NUCLEAR INTERJURA'81

NUCLEAR FUEL SUPPLY ARRANGEMENTS THROUGH THE IAEA

* Ha-Vinh Phuong, IAEA

I. Introduction

The original concept of the International Atomic Energy Agency as supplier of nuclear materials was an ambitious one: the Agency may have in its possession quantities of nuclear materials that Member States may wish to make available to it; it may establish or acquire facilities for the receipt, storage and physical protection of the deposited materials in such a way as to avoid concentration of large amounts in any one country or region of the world, pending delivery for use by any Member State or by the Agency as determined by the Board of Governors.

The role thus conceived for the Agency would consist in being both the custodian and the supplier of nuclear materials placed under its control. This is reflected in Article IX of the Statute concerning the supply of materials, as supplemented by Article XIV.E on financing of the Agency's activities and according to which a scale of charges would be periodically established by the Board of Governors to produce revenues adequate to meet the Agency's expenses and costs in performing the function of a supplier of nuclear materials.

In practice, however, neither of these provisions has been put into effect. The Agency from its inception has limited its role to

---

* The views expressed herein are those of the author. They do not necessarily reflect the views of the IAEA.

that of an intermediary or "unpaid broker" between Member States, at their request, in regard to transactions involving the procurement of nuclear materials, equipment or facilities for peaceful purposes as is provided for in Article III.A.1 of the Statute among other functions assigned to the Agency.

II. Materials made available to the IAEA

It may be said that if the original concept of the Agency becoming the custodian of a pool of nuclear materials in its depots did not materialize, this was due to a number of political as well as economic and technological considerations since the choice of such a role for the Agency essentially depends on the willingness of the supplying States. Some of them have nonetheless offered to make available to the Agency, in its early years of existence, certain quantities of materials for use by the Agency or its Members in accordance with the Statute.

Thus, on the basis of Article IX.A and B of the Statute, the Soviet Union, the United Kingdom and the United States on 11 May 1959 concluded bilateral agreements with the Agency[1/], under which they made available to the Agency special fissionalbe material in the form of uranium-235 contained in enriched uranium and amounting respectively to 50 kilograms, 20 kilograms and 5070 kilograms of uranium-235.

1/ Published in IAEA document INFCIRC/5.

Under each Agreement, the material is to be retained by the supplying State until delivery is requested by the Agency. The Agreement with the United States further provides that the United States will, from time to time, make available to the Agency such additional quantities of special fissionable materials as may be authorized by the United States legislation, and it will also assist the Agency in obtaining source and reactor materials from persons under its jurisdiction. Subsequently, the United States pledged to make available to the Agency an additional 0.5 kilogram of uranium-233 and 3 kilograms of plutonium.

The provisions concerning prices in each Agreement are as follows:

(1) USSR Agreement:

"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 their percentage content of uranium-235".

(2) United Kingdom Agreement:

"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".

(3) United States Agreement:

"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, ...".

The first-mentioned Agreement would thus potentially give the Agency the most favourable terms with respect to the pledged material but no preferential treatment in price is accorded to the Agency under the two other Agreements. Anyway, since the charges for the material needed as well as other terms and conditions for its delivery are to be negotiated and agreed in specific contracts with the supplying State selected by the recipient State, the Agency has practically no say in the commercial aspects of these transactions.

The duration of the Agreements also differs. The USSR Agreement will cease to have effect one year after the day of its denunciation by the Agency or the Government. The United Kingdom Agreement remains in force until the end of any calendar year after 1960 in which notice of the withdrawal of the offer has been given. The United States Agreement was to remain in force for a period of twenty years. Prior to the expiration of the latter Agreement, it was amended in 1974 to extend it for a further 35 years[2/]. The provision on price was deleted on that occasion for the reason that the United States could not guarantee any pricing formula in view of the duration of the

---

2/ Amendment published in IAEA document INFCIRC/5/Mod.1.

Agreement as amended. All three Agreements are currently in force.

A Second Amendment to the IAEA-United States Agreement was concluded in 1980[3/], setting forth in an annex the United States criteria for transfer and export arrangements concerning nuclear materials, equipment or facilities that are part of the United States applicable laws, regulations and licence requirements. The conclusion of this Amendment was authorized by the Board of Governors in 1979, on the understanding that such action did not constitute any expression of views on its part with respect to the criteria in question which are required by the United States legislation[4/].

