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UNITED STATES ARMS CONTROL AND DISARMAMENT AGENCY  
Washington, D. C.

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June 4, 1964

MEMORANDUM FOR THE COMMITTEE OF PRINCIPALS

SUBJECT: Cutoff of Fissionable Material Production and  
Transfer to Peaceful Uses as Separable Measures

The attached paper reflects the discussion of the meeting of Deputies of June 4. This paper, together with the views of the other agencies on this question, will be submitted to the White House for approval for use at the Eighteen Nation Disarmament Conference.

*Adrian S Fisher*

Adrian S. Fisher  
Acting Director

Attachment

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UNITED STATES ARMS CONTROL AND DISARMAMENT AGENCY

DMP # \_\_\_\_\_  
June 4, 1964

EIGHTEEN-NATION DISARMAMENT COMMITTEE  
US DISARMAMENT MEASURES PAPER # \_\_\_\_\_

CUTOFF OF PRODUCTION AND TRANSFERS OF FISSIONABLE MATERIALS  
AS SEPARABLE MEASURES

I. The Problem

A. To set forth the US position on a cutoff of production of fissionable material for use in weapons and the transfer of specified quantities of weapons grade U-235 to peaceful purposes as associated separate measures prior to agreement on Stage I of a treaty on general and complete disarmament. (See also DMP #4/Rev. 3 "Fissionable Material (GCD)" and DMP #19 "Non-Dissemination of Nuclear Weapons.")

II. US Position

A. The US is willing to agree to a cutoff of production of fissionable material for use in weapons as a separate measure prior to agreement on Stage I and establishment of the IDO in the manner envisaged in the US Treaty Outline.

B. An outline of a possible system of verification for a cutoff agreement as it would apply to the nuclear powers is contained in Annex A.

C. The US believes that provision should be made for accession to a cutoff agreement by the non-nuclear powers, who would undertake an obligation not to produce fissionable material for use in weapons. The undertaking would be verified by IAEA or other suitable inspection procedures. In presenting this position the Delegation should state clearly that the verification procedures adequate for nuclear powers might not prevent a non-nuclear country with a large nuclear energy program

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from diverting some fissionable material to weapons uses, so that verification procedures may be somewhat different for non-nuclear than nuclear powers.

D. The US also proposes that specified quantities of weapons grade U-235 be transferred to peaceful purposes on a reciprocal basis with the Soviet Union. The U.S. would not agree to such a transfer except in association with a halt in production of fissionable material for use in weapons, but would agree to a halt in production of fissionable material for use in weapons without a transfer agreement.

### III. Discussion

A. If the cutoff were agreed, even if limited only to the nuclear powers, it would have the following advantages:

1. It would slow the arms race by limiting the quantity of fissionable material available for further nuclear weapons of all kinds. The Soviet Union has attacked the US proposal for a freeze on strategic nuclear delivery systems on the grounds, inter alia, that the arms race would be transferred to the area of tactical nuclear weapons. An agreed cutoff of the production of fissionable material for use in weapons would limit the quantity of fissionable material available for tactical weapons systems and also antiballistic missile systems.

2. It could help reduce the spread of nuclear weapons by having a restraining effect on nations which might be considering a national nuclear weapons program.

B. In view of the benefits described in paragraphs A. 1. and 2., the US would be willing to consider a cutoff relating only to nuclear powers. However, the inclusion of as many non-nuclear powers as possible in any agreement would make the agreement a much more powerful means for inhibiting the spread of nuclear weapons.

C. (For Delegation's background use or private discussion within Western Four only: Adherence of France and Communist

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China to any cutoff agreement seems quite unlikely at the present time. The United States would be willing to agree to a cutoff including only the US and the USSR, although presumably the UK would also be included in any minimum agreement. The absence of France and Communist China would need to be tacitly understood and accepted by both sides. If the Soviet Union were willing to agree to a cutoff we should not permit the non-participation of France and China to be an obstacle, particularly if the agreement included a withdrawal clause as suggested in paragraph E.4. below which would permit the USSR to withdraw if it felt that French stockpiles were increasing to the point where they could pose a substantial additional threat to the Soviet Union, and would permit other countries to withdraw if they felt it necessary to respond to Chinese acquisition of weapons.)

