

APPENDIX IX-E

NUCLEAR SUPPLIERS CONSULTATIONS - 1

by

Ted Greenwood

Suppliers Consultations - 1

Since the dawn of the nuclear age no student of nuclear matters has doubted that any country that learned enough about nuclear technology to operate a nuclear power industry would in the process learn a great deal that is relevant for the design and fabrication of nuclear weapons. With varying levels of success the international community has sought to respond to what has been perceived to be a threat to world peace and security from this overlap between peaceful and military uses of atomic energy. The great successes include the establishment of the international safeguards system of the International Atomic Energy Agency (IAEA), the Treaty for the Prohibition of Nuclear Weapons in Latin America and the Non-Proliferation Treaty (NPT). Within this same tradition have been efforts of nuclear supplier states to act in concert to minimize the likelihood that the diffusion of peaceful nuclear technology will encourage or make easier the spread of nuclear weapons.

The First Suppliers' Agreement

On August 22, 1974, Australia, Denmark, Canada, the Federal Republic of Germany, Finland, the Netherlands, Norway, the Soviet Union, the United Kingdom and the United States filed identical memoranda with the Director General of the International Atomic Energy Agency concerning "procedures in relation to exports of (a) source or special fissionable material, and (b) equipment and material designed or prepared for the processing, use or production of special fissionable material."¹ As stated by all these states, except the Federal Republic of Germany and the Netherlands which had at the time not yet ratified the Non-Proliferation Treaty, these memoranda were intended to coordinate the fulfillment of "commitments under Article III paragraph 2 of the Treaty on the Non-Proliferation of Nuclear Weapons not to provide such items to any non-nuclear-weapon State for peaceful purposes, unless the source or special fissionable material is subject

to safeguards under an agreement with the International Atomic Energy Agency." ² The documents relating to this agreement were distributed by the IAEA in INFCIRC/209, a copy of which is provided as Appendix A.

The agreed procedures and the so-called Trigger List was the result of several years of negotiation and represented the first major agreement on uniform regulation of nuclear exports by actual and potential nuclear suppliers. It had great significance for several reasons. It was an attempt to enforce strictly and uniformly the obligations of Article III paragraph 2 of the Non-Proliferation Treaty. It was intended to reduce the likelihood that as a result of competition in the sale of nuclear equipment and fuel cycle services, states would be tempted to cut corners on safeguard requirements. In addition, and very important in the light of subsequent events, it established the principle that nuclear supplier nations should consult and agree among themselves on procedures to regulate the international market for nuclear materials and equipment in the interest on non-proliferation. Notably absent from the list of participant actual or potential suppliers as from the list of parties to the NPT were France, India and the People's Republic of China. By 1974, however, French policy had changed to one of respect for the agreed-upon Trigger List and in all other matters related to nuclear exports to act as if she were a party to the NPT.

The 1976 Agreement

Within a year of the delivery of these memoranda a second series of supplier negotiations were underway. ³ This round, convened largely at the initiative of the United States, was a response to the Indian nuclear test of May 1974, mounting evidence that the pricing actions of the Organization of Oil Exporting Countries were stimulating third world and other non-nuclear states to initiate or accelerate their nuclear power programs, and recent contracts or continuing negotiations on the part of France and West Germany for the supply of enrichment *or* reprocessing facilities *to* third world states, The initial participants in these discussions, conducted in London under the veil of official secrecy, were Canada, the Federal Republic of Germany, France, Japan, the Soviet Union, the United Kingdom and the United States.

Two major issues *were* discussed in the series of meetings leading to a new agreement in late 1976. The first was whether and if so under what conditions technology and equipment for enrichment and reprocessing, the most sensitive parts of the nuclear fuel cycle from a weapons proliferation perspective, should be transferred to non-nuclear states. The United States, with support from several other participants was reported to argue in favor of a prohibition on such transfer and a commitment to reprocessing in multinational facilities. France had already signed contracts to sell a small reprocessing plant to Pakistan and South Korea and West Germany had agreed to sell technology and facilities for the full fuel cycle to Brazil. They successfully resisted the prohibition proposed by others. The second issue was whether transfers should be made to states unwilling *to* submit all non-military nuclear facilities to IAEA safeguards, or whether total industry safeguards should become a condition on sales.

On January 27, 1976, the seven participants in the negotiations exchanged letters endorsing a uniform code for conducting international nuclear sales. The major provisions of the agreement require that before nuclear materials, equipment or technology are transferred, the recipient state must:

1. pledge not to use the transferred materials, equipment or technology in the manufacture of nuclear explosives;
2. accept, with no provision for termination, international safeguards on all transferred material and facilities employing transferred equipment or technology, including any facility that replicates otherwise employs transferred technology;
3. provide adequate physical security for transferred nuclear facilities and materials to prevent theft and sabotage; and
4. agree not to retransfer the materials, equipment or technology to third countries unless they too accept the constraints on use, replication, security and transfer and unless the original supplier nation concurs in the transactions.

