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## **Communication Received from Certain Member States Concerning their Policies Regarding the Management of Plutonium**

1. The Director General has received a note verbale, dated 13 February 1998, from the Permanent Mission to the IAEA of China. In keeping with China's commitment under the Guidelines for the Management of Plutonium (contained in INFCIRC/549 of 16 March 1998 and hereinafter referred to as the "Guidelines"), the government of China, in the enclosure of the note verbale of 13 February 1998, makes available information on its national holdings of civil unirradiated plutonium, as of 31 December 1996, in accordance with Annex B of the Guidelines. In the enclosure of the same note verbale, the government of China, in accordance with its commitment under the Guidelines, makes available a statement explaining its national strategy on the nuclear power and nuclear fuel cycle and on plutonium management.
2. In light of the request expressed by China in its note verbale of 1 December 1997 concerning its policies regarding the management of plutonium (INFCIRC/549 of 16 March 1998), the texts of the enclosures of the note verbale of 13 February 1998 are attached for the information of all Member States.

## ANNEX B

### Annual Figures for Holdings of Civil Unirradiated Plutonium

#### National Totals

as of 31 December 1996  
(Previous year's figures in brackets)  
brackets rounded to 100 kg  
plutonium with quantities less  
than 50 kg reported as such

1. Unirradiated separated plutonium in product stores at reprocessing plants	0	(0)
2. Unirradiated separated plutonium in the course of manufacture or fabrication and plutonium contained in unirradiated semi-fabricated or unfinished products at fuel or other fabricating plants or elsewhere	0	(0)
3. Plutonium contained in unirradiated MOX fuel or other fabricated products at reactor sites or elsewhere	0	(0)
4. Unirradiated separated plutonium held elsewhere	0	(0)

#### Note:

(i) Plutonium included in lines 1-4 above belonging to foreign bodies	0	(0)
(ii) Plutonium in any of the forms in lines 1-4 above held in locations in other countries and therefore not included above	0	(0)
(iii) Plutonium included in lines 1-4 above which is in international shipment prior to its arrival in the recipient State	0	(0)

## **China's Strategy of Nuclear Power and Nuclear Fuel Cycle and Its Plutonium Management Plan**

### **I. Introduction**

China's economy is now forging rapidly ahead, with energy resources demand increased. Though rich in energy resources in China, their composition is not so rational, and the geographical distribution quite uneven. Coal and hydropower resources as the main energy resources are mainly distributed in regions in the north, northwest and southwest of China, and oil and natural gas resources, comparatively insufficient in the country, in inland or seabed. The energy resources are relatively insufficient in the economically-developed coastal areas; nuclear power should be considered as an appropriate option to supplement the energy shortage in those areas. China is fairly rich in nuclear energy resources, and has positive foundation in nuclear power and nuclear fuel cycle.

### **II. Nuclear Power Strategy and Planning**

The principle implemented now in China's electric power industry involves the adaptation to local conditions, simultaneous development of hydropower and fossil-fired energy resources, moderate exploitation of nuclear power and synchronous construction of electric networks. Because of constraints in funds and techniques, nuclear power is just a moderate supplementary contribution to power industry. However from a long point of view, there are broad prospects for China's nuclear undertakings.

A total installed capacity in China exceeded 230 GWe as of 1996, the annual generation of electricity totaling 1.07 TWh, including 2,100 MWe associated with 3 existing nuclear power units, which show satisfactory operating performance, and produce 1.3% of the total generated energy. The procedures pertaining to 4 nuclear power projects including 8 units (6,600 MWe), which will be constructed in the coming 10 years, have been fulfilled in an all-round way, and construction is being initiated one after another. That marks the transition of nuclear power development in China from beginning stage into steady development period.

According to "National Economy and Social Development in the Ninth Five-Year Plan and the Programme for 2000 Long-Range Objectives", a total installed capacity of the whole country can be expected up to 590 GWe by 2010, annual generation of electricity totaling 2.75 TWh, including 20 GWe associated with nuclear power. The greater demand for energy will be required by the State by 2020; as pre-estimated, an installed capacity will reach 800 GWe, including nuclear sector over 40 GWe. Considering the factors of resources, transportation and environmental protection, nuclear power will be developed to a greater extent in the intermediate period, though limited proportion in installed capacity, the absolute value is significant.