D. The US has also stated that it is willing to approach the problem of reducing the quantities of fissionable material produced for use in weapons by mutual cutbacks in production with appropriate inspection. (See DMP #19 for details.)

E. The US suggests that a cutoff agreement should include the following elements:

1. Each party would agree to halt, prohibit and prevent the production, at facilities under its jurisdiction and control, of fissionable material for use in nuclear weapons. This provision could include both the obligation of the nuclear powers to cut off production of fissionable material for use in weapons and the obligation of the non-nuclear powers not to commence to produce fissionable material for use in weapons. (To further elaborate on this point delegation may wish to draw on section II of Annex A, which describes the nature of the cutoff.)

2. Each party would also agree to refrain from causing or participating in or rendering assistance for the purpose of the production anywhere of fissionable material for use in nuclear weapons. This provision would also be meaningful for both

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nuclear and non-nuclear powers, as it is conceivable that a non-nuclear state might, under certain circumstances, assist another state in the production of fissionable material for use in weapons.

3. Each party would agree to accept appropriate inspection.

4. The agreement would need to contain some sort of withdrawal clause, perhaps similar to that in the Test Ban Treaty.

F. 1. The United States has proposed that, in association with a halt in the production of fissionable material for use in weapons, there be a transfer by the United States and the Soviet Union of agreed quantities of weapons grade U-235 to peaceful purposes. In the context of the US Treaty Outline, the United States first proposed that the US and USSR each transfer 50,000 kilograms of weapons-grade U-235 to non-weapons uses. (ENDC/PV 2, p.21). The US in April 1963 privately indicated to the Soviets a new position on this matter, which was made public August 14, 1963. This position was stated on August 14, 1963 (ENDC/PV 151, pp. 11-12 attached as Annex B), was reaffirmed on Feb. 13, 1964 (ENDC/PV 166 p. 17), and may be reaffirmed again by the delegation at its discretion. It should be stressed that the US advanced the 60-40 ratio only as an example of a possible arrangement, that the US position is flexible with regard to the amounts to be transferred, and that the US is willing to consider any reasonable Soviet counter-proposal.

2. To emphasize the importance of US transfer proposal the Delegation may use figures put forward by US in ENDC February 13, 1964, attached as Annex C (ENDC/PV 166 p. 18).

3. The Delegation should bear in mind that, if the USSR should show any serious interest in the idea of the transfer of fissionable material to peaceful purposes, additional flexibility of the US position is contained in the memorandum

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of November 20, 1962, which was approved by the President.  
(Relevant portions are contained in Annex D.)

4. The US proposes that the transferred materials be placed under safeguards and inspection by an international organization, possibly the IAEA, either in stockpiles or at facilities in which they would be utilized for peaceful purposes. (FYI: Under this proposal a country would have an obligation to permit inspection of any facility using transferred material. However, to the extent that peaceful facilities have not been brought under inspection as provided in Annex A, the host country could avoid inspection by using fissionable material from permitted production rather than transferred material. In that event, no additional facilities would be opened to inspection in that country beyond the necessary establishment of safeguarded stockpiles. If the question is raised, the Delegation may make this point privately to other Delegations. END FYI)

5. Such transfers would greatly increase the benefits which would be derived from a cutoff agreement, as stockpiles of fissionable material for use in weapons would actually be decreased, thus reinforcing the advantages of a cutoff stated in paragraph III A above.

6. The Delegation may further state that, once a first measure involving cutoff and transfer had been agreed, it could be hoped that further verified transfers could take place to further reduce the existing stockpiles of fissionable materials for use in weapons. (FYI: No schedule for subsequent transfers has been devised, and until some indication of Soviet interest in the transfer proposal has been received we should not put forward any concrete suggestions. END FYI)

7. (For Delegation and private Western Four Discussion only: The UK has repeatedly suggested to the US that at least some of the materials to be transferred be taken from nuclear weapons. From a presentational standpoint such a change in the US position would enjoy certain advantages, although from a military standpoint the change would be of minimal significance and the problems of verification appear to be substantial.)