There is of course a problem in trying to impose such constraints on the diffusion of technology. Technical advances made by the recipient country may alter the initial technology to the point where it can be

reasonably claimed to be different technology. Such ambiguities are handled by specifying an arbitrary time period - reported to be twenty years - within which all related technology will be unambiguously considered to be transferred technology and after which differing interpretations may be possible. The basic obligation, however, is not limited in time. A copy of the news release of February 23, 1976 of the U.S. Arms Control and Disarmament Agency discussing these provisions is attached as Appendix B.

Evaluation of the 1976 Agreement

It is important to recognize what this suppliers' agreement does and does not do. It does not ban transfers to non-parties of the NPT OR to states that refuse to place all nuclear facilities under IAEA safeguards.* It also does not ban the export of reprocessing and enrichment facilities and equipment. Rather than deny states technology that is relevant to explosives programs, the agreement attempts to replace weakening technological barriers against nuclear proliferation with such institutional and political barriers as safeguards and governmental pledges.

It requires IAEA safeguards be applied to and a no-explosives-use pledge be associated with not only such facilities that are actually exported but also other facilities the recipient may build based on the same technology. This is a significant strengthening of the provisions previously applying to Trigger List equipment. The re-transfer provision not only precludes states acquiring technology with fewer constraints by retransfer but also gives the exporter a veto over what countries may receive retransfers. In this way any countries thought to be particularly high-risk can be prevented from obtaining help via an intermediary. The provisions also explicitly recognize the importance of physical security protection of nuclear materials and facilities and will strengthen the IAEA in its role as advisor on physical security matters to interested states.

Beyond the agreement's provisions themselves, its very existence and the process of negotiation that produced it have some significant implications.

*Ratification of the NPT or acceptance of international safeguards on all nuclear facilities has now been adopted unilaterally by Canada as a condition for the supply of reactors or uranium. Canada has also called on other suppliers to adopt comparable conditions of export.

The most important benefit is perhaps the strengthening of the international norm proscribing the acquisition of nuclear weapons by non-nuclear states. The importance that nuclear supplier states attach to the prevention of proliferation is indicated and symbolized by their agreement on uniform standards despite the rather considerable opportunities and incentives for each state to compete for sales in a rather tight and lucrative export market by demanding less stringent anti-proliferation requirements than other vendors. In addition, the process of negotiation and the publicity associated with it, were instrumental in causing the issues of nuclear proliferation and nuclear exports to be raised to the highest political levels within the governments of all participants. Rather considerable pressure could therefore be brought to bear on France and West Germany to adopt a policy more closely in line with other major exporters. While producing only partial (although still quite significant) changes before the major agreement on January 1976 was achieved, subsequent statements by both governments indicate continued movement closer to the American position and away from insistence on the right to export sensitive facilities. Finally, the existence of the supply negotiations made more likely, less difficult and less costly the application of American pressure on South Korea and Pakistan to abandon their plans to build reprocessing plants and increased the political cost for other states that might be contemplating acquiring reprocessing facilities.

On the negative side is the fact that the negotiations have involved only actual and potential nuclear suppliers. Having conducted the negotiations in official secrecy and totally outside the IAEA context, the parties have left themselves open to several criticisms by potential purchasing states. The first is that the suppliers are in violation of their obligations under Article IV Paragraph 2 of the NPT "to facilitate . . . the fullest possible exchange of equipment, materials and scientific and technological information for the peaceful uses of nuclear energy" and to "cooperate in contributing . . . to the further development of the application of nuclear energy for peaceful purposes, especially in the territories of non-nuclear-weapon States party to the Treaty, with due consideration for the needs of the developing areas of the world." The second possible criticism is that through the suppliers' agreement a group of industrialized states

have formed a nuclear cartel and conspired to promote the continued dependency on themselves of developing countries that will be prevented from acquiring industrial capability the importance of which for building modern industrial economies is demonstrated by the suppliers' own pursuit of such capability.

If such interpretations gain favor among potential recipients states, the suppliers' agreement could contribute to a weakening of the sense of bargain on which rests the acceptability of the NPT to many non-nuclear states. It could also weaken the American argument in international forums that cartelization is an inappropriate mechanism for organizing commodity markets. In addition, it could become a symbolic issue of contention in the context of North-South negotiations over the distribution of the world's resources, wealth, technological capabilities and power.

Current and Future Issues

As of November 1976, Belgium, Czechoslovakia, East Germany, Italy, the Netherlands, Poland, Sweden and Switzerland are reported to have adopted the suppliers' guidelines and joined the suppliers discussions.⁵ This raises the number of participants to fifteen and omits only Argentina, India and South Africa of those states potentially able to enter the nuclear equipment or services export market in the foreseeable future. There is still no indication that the IAEA will become involved, even to the extent of serving as a communications medium to other states as it did in the case of the 1974 Trigger List agreement. Possible items for future agendas of the suppliers' group include reopening the question of reprocessing and enrichment exports, establishing uniform non-proliferation provisions in Agreements for Cooperation and contracts leading to the supply of enrichment or reprocessing services, and multinational fuel reprocessing or spent fuel storage facilities.

