

## I – Safeguards Agreements with the International Atomic Energy Agency

### The Agency's Safeguards System (1965, as Provisionally Extended in 1966 and 1968)

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#### I. GENERAL CONSIDERATIONS

##### A. The purpose of this document

1. Pursuant to Article II of the Statute the Agency has the task of seeking 'to accelerate and enlarge the contribution of atomic energy and peace, health and prosperity throughout the world'. Inasmuch as the technology of nuclear energy for peaceful purposes is closely coupled with that for the production of materials for nuclear weapons, the same Article of the Statute provides that the Agency 'shall ensure so far as it is able, that assistance provided by it or at its request or under its supervision or control is not used in such a way as to further any military purpose'.

2. The principal purpose of the present document is to establish a system of controls to enable the Agency to comply with this statutory obligation with respect to the activities of Member States in the field of the peaceful uses of nuclear energy, as provided in the Statute. The authority to establish such a system is provided by Article III.A.5 of the Statute, which authorizes the Agency 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'. This Article further authorizes the Agency 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'. Article XII.A sets forth the rights and responsibilities that the Agency is to have, to the extent relevant, with respect to any project or arrangement which it is to safeguard.

3. The principles set forth in this document and the procedures for which it provides are established for the information of Member States, to enable them to determine in advance the circumstances and manner in which the Agency would administer safeguards, and for the guidance of the organs of the Agency itself, to enable the Board and the Director General to determine readily what provisions should be included in agreements relating to safeguards and how to interpret such provisions.

4. Provisions of this document that are relevant to a particular project, arrangement or activity in the field of nuclear energy will only become legally binding upon the entry into force of a *safeguards agreement* and to the extent that they are incorporated therein. Such incorporation may be made by reference.

5. Appropriate provisions of this document may also be incorporated in bilateral or multilateral arrangements between Member States, including all those that provide for the transfer to the Agency of responsibility for administering safeguards. The Agency will not assume such responsibility unless the principles of the safeguards and the procedures to be used are essentially consistent with those set forth in this document.

6. Agreements incorporating provisions from the earlier version of the Agency's safeguards system will continue to be administered in accordance with such provisions, unless all States parties thereto request the Agency to substitute the provisions of the present document.

7. Provisions relating to types of *principal nuclear facilities*, other than *reactors*, which may produce, process or use safeguarded *nuclear material* will be developed as necessary.

8. The principles and procedures set forth in this document shall be subject to periodic review in the light of the further experience gained by the Agency as well as of technological developments.

##### B. General principles of the Agency's safeguards The Agency's obligations

9. Bearing in mind Article II of the Statute, the Agency shall implement safeguards in a manner designed to avoid hampering a State's economic or technological development.

10. The safeguards procedures set forth in this document shall be implemented in a manner designed to be consistent with

prudent management practices required for the economic and safe conduct of nuclear activities.

11. In no case shall the Agency request a State to stop the construction or operation of any *principal nuclear facility* to which the Agency's safeguards procedures extend, except by explicit decision of the Board.

12. The State or States concerned and the Director General shall hold consultations regarding the application of the provisions of the present document.

13. In implementing safeguards, the Agency shall take every precaution to protect commercial and industrial secrets. No member of the Agency's staff shall disclose, except to the Director General and to such other members of the staff as the Director General may authorize to have such information by reason of their official duties in connection with safeguards, any commercial or industrial secret or any other confidential information coming to his knowledge by reason of the implementation of safeguards by the Agency.

14. The Agency shall not publish or communicate to any State, organization or person any information obtained by it in connection with the implementation of safeguards, except that:

- (a) Specific information relating to such implementation in a State may be given to the Board and to such Agency staff members as require such knowledge by reason of their official duties in connection with safeguards, but only to the extent necessary for the Agency to fulfil its safeguards responsibilities;
- (b) Summarized lists of items being safeguarded by the Agency may be published upon decision of the Board; and
- (c) Additional information may be published upon decision of the Board and if all States directly concerned agree.

##### Principles of implementation

15. The Agency shall implement safeguards in a State if:

- (a) The Agency has concluded with the State a *project agreement* under which materials, services, equipment, facilities or information are supplied, and such agreement provides for the application of safeguards; or
- (b) The State is a party to a bilateral or multilateral arrangement under which materials, services, equipment, facilities or information are supplied or otherwise transferred, and:
  - (i) All the parties to the arrangement have requested the Agency to administer safeguards; and
  - (ii) The Agency has concluded the necessary *safeguards agreement* with the State; or
- (c) The Agency has been requested by the State to safeguard certain nuclear activities under the latter's jurisdiction, and the Agency has concluded the necessary *safeguards agreement* with the State.

16. In the light of Article XI I.A.5 of the Statute, it is desirable that *safeguards agreements* should provide for the continuation of safeguards, subject to the provisions of this document, with respect to produced special fissionable material and to any materials substituted therefor.

17. The principal factors to be considered by the Board in determining the relevance of particular provisions of this document to various types of materials and facilities shall be the form, scope and amount of the assistance supplied, the character of each individual project and the degree to which such assistance could further any military purpose. The related *safeguards agreement* shall take account of all pertinent circumstances at the time of its conclusion.

18. In the event of any non-compliance by a State with a *safeguards agreement*, the Agency may take the measures set forth in Articles XI I.A.7 and XI I.C of the Statute.

#### II. CIRCUMSTANCES REQUIRING SAFEGUARDS

##### A. Nuclear materials subject to safeguards

19. Except as provided in paragraphs 21-28, *nuclear material* shall be subject to the Agency's safeguards if it is being or has been:

- (a) Supplied under a *project agreement*; or
- (b) Submitted to safeguards under a *safeguards agreement* by the parties to a bilateral or multilateral arrangement; or
- (c) *Unilaterally submitted* to safeguards under a *safeguards agreement*; or

- (d) Produced, processed or used in a *principal nuclear facility* which has been:
- (i) Supplied wholly or substantially under a *project agreement*; or
  - (ii) Submitted to safeguards under a *safeguards agreement* by the parties to a bilateral or multilateral arrangement; or
  - (iii) *Unilaterally submitted* to safeguards under a *safeguards agreement*; or
- (e) Produced in or by the use of safeguarded *nuclear material*; or
- (f) Substituted, pursuant to paragraph 26(d), for safeguarded *nuclear material*.

20. A *principal nuclear facility* shall be considered as substantially supplied under a *project agreement* if the Board has so determined.

## B. Exemption from Safeguards

### General Exemptions

21. *Nuclear material* that would otherwise be subject to safeguards shall be exempted from safeguards at the request so exempted in that State may not at any time exceed:

- (a) 1 kilogram in total of special fissionable material, which may consist of one or more of the following:
  - (i) Plutonium;
  - (ii) Uranium with an *enrichment* of 0.2 (20%) above, taken account of by multiplying its weight by its *enrichment*.
  - (iii) Uranium with an *enrichment* below 0.2 (20%) and above that of natural uranium, taken account of by multiplying its weight by five times the square of its *enrichment*.
- (b) 10 metric tons in total of natural uranium and depleted uranium with an *enrichment* above 0.005 (0.5%);
- (c) 20 metric tons of depleted uranium with an *enrichment* of 0.005 (0.5%) or below; and
- (d) 20 metric tons of thorium.

### Exemptions related to reactors

22. Produced or used *nuclear material* that would otherwise be subject to safeguards pursuant to paragraph 19(d) or (e) shall be exempted from safeguards if:

- (a) It is plutonium produced in the fuel of a *reactor* whose rate of production does not exceed 100 grams of plutonium per year; or
- (b) It is produced in a *reactor* determined by the Agency to have a maximum calculated power for continuous operation of less than 3 thermal megawatts, or is used in such a *reactor* and would not be subject to safeguards except for such use, provided that the total power of the *reactors* with respect to which these exemptions apply in any State may not exceed 6 thermal megawatts.

23. Produced special fissionable material that would otherwise be subject to safeguards pursuant only to paragraph 19(e) shall in part be exempted from safeguards if it is produced in a *reactor* in which the ratio of fissionable isotopes within safeguarded *nuclear material* to all fissionable isotopes is less than 0.3 (calculated each time any change is made in the loading of the *reactor* and assumed to be maintained until the next such change). Such fraction of the produced material as corresponds to the calculated ratio shall be subject to safeguards.

## C. Suspension of safeguards

24. Safeguards with respect to *nuclear material* may be suspended while the material is transferred, under an arrangement or agreement approved by the Agency, for the purpose of processing, reprocessing, testing, research or development within the State concerned or to any other member State or to an international organization, provided that the quantities of *nuclear material* with respect to which safeguards are thus suspended in a State may not at any time exceed:

- (a) 1 *effective kilogram* of special fissionable material;
- (b) 10 metric tons in total of natural uranium and depleted uranium with an *enrichment* above 0.005 (0.5%);
- (c) 20 metric tons of depleted uranium with an *enrichment* of 0.005 (0.5%) or below; and
- (d) 20 metric tons of thorium.

25. Safeguards with respect to *nuclear material* in irradiated fuel which is transferred for the purpose of reprocessing may also be suspended if the State or States concerned have, with the agreement of the Agency, placed under safeguards substitute *nuclear material* in accordance with paragraph 26(d) for the period of suspension. In addition, safeguards with respect to plutonium contained in irradiated fuel which is transferred for the purpose of

reprocessing may be suspended for a period not to exceed six months if the State or States concerned have, with the agreement of the Agency, placed under safeguards a quantity of uranium whose *enrichment* in the isotope uranium-235 is not less than 0.9 (90%) and the uranium-235 content of which is equal weight to such plutonium. Upon expiration of the said six months or the completion of reprocessing, whichever is earlier, safeguards shall, with the agreement of the Agency, be applied to such plutonium and shall cease to apply to the uranium substituted therefor.

## D. Termination of Safeguards

26. *Nuclear material* shall no longer be subject to safeguards after:

(a) It has been returned to the State that originally supplied it (whether directly or through the Agency), if it was subject to safeguards only by reason of such supply and if:

- (i) It was not *improved* while under safeguards; or
- (ii) Any special fissionable material that was produced in it under safeguards has been separated out, or safeguards with respect to such produced material have been terminated; or

(b) The Agency has determined that:

- (i) It was subject to safeguards only by reason of its use in a *principal nuclear facility* specified in paragraph 19(d);
- (ii) It has been removed from such facility; and
- (iii) Any special fissionable material that was produced in it under safeguards has been separated out, or safeguards with respect to such produced material have been terminated; or

(c) The Agency has determined that it has been consumed, or has been diluted in such a way that it is no longer usable for any nuclear activity relevant from the point of view of safeguards, or has become practicably irrecoverable; or

(d) The State or States concerned have, with the agreement of the Agency, placed under safeguards, as a substitute, such amount of the same element, not otherwise subject to safeguards, as the Agency has determined contains fissionable isotopes:

(i) Whose weight (with due allowance for processing losses) is equal to or greater than the weight of the fissionable isotopes of the material with respect to which safeguards are to terminate; and

(ii) Whose ratio by weight to the total substituted element is similar to or greater than the ratio by weight of the fissionable isotopes of the material with respect to which safeguards are to terminate to the total weight of such material; provided that the Agency may agree to the substitution of plutonium for uranium-235 contained in uranium whose *enrichment* is not greater than 0.05 (5%); or

(e) It has been transferred out of the State under paragraph 28(d), provided that such material shall again be subject to safeguards if it is returned to the State in which the Agency had safeguarded it; or

(f) The conditions specified in the *safeguards agreement* pursuant to which it was subject to Agency safeguards, no longer apply, by expiration of the agreement or otherwise.

27. If a State wishes to use safeguarded source material for non-nuclear purposes, such as the production of alloys or ceramics, it shall agree with the Agency on the circumstances under which the safeguards on such material may be terminated.

## E. Transfer of safeguarded nuclear material out of the State

28. No safeguarded *nuclear material* shall be transferred outside the jurisdiction of the State in which it is being safeguarded until the Agency has satisfied itself that one or more of the following conditions apply:

(a) The material is being returned, under the conditions specified in paragraph 26(a), to the State that originally supplied it; or

(b) The material is being transferred subject to the provisions of paragraph 24 or 24; or

(c) Arrangements have been made by the Agency to safeguard the material in accordance with this document in the State to which it is being transferred; or

(d) The material was not subject to safeguards pursuant to a *project agreement* and will be subject, in the State to which it is being transferred, to safeguards other than those of the Agency but generally consistent with such safeguards and accepted by the Agency.

### III. SAFEGUARDS PROCEDURES

#### A. General procedures

##### Introduction

29. The safeguards procedures, set forth below shall be followed, as far as relevant with respect to safeguarded *nuclear materials*, whether they are being produced, processed or used in any *principal nuclear facility* or are outside any such facility. These procedures also extend to facilities containing or to contain such materials, including *principal nuclear facilities* to which the criteria in paragraph 19(d) apply.

##### Design review

30. The Agency shall review the design of *principal nuclear facilities*, for the sole purpose of satisfying itself that a facility will permit the effective application of safeguards.

31. The design review of a *principal nuclear facility* shall take place at as early a stage as possible. In particular, such review shall be carried out in the case of:

- (a) An Agency project, before the project is approved;
- (b) A bilateral or multilateral arrangement under which the responsibility for administering safeguards is to be transferred to the Agency, or an activity *unilaterally submitted* by a State, before the Agency assumes safeguards responsibilities with respect to the facility;
- (c) A transfer of safeguarded *nuclear material* to a *principal nuclear facility* whose design has not previously been reviewed, before such transfer takes place; and
- (d) A significant modification of a *principal nuclear facility* whose design has previously been reviewed, before such modification is undertaken.

32. To enable the Agency to perform the required design review, the State shall submit to it relevant design information sufficient for the purpose, including information on such basic characteristics of the *principal nuclear facility* as may bear on the Agency's safeguards procedures. The Agency shall require only the minimum amount of information and data consistent with carrying out its responsibility under this section. It shall complete the review promptly after the submission of this information by the State and shall notify the latter of its conclusions without delay.

##### Records

33. The State shall arrange for the keeping of records with respect to *principal nuclear facilities* and also with respect to all safeguarded *nuclear material* outside such facilities. For this purpose the State and the Agency shall agree on a system of records with respect to each facility and also with respect to such material, on the basis of proposals to be submitted by the State in sufficient time to allow the Agency to review them before the records need to be kept.

34. If the records are not kept in one of the working languages of the Board, the State shall make arrangements to facilitate their examination by inspectors.

35. The records shall consist, as appropriate, of:

- (a) Accounting records of all safeguarded *nuclear material*; and
- (b) Operating records for *principal nuclear facilities*.

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

##### Reports

###### General Requirements

37. The State shall submit to the Agency reports with respect to the production, processing and use of safeguarded *nuclear material* in or outside *principal nuclear facilities*. For this purpose the State and the Agency shall agree on a system of reports with respect to each facility and also with respect to safeguarded *nuclear material* outside such facilities, on the basis of proposals to be submitted by the State in sufficient time to allow the Agency to review them before the reports need to be submitted. The reports need include only such information as is relevant for the purpose of safeguards.

38. Unless otherwise provided in the applicable *safeguards agreement*, reports shall be submitted in one of the working languages of the Board.

