

ANNEX 15
PROCEDURES FOR THE USE OF RADIATION DETECTION EQUIPMENT¹

I. Examination and Storage of Radiation Detection Equipment at the Point of Entry

1. The inspecting Party, prior to beginning to use its radiation detection equipment during the first inspection conducted with the use of radiation detection equipment, shall deliver to the inspected Party, for purchase or examination by the inspected Party, one of each of the items in the sets of radiation detection equipment specified in Sections I, II, and IV of Annex 8 to this Protocol, for each model, except for the calibration source. No later than 30 days after the inspected Party has received such items of radiation detection equipment, the inspected Party shall inform the inspecting Party whether the inspecting Party is permitted to use during inspections such radiation detection equipment. Until permission for the use of such radiation detection equipment is given by the inspected Party, the inspecting Party shall not bring to a point of entry on the territory of the inspected Party other radiation detection equipment.

2. For points of entry associated with inspection sites at which radiation detection equipment may be used, the inspecting Party shall bring, at times agreed upon with the inspected Party, to each such point of entry on the territory of the inspected Party for use during inspections no less than one set of radiation detection equipment.

- (a) Except as provided for in paragraphs 3 and 4 of this Section, each such set of radiation detection equipment shall be subject to examination and stored at the point of entry in accordance with the procedures provided for in this paragraph.
- (b) The examination of such sets of radiation detection equipment shall be completed no later than five days after the date when these sets of radiation detection equipment are brought to the point of entry. During the examination of the radiation detection equipment, the inspected Party shall be permitted, in the presence of the inspecting Party, to partially disassemble such equipment and examine it using non-damaging methods. Such examination must not impair the capability of the radiation detection equipment to perform functions connected with the inspection requirements under the Treaty. Upon completion of the examination and prior to departure from the point of entry, the inspecting Party shall have the right to confirm the operability of the radiation detection equipment in accordance with paragraph 1 of Section II of this Annex in order to establish that its capability to perform functions connected with the inspection requirements under the Treaty has not been impaired as a result of the examination of such radiation detection equipment by the inspected Party.

¹ JCIC Agreement No. 34, Article Three.

- (c) *Upon completion of the examination, the sets of radiation detection equipment shall be stored at the point of entry in tamper-proof containers provided by the inspecting Party, and shall be located within a secure structure or room in accordance with paragraph 14 of Section V of this Protocol. No more than three sets of radiation detection equipment shall be stored at each point of entry associated with inspection sites at which radiation detection equipment may be used.*
- (d) *The procedures for delivering radiation detection equipment for examination and storage at points of entry, the transportation and support for the stay of technical experts delivering and supporting the examination of such equipment on the territory of the inspected Party, and the reimbursement of associated costs shall be subject to agreement.*

3. *An inspection team shall be permitted to bring to a point of entry calibration sources that are part of the sets of radiation detection equipment stored at the point of entry, replacement spare batteries and rechargeable batteries, as well as an additional set of radiation detection equipment. All such equipment brought to the point of entry shall be subject to examination in accordance with paragraph 8 of Section V of this Protocol.*

4. *An inspection team, upon arrival at the point of entry, shall have the right, in the presence of the in-country escort, to examine the tamper-proof containers in which the radiation detection equipment is stored and the radiation detection equipment in such containers. The inspection team shall have the right, as set forth below, to select one set of radiation detection equipment for use during the inspection from among the sets of such equipment stored at the point of entry in accordance with subparagraph 2(c) of this Section or an additional set of radiation detection equipment brought to the point of entry by the inspection team, and to confirm the operability of the selected set in accordance with the procedures provided for in paragraph 1 of Section II of this Annex, for no more than four hours.*

- (a) *If the inspection team determines that the containers for at least one of the sets of radiation detection equipment have not been tampered with, and that the set of radiation detection equipment in such containers is operable in accordance with paragraph 1 of Section II of this Annex, then such a set of radiation detection equipment shall be used in conducting the inspection.*
- (b) *If either the inspection team or the in-country escort determines that the containers for all the sets of radiation detection equipment have been tampered with, the inspection team shall have the right to use an additional set of radiation detection equipment brought to the point of entry by the inspection team and examined in accordance with paragraph 8 of Section V of this Protocol, the operability of which has been confirmed in accordance with the procedures provided for in paragraph 1 of Section II of this Annex, in conducting the inspection.*

