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Item 2(a) of the provisional agenda
(GOV/506)

THE AGENCY'S FUNCTIONS UNDER ARTICLES III.5 and 6
AND XII OF THE STATUTE

(a) SAFEGUARDS AGAINST DIVERSION

Report by the Special Working Group of Expert
Representatives on Safeguards

I. INTRODUCTION

1. By a decision which it took on 20 January 1960, the Board established a Special Working Group of Expert Representatives on Safeguards,^{1/} and requested the Working Group to prepare for the Board's meetings in March a new version of the procedures for the attachment and application of Agency safeguards against diversion proposed in document GOV/463, Annex.^{2/}

2. The Working Group was composed of representatives from Brazil (Mr. P. Espirediáo de Andrade, Mr. H.F.S. Bittencourt), Czechoslovakia (Mr. C. Šimáne, Mr. V. Pekarek), France (Mr. A. Finkelstein, Mr. G. Klevanski), India (Mr. H. Sethna, Mr. P. Shunker), the Union of Soviet Socialist Republics (Mr. V. Lytkin, Mr. I.M. Palenykh), the United Kingdom of Great Britain and Northern Ireland (Mr. J.C. Wardrop, Mr. K. Frost) and the United States of America (Mr. E.L. Brady, Mr. M. Hudson) under the chairmanship of Mr. G. Randers. The Working Group met first on 15 February 1960, when it decided to base its work upon a document which had been prepared for it by its Chairman; and during the course of eleven meetings which lasted until 20 February, it drew up for the Board's consideration the proposals for the Agency's safeguards system that are annexed to the present report.

^{1/} GOV/DEC/16(III), decision number (34)(a).

^{2/} For the details of the Working Group's terms of reference, see document GOV/DEC/16(III), decision number (34)(b) and (c).

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3. At the outset of the meetings, the Chairman, referring to the Working Group's terms of reference, stated that the redraft of the safeguards procedures to be prepared for the Board would in no way commit the Governments represented in the Working Group.

4. The Working Group agreed to include in its report some comments on and explanations of certain clauses of its proposals which it considered might be helpful to the Board's consideration of them. In so far as such comments and explanations would reflect the view of individual representatives rather than of the whole Working Group, it was decided that their formulation should be left to the Chairman in consultation with the representatives concerned.

II. COMMENTS AND EXPLANATIONS

5. Paragraph 16. The representatives of Czechoslovakia and the Soviet Union considered that the definition "Principal nuclear facility" should not at present specifically cover plants other than reactor facilities, thus corresponding to the nature and scope of the assistance supplied by the Agency. A reservation to the effect that the list of items to be covered by the definition will in future be determined by the Board may remain in the definition.

6. Paragraphs 26 and 37. The representatives of Czechoslovakia and the Soviet Union objected to the attachment of safeguards to non-nuclear material supplied by the Agency and not directly utilized in a nuclear facility to which Agency safeguards are attached.

7. Paragraphs 26 and 37. The representative of India considered that Agency safeguards should not be attached to equipment or non-nuclear material, as it was not possible to define these items and they were normal articles of commerce.

8. Paragraph 32. The representative of Brazil, in order not to hinder the work of the Working Group, would accept the basic figures expressed in tons in sub-paragraphs (a) to (f) although he was not ready to justify, on technical grounds, why those figures should not be higher for simplicity and economy. He considered that higher values could be used in most of the practical cases that could be envisaged without affecting the effectiveness of safeguards.