The quantities, form and composition of materials received by the Agency for its own operations or delivered to Member States for use by them under agreements concluded with the Agency and the supplying State are annually reported to the Agency's Member States by the Secretariat[5/].

III. Supply of nuclear fuel

A. Statutory basis

The provisions of the Statute on the basis of which a Member State or group of Member States may request the Agency's assistance in securing nuclear and other materials, services, equipment or facilities for a peaceful project are laid down in:

3/ Second Amendment published in IAEA document INFCIRC/5/Mod.2.

4/ Nuclear Non-Proliferation Act of 1978,92 STAT.120, Public Law 95 - 242, March 10, 1978.

5/ The latest report on "Materials Delivered by Member States" was published in IAEA document INFCIRC/40/Rev.15, August 1980.

- Article III.A.1 enabling the Agency to act as an intermediary for supply arrangements; and
- Article XI.A to C providing for the Agency to arrange for the requested supply, either by one or more Member States or by itself directly, including arrangements to secure the necessary financing from outside sources.

The provision of the Agency's assistance in this regard is further governed by:

- Article III.A.5 providing for non-military diversion of any supplied item and for relevant safeguards control as specified in Article XII;
- Article III.A.6 requiring the application of health and safety standards prescribed by the Agency, whose rights and responsibilities in safety control over an assisted project are also specified in Article XII; and
- Article VIII.B securing for the Agency all scientific information developed as a result of its assistance so that it could in turn freely disseminate such information pursuant to Article VIII.C.

The procedures and criteria for dealing with a request for this type of assistance by the Agency and the main features of a requisite agreement between the Agency and the requesting State or States are specified in Article XI, paragraphs A, D and E, and paragraph F, respectively. These provisions equally apply to the assistance extended to an existing project, pursuant to Article XI.G.

As regards charges for supplied items, Article XIII provides for the Agency to enter into an agreement with the supplying State for reimbursement for the items furnished, unless otherwise agreed between them. This is linked to the original concept of the Agency serving as custodian of a pool of nuclear materials, contributed by supplying States and to be paid for only when distributed by the Agency pursuant to Article XI.D and G of the Statute. As stated earlier, this concept did not materialize and, in practice, the Agency has been confining itself to playing the role of an intermediary in supply arrangements. Therefore, payment for supplied items is usually arranged between the requesting and supplying States directly as foreseen in Article XI.F.3 of the Statute.

B. Processing of a request

Request for fuel for a reactor project is to be accompanied by a statement of the purpose, extent and usefulness of the project, including all relevant information and documentation concerning plans, funds, technical personnel, applicable health and safety measures, and a preliminary safety evaluation in the case of an initial project or a safety analysis report with respect to an existing one. On the basis of such submission, the Agency may require additional information to enable it to perform a technical and safety assessment of the project according to the criteria set forth in Article XI.E of the Statute.

For such an evaluation, close contact is maintained from the outset with the requesting State. The latter may wish to seek expert assistance on some aspects of a proposed project or of an ongoing

activity, in which case the Agency may send advisory missions to the State in using its own staff or in employing outside experts as provided for in Article XI.D of the Statute.

The choice of a supplier is a matter entirely within the discretion of the requesting State. Usually, the commercial arrangements for the supply have been worked out between the reactor operator in the requesting State and a manufacturer in the supplying State even before the Agency is approached for assistance in the international transfer of the nuclear fuel. In practice, most requests for significant quantities of nuclear material have been for fabrication into fuel elements for a specific reactor - generally, research reactors of standard design - and there has been no problem in obtaining the material from the State that has supplied the reactor. Only on rare occasions did a requesting State ask the Agency to explore for a potential supplying State[6/] but, in any case, the final say remains with the former State.

The willingness of a supplying State to enter into supply arrangements with the requesting State enables them to start consideration, through the good offices of the Agency, of the terms and conditions of the supply. The related negotiation is generally carried out in an informal fashion. Upon completion of such negotiation and as a result of the evaluation of the project by the Secretariat, a report is presented by the Director General to the Board of Governors, together with his recommendation, since approval of the Agency's assistance by the Board is required by Article XI.E of the Statute.