- (c) *For containers that have not been tampered with, if either the inspection team or the in-country escort determines that all the sets of radiation detection equipment stored in such containers are not operable, the inspection team shall have the right to use an additional set of radiation detection equipment brought to the point of entry by the inspection team in conducting the inspection. In this case, the date and time for the designation of the inspection site and the type of inspection pursuant to paragraph 4 of Section III of this Protocol shall be delayed, if necessary, until the in-country escort has completed its examination of such radiation detection equipment using the procedures provided for in paragraph 2 of Section I of this Annex, and the inspection team has confirmed the operability of such radiation detection equipment in accordance with paragraph 1 of Section II of this Annex. In no case shall such delay exceed 12 hours or require the inspection team to delay the date and time for the designation of the inspection site and type of inspection beyond the time limit specified in paragraph 4 of Section III of this Protocol for the type of inspection being conducted.*
- (d) *If there are no signs that the containers have been tampered with and any set of radiation detection equipment stored in such containers is not operable, the inspecting Party shall return such a set or sets of radiation detection equipment and associated containers to the territory of the inspecting Party. The inspecting Party shall inform the inspected Party of the cause of the malfunction and measures taken to preclude such malfunctions in the future.*
- (e) *If an additional set of radiation detection equipment is brought to the point of entry by the inspection team and is not used in conducting the inspection, such radiation detection equipment shall be stored at the point of entry in tamper-proof containers and removed from the territory of the inspected Party by the inspection team when it leaves the territory of the inspected Party.*
- (f) *In all cases, only one set of radiation detection equipment whose operability has been confirmed in accordance with the procedures provided for in paragraph 1 of Section II of this Annex shall be used during an inspection.*

II. Regarding the Use of Radiation Detection Equipment Prior to Measuring the Radiation Level of an Object

1. *Before conducting measuring procedures using radiation detection equipment, inspectors and the in-country escort shall have the right to confirm the operability of the radiation detection equipment, using the following procedures:*

- (a) *For radiation detection equipment used pursuant to this paragraph, the counting time of each individual measurement shall be the counting time specified in Sections I, II, and IV of Annex 8 to this*

Protocol for the neutron detectors in the sets of radiation detection equipment of the United States of America or the Russian Federation, respectively.

- (b) The operability of each neutron detector in a set of radiation detection equipment shall be confirmed.*
- (c) The neutron detector shall be placed in a mutually agreed location.*
- (d) The inspecting Party shall take two background radiation measurements with the calibration source at least three meters from the neutron detector. If the difference between these two measurements is less than or equal to 30 percent of their average, the average of these measurements shall be recorded as the average background radiation value for the operability check. If the difference between these two background radiation measurements is more than 30 percent of their average, a third background radiation measurement shall be taken. The third background radiation measurement shall be compared with the previously taken background radiation measurement that is closest to the third background radiation measurement. If the difference between the third background radiation measurement and the closest previous background radiation measurement is less than or equal to 30 percent of the average of these two measurements, the average of these two measurements shall be recorded as the average background radiation value for the operability check. Otherwise, the results of all three background radiation measurements shall be recorded and the radiation detection equipment shall not be accepted as operable.*
- (e) With the neutron detector in the same location used for the background radiation measurements taken in accordance with subparagraph (c) of this paragraph, the inspecting Party shall place the calibration source in contact with the neutron detector at the center of the detector's sensitive area as indicated by the markings on the neutron detector.*
- (f) The inspecting Party shall take two calibration measurements of the radiation level from the calibration source. The average of these two calibration measurements shall be recorded as the average value of the calibration measurement.*
- (g) The following values shall be calculated:*
 - (i) the calculated calibration value, which is the difference between the average value of the calibration measurement determined in accordance with subparagraph (f) of this paragraph and the average background radiation value determined in accordance with subparagraph (d) of this paragraph;*

- (d) *Measurements of radiation levels, in accordance with paragraphs 1 and 2 of Section III of this Annex, of the object designated by the inspection team for radiation measurements shall be taken at the location selected for that purpose by the in-country escort, using a neutron detector whose operability has been confirmed pursuant to subparagraph (c) of this paragraph.*
- (e) *Background radiation measurements shall be taken by the in-country escort no less than ten meters from the object designated by the inspection team for radiation measurements. Such background radiation measurements shall be taken in accordance with the following procedures:*
 - (i) *The inspection team shall identify to the in-country escort the front surface of the neutron detector that will be directed toward the object designated for measurement of the radiation level. The front surface of the neutron detector shall be positioned vertically, at approximately the same height at which measurements on the designated object will be taken.*
 - (ii) *Two background radiation measurements shall be taken. The average of these two measurements shall be calculated and recorded in the inspection report as the average background radiation value.*
 - (iii) *If the average background radiation value is greater than 450 counts, another location for taking the background radiation measurements shall be selected by the in-country escort. Background radiation measurements shall be taken until an average background radiation value is obtained that is less than 450 counts at a selected location.*
 - (iv) *The square root of the average background radiation value shall be calculated to two decimal places and the result multiplied by four. This number shall be added to the average background radiation value and the result shall be rounded up to the higher whole number. This number shall be recorded in the inspection report as the comparison number to be used in paragraph 1 of Section III and paragraphs 7 and 8 of Section IV of this Annex.*