9. Paragraph 32. The representatives of Czechoslovakia and the Soviet Union stated that definite numerical limits could not be given, but would have to be determined by the Board in each individual case.
10. Paragraph 32. The representative of France considered that there was a technical justification for the lower limits in this paragraph, but did not believe that the upper limits had the same justification.
11. Paragraph 32. The representative of India considered that Agency safeguards should not be attached to natural uranium or thorium supplied or processed by the Agency because these materials were normal articles of commerce.
12. Paragraph 40(a). The representatives of Czechoslovakia and the Soviet Union considered that the possibility of effective application of safeguards should not be the overriding factor in the examination of any project submitted to the Agency. The main purpose of examining a design should be to determine whether it is primarily of a character to facilitate the use of nuclear energy for peaceful purposes, but a design should not be judged on the ease of application of Agency safeguards.
13. Paragraph 41. The representatives of Czechoslovakia and the Soviet Union considered that the Agency should merely be advised of changes in the design, the stipulation of Agency approval of them being omitted.
14. Paragraphs 43 and 46. The representatives of Czechoslovakia and the Soviet Union considered that the plan for the system of records could, on the basis of agreement with the Agency, assume the form most convenient to both contracting parties. The same would apply to the plan for the system of reports.
15. Paragraph 64, footnote 9. "The representatives of Brazil, France, India, the United Kingdom and the United States considered that it was possible to establish a definite figure on technical grounds. The representatives of France, India, the United Kingdom and the United States considered that that figure could be 0.2 kilogrammes." Use of this value leads to the following frequencies for a number of specific cases:

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Type of facility	Power	Fuel enrichment (per cent)	Inspections per year
Homogeneous research reactor	50 KW	20	Eligible for nominal safeguards
Pool research reactor	1 MW	20	Eligible for nominal safeguards
Pool research reactor	2 MW	90	1.1
CP-5 type research reactor	5 MW	90	1.4
MTR type test reactor	30 MW	20	1.8
MTR type test reactor	30 MW	90	8.1
BR-3 PWR power reactor	40 MWT	4	0.9
Elk River BWR power reactor	58 MWT	4.2	1.5
BWR power reactor	100 MWT	2.7	1.2

16. General. The representative of the United Kingdom wished the view to be recorded that the paper as it emerged from the Working Group's discussions in some respects failed to provide sufficient guidance and consequently left a number of questions to be settled on a case by case basis. This would have the effect of placing too heavy a burden on the Board and prejudicing the successful conclusion of project agreements.

A N N E X
AGENCY SAFEGUARDS AGAINST DIVERSION

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AGENCY SAFEGUARDS AGAINST DIVERSION

I. INTRODUCTION

1. Under its Statute the Agency is authorized to establish and administer a system of safeguards to ensure so far as it is able that assistance provided by it or at its request is not used in such a way as to further any military purpose. The Agency may also, if so requested by the State or States concerned, apply appropriate safeguards to a State's own nuclear activities or to any bilateral or multilateral arrangement.
2. The principles and regulations for the attachment and application of safeguards by the Agency are based on the pertinent provisions of the Statute and enable:
 - (a) A State or group of States applying for assistance by or through the Agency to consider in advance the nature of the safeguards that the Agency would attach;
 - (b) The parties to a bilateral or multilateral arrangement, or a State, to determine how Agency safeguards might be applied to their activities if they so request; and
 - (c) The Board to determine readily what safeguards should be attached to Agency projects or applied to arrangements that the Agency has been requested to safeguard.
3. Agency safeguards will be applied to materials and facilities voluntarily placed under Agency safeguards by a State or States in accordance with the terms of a relevant agreement with the Agency and pursuant to the Statute. In drawing up such an agreement the Agency and the State or States concerned will have regard to the desirability of the greatest possible consistency of safeguards by the Agency under the agreement and those provided for by the procedures contained in this document.
4. This document specifies:
 - (a) The principles that are to be followed by the Agency in determining the safeguards that are to be applied to various types of assistance; and
 - (b) The procedures to implement these principles.

The procedures for the application of safeguards cover the anticipated requirements by the Agency in the immediate future and relate only to research, test and power reactors with less than 100 megawatts thermal output, to the source and special fissionable material used and produced in these reactors and to small research and development facilities. Procedures covering other types of nuclear facilities will be developed as the probable need for them becomes evident. This document does not deal with second or subsequent generations of produced material.