6/ The latest case involved the procurement of uranium enrichment services for the Mexican Nuclear Power Plant of Laguna Verde, Unit 1, that was the object of the Agreements concluded in 1974 and reproduced in IAEA document INFCIRC/203.

C. Legal arrangements

The terms and conditions of supply may broadly be categorized in two groups: those required by the supplying State as accepted by the receiving State, the Agency confining itself to the nominal position of a go-between entity - and those required by the Agency's statutory provisions concerning its rights and responsibilities to the extent relevant to its assistance. Accordingly, two types of legal instruments have been developed and used in a standard formulation by the Agency over the years:

- a Supply Agreement between the Agency and the receiving and supplying States, and
- a Project Agreement between the Agency and the receiving State.

Under the former Agreement, every obligation incumbent upon the Agency toward the supplying State in the supply transaction is ipso facto matched by a corresponding obligation of the receiving State toward the Agency. These concomitant obligations relate to such matters as acceptance of delivery of the supplied material, disclaimer of liability, payment of charges. Wherever the transfer of ownership is involved, it is effected through the Agency merely as a legal fiction. Actually, the receiving State is invariably empowered to take possession and ownership of the material on behalf of the Agency as well as on its own behalf; the Agency's liability as owner of the material does not thus arise during any interval. Provisions for settlement by arbitration of disputes are embodied in all Supply Agreements.

The Supply Agreement is incorporated by reference into a Project Agreement to the extent that the former instrument creates rights and obligations between the Agency and the receiving State.

The Project Agreement is designed to meet the Agency's statutory requirements as regards its prerogatives and responsibilities in providing assistance. Its content is broadly based on Article XI.F of the Statute which sets forth the points to be covered.

The Project Agreement specifies the project or installation for which the supplied material is allocated by the Agency, contains a peaceful use undertaking by the receiving State, provides for the application of relevant safeguards and safety measures and for the rights and protection of the Agency's safeguards and safety inspectors, and ensures that any scientific information developed as a result of the Agency's assistance be made available to it for the benefit of all Member States. The Project Agreement further incorporates by reference the clause on settlement of disputes as laid down in the Supply Agreement, with the proviso that any decision by the Board of Governors concerning the implementation of safeguards, safety requirements and the Agency's inspectors is to be given effect immediately, if it is so decided, pending the settlement of any dispute.

In addition, safeguards procedures are specified in an annex to the Project Agreement, unless there is an applicable Safeguards Agreement between the Agency and the receiving State, in which case safeguards are applied pursuant to the latter Agreement and no specific annex on safeguards implementation is required. The safety measures to be applied to an Agency-assisted project are also normally set out

in an annex to the Project Agreement, on the lines of the Agency's Safety Standards and Measures[7/].

With regard to the Supply Agreement, rather than limiting it to any one-time supply of a specific amount of nuclear material, some of them provide for the procurement of the material required for reactor operation over a five-year period[8/], thus avoiding the need for frequent additional supply arrangements.

In recent years, actually starting in 1978, the scope of the Supply Agreement has been expanded to cover also physical protection measures and restrictions on retransfer, storage, reprocessing or other alteration of the supplied nuclear material[9/] to meet the requirements of one main supplier - the United States - with whom most supply arrangements for Agency-assisted reactor projects have been concluded. This development reflects the corresponding requirements of the supplying State's legislation.

While earlier there was generally no termination clause in the Supply Agreement on the consideration that once fully executed it was practically no longer in force, as from 1978 also, the duration of such agreements has been specified to be as long as any supplied material remains in the territory or under the jurisdiction or control of the receiving State, or until such time as the Parties agree that such material is no longer usable for any nuclear activity relevant to safeguards control[9/].

7/ First published in 1960, revised in 1976 and published in IAEA document INFCIRC/18/Rev.1

8/ Five such Supply Agreements have been concluded. See IAEA documents INFCIRC/24/Add.4, INFCIRC/32/Add.3, INFCIRC/34/Add.4, INFCIRC/52/Add.1 and INFCIRC/136/Add.1.

9/ See e.g. the Supply Agreement reproduced in IAEA document INFCIRC/266, part I.