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4 June 1964  
ANNEX A

INSPECTION OF A FISSIONABLE MATERIAL CUTOFF

(Delegation may, at its discretion, table this Annex as a document of the ENDC, omitting the FYI portions. It has been determined that the Annex is unclassified if the FYI portions are omitted.)

I. INTRODUCTION:

A. This paper describes the inspection of nuclear powers under a cutoff of fissionable material production for use in weapons.

B. The possibility should be explored of application by the IAEA of the procedures described below for the inspection of declared facilities, as might be agreed in consultation with that organization. It is recognized that such a program would require the strengthening of IAEA organization and procedures. Inspection to provide assurance that activities contrary to the agreement were not being conducted at undeclared facilities would be conducted on an adversary basis.

II. NATURE OF CUTOFF

A. Production of fissionable material for use in weapons will be prohibited. Production of fissionable material will be permitted for purposes other than use in weapons, such as research, power and propulsion reactors, explosions for peaceful purposes, and foreign non-weapon uses. (FYI: Production of tritium for weapon replenishment as well as for non-weapon uses will be permitted, but U-235 required to fuel reactors for producing tritium for weapon replenishment will be obtained from existing stockpiles. If questioned, Delegation may so state privately to Soviets and Western Four. Tritium is a crucial material in the production of many nuclear weapons.

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It has a rather short half-life of 12 years, so it is important that the production for weapon replenishment continue. It is not a fissionable material but a fusionable material, hence continued production of tritium is not an exception or contradiction to our proposal to end production of fissionable material for use in weapons. Delegation should avoid public discussion of tritium problem but may use this information privately if necessary. Since a verification or monitoring system for tritium is currently under study but has not been resolved, the Delegation should not discuss what verification for tritium, if any, there would be, even in private discussions. END FYI)

B. Facilities such as fuel fabrication and chemical processing plants will remain in operation to the extent necessary to support allowed production and use.

### III. VERIFICATION REQUIREMENTS

A. Inspection of a nuclear power should provide a high degree of assurance that no violation could take place that would result in a significant increase in its existing stockpile of material available for use in weapons. Under a cutoff agreement, many of the existing fissionable material production plants of the nuclear powers would be shut down. The inventory and yearly production of fissionable material necessary for allowed uses would be small relative to present stocks of fissionable material, and hence diversion or illegal production for weapons uses would have to be substantial in order significantly to increase existing stocks.

B. As peaceful uses grow over a period of time and involve substantially larger quantities of fissionable material, or if existing weapon stockpiles are substantially reduced, a given amount of undetected diversion or illegal production may represent a greater security risk; hence, periodically the inspection outlined here will have to be reviewed to determine the need for revision, both as to inspection provisions and facilities subject to inspection.

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#### IV. INSPECTION PROVISIONS

##### A. Declarations

1. Each nuclear power will declare, with annual revisions as appropriate:

(a) By individual identification and location, all U-235 separation plants, chemical separation plants, and reactors, with the initial declaration of reactors to consist of those of 100 or more thermal megawatts.

(b) The production of fissionable material required for allowed uses and schedules for production at each operating facility.

2. Each nuclear power would have the right to question the declaration of any other nuclear power and, if the other party does not justify its declaration to the satisfaction of the questioning party, to withdraw from the agreement. (FYI: Unilateral means would be used to provide necessary assurance that all facilities were declared and that declared production requirements were reasonable. The inspection provisions mentioned in paragraph B.3. below would also deter incorrect declarations. END FYI)

##### B. Inspection Procedures

###### 1. Shutdown Production Facilities

(a) The inspection of a shutdown facility is comparatively simple and foolproof. The start-up and shut-down of a significant part of a production complex are difficult and time consuming operations, and inspections carried out with little (at most a few days) advance warning should suffice to detect any effort to change the status of these facilities.