##### Routine reports

39. Routine reports shall be based on the records compiled in accordance with paragraphs 33-36 and shall consist, as appropriate, of:

- (a) Accounting reports showing the receipt, transfer out, inventory and use of all safeguarded *nuclear material*. The inventory shall indicate the nuclear and chemical composition and physical form of all material and its location on the date of the report; and
- (b) Operating reports showing the use that has been made of each *principal nuclear facility* since the last report and, as far as possible, the programme of future work in the period until the next routine report is expected to reach the Agency.

40. The routine report shall be submitted as soon as:

- (a) There is any safeguarded *nuclear material* to be accounted for; or
- (b) The *principal nuclear facility* to which it relates is in a condition to operate.

##### Progress in construction

41. The Agency may, if so provided in a *safeguards agreement*, request information as to when particular stages in the construction of a *principal nuclear facility* have been or are to be reached.

##### Special reports

42. The State shall report to the Agency without delay:

- (a) If any unusual incident occurs involving actual or potential loss or destruction of, or damage to, any safeguarded *nuclear material* or *principal nuclear facility*; or
- (b) If there is good reason to believe that safeguarded *nuclear material* is lost or unaccounted for in quantities that exceed the normal operating and handling losses that have been accepted by the Agency as characteristic of the facility.

43. The State shall report to the Agency, as soon as possible, and in any case within two weeks, any transfer not requiring advance notification that will result in a significant change (to be defined by the Agency in agreement with the State) in the quantity of safeguarded *nuclear material* in a facility, or in a complex of facilities considered as a unit for this purpose by agreement with the Agency. Such report shall indicate the amount and nature of the material and its intended use.

##### Amplification of reports

44. At the Agency's request, the State shall submit amplifications or clarifications of any report, in so far as relevant for the purpose of safeguards.

##### Inspections

###### General procedures

45. The Agency may inspect safeguarded *nuclear materials* and *principal nuclear facilities*.

46. The purpose of safeguards inspections shall be to verify compliance with *safeguards agreements* and to assist States in complying with such agreements and in resolving any questions arising out of the implementation of safeguards.

47. The number, duration and intensity of inspections actually carried out shall be kept to the minimum consistent with the effective implementation of safeguards, and if the Agency considers that the authorized inspections are not all required, fewer shall be carried out.

48. Inspectors shall neither operate any facility themselves nor direct the staff of a facility to carry out any particular operation.

###### Routine inspections

49. Routine inspections may include, as appropriate:

- (a) Audit of records and reports;
- (b) Verification of the amount of safeguarded *nuclear material* by physical inspection, measurement and sampling;
- (c) Examination of *principal nuclear facilities*, including a check of their measuring instruments and operating characteristics; and
- (d) Check of the operations carried out at *principal nuclear facilities* and at *research and development facilities* containing safeguarded *nuclear material*.

50. Whenever the Agency has the right of access to a *principal nuclear facility* at all times, it may perform inspections of which notice as required by paragraph 4 of the *Inspectors Document* need not be given, in so far as this is necessary for the effective application of safeguards. The actual procedures to implement

these provisions shall be agreed upon between the parties concerned in the *safeguards agreement*.

#### Initial inspections

51. To verify that the construction of a *principal nuclear facility* is in accordance with the design reviewed by the Agency, an initial inspection or inspections of the facility may be carried out, if so provided in a *safeguards agreement*:

(a) As soon as possible after the facility has come under Agency safeguards, in the case of a facility already in operation; or  
(b) Before the facility starts to operate, in other cases.

52. The measuring instruments and operating characteristics of the facility shall be reviewed to the extent necessary for the purpose of implementing safeguards. Instruments that will be used to obtain data on the *nuclear materials* in the facility may be tested to determine their satisfactory functioning. Such testing may include the observation by inspectors of commissioning or routine tests by the staff of the facility, but shall not hamper or delay the construction, commissioning or normal operation of the facility.

#### Special inspections

53. The Agency may carry out special inspections if:

(a) The study of a report indicates that such inspection is desirable; or  
(b) Any unforeseen circumstance requires immediate action. The Board shall subsequently be informed of the reasons for and the results of each such inspection.

54. The Agency may also carry out special inspections of substantial amounts of safeguarded *nuclear material* that are to be transferred outside the jurisdiction of the State in which it is being safeguarded, for which purpose the State shall give the Agency sufficient advance notice of any such proposed transfer.

#### B. Special procedures for reactors Reports

55. The frequency of submission of routine reports shall be agreed between the Agency and the State, taking into account the frequency established for routine inspections. However, at least two such reports shall be submitted each year and in no case shall more than 12 such reports be required in any year.

#### Inspections

56. One of the initial inspections of a *reactor* shall if possible be made just before the reactor first reaches criticality.

57. The maximum frequency of routine inspections of a *reactor* and of the safeguarded *nuclear material* in it shall be determined from the following table:

Whichever is the largest of: (a) Facility inventory (including loading); (b) Annual throughput; (c) Maximum potential annual production of special fissionable material ( <i>Effective kilograms of nuclear material</i> )	Maximum number of routine inspections annually
Up to 1	0
More than 1 and up to 5	1
More than 5 and up to 10	2
More than 10 and up to 15	3
More than 15 and up to 20	4
More than 20 and up to 25	5
More than 25 and up to 30	6
More than 30 and up to 35	7
More than 35 and up to 40	8
More than 40 and up to 45	9
More than 45 and up to 50	10
More than 50 and up to 55	11
More than 55 and up to 60	12
More than 60	Right of access at all times

58. The actual frequency of inspection of a *reactor* shall take account of:

(a) Whether the State possesses irradiated-fuel reprocessing facilities;  
(b) The nature of the *reactor*; and  
(c) The nature and amount of the *nuclear material* produced or used in the *reactor*.

#### C. Special procedures relating to safeguarded nuclear material outside principal nuclear facilities Nuclear material in research and development facilities

##### Routine reports

59. Only accounting reports need be submitted in respect of *nuclear material* in *research and development facilities*. The frequency of submission of such routine reports shall be agreed between the Agency and the State, taking into account the frequency established for routine inspections; however, at least one such report shall be submitted each year and in no case shall more than 12 such reports be required in any year.

##### Routine inspections

60. The maximum frequency of routine inspections of safeguarded *nuclear material* in a *research and development facility* shall be that specified in the table in paragraph 57 for the total amount of material in the facility.

##### Source materials in sealed storage

61. The following simplified procedures for safeguarding stockpiled source material shall be applied if a State undertakes to store such material in a sealed storage facility and not to remove it therefrom without previously informing the Agency.

##### Design of storage facilities

62. The State shall submit to the Agency information on the design of each sealed storage facility and agree with the Agency on the method and procedure for sealing it.

##### Routine reports

63. Two routine accounting reports in respect of source material in sealed storage shall be submitted each year.

##### Routine inspections

64. The Agency may perform one routine inspection of each sealed storage facility annually.

##### Removal of material

65. The State may remove safeguarded source material from a sealed storage facility after informing the Agency of the amount, type and intended use of the material to be removed, and providing sufficient other data in time to enable the Agency to continue safeguarding the material after it has been removed.

##### Nuclear material in other locations

66. Except to the extent that safeguarded *nuclear material* outside of *principal nuclear facilities* is covered by any of the provisions set forth in paragraphs 59-65, the following procedures shall be applied with respect to such material (for example, source material stored elsewhere than in a sealed storage facility, or special fissionable material used in a sealed neutron source in the field).

##### Routine reports

67. Routine accounting reports in respect of all safeguarded *nuclear material* in this category shall be submitted periodically. The frequency of submission of such reports shall be agreed between the Agency and the State, taking into account the frequency established for routine inspections; however, at least one such report shall be submitted each year and in no case shall more than 12 such reports be required in any year.

##### Routine inspections

68. The maximum frequency of routine inspections of safeguarded *nuclear material* in this category shall be one inspection annually if the total amount of such material does not exceed five *effective kilograms*, and shall be determined from the table in paragraph 57 if the amount is greater.

#### IV. DEFINITIONS

69. 'Agency' means the International Atomic Energy Agency.

70. 'Board' means the Board of Governors of the Agency.

71. 'Director General' means the Director General of the Agency.

72. 'Effective kilograms' means:

(a) In the case of plutonium, its weight in kilograms;

- (b) In the case of uranium with an *enrichment* of 0.01 (1 %) and above, its weight in kilograms multiplied by the square of its *enrichment*;
- (c) In the case of uranium with an *enrichment* below 0.01 (1 %) and above 0.005 (0.5%), its weight in kilograms multiplied by 0.0001; and
- (d) In the case of depleted uranium with an *enrichment* of 0.005 (0.5%) or below, and in the case of thorium, its weight in kilograms multiplied by 0.00005.

73. 'Enrichment' means the ratio of the combined weight of the isotopes uranium-233 and uranium-235 to that of the total uranium in question.

74. 'Improved' means, with respect to *nuclear material*, that either:

- (a) The concentration of fissionable isotopes in it has been increased; or
- (b) The amount of chemically separable fissionable isotopes in it has been increased; or
- (c) Its chemical or physical form has been changed so as to facilitate further use or processing.

75. 'Inspector' means an Agency official designated in accordance with the *Inspectors Document*.

76. 'Inspectors Document' means the Annex to the Agency's document GC(V)/INF/39.

77. 'Nuclear material' means any source or special fissionable material as defined in Article XX of the Statute.

78. 'Principal nuclear facility' means a *reactor*, a plant for processing *nuclear material* irradiated in a *reactor*, a plant for separating the isotopes of a *nuclear material*, a plant for processing or fabricating *nuclear material* (excepting a mine or ore-processing plant) or a facility or plant of such other type as may be designated by the Board from time to time, including associated storage facilities.

79. 'Project agreement' means a *safeguards agreement* relating to an Agency project and containing provisions as foreseen in Article XI.F4(b) of the Statute.

80. 'Reactor' means any device in which a controlled, self-sustaining fission chain-reaction can be maintained.

81. 'Research and development facility' means a facility, other than a *principal nuclear facility*, used for research or development in the field of nuclear energy.

82. 'Safeguards agreement' means an agreement between the Agency and one or more Member States which contains an undertaking by one or more of those States not to use certain items in such a way as to further any military purpose and which gives the Agency the right to observe compliance with such undertaking. Such an agreement may concern:

- (a) An Agency project;
- (b) A bilateral or multilateral arrangement in the field of nuclear energy under which the Agency may be asked to administer safeguards; or
- (c) Any of a State's nuclear activities *unilaterally submitted* to Agency safeguards.

83. 'Statute' means the Statute of the Agency.

84. 'Throughput' means the rate at which *nuclear material* is introduced into a facility operating at full capacity.

85. 'Unilaterally submitted' means submitted by a State to Agency safeguards, pursuant to a *safeguards agreement*.

## ANNEX I. PROVISIONS FOR REPROCESSING PLANTS

### Introduction

1. The Agency's Safeguards System (1965) is so formulated as to permit application to *principal nuclear facilities* other than *reactors* as foreseen in paragraph 7. This Annex lays down the additional procedures which are applicable to the safeguarding of *reprocessing plants*. However, because of the possible need to revise these procedures in the light of experience, they shall be subject to review at any time and shall in any case be reviewed after two year's experience of their application has been gained.

### Special procedures

#### Reports

2. The frequency of submission of routine reports shall be once each calendar month.

### Inspections

3. A *reprocessing plant* having an annual *throughput* not exceeding 5 *effective kilograms* of *nuclear material*, and the safeguarded *nuclear material* in it, may be routinely inspected twice a year. A *reprocessing plant* having an annual *throughput* exceeding 5 *effective kilograms* of *nuclear material*, and the safeguarded *nuclear material* in it, may be inspected at all times. The arrangements for inspections set forth in paragraph 50 shall apply to all inspections to be made under this paragraph.

4. When a *reprocessing plant* is under Agency safeguards only because it contains safeguarded *nuclear material*, the inspection frequency shall be based on the rate of delivery of safeguarded *nuclear material*.

5. The State and the Agency shall co-operate in making all the necessary arrangements to facilitate the taking, shipping or analysis of samples, due account being taken of the limitations imposed by the characteristics of a plant already in operation when placed under Agency safeguards.

### Mixtures of safeguarded and un-safeguarded nuclear material

6. By agreement between the State and the Agency, the following special arrangements may be made in the case of a *reprocessing plant* to which the criteria in paragraph 19(d) do not apply, and in which safeguarded and un-safeguarded *nuclear materials* are present:

(a) Subject to the provisions of sub-paragraph (b) below, the Agency shall restrict its safeguards procedures to the area in which irradiated fuel is stored, until such time as all or any part of such fuel is transferred out of the storage area into other parts of the plant. Safeguards procedures shall cease to apply to the storage area or plant when either contains no safeguarded *nuclear material*; and

(b) Where possible, safeguarded *nuclear material* shall be measured and sampled separately from un-safeguarded material, and at as early a stage as possible. Where separate measurement, sampling or processing are not possible, the whole of the material being processed in that *campaign* shall be subject to the safeguards procedures set out in this Annex. At the conclusion of the processing the *nuclear material* that is thereafter to be safeguarded shall be selected by agreement between the State and the Agency from the whole output of the plant resulting from that *campaign*, due account being taken of any processing losses accepted by the Agency.

### Definitions

7. 'Reprocessing plant' means a facility to separate irradiated *nuclear materials* and fission products, and includes the facility's head-end treatment section and its associated storage and analytical sections.

8. 'Campaign' means the period during which the chemical processing equipment in a *reprocessing plant* is operated between two successive wash-outs of the *nuclear material* present in the equipment.

## ANNEX II. PROVISIONS FOR SAFEGUARDED NUCLEAR MATERIAL IN CONVERSION PLANTS AND FABRICATION PLANTS

### Introduction

1. The Agency's Safeguards System (1965, as Provisionally Extended in 1966) is so formulated as to permit application to *principal nuclear facilities* other than *reactors* as foreseen in paragraph 7. This Annex lays down the additional procedures which are applicable to safeguarded *nuclear material* in *conversion plants* and *fabrication plants*. However, because of the possible need to revise these procedures in the light of experience, they shall be subject to review at any time and shall in any case be reviewed after two years' experience of their application has been gained.

### Special procedures

#### Reports

2. The frequency of submission of routine reports shall be once each calendar month.

### Inspections

3. A *conversion plant* or *fabrication plant* to which the criteria in

paragraph 19(d) apply and the *nuclear material* in it, may be inspected at all times if the plant inventory at any time, or the annual input, of *nuclear material* exceeds five *effective kilograms*. Where neither the inventory at any time, nor the annual input, exceeds five *effective kilograms* of *nuclear material*, the routine inspections shall not exceed two in a year. The arrangements for inspection set forth in paragraph 50 shall apply to all inspections to be made under this paragraph.

4. When a *conversion plant* or *fabrication plant* to which the criteria in paragraph 19(d) do not apply contains safeguarded *nuclear material* the frequency of routine inspections shall be based on the inventory at any time and the annual input of safeguarded *nuclear material*. Where the inventory at any time, or the annual input, of safeguarded *nuclear material* exceeds five *effective kilograms* the plant may be inspected at all times. Where neither the inventory at any time, nor the annual input, exceeds five *effective kilograms* of safeguarded *nuclear material* the routine inspections shall not exceed two a year. The arrangements for inspection set forth in paragraph 50 shall apply to all inspections to be made under this paragraph 2.

