SCHEDULE 1

Regulation 2(1)

Determination of A_1 and A_2 values

1. Values of A_1 and A_2 for individual radionuclides are those given in Table I of Schedule 36.

2. For individual radionuclides whose identities are known, but which are not listed in Table I of Schedule 36, the determination of the values of A_1 and A_2 shall require the approval of the Secretary of State or, for international transport, multilateral approval. Alternatively, the values of A_1 and A_2 in Table II of Schedule 36 may be used without obtaining competent authority approval.

3. In the calculations of A_1 and A_2 for a radionuclide not in Table I of Schedule 36, a single radioactive decay chain in which the radionuclides are present in their naturally occurring proportions and in which no daughter nuclide has a half-life either longer than 10 days or longer than that of the parent nuclide shall be considered as a single radionuclide, and the activity to be taken into account and the A_1 or A_2 value to be applied shall be those corresponding to the parent nuclide of that chain. In the case of radioactive decay chains in which any daughter nuclide has a half-life either longer than 10 days or greater than that of the parent nuclide, the parent and such daughter nuclides shall be considered as mixtures of different nuclides.

4. An A value for a mixture of radionuclides whose identities and respective activities are known may be determined as follows:

(a) for special form radioactive material:

$$A_1 \text{ for mixture} = \frac{1}{\sum_i \frac{f(i)}{A_1(i)}}$$

(b) for other forms of radioactive material:

$$A_2 \text{ for mixture} = \frac{1}{\sum_i \frac{f(i)}{A_2(i)}}$$

where

f(i) is the fraction of activity of nuclide in the mixture and $A_1(i)$ and $A_2(i)$ are the respective A_1 and A_2 values for nuclide i.

5. When the identity of each radionuclide is known but the individual activities of some of the radionuclides are not known, the radionuclides may be grouped and the lowest A_1 or A_2 value, as appropriate, for the radionuclides in each group may be used in applying the formulae in paragraph 4 above. Groups may be based on the total alpha activity and the total beta/gamma activity when these are known, using the lowest A_1 or A_2 values for the alpha emitters or beta/gamma emitters, respectively.

6. For individual radionuclides or for mixtures of radionuclides for which relevant data are not available, the values shown in Table II of Schedule 36 shall be used.

SCHEDULE 2

Regulation 2(1)

General requirements for packages and packaging

1. A package shall be so designed in relation to its mass, volume and shape that it can easily and safely be handled and transported and so that it can be properly secured in or on the conveyance during transport.

2. The design of a package shall be such that any lifting attachments on it will not fail when used in the intended manner and such that, if failure of the attachments should occur, the ability of the package to meet other requirements of these Regulations would not be impaired, taking into account appropriate safety factors to cover snatch lifting.

3. Any attachment or other feature on the outer surface of a package which could be used to lift it but is not designed to support its mass in accordance with paragraph 2 above shall be removed or otherwise rendered incapable of being used during transport.

4. As far as reasonably practicable, packaging shall be so designed and finished that the external surfaces are free from protruding features and can easily be decontaminated.

5. As far as reasonably practicable, the outer layer of a package shall be so designed as to prevent the collection and retention of water.

6. No feature, not forming an integral part of a package, shall be added to the package at the time of transport if it will reduce the safety of the package.

7. A package shall be capable of withstanding the effects of any acceleration, vibration or vibration resonance which may arise under conditions likely to be encountered in routine transport without any deterioration in the effectiveness of the closing devices on the various receptacles or in the integrity of the package as a whole, and in particular nuts, bolts, and other securing devices shall be so designed as to prevent them from becoming loose or being released unintentionally, even after repeated use.

8. The materials of packaging and any components or structures thereof shall be physically and chemically compatible with each other and with the radioactive contents, taking into account their behaviour under irradiation.

9. All valves through which radioactive contents could otherwise escape shall be protected against unauthorised operation.

10. A package shall not contain any other items except such articles and documents as are necessary for the use of the radioactive material. This requirement shall not preclude the transport of LSA material or SCO with other items. The transport of such articles and documents in a package, or of LSA material or SCO with other items may be permitted, provided that there is no interaction between them and the packaging or its contents that would reduce the safety of the package.

11. The transport of other goods with consignments being transported under exclusive use shall be permitted provided the arrangements are controlled only by the consignor and it is not prohibited by any other provision of these Regulations.

12. In addition to the radioactive properties, any other dangerous properties of the contents of a package, such as explosiveness, flammability, pyrophoricity, chemical, toxicity, corrosiveness and (as in the case of UF_6) the possibility of the formation of products having dangerous properties by interaction of the contents with the atmosphere or with water shall be taken into account.

13. Except for packages or overpacks transported under exclusive use under the conditions specified in paragraph (a) of Schedule 32 the maximum radiation level at any point on any external surface of a package or overpack shall not exceed 2 mSv/h.

14. The following additional requirements shall apply to overpacks:

(a) Packages of fissile material for which the transport index for nuclear criticality control is 0 and packages of non-fissile radioactive material may be combined together in an overpack for transport, provided that each package contained therein meets the applicable requirements of these Regulations.

(b) No package of fissile material for which the transport index for nuclear criticality control exceeds 0 shall be carried in an overpack.

(c) Only the original consignor of the packages contained within an overpack shall be permitted to use the method of direct measurement of radiation level to determine the Transport Index (TI) of a rigid overpack.

SCHEDULE 3

Regulation 2(1)

Requirements for excepted packages of limited activity

1. The package shall comply with paragraphs 1 to 9 and 12 of Schedule 2.

2. If the package contains fissile material it must fall within one of the paragraphs of Schedule 8.

3. The radiation level at any point of the external surface of the package shall not exceed 5 μ Sv/h.

4. The non-fixed contamination on any external surface of the package shall not exceed the levels specified in Table III of Schedule 36.

5. Radioactive material which is not enclosed in or forming a component part of an instrument or manufactured article may be transported in an excepted package if the activity of the material does not exceed the limit specified in column 4 of Table IV of Schedule 36 for material in that physical state.

6. The package shall retain its contents under conditions likely to be encountered in routine transport.

7. The package shall bear the marking “Radioactive” on an internal surface in such a manner that a warning of the presence of radioactive material is visible on opening the package.

8. If the gross mass of the package exceeds 50 kg, the permissible gross mass shall be legibly and durably marked on the outside of the packaging.

SCHEDULE 4

Regulation 2(1)

Requirements for excepted packages containing instruments or other manufactured articles

1. The radioactive material shall be enclosed in or form a component part of an instrument or other manufactured article.

2. The package and its packaging shall comply with Schedule 3.

3. The activity of the instruments or articles, and of the package, shall not exceed the limits specified in columns 2 and 3 respectively of Table IV of Schedule 36.

4. The radiation level at 10 cm from any point on the external surface of any unpackaged instrument or article shall not exceed 0.1 mSv/h.

5. Each instrument or article (except radioluminescent time-pieces or devices) shall bear the marking “Radioactive”.

6. In the case of a manufactured article in which the sole radioactive material is unirradiated natural uranium, unirradiated depleted uranium or unirradiated natural thorium, the outer surface of the uranium or thorium must be enclosed in an inactive sheath made of metal or some other substantial material.

SCHEDULE 5

Regulation 2(1)

Requirements for excepted packages which are empty packagings

1. The package and its packaging shall comply with Schedule 3.

2. The package shall be in a well maintained condition and securely closed.

3. The outer surface of any uranium or thorium in the structure of the package shall be covered with an inactive sheath made of metal or some other substantial material.

4. The level of internal non-fixed contamination shall not exceed one thousand times the levels specified in Table III of Schedule 36.

5. Any labels which may have been displayed on the package in conformity with paragraph 5 of Schedule 18, must no longer be visible.

SCHEDULE 6

Regulation 2(1)

Requirements for special form radioactive material

1. Special form radioactive material shall have at least one dimension not less than 5 mm.

2. Special form radioactive material shall be of such a nature or shall be so designed that if it is subjected to the tests specified in Part II of Schedule 15, it meets the following requirements:

(a) it would not break or shatter under the impact, percussion and bending tests in paragraphs 4, 5, 6 and 8(a) of that Part of that Schedule as applicable;

(b) it would not melt or disperse in the heat test in paragraphs 7 and 8(b) of that Part of that Schedule as applicable; and

(c) the activity in the water from the leaching tests specified in paragraphs 9 and 10 of that Part of that Schedule would not exceed 2 kBq; or alternatively for sealed sources, the leakage rate for the volumetric leakage assessment test specified in the ISO leak test document would not exceed the applicable acceptance threshold acceptable to the Secretary of State.

3. When a sealed capsule constitutes part of the special form radioactive material, the capsule shall be so constructed that it can be opened only by destroying it.

SCHEDULE 7

Regulation 2(1)

Requirements for packages containing fissile material

1. Fissile material shall be packaged and shipped in such a manner that subcriticality is maintained under conditions likely to be encountered during normal and accident conditions of transport. The following contingencies shall be considered:

(a) Water leaking into or out of packages;

(b) The loss of efficiency of built-in neutron absorbers or moderators;

(c) Possible rearrangement of the radioactive contents either within the package or as a result of loss from the package;

(d) Reduction of spaces between packages or radioactive contents;

(e) Packages becoming immersed in water or buried in snow; and

(f) Possible effects of temperature changes.