(b) An initial inspection would be made to identify each plant in this category and ensure that it has in fact been shut down. After confirmation by the initial

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inspection that the plant has been shut down, subsequent inspections would be made at appropriately spaced but irregular intervals with little advance warning to ensure that the plant continued in a shut-down status.

2. Operating Facilities

(a) Mines and Refineries

No declaration or inspection of mines or refineries would be made.

(b) U-235 Separation Plants

(i) A U-235 separation plant capable of producing enriched U-235 can represent a potential for diversion or illegal production of significant amounts of fissionable material suitable for use in weapons. The inspection objective would be to ensure that only declared U-235 separation plant buildings are operating and that they are operating within the declared levels; i.e., that only agreed quantities of material of stated enrichment are being produced.

(ii) Inspection would involve: (1) Ground access at the perimeter of the process buildings, with continuous examination of the perimeters; (2) measurement of electrical power input to the plant; and (3) measurement of perimeter uranium input and declared product output, and uranium tails, for uranium content and U-235 content.

(iii) This inspection will permit an estimate of the U-235 production potential adequate at present to assure against diversions which would be significant relative to existing stocks. Measurement of U-235 product would provide current information concerning the quantities available for allowed uses.

(iv) If the U-235 produced is stored until it is needed, the storage sites would be monitored and the U-235 input and output would be recorded.

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## (c) Reactors

(i) The nuclear powers would agree to accept on a phased basis IAEA inspection\* or similar inspection of their reactors, starting with reactors of 100 or more thermal megawatts. (FYI: When and whether we would propose extending inspection to smaller reactors will depend mainly on reactions of Soviets and other countries to our proposal. Delegation, at its discretion, may privately indicate to Western Four and Soviets that no direct inspection would be applied to military propulsion or military power reactors, although declarations of quantities of fissionable materials required for permitted uses and measurement of feed into the chemical separation plants would give some indication of the quantities of material being utilized or produced in such reactors. END FYI)

(ii) All fissionable material discharged from reactors would be processed in declared chemical separation plants.

## (d) Chemical Separation Plants

(i) The products of chemical separation will be plutonium or U-233 produced during operation of reactors and the uranium not consumed during its use as fuel. The plutonium, the U-233, and possibly the uranium fuel (depending upon its enrichment) are potentially useful in weapons, and hence close monitoring of this activity is required.

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\* This provides for declarations of reactor characteristics, design review, specific activities of inspectors, and a frequency of inspection and reporting adequate to ensure that fissionable material is not diverted to prohibited uses.

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(ii) Inspectors at the chemical separation plant would have complete access at all times to the facility. The inspection and control procedures would provide for (1) the review of the design of the facility from the viewpoint of assuring that it will permit effective inspection; (2) the maintenance of an adequate system of records and the submission of reports on materials and use of the facility; and (3) inspections to account for material and to detect diversion. Plutonium, U-233, and enriched uranium output would be stored and monitored or used under safeguards consistent with those in this paper.

(iii) Alternatively, the purpose of the inspection can be fulfilled by the placement under international safeguards of material of the same type not previously subject to international safeguards in an amount at least equal to that contained in the material to be processed. The inspectors would make an independent measurement of the material to be processed to determine the amount required to be placed under safeguards.

### 3. Undeclared Facilities

(a) There would be agreed rights to conduct a limited number of inspections of suspected undeclared facilities on an adversary basis. The objective of an inspection of a suspected undeclared facility is to provide assurance that no U-235 separation plants, reactors, or chemical separation plants are in operation in violation of the agreement. That objective could be met by internal inspection of the facility or, in the case of a particularly sensitive facility, by appropriate external inspection procedures such as environmental sampling, external observation of the structures, or the measurement of electrical power and other utilities within a radius of a few miles.