5. The intensity of inspection of safeguarded *nuclear material* at various steps in a *conversion plant* or *fabrication plant* shall take account of the nature, isotopic composition and amount of safeguarded *nuclear material* in the plant. Safeguards shall be applied in accordance with the general principles set forth in paragraphs 9-14. Emphasis shall be placed on inspection to control uranium of high enrichments and plutonium.

6. Where a plant may handle safeguarded and unsafeguarded *nuclear material*, the State shall notify the Agency in advance of the programme for handling safeguarded batches to enable the Agency to make inspections during these periods, due account being also taken of the arrangements under paragraph 10 below.

7. The State and the Agency shall co-operate in making all the necessary arrangements to facilitate the preparation of inventories of safeguarded *nuclear material* and the taking, shipping and/or analysis of samples, due account being taken of the limitations imposed by the characteristics of a plant already in operation when placed under Agency safeguards.

#### Residue, scrap and waste

8. The State shall ensure that safeguarded *nuclear material* contained in residues, scrap or waste created during conversion or fabrication is recovered, as far as is practicable, in its facilities and within a reasonable period of time. If such recovery is not considered practicable by the State, the State and the Agency shall co-operate in making arrangements to account for and dispose of the material.

#### Safeguarded and unsafeguarded nuclear material

9. By agreement between the State and the Agency, the following special arrangements may be made in the case of a conversion plant or a fabrication plant to which the criteria in paragraph 19(d) do not apply, and in which safeguarded and unsafeguarded nuclear material are both present:

(a) Subject to the provisions of sub-paragraph (b) below, the Agency shall restrict its safeguards procedures to the area in which safeguarded *nuclear material* is stored, until such time as all or any part of such *nuclear material* is transferred out of the storage area into other parts of the plant. Safeguards procedures shall cease to be applied to the storage area or plant when it contains no safeguarded *nuclear material*; and

(b) Where possible, safeguarded *nuclear material* shall be measured and sampled separately from unsafeguarded *nuclear material*, and at as early a stage as possible. Where separate measurement sampling or processing is not possible, any *nuclear material* containing safeguarded *nuclear material* shall be subject to the safeguards procedures set out in this Annex. At the conclusion of processing, the *nuclear material* that is thereafter to be safeguarded shall be selected, in accordance with paragraph 11 below when applicable, by agreement between the State and the Agency, due account being taken of any processing losses accepted by the Agency.

#### Blending of nuclear material

10. When safeguarded *nuclear material* is to be blended with either safeguarded or unsafeguarded *nuclear material*, the State shall notify the Agency sufficiently in advance of the programme of blending to enable the Agency to exercise its right to obtain

evidence, through inspection of the blending operation or otherwise, that the blending is performed according to the programme.

11. When safeguarded and unsafeguarded *nuclear material* are blended, if the ratio of fissionable isotopes in the safeguarded component going into the blend to all the fissionable isotopes in the blend is 0.3 or greater, and if the concentration of fissionable isotopes in the unsafeguarded *nuclear material* is increased by such blending, then the whole blend shall remain subject to safeguards. In other cases the following procedures shall apply:

(a) Plutonium/plutonium blending. The quantity of the blend that shall continue to be safeguarded shall be such that its weight, when multiplied by the square of the weight fraction of contained fissionable isotopes, is not less than the weight of originally safeguarded plutonium multiplied by the square of the weight fraction of fissionable isotopes therein, provided however that:

(i) In cases where the weight of the whole blend, when multiplied by the square of the weight fraction of contained fissionable isotopes, is less than the weight of originally safeguarded plutonium multiplied by the square of the weight fraction of fissionable isotopes therein, the whole of the blend shall be safeguarded; and

(ii) The number of fissionable atoms in the portion of the blend that shall continue to be under safeguards shall in no case be less than the number of fissionable atoms in the originally safeguarded plutonium;

(b) Uranium/uranium blending. The quantity of the blend that shall continue to be safeguarded shall be such that the number of *effective kilograms* is not less than the number of *effective kilograms* in the originally safeguarded uranium, provided however that:

(i) In cases where the number of *effective kilograms* in the whole blend is less than in the safeguarded uranium, the whole of the blend shall be safeguarded; and

(ii) The number of fissionable atoms in the portion of the blend that shall continue to be under safeguards shall in no case be less than the number of fissionable atoms in the originally safeguarded uranium;

(c) Uranium/plutonium blending. The whole of the resultant blend shall be safeguarded until the uranium and the plutonium constituents are separated. After separation of the uranium and plutonium, safeguards shall apply to the originally safeguarded component; and

(d) Due account shall be taken of any processing losses agreed upon between the State and the Agency.

#### Definitions

12. 'Conversion plant' means a facility (excepting a mine or ore-processing) plant to *improve* unirradiated *nuclear material*, or irradiated *nuclear material* that has been separated from fission products, by changing its chemical or physical form so as to facilitate further use or processing. The term *conversion plant* includes the facility's storage and analytical sections. The term does not include a plant intended for separating the isotopes of a *nuclear material*.

13. 'Fabrication plant' means a plant to manufacture fuel elements or other components containing *nuclear material* and includes the plant's storage and analytical sections.

[Eds – footnotes not included. They may be viewed at <http://www.iaea.org/Publications/Documents/Infcircs/Others/inf66r2.shtml>]

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### The Structure and Content of Agreements between the Agency and States Required in Connection with the Treaty on the Non-Proliferation of Nuclear Weapons

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[Reproduced from IAEA Information Circular 153 (Corrected) (INFCIRC/153), dated June 1972]

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#### PART I

##### Basic Undertaking

1. The Agreement should contain, in accordance with Article I II.1 of the Treaty on the Non-Proliferation of Nuclear Weapons, an undertaking by the State to accept safeguards, in accordance with the terms of the Agreement, on all source or special fissionable material in all peaceful nuclear activities within its territory, under its

jurisdiction or carried out under its control anywhere, for the exclusive purpose of verifying that such material is not diverted to nuclear weapons or other nuclear explosive devices.

#### Application of Safeguards

2. The Agreement should provide for the Agency's right and obligation to ensure that safeguards will be applied, in accordance with the terms of the Agreement, on all source or special fissionable material in all peaceful nuclear activities within the territory of the State, under its jurisdiction or carried out under its control anywhere, for the exclusive purpose of verifying that such material is not diverted to nuclear weapons or other nuclear explosive devices.

#### Co-operation Between the Agency and the State

3. The Agreement should provide that the Agency and the State shall co-operate to facilitate the implementation of the safeguards provided for therein.

#### Implementation of Safeguards

4. The Agreement should provide that safeguards shall be implemented in a manner designed:

(a) To avoid hampering the economic and technological development of the State or international co-operation in the field of peaceful nuclear activities, including international exchange of *nuclear material*;

(b) To avoid undue interference in the State's peaceful nuclear activities, and in particular in the operation of *facilities*; and

(c) To be consistent with prudent management practices required for the economic and safe conduct of nuclear activities.

5. The Agreement should provide that the Agency shall take every precaution to protect commercial and industrial secrets and other confidential information coming to its knowledge in the implementation of the Agreement. The Agency shall not publish or communicate to any State, organization or person any information obtained by it in connection with the implementation of the Agreement, except that specific information relating to such implementation in the State may be given to the Board of Governors and to such Agency staff members as require such knowledge by reason of their official duties in connection with safeguards, but only to the extent necessary for the Agency to fulfil its responsibilities in implementing the Agreement. Summarized information on *nuclear material* being safeguarded by the Agency under the Agreement may be published upon decision of the Board if the states directly concerned agree.

6. The Agreement should provide that in implementing safeguards pursuant thereto the Agency shall take full account of technological developments in the field of safeguards, and shall make every effort to ensure optimum cost-effectiveness and the application of the principle of safeguarding effectively the flow of *nuclear material* subject to safeguards under the Agreement by use of instruments and other techniques at certain *strategic points* to the extent that present or future technology permits. In order to ensure optimum cost-effectiveness, use should be made, for example, of such means as:

(a) Containment as a means of defining *material balance points* for accounting purposes;

(b) Statistical techniques and random sampling in evaluating the flow of *nuclear material*; and

(c) Concentration of verification procedures on those stages in the nuclear fuel cycle involving the production, processing, use or storage of *nuclear material* from which nuclear weapons or other nuclear explosive devices could readily be made, and minimization of verification procedures in respect of other *nuclear material* on condition that this does not hamper the Agency in applying safeguards under the Agreement.

#### National System of Accounting for and Control of Nuclear Material

7. The Agreement should provide that the State shall establish and maintain a system of accounting for and control of all *nuclear material* subject to safeguards under the Agreement, and that such safeguards shall be applied in such a manner as to enable the Agency to verify, in ascertaining that there has been no diversion of *nuclear material* from peaceful uses to nuclear weapons or other nuclear explosive devices, findings of the State's system. The Agency's verification shall include, inter alia, independent measurements and observations conducted by the Agency in

accordance with the procedures specified in Part II below. The Agency, in its verification, shall take due account of the technical effectiveness of the State's system.

#### Provision of Information to the Agency

8. The Agreement should provide that to ensure the effective implementation of safeguards thereunder the Agency shall be provided, in accordance with the provisions set out in Part II below, with information concerning *nuclear material* subject to safeguards under the Agreement and the features of *facilities* relevant to safeguarding such material. The Agency shall require only the minimum amount of information and data consistent with carrying out its responsibilities under the Agreement. Information pertaining to *facilities* shall be the minimum necessary for safeguarding *nuclear material* subject to safeguards under the Agreement. In examining design information, the Agency shall, at the request of the State, be prepared to examine on premises of the State design information which the State regards as being of particular sensitivity. Such information would not have to be physically transmitted to the Agency provided that it remained available for ready further examination by the Agency on premises of the State.

#### Agency Inspectors

9. The Agreement should provide that the State shall take the necessary steps to ensure that Agency inspectors can effectively discharge their functions under the Agreement. The Agency shall secure the consent of the State to the designation of Agency inspectors to that State. If the State, either upon proposal of a designation or at any other time after a designation has been made, objects to the designation, the Agency shall propose to the State an alternative designation or designations. The repeated refusal of a State to accept the designation of Agency inspectors which would impede the inspections conducted under the Agreement would be considered by the Board upon referral by the Director General with a view to appropriate action. The visits and activities of Agency Inspectors shall be so arranged as to reduce to a minimum the possible inconvenience and disturbance to the State and to the peaceful nuclear activities inspected, as well as to ensure protection of industrial secrets or any other confidential information coming to the inspectors' knowledge.

#### Privileges and Immunities

10. The Agreement should specify the privileges and immunities which shall be granted to the Agency and its staff in respect of their functions under the Agreement. In the case of a State party to the Agreement on the Privileges and Immunities of the Agency, the provisions thereof, as in force for such State, shall apply. In the case of other States, the privileges and immunities granted should be such as to ensure that:

(a) The Agency and its staff will be in a position to discharge their functions under the Agreement effectively; and

(b) No such State will be placed thereby in a more favourable position than States party to the Agreement on the Privileges and Immunities of the Agency.

#### Termination of Safeguards

##### *Consumption or dilution of nuclear material*

11. The Agreement should provide that safeguards shall terminate on *nuclear material* subject to safeguards thereunder upon determination by the Agency that it has been consumed, or has been diluted in such a way that it is no longer usable for any nuclear activity relevant from the point of view of safeguards, or has become practicably irrecoverable.

##### *Transfer of nuclear material out of the State*

12. The Agreement should provide, with respect to *nuclear material* subject to safeguards thereunder, for notification of transfers of such material out of the State, in accordance with the provisions set out in paragraphs 92-94 below. The Agency shall terminate safeguards under the Agreement on *nuclear material* when the recipient State has assumed responsibility therefore, as provided for in paragraph 91. The Agency shall maintain records indicating each transfer and, where applicable, the re-application of safeguards to the transferred *nuclear material*.

##### *Provisions relating to nuclear material to be used in non-nuclear activities*

13. The Agreement should provide that if the State wishes to

use *nuclear material* subject to safeguards thereunder in non-nuclear activities, such as the production of alloys or ceramics, it shall agree with the Agency on the circumstances under which the safeguards on such *nuclear material* may be terminated.

#### **Non-application of Safeguards to Nuclear Material to be Used in Non-peaceful Activities**

14. The Agreement should provide that if the State intends to exercise its discretion to use *nuclear material* which is required to be safeguarded thereunder in a nuclear activity which does not require the application of safeguards under the Agreement, the following procedures will apply:

(a) The State shall inform the Agency of the activity, making it clear:

(i) That the use of the *nuclear material* is a non-prescribed military activity will not be in conflict with an undertaking the State may have given and in respect of which Agency safeguards apply, that the *nuclear material* will be used only in a peaceful nuclear activity; and

(ii) That during the period of non-application of safeguards the *nuclear material* will not be used for the production of nuclear weapons or other nuclear explosive devices;

(b) The Agency and the State shall make an arrangement so that, only while the *nuclear material* is in such an activity, the safeguards provided for in the Agreement will not be applied. The arrangement shall identify, to the extent possible, the period or circumstances during which safeguards will not be applied. In any event, the safeguards provided for in the Agreement shall again apply as soon as the *nuclear material* is reintroduced into a peaceful nuclear activity. The Agency shall be kept informed of the total quantity and composition of such unsafeguarded *nuclear material* in the State and of any exports of such material; and

(c) Each arrangement shall be made in agreement with the Agency. The Agency's agreement shall be given as promptly as possible; it shall only relate to the temporary and procedural provisions, reporting arrangements, etc., but shall not involve any approval or classified knowledge of the military activity or relate to the use of the *nuclear material* therein.

#### **Finance**

15. The Agreement should contain one of the following sets of provisions:

(a) An agreement with a Member of the Agency should provide that each party thereto shall bear the expenses it incurs in implementing its responsibilities thereunder. However, if the State or persons under its jurisdiction incur extraordinary expenses as a result of a specific request by the Agency, the Agency shall reimburse such expenses provided that it has agreed in advance to do so. In any case the Agency shall bear the cost of any additional measuring or sampling which inspectors may request; or

(b) An agreement with a party not a Member of the Agency should in application of the provisions of Article XIV.C of the Statute, provide that the party shall reimburse fully to the Agency the safeguards expenses the Agency incurs thereunder. However, if the party or persons under its jurisdiction incur extraordinary expenses as a result of a specific request by the Agency, the Agency shall reimburse such expenses provided that it has agreed in advance to do so.

#### **Third Party Liability for Nuclear Damage**

16. The Agreement should provide that the State shall ensure that any protection against third party liability in respect of nuclear damage, including any insurance or other financial security, which may be available under its laws or regulations shall apply to the Agency and its officials for the purpose of the implementation of the Agreement, in the same way as that protection applies to nationals of the State.

#### **International Responsibility**

17. The Agreement should provide that any claim by one party thereto against the other in respect of any damage, other than damage arising out of a nuclear incident, resulting from the implementation of safeguards under the Agreement, shall be settled in accordance with international law.