2. A packaging for fissile material shall be so designed that, if it were subjected to the tests specified in paragraphs 6–11 of Part III of Schedule 15:

(a) Neither the volume nor any spacing on the basis of which nuclear criticality control for the purpose of paragraph 6(a) has been assessed would suffer more than 5% reduction, and the construction of the packaging would prevent the entry of a 10 cm cube; and

(b) Water would not leak into or out of any part of the package unless water in-leakage into or out-leakage from that part, to the optimum foreseeable extent, has been assumed for the purposes of paragraphs 5 and 6; and

(c) The configuration of the radioactive contents and the geometry of the containment system would not be altered so as to increase the neutron multiplication significantly.

3. For the purposes of this Schedule the following words have the following meanings:

"undamaged", in relation to a package, means the condition of the package as it is designed to be presented for transport; and

"damaged", in relation to a package, means the evaluated or demonstrated condition of the package if it had been subjected to whichever of the following combination of tests is the more limiting—

(a) the tests specified in paragraphs 6–11 of Part III of Schedule 15 followed by the tests specified in paragraphs 13 to 15 of that Part of that Schedule and completed by the tests specified in paragraphs 18–20 of that Part of that Schedule (the mechanical test of paragraph 14 of that Part of that Schedule shall be that required by paragraph 8 of Schedule 12); or

(b) the tests specified in paragraphs 6–11 of Part III of Schedule 15 followed by the test in paragraph 16 of Part III of Schedule 15.

4. In determining the subcriticality of individual packages in isolation for the purposes of this Schedule, it shall be assumed that water can leak into or out of all void spaces of the package, including those within the containment system. However, if the design incorporates special features to prevent such leakage of water into or out of certain void spaces, even as a result of human error, absence of leakage may be assumed in respect of those void spaces. Special features shall include the following:

(a) Multiple high standard water barriers, each of which would remain leaktight if the package were damaged; a high degree of quality control in the production and maintenance of packagings; and special tests to demonstrate the closure of each package before shipment; or

(b) Other features given multilateral approval.

5. The individual package damaged or undamaged shall be subcritical under the conditions specified in paragraphs 3 and 4 taking into account the physical and chemical characteristics including any change in those characteristics which could occur when the package is damaged and with the conditions of moderation and reflection as specified below:

(a) For all material within the containment system: the material arranged in the containment system

(i) in the configuration and moderation that results in maximum neutron multiplication; and

(ii) with close reflection of the containment system by water 20 cm thick (or equivalent) or such greater reflection of the containment system as may additionally be provided by the surrounding material of the packaging; and, in addition

(b) If any part of the material escapes from the containment system: that material arranged in

(i) the configuration and moderation that results in maximum neutron multiplication; and

(ii) with close reflection of that material by water 20 cm thick (or equivalent).

6. An array of packages shall be subcritical. A number, "N" shall be derived assuming that if packages were stacked together in any arrangement with the stack closely reflected on all sides by water 20 cm thick (or its equivalent) both of the following conditions would be satisfied:

(a) Five times "N" undamaged packages without anything between the packages would be subcritical; and

(b) Two times "N" damaged packages with hydrogenous moderation between packages to the extent which results in the greatest neutron multiplication would be subcritical.

7. In evaluating the subcriticality of fissile material in its transport configuration, the following shall apply:

(a) The determination of subcriticality for irradiated fissile material may be based on the actual irradiation experience, taking into account significant variations in composition.

(b) For irradiated fissile material of unknown irradiation experience the following assumptions shall be made in determining subcriticality:

(i) If its neutron multiplication decreases with irradiation, the material shall be regarded as unirradiated;

(ii) If its neutron multiplication increases with irradiation, the material shall be regarded as irradiated to the point corresponding to the maximum neutron multiplication; and

(c) For unspecified fissile material, such as residues or scrap, whose fissile composition, mass, concentration, moderation ratio or density is not known or cannot be identified, the assumption shall be made in determining subcriticality that each parameter that is not known has the value which gives the maximum neutron multiplication under credible conditions of transport.

SCHEDULE 8

Regulations 8 and 18

Packages excepted from the requirements for fissile material

1. A package containing individually not more than 15 g of fissile material, provided that its smallest external dimension is not less than 10 cm. For unpackaged material, the quantity limitation applies to the consignment being carried in or on the conveyance.

2. A package containing homogeneous hydrogenous solutions or mixtures satisfying the conditions listed in Table XII of Schedule 36. For unpackaged material, the quantity limitations in Table XII of Schedule 36 shall apply to the consignment being transported in or on the conveyance.

3. A package containing uranium enriched in uranium-235 to a maximum of 1% by mass, and with a total plutonium and uranium-233 content not exceeding 1% of the mass of uranium-235, provided that the fissile material is distributed essentially homogeneously throughout the material;

provided also that if uranium-235 is present in metallic, oxide, or carbide forms, it does not form a lattice arrangement within the package.

4. A package containing not more than 5 g of fissile material in any 10 litre volume, provided that the radioactive material is contained in packages which will maintain the limitations on fissile material distribution under conditions likely to be encountered during routine transport.

5. A package containing individually not more than 1 kg of total plutonium, of which not more than 20% by mass may consist of plutonium-239, plutonium-241, or any combination of those radionuclides.

6. A package containing liquid solutions of uranyl nitrate enriched in uranium-235 to a maximum of 2% by mass, with a total plutonium and uranium-233 content not exceeding 0.1% of the mass of uranium-235, and with a minimum nitrogen to uranium atomic ratio (N/U) of 2.

SCHEDULE 9

Regulation 2(1)

Requirements for industrial packages

PART I

Requirements for an industrial package Type 1 (IP-1)

An industrial package Type 1 (IP-1) is a packaging, tank or freight container containing LSA material or an SCO that meets the requirements of Schedule 2 and—

(a) has a smallest overall external dimension of not less than 10 cm., and

(b) meets the requirements of Schedule 10.

PART II

Requirements for an industrial package Type 2 (IP-2)

An industrial package Type 2 (IP-2) is a packaging, tank or freight container containing LSA material or an SCO that meets the requirements of Schedules 2 and 10 and—

(a) in the case of a package, its smallest overall external dimension is not less than 10 cm, and, if it were subjected to the tests specified in paragraphs 9 and 10 of Part III of Schedule 15 or alternatively to the tests specified for packaging group III in the Dangerous Goods Recommendations, it would prevent:

(i) the loss or dispersal of the radioactive contents; and

(ii) the loss of shielding integrity which would result in more than a 20% increase in the radiation level at any external surface of the package; or

(b) in the case of a tank container it is:

(i) designed to conform to the standards prescribed in Chapter 12 of the Dangerous Goods Recommendations, or other requirements at least equivalent to those standards, and are capable of withstanding a test pressure of 265 kPa; and

(ii) it is designed so that any additional shielding which is provided shall be capable of withstanding the static and dynamic stresses resulting from normal handling and routine conditions of transport and of preventing a loss of shielding which would

result in more than a 20% increase in the radiation level at any external surface of the tank container; or

(c) in the case of a tank other than a tank container, it is used for transporting LSA-I or LSA-II liquids or gases as prescribed in Table V of Schedule 36, and conforms to standards at least equivalent to those required in the case of tank containers by paragraph (b); or

(d) in the case of a freight container, it is designed to conform to the requirements prescribed in the ISO freight containers document, and if it were subjected to the tests prescribed in that document it would prevent:

(i) loss or dispersal of the radioactive contents; and

(ii) loss of shielding which would result in more than a 20% increase in the radiation level at any external surface of the freight container; and

(e) in the case of a package containing uranium hexafloride complies with the provisions of marginal 3771 of ADR.

PART III

Requirements for an industrial package Type 3 (IP-3)

An industrial package Type 3 (IP-3) is a packaging, tank or freight container containing LSA material or an SCO that meets the requirements of Schedules 2 and 10, and—

(a) in the case of a package it meets the requirements of paragraphs 2 to 15 of Schedule 11; or

(b) in the case of a tank container,

(i) it is designed to conform to the standards prescribed in Chapter 12 of the Dangerous Goods Recommendations, or other requirements at least equivalent to those standards, and are capable of withstanding a test pressure of 265 kPa; and

(ii) it is designed so that any additional shielding which is provided shall be capable of withstanding the static and dynamic stresses resulting from normal handling and routine conditions of transport and of preventing a loss of shielding which would result in more than a 20% increase in the radiation level at any external surface of the tank container; or

(c) in the case of a tank other than a tank container, it is used for transporting LSA-I or LSA-II liquids or gases as prescribed in Table V of Schedule 36, and conforms to standards at least equivalent to those required in the case of tank containers by paragraph (b) above; or

(d) in the case of a freight container, it is designed to conform to the requirements prescribed in the ISO freight containers document, and if it were subjected to the tests prescribed in that document it would prevent:

(i) loss or dispersal of the radioactive contents; and

(ii) loss of shielding which would result in more than a 20% increase in the radiation level at any external surface of the freight container; and

(e) in the case of a package containing uranium hexafloride complies with the provisions of marginal 3771 of ADR.

SCHEDULE 10

Regulation 8

Additional requirements and controls for transport of LSA material and SCO in industrial packages and requirements and controls for transport of unpackaged LSA material and SCO

1. The quantity of LSA material or SCO in a single industrial package Type 1 (IP-1), industrial package Type 2 (IP-2), industrial package Type 3 (IP-3), or object or collection of objects, whichever is appropriate, shall be so restricted that the external radiation level at 3 metres from the unshielded material or object or collection of objects does not exceed 10 mSv/h.

