



International Atomic Energy Agency

General Conference

GC(XIII)/409

30 July 1969

GENERAL Distr.

Original: ENGLISH

Thirteenth regular session

Item 19 of the provisional agenda
(GC(XIII)/400)

FUND OF SPECIAL FISSIONABLE MATERIALS

Memorandum by the Board of Governors

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I. PURPOSE OF THIS MEMORANDUM

1. The purpose of this memorandum is to provide the General Conference with a background paper for its discussion of the request made by the Conference of Non-Nuclear-Weapon States in September 1968 that it consider "the establishment of a fund of special fissionable materials for the benefit of non-nuclear-weapon States and in particular of developing countries" [1]. The information presented relates largely to the international transfer of enriched uranium, since the need for transfers of plutonium except in small quantities for research purposes has not yet developed.

II. INTERNATIONAL TRANSFER OF SPECIAL FISSIONABLE MATERIALS

2. Four Member States - France, the Union of Soviet Socialist Republics, the United Kingdom of Great Britain and Northern Ireland and the United States of America - have plants for enriching uranium. All transfers are arranged through governmental channels, either directly between the exporting and importing States, or through the Agency, acting as an intermediary between the two States concerned.

III. INTERNATIONAL TRANSFER THROUGH THE AGENCY

The Agency's supply function

3. The Agency's function in the supply of nuclear materials was a matter of very great interest when the Statute was being drafted 13 years ago. Evidence of this is the fact that seven of the Statute's 23 articles deal partly or exclusively with this function. The most important is Article IX (Supplying of materials); the other main ones are Articles XI (Agency projects), XII (Agency safeguards) and XIII (Reimbursement of members).

4. Under Article IX, Members may make special fissionable materials available to the Agency and the Agency may receive and allocate them to other Members. The Agency may take and maintain physical possession of these materials, but in practice no material has been physically handed over to it. In all the international transfers in which it has participated, the Agency has acted as an unpaid intermediary between one Member State and another.

Availability of materials through the Agency

5. In 1957 the Soviet Union, the United Kingdom and the United States offered under Article IX.A of the Statute to make special fissionable material available to the Agency in the form of uranium-235 contained in enriched uranium. Later the United States also offered small quantities of uranium-233 and plutonium. The quantities offered were as follows:

[1] See United Nations document A/7277, Resolution J. II, para. 1 on page 14.

Member	Material	Quantity (kg)
Soviet Union	^{235}U contained in enriched uranium	50
United Kingdom	^{235}U contained in enriched uranium	20
United States	^{235}U contained in enriched uranium	5070
	^{233}U	0.5
	^{239}Pu	3.0

6. In order to determine the terms and conditions for the international transfer through the Agency of the uranium-235 thus offered, the Agency entered into a general supply agreement with each of the three Governments on 11 May 1959 [2]. Each Government offered to make the uranium available in any enrichment up to 20%, but both the United Kingdom and the United States agreements further provide that the "parties may agree to a higher enrichment with respect to uranium to be used in research reactors, material testing reactors or for research purposes".

7. The provisions in the agreements regarding prices are as follows:

- (a) Soviet Union: "The Government undertakes to base prices on a scale of charges corresponding to the lowest international prices in effect at the time of delivery for enriched uranium hexafluoride and for uranium compounds according to the percentage content of uranium-235";
- (b) United Kingdom: "The material shall be supplied at a price and on conditions which are not less favourable than the most favourable price and conditions which the United Kingdom Atomic Energy Authority are offering or are prepared to offer, at the date of the contract in question, to any other customer outside the United Kingdom for the supply of similar material"; and
- (c) United States: "The United States undertakes to make special nuclear material available to the Agency at the United States Atomic Energy Commission's published charges applicable to the domestic United States distribution of such material in effect at the time"

8. The duration of the agreements differs. That with the Soviet Union "shall cease to have effect one year after the day of its denunciation by the Agency or the Government"; that with the United Kingdom will remain in force "until the end of any calendar year after 1960 in which notice of the withdrawal of the offer [of enriched uranium] has been given"; and the agreement with the United States was concluded for a period of twenty years, which will end on 10 May 1979.

[2] The texts of the agreements are reproduced in document INFCIRC/5.

9. It is to be noted that under the general supply agreements the three Members in question have undertaken to make materials available to the Agency on request. Further steps have to be taken to enable the Agency to supply the materials to other Members.

10. It is to be noted further that the United States Atomic Energy Commission is able, under the Atomic Energy Act of 1954, to donate to the Agency every year up to US \$50 000 worth of special fissionable materials to assist and encourage research on peaceful uses of atomic energy or for medical purposes. The United States has made these free gifts every year since 1960 and they now total \$500 000 in value. The materials in question are not available for power reactors and have been used mainly for fuel for research reactors, in plutonium-beryllium neutron sources and in fission counters for research projects. Small quantities have also been given for such research purposes as the determination of nuclear data. The charges for the fabrication of the material into the desired form and its transport to the place of use are paid by the recipient Government.

Supply of materials through the Agency

11. The procedures which the Agency must follow in supplying special fissionable materials are outlined in Article XI of the Statute. Any Member or group of Members desiring to set up a project for a peaceful use of nuclear energy may request the Agency's assistance in securing such materials; such a request must be accompanied by an explanation of the project and must be considered by the Board of Governors. Article XI.E lists certain matters to which the Board must give consideration before approving the project and the supply of the material; one of these matters is "the special needs of the under-developed areas of the world" (Article XI.E.6).