#### **Measures in Relation to Verification of Non-diversion**

18. The Agreement should provide that if the Board, upon report of the Director General decides that an action by the State is

essential and urgent in order to ensure verification that *nuclear material* subject to safeguards under the Agreement is not diverted to nuclear weapons or other nuclear explosive devices the Board shall be able to call upon the State to take the required action without delay, irrespective of whether procedures for the settlement of a dispute have been invoked.

19. The Agreement should provide that if the Board upon examination of relevant information reported to it by the Director General finds that the Agency is not able to verify that there has been no diversion of *nuclear material* required to be safeguarded under the Agreement to nuclear weapons or other nuclear explosive devices, it may make the reports provided for in paragraph C of Article XI I of the Statute and may also take, where applicable, the other measures provided for in that paragraph. In taking such action the Board shall take account of the degree of assurance provided by the safeguards measures that have been applied and shall afford the State every reasonable opportunity to furnish the Board with any necessary reassurance.

#### **Interpretation and Application of the Agreement and Settlement of Disputes**

20. The Agreement should provide that the parties thereto shall, at the request of either, consult about any question arising out of the interpretation or application thereof.

21. The Agreement should provide that the State shall have the right to request that any question arising out of the interpretation or application thereof be considered by the Board; and that the State shall be invited by the Board to participate in the discussion of any such question by the Board.

22. The Agreement should provide that any dispute arising out of the interpretation or application thereof except a dispute with regard to a finding by the Board under paragraph 19 above or an action taken by the Board pursuant to such a finding which is not settled by negotiation or another procedure agreed to by the parties should, on the request of either party, be submitted to an arbitral tribunal composed as follows: each party would designate one arbitrator, and the two arbitrators so designated would elect a third, who would be the Chairman. If, within 30 days of the request for arbitration, either party has not designated an arbitrator, either party to the dispute may request the president of the International Court of Justice to appoint an arbitrator. The same procedure would apply if, within 30 days of the designation or appointment of the second arbitrator, the third arbitrator had not been elected. A majority of the members of the arbitral tribunal would constitute a quorum, and all decisions would require the concurrence of two arbitrators. The arbitral procedure would be fixed by the tribunal. The decisions of the tribunal would be binding on both parties.

#### **Final Clauses**

##### *Amendment of the Agreement*

23. The Agreement should provide that the parties thereto shall, at the request of either of them, consult each other on amendment of the Agreement. All amendments shall require the agreement of both parties. It might additionally be provided, if convenient to the State, that the agreement of the parties on amendments to Part I I of the Agreement could be achieved by recourse to a simplified procedure. The Director General shall promptly inform all Member States of any amendment to the Agreement.

##### *Suspension of application of Agency safeguards under other agreements*

24. Where applicable and where the State desires such a provision to appear, the Agreement should provide that the application of Agency safeguards in the State under other safeguards agreements with the Agency shall be suspended while the Agreement is in force. If the State has received assistance from the Agency for a project, the State's undertaking in the Project Agreement not to use items subject thereto in such a way as to further any military purpose shall continue to apply.

##### *Entry into force and duration*

25. The Agreement should provide that it shall enter into force on the date on which the Agency receives from the State written notification that the statutory and constitutional requirements for entry into force have been met. The Director General shall promptly inform all Member States of the entry into force.

26. The Agreement should provide for it to remain in force as

long as the State is party to the Treaty on the Non-Proliferation of Nuclear Weapons.

## PART II

### Introduction

27. The Agreement should provide that the purpose of Part I I thereof is to specify the procedures to be applied for the implementation of the safeguards provisions of Part I.

### Objective of Safeguards

28. The Agreement should provide that the objective of safeguards is the timely detection of diversion of significant quantities of *nuclear material* from peaceful nuclear activities to the manufacture of nuclear weapons or of other nuclear explosive devices or for purposes unknown, and deterrence of such diversion by the risk of early detection.

29. To this end the Agreement should provide for the use of material accountancy as a safeguards measure of fundamental importance, with containment and surveillance as important complementary measures.

30. The Agreement should provide that the technical conclusion of the Agency's verification activities shall be a statement, in respect of each *material balance area*, of the amount of *material unaccounted for* over a specific period, giving the limits of accuracy of the amounts stated.

### National System of Accounting for and Control of Nuclear Material

31. The Agreement should provide that pursuant to paragraph 7 above the Agency, in carrying out its verification activities, shall make full use of the State's system of accounting for and control of all *nuclear material* subject to safeguards under the Agreement, and shall avoid unnecessary duplication of the State's accounting and control activities.

32. The Agreement should provide that the State's system of accounting for and control of all *nuclear material* subject to safeguards under the Agreement shall be based on a structure of material balance areas, and shall make provision as appropriate and specified in the Subsidiary Arrangements for the establishment of such measures as:

- (a) A measurement system for the determination of the quantities of *nuclear material* received, produced, shipped, lost or otherwise removed from inventory, and the quantities on inventory;
- (b) The evaluation of precision and accuracy of measurements and the estimation of measurement uncertainty;
- (c) Procedures for identifying, reviewing and evaluating differences in shipper/receiver measurements;
- (d) Procedures for taking a *physical inventory*;
- (e) Procedures for the evaluation of accumulations of unmeasured inventory and unmeasured losses;
- (f) A system of records and reports showing, for each *material balance area*, the inventory of *nuclear material* and the changes in that inventory including receipts into and transfers out of the *material balance area*;
- (g) Provisions to ensure that the accounting procedures and arrangements are being operated correctly; and
- (h) Procedures for the submission of reports to the Agency in accordance with paragraphs 59–69 below.

### Starting Point of Safeguards

33. The Agreement should provide that safeguards shall not apply thereunder to material in mining or ore processing activities.

34. The Agreement should provide that:

- (a) When any material containing uranium or thorium which has not reached the stage of the nuclear fuel cycle described in subparagraph (c) below is directly or indirectly exported to a non-nuclear-weapon State, the State shall inform the Agency of its quantity, composition and destination, unless the material is exported for specifically non-nuclear purposes;
- (b) When any material containing uranium or thorium which has not reached the stage of the nuclear fuel cycle described in subparagraph (c) below is imported, the State shall inform the Agency of its quantity and composition, unless the material is imported for specifically non-nuclear purposes; and
- (c) When any *nuclear material* of a composition and purity suitable for fuel fabrication or for being isotopically enriched leaves the plant or the process stage in which it has been produced, or

when such *nuclear materials*, or any other *nuclear material* produced at a later stage in the nuclear fuel cycle, is imported into the State, the *nuclear material* shall become subject to the other safeguards procedures specified in the Agreement.

### Termination of Safeguards

35. The Agreement should provide that safeguards shall terminate on *nuclear material* subject to safeguards thereunder under the conditions set forth in paragraph 11 above. Where the conditions of that paragraph are not met, but the State considers that the recovery of safeguarded *nuclear material* from residues is not for the time being practicable or desirable, the Agency and the State shall consult on the appropriate safeguards measures to be applied. It should further be provided that safeguards shall terminate on *nuclear material* subject to safeguards under the Agreement under the conditions set forth in paragraph 13 above, provided that the State and the Agency agree that such *nuclear material* is practicably irrecoverable.

### Exemptions from Safeguards

36. The Agreement should provide that the Agency shall, at the request of the State, exempt *nuclear material* from safeguards, as follows:

- (a) Special fissionable material, when it is used in gram quantities or less as a sensing component in instruments;
- (b) *Nuclear material*, when it is used in non-nuclear activities in accordance with paragraph 13 above, if such *nuclear material* is recoverable; and
- (c) Plutonium with an isotopic concentration of plutonium-238 exceeding 80%.

37. The Agreement should provide that *nuclear material* that would otherwise be subject to safeguards shall be exempted from safeguards at the request of the State, provided that *nuclear material* so exempted in the State may not at any time exceed:

- (a) One kilogram in total of special fissionable material, which may consist of one or more of the following:
    - (i) Plutonium;
    - (ii) Uranium with an *enrichment* of 0.2 (20%) and above, taken account of by multiplying its weight by its *enrichment*; and
    - (iii) Uranium with an *enrichment* below 0.2 (20%) and above that of natural uranium, taken account of by multiplying its weight five times the square of its *enrichment*;
  - (b) Ten metric tons in total of natural uranium and depleted uranium with an *enrichment* above 0.005 (0.5%);
  - (c) Twenty metric tons of depleted uranium with a *enrichment* of 0.005 (0.5%) or below; and
  - (d) Twenty metric tons of thorium;
- or such greater amounts as may be specified by the Board of Governors for uniform application.

38. The Agreement should provide that if exempted *nuclear material* is to be processed or stored together with safeguarded *nuclear material*, provision should be made for the re-application of safeguards thereto.

### Subsidiary Arrangements

39. The Agreement should provide that the Agency and the State shall make Subsidiary Arrangements which shall specify in detail, to the extent necessary to permit the Agency to fulfil its responsibilities under the Agreement in an effective and efficient manner, how the procedures laid down in the Agreement are to be applied. Provision should be made for the possibility of an extension or change of the Subsidiary Arrangements by agreement between the Agency and the State without amendment of the Agreement.

40. It should be provided that the Subsidiary Arrangements shall enter into force at the same time as, or as soon as possible after, the entry into force of the Agreement. The State and the Agency shall make every effort to achieve their entry into force within 90 days of the entry into force of the Agreement, a later date being acceptable only with the agreement of both parties. The State shall provide the Agency promptly with the information required for completing the Subsidiary Arrangements. The Agreement should also provide that, upon its entry into force, the Agency shall be entitled to apply the procedures laid down therein in respect of the *nuclear material* listed in the inventory provided for in paragraph 41 below.

## Inventory

41. The Agreement should provide that, on the basis of the initial report referred to in paragraph 62 below, the Agency shall establish a unified inventory of all *nuclear material* in the State subject to safeguards under the Agreement, irrespective of its origin, and maintain this inventory on the basis of subsequent reports and of the results of its verification activities. Copies of the inventory shall be made available to the State at agreed intervals.

## Design Information

### General

42. Pursuant to paragraph 8 above, the Agreement should stipulate that design information in respect of existing *facilities* shall be provided to the Agency during the discussion of the Subsidiary Arrangements, and that the time limits for the provision of such information in respect of new *facilities* shall be specified in the Subsidiary Arrangements. It should further be stipulated that such information shall be provided as early as possible before *nuclear material* is introduced into a new *facility*.

43. The Agreement should specify that the design information in respect of each *facility* to be made available to the Agency shall include, when applicable:

- (a) Identification of the *facility*, stating its general character, purpose, nominal capacity and geographic location, and the name and address to be used for routine business purposes;
- (b) A description of the general arrangement of the *facility* with reference, to the extent feasible, to the form, location and flow of *nuclear material* and to the general layout of important items of equipment which use, produce or process *nuclear material*;
- (c) A description of features of the *facility* relating to material accountancy, containment and surveillance; and
- (d) A description of the existing and proposed procedures at the *facility* for *nuclear material* accountancy and control, with special reference to *material balance areas* established by the operator, measurements of flow and procedures for *physical inventory* taking.

44. The Agreement should further provide that other information relevant to the application of safeguards shall be made available to the Agency in respect of each *facility*, in particular on organizational responsibility for material accountancy and control. It should also be provided that the State shall make available to the Agency supplementary information on the health and safety procedures which the Agency shall observe and with which the inspectors shall comply at the *facility*.

45. The Agreement should stipulate that design information in respect of a modification relevant for safeguards purposes shall be provided for examination sufficiently in advance for the safeguards procedures to be adjusted when necessary.

### Purposes of examination of design information

46. The Agreement should provide that the design information made available to the Agency shall be used for the following purposes:

- (a) To identify the features of *facility* and *nuclear material* relevant to the application of safeguards to *nuclear material* in sufficient detail to facilitate verification;
- (b) To determine *material balance points* to be used for Agency accounting purposes and to select those *strategic points* which are *key measurement points* and which will be used to determine the *nuclear material* flows and inventories; in determining such *material balance points* the Agency shall, inter alia, use the following criteria:
  - (i) The size of the *material balance area* should be related to the accuracy with which the material balance can be established;
  - (ii) In determining the *material balance area* advantage should be taken of any opportunity to use containment and surveillance to help ensure the completeness of flow measurements and thereby simplify the application of safeguards and concentrate measurement efforts at *key measurement points*;
  - (iii) A number of *material balance points* in use at a *facility* or at distinct sites may be combined in one *material balance area* to be used for Agency accounting purposes when the Agency determines that this is consistent with its verification requirements; and
  - (iv) If the State so requests, a special *material balance area* around a process step involving commercially sensitive information may be established;

- (c) To establish the nominal timing and procedures for taking of *physical inventory* for Agency accounting purposes;
- (d) To establish the records and reports requirements and records evaluation procedures;
- (e) To establish requirements and procedures for verification of the quantity and location of *nuclear material*; and
- (f) To select appropriate combinations of containment and surveillance methods and techniques and the *strategic points* at which they are to be applied.

It should further be provided that the results of the examination of the design information shall be included in the Subsidiary Arrangements.

### Re-examination of design information

47. The Agreement should provide that design information shall be re-examined in the light of changes in operating conditions, of developments in safeguards technology or of experience in the application of verification procedures, with a view to modifying the action the Agency has taken pursuant to paragraph 46 above.

### Verification of design information

48. The Agreement should provide that the Agency, in cooperation with the State, may send inspectors to *facilities* to verify the design information provided to the Agency pursuant to paragraphs 42-45 above for the purposes stated in paragraph 46.

## Information in Respect of Nuclear Material Outside Facilities

49. The Agreement should provide that the following information concerning *nuclear material* customarily used outside *facilities* shall be provided as applicable to the Agency:

- (a) A general description of the use of the *nuclear material*, its geographic location, and the user's name and address for routine business purposes; and
- (b) A general description of the existing and proposed procedures for *nuclear material* accountancy and control, including organizations responsibility for material accountancy and control. The Agreement should further provide that the Agency shall be informed on a timely basis of any change in the information provided to it under this paragraph.

50. The Agreement should provide that the information made available to the Agency in respect of *nuclear material* customarily used outside *facilities* may be used, to the extent relevant, for the purposes set out in sub-paragraphs 46(b)–(f) above.

## Records System

### General

51. The Agreement should provide that in establishing a national system of accounting for and control of *nuclear material* as referred to in paragraph 7 above, the State shall arrange that records are kept in respect of each *material balance area*. Provision should also be made that the Subsidiary Arrangements shall describe the records to be kept in respect of each *material balance area*.

52. The Agreement should provide that the State shall make arrangements to facilitate the examination of records by inspectors, particularly if the records are not kept in English, French, Russian or Spanish.

53. The Agreement should provide that the records shall be retained for at least five years.

54. The Agreement should provide that the records shall consist, as appropriate, of:

- (a) Accounting records of all *nuclear material* subject to safeguards under the Agreement; and
- (b) Operating records for *facilities* containing such *nuclear material*.

55. The Agreement should provide that the system of measurements on which the records used for the preparation of reports are based shall either conform to the latest international standards or be equivalent in quality to such standards.