2. LSA material and SCO which is or contains fissile material shall meet the applicable requirements of Schedule 7.

3. LSA material and SCO in groups LSA-I and SCO-I may be transported unpackaged under the following conditions:

(a) all unpackaged material other than ores containing only naturally occurring radionuclides shall be transported in such a manner that under conditions likely to be encountered in routine transport there will be no escape of the contents from the conveyance nor will there be any loss of shielding;

(b) each conveyance shall be under exclusive use, except when only transporting SCO-I on which the contamination on the accessible and the inaccessible surfaces is not greater than ten times the applicable level specified in table III of Schedule 36; and

(c) for SCO-I where it is suspected that non-fixed contamination exists on inaccessible surfaces in excess of the values specified in paragraph (i) of the definition of "SCO-I" in regulation 2(1) measures shall be taken to ensure that the radioactive material is not released into the conveyance.

4. LSA material and SCO, except as otherwise specified in paragraph 3, shall be packaged in accordance with the package integrity levels specified in Table V of Schedule 36. LSA-II, LSA-III and SCO-II shall not be transported unpackaged.

5. The total activity of LSA material and SCO in any single conveyance shall not exceed the limits shown in Table VI of Schedule 36.

SCHEDULE 11

Regulation 2(1)

Requirements for Type A packages

1. A Type A package shall meet the requirements of Schedule 2 and of this Schedule.

2. The smallest overall external dimension of the package shall not be less than 10 cm.

3. The outside of the package shall incorporate a feature such as a seal, which is not readily breakable and which, while intact, will be evidence that it has not been opened.

4. Any tie-down attachments on the package shall be so designed that, under both normal and accident conditions of transport, the forces in those attachments shall not impair the ability of the package to meet the requirements of these Regulations.

5. The design of the package shall take into account temperatures ranging from −40°C to 70°C, giving special attention to freezing temperatures for liquid contents and to the potential degradation of packaging materials within the given temperature range.

6. The design, fabrication and manufacturing techniques shall be in accordance with national or international standards, or other requirements, acceptable to the Secretary of State.

7. The design shall include a containment system securely closed by a positive fastening device which cannot be opened unintentionally or by a pressure which may arise within the package.

8. Special form radioactive material may be considered as a component of the containment system.

9. If the containment system forms a separate unit of the package, it shall be capable of being securely closed by a positive fastening device which is independent of any other part of the packaging.

10. The design of any component of the containment system shall take into account, where applicable, the radiolytic decomposition of liquids and other vulnerable materials and the generation of gas by chemical reaction and radiolysis.

11. The containment system shall retain its radioactive contents under a reduction of ambient pressure to 25 kPa.

12. All valves, other than pressure relief valves, shall be provided with an enclosure to retain any leakage from the valve.

13. A radiation shield which encloses a component of the package specified as a part of the containment system shall be so designed as to prevent the unintentional release of that component from the shield. Where the radiation shield and such component within it form a separate unit, the radiation shield shall be capable of being securely closed by a positive fastening device which is independent of any other packaging structure.

14. A package shall be so designed that if it were subjected to the tests specified in paragraphs 6 to 11 of Part III of Schedule 15, it would prevent:

(a) Loss or dispersal of the radioactive contents; and

(b) Loss or shielding integrity which would result in more than a 20% increase in the radiation level at any external surface of the package.

15. The design of a package intended for liquid radioactive material shall make provision for ullage to accommodate variations in the temperature of the contents, dynamic effects and filling dynamics.

16. A Type A package designed to contain liquids shall, in addition:

(a) be adequate to meet the conditions specified in paragraph 14 if the package is subjected to the tests specified in paragraph 12 of Part III of Schedule 15; and

(b) either

(i) be provided with sufficient absorbent material to absorb twice the volume of the liquid contents. Such absorbent material must be suitably positioned so as to contact the liquid in the event of leakage; or

(ii) be provided with a containment system composed of primary inner and secondary outer containment components designed to ensure retention of the liquid contents, within the secondary outer containment components, even if the primary inner components leak.

17. In the case of a Type B package which has been designed and approved for liquids and which is consigned as a Type A package containing the same liquids and not exceeding the A_2 limit for those liquids, the requirements of paragraph 16(b) above shall not apply.

18. A package designed for compressed gases or uncompressed gases shall prevent loss or dispersal of the radioactive contents if the package were subjected to the tests specified in paragraph 12 of Part III of Schedule 15. A package designed for contents not exceeding 40 TBq of tritium or for noble gases in gaseous form with contents not exceeding A_2 shall be excepted from this requirement.

19. In the case of a package containing uranium hexafloride the package shall comply with the provisions of marginal 3771 of ADR.

SCHEDULE 12

Regulation 2(1)

General requirements for Type B packages

1. A Type B package shall meet the requirements of Schedule 2, and of paragraphs 2 to 13, and 15, of Schedule 11, and of paragraph 14 of Schedule 11 except as specified in paragraph 8(a) below, and the requirements of this Schedule.

2. A package shall be so designed that, if it were subjected to the tests in paragraphs 13–16 of Part III of Schedule 15, it would retain sufficient shielding to ensure that the radiation level at 1 metre from the surface of the package would not exceed 10 mSv/h with the maximum radioactive contents which the package is designed to carry.

3. A package shall be so designed that, under the ambient conditions specified in paragraphs 5 and 6, heat generated within the package by the radioactive contents shall not, under normal conditions of transport, as demonstrated by the tests in paragraphs 6–11 of Part III of Schedule 15, adversely affect the package in such a way that it would fail to meet the applicable requirements for containment and shielding if left unattended for a period of one week. Particular attention shall be paid to the effects of heat which may:

(a) alter the arrangement, the geometrical form or the physical state of the radioactive contents or, if the radioactive material is enclosed in a can or receptacle (for example, clad fuel elements), cause the can, receptacle or radioactive material to deform or melt; or

(b) lessen the efficiency of the packaging through differential thermal expansion or cracking or melting of the radiation shielding material; or

(c) in combination with moisture, accelerate corrosion.

4. A package shall be so designed that, under the ambient condition specified in paragraph 5, the temperature of its accessible surfaces shall not exceed 50 °C, unless the package is transported under exclusive use.

5. In applying paragraphs 3 and 4, the ambient temperature shall be assumed to be 38°C.

6. In applying paragraph 3 above, the solar insolation conditions shall be assumed to be as specified in Table XI of Schedule 36.

7. A package which includes thermal protection for the purpose of satisfying the requirements of the thermal test specified in paragraph 15 of Part III of Schedule 15 shall be so designed that such protection will remain effective if the package is subjected to the tests specified in paragraphs 6–11 and 14(a) and (b) or 14(b) and (c) of Part III of Schedule 15, as appropriate. Any such protection on the exterior of the package shall not be rendered ineffective by conditions likely to be encountered in routine handling or routine transport, or in accident conditions of transport, and which are not simulated in the tests referred to above, e.g., by ripping, cutting, skidding, abrasion, or rough handling.

8. A package shall be so designed that, if it were subjected to:

(a) the tests specified in paragraphs 6–11 of Part III of Schedule 15, it would restrict the loss of radioactive contents to not more than $10^{-6}6$ A_2 per hour; and

(b) the tests specified in paragraphs 13, 14(b), 15 and 16 of that Part of that Schedule and the test in paragraph—

(i) 14(c) of that Part of that Schedule, when the package has a mass not greater than 500 kg, an overall density not greater than 1000 kg/m^3 based on the external dimensions, and radioactive contents greater than 1000 A_2 not as special form radioactive material, or

(ii) 14(a) of that Part of that Schedule for all other packages,

it would restrict the accumulated loss of radioactive contents in a period of one week to not more than 10 A_2 for krypton-85 and not more than A_2 for all other radionuclides.

Where mixtures of different radionuclides are present, the provisions of paragraphs 4 to 6 of Schedule 1 shall apply except that for krypton-85 an effective A_2 value equal to 100 TBq may be used.

For the purposes of sub-paragraph (a) above, the evaluation shall take into account the requirements of Regulation 21.

9. In the case of a package containing uranium hexafloride the package shall comply with the provisions of marginal 3771 of ADR.

SCHEDULE 13

Regulations 2(1) & 19

Requirements of Type B(U) packages

1. A Type B(U) package shall meet the requirements of Schedule 12 and the requirements of this Schedule.

2. A package for irradiated nuclear fuel with activity greater than 37 PBq shall be so designed that if it were subjected to the water immersion test specified in paragraph 17 of Part III of Schedule 15, there would be no rupture of the containment system.

3. Compliance with the permitted activity release limits shall depend neither upon filters nor upon a mechanical cooling system.

4. A package shall not include a pressure relief system from the containment system which would allow the release of radioactive material to the environment under the conditions of the tests specified in paragraphs 6–11 and 13–16 of Part III of Schedule 15.

5. A package shall be so designed that if it were at the maximum normal operating pressure and it were subjected to the tests specified in paragraphs 6–11 and 13–16 of Part III of Schedule 15, the level of strains in the containment system would not attain values which would adversely affect the package in such a way that it would fail to meet the applicable requirements.

6. A package shall not have a maximum normal operating pressure in excess of a gauge pressure of 700 kPa.

7. The maximum temperature of any surface readily accessible during transport of a package shall not exceed 85°C in the absence of insolation under the ambient condition specified in paragraph 5 of Schedule 12 and the package shall be carried under exclusive use, as specified in paragraph 4 of Schedule 12, if the maximum temperature exceeds 50°C. Account may be taken of barriers or screens to give protection to transport workers without the need for the barriers or screens being subject to any test.