II. DEFINITIONS

5. "Agency" means the International Atomic Energy Agency.
6. "Statute" means the Statute of the Agency.
7. "Board" means the Board of Governors of the Agency.
8. "Director General" means the Director General of the Agency.
9. "Nuclear material" means any source and/or special fissionable material as defined in Article XX of the Statute.
10. "Source content" means the total weight of uranium and thorium contained in source material as defined in Article XX of the Statute.
11. "Fissile content" means the total weight of uranium-235, of uranium-233 and of plutonium contained in nuclear material.
12. "Enrichment" means the percentage by weight of the isotope uranium-235 in the total uranium present.
13. "Depleted uranium" means uranium in which the percentage by weight of the isotope uranium-235 in the total uranium present is less than that occurring in natural uranium.
14. "Reactor" means any device that can be operated so as to maintain a controlled, self-sustaining fission chain reaction.
15. "Reactor facility" means a reactor including appurtenant facilities such as fuel storage or cooling facilities or other portions of the plant in which nuclear materials are handled or used.

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16. "Principal nuclear facility" means reactor facilities, plants for processing special fissionable or irradiated source material, plants for separating the isotopes of uranium or isotopes of plutonium and such other facilities or plants which may be designated by the Board.
17. "Supplied or processed by the Agency" means supplied or processed by the Agency directly, or with the assistance of the Agency.
18. "Diversion" means the use by a recipient State of fissionable or other materials, facilities or equipment supplied by the Agency so as to further any military purpose or in violation of any other condition prescribed in the agreement between the Agency and the States concerning the use of such materials, facilities or equipment.
19. "Agency safeguards" means the measures pursuant to the Statute to prevent loss or diversion of nuclear materials, specialized equipment or principal nuclear facilities.
20. "Attachment of safeguards" means the requirement to apply appropriate safeguard procedures.
21. "Application of safeguards" to materials or facilities means the implementation of appropriate safeguards procedures.
22. "PN¹/material" and "PN facility" mean materials and facilities:
 - (a) Supplied by the Agency or to which Agency safeguards are otherwise attached;
 - (b) Placed under Agency safeguards by agreement with the State or States concerned; or
 - (c) Allocated by a State or States for peaceful purposes exclusively, provided the State or States concerned voluntarily send the Agency notification thereof.

III. GENERAL PRINCIPLES OF AGENCY SAFEGUARDS

A. Introduction

23. The principal factors considered by the Board for determining the relevance of particular safeguards for various types of facilities will depend upon the form, scope and amount of the assistance

¹/ This abbreviation means "peaceful nuclear".

supplied by the Agency, the nature of the specific project and the degree to which the assistance can further a military purpose. The Agency will take into account all pertinent circumstances existing at the time.

B. Principles of attachment

24. The attachment of Agency safeguards to Agency projects will take into consideration all PN materials and facilities in the State.
25. Agency safeguards will be attached to nuclear material supplied by the Agency whenever the total amount of PN material in a State exceeds a certain minimum, and will also be attached to special fissionable material produced in or by the use of material to which Agency safeguards are thus attached. Agency safeguards will be attached to nuclear material used, produced or processed in a principal nuclear facility to which Agency safeguards are attached.
26. Agency safeguards will be attached to principal nuclear facilities supplied or substantially assisted by the Agency. If in the opinion of the Board equipment or non-nuclear material supplied by the Agency can substantially assist a principal nuclear facility, Agency safeguards will be attached to such equipment or material even when it is not in a principal nuclear facility.
27. No Agency safeguards will be attached to mines, to mining equipment or to ore-processing plants.

C. Principles of application

28. The application of Agency safeguards to Agency projects will take into consideration all PN materials and facilities in the State.
29. Agency safeguards will be applied to:
 - (a) Nuclear material to which Agency safeguards are attached;
 - (b) Nuclear material while it is intermixed with nuclear material to which Agency safeguards are attached; and
 - (c) Nuclear material in Member States to which Agency safeguards are attached at the request of Member States.