Now that France and West Germany seem to have altered their own positions on the issue of sensitive technology exports, this question might be taken up again in the multinational forum. A total ban on the transfer of enrichment and reprocessing technology and equipment, if it were achievable, would be a very significant negotiating accomplishment. Except to the extent that it would further reinforce the norm

proscribing proliferation, however, it might not contribute very much to the objective of preventing non-nuclear states from obtaining the technical capabilities to produce weapons grade materials. Such a capability would be relatively easily acquired by any state with sufficient technical sophistication to sustain a domestic nuclear power industry. The technical demands for building small plutonium production reactors and a fuel reprocessing plant whose only purpose was to recover weapons grade plutonium from low burnup fuel are significantly less stringent than those required to sustain a commercial nuclear industry. Indeed, many third world nuclear states would be capable, completely on their own, of building a small, pilot plant scale, commercial reprocessing plant if one could not be purchased on the international market. Except for operational experience and industrial know-how of those who have actually operated plants, the technology for reprocessing is totally in the public domain. The great danger of a ban on the transfer of technology is that states determined to obtain a reprocessing facility may build one on their own, and then, if they are not parties to the NPT be under no obligation to the international community regarding safeguards or non-weapons-use.

I-f the suppliers decide that providing market incentives is a useful means of discouraging states from seeking their own sensitive fuel cycle facilities, they might take up questions such as the supply of enrichment and reprocessing services. Just as in the case of technology exports, in order to avoid competition among suppliers of services that encourages one state to impose less stringent non-proliferation-related conditions on its customers than another, agreement on uniform standards would be very useful. In addition, to satisfy those states who wish to dispose of spent fuel or who might turn to reprocessing to help manage their nuclear waste, the supplier states could act to create or encourage the creation of one or more spent fuel repositories under national or multinational control. These might be associated with reprocessing facilities or be independent. In the former case, agreement would have to be reached concerning whether or under what conditions recovered plutonium would be returned to the country from which it came.

1. **International Atomic Energy Agency, INFCIRC/209** p. 1.
2. **ibid.**
3. **David Binder, "6 Nuclear Lands Meet on Control"**, The New York Times, (June 18, 1975), p. 1.
4. **The Honorable Donald Jamieson, "Canada's Nuclear Policy"**, **Text of Statement on Motions Made in House of Commons**, Ottawa, 22 December 1976.
5. David Binder, **"15 Major Nuclear Nations Will Discuss Ways to Curb Spread of Ability to Make Atomic Arms"**, The New York Times, (November 9, 1976), p. 7.

APPENDIX A

IAEA INFCIRC/209

Communication Received from Members Regarding the
Export of Nuclear Material and of Certain
Categories of Equipment and Other Material



International Atomic Energy Agency

INFORMATION CIRCULAR

INFCIRC/209
'3 September 1974

GENERAL Distr.

Original: ENGLISH and
RUSSIAN

COMMUNICATIONS RECEIVED FROM MEMBERS REGARDING THE
EXPORT OF NUCLEAR MATERIAL AND OF CERTAIN
CATEGORIES OF EQUIPMENT AND OTHER MATERIAL

1. On 22 August 1974 the Director General received letters, all dated that day, from the Resident Representatives to the Agency of Australia, Denmark, Canada, Finland, Norway, the Union of Soviet Socialist Republics, the United Kingdom of Great Britain and Northern Ireland and the United States of America, relating to the commitments of these eight Members under Article 111, paragraph 2 of the Treaty on the Non-Proliferation of Nuclear Weapons[I]. In the light of the wish expressed at the end of each of those letters, their text is reproduced below as Letter I.
2. On the same day, the Resident Representatives, of Denmark and of the United Kingdom also addressed complementary letters to the Director General, the text of which is reproduced below as Letter II. On that day also the Resident Representative of the United States sent a complementary letter, the text of which is reproduced as Letter III.
3. Also on 22 August, the Resident Representatives of the Federal Republic of Germany, and of the Netherlands each addressed to the Director General a letter analogous to the above-mentioned Letters I and II, the text of which is reproduced below as Letter IV.
4. The attachments to the Letters I and IV, which consist in both cases of the same memoranda, are reproduced in the Appendix.

Letter I

I have the honour to inform you that the Government of . . . has had under consideration procedures in relation to exports of (a) source or special fissionable material, and (b) equipment and material especially designed or prepared for the processing, use or production of special fissionable material, in the light of its commitment under Article III paragraph 2 of the Treaty on the Non-Proliferation of Nuclear Weapons not to provide such

[1] Reproduced in document INFCIRC/ 140.

items to any non-nuclear-weapon State for peaceful purposes, unless the source or special fissionable material is subject to safeguards under an agreement with the International Atomic Energy Agency.

The Government of has decided to act in this context in accordance with the attached memoranda.

I shall be grateful if you will bring this information to the attention of all Members of the Agency.

Letter H

I have the honour to refer to my letter of today's date, and to inform you that, so far as trade within the European Community is concerned, the Government of will, where necessary, implement paragraphs 5 of the memoranda enclosed with that letter in the light of its commitments under the Treaties of Rome.

Letter 111

With reference to my letter of this date, concerning procedures of the Government of the United States of America in relation to exports of source and special fissionable material and of equipment and material especially designed or prepared for the processing, use or production of special fissionable material, I shall provide you shortly with additional information concerning the implementation by my Government of such procedures.