8. A package shall be designed for an ambient temperature range from −40°C to +38°C.

SCHEDULE 14

Regulations 2(1) & 20

Requirements for Type B(M) packages

1. A Type B(M) package shall meet the requirements of Schedule 12, except that for packages to be transported between the United Kingdom and another state, conditions other than those given in paragraphs 5 and 6 of that Schedule and paragraph 8 of Schedule 13 may be assumed with the approval of the Secretary of State and the competent authority of any state through or to which it is be transported. As far as reasonably practicable the requirements of Schedule 13 shall be met.

2. Intermittent venting of Type B(M) packages may be permitted during transport, provided that the operational controls for venting are acceptable to the Secretary of State.

SCHEDULE 15

Regulations 2(1) & 25

TEST PROCEDURES

PART I—

TEST FOR LSA-III MATERIAL

Solid material representing no less than the entire contents of the package shall be immersed for 7 days in water at ambient temperature. The volume of water to be used in the test shall be sufficient to ensure that at the end of the 7-day test period, the free volume of the unabsorbed and unreacted water remaining shall be at least 10% of the volume of the solid test sample itself. The water shall have an initial pH of 6–8 and a maximum conductivity of 1 mS/m at 20°C. The total activity of the free volume of water shall be measured following the 7-day immersion of the test sample.

PART II—

TESTS FOR SPECIAL FORM RADIOACTIVE MATERIAL

General

1. The tests which shall be performed on specimens that comprise or simulate special form radioactive material are: the impact test, the percussion test, the bending test, and the heat test.

2. A different specimen may be used for each of the tests.

3. After each test specified in paragraphs 4–8 below, a leaching assessment or volumetric leakage test shall be performed on the specimen by a method no less sensitive than the methods given in paragraph 9 below for indispersable solid material and paragraph 10 below for encapsulated material.

Test methods

4. Impact test: The specimen shall drop onto the target from a height of 9 metres. The target shall be a flat, horizontal surface of such a character that any increase in its resistance to displacement or deformation upon impact by the specimen would not significantly increase the damage to the specimen.

Percussion test:

5. The specimen shall be placed on a sheet of lead which is supported by a smooth solid surface and struck by the flat face of a steel billet so as to produce an impact equivalent to that resulting from a free drop of 1.4 kg through 1 metre. The flat face of the billet shall be 25 mm in diameter with the edges rounded off to a radius of (3.0±0.3)mm. The lead, of hardness number 3.5 to 4.5 on the Vickers scale and not more than 25 mm thick, shall cover an area greater than that covered by the specimen. A fresh surface of lead shall be used for each impact. The billet shall strike the specimen so as to cause maximum damage.

Bending test:

6. The test shall apply only to long, slender sources with both a minimum length of 10 cm and a length to minimum width ratio of not less than 10. The specimen shall be rigidly clamped in a horizontal position so that one half of its length protrudes from the face of the clamp. The orientation of the specimen shall be such that the specimen will suffer maximum damage when its free end is struck by the flat face of a steel billet. The billet shall strike the specimen so as to produce an impact equivalent to that resulting from a free vertical drop of 1.4 kg through 1 metre. The flat face of the billet shall be 25 mm in diameter with the edges rounded off to a radius of (3.0±0.3)mm.

Heat test:

7. The specimen shall be heated in air to a temperaturte of 800°C and held at that temperature for a period of 10 minutes and shall then be allowed to cool.

8. Specimens that comprise or simulate radioactive material enclosed in a sealed capsule may be excepted from:

(a) The tests prescribed in paragraphs 4 and 6 provided they are alternatively subjected to the Class 4 impact test prescribed in the ISO classification document; and

(b) The test prescribed in paragraph 7 provided they are alternatively subjected to the Class 6 temperature test specified in the ISO classification document.

Leaching and volumetric leakage assessment methods

9. For specimens which comprise or simulate indispersable solid material, a leaching assessment shall be performed as follows:

(a) The specimen shall be immersed for 7 days in water at ambient temperature. The volume of water to be used in the test shall be sufficient to ensure that at the end of the 7-day test period, the free volume of the unabsorbed and unreacted water remaining shall be at least 10% of the volume of the solid test sample itself. The water shall have an initial pH of 6–8 and a maximum conductivity of 1 mS/m at 20°C.

(b) The water with specimen shall then be heated to a temperature of (50±5)°C and maintained at this temperature for 4 hours.

(c) The activity of the water shall then be determined.

(d) The specimen shall then be stored for at least 7 days in still air of relative humidity not less than 90% at 30°C.

(e) The specimen shall then be immersed in water of the same specification as in (a) above and the water with the specimen heated to (50±5)°C and maintained at this temperature for 4 hours.

(f) The activity of the water shall then be determined.

10. For specimens which comprise or simulate radioactive material enclosed in a sealed capsule, either a leaching assessment or a volumetric leakage assessment shall be performed as follows:

(a) the leaching assessment shall consist of the following steps:

(i) The specimen shall be immersed in water at ambient temperature. The water shall have an initial pH of 6–8 with a maximum conductivity of 1 mS/m at 20°C.

(ii) The water and specimen shall be heated to a temperature of (50±5)°C and maintained at this temperature for 4 hours.

(iii) The activity of the water shall then be determined.

(iv) The specimen shall then be stored for at least 7 days in still air at a temperature not less than 30°C.

(v) The process in (i), (ii) and (iii) shall be repeated.

(b) The alternative volumetric leakage assessment shall comprise any of the tests prescribed in the ISO leak test document which are acceptable to the Secretary of State.

PART III—

TESTS FOR PACKAGES

Preparation of a specimen for testing

1. All specimens shall be examined before testing in order to identify and record faults or damage including the following:

(a) divergence from the design;

(b) defects in construction;

(c) corrosion or other deterioration; and

(d) distortion of features.

2. The containment system of the package shall be clearly specified.

3. The external features of the specimen shall be clearly identified so that reference may be made simply and clearly to any part of such specimen.

Testing the integrity of the containment system, shielding and criticality safety

4. After the applicable tests specified in paragraphs 6–20 below:

(a) Faults and damage shall be identified and recorded;

(b) It shall be determined whether the integrity of the containment system and shielding has been retained to the extent required in Schedules 2, 7, 9, 11, 12 and 13 for the packaging under test; and

(c) For packages containing fissile material, it shall be determined whether the assumptions made in paragraphs 1 to 6 of Schedule 7 regarding the most reactive configuration and degree of moderation of the fissile contents, of any escaped material, and of one or more packages are valid.

Target for drop tests

5. The target for the drop tests specified in paragraphs 9, 12(a) and 14 shall be a flat, horizontal surface of such a character that any increase in its resistance to displacement or deformation upon impact by the specimen would not significantly increase the damage to the specimen.

Test for demonstrating ability to withstand normal conditions of transport

6. The tests are: the water spray test, the free drop test, the stacking test, and the penetration test. Specimens of the package shall be subjected to the free drop test, the stacking test and the penetration test, preceded in each case by the water spray test. One specimen may be used for all the tests, provided that the requirements of paragraph 7 are fulfilled.

7. The time interval between the conclusion of the water spray test and the succeeding test shall be such that the water has soaked in to the maximum extent, without appreciable drying of the exterior of the specimen. In the absence of any evidence to the contrary, this interval shall be taken to be two hours if the water spray is applied from four directions simultaneously. No time interval shall elapse, however, if the water spray is applied from each of the four directions consecutively.

Water spray test:

8. The specimen shall be subjected to a water spray test that simulates exposure to rainfall of approximately 5 cm per hour for at least one hour.

Free drop test:

9. The specimen shall drop on to the target so as to suffer maximum damage in respect of the safety features to be tested and—

(a) The height of drop measured from the lowest point of the specimen to the upper surface of the target shall be not less than the distance specified in Table XIII of Schedule 36 for the applicable mass. The target shall be as defined in paragraph 5 above.

(b) For packages containing fissile material the free drop test specified above shall be preceded by a free drop from a height of 0.3 metres on to each corner or, in the case of a cylindrical package, on to each of the quarters of each rim.

(c) For rectangular fibreboard or wood packages not exceeding a mass of 50 kg, a separate specimen shall be subjected to a free drop on to each corner from a height of 0.3 metres.

(d) For cylindrical fibreboard packages not exceeding a mass of 100 kg, a separate specimen shall be subjected to a free drop on to each of the quarters of each rim from a height of 0.3 metres.

Stacking test:

10. Unless the shape of the packaging effectively prevents stacking, the specimen shall be subjected, for a period of 24 hours, to a compressive load equal to the greater of the following:

(a) The equivalent of 5 times the mass of the actual package; and

(b) The equivalent of 13 kPa multiplied by the vertically projected area of the package.

The load shall be applied uniformly to two opposite sides of the specimen, one of which shall be the base on which the package would normally rest.

Penetration test:

11. The specimen shall be placed on a rigid, flat, horizontal surface which will not move significantly while the test is carried out.

(a) A bar of 3.2 cm in diameter with a hemispherical end and a mass of 6 kg shall be dropped and directed to fall, with its longitudinal axis vertical, on to the centre of the weakest part of the specimen, so that, if it penetrates sufficiently far, it will hit the containment system. The bar shall not be significantly deformed by the test performance.

(b) The height of drop of the bar measured from its lower end to the intended point of impact on the upper surface of the specimen shall be 1 metre.

Additional tests for Type A packages designed for liquids and gases

12. A specimen or separate specimens shall be subjected to each of the following tests unless it can be demonstrated that one test is more severe for the specimen in question than the other, in which case one specimen shall be subjected to the more severe test:

(a) Free drop test: The specimen shall drop on to the target so as to suffer the maximum damage in respect of containment. The height of the drop measured from the lowest part of the specimen to the upper surface of the target shall be 9 metres. The target shall be as defined in paragraph 5 above.