### Accounting records

56. The Agreement should provide that the accounting records shall set forth the following in respect of each *material balance area*:

- (a) All *inventory changes*, so as to permit a determination of the *book inventory* at any time;
- (b) All measurement results that are used for determination of the *physical inventory*; and

(c) All *adjustments* and *corrections* that have been made in respect of *inventory changes*, *book inventories* and *physical inventories*.

57. The Agreement should provide that for all *inventory changes* and *physical inventories* the records shall show, in respect of each *batch of nuclear material*: material identification, *batch data* and *source data*. Provision should further be included that records shall account for uranium, thorium and plutonium separately in each *batch of nuclear material*. Furthermore, the date of the *inventory change* and, when appropriate, the originating *material balance area* and the receiving *material balance area* or the recipient, shall be indicated for each *inventory change*.

#### Operating records

58. The Agreement should provide that the operating records shall set forth as appropriate in respect of each *material balance area*:

- (a) Those operating data which are used to establish changes in the quantities and composition of *nuclear material*;
- (b) The data obtained from the calibration of tanks and instruments and from sampling and analyses, the procedures to control the quality of measurements and the derived estimates of random and systematic error;
- (c) A description of the sequence of the actions taken in preparing for, and in taking, a *physical inventory* in order to ensure that it is correct and complete; and
- (d) A description of the actions taken in order to ascertain the cause and magnitude of any accidental or unmeasured loss that might occur.

#### Reports System

##### General

59. The Agreement should specify that the State shall provide the Agency with reports as detailed in paragraphs 60–69 below in respect of *nuclear material* subject to safeguards thereunder.

60. The Agreement should provide that reports shall be made in English, French, Russian or Spanish, except as otherwise specified in the Subsidiary Arrangements.

61. The Agreement should provide that reports shall be based on the records kept in accordance with paragraphs 51–58 above and shall consist, as appropriate, of accounting reports and special reports.

##### Accounting reports

62. The Agreement should stipulate that the Agency shall be provided with an initial report on all *nuclear material* which is to be subject to safeguards thereunder. It should also be provided that the initial report shall be dispatched by the State to the Agency within 30 days of the last day of the calendar month in which the Agreement enters into force, and shall reflect the situation as of the last day of that month.

63. The Agreement should stipulate that for each *material balance area* the State shall provide the Agency with the following accounting reports:

- (a) *Inventory change* reports showing changes in the inventory of *nuclear material*. The reports shall be dispatched as soon as possible and in any event within 30 days after the end of the month in which the *inventory changes* occurred or were established; and
- (b) Material balance reports showing the material balance based on a *physical inventory* of *nuclear material* actually present in the *material balance area*. The report shall be dispatched as soon as possible and in any event within 30 days after the *physical inventory* has been taken. The reports shall be based on data available as of the date of reporting and may be corrected at a later date as required.

64. The Agreement should provide that *inventory change* reports shall specify identification and *batch data* for each *batch of nuclear material*, the date of the *inventory change* and, as appropriate, the originating *material balance area* and the receiving *material balance area* or the recipient. These reports shall be accompanied by concise notes:

- (a) Explaining the *inventory changes*, on the basis of the operating data contained in the operating records provided for under subparagraph 58(a) above; and
- (b) Describing, as specified in the Subsidiary Arrangements, the anticipated operational programme, particularly the taking of a *physical inventory*.

65. The Agreement should provide that the State shall report each *inventory change*, *adjustment* and *correction* either periodically in a consolidated list or individually. The *inventory changes* shall be reported in terms of *batches*; small amounts, such as analytical samples, as specified in the Subsidiary Arrangements, may be combined and reported as one *inventory change*.

66. The Agreement should stipulate that the Agency shall provide the State with semi-annual statements of *book inventory* of *nuclear material* subject to safeguards, for each *material balance area*, as based on the *inventory change* reports for the period covered by each such statement.

67. The Agreement should specify that the material balance reports shall include the following entries, unless otherwise agreed by the Agency and the State:

- (a) Beginning *physical inventory*;
- (b) *Inventory changes* (first increases, then decreases);
- (c) Ending *book inventory*;
- (d) *Shipper/receiver differences*;
- (e) Adjusted ending *book inventory*;
- (f) Ending *physical inventory*; and
- (g) *Material accounted for*.

A statement of the *physical inventory*, listing all *batches* separately and specifying material identification and *batch data* for each *batch*, shall be attached to each material balance report.

##### Special reports

68. The Agreement should provide that the State shall make special reports without delay:

- (a) If any unusual incident or circumstances lead the State to believe that there is or may have been loss of *nuclear material* that exceeds the limits to be specified for this purpose in the Subsidiary Arrangements; or
- (b) If the containment has unexpectedly changed from that specified in the Subsidiary Arrangements to the extent that unauthorized removal of *nuclear material* has become possible.

##### Amplification and clarification of reports

69. The Agreement should provide that at the Agency's request the State shall supply amplifications or clarifications of any report, in so far as relevant for the purpose of safeguards.

#### Inspections

##### General

70. The Agreement should stipulate that the Agency shall have the right to make inspections as provided for in paragraphs 71–82 below.

##### Purposes of inspections

71. The Agreement should provide that the Agency may make ad hoc inspections in order to:

- (a) Verify the information contained in the initial report on the *nuclear material* subject to safeguards under the Agreement;
- (b) Identify and verify changes in the situation which have occurred since the date of the initial report; and
- (c) Identify, and if possible verify the quantity and composition of, *nuclear material* in accordance with paragraphs 93 and 96 below, before its transfer out of or upon its transfer into the State.

72. The Agreement should provide that the Agency may make routine inspections in order to:

- (a) Verify that reports are consistent with records;
- (b) Verify the location, identity, quantity and composition of all *nuclear material* subject to safeguards under the Agreement; and
- (c) Verify information on the possible causes of *material unaccounted for*, *shipper/receiver differences* and uncertainties in the *book inventory*.

73. The Agreement should provide that the Agency may make special inspections subject to the procedures laid down in paragraph 77 below:

- (a) In order to verify the information contained in special reports; or
- (b) If the Agency considers that information made available by the State, including explanations from the State and information obtained from routine inspections, is not adequate for the Agency to fulfil its responsibilities under the Agreement. An inspection shall be deemed to be special when it is either additional to the routine inspection effort provided for in paragraphs 78–82 below, or involves access to information or locations in addition to the access specified in paragraph 76 for ad hoc and routine inspections, or

both.

#### Scope of inspections

74. The Agreement should provide that for the purposes stated in paragraphs 71-73 above the Agency may:

- (a) Examine the records kept pursuant to paragraphs 51-58;
- (b) Make independent measurements of all *nuclear material* subject to safeguards under the Agreement;
- (c) Verify the functioning and calibration of instruments and other measuring and control equipment;
- (d) Apply and make use of surveillance and containment measures; and
- (e) Use other objective methods which have been demonstrated to be technically feasible.

75. It should further be provided that within the scope of paragraph 74 above the Agency shall be enabled:

- (a) To observe that samples at *key measurement points* for material balance accounting are taken in accordance with procedures which produce representative samples, to observe the treatment and analysis of the samples and to obtain duplicates of such samples;
- (b) To observe that the measurements of *nuclear material* at *key measurement points* for material balance accounting are representative, and to observe the calibration of the instruments and equipment involved;
- (c) To make arrangements with the State that, if necessary:
  - (i) Additional measurements are made and additional samples taken for the Agency's use;
  - (ii) The Agency's standard analytical samples are analysed;
  - (iii) Appropriate absolute standards are used in calibrating instruments and other equipment; and
- (d) To arrange to use its own equipment for independent measurement and surveillance, and if so agreed and specified in the Subsidiary Arrangements, to arrange to install such equipment;
- (e) To apply its seals and other identifying and tamper-indicating devices to containments, if so agreed and specified in the Subsidiary Arrangements; and
- (f) To make arrangements with the State for the shipping of samples taken for the Agency's use.

#### Access for inspections

76. The Agreement should provide that:

- (a) For the purposes specified in sub-paragraphs 71(a) and (b) above and until such time as the *strategic points* have been specified in the Subsidiary Arrangements, the Agency's inspectors shall have access to any location where the initial report or any inspections carried out in connection with it indicate that *nuclear material* is present;
- (b) For the purposes specified in sub-paragraph 71(c) above the inspectors shall have access to any location of which the Agency has been notified in accordance with sub-paragraphs 92(c) or 95(c) below;
- (c) For the purposes specified in paragraph 72 above the Agency's inspectors shall have access only to the *strategic points* specified in the Subsidiary Arrangements and to the records maintained pursuant to paragraphs 51-58; and
- (d) In the event of the State concluding that any unusual circumstances require extended limitations on access by the Agency, the State and the Agency shall promptly make arrangements with a view to enabling the Agency to discharge its safeguards responsibilities in the light of these limitations. The Director General shall report each such arrangement to the Board.

77. The Agreement should provide that in circumstances which may lead to special inspections for the purposes specified in paragraph 73 above the State and the Agency shall consult forthwith. As a result of such consultations the Agency may make inspections in addition to the routine inspection effort provided for in paragraphs 78-82 below, and may obtain access in agreement with the State to information or locations in addition to the access specified in paragraph 76 above for ad hoc and routine inspections. Any disagreement concerning the need for additional access shall be resolved in accordance with paragraphs 21 and 22; in case action by the State is essential and urgent, paragraph 18 above shall apply.

#### Frequency and intensity of routine inspections

78. The Agreement should provide that the number, intensity, duration and timing of routine inspections shall be kept to the minimum consistent with the effective implementation of the safeguards procedures set forth therein, and that the Agency shall make the optimum and most economical use of available inspection resources.

79. The Agreement should provide that in the case of *facilities* and *material balance area* outside *facilities* with a content or *annual throughput*, whichever is greater, of *nuclear material* not exceeding five *effective kilograms*, routine inspections shall not exceed one per year. For other *facilities* the number, intensity, duration, timing and mode of inspections shall be determined on the basis that in the maximum or limiting case the inspection regime shall be no more intensive than is necessary and sufficient to maintain continuity of knowledge of the flow and inventory of *nuclear material*.

80. The Agreement should provide that the maximum routine inspection effort in respect of *facilities* with a content or *annual throughput* of *nuclear material* exceeding five *effective kilograms* shall be determined as follows:

- (a) For reactors and sealed stores, the maximum total of routine inspection per year shall be determined by allowing one sixth of a *man-year of inspection* for each such *facility* in the State;
- (b) For other *facilities* involving plutonium or uranium enriched to more than 5%, the maximum total of routine inspection per year shall be determined by allowing for each such *facility* 30 x -E man-days of inspection per year, where E is the inventory or *annual throughput* of *nuclear material*, whichever is greater, expressed in *effective kilograms*. The maximum established for any such *facility* shall not, however, be less than 1.5 *man-years of inspection*; and
- (c) For all other *facilities*, the maximum total of routine inspection per year shall be determined by allowing for each such *facility* one third of a *man-year of inspection* plus 0.4 x E man-days of inspection per year, where E is the inventory or *annual throughput* of *nuclear material*, whichever is greater, expressed in *effective kilograms*.

The Agreement should further provide that the Agency and the State may agree to amend the maximum figures specified in this paragraph upon determination by the Board that such amendment is reasonable.

81. Subject to paragraphs 78-80 above the criteria to be used for determining the actual number, intensity, duration, timing and mode of routine inspections of any *facility* shall include:

- (a) The form of *nuclear material*, in particular, whether the material is in bulk form or contained in a number of separate items; its chemical composition and, in the case of uranium, whether it is of low or high *enrichment*; and its accessibility;
- (b) The effectiveness of the State's accounting and control system, including the extent to which the operators of *facilities* are functionally independent of the State's accounting and control system; the extent to which the measures specified in paragraph 32 above have been implemented by the State; the promptness of reports submitted to the Agency; their consistency with the Agency's independent verification; and the amount and accuracy of the *material unaccounted for*, as verified by the Agency;
- (c) Characteristics of the State's nuclear fuel cycle, in particular, the number and types of *facilities* containing *nuclear material* subject to safeguards, the characteristics of such *facilities* relevant to safeguards, notably the degree of containment; the extent to which the design of such *facilities* facilitates verification of the flow and inventory of *nuclear material*; and the extent to which information from different *material balance points* can be correlated;
- (d) International interdependence, in particular, the extent to which *nuclear material* is received from or sent to other States for use or processing; any verification activity by the Agency in connection therewith; and the extent to which the State's nuclear activities are interrelated with those of other States; and
- (e) Technical developments in the field of safeguards, including the use of statistical techniques and random sampling in evaluating the flow of *nuclear material*.

82. The Agreement should provide for consultation between the Agency and the State if the latter considers that the inspection effort is being deployed with undue concentration on particular *facilities*.

*Notice of inspections*

83. The Agreement should provide that the Agency shall give advance notice to the State before arrival of inspectors at *facilities* or *material balance points* outside *facilities*, as follows:

- (a) For ad hoc inspections pursuant to sub-paragraph 71(c) above, at least 24 hours, for those pursuant to sub-paragraphs 71(a) and (b), as well as the activities provided for in paragraph 48, at least one week;
- (b) For special inspections pursuant to paragraph 73 above, as promptly as possible after the Agency and the State have consulted as provided for in paragraph 77, it being understood that notification of arrival normally will constitute part of the consultations; and
- (c) For routine inspections pursuant to paragraph 72 above, at least 24 hours in respect of the *facilities* referred to in sub-paragraph 80(b) and sealed stores containing plutonium or uranium enriched to more than 5%, and one week in all other cases. Such notice of inspections shall include the names of the inspectors and shall indicate the *facilities* and the *material balance area* outside *facilities* to be visited and the periods during which they will be visited. If the inspectors are to arrive from outside the State the Agency shall also give advance notice of the place and time of their arrival in the State.

84. However, the Agreement should also provide that, as a supplementary measure, the Agency may carry out without advance notification a portion of the routine inspections pursuant to paragraph 80 above in accordance with the principle of random sampling. In performing any unannounced inspections, the Agency shall fully take into account any operational programme provided by the State pursuant to paragraph 64(b). Moreover, whenever practicable, and on the basis of the operational programme, it shall advise the State periodically of its general programme of announced and unannounced inspections, specifying the general periods when inspections are foreseen. In carrying out any unannounced inspections, the Agency shall make every effort to minimize any practical difficulties for *facility* operators and the State, bearing in mind the relevant provisions of paragraphs 44 above and 89 below. Similarly the State shall make every effort to facilitate the task of the inspectors.

*Designation of inspectors*

85. The Agreement should provide that:
- (a) The Director General shall inform the State in writing of the name, qualifications, nationality, grade and such other particulars as may be relevant, of each Agency official he proposes for designation as an inspector for the State;
  - (b) The State shall inform the Director General within 30 days of the receipt of such a proposal whether it accepts the proposal;
  - (c) The Director General may designate each official who has been accepted by the State as one of the inspectors for the State, and shall inform the State of such designations; and
  - (d) The Director General, acting in response to a request by the State or on his own initiative, shall immediately inform the State of the withdrawal of the designation of any official as an inspector for the State.