I would like to call attention to paragraph 6 of Memorandum B, enclosed with my letter, and to note that, in accordance with existing procedures of my Government, safeguards are required in relation to items of equipment and material exported from the United States of America, in addition to those specified in paragraph 2 of that Memorandum.

I shall be grateful if you will bring this information to the attention of all Members of the Agency.

Letter IV

I have the honour to inform you that the Government of has had under consideration procedures in relation to exports to any non-nuclear-weapon State for peaceful purposes of (a) source or special fissionable material, and (b) certain categories of equipment and material especially designed or prepared for the processing, use or production of special fissionable material.

The Government of has decided to act in this context in accordance with the attached memoranda. So far as trade within the European Community is concerned, the Government of will, where necessary, implement paragraphs 5 of the memoranda in the light of its commitments under the Treaties of Rome.

I shall be grateful if you will bring this information to the attention of all Members of the Agency.

APPENDIX

MEMORANDUM A

INTRODUCTION

1. The Government has had under consideration procedures in relation to exports of nuclear materials in the light of its commitment not to provide source or special fissionable material to any non-nuclear-weapon State for peaceful purposes unless the source or special fissionable material is subject to safeguards under an agreement with the International Atomic Energy Agency.

DEFINITION OF SOURCE AND SPECIAL FISSIONABLE MATERIAL

2. The definition of source and special fissionable material adopted by the Government shall be that contained in Article XX of the Agency's Statute. [1]

THE APPLICATION OF SAFEGUARDS

3. The Government is solely concerned with ensuring, where relevant, the application of safeguards in non-nuclear-weapon States not party to the Treaty on the Non-Proliferation of Nuclear Weapons (NPT)[2] with a view to preventing diversion of the safeguarded nuclear material from peaceful purposes to nuclear weapons or other nuclear explosive devices. If the Government wishes to supply source or special fissionable material for peaceful purposes to such a State, it will:

- (a) Specify to the recipient State, as a condition of supply, that the source or special fissionable material, or special fissionable material produced in or by the use of the reef, shall not be diverted to nuclear weapons or other nuclear explosive devices; and
- (b) Satisfy itself that safeguards to that end, under an agreement with the Agency and in accordance with its safeguards system, will be applied to the source or special fissionable material in question.

DIRECT EXPORTS

4. In the case of direct exports of source or special fissionable material to non-nuclear-weapon States not party to NPT, the Government will satisfy itself, before authorizing the export of the material in question, that such material will be subject to a safeguards agreement with the Agency, as soon as the recipient State takes over responsibility for the material, but no later than the time the material reaches its destination.

RETRANSFERS

5. The Government, when exporting source or special fissionable material to a nuclear-weapon State not party to NPT, will require satisfactory assurances that the material will not be re-exported to a non-nuclear-weapon State not party to NPT unless arrangements corresponding to those referred to above are made for the acceptance of safeguards by the State receiving such re-export.

[1] See also para. 6 below.

[2] Reproduced in document **INFCIRC/140**.

MISCELLANEOUS

6. Exports of the items specified in sub-paragraph (a) below, and exports of source or special fissionable material to a given recipient country, within a period of 12 months, below the limits specified in sub-paragraph (b) below, shall be disregarded for the purpose of the procedures described above:

(a) Plutonium with an isotopic concentration of plutonium-238 exceeding 80%;

Special fissionable material when used in gram quantities or less as a sensing component in instruments; and

Source material which the Government is satisfied is to be used only in non-nuclear activities, such as the production of alloys or ceramics;

(b) Special fissionable material 50 effective grams;
 Natural uranium 500 kilograms;
 Depleted uranium 1000 kilograms; and
 Thorium 1000 kilograms.

MEMORANDUM B

INTRODUCTION

1. The Government has had under consideration procedures in relation to exports of certain categories of equipment and material, in the light of its commitment not to provide equipment or material especially designed or prepared for the processing, use or production of special fissionable material to any non-nuclear-weapon State for peaceful purposes, unless the source or special fissionable material produced, processed or used in the equipment or material in question is subject to safeguards under an agreement with the International Atomic Energy Agency.

THE DESIGNATION OF EQUIPMENT OR MATERIAL ESPECIALLY DESIGNED OR PREPARED FOR THE PROCESSING, USE OR PRODUCTION OF SPECIAL FISSIONABLE MATERIAL

9 The designation of items of equipment or material especially designed or prepared for the processing, use or production of special fissionable material {hereinafter referred to as the "Trigger List" } adopted by the Government is as follows (quantities below the indicated levels being regarded as insignificant for practical purposes):

2.1. Reactors and equipment therefor:

2.1.1. Nuclear reactors capable of operation so as to maintain a controlled self- sustaining fission chain reaction, excluding zero energy reactors, the latter being defined as reactors with a designed maximum rate of production of plutonium not exceeding 100 grams ● per year.

2.1.2. Reactor pressure vessels:

Metal vessels, as complete units or as major shop-fabricated parts therefor, which are especially designed or

prepared to contain the core of a nuclear reactor as defined in paragraph 2. 1.1 above and are capable of withstanding the operating pressure of the primary coolant.

