuel Cycle Program

(1) Adherence to peaceful use and actions for enhancing transparency

Japan has promoted the development and utilization of nuclear energy, which is strictly limited to peaceful purposes, in accordance with the Atomic Energy Basic Law. The nuclear fuel cycle is promoted based on the principle that plutonium beyond the amount required to implement the program is not to be held, i.e. the principle of no surplus plutonium. Nuclear materials are also strictly managed, so as not to give rise to any international doubts concerning nuclear proliferation. Japan intends to ensure transparency of the plutonium utilization program through these efforts.

Also, from the international standpoint, Japan is a Party to the Treaty on the Non-Proliferation of Nuclear Weapons (NPT) and adheres to the Treaty. Furthermore, in July 1997, Japan ratified the Comprehensive Nuclear Test-Ban Treaty (CTBT).

(2) Implementation of International Atomic Energy Agency (IAEA) safeguards

Japan concluded a safeguards agreement with the IAEA in accordance with the NPT. All nuclear materials related to nuclear activities in Japan are subject to IAEA safeguards. At the same time, according to the Law for the Regulations of Nuclear Source Material, Nuclear Fuel Material and Reactors, the Government of Japan operates a state system of accounting for and control of all nuclear material. The system requires an operator of a nuclear facility to obtain a sanction for accountancy and control rules of the facility from the Government and to submit accounting reports for the facility, such as inventory change reports, to the Government. The contents of these reports are independently verified by national and IAEA inspectors. Thus, all nuclear activities in Japan are confirmed to be limited to peaceful purposes only.

In addition, Japan recognizes the importance of strengthening the effectiveness and improving the efficiency of the safeguards system of the IAEA and is making its best efforts towards the early implementation of the Additional Protocol.

(3) Projection of plutonium supply and demand

Projections of plutonium supply and demand in Japan through 2010 have been published by the AEC, as appropriate, based on the progress of related programs, in order to demonstrate that the nuclear fuel cycle program follows the principle of no surplus plutonium.

(4) Publication of amounts of separated plutonium in Japan

Japan was the first country to publish holdings of separated plutonium categorized by each type of nuclear facility. Since 1994, the AEC has published these figures each year in the *White Paper on Nuclear Energy*, so as to enhance the transparency of Japan's plutonium utilization program.