



Fourth regular session

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(GC(IV)/109)

AGENCY SAFEGUARDS

Note by the Director General

1. On 7 April 1960 the Board of Governors adopted a resolution in two parts relating to Agency safeguards which is reproduced below.
2. The Annexes to the Board's document GOV/549, which are cited in both parts of the resolution, have been consolidated into a single text in the Annex to the present document.

AGENCY SAFEGUARDS

A

The Board of Governors,

- (a) Recalling that the Agency is authorized under Article III, A. 5 of its Statute "to establish and administer safeguards designed to ensure that special fissionable and other materials, services, equipment, facilities, and information made available by the Agency or at its request or under its supervision or control are not used in such a way as to further any military purpose; and to apply safeguards, at the request of the parties, to any bilateral or multilateral arrangements, or, at the request of a State, to any of that State's activities in the field of atomic energy",
- (b) Recalling also Article XII of the Statute, and
- (c) Taking into account the need to establish principles and procedures for the information and guidance of Member States, as well as for the guidance of the Board itself, in administering safeguards,

Approves provisionally the principles and procedures set forth in the Annexes to document GOV/549.

B

The Board of Governors

Decides to submit to the General Conference, for consideration and appropriate action in accordance with the Statute at its fourth regular session, the principles and procedures set forth in the Annexes to document GOV/549.

[1] This revision incorporates editorial changes in the note by the Director General and in paragraph 4, sub-heading III. A and paragraph 40(b) of the Annex.

A N N E X

AGENCY SAFEGUARDS

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I. INTRODUCTION

1. Under Article III. A. 5 of the Statute the Agency is authorized

"to establish and administer safeguards designed to ensure that special fissionable and other materials, services, equipment, facilities, and information made available by the Agency or at its request or under its supervision or control are not used in such a way as to further any military purpose; and to apply safeguards, at the request of the parties, to any bilateral or multilateral arrangement, or, at the request of a State, to any of that State's activities in the field of atomic energy. "

2. The principles and procedures established for the information and appropriate guidance of Member States as well as for the guidance of the Board itself in the administration 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, and embodied in the relevant agreements.

3. Agency safeguards will be applied to materials and facilities voluntarily placed under Agency safeguards by a State or States. Where two or more States request the Agency to administer the safeguards provisions of an agreement between those States, the Agency will apply those provisions provided that they are consistent with the procedures laid down in this document. The administration of safeguards by the Agency under this paragraph shall be governed by an agreement pursuant to the Statute between the Agency and the State or States concerned which shall be made for a specified period.

4. This document specifies:

- (a) The principles that are to be followed by the Agency in determining the safeguards that are to be attached and applied to various types of assistance, and
- (b) The procedures to implement these principles.

The safeguards procedures 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. In regard to produced material, the safeguards provided for in this document relate only to first generation produced material.

5. The principles and procedures for the attachment and application of safeguards by the Agency which are set forth hereafter shall be subject to a general review after two years, in the light of the actual experience gained by the Agency as well as of the technological development which has taken place.

II. DEFINITIONS

6. "Agency" means the International Atomic Energy Agency.

7. "Statute" means the Statute of the Agency.

8. "Board" means the Board of Governors of the Agency.

9. "Director General" means the Director General of the Agency.

10. "Nuclear material" means any source and/or special fissionable material as defined in Article XX of the Statute.
11. "Source content" means the total weight of uranium and thorium contained in source material as defined in Article XX of the Statute.
12. "Fissile content" means the total weight of uranium-235, of uranium-233 and of plutonium contained in nuclear material.
13. "Enrichment" means the percentage by weight of the isotope uranium-235 in the total uranium present.
14. "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.
15. "Reactor" means any device that can be operated so as to maintain a controlled, self-sustaining fission chain reaction.
16. "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.
17. "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.
18. "Supplied or processed by the Agency" means supplied or processed by the Agency directly, or supplied or processed with the assistance of the Agency when, in the opinion of the Board, that assistance is of a substantial nature.
19. "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.
20. "Agency safeguards" means the measures pursuant to the Statute to prevent loss or diversion of nuclear materials, specialized equipment or principal nuclear facilities.
21. "Attachment of safeguards" means the requirement to apply appropriate safeguard procedures.
22. "Application of safeguards" to materials or facilities means the implementation of appropriate safeguards procedures.
23. "PN[1] 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
 - (c) Allocated by a State for peaceful purposes exclusively, provided the State concerned voluntarily send the Agency notification thereof in connexion with Agency safeguards; or
 - (d) Supplied from a source external to a State under an agreement that they shall not be used to further a military purpose or otherwise safeguarded in that State by other organizations or States, provided that all parties concerned shall have voluntarily notified the Agency in connexion with Agency safeguards of the material or facilities supplied or otherwise safeguarded in the State so that the Agency can take account thereof.