(b) Penetration test: The specimen shall be subjected to the test specified in paragraph 11 above except that the height of drop shall be increased to 1.7 metres from the 1 metre specified in paragraph 11(b).

Tests for demonstrating ability to withstand accident conditions of transport

13. The specimen shall be subjected to the cumulative effects of the tests specified in paragraphs 14 and 15, in that order. Following these tests, either this specimen or a separate specimen shall be subjected to the effect(s) of the water immersion test(s) as specified in paragraph 16 and, if applicable, paragraph 17.

Mechanical test:

14. The mechanical test consists of three different drop tests. Each specimen shall be subjected to the applicable drops as specified in paragraph 8 of Schedule 12. The order in which the specimen is subjected to the drops shall be such that, on completion of the mechanical test, the specimen shall have suffered such damage as will lead to the maximum damage in the thermal test which follows.

(a) For drop I, the specimen shall be dropped on to the target so as to suffer the maximum damage, and the height of the drop measured from the lowest point of the specimen to the upper surface of the target shall be 9 metres. The target shall be as defined in paragraph 5 above.

(b) For drop II, the specimen shall be dropped so as to suffer the maximum damage on to a bar rigidly mounted perpendicularly on the target. The height of the drop measured from the intended point of impact of the specimen to the upper surface of the bar shall be 1 metre. The bar shall be of solid mild steel of circular section, (15.0±0.5)cm in diameter, and 20 cm long unless a longer bar would cause greater damage, in which case a bar of sufficient length to cause maximum damage shall be used. The upper end of the bar shall be flat and horizontal with its edges rounded off to a radius of not more than 6 mm. The target on which the bar is mounted shall be as described in paragraph 5.

(c) For drop III, the specimen shall be subjected to a dynamic crush test by positioning the specimen on the target so as to suffer maximum damage by the drop of a 500 kg mass from 9 metres on to the specimen. The mass shall consist of a solid mild steel plate 1 metre×1 metre and shall fall in a horizontal attitude. The height of the drop shall be measured from the underside of the plate to the highest point of the specimen. The target on which the specimen rests shall be as defined in paragraph 5.

Thermal test:

15. The thermal test shall consist of the exposure of a specimen fully engulfed, except for a simple support system, in a hydrocarbon fuel/air fire of sufficient extent and in sufficiently quiescent

ambient conditions to provide an average emissivity coefficient of at least 0.9, with an average flame temperature of at least 800°C for a period of 30 minutes, or shall be any other thermal test which provides the equivalent total heat input to the package. The fuel source shall extend horizontally at least 1 metre, and shall not extend more than 3 metres, beyond any external surface of the specimen, and the specimen shall be positioned 1 metre above the surface of the fuel source. After the cessation of external heat input, the specimen shall not be cooled artifically and any combustion of materials of the specimen shall be allowed to proceed naturally. For demonstration purposes, the surface absorptivity coefficient shall be either 0.8 or that value which the package may be demonstrated to possess if exposed to the fire specified; and the convective coefficient shall be that value which the designer can justify if the package were exposed to the fire specified. With respect to the initial conditions for the thermal test, the demonstration of compliance shall be based upon the assumption that the package is in equilibrium at an ambient temperature of 38°C. The effects of solar radiation may be neglected prior to and during the tests, but must be taken into account in the subsequent evaluation of the package response.

Water immersion test:

16. The specimen shall be immersed under a head of water of at least 15 metres for a period of not less than eight hours in the attitude which will lead to maximum damage. For demonstration purposes, an external gauge pressure of at least 150 kPa shall be considered to meet these conditions.

Water immersion test for packages containing irradiated nuclear fuel

17. The specimen shall be immersed under a head of water of at least 200 metres for a period of not less than one hour. For demonstration purposes, an external gauge pressure of at least 2 MPa shall be considered to meet these conditions.

Water leakage test for packages containing fissile material

18. Packages for which water in-leakage or out-leakage to the extent which results in greatest reactivity has been assumed for purposes of assessment under paragraphs 3 to 6 of Schedule 7 shall be excepted from the test specified in paragraph 20.

19. Before the specimen is subjected to the water leakage test specified in paragraph 20, it shall be subjected to the tests in paragraph 14(b), and either paragraph 14(a) or (c) as required by paragraph 8 of Schedule 12, and the test specified in paragraph 15.

20. The specimen shall be immersed under a head of water of at least 0.9 metres for a period of not less than eight hours and in the attitude for which maximum leakage is expected.

PART IV—

DEMONSTRATION OF COMPLIANCE

Demonstration of compliance with the performance standards in this Schedule shall be accomplished by any of the following methods or by a combination thereof.

1. Performance of tests with specimens simulating as closely as practicable the expected range of radioactive contents, and with the specimen or packaging to be tested prepared as normally presented for transport.

2. Reference to previous satisfactory demonstrations of a sufficiently similar nature.

3. Performance of tests with models of appropriate scale incorporating those features which are significant with respect to the item under investigation when engineering experience has shown

results of such tests to be suitable for design purposes. When a scale model is used, the need for adjusting certain test parameters, such as penetrator diameter or compressive load, shall be taken into account.

4. Calculation, or reasoned argument, when the calculation procedures and parameters are agreed by the Secretary of State to be reliable or conservative.

SCHEDULE 16

Regulation 13

Contents limits for packages

Excepted packages

1. An excepted package containing radioactive material other than articles manufactured of natural uranium, depleted uranium, or natural thorium shall not contain activities greater than the following:

(a) where the radioactive material is enclosed in or forms a component part of an instrument or other manufactured article, such as a clock or electronic apparatus, the limits specified in paragraph 3 of Schedule 4 for each individual item and each package respectively; and

(b) where the radioactive material is not so enclosed or manufactured, the limits specified in paragraph 5 of Schedule 3.

2. An excepted package consisting of articles manufactured of natural uranium, depleted uranium, or natural thorium may contain any quantity of such material provided that the outer surface of the uranium or thorium is enclosed in an inactive sheath made of metal or some other substantial substance.

Industrial packages

3. The total activity in a single package of LSA material or in a single package of SCO shall be so restricted that the radiation level specified in paragraph 1 of Schedule 10 shall not be exceeded, and the activity in a single package shall also be so restricted that the activity limits for a conveyance specified in paragraph 5 of Schedule 10 shall not be exceeded.

Type A packages

(a) (a) A Type A package containing a single radionuclide shall not contain activities greater than the following:

(i) for special form radioactive material: A_1; or

(ii) for all other radioactive material: A_2.

(b) For a Type A package containing a mixture of radionuclides whose identities and respetive activities are known the following formulae shall apply:

(i) To calculate package limit for special form radioactive material:

$$\sum_i \frac{B(i)}{A_1(i)} \text{ shall be less than or equal to } 1$$

(ii) To calculate package limit for other forms of radioactive material:

$$\sum_i \frac{B(i)}{A_2(j)} \text{ shall be less than or equal to } 1$$

where

B(i) is the activity of radionuclide i and A_1(i) and A_2(i) are the A_1 and A_2 values for radionuclide i, respectively.

Type B packages

5. A Type B package shall not contain:

(a) activities greater than those authorised for the package design,

(b) radionuclides different from those authorised for the package design, or

(c) contents in a form, or a physical or chemical state different from those authorised for the package design,

as specified in the package design approval certificate.

Packages containing fissile material

6. Any packaging containing fissile material shall comply with the activity limits for packages of that type specified in this Schedule.

7. No packaging containing fissile material, other than a package falling within Schedule 8, shall contain:

(a) a mass of fissile material greater than that authorised for the package design,

(b) any contents different from those authorised for the package design, or

(c) contents in a form or physical or chemical state, or in a spatial arrangement, different from those authorised for the package design,

as specified in the package design approval certificate.

SCHEDULE 17

Regulations 2(1) & 14(1)

Determination of Transport Index (TI)

1. The Transport Index (TI) based on radiation exposure control for a package, overpack, tank, freight container, or for unpackaged LSA-I or SCO-I, shall be the number derived in accordance with the following procedure:

(a) Determine the maximum radiation level in units of mSv/h at a distance of 1 metre from the external surfaces of the package, overpack, tank, freight container, or unpackaged LSA-I and SCO-I. Multiply the value determined by 100. For uranium and thorium ores and concentrates, the maximum radiation dose rate at any point 1 metre from the external surface of the load may be taken as:

0.4 mSv/h for ores and physical concentrates of uranium and thorium;

0.3 mSv/h for chemical concentrates of thorium;

0.02 mSv/h for chemical concentrates of uranium, other than uranium hexafluoride.

(b) For tanks, freight containers and unpackaged LSA-I and SCO-I, the value determined in step (a) above shall be multiplied by the appropriate factor from Table VII of Schedule 36.

(c) The figure obtained in steps (a) and (b) above shall be rounded up to the first decimal place (e.g., 1.13 becomes 1.2), except that a value of 0.05 or less may be considered as zero.

2. The Transport Index (TI) based on nuclear criticality control shall be obtained by dividing the number 50 by the value of N derived using the procedures specified in paragraph 6 of Schedule 7 (i.e., TI=50/N). The value of the Transport Index (TI) for nuclear criticality control may be zero, provided that an unlimited number of packages is subcritical (i.e., N is effectively equal to infinity).