2.1.3. Reactor fuel charging and discharging machines:

Manipulative equipment especially designed or prepared for inserting or removing fuel in a nuclear reactor as defined in paragraph 2. 1.1 above capable of on-load operation or employing technically sophisticated positioning or alignment features to allow complex off-load fueling operations such as those in which direct viewing of or access to the fuel is not normally available.

2.1.4. Reactor control rods:

Rods especially designed or prepared for the control of the reaction rate in a nuclear reactor as defined in paragraph 2. 1.1 above.

2.1.5. Reactor pressure tubes:

Tubes which are especially designed or prepared to contain fuel elements and the primary coolant in a reactor as defined in paragraph 2. 1.1 above at an operating pressure in excess of 50 atmospheres.

2.1.6. Zirconium tubes:

Zirconium metal and alloys in the form of tubes or assemblies of tubes, and in quantities exceeding 500 kg, especially designed or prepared for use in a reactor as defined in paragraph 2. 1.1 above, and in which the relationship of hafnium to zirconium is less than 1: 500 parts by weight.

2.1.7. Primary coolant pumps:

Pumps especially designed or prepared for circulating liquid metal as primary coolant for nuclear reactors as defined in paragraph 2. 1.1 above.

2.2. Non-nuclear materials for reactors:

2.2.1. Deuterium and heavy water:

Deuterium and any deuterium compound in which the ratio of deuterium to hydrogen exceeds 1:5000 for use in a nuclear reactor as defined in paragraph 2.1. i above in quantities exceeding 200 kg of deuterium atoms for any one recipient country in any period of 12 months.

2.2.2. Nuclear grade graphite:

Graphite having a purity level better than 5 parts per million boron equivalent and with a density greater than 1.50 grams per cubic centimetre in quantities exceeding 30 metric tons for any one recipient country in any period of 12 months.

- 2.3.1. Plants for the reprocessing of irradiated fuel elements, and equipment especially designed or prepared therefor.
- 2.4.1. Plants for the fabrication of fuel elements.
- 2.5..1. Equipment, other than analytical instruments, especially designed or prepared for the separation of isotopes of uranium.

Clarifications of certain of the items on the above list are annexed.

THE APPLICATION OF SAFEGUARDS

3. The Government is solely concerned with ensuring, where relevant, the application of safeguards in non-nuclear-weapon States not party to the Treaty on the Non-Proliferation of Nuclear Weapons (NPT)[1] with a view to preventing diversion of the safeguarded nuclear material from peaceful purposes to nuclear weapons or other nuclear explosive devices. If the Government wishes to supply Trigger List items for peaceful purposes to such a State, it will:

- (a) Specify to the recipient State, as a condition of supply, that the source or special fissionable material produced, processed or used in the facility for which the item is supplied shall not be diverted to nuclear weapons or other nuclear explosive devices; and
- (b) Satisfy itself that safeguards to that end, under an agreement with the Agency and in accordance with its safeguards system, will be applied to the source or special fissionable material in question.

DIRECT EXPORTS

4. In the case of direct exports to non-nuclear-weapon States not party to NPT, the Government will satisfy itself, before authorizing the export of the equipment or material in question, that such equipment or material will fall under a safeguards agreement with the Agency.

RETRANSFERS

5. The Government, when exporting Trigger List items, will require satisfactory assurances that the items will not be re-exported to a non-nuclear-weapon State not party to NPT unless arrangements corresponding to those referred to above are made for the acceptance of safeguards by the State receiving such re-export.

MISCELLANEOUS

6. The Government reserves to itself discretion as to interpretation and implementation of its commitment referred to in paragraph 1 above and the right to require, if it wishes, safeguards as above in relation to items it exports in addition to those items specified in paragraph 2 above.

[1] Reproduced in document INFCIRC/140.

ANNEX

CLARIFICATIONS OF' ITEMS ON THE TRIGGER LIST

A. Complete nuclear reactors

(Item 2.1.1 of the Trigger List)

1. A "nuclear reactor" basically includes the items within or attached directly to reactor vessel, the equipment which controls the level of power in the core, and the components which normally contain or come in direct contact with or control the primary coolant of the reactor core.

2. The export of the whole set of major items within this boundary will take place only in accordance with the procedures of the memorandum. Those individual items within this functionally defined boundary which will be exported only in accordance with the procedures of the memorandum are listed in paragraphs 2. 1.1 to 2.1.5. Pursuant to paragraph 6 of the memorandum, the Government reserves to itself the right to apply the procedures of the memorandum to other items within the functionally defined boundary.

3. It is not intended to exclude reactors which could reasonably be capable of modification to produce significantly more than 100 grams of plutonium per year. Reactors designed for sustained operation at significant power levels, regardless of their capacity for plutonium production, are not considered as "zero energy reactors"

B. Pressure vessels

(Item 2.1.2 of the Trigger List)

4. A top plate for a reactor pressure vessel is covered by item 2. 1.2 as a major shop-fabricated part of a pressure vessel.