The Project Agreement, however, continues to be of indefinite duration in view of the Agency's continuing responsibilities in relation to an assisted project or activity, in particular in the implementation of safeguards and safety controls, and the receiving State's corresponding obligations toward the Agency that extend to any nuclear material produced through the use of the supplied material. Moreover, the Project Agreements concluded in recent years provide that in the event of non-compliance by the receiving State with the safeguards provisions and of its failure to take fully corrective action within a reasonable time as may be requested by the Board of Governors of the Agency, the Board may decide to apply any of the sanctions listed in Article XII.C of the Statute, ranging from suspension or termination of assistance to suspension of the non-complying State from the exercise of the privileges and rights of membership[10/].

In view of the close relationship between the Supply and Project Agreements as outlined above and in order to streamline the negotiation process, the Agency recently adopted the combination of such legal arrangements into a single instrument, wherever possible. This approach was first used more than ten years ago to simplify the requisite arrangements[11/]; however, it was not pursued in view of the concern of supplier States not to get involved in specific undertakings by, and obligations of a bilateral nature of, recipient States to the Agency, i.e. those relating to safeguards and safety controls. The advantages

---

10/ See e.g. the Project Agreements reproduced in IAEA document INFCIRC/266, part II, Article III, Section 6.

11/ See the Agreements reproduced in IAEA documents INFCIRC/143 and 162 respectively.

of such international controls now appear to be perceived with an increasing interest, and it may be assumed that the "combination approach" to legal arrangements for the international transfer of nuclear materials would be favoured as appropriate[12/].

D. Consideration by the Board of Governors

The criteria listed in Article XI.E of the Statute to govern consideration by the Board of Governors of a request for the Agency's assistance in supply arrangements connected with a proposed project or an ongoing activity also serve as the basis for the evaluation performed by the Secretariat. Therefore, on the basis of this evaluation accompanied by a recommendation of the Director General, together with his indication that the requesting and supplying States have agreed with the Agency on the requisite supply arrangements, the Board's approval has invariably been a short formality.

The criteria in question cover such matters as the usefulness of the project or activity, its technical feasibility, the adequacy of plans, funds and qualified personnel, the adequacy of applicable safety measures, the special needs of developing countries.

Two other factors are also enumerated in Article XI.E of the Statute: the inability of the requesting State to secure the necessary financing, and the equitable distribution of materials and resources available to the Agency. These considerations, however, are to be linked to the original concept of the Agency eventually becoming the custodian and supplier of nuclear materials entrusted to or owned

---

12/ See the combined Supply and Project Agreement reproduced in IAEA document INFCIRC/287.

by it as envisaged by Article IX of the Statute, the charges for which materials, including storage and handling charges, could result in an excess of revenues that may be used for assistance to Member States as the Board of Governors may determine with the approval of the General Conference, pursuant to Article XIV.F of the Statute. As the Agency has never had any materials in its possession or ownership, no financial assistance could ever be contemplated for the procurement of such items, even in small quantities, since the establishment of the Agency.

In the case of nuclear material transferred by the United States under supply arrangements made through the Agency, it may however be provided free of charge as part of the United States annual offers of gift material to the Agency, of up to US$ 50,000 dollars worth of special fissionable material to assist and encourage research on peaceful nuclear uses or for medical therapy. This has induced many developing countries to enter into supply arrangements with the Agency when the material needed for research and training reactors is to be obtained from the United States[13/]. Only on two occasions in the early years of the Agency's assistance, two other countries - Canada and the Soviet Union - supplied some materials through the Agency, and it was a sale in both cases[14/].

E. Implementation

For the implementation of a Supply Agreement, the further conclusion of a sale contract is required, which deals with the

---

13/ A list of Supply and Project Agreements is provided in the Annex hereto.

14/ See the Agreements reproduced in IAEA documents INFCIRC/3 and INFCIRC/53 respectively.

commercial details of the supply such as delivery and acceptance, price, transportation and other costs, payment procedure, transfer of title and responsibility. With respect to supply arrangements to which the United States is a party, which have been generally the case up to now, such a Supplemental Contract between the Agency, the recipient State and the United States incorporates by reference the corresponding provisions of the IAEA-USA Master Agreement Governing Sales of Source, By-Product and Special Nuclear Materials for Research Purposes[15/]. In the case of the procurement by the United States, through the Agency, of uranium enrichment services for two nuclear power plants, the particular terms and conditions of supply were specified in bilateral contracts between the supplier and the plant operators directly[16/].