3. The Transport Index (TI) for each consignment shall be determined in accordance with Table VIII of Schedule 36.

SCHEDULE 18

Regulations 6, 22(3) & 30

Requirements for marking, labelling and placarding

Marking

1. Each package of gross mass exceeding 50 kg shall have its permissible gross mass legibly and durably marked on the outside of the packaging.

2. Each package which conforms to a Type A package design shall be legibly and durably marked on the outside of the packaging with "Type A".

3. Each package which conforms to a design approved under regulation 19(3), 20(3) or 21(3) or falling within regulation 23(1), shall be legibly and durably marked on the outside of the packaging with:

(a) the identification mark allocated to that design by the competent authority;

(b) a serial number to uniquely identify each packaging which conforms to that design; and

(c) in the case of a Type B(U) or Type B(M) package design, with "Type B(U)" or "Type B(M)" respectively.

4. Each package which conforms to a Type B(U) or Type B(M) package design shall have the outside of the outermost receptacle which is resistant to the effects of fire and water plainly marked by embossing, stamping, or other means resistant to the effects of fire and water with the trefoil symbol shown in Fig. 1 in the Appendix below.

Labelling

5. Each package, overpack, tank and freight container shall bear the labels which conform to the models in Figs. 2, 3 or 4 in the Appendix below, except as allowed under the alternative provision of paragraph 9 below for large freight containers and tanks, according to the appropriate category determined in accordance with Schedule 19. Any labels which do not relate to the contents shall be removed or covered. For radioactive materials having other dangerous properties see paragraph 12 of Schedule 2.

6. The labels shall be affixed to two opposite sides of the outside of a package or overpack, or on the outside of all four sides of a freight container or tank.

7. Each label shall be completed with the following information:

(a) Contents:

(i) Except for LSA-I material, the name of the radionuclide as taken from Table I of Schedule 36, using the symbols prescribed therein. For mixtures of radionuclides, the most restrictive nuclides must be listed to the extent the space on the line permits. The group of LSA or SCO shall be shown following the name of the radionuclide. The terms "LSA-II", "LSA-III", "SCO-I" and "SCO-II" shall be used for this purpose.

(ii) For LSA-I materials, the term "LSA-I" is all that is necessary; the name of the radionuclide is not necessary.

(b) Activity: The maximum activity of the radioactive contents during transport expressed in units of Bq. For fissile material, the total mass in units of grams (g), or multiples thereof, may be used in place of activity.

(c) For overpacks, tanks, and freight containers, the "contents" and "activity" entries on the label shall bear the information required in sub-paragraphs (a) and (b) above, respectively, totalled together for the entire contents of the overpack, tank, or freight container except that on labels for overpacks or freight containers containing mixed loads of packages with different radionuclides, such entries may read, "See Transport Documents".

(d) Transport Index (TI)—see Schedule 17.

(No Transport Index (TI) entry is required for category I-WHITE).

(a) (a) Each package, overpack, tank, freight container or vehicle containing any of the substances mentioned in paragraph 8(a)(iv) and 9(a)(ii) of marginal 2703 of ADR shall bear the additional label prescribed for the substance in those paragraphs.

(b) Each package except tank containers and overpacks shall be clearly and durably marked with the United Nations number assigned to the material as specified in Schedule 37, preceded by the letters "UN".

Placarding

9. Large freight containers carrying packages other than excepted packages, and tanks shall bear four placards which conform to the model given in Fig. 5 in the Appendix below. The placards shall be affixed in a vertical orientation to each side wall and each end wall of the freight container or tank. Any placards which do not relate to the contents shall be removed. Instead of using a label and a placard, it is permitted as an alternative to use enlarged labels only, as shown in Figs 2, 3 and 4 in the Appendix below, with dimensions of the minimum size shown in Fig. 5 in the Appendix below.

10. Where the consignment in the freight container or tank is unpackaged LSA-I or SCO-I or where an exclusive use consignment in a freight container is packaged radioactive material comprised of a single United Nations Number commodity, the appropriate United Nations Number for the consignment (see Schedule 37) shall also be displayed, in black digits not less than 65 mm high, either:

(a) in the lower half of the placard shown in Fig. 5 in the Appendix below, against the white background, or

(b) on the placard shown in Fig. 6 in the Appendix below.

When the alternative given in (b) above is used, the subsidiary placard shall be affixed immediately adjacent to the main placard, on all four sides of the freight container or tank.

11. Subject to paragraph 16 in the Appendix below, a vehicle carrying a package, overpack, tank or freight container labelled with any of the labels shown in Figs. 2, 3 or 4 in the Appendix below, or carrying a consignment under exclusive use, shall display the placard shown in Fig. 5 on each of the two external lateral walls and the external rear wall of the vehicle. In the case of a vehicle without sides the placards may be affixed directly on the cargo-carrying unit provided that they are readily visible; in the case of a physically large tank or freight container, the placards on the tank or freight container will suffice, but any placards which do not relate to the contents must be removed.

12. Where the consignment in or on the vehicle is unpackaged LSA-I or SCO-I or where an exclusive use consignment is packaged radioactive material comprised of a single United Nations Number commodity, the appropriate United Nations Number (see Schedule 37) shall also be displayed, in black digits not less than 65 mm high, either:

(a) in the lower half of the placard shown in Fig. 5 in the Appendix below, against the white background, or

(b) on the placard shown in Fig. 6 in the Appendix below. When the alternative given in (b) above is used, the subsidiary placard shall be affixed immediately adjacent to the main placard on the two lateral walls and the end wall of the vehicle.

13. A vehicle transporting radioactive material shall, in addition to any placard required by paragraphs 8 to 11, bear either:

(a) plates conforming to the requirements of paragraph 14; or

(b) a notice conforming to the requirements of paragraph 15.

14. For the purposes of paragraph 13(a), the plates to be displayed by a vehicle while it is transporting radioactive material shall conform to the requirements of paragraph (1) of marginal 10500 of ADR.

15. For the purposes of paragraph 13(b), the notice to be displayed in a vehicle while it is transporting radioactive material shall conform to the following:

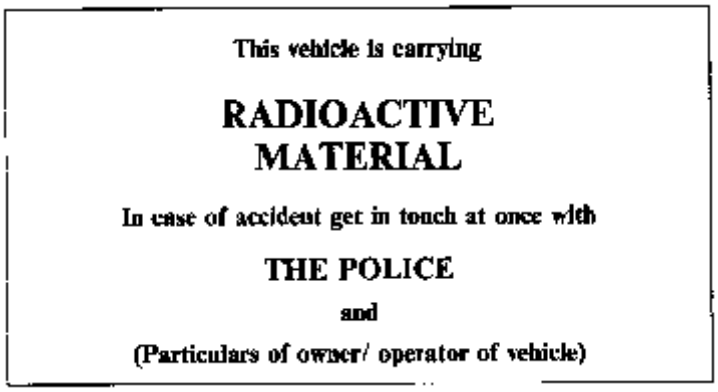
(a) It shall be not less than 12 cm square. All lettering on the notice shall be black, bold and legible. All lettering shall also be embossed or stamped. The capital letters in the words "RADIOACTIVE" shall be not less than 12 mm high and all other capital letters shall be not less than 5 mm high.

(b) It shall be fireproof to the extent that the words on the notice shall remain legible after exposure to a fire involving the vehicle.

(c) It shall be securely posted in the vehicle cab in a position where it is plainly visible to the driver, but does not obstruct his view of the road and shall be exhibited only when the vehicle is transporting radioactive material.

(d) It shall be in the form set out below and shall state the name, address and telephone number of the owner or operator of the vehicle. For the purposes of this sub-paragraph and in relation to a vehicle which is the subject of a hiring agreement or a hire-purchase agreement, "owner" means the person in possession of the vehicle under that agreement.

FORM OF NOTICE
FORM OF NOTICE



16. The provisions of paragraph 11 shall not apply to the transport in a motor car of packages labelled with any of the labels shown in Figs. 2, 3 or 4 in the Appendix below provided that:

(a) No more than 10 such packages are carried in the vehicle at any one time; and

(b) The sum of the Transport Indexes (TI) of the packages carried in the vehicle at any one time does not exceed 3; and

(c) The vehicle bears a placard conforming to the requirements of paragraph 11 except that the minimum dimensions for the placard shall be 150 mm by 150 mm, with symbols of sizes in proportion to those specified in Fig. 5 in the Appendix below.

In this paragraph "motor car" has the meaning given in section 185(1) of the Road Traffic Act 1988(**1**).

(**1**) 1988 c. 52.

APPENDIX

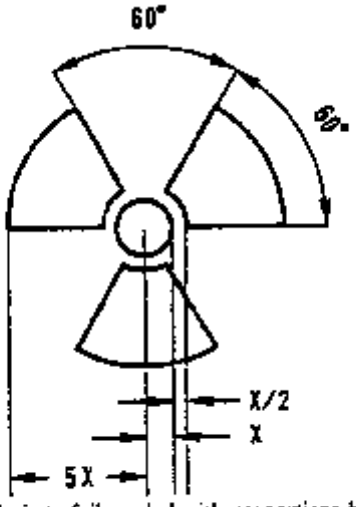


Fig. 1. Basic trefoil symbol with proportions based on a central circle of radius X. The minimum allowable size of X shall be 4 mm.

Figs. 2. - 6.
Figs. 2. - 6.

Fig. 2. Category I-WHITE label. The background colour of the label shall be white, the colour of the trefoil and the printing shall be black, and the colour of the category bar shall be red.

Fig. 3. Category II-YELLOW label. The background colour of the upper half of the label shall be yellow and of the lower half white, the colour of the trefoil and the printing shall be black, and the colour of the category bars shall be red.