5. Reactor internals (e. g. support *columns* and plates for the core and other vessel internals, control rod guide tubes, thermal shields, baffles, core grid plates, diffuser plates, etc.) are normally supplied by the reactor supplier. In *some* cases, certain *internal* support components are included in the fabrication of the pressure vessel. These items are sufficiently critical to the safety and reliability of the operation of the reactor (and, therefore, to the guarantees and liability of the reactor supplier), so that their supply, outside the basic supply arrangement for the reactor itself, would not be common practice. Therefore, although the separate supply of these unique, especially designed and prepared, critical, large and expensive items would not necessarily be considered as falling outside the area of concern, such a mode of supply is considered unlikely.

C. Reactor control rods

(Item 2.1.4 of the Trigger List)

6. This item includes, in addition to the neutron absorbing part, the support or suspension structures therefor if supplied separately.

D. Fuel reprocessing plants

(Item 2.3.1 of the Trigger List)

7. A "plant for the reprocessing of irradiated fuel elements" includes the equipment and components which normally come in direct contact with and directly control the irradiated fuel and the major nuclear material and fission product processing streams. The export of the whole set of major items within this boundary will take place only in accordance with the

procedures of the memorandum. In the present state of technology only two items of equipment are considered to fall within the meaning of the phrase "and equipment especially designed or prepared therefor". These items are:

- (a) Irradiated fuel element chopping machines: remotely operated equipment especially designed or prepared for use in a reprocessing plant as identified above and intended to cut, chop or shear irradiated nuclear fuel assemblies, bundles or rods; and
- (b) Critically safe tanks (e. g. small diameter, annular or slab tanks) especially designed or prepared for use in a reprocessing plant as identified above, intended for dissolution of irradiated nuclear fuel and which are capable of withstanding hot, highly corrosive liquid, and which can be remotely loaded and maintained.

8. Pursuant to paragraph 6 of the memorandum, the Government reserves to itself the right to apply the procedures of the memorandum to other items within the functionally defined boundary.

E. Fuel fabrication plants

(Item 2.4.1 of the Trigger List)

9. A "plant for the fabrication of fuel elements" includes the equipment:

- (a) Which normally comes in direct contact with, or directly processes, or controls, the production flow of nuclear material, or
- (b) Which seals the nuclear material within the cladding.

10. The export of the whole set of items for the foregoing operations will take place only in accordance with the procedures of the memorandum. The Government will also give consideration to application of the procedures of the memorandum to individual items intended for any of the foregoing operations, as well as for other fuel fabrication operations, such as checking the integrity of the cladding or the seal, and the finish treatment to the solid fuel.

F. Isotope separation plant equipment

(Item 2.5.1 of the Trigger List)

11. "Equipment, other than analytical instruments, especially designed or prepared for the separation of isotopes of uranium" includes each of the major items of equipment especially designed or prepared for the separation process.

APPENDIX B

U.S. Arms Control and Disarmament Agency
Press Release of February 23, 1976

U.S. Arms Control and Disarmament Agency

76-3

Please HOLD for release
10: 00 A. M. EST
Monday, February 23, 1976

In a statement prepared for delivery today before the Senate Subcommittee on Arms Control, international Organizations and Security Agreements (Committee on Foreign Relations) Dr. Fred C. Ikle (Ee-Clay) , Director of the U.S. Arms Control and Disarmament Agency, reported for the first time on two important U.S. initiatives to reduce the threat of further proliferation of nuclear weapons.

Following discussions with other exporters of nuclear equipment and technology, the United States will now follow a comprehensive set of principles governing nuclear exports. These are intended to serve as a further barrier to nuclear proliferation without hindering civil nuclear development to meet the world's energy needs. These rules involve more widespread application of International Atomic Energy Agency safeguards, strengthened requirements for physical security measures, restraint in exports of specified sensitive technologies, and stronger provisions governing the transfer and retransfer of equipment and technology.

The second U.S. initiative concerns promotion of multinational fuel-cycle centers as a long-term concept to head off the severe dangers of nuclear proliferation and terrorism stemming from further national development of reprocessing Plants. Emphasizing that our intention is not to Promote reprocessing, Dr. Ikle reported on IAEA and U.S. studies which have been initiated to find practical, economic alternatives to such national reprocessing.

STATEMENT OF FRED C. IKLE, DIRECTOR

United States Arms Control and Disarmament Agency
before the
Subcommittee on Arms Control, International
Organizations and Security Agreements
Committee on Foreign Relations
United States Senate
Monday, February 23, 1976

Mr. Chairman, and members of the Committee, I greatly appreciate this opportunity to appear before you.

This morning I would like to comment on two kinds of initiatives undertaken by the Arms Control and Disarmament Agency and the Executive Branch to deal with nuclear proliferation.

The first concerns nuclear exports, the second, multinational fuel centers.

The United States over the years has sought to work with other countries to insure that civil nuclear exports would be used only for peaceful purposes. We have recently had a number of bilateral and multilateral discussions with nuclear exporters to develop common rules on safeguards and export controls. As a result, the United States together with other exporters has decided to apply certain principles to our future nuclear exports. Most of these are consistent with current U.S. practice; some are new. All are designed to inhibit the spread of nuclear weapons while permitting nuclear exports of equipment to meet the world's growing energy needs. These principles include the following:

- 1- The requirement that recipients must apply international (IAEA) safeguards on all nuclear imports.
- 2- The requirement that the importer give assurances not to use these imports to make nuclear explosives for any purpose -- whether called "peaceful" or not.
- 3- The requirement that the importer have adequate physical security for these nuclear facilities and materials to prevent theft and sabotage.
- 4- The requirement for assurances that the importers will demand the same conditions on any retransfer of these materials or types of equipment to third countries.