[1] This abbreviation means "peaceful nuclear".

III. PRINCIPLES OF AGENCY SAFEGUARDS

A. General principle

24. The principal factors considered by the Board for determining the relevance of particular safeguards for various types of materials and facilities will depend upon the form, scope and amount of the assistance supplied by the Agency, the specific character of each individual 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

25. The attachment of Agency safeguards to Agency projects will take into consideration all PN materials and PN facilities in the State.

26. 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.

27. Agency safeguards will be attached to principal nuclear facilities supplied or substantially assisted by the Agency. [2] If in the opinion of the Board specialized equipment or non-nuclear material supplied by the Agency could substantially assist a principal nuclear facility or could in other ways further a military purpose, Agency safeguards will be attached to such equipment or material even when it is not in a principal nuclear facility.

28. No Agency safeguards will be attached to mines, to mining equipment or to ore-processing plants.

C. Principles of application

29. The application of Agency safeguards to Agency projects will take into consideration all PN materials and PN facilities in the State.

30. 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.

31. 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.

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

[2] Subject to the exemptions provided for in paragraph 37 below.

IV. ATTACHMENT AND TERMINATION OF AGENCY SAFEGUARDS

A. Attachment to nuclear materials

33. 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) Two 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) Four metric tons in the case of depleted uranium with a uranium-235 content of less than 0.5 per cent;
- (c) Four metric tons in the case of thorium.

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:

- (d) Two 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; [4]
- (e) Four to 20 metric tons in the case of depleted uranium with a uranium-235 content of less than 0.5 per cent;
- (f) Four to 20 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.

34. Agency safeguards will be attached to special fissionable material produced in a principal nuclear facility to which Agency safeguards are attached.

35. Agency safeguards will be attached to nuclear material processed or used in a principal nuclear facility to which Agency safeguards are attached.

36. 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 200 per cent of the power at which it could operate without such material.

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

37. Agency safeguards will be attached to principal nuclear facilities supplied or, in the opinion of the Board, substantially assisted by the Agency. Reactors, which after an inspection at initial criticality, are assessed by the Board to have a maximum calculated power for continuous operation of less than 3 thermal megawatts shall be exempted from such attachment provided that the total such power of reactors thus exempted in any State may not exceed 6 thermal megawatts.

[3] Equivalent amounts can be determined from the equation in the Appendix. The equivalent amounts of plutonium and uranium-233 are the same as for fully enriched uranium.

[4] 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.

38. Agency safeguards will be attached to specialized 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 maximum calculated power for continuous operation of less than three thermal megawatts, or could in other ways further a military purpose, even when such specialized equipment or non-nuclear material is not in a principal nuclear facility. The Board may from time to time designate certain specific specialized equipment and non-nuclear material as being items which would be considered capable of substantially assisting a principal nuclear facility or in other ways of furthering a military purpose.

C. Termination or suspension of Agency safeguards

39. The attachment of Agency safeguards to a facility, to materials or to equipment will terminate when there are no conditions as listed in paragraphs 33 to 38 above that require attachment of Agency safeguards.

40. 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 or to any group of States or to an international organization under an agreement between the parties 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, provided that:

- (a) The agreement or the arrangement require that a party thereto place under Agency safeguards, at a time to be agreed and with due allowance for processing losses, an amount of nuclear material at least equal to that transferred between States or within a Member State and not otherwise subject to safeguards; or
- (b) The quantities and materials so received or sent out by any State in accordance with this paragraph are not at any time in excess of the maximum amounts shown in sub-paragraphs (d), (e) or (f) of paragraph 33 above.

V. APPLICATION OF AGENCY SAFEGUARDS

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

(a) Introduction

41. 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 may extend, as appropriate, to 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 agreed with 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.

42. The Agency staff shall not disclose any industrial secret or other confidential information coming to their knowledge by reason of the application of Agency safeguards except to the Director General and such other staff of the Agency as he may authorize to have such information for discharging their official duties.

(b) Procedure for approval of design

43. 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 will further any military purpose 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 substantial 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.

44. 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 agreement of the records system

45. The State shall agree with the Agency a plan for the system of records for each facility and material to which Agency safeguards are to be applied. A draft of this plan shall be submitted by the State in sufficient time to permit review by the Agency and adoption by the State of an agreed system before the records need to be used. Any changes in this plan shall similarly be agreed with the Agency.

46. The records shall include operating records for nuclear facilities, as well as accounting records of material and equipment, to which Agency safeguards are applied.