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30. Agency safeguards will be applied to:
 - (a) Facilities to which Agency safeguards are attached;
 - (b) Facilities while they are processing, using, storing or transporting materials to which Agency safeguards are attached; and
 - (c) Facilities in Member States to which Agency safeguards are attached at the request of Member States.

31. Agency safeguards will be applied to equipment and non-nuclear materials to which Agency safeguards are attached and to facilities incorporating these items.

IV. ATTACHMENT AND TERMINATION OF AGENCY SAFEGUARDS

A. Attachment to nuclear materials

32. ^{2/} In each of the following cases Agency safeguards will be attached to nuclear material supplied by the Agency and to special fissionable material produced in or by the use of such material, if the quantity of such PN material in the State exceeds:

- (a) 2 metric tons in the case of uranium with a uranium-235 content between 0.5 and 1.0 per cent, or for any portion thereof the equivalent amount of more highly enriched uranium, plutonium or uranium-233; ^{3/}
- (b) 4 metric tons in the case of depleted uranium with a uranium-235 content of less than 0.5 per cent;
- (c) 4 metric tons in the case of thorium.

^{4/} However, in each of the following cases Agency safeguards will be applied in a nominal manner to nuclear material supplied by the Agency if the quantity of such PN material in the State lies between the following amounts:

- (A) 2 to 10 metric tons in the case of uranium with a uranium-235 content between 0.5 and 1.0 per cent, or for any portion thereof the equivalent amount of more highly enriched uranium, plutonium or uranium-233; ^{5/}

^{2/} The representatives of Czechoslovakia, India and the Union of the Soviet Socialist Republics are of the opinion that it is technically impossible to specify such universal limits, as is done in this paragraph, in advance.

^{3/} Equivalent amounts are shown in the Appendix, from which it will be seen that 200 grammes of fully enriched uranium are equivalent to the 2 metric tons specified. The equivalent amounts of plutonium and uranium-233 are the same as for fully enriched uranium.

^{4/} The subsequent parts of this paragraph provide for the application of safeguards; the Board may wish to transfer these provisions to section V.A. below.

^{5/} From the Appendix it will be seen that 200 to 1 000 grammes of fully enriched uranium are equivalent to the 2 to 10 metric tons specified. The equivalent amounts of plutonium and uranium-233 are the same as for fully enriched uranium.

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- (e) 4 to 10⁶/metric tons in the case of depleted uranium with a uranium-235 content of less than 0.5 per cent;
- (f) 4 to 10⁶/metric tons in the case of thorium.

Safeguards will be applied fully to all special fissionable material produced in or by the use of material supplied by the Agency fulfilling the conditions of sub-paragraphs (d), (e) and (f) above.

33. Agency safeguards will be attached to special fissionable material produced in a principal nuclear facility to which Agency safeguards are attached.
34. Agency safeguards will be attached to nuclear material processed or used in a principal nuclear facility to which Agency safeguards are attached.
35. Agency safeguards will be attached to all special fissionable material produced in a reactor to which Agency safeguards are not attached but which contains nuclear material to which Agency safeguards are attached, if such material permits the reactor to operate at more than 150 per cent of the power at which it could operate without such material; if such material does not permit the reactor to operate at such increased power, Agency safeguards will only be attached to the special fissionable material produced in the nuclear material supplied or processed by the Agency.

B. Attachment to facilities, equipment and non-nuclear material

36. Agency safeguards will be attached to principal nuclear facilities supplied or, in the opinion of the Board, substantially assisted by the Agency, except for reactors with a nominal power of less than three thermal megawatts, provided that the total nominal power of reactors thus exempted in any State may not exceed six thermal megawatts.

^{6/} It was the understanding of the Chairman that the values for depleted uranium and thorium should be double the amounts for natural uranium. However, the figures "4 to 10" instead of "4 to 20" were inserted here through a typographical error and were not corrected during any of the meetings of the Working Group. The Chairman has decided that the values "4 to 10" should be shown in this document, but the Board should consider altering them to "4 to 20".