Now, on the question of more sensitive exports -- those which involve fuel enrichment, spent fuel reprocessing, and heavy water. We intend to use restraint in supply of these exports, particularly when we think they could add to the risk of proliferation,

In addition, in cases where we do export sensitive technology, we require that the importers obtain our consent before they re-transfer any sensitive nuclear technology to a third country.

These are the minimum standards the US will apply to its nuclear exports. We are prepared to be more stringent when appropriate.

Together with other leading exporters of nuclear technology, we are also committed to follow-up efforts along three lines.

1. To promote international cooperation in exchanging information on physical security, on measures of protection of nuclear material in transit, and on measures for recovery of stolen nuclear material and equipment;
2. To improve the effectiveness of IAEA safeguards through special efforts that support that organization, and
3. To encourage the designers and makers of sensitive equipment to construct it in a way that will aid safeguards.

Mr. Chairman, the second kind of initiatives we are undertaking have to do with multinational fuel-cycle centers.. The idea for such centers was promoted in the final declaration of the Review Conference of the Non-Proliferation Treaty held in Geneva last year. At the United Nations General Assembly last autumn, Secretary Kissinger stressed the grave danger of national reprocessing plants to nuclear proliferation and thus to world security, and proposed establishment of multinational fuel-cycle centers as a safer alternative to national control of reprocessing facilities.

The International Atomic Energy Agency has now begun a major study of the regional multinational center concept; the United States actively supports it, and I expect it will be completed sometime next year. Preliminary results suggest that

large scale centers could bring significant economies of scale compared with smaller national reprocessing plants. But more important from my perspective -- these centers may be an attractive alternative to national reprocessing plants, particularly for countries with more limited nuclear capacity. This alternative then may encourage countries to forego national reprocessing facilities and work together. This would make safeguards -- and the protection of dangerous nuclear materials more effective. In short, if the concept proves successful, multinational centers should reduce the dangers of further nuclear proliferation and of nuclear terrorism.

The Arms Control and Disarmament Agency has strongly supported the IAEA study by supplying experts and consultants. We have also begun our own study on a broad range of related questions. One such question is whether new approaches to storing spent fuel could forestall premature national reprocessing; another is how to better manage transportation of nuclear materials. We are also beginning a preliminary study of the practical steps the U.S. -- both government and industry -- might take to advance the concept of multinational centers abroad,

I was asked recently why ACDA wishes to build reprocessing plants. The question indicates a misunderstanding of our objectives. Our efforts for multinational approaches should not be misunderstood: we do not wish to promote the reprocessing of Plutonium. On the contrary, Our hope, in all these efforts, is to investigate practical, economic alternatives to national reprocessing, and thereby reduce the growing dangers of nuclear proliferation,

Mr. Chairman, this completes my initial remarks. I would be pleased to answer your questions concerning these initiatives or any other aspects of our non-proliferation efforts, past or present.

APPENDIX IX-E

NUCLEAR SUPPLIERS CONSULTATION - 2

by

Stieff Research and Development Co., Inc.

Suppliers Consultations - 2

In the Fall of 1974 the United States began a series of bilateral discussions with a small group of nuclear supplier states and potential nuclear supplier states for the purpose of determining whether a common set of principles could be evolved which would govern the action of the States in the area of nuclear exports. These discussions, which were conducted under a cloak of secrecy which has continued until this day, led to the formation of what is now known as the Nuclear Suppliers Group. Although the secrecy which has surrounded these activities has extended to the members of the Group, it is now generally conceded that the United States, Canada, the USSR, Japan, France, Germany and the United Kingdom were involved in these early discussions.

The initial concerns of the nuclear suppliers found their first formal expression in the final declaration of the NPT Review Conference (40) held in Geneva from May 5th to the 30th of 1975. This declaration, accepted by consensus urged that:

- (a) "in all achievable ways, common export requirements relating to safeguards be strengthened, in particular by extending the application of safeguards to all peaceful nuclear activities in importing states not Party to the Treaty;
- (b) "such common requirements be accorded the widest possible measure of acceptance among all suppliers and recipients;
- (c) "all Parties to the Treaty should actively pursue their efforts to these ends."

The Conference also urged that actions be pursued to elaborate further, within the IAEA, concrete recommendations for physical protection of nuclear materials in use, storage or transit with a view to ensuring a uniform, minimum level of protection and called upon the States to give the earliest possible effective application to the IAEA's recommendations within the framework of their respective physical protection systems.

Finally, the Conference noted that a number of nuclear supplier states had adopted certain minimum, standard requirements for IAEA safeguards in connection with their exports to non-nuclear weapon States not Party to the Treaty and the Conference attached particular importance to the condition, established by those States of the undertaking not to divert to nuclear weapons or other nuclear explosive devices.

When it is recalled that the attendance at the Convention included 58 States Party to the NPT, and seven States signatory but not Party as well as seven additional States with representation, the significance of the consensus can be more fully appreciated. Only France among the nuclear supplier states is not now a part to the Treaty.