(b) The inspected country would be permitted to take all reasonable precautions to assure that the inspectors did not observe any sensitive activities it did not wish observed, so long as it permitted the inspectors to observe such characteristics of a facility or perform such measurements as would permit determination that prohibited activities were not occurring.

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(c) A procedure for initiation of an inspection would need to be developed, and specification of the rights of the country requesting the inspections and the obligations of the inspected country would need to be developed prior to detailed negotiations.

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ANNEX B

EXTRACT FROM STATEMENT BY AMBASSADOR CHARLES C. STELLE  
AT 151st PLENARY MEETING OF THE ENDC (ENDC/PV 151,  
pp. 11-12)

"In our statements we have repeatedly indicated that if that amount is for some reason unsatisfactory to the Soviet Union we should be prepared to consider, within reason, appropriate adjustments. In its effort to find a mutually acceptable arrangement in this field, the United States delegation approached the Soviet delegation in April of this year and indicated that if the Soviet Union's objection to the United States proposal was based on a feeling that the amount proposed by the United States was not sufficiently large to have a tangible effect on the nuclear capabilities of the parties concerned, the United States would be prepared to consider, within reason, an amount larger than 50,000 kg. In addition, my delegation stated that if the Soviet Union felt that transfer of equal amounts by both the United States and the USSR would for some reason entail certain inequities for the Soviet Union, the United States would be prepared to consider an arrangement providing for a ratio of transfer calling for transfer by the United States, after a cutoff of production, of an amount larger, again within reason, than the amount to be transferred by the USSR. My delegation told the Soviet delegation that transfer by the United States of 60,000 kg and by the USSR of 40,000 kg would be an example of such an arrangement."

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ANNEX C

EXTRACT FROM STATEMENT BY US REPRESENTATIVE WILLIAM C. FOSTER  
AT 166th PLENARY MEETING OF THE ENDC (ENDC/PV 166, p. 18)

"This proposal is not merely a gesture. Some figures illustrate its scope. As examples, the approximate monetary value of 60,000 kilograms of weapon-grade U-235 is \$720 million. If completely fissioned in explosions, 60,000 kilograms would release about 1,000 megatons, or one-third of a ton of TNT equivalent for every man, woman and child on earth. On the other hand, if the 60,000 kilograms were completely converted to electrical energy in nuclear power reactors, it would produce 370 billion kilowatt-hours, or somewhat more than one-third as much as the entire United States production of electrical energy in 1963. These figures give some idea of the dimensions of the United States proposal."

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ANNEX D

MEMORANDUM DATED NOV. 20, 1962 APPROVED BY  
THE PRESIDENT

(Only that portion of this memorandum dealing with fissionable material is quoted here.)

I. Stage I Reduction of Nuclear Weapons

A. The United States should be prepared to agree to transfer 50,000 kg of weapons grade U-235 to peaceful purposes if the Soviet Union would make an equivalent transfer of 25,000 kg of weapons grade U-235.

B. The foregoing proposal should be presented in the context of Stage I and as an alternative to the present United States proposal respecting the transfer of fissionable materials from past production.

C. The United States should express willingness to consider, within limits, larger numbers at the same ratio if the Soviet Union is interested. The upper limit for the United States would be 100,000 kg of weapons graded U-235. This figure could not be mentioned in negotiations without subsequent specific authorization in the light of additional technical studies which are required.

D. The United States should be prepared to accept an arrangement along the foregoing lines as a separate measure associated with a cutoff of the production of fissionable materials and appropriately verified.

(Comment): Any discussion of ratio other than one-to-one or numbers higher than 50,000 kg of weapons grade U-235 would take place privately with the

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Soviet Union, although it might be made public at a later date. The initial approach should not be on the basis of 50,000-25,000, but should involve a ratio such as 60,00-40,000 as an attempt to probe the Soviets as to whether it is the ratio problem that is concerning them. The initial approach should seek to determine in the first instance whether the Soviets are fundamentally opposed to the idea of transfer of fissionable materials before discussing specific amounts and ratios.

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