The Agreement should also provide, however, that in respect of inspectors needed for the purposes stated in paragraph 48 above and to carry out ad hoc inspections pursuant to sub-paragraphs 71(a) and (b) the designation procedures shall be completed if possible within 30 days after the entry into force of the Agreement. If such designation appears impossible within this time limit, inspectors for such purposes shall be designated on a temporary basis.

86. The Agreement should provide that the State shall grant or renew as quickly as possible appropriate visas, where required, for each inspector designated for the State.

*Conduct and visits of inspectors*

87. The Agreement should provide that inspectors, in exercising their functions under paragraphs 48 and 71–75 above, shall carry out their activities in a manner designed to avoid hampering or delaying the construction, commissioning or operation of *facilities* or affecting their safety. In particular inspectors shall not operate any *facility* themselves or direct the staff of a *facility* to carry out any operation. If inspectors consider that in pursuance of paragraphs 74 and 75, particular operations in a facility should be carried out by the operator, they shall make a request therefor.

88. When inspectors require services available in the State, including the use of equipment, in connection with the performance of inspections, the State shall facilitate the procurement of such services and the use of such equipment by inspectors.

89. The Agreement should provide that the State shall have the right to have inspectors accompanied during their inspections by representatives of the State, provided that inspectors shall not thereby be delayed or otherwise impeded in the exercise of their functions.

**Statements on the Agency's Verification Activities**

90. The Agreement should provide that the Agency shall inform the State of:

- (a) The results of inspections, at intervals to be specified in the Subsidiary Arrangements; and
- (b) The conclusions it has drawn from its verification activities in the State, in particular by means of statements in respect of each *material balance area*, which shall be made as soon as possible after a *physical inventory* has been taken and verified by the Agency and a material balance has been struck.

**International Transfers***General*

91. The Agreement should provide that *nuclear material* subject or required to be subject to safeguards thereunder which is transferred internationally shall, for purposes of the Agreement, be regarded as being the responsibility of the State:

- (a) In the case of import, from the time that such responsibility ceases to lie with the exporting State, and no later than the time at which the *nuclear material* reaches its destination; and
- (b) In the case of export, up to the time at which the recipient State assumes such responsibility, and no later than the time at which the *nuclear material* reaches its destination.

The Agreement should provide that the States concerned shall make suitable arrangements to determine the point at which the transfer of responsibility will take place. No State shall be deemed to have such responsibility for *nuclear material* merely by reason of the fact that the *nuclear material* is in transit on or over its territory or territorial waters, or that it is being transported under its flag or in its aircraft.

*Transfers out of the State*

92. The Agreement should provide that any intended transfer out of the State of safeguarded *nuclear material* in a amount exceeding one *effective kilogram* or by successive shipments to the same State within a period of three months each of less than one *effective kilogram* but exceeding in total one *effective kilogram*, shall be notified to the Agency after the conclusion of the contractual arrangements leading to the transfer and normally at least two weeks before the *nuclear material* is to be prepared for shipping. The Agency and the State may agree on different procedures for advance notification. The notification shall specify:

- (a) The identification and, if possible, the expected quantity and composition of the *nuclear material* to be transferred, and the *material balance area* from which it will come;
- (b) The State for which the *nuclear material* is destined;
- (c) The dates on and locations at which the *nuclear material* is to be prepared for shipping;
- (d) The approximate dates of dispatch and arrival of the *nuclear material*; and
- (e) At what point of the transfer the recipient State will assume responsibility for the *nuclear material*, and the probable date on which this point will be reached.

93. The Agreement should further provide that the purpose of this notification shall be to enable the Agency if necessary to identify, and if possible verify the quantity and composition of, *nuclear material* subject to safeguards under the Agreement before it is transferred out of the State and, if the Agency so wishes or the State so requests, to affix seals to the *nuclear material* when it has been prepared for shipping. However, the transfer of the *nuclear material* shall not be delayed in any way by any action taken or contemplated by the Agency pursuant to this notification.

94. The Agreement should provide that, if the *nuclear material* will not be subject to Agency safeguards in the recipient State, the exporting State shall make arrangements for the Agency to receive, within three months of the time when the recipient State accepts responsibility for the *nuclear material* from the exporting State, confirmation by the recipient State of the transfer.

### Transfers into the State

95. The Agreement should provide that the expected transfer into the State of *nuclear material* required to be subject to safeguards in an amount greater than one *effective kilogram*, or by successive shipments from the same State within a period of three months each of less than one *effective kilogram* but exceeding in total one *effective kilogram*, shall be notified to the Agency as much in advance as possible of the expected arrival of the *nuclear material*, and in any case not later than the date on which the recipient State assumes responsibility therefor. The Agency and the State may agree on different procedures for advance notification. The notification shall specify:

- (a) The identification and, if possible, the expected quantity and composition of the *nuclear material*;
- (b) At what point of the transfer responsibility for the *nuclear material* will be assumed by the State for the purposes of the Agreement, and the probable date on which this point will be reached; and
- (c) The expected date of arrival, the location to which the *nuclear material* is to be delivered and the date on which it is intended that the *nuclear material* should be unpacked.

96. The Agreement should provide that the purpose of this notification shall be to enable the Agency if necessary to identify, and if possible verify the quantity and composition of, *nuclear material* subject to safeguards which has been transferred into the State, by means of inspection of the consignment at the time it is unpacked. However, unpacking shall not be delayed by any action taken or contemplated by the Agency pursuant to this notification.

### Special reports

97. The Agreement should provide that in the case of international transfers a special report as envisaged in paragraph 68 above shall be made if any unusual incident or circumstances lead the State to believe that there is or may have been loss of *nuclear material*, including the occurrence of significant delay during the transfer.

### Definitions

98. 'Adjustment' means an entry into an accounting record or a report showing a *shipper/receiver difference* or *material unaccounted for*.

99. 'Annual throughput' means, for the purposes of paragraphs 79 and 80 above, the amount of *nuclear material* transferred annually out of a *facility* working at nominal capacity.

100. 'Batch' means a portion of *nuclear material* handled as a unit for accounting purposes at a *key measurement point* and for which the composition and quantity are defined by a single set of specifications or measurements. The *nuclear material* may be in bulk form or contained in a number of separate items.

101. 'Batch data' means the total weight of each element of *nuclear material* and, in the case of plutonium and uranium, the isotopic composition when appropriate. The units of account shall be as follows:

- (a) Grams of contained plutonium;
- (b) Grams of total uranium and grams of contained uranium-235 plus uranium-233 for uranium enriched in these isotopes; and
- (c) Kilograms of contained thorium, natural uranium or depleted uranium.

For reporting purposes the weights of individual items in the *batch* shall be added together before rounding to the nearest unit.

102. 'Book inventory' of a *material balance area* means the algebraic sum of the most recent *physical inventory* of that *material balance area* and of all *inventory changes* that have occurred since that *physical inventory* was taken.

103. 'Correction' means an entry into an accounting record or a report to rectify an identified mistake or to reflect an improved measurement of a quantity previously entered into the record or report. Each correction must identify the entry to which it pertains.

104. 'Effective kilogram' means a special unit used in safeguarding *nuclear material*. The quantity in 'effective kilograms' is obtained by taking:

- (a) For plutonium, its weight in kilograms;
- (b) For uranium with an *enrichment* of 0.01 (1 %) and above, its weight in kilograms multiplied by the square of its *enrichment*;
- (c) For uranium with an *enrichment* below 0.01 (1 %) and above 0.005 (0.5%), its weight in kilograms multiplied by 0.0001; and
- (d) For depleted uranium with an *enrichment* of 0.005 (0.5%) or below, and for thorium, its weight in kilograms multiplied by

0.00005.

105. 'Enrichment' means the ratio of the combined weight of the isotopes uranium-233 and uranium-235 to that of the total uranium in question.

106. 'Facility' means:

- (a) A reactor, a critical facility, a conversion plant, a fabrication plant, a reprocessing plant, an isotope separation plant or a separate storage installation; or
- (b) Any location where *nuclear material* in amounts greater than one *effective kilogram* is customarily used.

107. 'Inventory change' means an increase or decrease, in terms of *batches of nuclear material* in a *material balance area* such a change shall involve one of the following:

- (a) Increases:
  - (i) Import;
  - (ii) Domestic receipt: receipts from other *material balance points*, receipts from a non-safeguarded (non-peaceful) activity or receipts at the starting point of safeguards;
  - (iii) Nuclear production: production of special fissionable material in a reactor; and
  - (iv) De-exemption: reapplication of safeguards on *nuclear material* previously exempted therefrom on account of its use or quantity.
- (b) Decreases:
  - (i) Export;
  - (ii) Domestic shipment: shipments to other *material balance points* or shipments for a non-safeguarded (non-peaceful) activity;
  - (iii) Nuclear loss: loss of *nuclear material* due to its transformation into other element(s) or isotope(s) as a result of nuclear reactions;
  - (iv) Measured discard: *nuclear material* which has been measured, or estimated on the basis of measurements, and disposed of in such a way that it is not suitable for further nuclear use;
  - (v) Retained waste: *nuclear material* generated from processing or from an operational accident, which is deemed to be unrecoverable for the time being but which is stored;
  - (vi) Exemption: exemption of *nuclear material* from safeguards on account of its use or quantity; and
  - (vii) Other loss: for example, accidental loss (that is, irretrievable and inadvertent loss of *nuclear material* as the result of an operational accident) or theft.

108. 'Key measurement point' means a location where *nuclear material* appears in such a form that it may be measured to determine material flow or inventory. 'Key measurement points' thus include, but are not limited to, the inputs and outputs (including measured discards) and storages in *material balance points*.

109. 'Man-year of inspection' means, for the purposes of paragraph 80 above, 300 man-days of inspection, a man-day being a day during which a single inspector has access to a *facility* at any time for a total of not more than eight hours.

110. 'Material balance area' means an area in or outside of a *facility* such that:

- (a) The quantity of *nuclear material* in each transfer into or out of each 'material balance area' can be determined; and
- (b) The *physical inventory* of *nuclear material* in each 'material balance area' can be determined when necessary, in accordance with specified procedures, in order that the material balance for Agency safeguards purposes can be established.

111. 'Material unaccounted for' means the difference between *book inventory* and *physical inventory*.

112. 'Nuclear material' means any source or any special fissionable material as defined in Article XX of the Statute. The term source material shall not be interpreted as applying to ore or ore residue. Any determination by the Board under Article XX of the Statute after the entry into force of this Agreement which adds to the materials considered to be source material or special fissionable material shall have effect under this Agreement only upon acceptance by the State.

113. 'Physical inventory' means the sum of all the measured or derived estimates of *batch* quantities of *nuclear material* on hand at a given time within a *material balance area*, obtained in accordance with specified procedures.

114. 'Shipper/receiver difference' means the difference between the quantity of *nuclear material* in a *batch* as stated by the shipping *material balance area* and as measured at the receiving *material balance area*.

115. 'Source data' means those data, recorded during measurement or calibration or used to derive empirical

relationships, which identify *nuclear material* and provide *batch data*. 'Source data' may include, for example, weight of compounds, conversion factors to determine weight of element, specific gravity, element concentration, isotopic ratios, relationship between volume and manometer readings and relationship between plutonium produced and power generated.

116. 'Strategic point' means a location selected during examination of design information where, under normal conditions and when combined with the information from all 'strategic points' taken together, the information necessary and sufficient for the implementation of safeguards measures is obtained and verified; a 'strategic point' may include any location where key measurements related to material balance accountancy are made and where containment and surveillance measures are executed.

[Eds – footnotes not included. They may be viewed at <http://www.iaea.org/Publications/Documents/Infcircs/Other/infirc153.pdf>]

### **Protocol Additional to the Agreement(s) Between ..... and the International Atomic Energy Agency for the Application of Safeguards**

[IAEA Information Circular 540, (INFCIRC/540), September 1997, as corrected by INFCIRC/540/Corr.1, 12 October 1998]

#### **Foreword to the model Protocol**

This document is a model Additional Protocol designed for States having a Safeguards Agreement with the Agency, in order to strengthen the effectiveness and improve the efficiency of the safeguards system as a contribution to global nuclear non-proliferation objectives.

The Board of Governors has requested the Director General to use this Model Protocol as the standard for additional protocols that are to be concluded by States and other parties to comprehensive safeguards agreements with the Agency. Such protocols shall contain all of the measures in this Model Protocol.

The Board of Governors has also requested the Director General to negotiate additional protocols or other legally binding agreements with nuclear-weapon States incorporating those measures provided for in the Model Protocol that each nuclear-weapon State has identified as capable of contributing to the non-proliferation and efficiency aims of the Protocol, when implemented with regard to that State, and as consistent with that State's obligations under Article I of the NPT.

The Board of Governors has further requested the Director General to negotiate additional protocols with other States that are prepared to accept measures provided for in the model Protocol in pursuance of safeguards effectiveness and efficiency objectives.

In conformity with the requirements of the Statute, each individual Protocol or other legally binding agreement will require the approval of the Board and its authorization to the Director General to conclude and subsequently implement the Protocol so approved.

#### **Preamble**

WHEREAS ..... (hereinafter referred to as '.....') is a party to (an) Agreement(s) between ..... and the International Atomic Energy Agency (hereinafter referred to as the 'Agency') for the application of safeguards [full title of the Agreement(s) to be inserted] (hereinafter referred to as the 'Safeguards Agreement(s)'), which entered into force on .....

AWARE OF the desire of the international community to further enhance nuclear non-proliferation by strengthening the effectiveness and improving the efficiency of the Agency's safeguards system;

RECALLING that the Agency must take into account in the implementation of safeguards the need to: avoid hampering the economic and technological development of ..... or international co-operation in the field of peaceful nuclear activities; respect health, safety, physical protection and other security provisions in force and the rights of individuals; and take every precaution to protect commercial, technological and industrial secrets as well as other confidential information coming to its knowledge;

WHEREAS the frequency and intensity of activities described in this Protocol shall be kept to the minimum consistent with the

objective of strengthening the effectiveness and improving the efficiency of Agency safeguards;

NOW THEREFORE ..... and the Agency have agreed as follows:

### **RELATIONSHIP BETWEEN THE PROTOCOL AND THE SAFEGUARDS AGREEMENT**

#### **Article 1**

The provisions of the Safeguards Agreement shall apply to this Protocol to the extent that they are relevant to and compatible with the provisions of this Protocol. In case of conflict between the provisions of the Safeguards Agreement and those of this Protocol, the provisions of this Protocol shall apply.

### **PROVISION OF INFORMATION**

#### **Article 2**

a ..... shall provide the Agency with a declaration containing:

(i) A general description of and information specifying the location of *nuclear fuel cycle-related research and development activities*<sup>1</sup> not involving *nuclear material* carried out anywhere that are funded, specifically authorized or controlled by, or carried out on behalf of, .....

(ii) Information identified by the Agency on the basis of expected gains ineffectiveness or efficiency, and agreed to by ..... on operational activities of safeguards relevance at *facilities* and at *locations outside facilities* where nuclear material is customarily used.

(iii) A general description of each building on each *site*, including its use and, if not apparent from that description, its contents. The description shall include a map of the *site*.

(iv) A description of the scale of operations for each location engaged in the activities specified in Annex I to this Protocol.