The efforts of the nuclear suppliers, including France, to develop a common export and safeguards policy has been described by both Mr. George Vest, Director of Politico-Military Affairs (41) and Secretary Kissinger (42) in testimony before Congress. Although their remarks were severely constrained by the confidential nature of the suppliers consultations they did announce the adoption by the United States of certain minimum principles. These principles include:

- provisions for the application of IAEA Safeguards on all nuclear exports.

- prohibition of the use of any U.S. export to make any nuclear explosive device - peaceful or not.
- requirement of adequate physical protection of nuclear facilities and material against theft or sabotage.
- requirement for similar safeguards and physical protection on any re-export or transfer of these materials or equipment to third countries.
- requirement of special conditions governing sensitive materials and technology.

The contribution of the NPT Review Conference declarations to the formulations of the export and safeguards principles of the nuclear suppliers is obvious. These principles, which the United States has announced it will apply to its exports, is a unilateral declaration. The announcement does not reflect a treaty commitment and is not a legal or binding obligation. However, the United States as well as the other nuclear suppliers do have a substantial political investment in these principles and would not abandon them lightly.

The effectiveness of this informal arrangement will be determined most probably on the basis of the actions which the other Nuclear Supplier States take with regard to the safeguard conditions which they apply to the export of their nuclear materials, equipment and technology. The recent decision by the French president, Monsieur Giscard d'Estang to form a cabinet level committee to coordinate and supervise French nuclear exports is a very encouraging development. The impact of this development on French nuclear export policy will be followed with great interest.

An important statement of Canadian nuclear policy was made in the House of Commons on December 22, 1976. This unilateral export policy declaration states that:

"Canadian reactors and uranium shipments to non-nuclear weapon states under future contracts will be restricted to those which ratify the Non-proliferation Treaty or otherwise accept international safeguards on their entire nuclear programme. It follows from this that Canada will terminate nuclear shipments to any non-nuclear state which explodes a nuclear device."

Existing Canadian export policy included a binding assurance that Canadian materials and technology could not be used for explosive purposes. The new policy closes a gap by including not only what a State might receive from other than Canadian suppliers but also what it might do on its own, as in the case of India. In this way Canada will have an assurance that its nuclear customers will have been selected only from those countries which have made a clear and unequivocal commitment to the non-proliferation of nuclear weapons.

In concluding the statement to the House, Canada urged the other suppliers to take a collective decision to:

"restrict their nuclear exports to those non-nuclear weapon states which have ratified the Non-proliferation Treaty or otherwise accept full-scope safeguards. We regret that to-date it has not been possible to reach a collective decision to this effect . . . With this announcement I am calling on other nuclear exporters to review their own export policies not in the light of commercial gain but in the interest of maintaining a safe and secure world."

Prior to the Canadian statement, on October 28, 1976, President Ford issued a major announcement on U.S. nuclear policy (8, op. cit.). This document, the product of intense debate and negotiation within the Executive Branch of the Government reflects and implements in many ways the declarations of the NPT Review Conference and the principles developed during the supplier consultations. Above all, it reflects a renewed and urgent concern with the dilemma of the fissionable atom and the clear threat to the security of all that will accompany the continued spread of nuclear weapons and their technology around the world.

President Ford announced a decision to greatly accelerate U.S. initiatives in conjunction with both nuclear supplier and consumer nations to control the spread of plutonium and technologies for separating plutonium and proposed a three-year moratorium on the export of reprocessing and enrichment technologies and facilities. New criteria were also announced for determining whether to expand or enter into new agreements for nuclear cooperation which include:

- Adherence to the NPT which will be a strong positive factor.
- Willingness to submit to full fuel cycle safeguards pending adherence to NPT will receive positive recognition, as will
- Willingness to forego or postpone decisions to establish a national reprocessing or enrichment plant, or
- Willingness to participate in the storage of spent fuel and separated plutonium under an international regime.

President Ford has also directed the Secretary of State to pursue vigorously the problem of physical security and a possible international convention as

well as the substantial strengthening of the IAEA safeguards System. Finally, the President, addressed the question of sanctions against States which violate their nuclear safeguards agreements. The minimum U.S. response regardless of whether the diverted material was of U.S. origin would be the immediate termination of our agreements for cooperation and fuel supply. Additional steps are implied not necessarily related to nuclear matters, including consultations with all interested nations to determine appropriate additional action.

It is to be hoped that the remaining nuclear suppliers will issue similar statements of their revised and strengthened export policies. Such concerted action may be increasingly difficult to obtain.

Recently, it has been reported in the press that the membership of the Nuclear Suppliers Group has been substantially expanded to include the Netherlands, Belgium, Sweden, the German Democratic Republic, Poland and Czechoslovakia.

It seems clear that the larger Group could consolidate many of the gains that have been made to date and that this Group might consider some additional non-proliferation initiatives. The enlargement of the Group is not, however, without some drawbacks; the most obvious being the increased difficulty in obtaining a consensus with States with very diverse interests which include both export and import of nuclear materials and technology. The informal nature of the suppliers consultations, however, may provide an essential ingredient in the difficult process of changing long standing national policies.