Fig. 4. Category III-YELLOW label The background colour of the upper half of the label shall be yellow and of the lower half white, the colour of the trefoil and the printing shall be black, and the colour of the category bars shall be red.

Fig. 5. Placard. Minimum dimensions are given: when larger dimensions are used the relative proportions must be maintained. The figure "7" shall not be less than 25 mm high. The background colour of the upper half of the placard shall be yellow and the lower half white, the colour of the trefoil and the printing shall be black. The use of the word "RADIOACTIVE" in the bottom half is optional to allow the alternative use of this placard to display the appropriate United Nations Number for the consignment.

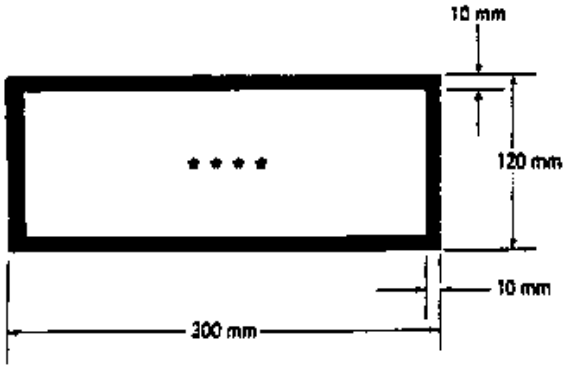


Fig. 6. Placard for separate display of the United Nations Number. The background colour of the placard shall be orange and the border and United Nations Number shall be black. The symbol "****" denotes the space in which the appropriate United Nations Number for radioactive material, as specified in Appendix I, shall be displayed.

SCHEDULE 19

Schedule 18, paragraph 5

Determination of categories

Packages and overpacks shall be assigned to either category I-WHITE, II-YELLOW or III-YELLOW in accordance with the conditions specified in Tables IX and X of Schedule 36, as applicable, and with the following requirements:

(a) For a package, both the Transport Index (TI) and the surface radiation level conditions shall be taken into account in determining which is the appropriate category. Where the Transport Index (TI) satisfies the condition for one category but the surface radiation level satisfies the condition for a different category, the package shall be assigned to the higher category of the two. For this purpose, category I-WHITE shall be regarded as the lowest category.

(b) The Transport Index (TI) shall be determined following the procedures specified in Schedule 17, and subject to the limitation of paragraph 14 of Schedule 2.

(c) If the Transport Index (TI) is greater than 10, the package or overpack shall be transported under exclusive use.

(d) If the surface radiation level is greater than 2 mSv/h, the package or overpack shall be transported under exclusive use and in accordance with the conditions prescribed in paragraph (a) of Schedule 32.

(e) A package transported under special arrangement shall be assigned to category III-YELLOW.

(f) An overpack which contains packages transported under special arrangement shall be assigned to category III-YELLOW.

SCHEDULE 20

Regulations 6 & 27(1)(a) & (2)

Contents of transport document

The transport document for a consignment shall include, in respect of each package included in the consignment, the following:

1. The document shall be headed with or shall contain a reference to the title of these Regulations.

2. The name of the consignor, and an address and telephone number by which he can be contacted in the event of an accident occuring to the consignment.

3. The name and address of the consignee.

4. The proper shipping name, as specified in Schedule 37.

5. The United Nations Class Number “7”.

6. The words “RADIOACTIVE MATERIAL” unless these words are contained in the proper shipping name.

7. The United Nations Number assigned to the material as specified in Schedule 37, the number is to be prefixed with the letters “UN”.

8. For LSA material, the group notation “LSA-I”, “LSA-II” or “LSA-III”, as appropriate.

9. For SCO, the group notation “SCO-I” or “SCO-II”, as appropriate.

10. The name or symbol of each radionuclide or, for mixtures of radionuclides, an appropriate general description or a list of the most restrictive nuclides.

11. A description of the physical and chemical form of the material, or a notation that the material is special form radioactive material. A generic chemical description is acceptable for chemical form.

12. The maximum activity of the radioactive contents during transport expressed in units of Bq. For fissile material, the total mass of fissible material in units of grams (g), or appropriate multiples thereof, may be used in place of activity.

13. The category of the package, i.e., I-WHITE, II-YELLOW, or III-YELLOW.

14. The Transport Index (TI) (categories II-YELLOW and III-YELLOW only).

15. All items and materials transported under the provisions for excepted packages (see Schedules 3, 4 and 5) shall be described in the transport document as "RADIOACTIVE MATERIAL, EXCEPTED PACKAGE," and shall include the proper shipping name of the substance or article being transported from the list of United Nations Numbers (see Schedule 37).

16. For a consignment of fissile material, where all of the packages in the consignment are excepted under Schedule 8, the words "FISSILE EXCEPTED".

17. The identification mark for each competent authority approval certificate (special form radioactive material, special arrangement, package design, or shipment) applicable to the consignment.

18. For consignments of packages in an overpack or freight container, a detailed statement of the contents of each package within the overpack or freight container and, where appropriate, of each overpack or freight container in the consignment. If packages are to be removed from the overpack or freight container at a point of intermediate unloading, appropriate transport documentation shall be made available.

19. Where a consignment is required to be shipped under exclusive use, the statement "EXCLUSIVE USE SHIPMENT".

20. A declaration signed and dated by the consignor in the following terms or in terms having an equivalent meaning:

> "I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked and labelled, and are in all respects in proper condition for transport by road according to the applicable international and national governmental regulations".

A facsimile signature is authorised.

No such declaration is required for any part of the consignment already covered by any international convention which requires a similar declaration as a condition of transport.

SCHEDULE 21

Regulation 27(1)

Contents of statement for the carrier

1. The statement shall specify the actions, if any, that are required to be taken by the carrier.

2. The statement shall be in the languages deemed necessary by the carrier or the competent authorities concerned, and shall include at least the following points:

(a) Supplementary operational requirements for loading, stowage, transport, handling, and unloading of the package, overpack, freight container or tank including any special stowage provisions for the safe dissipation of heat (see paragraph 2 of Schedule 33), or a statement that no such requirements are necessary;

(b) Restrictions on the mode of transport or conveyance and any necessary routing instructions;

(c) Emergency arrangements appropriate to the consignment.

SCHEDULE 22

Regulation 17(2)

Application for approval of design for special form radioactive material

An application for approval shall include the following:

1. A detailed description of the radioactive material or, if a capsule, the contents. Particular reference shall be made to both physical and chemical states.

2. A detailed statement of the design of any capsule to be used.

3. A statement of the tests which have been done and their results, or evidence based on calculative methods to show that the radioactive material is capable of meeting the performance standards, or other evidence that the special form radioactive material meets the applicable requirements of these Regulations.

4. Evidence of a quality assurance programme as required by regulation 24.

SCHEDULE 23

Regulation 2(1)

Competent authority identification marks

Each approval certificate issued by a competent authority shall be assigned an identification mark. The mark shall be of the following generalized type:

"VRI/Number/Type Code", where—

(a) VRI represents the international vehicle registration identification code of the state issuing the certificate.

(b) The number shall be assigned by the competent authority, and shall be unique and specific with regard to the particular design or shipment. The shipment approval identification mark shall be clearly related to the design approval identification mark.

(c) The following type codes shall be used to indicate the types of approval certificates issued:

AF	Type A package design for fissile material
B(U)	Type B(U) package design (B(U)F if for fissile material)
B(M)	Type B(M) package design (B(M)F if for fissile material)
IF	Industrial package design for fissile material
S	Special form radioactive material
T	Shipment
X	Special arrangement

(d) For package design approval certificates, other than those issued under the provisions of regulation 22, the symbols '−85' shall be added to the type code of the package design.

SCHEDULE 24

Regulation 18(2)

Application for package design approval certificate for fissile material

An application for a package design approval certificate for fissile material shall include the following:

1. All information necessary to satisfy the Secretary of State that the package design meets the requirements of Schedule 7 and Schedules 9, 11, or 12 and 13 or 14, as applicable, taking into account the nature, activity and form of the contents; and

2. Evidence of a quality assurance programme as required by regulation 24.

SCHEDULE 25

Regulation 19(2)

Application for package design approval certificate for a Type B(U) package

An application for a package design approval certificate for a Type B(U) package shall include the following:

1. A detailed description of the proposed radioactive contents with particular reference to their physical and chemical states and the nature of the radiation emitted.

2. A detailed statement of the design, including complete engineering drawings and schedules of materials and methods of construction to be used.

3. A statement of the tests which have been done and their results, or evidence based on calculative methods or other evidence that the design is adequate to meet the applicable requirements of these Regulations.

4. The proposed operating and maintenance instructions for the use of the packaging.

5. If the package is designed to have a maximum normal operating pressure in excess of 100 kPa gauge, the application for approval shall, in particular, state, in respect of the materials of construction of the containment system, the specifications, the samples to be taken, and the tests to be made.

6. Where the proposed radioactive contents are irradiated fuel, the applicant shall state and justify any assumption in the safety analysis relating to the characteristics of the fuel.

7. Any special stowage provisions necessary to ensure the safe dissipation of heat from the package; consideration shall be given to the various modes of transport to be used and type of conveyance or freight container.

8. A reproducible illustration not larger than 21 cm×30 cm showing the make-up of the package.

9. Evidence of a quality assurance programme as required by regulation 24.

10. Evidence of a suitable emergency plan.

SCHEDULE 26

Regulation 20(2)

Application for package design approval certificate for a Type B(M) package

An application for a package design approval certificate for a Type B(M) package design shall include the following:

1. The information required in Schedule 25 for Type B(U) packages.

2. A list of the specific requirements for Type B(U) packages specified in paragraph 1 of Schedule 13, with which the package does not conform.