47. All records shall be retained for at least two years.

(d) Procedure for submission of reports

(i) General considerations

48. The State shall agree with the Agency a plan for the system of reports for each facility and material to which Agency safeguards are to be applied. A draft of this plan shall be submitted by the State in sufficient time to permit review by the Agency and adoption by the State of the agreed plan before the first report is required to be submitted.

(ii) Routine reports

49. 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.

50. 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.

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

(iii) Special reports

52. 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.

53. 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 a significant change 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.

54. The State shall submit any additional special reports requested by the Agency concerning matters referred to in paragraphs 52 and 53 above.

(e) Procedure for inspections

(i) Routine inspections

55. 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.

56. 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.

57. 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.

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

(ii) Special inspections

59. If an examination of the special reports made under paragraphs 52 and 53 above indicates the need for a special inspection, the Agency is entitled to carry out such an inspection, to investigate the occurrence.

60. 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

61. 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 33 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

62. 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

63. The frequency of routine reports for a facility shall normally be twice a year. The actual frequency for a given facility shall be determined in relation to the frequency of inspection of that facility.

(c) Frequency of routine inspections

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

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

66. The frequency of inspection of a reactor facility shall take into account the following considerations:

- (a) The nature of the reactor facility;
- (b) The nature of the nuclear material used or produced in the reactor facility; and
- (c) The amount of nuclear material used or produced in the reactor facility.

In the light of these considerations, routine inspections shall be conducted at such a frequency that in the interval between inspections the total possible error in the measurement of the quantity of nuclear material used or produced by the reactor facility [5] cannot amount to more than 0.2 kilogrammes of plutonium, U-233 or fully enriched U-235 or their equivalents. The maximum frequency of routine inspections for a reactor facility shall be as shown in the table below. The first column of this table indicates the annual usage [6] or the maximum potential production of plutonium, U-233, or U-235 expressed in equivalent kilogrammes, and the second column indicates the corresponding inspection frequencies.

[5] For the purposes of this document "the total possible error in the measurement of the quantity of nuclear material used or produced by the reactor facility" shall mean one standard deviation of the measurement.

[6] Annual usage is the equivalent yearly throughput or inventory, whichever is larger, and "equivalent" is used in the sense in which it is used in paragraph 33 above and in the Appendix.

Frequency of routine inspections[7]

| Annual usage or maximum potential production of Pu, U-233 or U-235 (Equivalent kilogrammes) | Maximum number of routine inspections per year |
|---|--|
| From 0.2 to 1 | None (Nominal safeguards) |
| More than 1 up to 5 | 1 |
| More than 5 up to 10 | 2 |
| More than 10 up to 15 | 3 |
| More than 15 up to 20 | 4 |
| More than 20 up to 25 | 5 |
| More than 25 up to 30 | 6 |

The appropriate number of routine inspections will be stated in each project agreement and provision made therein for changes in case of changed conditions.

C. Additional procedures for application to research and development facilities other than reactor facilities

67. In this paragraph the only research and development facilities that are provided for are those in a State which possesses PN material in quantities that qualify, in accordance with paragraph 33 above, for the application of safeguards in a nominal manner. For such facilities the application shall be limited to that shown in paragraph 61 above.

[7] Examples of the application of the principle illustrated in the above table are given in the following table; they are calculated on the basis of typical operating conditions at the reactor facility:

Illustrative frequencies of routine inspection

| Type of reactor facility | Design power | Enrichment of fuel (per cent) | Number of routine inspections per year |
|-----------------------------|--------------|-------------------------------|---|
| Homogeneous research | 50 KW | 20 | None, subject to the provisions of paragraphs 33 and 37 above |
| Heavy water research | 3 MW | Natural | |
| Pool research | 1 MW | 20 | |
| Pool research | 2 MW | 90 | |
| Graphite moderated research | 4 MW | Natural | 1 |
| Test or large research | 30 MW | 20 | 2 |
| Pressurized water power | 40 MWT | 4 | 2 |
| Boiling water power | 58 MWT | 4.2 | 2 |
| Test or large research | 20 MW | 90 | 4 |
| Graphite moderated power | 100 MWT | Natural | 6 |

APPENDIX

Equivalent amounts of enriched uranium

1. The amount of uranium enriched to greater than 1.0 per cent that is equivalent to 200 grammes of fully enriched uranium is given by the equation:

$$\text{Amount of uranium in kilogrammes} = \frac{0.2}{\left(\frac{\text{Enrichment}}{100}\right)^2}$$

2. The amount of uranium enriched between 0.5 and 1.0 per cent that is equivalent to 200 grammes of fully enriched uranium is 2 000 kilogrammes.
3. In either of the above cases, the amount of uranium equivalent to x kilogrammes of fully enriched uranium can be determined by substituting x for the figure 0.2 in the equation in paragraph 1 above.

