
IAEA GUIDELINES FOR THE MANAGEMENT OF PLUTONIUM

Adopted at Vienna on 1 December 1997

*General*¹

1. Each State has an inalienable right to develop research, production and use of nuclear energy for peaceful purposes. This right is accompanied by sovereign responsibility for the use and management of all nuclear materials under its jurisdiction. Materials, however, which can be used for the manufacture of nuclear explosive components without transmutation or further enrichment are particularly sensitive and require special precautions. This paper sets out guidelines for the responsible management by Governments of plutonium in all peaceful nuclear activities. Although these guidelines do not apply to the management of plutonium contained in spent fuel² or of highly enriched uranium, the Government of [.....] recognizes the sensitivity of those materials and the need to manage them with the same sense of responsibility as the plutonium covered by these guidelines.

2. Plutonium as referred to in the following guidelines means:—

- separated plutonium;
- plutonium contained in unirradiated mixed oxide fuel elements;
- plutonium contained in other unirradiated fabricated goods;
- plutonium in the course of manufacture or fabrication or contained in unirradiated goods in the course of manufacture or fabrication.

¹ These guidelines should be read in conjunction with the Note Verbale, dated [.....], communicating them to the Director General of the International Atomic Energy Agency (IAEA).

² Except for the publication of estimated amounts of plutonium contained in spent civil fuel which is envisaged in paragraph 14(iii) below.

3. These guidelines apply to the management of all plutonium in all peaceful nuclear activities, and to other plutonium after it has been designated by the Government concerned as no longer required for defence purposes.

4. Notwithstanding the above, these guidelines do not apply to:–

i. plutonium with an isotopic concentration of plutonium 238 exceeding 80%;

ii. plutonium used in gram quantities or as a sensing component in instruments;

iii. plutonium which has been exempted from safeguards by the International Atomic Energy Agency (IAEA) under the procedures set out in paragraph 37 of INFCIRC 153 and the corresponding [(France), (China), (Russia), (UK), (US) comparable] paragraph of the Safeguards Agreement between the IAEA [(France), (UK), ((Belgium), (Germany), Euratom)] and the Government of [.....];

iv. plutonium on which IAEA safeguards have been terminated under the procedures set out in paragraphs 11, 13 and 35 of INFCIRC 153 and the corresponding [(France), (China), (Russia), (UK), (US) comparable] paragraph of the Safeguards Agreement between the IAEA [(France), (UK), (Belgium), Germany), Euratom] and the Government of [.....].

Non-Proliferation and International Safeguards

5. Plutonium will continue to be handled in accordance with the Government of [.....]'s obligations under the Treaty on the Non-Proliferation of Nuclear Weapons, [(Belgium), (Germany), (France), (UK) its obligations under the Euratom Treaty], its Safeguards Agreement(s) with the IAEA, and its other nuclear non-proliferation commitments.

Responsible Handling

6. Plutonium will continue to be handled in accordance with current internationally recognised standards for radiological protection³ and nuclear safety⁴, as accepted by the Government of [.....], and its other relevant international commitments⁵, at all stages of production, separation, processing, fabrication, use, transport, storage and disposal.

Physical Protection

7. In applying measures for the physical protection of plutonium in use, storage or transport (including international transport), the Government of [.....] will apply as appropriate the requirements of the Convention on the Physical Protection of Nuclear Material and the note on “Levels of Physical Protection” attached to this paper as Annex A, taking account of the recommendations on the Physical Protection of Nuclear Material published by the IAEA as INFCIRC 225, Rev.3.

8. Until they are used (including use for research or development) or disposed of, holdings of separated plutonium in excess of 15 grams will only be stored at reprocessing plants, at fabricating plants, or at sites authorised by the Government of [.....] for that purpose. In authorising storage sites, the Government of [.....] will bear in mind the desirability on security grounds of limiting the number of sites where such material is held.

³ Notably the IAEA's Basic Standards of Radiological Protection, and the standards derived from them.

⁴ Notably the IAEA's Fundamentals of Nuclear Safety and the standards derived from them, as well as the regulations of the IAEA and those of the IMO and other international organisations for the safe transport of nuclear materials.

⁵ For example, the International Convention on Nuclear Safety and various international conventions dealing with the safe transport of nuclear materials etc.