The Agency's responsibilities under the Project Agreement mainly concern safeguards and safety controls; they are carried out as the project is being executed or the activity continued with the items supplied under the Agency's auspices. The Agency's right of securing any scientific information developed as a result of its assistance, though also embodied in the Project Agreement to conform to a statutory requirement, has over the years remained academic because almost all the projects involved relate to training and research reactors of a standard design in regard to which not much original research could be carried out.

It is in the area of nuclear safety and related matters that the Agency's technical help in connection with the implementation of

---

15/ Published in IAEA document INFCIRC/210. This Master Agreement of 1974 superseded the Master Contract of 1962 for Sales of Research Quantities of Special Nuclear Materials, reproduced in document INFCIRC/83, part II, Annex A.

16/ See the Agreements reproduced in IAEA documents INFCIRC/203 and Add.1, and INFCIRC/213 respectively.

Supply and Project Agreements has often been demanded and most appreciated, especially by developing countries. Safety advice and expertise have been provided by the Agency in the early stages of planning and siting and during the subsequent phases of construction and operation of a nuclear facility. The Agency's right of safety control over projects or activities assisted by it has, in practice, developed into and has been implemented through the broader concept of safety missions aimed at assisting Member States as far is desired by them while final determinations on safety issues remain under their responsibility[17/]. Thus, to date safety advisory missions have been sent to more than 50 countries, i.e. more than twice the number of Member States having Project Agreements with the Agency, and on the average about twelve such missions a year have been organized since 1973.

IV. Concluding remarks

In transactions concerning the international transfer of nuclear materials and in related supply arrangements made through the Agency, the latter has no say on any commercial issue involved for the simple reason that it has no stock of materials in its possession or under its control anywhere. Thus, the arrangements concluded under its auspices merely reflect the terms and conditions which the supplier States are in a position to impose to a large extent in view of their limited number. That, however, recipient States favour a trilateral or

---

17/ The concept of safety missions has been embodied in the Agency's Safety Standards and Measures, INFCIRC/18/Rev.1, 1976, section 5.

multilateral approach through the Agency may be motivated by political considerations as well as their wish to rely on the Agency for continued assistance. Though it has no leverage on the supplier States, the Agency's constant policy has been to assist the recipient States as much as is feasible within the ambit of its statutory provisions, with due consideration for the special needs of developing countries.

The performance of this limited role of an intermediary or broker has enabled the Agency to help about 20 Member States - all but three are developing countries - to secure fuel materials for nuclear reactors, in most cases for training and research purposes, and in three instances also for the operation of nuclear power plants. In this connection, the recipient States appear to value the advice and expertise on safety and safety-related matters which the Agency has been providing as part of, and in follow-up to, its assistance for appropriate assessment, review and determinations by the responsible national authorities.

Under its Statute, the Agency may assume another role in the procurement of nuclear materials - namely that of custodian and supplier of materials of its own or placed under its control for uses conforming to the Statute. The performance of this role presupposes that the Agency would be vested with commensurate resources to own and store materials donated to it or purchased by it, prior to selling or otherwise supplying them to Member States at the discretion of the Board of Governors. The choice of this role for the Agency did not however occur for it primarily depends on the

supplier States; their reluctance to the possibility of an international supplier competing with bilateral transactions in the supply of nuclear materials did not permit the Agency actually to come to that role.

Such a potentiality nonetheless remains enshrined in the Agency's Statute. And as convenient it could materialize, should the Member States agree on the issue. For an international organization hardly has any will of its own - it can only reflect the combined will of its members.