(v) Information specifying the location, operational status and the estimated annual production capacity of uranium mines and concentration plants and thorium concentration plants, and the current annual production of such mines and concentration plants for ..... as a whole ..... shall provide, upon request by the Agency, the current annual production of an individual mine or concentration plant. The provision of this information does not require detailed *nuclear material* accountancy.

(vi) Information regarding source material which has not reached the composition and purity suitable for fuel fabrication or for being isotopically enriched, as follows:

(a) the quantities, the chemical composition, the use or intended use of such material, whether in nuclear or non-nuclear use, for each location in ..... at which the material is present in quantities exceeding ten metric tons of uranium and/or twenty metric tons of thorium, and for other locations with quantities of more than one metric ton, the aggregate for ..... as a whole if the aggregate exceeds ten metric tons of uranium or twenty metric tons of thorium. The provision of this information does not require detailed *nuclear material* accountancy;

(b) the quantities, the chemical composition and the destination of each export out of ..... of such material for specifically non-nuclear purposes in quantities exceeding:

(1) ten metric tons of uranium, or for successive exports of uranium from ..... to the same State, each of less than ten metric tons, but exceeding a total of ten metric tons for the year;

(2) twenty metric tons of thorium, or for successive exports of thorium from ..... to the same State, each of less than twenty metric tons, but exceeding a total of twenty metric tons for the year;

(c) the quantities, chemical composition, current location and use or intended use of each import into ..... such material for specifically non-nuclear purposes in quantities exceeding:

(1) ten metric tons of uranium, or for successive imports of uranium in to ..... each of less than ten metric tons, but exceeding a total of ten metric tons for the year;

(2) twenty metric tons of thorium, or for successive imports of thorium into ..... each of less than twenty metric tons, but exceeding a total of twenty metric tons for the year;

it being understood that there is no requirement to provide information on such material intended for a non-nuclear use once it is in its non-nuclear end-use form.

<sup>1</sup> Terms in italics have specialized meanings, which are defined in Article 18 below.

(vii) (a) information regarding the quantities, uses and locations of *nuclear material* exempted from safeguards pursuant to [paragraph 37 of INFCIRC/153]<sup>2</sup>;

(b) information regarding the quantities (which may be in the form of estimates) and uses at each location, of *nuclear material* exempted from safeguards pursuant to [paragraph 36(b) of INFCIRC/153]<sup>2</sup> but not yet in a non-nuclear end-use form, in quantities exceeding those set out in [paragraph 37 of INFCIRC/153]<sup>2</sup>. The provision of this information does not require detailed *nuclear material* accountability.

(viii) Information regarding the location or further processing of intermediate or high-level waste containing plutonium, *high enriched uranium* or uranium-233 on which safeguards have been terminated pursuant to [paragraph 11 of INFCIRC/153]<sup>2</sup>. For the purpose of this paragraph, 'further processing' does not include repackaging of the waste or its further conditioning not involving the separation of elements, for storage or disposal.

(ix) The following information regarding *specified equipment and non-nuclear material* as follows:

(a) for each export out of ..... of such equipment and material: the identity, quantity, location of intended use in the receiving State and date or, as appropriate, expected date, of export;

(b) upon specific request by the Agency, confirmation by ..... as importing State, of information provided to the Agency by another State concerning the export of such equipment and material to .....

(x) General plans for the succeeding ten-year period relevant to the development of the nuclear fuel cycle (including planned *nuclear fuel cycle-related research and development activities*) when approved by the appropriate authorities in .....

b. .... shall make every reasonable effort to provide the Agency with the following information:

(i) a general description of and information specifying the location of *nuclear fuel cycle-related research and development activities* not involving *nuclear material* which are specifically related to enrichment, reprocessing of nuclear fuel or the processing of intermediate or high-level waste containing plutonium, *high enriched uranium* or uranium-233 that are carried out anywhere in ..... but which are not funded, specifically authorized or controlled by, or carried out on behalf of, ..... For the purpose of this paragraph, 'processing' of intermediate or high-level waste does not include repackaging of the waste or its conditioning not involving the separation of elements, for storage or disposal.

(ii) A general description of activities and the identity of the person or entity carrying out such activities, at locations identified by the Agency outside a *site* which the Agency considers might be functionally related to the activities of that *site*. The provision of this information is subject to a specific request by the Agency. It shall be provided in consultation with the Agency and in a timely fashion.

c. Upon request by the Agency, ..... shall provide amplifications or clarifications of any information it has provided under this Article, in so far as relevant for the purpose of safeguards.

### Article 3

a. .... shall provide to the Agency the information identified in Article 2.a.(i), (iii), (iv), (v), (vi)(a), (vii) and (x) and Article 2.b.(i) within 180 days of the entry into force of this Protocol.

b. .... shall provide to the Agency, by 15 May of each year, updates of the information referred to in paragraph a. above for the period covering the previous calendar year. If there has been no change to the information previously provided, ..... shall so indicate.

c. .... shall provide to the Agency, by 15 May of each year, the information identified in Article 2.a.(vi)(b) and (c) for the period covering the previous calendar year.

d. .... shall provide to the Agency on a quarterly basis the information identified in Article 2.a.(ix)(a). This information shall be provided within sixty days of the end of each quarter.

e. .... shall provide to the Agency the information identified in Article 2.a.(viii) 180 days before further processing is carried out and, by 15 May of each year, information on changes in location

for the period covering the previous calendar year.

f. .... and the Agency shall agree on the timing and frequency of the provision of the information identified in Article 2.a.(ii).

g. .... shall provide to the Agency the information in Article 2.a.(ix)(b) within sixty days of the Agency's request.

## COMPLEMENTARY ACCESS

### General

#### Article 4

The following shall apply in connection with the implementation of complementary access under Article 5 of this Protocol:

a. The Agency shall not mechanically or systematically seek to verify the information referred to in Article 2; however, the Agency shall have access to:

(i) Any location referred to in Article 5.a.(i) or (ii) on a selective basis in order to assure the absence of undeclared *nuclear material* and activities;

(ii) Any location referred to in Article 5.b. or c. to resolve a question relating to the correctness and completeness of the information provided pursuant to Article 2 or to resolve an inconsistency relating to that information;

(iii) Any location referred to in Article 5.a.(iii) to the extent necessary for the Agency to confirm, for safeguards purposes, .....s declaration of the decommissioned status of a *facility* or of a *location outside facilities* where *nuclear material* was customarily used.

b. (i) Except as provided in paragraph (ii) below, the Agency shall give ..... advance notice of access of at least 24 hours;

(ii) For access to any place on a *site* that is sought in conjunction with design information verification visits or ad hoc or routine inspections on that *site*, the period of advance notice shall, if the Agency so requests, be at least two hours but, in exceptional circumstances, it may be less than two hours.

c. Advance notice shall be in writing and shall specify the reasons for access and the activities to be carried out during such access.

d. In the case of a question or inconsistency, the Agency shall provide ..... with an opportunity to clarify and facilitate the resolution of the question or inconsistency. Such an opportunity will be provided before a request for access, unless the Agency considers that delay in access would prejudice the purpose for which the access is sought. In any event, the Agency shall not draw any conclusions about the question or inconsistency until ..... has been provided with such an opportunity.

e. Unless otherwise agreed to by ..... access shall only take place during regular working hours.

f. .... shall have the right to have Agency inspectors accompanied during their access by representatives of ..... provided that the inspectors shall not thereby be delayed or otherwise impeded in the exercise of their functions.

### Provision of access

#### Article 5

..... shall provide the Agency with access to:

a. (i) Any place on a *site*;  
(ii) Any location identified by ..... under Article 2.a.(v)–(viii);  
(iii) Any *decommissioned facility* or *decommissioned location outside facilities* where *nuclear material* was customarily used.

b. Any location identified by ..... under Article 2.a.(i), Article 2.a.(iv), Article 2.a.(ix)(b) or Article 2.b, other than those referred to in paragraph a.(i) above, provided that if ..... is unable to provide such access, ..... shall make every reasonable effort to satisfy Agency requirements, without delay, through other means.

c. Any location specified by the Agency, other than locations referred to in paragraphs a. and b. above, to carry out *location-specific environmental sampling*, provided that if ..... is unable to provide such access, ..... shall make every reasonable effort to satisfy Agency requirements, without delay, at adjacent locations or through other means.

<sup>2</sup> The reference to the corresponding provision of the relevant Safeguards Agreement should be inserted where bracketed references to INFCIRC/153 are made.

## Scope of Activities

### Article 6

When implementing Article 5, the Agency may carry out the following activities:

- a. For access in accordance with Article 5.a.(i) or (iii): visual observation; collection of environmental samples; utilization of radiation detection and measurement devices; application of seals and other identifying and tamper indicating devices specified in Subsidiary Arrangements; and other objective measures which have been demonstrated to be technically feasible and the use of which has been agreed by the Board of Governors (hereinafter referred to as the 'Board') and following consultations between the Agency and
- b. For access in accordance with Article 5.a.(ii): visual observation; item counting of nuclear material; non-destructive measurements and sampling; utilization of radiation detection and measurement devices; examination of records relevant to the quantities, origin and disposition of the material; collection of environmental samples; and other objective measures which have been demonstrated to be technically feasible and the use of which has been agreed by the Board and following consultations between the Agency and
- c. For access in accordance with Article 5.b.: visual observation; collection of environmental samples; utilization of radiation detection and measurement devices; examination of safeguards relevant production and shipping records; and other objective measures which have been demonstrated to be technically feasible and the use of which has been agreed by the Board and following consultations between the Agency and
- d. For access in accordance with Article 5.c., collection of environmental samples and, in the event the results do not resolve the question or inconsistency at the location specified by the Agency pursuant to Article 5.c., utilization at that location of visual observation, radiation detection and measurement devices, and, as agreed by and the Agency, other objective measures.

## Managed access

### Article 7

- a. Upon request by ..... the Agency and ..... shall make arrangements for managed access under this Protocol in order to prevent the dissemination of proliferation sensitive information, to meet safety or physical protection requirements, or to protect proprietary or commercially sensitive information. Such arrangements shall not preclude the Agency from conducting activities necessary to provide credible assurance of the absence of undeclared *nuclear materials* and activities at the location in question, including the resolution of a question relating to the correctness and completeness of the information referred to in Article 2 or of an inconsistency relating to that information.
- b. .... may, when providing the information referred to in Article 2, inform the Agency of the places at a *site* or location at which managed access may be applicable.
- c. Pending the entry into force of any necessary Subsidiary Arrangements, ..... may have recourse to managed access consistent with the provisions of paragraph a. above.

### Article 8

Nothing in this Protocol shall preclude .....from offering the Agency access to locations in addition to those referred to in Articles 5 and 9 or from requesting the Agency to conduct verification activities at a particular location. The Agency shall, without delay, make every reasonable effort to act upon such a request.

### Article 9

.....shall provide the Agency with access to locations specified by the Agency to carry out *wide-area environmental sampling*, provided that if ..... is unable to provide such access it shall make every reasonable effort to satisfy Agency requirements at alternative locations. The Agency shall not seek such access until the use of *wide-area environmental sampling* and the procedural arrangements therefor have been approved by the Board and following consultations between the Agency and .....

## Statements on the Agency's access activities

### Article 10

The Agency shall inform .....of:

- a. The activities carried out under this Protocol, including those in respect of any questions or inconsistencies the Agency had brought to the attention of ..... within sixty days of the activities being carried out by the Agency.
- b. The results of activities in respect of any questions or inconsistencies the Agency had brought to the attention of ..... as soon as possible but in any case within thirty days of the results being established by the Agency.
- c. The conclusions it has drawn from its activities under this Protocol. The conclusions shall be provided annually.

## DESIGNATION OF AGENCY INSPECTORS

### Article 11

- a. (i) The Director General shall notify .....of the Board's approval of any Agency official as a safeguards inspector. Unless ..... advises the Director General of its rejection of such an official as an inspector for ..... within three months of receipt of notification of the Board's approval, the inspector so notified to ..... shall be considered designated to .....
- (ii) The Director General, acting in response to a request by ..... or on his own initiative, shall immediately inform ..... of the withdrawal of the designation of any official as an inspector for .....
- b. A notification referred to in paragraph a. above shall be deemed to be received by ..... seven days after the date of the transmission by registered mail of the notification by the Agency to .....

## Visas

### Article 12

..... shall, within one month of the receipt of a request therefor, provide the designated inspector specified in the request with appropriate multiple entry/exit and/or transit visas, where required, to enable the inspector to enter and remain on the territory of .....for the purpose of carrying out his/her functions. Any visas required shall be valid for at least one year and shall be renewed, as required, to cover the duration of the inspector's designation to .....

## SUBSIDIARY ARRANGEMENTS

### Article 13

- a. Where ..... or the Agency indicates that it is necessary to specify in Subsidiary Arrangements how measures laid down in this Protocol are to be applied, and the Agency shall agree on such Subsidiary Arrangements within ninety days of the entry into force of this Protocol or, where the indication of the need for such Subsidiary Arrangements is made after the entry into force of this Protocol, within ninety days of the date of such indication.
- b. Pending the entry into force of any necessary Subsidiary Arrangements, the Agency shall be entitled to apply the measures laid down in this Protocol.

## COMMUNICATIONS SYSTEMS

### Article 14

a. .... shall permit and protect free communications by the Agency for official purposes between Agency inspectors in ..... and Agency Headquarters and/or Regional Offices, including attended and unattended transmission of information generated by Agency containment and/or surveillance or measurement devices. The Agency shall have, in consultation with ..... the right to make use of internationally established systems of direct communications, including satellite systems and other forms of telecommunication, not in use in ..... At the request of ..... or the Agency, details of the implementation of this paragraph with respect to the attended or unattended transmission of information generated by Agency containment and/or surveillance or measurement devices shall be specified in the Subsidiary Arrangements.

b. Communication and transmission of information as provided for in paragraph a. above shall take due account of the need to

protect proprietary or commercially sensitive information or design information which ..... regards as being of particular sensitivity.

## PROTECTION OF CONFIDENTIAL INFORMATION

### Article 15

a. The Agency shall maintain a stringent regime to ensure effective protection against disclosure of commercial, technological and industrial secrets and other confidential information coming to its knowledge, including such information coming to the Agency's knowledge in the implementation of this Protocol.

b. The regime referred to in paragraph a. above shall include, among others, provisions relating to:

- (i) General principles and associated measures for the handling of confidential information;
- (ii) Conditions of staff employment relating to the protection of confidential information;
- (iii) Procedures in cases of breaches or alleged breaches of confidentiality.

c. The regime referred to in paragraph a. above shall be approved and periodically reviewed by the Board.

## ANNEXES

### Article 16

a. The Annexes to this Protocol shall be an integral part thereof. Except for the purposes of amendment of the Annexes, the term 'Protocol' as used in this instrument means the Protocol and the Annexes together.

b. The list of activities specified in Annex I, and the list of equipment and material specified in Annex I I, may be amended by the Board upon the advice of an open-ended working group of experts established by the Board. Any such amendment shall take effect four months after its adoption by the Board.

## ENTRY INTO FORCE

### Article 17

a. This Protocol shall enter into force on the date on which the Agency receives from ..... written notification that .....<sup>3</sup>'s statutory and/or constitutional requirements for entry into force have been met.