The chief type of power reactors in China is PWR, i.e. mainly PWR with two HWR units imported at present. China is capable in designing and manufacturing independently of 300 MWe PWR units. For the 600 MWe PWR units now under construction, the principle adopted is D & M by self-reliance together with co-operation with foreign countries while developing on its own the second generation of middle capacity PWR. The PWR units at 1000 MWe grade have to be imported for the time being. At the same time, China is closely tracing the reactor types in the second generation with higher safety performance and more economic effects for the benefit of nuclear power consumers, in order to meet the requirements of further development of nuclear power in the next century. In addition, the project of experimental FBR (25 MWe) has been incorporated into the national high-tech development programme, and construction will be started in the near future, completion expected around 2005.

### **III. Strategy of Nuclear Fuel Cycle**

According to the integrated development planning of China's economy, the industry of nuclear fuel cycle aims mainly to meet the demand in developing nuclear power under the principle of "self-reliance in nuclear fuel supply" and "opening to the outside world", striving for a modernized and new-type industrial nuclear fuel system which can match with nuclear power development, specific policies and technical routes include:

- Fully exploiting nuclear resources, developing new techniques in uranium mining;
- Developing the centrifugal process in uranium enrichment;
- Inducing necessary newly-developed foreign techniques, improving manufacture facilities for nuclear fuels applicable to power reactors, developing high-performance and low-cost fuels;
- Developing spent fuel reprocessing, recycling of MOX fuel made of the extracted plutonium to form a closed fuel cycle; and
- Reducing the generation of radwastes as low as possible, promoting the radwastes management policy with final disposal centered on, early solidification and regional near-surface disposal of low- and intermediate-level liquid radwastes, developing solidification process for high-level liquid radwastes and deep geological centralized disposal of solidified waste after surface storage and cooling.

#### IV. Plutonium Management Plan

Though the plutonium stock separated from civil application is not available in China, laws and regulations pertaining to plutonium management have been issued by the Chinese government or competent authorities, mainly including:

1. "Regulations for Control of Nuclear Materials of the People's Republic of China". The Regulations, as issued by the State Council for implementation in June 1987, specifies that nuclear materials including plutonium shall be subject to the implementation of the licensing management, procedure of license application, approval and issue, account recording management and nuclear material accountancy system carried out, the physical protection and technical precaution systems established and regular check performed. In order to facilitate its implementation, guidelines were prepared and issued by competent authorities of the State in 1990. Nuclear materials control is implemented under the jurisdiction of China Atomic Energy Authority;
2. "Regulations for Physical Protection of Nuclear Materials in International Transport of the People's Republic of China". The Regulations, as jointly issued by Ministry of Public Security and China Atomic Energy Authority in 1994, specifies that according to the provisions in the IAEA Convention on the Physical Protection of Nuclear Material as well as "Regulations for Control of Nuclear Materials of the People's Republic of China", the licensing system shall be implemented in physical protection of nuclear materials in international transport, physical protection measures being defined in nuclear materials transport; and
3. "Regulations for Control of Nuclear Export of the People's Republic of China". The Regulations, as issued for implementation by the State Council in September 1997, specifies that plutonium is among the nuclear materials in the export control list, subject to strict control and the implementation of export licensing system in its export.

The spent fuels from the existing nuclear power plants in China are now stored in the storage ponds of the reactors. Generally, the storage capacity for each can hold about 10 years discharges from the reactor. The spent fuels, when stored in the pond at least 5 years can be transported to the reprocessing plant. A pilot reprocessing plant specially for power reactors is being built in China; as predicted, this facility can be built up and put into operation by the end of this century. Based on the development scale of nuclear power and thus the accumulated amount of spent fuel, a commercial reprocessing plant shall be constructed, operation expected around 2020.

Early in the next century, plutonium separated from reprocessing process will be used in R & D and application of the experimental FBR's MOX fuel, and at the same time, consideration will be put on the possible application in thermal reactors (LWRs).

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\* Translation supplied by the Permanent Mission of China.