37. Agency safeguards will be attached to equipment and non-nuclear material supplied by the Agency, which in the opinion of the Board could substantially assist a principal nuclear facility, other than a reactor with a nominal power of less than three thermal megawatts, even when such equipment or material is not in a principal nuclear facility.

C. Termination or suspension of Agency safeguards

38. The attachment of Agency safeguards to a facility, to materials or to equipment will terminate when there are no conditions as listed in paragraphs 32 to 37 above that require attachment of Agency safeguards.

39. The attachment of Agency safeguards to nuclear material will be suspended while it is transferred solely for the purpose of processing, reprocessing or testing to any other Member State under an agreement between the two States concerned approved by the Agency or to a facility within the State to which safeguards are not attached under an arrangement approved by the Agency.^{7/} The Agency will not apply safeguards to the material while it is thus transferred to another State.

^{7/} The representative of the United States of America felt that it was desirable to add the following details as guidance to the Board:

- ": (a) If the agreement or the arrangement provides that either the transferring or the receiving State place under Agency safeguards nuclear materials at least equal to that transferred and not otherwise subject to safeguards; or
- (b) If the quantities and materials so transferred are not in excess of the maximum amounts shown in sub-paragraphs (d), (e) and (f) of paragraph 32 above."

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V. APPLICATION OF AGENCY SAFEGUARDS

A. General procedures concerning application to all types of facilities and materials

(a) Introduction

40. Agency safeguards will be applied to facilities and to materials in facilities in accordance with agreements entered into by the Agency with the State or States concerned. The application of such safeguards shall be as specified in the agreements and shall, as appropriate, include the following:

- (a) The Agency shall examine the design and approve it only from the viewpoint of assuring that it will not further any military purpose and that it will permit effective application of Agency safeguards;
- (b) The State shall maintain a system of records as approved by the Agency of the material and facilities to which Agency safeguards are to be applied;
- (c) The State shall submit to the Agency routine and special reports on the facilities and the materials under safeguards; and
- (d) The State shall permit inspections by the Agency to account for material to which Agency safeguards are applied and to detect diversion.

(b) Procedure for approval of design

41. The design of facilities existing at the time of the signing of the project agreement shall be approved by the Agency in order to determine, in so far as it is able, whether the facility can further any military purpose^{8/} and that the facility will permit the effective application of Agency safeguards. In the event of additional facilities being designed which require the application of safeguards or in the event of a change in the design of facilities already approved under the project agreement, the State will advise the Agency accordingly and submit such designs for examination and approval together with any information that the Agency may request.

^{8/} The Working Group is of the opinion that it is difficult to make such a determination.

42. The Agency shall make its decision about approval of these designs as expeditiously as possible after the submission of the information by the State.
- (c) Procedure for approval of the records system
43. The State shall submit to the Agency for approval the plan for the system of records for each facility and material to which Agency safeguards are to be applied. This plan shall be submitted in sufficient time to permit review by the Agency and adoption by the State of an approved system before the records need to be used. Any changes in this plan shall similarly be submitted to the Agency for approval.
44. The records shall include operating records for nuclear facilities, as well as accounting records of material and equipment, to which Agency safeguards are applied.
45. All records shall be retained for at least two years.
- (d) Procedure for submission of reports
- (i) General considerations
46. The State shall submit to the Agency for approval the plan for the system of reports for each facility and material to which Agency safeguards are to be applied. This plan shall be submitted in sufficient time to permit review by the Agency and adoption by the State before the first report is required to be submitted.
- (ii) Routine reports
47. The State shall submit the following routine reports to the Agency:
- (a) Operating reports showing the use that has been made of the facility and the material in the facility since the last report and as far as possible the programme of work which is going to be carried out in the facility and with the material; and
- (b) Accounting reports showing the receipt, issue and location of the material to which Agency safeguards are applied.
48. The State shall submit the first routine report at the time of the first operation of the facility under Agency safeguards or at the

time when material to which Agency safeguards are attached is first received at the facility.