Nuclear Material Accountancy and Control

9. Plutonium will be subject to an effective system of nuclear material accountancy and control, based on a system of material balance areas⁶. Such a system will require the keeping for each material balance area of accounting records of regular physical inventories⁶ and the measurement results used in determining them, of all inventory changes⁶, in such detail as to permit the book inventory⁶ to be determined at any time, and of any adjustments⁶ and corrections made in respect of physical inventories and book inventories. It will also make provision for:-

(a) a measurement system for the determination of the quantities of plutonium received, produced, shipped, lost, or otherwise removed from inventory and the quantities on inventory. This system will either conform to the latest international standards or be equivalent in quality to such standards;

(b) the evaluation of the precision and the accuracy of measurements and the estimation of measurement uncertainty;

(c) procedures for identifying, reviewing and evaluating differences in shipper/receiver measurements;

(d) procedures for taking a physical inventory⁶;

(e) procedures for the evaluation of accumulations of unmeasured inventory and unmeasured losses;

(f) a system of records and reports showing, for each material balance area, the inventory of plutonium and the changes in that inventory including receipts into and transfers out of the material balance area; and

(g) provisions to ensure that the accounting procedures and arrangements are being operated correctly.

Provision will also be made for the regular verification of accountancy records.

International Transfers⁷

10. Before authorising transfers of plutonium for peaceful purposes to any non-nuclear weapon State, exceeding 50 grams to one recipient⁸ country in any period of 12 months, the Government of [.....] will require formal assurances from the Government of the recipient State that:-

i. the plutonium will be used exclusively for peaceful purposes and will not be put to any use which would result in any nuclear explosive device;

⁶ This term has the same definition as in paragraphs 98–116 of IAEA Document INFCIRC 153 (“The Structure and Content of Agreements between the Agency and States required in connection with the Treaty on the Non-Proliferation of Nuclear Weapons”).

⁷ As a Member of the European Community, the Government of the [.....], so far as transfers within the Community are concerned, will implement this guideline in the light of its legal obligations under the Euratom Treaty.

⁸ The “recipient” country or State is the country or State to which the intended recipient (importer) belongs; the “recipient Government” is the government of that country or State. The “supplier Government” is the Government responsible for authorising the export; the “supplier country” or “supplier State” is the country or State governed by the “supplier Government”.

ii. the plutonium will be subject to IAEA Safeguards under an agreement whose duration corresponds at least to the actual use of the plutonium in the recipient State and which provides that the rights and obligations of the parties continue to apply in connection with that plutonium and any special fissionable material produced, processed or used in connection with it until the Agency has terminated safeguards on them in accordance with its normal procedures;

iii. the plutonium will be placed under effective physical protection in accordance with the requirements of paragraph 7 of these guidelines in order to prevent unauthorised use and handling. Responsibilities for the transport of the plutonium will be clearly defined in accordance with the requirements of the Convention on the Physical Protection of Nuclear Material;

iv. the plutonium will not be further transferred to a third country without the prior consent of the Government of [.....]. Any such further transfers are to be subject to the requirements of this paragraph and of paragraphs 11 and 12 below.

11. In addition, before any shipment of separated plutonium exceeding 50 grams to one recipient country in any period of 12 months is undertaken, the Government of [.....] will require the provision by the intended recipient of a certificate stating, besides the quantity, the approximate date of delivery, the final destination and end-use, and the timetable foreseen for utilisation. The recipient Government will confirm the correctness of this information.

12. Any such proposed shipment of separated plutonium will be discussed between the supplying and recipient Governments in the light of their non-proliferation commitments, the information published by the recipient Government on its holdings of separated plutonium and its strategy for plutonium use, the intended recipient's certificate of end-use, and other relevant circumstances.

Policies for the Management of Plutonium

13. The Government of [.....] is committed to management of plutonium in ways which are consistent with its national decisions on the nuclear fuel cycle and which will ensure the peaceful use or the safe and permanent disposal of plutonium. The formulation of that strategy will take into account: the need to avoid contributing to the risks of nuclear proliferation, especially during any period of storage before the plutonium is either irradiated as fuel in a reactor or permanently disposed of; the need to protect the environment, workers and the public; the resource value of the material, the costs and benefits involved and budgetary requirements; and the importance of balancing supply and demand, including demand for reasonable working stocks for nuclear operations, as soon as practical.