OR<sup>3</sup>

upon signature by the representatives of ..... and the Agency.

b. .... may, at any date before this Protocol enters into force, declare that it will apply this Protocol provisionally.

c. The Director General shall promptly inform all Member States of the Agency of any declaration of provisional application of, and of the entry into force of, this Protocol.

## DEFINITIONS

### Article 18

For the purpose of this Protocol:

a. *Nuclear fuel cycle-related research and development activities* means those activities which are specifically related to any process or system development aspect of any of the following:

- conversion of *nuclear material*,
- enrichment of *nuclear material*,
- nuclear fuel fabrication,
- reactors,
- critical facilities,
- reprocessing of nuclear fuel,
- processing (not including repackaging or conditioning not involving the separation of elements, for storage or disposal) of intermediate or high-level waste containing plutonium, *high enriched uranium* or uranium-233, but do not include activities related to theoretical or basic scientific research or to research and development on industrial radioisotope applications, medical, hydrological and agricultural applications, health and environmental effects and improved maintenance.

b. *Site* means that area delimited by ..... in the relevant design information for a *facility*, including a *closed-down facility*, and in the relevant information on a *location outside facilities* where *nuclear material* is customarily used, including a *closed-down location*

*outside facilities* where *nuclear material* was customarily used (this is limited to locations with hot cells or where activities related to conversion, enrichment, fuel fabrication or reprocessing were carried out). It shall also include all installations, co-located with the *facility* or location, for the provision or use of essential services, including: hot cells for processing irradiated materials not containing *nuclear material*; installations for the treatment, storage and disposal of waste; and buildings associated with specified activities

identified by ..... under Article 2.a.(iv) above.

c. *Specific equipment and non-nuclear material* means equipment and non-nuclear material listed in Annex II to this Protocol.

d. *Decommissioned facility or decommissioned location outside facilities* means an installation or location at which residual structures and equipment essential for its use have been removed or rendered inoperable so that it is not used to store and can no longer be used to handle, process or utilize nuclear material.

e. *Closed-down facility or closed-down location outside facilities* means an installation or location where operations have been stopped and the *nuclear material* removed but which has not been decommissioned.

f. *High enriched uranium* means uranium containing 20 percent or more of the isotope uranium-235.

g. *Location-specific environmental sampling* means the collection of environmental samples (e.g., air, water, vegetation, soil, smears) at, and in the immediate vicinity of, a location specified by the Agency for the purpose of assisting the Agency to draw conclusions about the absence of undeclared *nuclear material* or nuclear activities at the specified location.

h. *Wide-area environmental sampling* means the collection of environmental samples (e.g., air, water, vegetation, soil, smears) at a set of locations specified by the Agency for the purpose of assisting the Agency to draw conclusions about the absence of undeclared *nuclear material* or nuclear activities over a wide area.

i. *Nuclear material* means any source or any special fissionable material as defined in Article XX of the Statute. The term source material shall not be interpreted as applying to ore or ore residue. Any determination by the Board under Article XX of the Statute of the Agency after the entry into force of this Protocol which adds to the materials considered to be source material or special fissionable material shall have effect under this Protocol only upon acceptance by .....

j. *Facility means:*

(i) A reactor, a critical facility, a conversion plant, a fabrication plant, a reprocessing plant, an isotope separation plant or a separate storage installation; or

(ii) Any location where *nuclear material* in amounts greater than one effective kilogram is customarily used.

k. *Location outside facilities* means any installation or location, which is not a *facility*, where *nuclear material* is customarily used in amounts of one effective kilogram or less.

## Annex I

[Editorial Note: Annex I consists of a list of manufacturing and construction activities that should be reported to the Agency by each state. For example, the manufacture of centrifuge rotor tubes or the construction of hot cells.]

## Annex II

[Editorial Note: Annex II consists of specified equipment and non-nuclear material about which import and export data should be provided to the Agency. The list is based upon Annex B of *Guidelines for Nuclear Transfers* (INFCIRC/254). This is reproduced in the 'Export Controls' section of this volume of the *Briefing Book*.]

## Strengthened Safeguards System: States with Additional Protocols

[As at 31 March 2009]

State	Board Approval	Date signed	In Force
Afghanistan	1 Mar '05	19 Jul '05	19 Jul '05
Albania	16 Jun '04	2 Dec '04	
Algeria	14 Sep '04		
Andorra	7 Dec '00	9 Jan '01	

<sup>3</sup> The choice of alternative depends on the preference of the State concerned according to its internal legal requirements.

Armenia	23 Sep '97	29 Sep '97	28 Jun '04
Australia	23 Sep '97	23 Sep '97	12 Dec '97
Austria	11 Jun '98	22 Sep '98	30 Apr '04
Azerbaijan	7 Jun '00	5 Jul '00	29 Nov '00
Bangladesh	25 Sep '00	30 Mar '01	30 Mar '01
Belarus	3 Oct '05	15 Nov '05	
Belgium	11 Jun '98	22 Sep '98	30 Apr '04
Benin	17 Sep '04	7 Jun '05	
Botswana	20 Sep '05	24 Aug '06	24 Aug '06
Bulgaria	14 Sep '98	24 Sep '98	10 Oct '00
Burkina Faso	18 Mar '03	17 Apr '03	17 Apr '03
Burundi	13 Jun '07	27 Sep '07	27 Sep '07
Cameroon	16 Jun '04	16 Dec '04	
Canada	11 Jun '98	24 Sep '98	8 Sep '00
Cape Verde	16 Jun '05	28 Jun '05	
Central African Rep.	7 Mar '06		
Chad	22 Nov '07		
Chile	10 Sep '02	19 Sep '02	3 Nov '03
China	25 Nov '98	31 Dec '98	28 Mar '02
Colombia	25 Nov '04	11 May '05	
Comoros	16 Jun '05	13 Dec '05	20 Jan 09
Costa Rica	29 Nov '01	12 Dec '01	
Côte d'Ivoire	22 Nov '07	22 Oct 08	
Croatia	14 Sep '98	22 Sep '98	6 Jul '00
Cuba	9 Sep '03	18 Sep '03	3 Jun '04
Cyprus	25 Nov '98	29 Jul '99	19 Feb '03
Czech Republic	20 Sep '99	28 Sep '99	1 Jul '02
Democratic Republic of the Congo	28 Nov '02	9 Apr '03	9 Apr '03
Denmark	11 Jun '98	22 Sep '98	30 Apr '04
Djibouti	3 Mar '09		
Dominican Republic	23 Nov '06	20 Sep '07	
Ecuador	20 Sep '99	1 Oct '99	24 Oct '01
El Salvador	23 Sep '02	5 Sep '03	24 May '04
Estonia	<sup>2</sup>	<sup>2</sup>	1 Dec '05 <sup>2</sup>
Fiji	16 Jun '05	14 Jul '06	14 Jul '06
Finland	11 Jun '98	22 Sep '98	30 Apr '04
France	11 Jun '98	22 Sep '98	30 Apr '04
Gabon	18 Mar '03	8 Jun '05	
Georgia	23 Sep '97	29 Sep '97	3 Jun '03
Germany	11 Jun '98	22 Sep '98	30 Apr '04
Ghana	11 Jun '98	12 Jun '98	11 Jun '04
Greece	11 Jun '98	22 Sep '98	30 Apr '04
Guatemala	29 Nov '01	14 Dec '01	28 May 08
Haiti	20 Mar '02	10 Jul '02	9 Mar '06
Holy See	14 Sep '98	24 Sep '98	24 Sep '98
Honduras	16 Jun '05	7 Jul '05	
Hungary	<sup>2</sup>	<sup>2</sup>	1 Jul '07 <sup>2</sup>
Iceland	9 Sep '03	12 Sep '03	12 Sep '03
India	3 Mar '09		
Indonesia	20 Sep '99	29 Sep '99	29 Sep '99
Iran, Islamic Rep. of	21 Nov '03	18 Dec '03	
Iraq	24 Sep 08	9 Oct 08	
Ireland	11 Jun '98	22 Sep '98	30 Apr '04
Italy	11 Jun '98	22 Sep '98	30 Apr '04
Jamaica	12 Jun '02	19 Mar '03	19 Mar '03
Japan	25 Nov '98	4 Dec '98	16 Dec '99
Jordan	18 Mar '98	28 Jul '98	28 Jul '98
Kazakhstan	18 Jun '03	6 Feb '04	9 May '07
Kiribati	10 Sep '02	9 Nov '04	
Korea, Republic of	24 Mar '99	21 Jun '99	19 Feb '04
Kuwait	12 Jun '02	19 Jun '02	2 Jun '03
Kyrgyzstan	23 Nov '06	29 Jan '07	
Latvia	<sup>2</sup>	<sup>2</sup>	1 Oct '08 <sup>2</sup>

Lesotho	24 Sep 08		
Libyan Arab Jamahiriya	9 Mar '04	10 Mar '04	11 Aug '06
Liechtenstein	16 Jun '05	14 Jul '06	
Lithuania	8 Dec '97	11 Mar '98	5 Jul '00
Luxembourg	11 Jun '98	22 Sep '98	30 Apr '04
Madagascar	18 Jun '03	18 Sep '03	18 Sep '03
Malawi	23 Nov '06	26 Jul '07	26 Jul '07
Malaysia	22 Sep '05	22 Nov '05	
Mali	10 Sep '02	12 Sep '02	12 Sep '02
Malta	<sup>2</sup>	<sup>2</sup>	1 Jul '07 <sup>2</sup>
Marshall Islands	1 Mar '05	3 May '05	3 May '05
Mauritania	18 Mar '03	2 Jun '03	
Mauritius	14 Sep '04	9 Dec '04	17 Dec '07
Mexico	12 Mar '04	29 Mar '04	
Monaco	25 Nov '98	30 Sep '99	30 Sep '99
Mongolia	11 Sep '01	5 Dec '01	12 May '03
Montenegro	13 Jun '07	26 May 08	
Morocco	16 Jun '04	22 Sep '04	
Mozambique	22 Nov '07		
Namibia	21 Mar '00	22 Mar '00	
Netherlands	11 Jun '98	22 Sep '98	30 Apr '04
New Zealand	14 Sep '98	24 Sep '98	24 Sep '98
Nicaragua	12 Jun '02	18 Jul '02	18 Feb '05
Niger	9 Mar '04	11 Jun '04	2 May '07
Nigeria	7 Jun '00	20 Sep '01	4 Apr '07
Norway	24 Mar '99	29 Sep '99	16 May '00
Palau	1 Mar '05	13 May '05	13 May '05
Panama	29 Nov '01	11 Dec '01	11 Dec '01
Paraguay	12 Jun '02	24 Mar '03	14 Sep '04
Peru	10 Dec '99	22 Mar '00	23 Jul '01
Philippines	23 Sep '97	30 Sep '97	
Poland	<sup>2</sup>	<sup>2</sup>	1 Mar '07 <sup>2</sup>
Portugal	11 Jun '98	22 Sep '98	30 Apr '04
Republic of Moldova	13 Sep '06		
Romania	9 Jun '99	11 Jun '99	7 Jul '00
Russia	21 Mar '00	22 Mar '00	16 Oct '07
Senegal	1 Mar '05	15 Dec '06	
Seychelles	18 Mar '03	7 Apr '04	13 Oct '04
Singapore	20 Sep '05	22 Sep '05	31 Mar 08
Slovakia	<sup>2</sup>	<sup>2</sup>	1 Dec '05 <sup>2</sup>
Slovenia	<sup>2</sup>	<sup>2</sup>	1 Sep '06 <sup>2</sup>
South Africa	12 Jun '02	13 Sep '02	13 Sep '02
Spain	11 Jun '98	22 Sep '98	30 Apr '04
Swaziland	04 Mar 08		
Sweden	11 Jun '98	22 Sep '98	30 Apr '04
Switzerland	7 Jun '00	16 Jun '00	1 Feb '05
Tajikistan	12 Jun '02	7 Jul '03	14 Dec '04
Thailand	20 Sep '05	22 Sep '05	
Timor-Leste	11 Sep '07		
The FYROM	16 Jun '05	12 Jul '05	11 May '07
Togo	22 Sep '03	26 Sep '03	
Tunisia	1 Mar '05	24 May '05	
Turkey	7 Jun '00	6 Jul '00	17 Jul '01
Turkmenistan	1 Mar '05	17 May '05	3 Jan '06
Uganda	25 Nov '04	14 Jun '05	14 Feb '06
Ukraine	7 Jun '00	15 Aug '00	24 Jan '06
United Arab Emirates	3 Mar '09		
United Kingdom of Great Britain and Northern Ireland	11 Jun '98	22 Sep '98	30 Apr '04
United Republic of Tanzania	16 Jun '04	23 Sep '04	7 Feb '05
United States of America	11 Jun '98	12 Jun '98	06 Jan 09
Uruguay	23 Sep '97	29 Sep '97	30 Apr '04

Uzbekistan	14 Sep '98	22 Sep '98	21 Dec '98
Vietnam	6 Mar '07	10 Aug '07	
Zambia	27 Nov 08		
<b>Totals</b>	<b>131</b>	<b>119</b>	<b>90</b>

**Strengthened Safeguards System:**

**Other Parties with Additional Protocols**

Other Parties <sup>1</sup>	Board Approval	Date signed	In Force
Euratom	11 June '98	22 Sept '98	30 April '04
<b>Totals</b>	<b>1</b>	<b>1</b>	<b>1</b>

<sup>1</sup> The Agency also applies safeguards, including the measures foreseen in the Model Additional Protocol, in Taiwan, China. Pursuant to a decision by the Board, the relations between the Agency and the authorities in Taiwan, China are non-governmental.

<sup>2</sup> Accession to the additional protocol with EU NNWS reproduced in INFCIRC 193/Add.8

**Communication received from the Permanent Mission of the United States of America to the Agency regarding ratification by the United States of the protocol additional to its safeguards agreement with the Agency**

[INFCIRC/744, 19 January 2009]

The Permanent Mission of the United States of America presents its compliments to the Director General of the International Atomic

Energy Agency and has the honor of requesting that the following information regarding U.S. ratification of the Additional Protocol be communicated to all member states.

On December 30, 2008 the President of the United States signed the instrument of ratification for the Protocol Additional to the Agreement between the United States of America and the International Atomic Energy Agency for the Application of Safeguards in the United States of America. The United States confirmed that the constitutional and statutory requirements had been met, and formally deposited this instrument with the International Atomic Energy Agency on January 6, 2009, thus bringing the Additional Protocol into force.

The Additional Protocol constitutes the International Atomic Energy Agency's highest standard of verification. It improves the capability to detect clandestine nuclear weapon programs by providing it with increased information about and access to nuclear fuel cycle activities.

By adopting an Additional Protocol, the United States further underscores its commitment to the International Atomic Energy Agency and its safeguards system. The United States joins with the Director General in calling on all countries to adopt and implement the Additional Protocol.

United States Mission to the United Nations and International Organizations in Vienna. January 19, 2009

The Permanent Mission of the United States avails itself of this opportunity to renew to the Director General and Secretariat of the International Atomic Energy Agency assurances of its highest consideration.