49. At the request of the Agency the State shall submit amplifications or elucidations of routine reports referred to in paragraph 47 above, in the event of unusual circumstances as determined by the Agency.

(iii) Special reports

50. The State shall notify the Agency within forty-eight hours by the most expeditious means available:

(a) If any unusual incident occurs, involving an actual or potential loss, destruction or damage of any facility or material to which Agency safeguards are applied; or

(b) If material is lost or unaccounted for in quantities that exceed those normal operating losses or unaccounted-for quantities that are accepted by the Agency to be characteristic of the facility involved.

51. The State shall submit to the Agency a report at least two weeks before:

(a) Any proposed transfer or other transaction that will result in a change in the quantity of materials to which Agency safeguards are applied in the State, or in any facility or complex of facilities considered as a unit for this purpose by agreement with the Agency; and

(b) Any proposed major change in the planned future programme as reported in the routine reports.

52. The State shall submit any additional special reports requested by the Agency concerning matters referred to in paragraphs 50 and 51 above.

(e) Procedure for inspections

(i) Routine inspections

53. The Agency may make routine inspections of the facility and material to which Agency safeguards are applied, beginning at a time specified in the project agreement.

54. Inspections will include the examination of the facility to ensure that it is constructed in accordance with the approved design, and

the testing of any equipment or instruments that are to be used to measure material in the facility to which Agency safeguards are to be applied.

55. Routine inspections after the facility is in operation shall normally include:

- (a) Examination of the facility and/or material to which Agency safeguards are applied;
- (b) Audit of reports and records;
- (c) Verification of the amounts of material to which Agency safeguards are applied, by physical inspection, measurement and sampling; and
- (d) Examination and testing of the measurement instruments.

If the Agency considers that all the routine inspections that are authorized are not required, fewer inspections may be carried out.

(ii) Special inspections

56. If an examination of the special reports made under paragraphs 50 and 51 above indicates the need for a special inspection, the Agency is entitled to carry out such an inspection to investigate the occurrence.

57. In the event of unforeseen circumstances requiring immediate action, a special inspection may be made provided that a report shall be made to the Board on the circumstances leading to such inspection.

(f) Nominal safeguards

58. If the quantities of PN material in the State are such that material supplied by the Agency qualifies for the application of safeguards in a nominal manner as specified in paragraph 32 above, the following shall apply:

- (a) Only one routine report shall be required each year regarding the material and the facilities which are processing, using, storing or transporting such material;
- (b) No routine inspections shall be carried out; and
- (c) Special reports will be submitted and special inspections performed as necessary.

B. Additional procedures for application to reactor facilities

(a) Introduction

59. The following additional provisions apply to reactor facilities. In the present procedures only reactors below 100 thermal megawatts are considered.

(b) Frequency of routine reports

60. The frequency of routine reports for a facility shall normally be no less than twice the number of routine inspections that will be performed on that facility.

(c) Frequency of routine inspections

61. Routine inspections shall be made to each facility to which safeguards are applied except those subject only to nominal safeguards.

62. The number of inspections will be kept to a minimum consistent with the effective application of safeguards.

63. The number and scope of inspections to be carried out by the Agency for a project will be determined and stated in the project agreement. Provisions should be made in the project agreement for changes in the number and scope of inspections in case of changed conditions. This determination will take into account a number of considerations, amongst them:

(a) The state of industrialization of the country;

(b) The possession by the State or States of an irradiated fuel reprocessing facility;

(c) The nature of the principal nuclear facility; and

(d) The nature and amount of the nuclear material or special fissionable material supplied by the Agency.

64. The number of days between periodic inspections should be limited to the period of time within which the cumulative uncertainties in the nuclear material associated with the project can mount to the specified value of kilogrammes of plutonium, uranium-233 or fully enriched uranium-235.^{2/}

^{2/} The Working Group did not consider it possible from a technical point of view to agree on a definite figure.



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