12. As the Agency does not keep its own stocks of materials, a supplier of the material has to be selected. In choosing the supplier, the wishes of the requesting Government are taken into consideration in accordance with Article XI.C of the Statute. If the requesting Government does not express a preference, enquiries are addressed to Members likely to have the material available. Most major requests have involved fuel for a particular reactor, and the type of fuel element required was therefore determined by that reactor's design. However, the country supplying the material and the country where it is processed into the required chemical and physical form need not necessarily be the same, and there have been a few cases of what may be termed "third country fuel services",

13. Before material can be supplied, two agreements have to be concluded. One of these is known as a Project Agreement, to which the recipient Government and the Agency are parties; it is required by Article XI.F of the Statute, where most of the points to be covered are set forth. One of them is that "the project shall be subject to the safeguards provided for in Article XII, the relevant safeguards being specified in the agreement". Safeguards are usually required in connection with reactor projects, whereas the quantities of materials supplied for research projects are usually well below those that can be exempted from safeguards. The main provisions of Project Agreements are standardized being varied only to meet particular circumstances.

14. The other agreement is known as a Supply Agreement, in which the exact type and quantity of material to be supplied, as well as the terms and conditions of supply, are specified. The supplying Government and the Agency must clearly be party to a Supply Agreement; on grounds of convenience the recipient Government becomes party as well.

15. The terms and conditions of supply to the recipient Government, including the price of the material, are normally the same as those offered by the supplying Government. The Agency's intermediary services are thus provided free of charge. In exceptional cases, the material itself has been provided free of charge; occasionally, also, small quantities for research have been lent to the requesting Government.

16. By June 1969 some 65 transfers of special fissionable materials had taken place through the Agency. The supplying Governments were those of France, the Soviet Union, the United Kingdom and the United States; the 15 recipients were Argentina, Austria, the Democratic Republic of the Congo, Finland, Greece, Iran, Mexico, Norway, Pakistan, Philippines, Romania, Spain, Uruguay, Viet-Nam and Yugoslavia. These transfers, about half of which were made as gifts, totalled approximately 54.5 kg of uranium-235 and 811 g of plutonium; with the exception of 1.7 kg of uranium-235 for a natural uranium power reactor in Pakistan, all the materials so transferred were for research reactor fuel or for other research purposes. [3]

IV. INCENTIVES FOR TRANSFER THROUGH THE AGENCY

17. At present two incentives to transfers through the Agency can be definitely identified. One is the cost-free nature of the materials annually made available by the United States; [4] the other is that the transfer arrangements that the Agency is in a position to make offer to some Member States opportunities of obtaining special fissionable materials which would not otherwise be open to them.

18. Nevertheless, the use made of the materials offered to the Agency more than ten years ago has not been very great, and more than 5000 kg of the uranium-235 still remains available. [5] This situation has led to an examination of the prevailing differences in the arrangements that can be made for supply bilaterally and through the Agency, four of the more important of which are the following:

- (a) Duration of supply arrangements. The Agency has up to now only undertaken to supply enriched uranium for one reactor core loading at a time, and most of the process leading up to the conclusion of the new agreements needed for a subsequent supply has had to be repeated each time. The potential delays inherent in this procedure could be very expensive in the case of power reactors. Under bilateral agreements, however, supply arrangements normally cover longer periods; one supplier, for example, is prepared to guarantee fuel supplies for the lifetime of nuclear power stations (up to 30 years). The possibility that such longer-term supply arrangements could be negotiated through the Agency is therefore well worth exploring. It is to be noted also that the total quantity of enriched uranium at present available to the Agency is insufficient to fuel one large light-water power reactor for a period of more than 10-15 years (which is only about half its lifetime), even if complete recycling of the plutonium produced is also taken into consideration;
- (b) Supply in advance of immediate needs. One supplier is ready to accept orders on a bilateral basis for advance delivery of enriched uranium and enrichment services covering estimated requirements for five years, and is prepared, on request, to consider even longer periods. This enables the user to protect himself against possible interruptions in supply and avoid the risk of having to shut down his power station on account of a fuel shortage. It should be possible for such supply arrangements to be made through the Agency also;

[3] A summary statement of transfers made through the Agency is to be found in the latest revision of document INFCIRC/40.

[4] See para. 10 above.

[5] See paras 5 and 16 above.

- (c) Toll enrichment. With this method of supply a user of enriched uranium provides natural uranium and pays a fee for its enrichment by a supplier of enriched uranium. The Agency cannot yet act as an intermediary in arranging for toll enrichment; and
- (d) Third country fuel services. [6] At present it is difficult for the Agency to arrange for fuel services (such as fabrication, reprocessing or blending) elsewhere than in the country of the supplier. On the other hand one supplier is today prepared to enter into arrangements for bilateral supply involving third country fuel services whenever a potential recipient so requests. It would appear desirable for the Agency to take steps to enable it to meet such requests as a matter of routine.

19. It will be apparent that there is a connection between the fact that ten years have passed since the Agency concluded its general supply agreements with the Soviet Union, the United Kingdom and the United States, and that in the meantime these major suppliers of special fissionable materials, particularly the United States, have developed and liberalized their bilateral supply policies. It would be desirable for these changes to be reflected in the Agency's general supply agreements, and to that end the major suppliers have been asked by the Secretariat whether they would henceforth be prepared to supply enriched uranium through the Agency on the same general conditions as those applying to bilateral supply. The Governments concerned have also been asked whether they would be prepared to increase the amount of enriched uranium that they will make available for supply through the Agency. The replies to these inquiries will have a bearing on the General Conference's consideration of the request made by the Conference of Non-Nuclear-Weapon States, and the Board of Governors has therefore asked the Director General to bring to the notice of the General Conference such developments as may occur before it comes to discuss the matter.

[6] See para. 12 above.