*

* *

A N N E X

Supply and Project Agreements concluded with the IAEA

Recipient	Project	Supplier	Material	Agreements	INFCIRC document
Argentina	Siemens SUR-100 University of Rosario	F.R.Germany	3750 g of 20% enriched uranium of US origin	13 March 1970	143
	RAEP reactor Ezeiza Atomic Centre Buenos Aires	USA	3268.4 g of 90% enriched uranium	2 December 1964	62
	"	USA	993 g of 90% enriched uranium	30 December 1965	62/Add.1
Chile	HERALD reactor Santiago	USA	10290 g of 93% enriched uranium	19 December 1969	137
Finland	FiR-1 reactor Institute of Technology	USA	13000 g of 20% enriched uranium and 5.16 g of 90% enriched uranium	30 December 1960	24 and Add.1
	"	USA	1850 g of 20% enriched uranium	8 July 1966	24/Add.2
	"	USA	1900 g of 20% enriched uranium	5 November 1967	24/Add.3

Recipient	Project	Supplier	Material	Agreements	INFCIRC document
Finland	FiR-1 reactor Institute of Technology Otaniemi	USA	23750 g of 20% enriched uranium and 3.4 g of 90% enriched uranium	27 November 1969	24/Add.4
	FINN sub-critical assembly Institute of Technology Otaniemi	USSR	30000 g of 10% enriched uranium	30 July 1963	53
Greece	GRR-1 reactor Nuclear Research Centre "Demokritos", Aghia Paraskevi Attiki	USA	1355 g of 90% enriched uranium	1 March 1972	163
	"	USA	1755 g of 90% enriched uranium	1 March 1974	163/Add.1
	"	USA	7000 g of 90% enriched uranium	12 October 1977	163/Add.2
Indonesia	TRIGA-II reactor Bandung Reactor Centre	USA	18025 g of 20% enriched uranium	19 December 1969	136
	"	USA	12000 g of 20% enriched uranium	14 September 1972	136/Add.1
	"	USA	3647.67 g of 20% enriched uranium	7 December 1979	136/Add.2

Recipient	Project	Supplier	Material	Agreements	INFCIRC document
Iran	UTRR reactor Teheran Nuclear Centre University of Teheran	USA	5585 g of 93% enriched uranium and 112 g of plutonium	7 June 1967	97
Japan	JRR-3 reactor Tokai Laboratory	Canada	3200 kg of natural uranium	24 March 1959	3
Malaysia	TRIGA-II reactor Tun Ismail Atomic Research Centre Bangi, Selangor	USA	24760 g of 20% enriched uranium and 7.6 g of 93% enriched uranium	22 September 1980	287
Mexico	TRIGA-III reactor Salazar	USA	20000 g of 20% enriched uranium and 4 g of 90% enriched uranium	18 December 1963	52
	"	USA	3860 g of 20% enriched uranium and 10800 g of 70% enriched uranium	4 October 1972	52/Add.1
	Model 9000 Nuclear Chicago sub-critical facility National Polytechnic Institute Mexico City	USA	2526.770 kg of natural uranium contained in 1400 fuel elements	20 June 1966	82

Recipient	Project	Supplier	Material	Agreements	INFCIRC document
Mexico	Model 9000 Nuclear Chicago sub-critical facility School of Engineering University of Zacatecas	USA	2519 kg of natural uranium contained in 1400 fuel elements	23 August 1967	102
	Siemens SUR-100 reactor University of Mexico	F.R. Germany	3750 g of 20% enriched uranium of US origin	21 December 1971	162
	Laguna Verde Nuclear Power Plant, Unit 1	USA	Uranium enrichment services during an initial period from 1976 to 1986	12 February 1974 (for a duration of 32 years)	203
	Laguna Verde Nuclear Power Plant, Unit 2	USA	Uranium enrichment services during an initial period from 1977 to 1987	14 June 1974 (for a duration of 33 years)	203/Add.1
Norway	NORA reactor */ Institute of Atomic Energy Kjeller	USA	1407 kg of 3% enriched uranium contained in 1000 fuel elements	10 April 1961	29

*/ The joint IAEA-Norwegian research program in reactor physics, initiated in 1961 with the zero-power reactor NORA, expired in 1968 pursuant to the Project Agreement of 10 April 1961 and the Project Extension Agreement of 8 April 1964, as further extended by the Amendment of 10 April 1967, reproduced in IAEA documents INFCIRC/29 and Add.2 and 3, respectively.