Publication of Information

14. With a view to increasing the transparency and public understanding of the management of plutonium, the Government of [.....] will therefore publish:—

i. occasional brief statements explaining its national strategy for nuclear power and the nuclear fuel cycle and, against that background, its general plans for managing national holdings of plutonium; and

ii. an annual statement, in the format set out at Annex B, of its holdings of all plutonium subject to these guidelines; and

iii. an annual statement, in the format set out in Annex C, of its estimate of the plutonium contained in its holdings of spent civil reactor fuel.

15. The Government of [.....] is willing to exchange experience in implementing these guidelines with other governments who implement similar guidelines and, as appropriate, to cooperate with them in seeking solutions to any practical problems which may emerge. It will be ready to join with them in reviewing these guidelines in the light of experience with their application and changing circumstances at an agreed time not less than five years after the date on which these guidelines are notified to the Director General of the Agency.

ANNEX A

LEVELS OF PHYSICAL PROTECTION

1. The purpose of physical protection of nuclear materials is to prevent unauthorised use and handling of these materials. This note records consensus among Governments who have adopted the Guidelines on the Management of Plutonium on the levels of protection to be ensured in relation to the amount of plutonium, and equipment and facilities containing it, taking account of international recommendations.

2. Implementation of measures of physical protection in each country is the responsibility of the Government of that country. Where the international transfer of plutonium is involved, the levels of physical protection on which these measures are to be based should be the subject of an agreement between supplier and recipient Governments. In this context these requirements should apply to transfers to all States.

3. The document INFCIRC/225 of the International Atomic Energy Agency entitled "The Physical Protection of Nuclear Material" and similar documents which from time to time are prepared by international groups of experts and updated as appropriate to reflect changes in the state of the art and state of knowledge with regard to physical protection of nuclear material are a useful basis for guiding States in designing a system of physical protection measures and procedures.

4. The categorisation of nuclear material presented below, as it may be up-dated from time to time by consensus among States implementing these guidelines, is to serve as the agreed basis for designating specific levels of physical protection in relation to different amounts of plutonium.

5. The levels of physical protection to be ensured in the use, storage and transport of plutonium will, as a minimum, include protection characteristics according to the amount involved as follows:—

a) where the amount of plutonium is more than 15 grams but less than 500 grams:—

– *use and storage* within an area to which access is controlled;

– *transport* under special precautions including prior arrangements among sender, recipient and carrier, and, in case of international transport, prior agreement between entities subject to the jurisdiction and regulation of supplier and recipient Governments respectively, specifying time, place and procedures for transferring transport responsibility;

b) where the amount of plutonium is more than 500 grams but less than 2 kilograms:—

– *use and storage* within a protected area to which access is controlled, i.e. an area under constant surveillance by guards or electronic devices, surrounded by a phys-

ical barrier with a limited number of points of entry under appropriate control, or any area with an equivalent level of physical protection;

– *transport* under special precautions including prior arrangements among sender, recipient and carrier, and, in case of international transport, prior agreement between entities subject to the jurisdiction and regulation of supplier and recipient Governments respectively, specifying time, place and procedures for transferring transport responsibility;

c) where the amount of plutonium is 2 kilograms or more:–

– *protection* with highly reliable systems against unauthorised use as follows:

– *use and storage* within a highly protected area, i.e. a protected area, as defined in (b) above to which, in addition, access is restricted to persons whose trustworthiness has been determined, and which is under surveillance by guards who are in close communication with appropriate response forces. Specific measures taken in this context should have as their objective the detection and prevention of any assault, unauthorised access or unauthorised removal of material;

– *transport* under the precautions for transport as identified in (a) and (b) above and, in addition, under constant surveillance by escorts and under conditions which assure close communication with appropriate response forces.

6. In the case of an international transfer, the supplier, together with the recipient, should take the steps necessary to confirm that the agencies or authorities having national responsibility for ensuring that prescribed levels of physical protection are adequately met and for coordinating recovery and response operations in the event of unauthorised handling or use of plutonium are in touch with one another. These national agencies should consult and cooperate as appropriate to secure the safe completion of the transfer.

ANNEX B

ANNUAL FIGURES FOR HOLDINGS OF CIVIL UNIRRADIATED PLUTONIUM

...

ANNEX C

ESTIMATED AMOUNTS OF PLUTONIUM CONTAINED IN SPENT CIVIL REACTOR FUEL

...

Source: International Atomic Energy Agency document INFCIRC/549, 16 March 1998