III. For Inspections Conducted Pursuant to Paragraph 2, 3, 4 or 12 of Article XI of the Treaty with Respect to Long-Range ALCMs and Containers for Long-Range ALCMs

1. *For inspecting long-range ALCMs and containers for long-range ALCMs in accordance with paragraph 4 of Section I, or paragraph 4 or subparagraph 5(c) of Section IV of Annex 4 to this Protocol, the following procedures shall be used:*

- (a) *The inspection team shall select no more than four points along the ALCM or container at which measurements of radiation levels will*

be taken. A description of the ALCM or container shall be recorded as a diagram in the inspection report. The approximate dimensions of the ALCM or container, and the approximate location of each measurement point, shall be indicated on this diagram.

- (b) *The in-country escort shall position the neutron detector in a location specified by the inspection team, no less than seven centimeters and no more than two meters from the surface of the ALCM or container, with a maximum permissible deviation from these established distances not to exceed 20 percent, so that the neutron detector is at the same level as the point where the measurement will be taken, with the front surface of the neutron detector facing the point on the ALCM or container where the measurement will be taken.*
- (c) *The in-country escort shall take two measurements of the radiation level at each selected point. The average of the two measurements shall be calculated, and if not a whole number, shall be rounded up to the higher whole number. This average shall be recorded in the inspection report as the average measurement at that point.*
- (d) *If the average measurement of the radiation level at each selected point is less than or equal to the comparison number calculated in accordance with subparagraph 2(e)(iv) of Section II of this Annex, the ALCM or container shall not be subject to further inspection.*
- (e) *If the average measurement of the radiation level at any of the four selected points is greater than the comparison number calculated in accordance with subparagraph 2(e)(iv) of Section II of this Annex, this fact shall be recorded in the inspection report and the ALCM or container shall be subject to further inspection in accordance with subparagraph 4(a)(ii) or subparagraph 4(b)(iii) of Section IV of Annex 4 to this Protocol, as applicable.*

2. To confirm, pursuant to paragraph 4 of Section I or subparagraph 5(c) of Section IV of Annex 4 to this Protocol, that a container does not conceal the presence of radiation, the following procedures shall be used:

- (a) *The inspection team shall select no more than four points on the container wall at which measurements of radiation levels will be taken for the purpose of measuring the radiation shielding effect. A description of the container shall be recorded as a diagram in the inspection report. The approximate dimensions of the container and the approximate location of each measurement point shall be indicated on this diagram.*
- (b) *The in-country escort shall open the container and place the calibration source on its stand inside the container on the longitudinal axis of the container. The in-country escort shall position the neutron detector outside the container in a location*

specified by the inspection team, no less than seven centimeters and no more than two meters from the surface of the container, with a maximum permissible deviation from established distances not to exceed 20 percent. The calibration source and neutron detector shall be placed on a horizontal straight line that passes through the center of the calibration source and the center of the neutron detector, that lies on a plane perpendicular to the longitudinal axis of the container, and that intersects the wall of the container at the selected point on the container. The distance between the center of the calibration source and the center of the neutron detector shall be recorded in the inspection report. The front surface of the neutron detector shall face the selected point.

- (c) The in-country escort shall take two measurements of the radiation level at each selected point on the container. The container shall remain closed during measurements of the radiation level. The average of the two measurements shall be calculated. The average background radiation value, calculated in accordance with subparagraph 2(e)(ii) of Section II of this Annex, shall be subtracted from this average. The result shall be recorded in the inspection report as the net average value of radiation obtained when the calibration source is placed inside the container at that point.*
- (d) The procedures provided for in subparagraphs (b) and (c) of this paragraph shall be repeated until measurements have been taken at all the points on the container selected by the inspection team, and the results have been recorded in the inspection report.*
- (e) The calibration source shall be removed from the container and the neutron detector repositioned no less than two meters from the container with its front surface no longer facing the container.*
- (f) The in-country escort shall position the calibration source in front of the front surface of the neutron detector so that the distance between the front surface of the neutron detector and the calibration source is the same distance, within three percent, as that used for one of the measurements taken pursuant to subparagraph (c) of this paragraph. No objects that could interfere with the flow of neutrons to the neutron detector shall be located near the calibration source or the neutron detector.*
- (g) The in-country escort shall take two measurements of the radiation level with the calibration source and the neutron detector positioned in accordance with subparagraphs (e) and (f) of this paragraph. The average of the two measurements shall be calculated. The average background radiation value calculated in accordance with subparagraph 2(e)(ii) of Section II of this Annex shall be subtracted from this average. The result shall be recorded in the inspection report as the net average value of radiation obtained when the calibration source is placed outside the container at the distance used pursuant to subparagraph (f) of this paragraph.*