Recipient	Project	Supplier	Material	Agreements	INFCIRC document
Norway	NORA reactor Institute of Atomic Energy Kjeller	USA	1700 kg of 3.4% enriched uranium contained in 1200 fuel elements	8 April 1964	29/Add.2
Pakistan	PRR Reactor Pakistan Institute of Nuclear Science and Technology (PINSTECH), Rawalpindi	USA	5775 g of 90% enriched uranium and 112 g of plutonium	5 March 1962	34
	"	USA	4445 g of 90% enriched uranium	19 October 1967, as amended on 16 June 1971	34/Add.1 and 3
	"	USA	2 g of 93% enriched uranium	30 September 1969	34/Add.2
	"	USA	5000 g of 93% enriched uranium	14 June 1974	34/Add.4
	Karachi Nuclear Power Plant (KANUPP)	USA	17000 g of 10.5% enriched uranium (for booster rods)	17 June 1968	116
	"	USA	100 kg of 10.5% enriched uranium (for booster rods)	22 June 1971	116/Add.1

Recipient	Project	Supplier	Material	Agreements	INFCIRC document
Peru	Zero-power research reactor, Nuclear Research Centre, Lima	Argentina	14785.90 g of 20% enriched uranium of United States origin	9 May 1978	266
Philippines	PRR-1 reactor, Philippine Atomic Research Centre Diliman, Queson City	USA	3142 g of 93% enriched uranium	28 September 1966	88
	"	USA	1399 g of 93% enriched uranium	23 August 1968	88/Add.1
Romania	TRIGA dual-core reactor Romanian Institute of Nuclear Technology, Pitesti	USA	42000 g of 93% enriched uranium	30 March 1973, as amended on 24 July 1975	206 and Mod.1
	"	USA	16730 g of 93% enriched uranium	15 July 1975	206/Add.1
Spain	CORAL-1 zero-power fast reactor, Nuclear Energy Commission, Madrid	USA	11.56 kg of 90% enriched uranium	23 June 1967	99
Turkey	Sub-critical assembly Cekmece Nuclear Research and Training Centre, Istanbul	USA	104 kg of uranium enriched to 1.143%	17 May 1974	212

Recipient	Project	Supplier	Material	Agreements	INFCIRC document
Uruguay	URR reactor Nuclear Research Centre Montevideo	USA	16049.57 g of 20% enriched uranium, 1.68 g of 90% enriched uranium, and 79.98 g of plutonium	24 September 1965	67
Venezuela	RV-1 reactor Venezuelan Scientific Research Institute Caracas	USA	15256 g of 20% enriched uranium	7 November 1975	238
(Viet Nam)	TRIGA-II reactor Nuclear Research Centre Dalat	(USA)	(360 g of 20% enriched uranium)	(16 October 1967)*/	106
Yugoslavia	TRIGA-II reactor Nuclear Institute "Jozef Stefan", Ljubljana	USA	13000 g of 20% enriched uranium and 5 g of 90% enriched uranium	4 October 1961	32
	"	USA	1500 g of 20% enriched uranium	28 September 1965	32/Add.1
	"	USA	764 g of 20% enriched uranium	20 February 1968	32/Add.2

*/ These Agreements are no longer in force but are listed merely for historical purposes.

Recipient	Project	Supplier	Material	Agreements	INFCIRC document
Yugoslavia	TRIGA-II reactor Nuclear Institute "Jozef Stefan", Ljubljana	USA	6857 g of 70% enriched uranium and 3.4 g of 90% enriched uranium	30 December 1970 as amended on 29 December 1972 and 31 October 1974	32/Add.3 and Mod.1
	"	USA	1372 g of 70% enriched uranium	16 January 1980	32/Add.4
	Nuclear Power Plant Krsko, Slvovenia	USA	uranium enrichment services	14 June 1974 (for a duration of 33 years)	213
Zaire	TRICO reactor TRICO Centre of Lovanium University of Kinshasa	Belgium	10049.78 g of 20% enriched uranium and 3.44 g of 90% enriched uranium of United States origin	27 June 1962	37, part I
	"	USA	1400 g of 20% enriched uranium and 5.5 g of 90% enriched uranium	27 June 1962 as amended on 14 February 1968	37, part II, and Add.2
	"	USA	1.35 g of 93% enriched uranium	9 December 1970	37, Add.3
	"	USA	14500 g of 20% enriched uranium	15 April 1971	37/Add.4