- (h) *The procedures provided for in subparagraphs (f) and (g) of this paragraph shall be repeated for each distance between the calibration source and the neutron detector used for the measurements of the radiation level taken pursuant to subparagraph (c) of this paragraph.*
- (i) *For each point on the container, calculations shall be carried out, in which the net average value of the radiation level obtained pursuant to subparagraph (c) of this paragraph when the calibration source is placed inside the container is divided by the corresponding net average value of the radiation level obtained pursuant to subparagraph (g) of this paragraph when the calibration source is placed outside the container. The division shall be carried out to two decimal places. If the result of the division with respect to any point is less than 0.5, this fact shall be recorded in the inspection report.*
- (j) *For containers of long-range non-nuclear ALCMs of a type for which a notification has been provided in accordance with Section VII of the Notification Protocol, if either the width or the diameter of such containers exceeds 190 centimeters, the Parties shall agree, within the framework of the Joint Compliance and Inspection Commission, on procedures for the placement of the neutron detector and the calibration source with respect to such containers.*

IV. For Inspections Conducted Pursuant to Paragraph 6 of Article XI of the Treaty

1. *For an inspection conducted pursuant to paragraph 6 of Article XI of the Treaty, radiation detection equipment shall be used in accordance with the procedures contained in this Section.*

2. *The in-country escort shall position, for radiation measurements, an object contained in the front section and declared by the in-country escort to be a non-nuclear object, hereinafter referred to as the inspected object, at a location specified by the in-country escort, at a distance of no less than ten meters from the front section, or shall provide for radiation measurements of the inspected object while it is in the front section. If radiation measurements of the inspected object are taken while it is in the front section, the in-country escort shall have the right to use special shields to prevent neutrons from a reentry vehicle or reentry vehicles remaining on the front section from striking the neutron detector, but which do not interfere with the flow of neutrons from the inspected object to the neutron detector, or to remove the reentry vehicle or reentry vehicles from the front section to a distance of no less than ten meters from the front section. Whichever method is used for the placement of the inspected object for radiation measurements, the in-country escort shall ensure that the procedures for the use of radiation detection equipment, as set forth below, are carried out.*

3. *The process of removing the inspected object from the front section and moving it to a location where radiation measurements will be taken and the process of removing a reentry vehicle or reentry vehicles from the front section,*

shall be carried out outside the field of view of inspectors in such a manner as to permit inspectors to ascertain that the inspected object is that same inspected object. Before the inspected object or the reentry vehicle or reentry vehicles are removed from the front section, inspectors shall have the right to view the specially allocated site inside a room or within a portion of the site for viewing the front section, to ascertain that the site does not contain other objects similar to the inspected object. During the entire process of removing the inspected object or the reentry vehicle or reentry vehicles from the front section, the inspectors shall have the right, at their own choice, either to observe all exits of the site to ascertain that no objects that are similar to the inspected object are delivered to that site, or to seal all the exits with seals.

4. The inspection team shall select the point on the inspected object where radiation measurements will be taken. A description of the inspected object shall be recorded as a diagram in the inspection report. The approximate dimensions of the inspected object, determined visually without taking linear measurements, and the approximate location of the measurement point, shall be indicated on this diagram.

5. The in-country escort shall position the neutron detector in a location specified by the inspection team, no less than seven centimeters and no more than two meters from the surface of the inspected object, with a maximum permissible deviation from these established distances not to exceed 20 percent, so that the neutron detector is at the same level as the point where the measurement will be taken, with the front surface of the neutron detector facing the point on the inspected object where the measurement will be taken.

6. The in-country escort shall take two measurements of the radiation level at the selected point. The average of the two measurements shall be calculated, and if not a whole number, shall be rounded up to the higher whole number. This average shall be recorded in the inspection report as the average measurement at that point.

7. If the average measurement of the radiation level at the selected point is less than or equal to the comparison number calculated in accordance with subparagraph 2(e)(iv) of Section II of this Annex, the inspected object is, in fact, a non-nuclear object.

8. If the average measurement of the radiation level at the selected point is greater than the comparison number calculated in accordance with subparagraph 2(e)(iv) of Section II of this Annex, this fact shall be recorded in the inspection report.