3. Any proposed supplementary operational controls to be applied during transport not routinely provided for in these Regulations, but which are necessary to ensure the safety of the package or to compensate for the deficiencies listed in paragraph 2 above, such as human intervention for temperature or pressure measurements or for periodic venting, taking into account the possibility of unexpected delay.

4. A statement relative to any restrictions on the mode of transport and to any special loading, carriage, unloading or handling procedures.

5. The maximum and minimum ambient conditions (temperature, solar radiation) expected to be encountered during transport and which have been taken into account in the design.

6. Evidence of a suitable emergency plan.

SCHEDULE 27

Regulation 23(2)

Application for a shipment approval certificate

An application for a shipment approval certificate shall include:

1. The period of time, related to the shipment, for which the approval is sought.

2. The actual radioactive contents, the expected modes of transport and the type of conveyance.

3. The details of how the special precautions and special administrative or operational controls, referred to in the package design approval certificates issued under regulations 18, 19 and 20 are to be put into effect.

4. Evidence of a suitable emergency plan.

SCHEDULE 28

Regulation 15(3)

Application for a special arrangement approval certificate

An application for approval of a shipment under special arrangement shall include:

1. All the information necessary to satisfy the competent authority that the overall level of safety in transport is at least equivalent to that which would be provided if all the applicable requirements of these Regulations had been met.

2. A statement of the respects in which, and justification of why, the consignment cannot be made in full accordance with the applicable requirements.

3. A statement of any special precautions or special administrative or operational controls which are to be employed during transport to compensate for the failure to meet the applicable requirements.

4. Evidence of a suitable emergency plan.

SCHEDULE 29

Regulation 31(1)

Package inspection requirements before the first shipment

1. The containment system of any package whose design pressure exceeds 35 kPa gauge is to conform to the approved design requirements relating to the capability of that system to maintain its integrity under pressure.

2. For each Type B package and for each packaging containing fissile material, the effectiveness of its shielding and containment system, and, where necessary, the heat transfer characteristics, are to be within the limits applicable to or specified for the approved design.

3. For each package containing fissile material, where, in order to comply with the requirements of Schedule 7, neutron poisons are specifically included as components of the packaging, tests shall be performed to confirm the presence and distribution of those neutron poisons.

SCHEDULE 30

Regulation 31(2)

Package inspection requirements before any shipment

1. It must be ensured that lifting attachments which do not meet the requirements of paragraph 2 of Schedule 2 have been removed or otherwise rendered incapable of being used for lifting the package.

2. For each Type B package and for each packaging containing fissile material, it must be ensured that all the requirements specified in the approval certificates and the relevant provisions of these Regulations are to be satisfied.

3. Each Type B package shall be held until equilibrium conditions have been approached closely enough to demonstrate compliance with the shipment requirements for temperature and pressure unless an exemption from these requirements has received unilateral approval.

4. For each Type B package, it shall be ensured by examination and/or appropriate tests that all closures, valves, and other openings of the containment system through which the radioactive contents might escape are properly closed and, where appropriate, sealed in the manner for which the demonstrations of compliance with the requirements of paragraph 8 of Schedule 12 were made. In the case of a package where containment is provided by radioactive material in special form, compliance may be demonstrated by possession of a valid special form radioactive material approval certificate issued in accordance with regulation 17.

SCHEDULE 31

Regulation 33(2)

Notification of consignments to competent authorities

1. Notification required by regulation 33(2) shall be delivered to the competent authority prior to the commencement of the shipment, and at least 7 days before the commencement of the shipment.

2. The notification shall include:

(a) Sufficient information to identify the package including all applicable certificate numbers and identification marks;

(b) Information on the date of shipment, the expected data of arrival and proposed routing;

(c) The name of the radioactive material or nuclide;

(d) A description of the physical and chemical form of the radioactive material, or whether it is special form radioactive material;

(e) The maximum activity of the radioactive contents during transport expressed in units of Bq. For fissile material, the mass of fissile material in units of grams (g), or multiples thereof, may be used in place of activity.

3. Separate notification to the Secretary of State is not required of information specified in paragraph 2 which was included in the application for shipment approval under regulation 23(2).

SCHEDULE 32

Regulation 16

Radiation level limits for consignments under exclusive use

The radiation level for a consignment transported under exclusive use by a vehicle shall not exceed:

(a) 10 mSv/h at any point on the external surface of any package or overpack, and may only exceed 2 mSv/h provided that:

(i) the vehicle by which the consignment is transported is equipped with an enclosure which, during routine transport, prevents the access of unauthorised persons to the interior of the enclosure;

(ii) provisions are made to secure the package or overpack so that its position within the vehicle remains fixed during routine transport; and

(iii) there are no loading or unloading operations between the beginning and end of the shipment; and

(b) 2 mSv/h at any point on the outer surfaces of the vehicle, including the upper and lower surfaces, or in the case of an open vehicle, at any point on the vertical planes projected from the outer edges of the vehicle, on the upper surface of the load, and on the lower external surface of the vehicle; and

(c) 0.1 mSv/h at any point 2 metres from the vertical planes represented by the outer lateral surfaces of the vehicle, or, if the load is transported in an open vehicle, at any point 2 metres from the vertical planes projected from the outer edges of the vehicle.

SCHEDULE 33

Regulation 32(1)

Stowing for transport

1. Consignments shall be securely stowed.

2. During stowage, packages, overpacks, freight containers and tanks shall be sufficiently segregated from undeveloped photographic film.

3. In the case of undeveloped photographic film the basis for determining segregation distances shall be that the radiation exposure of undeveloped photographic film due to the transport of radioactive material be limited to 0.1 mSv per consignment of such film.

4. Provided that its average surface heat flux does not exceed 15 W/m^2 and that the immediately surrounding cargo is not in sacks or bags, a package or overpack may be carried among packaged general cargo without any special stowage provisions except as may be specifically required by the Secretary of State in an applicable approval certificate.

5. Except in the case of shipment under special arrangement, mixing of packages of different kinds of radioactive material, including fissile material, and mixing of different kinds of packages with different Transport Indexes (TI) is permitted without the specific approval of the Secretary of State. In the case of shipments under special arrangement, mixing shall not be permitted except as specifically authorised under the special arrangement.

SCHEDULE 34

Regulation 35

Storage in transit

1. During storage in transit packages, overpacks, freight containers and tanks shall be sufficiently segregated from:

(a) undeveloped photographic film; and

(b) other dangerous goods.

2. In the case of undeveloped photographic film the basis for determining segregation distances shall be that the radiation exposure of undeveloped photographic film due to the transport of radioactive material be limited to 0.1 mSv per consignment of such film.

3. In the case of other dangerous goods segregation shall comply with the [relevant UK transport regulations for dangerous goods].

4. The number of category II-YELLOW and category III-YELLOW packages, overpacks, tanks and freight containers containing fissile material stored in any one storage area, such as a transit area, terminal building, store-room or assembly yard, shall be so limited that the total sum of the Transport Indexes (TI) in any individual group of such packages, overpacks, tanks or freight containers does not exceed 50. Groups of such packages, overpacks, tanks and freight containers shall be stored so as to maintain a spacing of at least 6 metres from other groups of such packages, overpacks, tanks or freight containers.

5. Where the Transport Index (TI) of a single package, overpack, tank or freight container exceeds 50 or the total Transport Index (TI) on board a conveyance exceeds 50, storage shall be such as to maintain a spacing of at least 6 metres from other groups of packages, overpacks, tanks or freight containers or any other conveyance carrying radioactive material.

6. Paragraphs 4 and 5 do not apply to consignments in which the radioactive contents are LSA-I materials.

7. Except in the case of shipment under special arrangement, mixing of packages of different kinds of radioactive material, including fissile material, and mixing of different kinds of packages with different Transport Indexes (TI) is permitted without the specific approval of the Secretary of State. In the case of shipment under special arrangement, mixing shall not be permitted except as specifically authorised under the special arrangement.

SCHEDULE 35

Regulation 28(1)

Contents of regular consignment certificate

A regular consignment certificate shall include the following:

1. A statement that the certificate is a regular consignment certificate.

2. The issue date.

3. The information listed in Schedule 20 with the exception of paragraph 3 of that Schedule, relating to the package at the date the certificate is issued.

SCHEDULE 36

Regulations 2(3) & 21

TABLES

TABLE I

CALCULATION OF A_1 AND A_2 VALUES

Values of A_1 and A_2 for individual radionuclides

Symbol of radionuclide	Element and atomic number	A_1 TBq	A_2 TBq
^{225}Ac[(a)]	Actinium (89)	0.6	1×10^{-2}
^{227}Ac		40	2×10^{-5}
^{228}Ac		0.6	0.4
^{105}Ag	Silver (47)	2	2
$^{108}Ag^{m}$		0.6	0.6
$^{110}Ag^{m}$		0.4	0.4
^{111}Ag		0.6	0.5
^{26}Al	Aluminium (13)	0.4	0.4
^{241}Am	Americium (95)	2	2×10^{-4}
$^{242}Am^{m}$		2	2×10^{-4}
^{243}Am		2	2×10^{-4}
^{37}Ar	Argon (18)	40	40
^{39}Ar		20	20
^{41}Ar		0.6	0.6

(a) A1 and/or A2 value limited by daughter product decay.

(b) A1 and A2 are unlimited for radiation control purposes only. For nuclear criticality safety this material is subject to the controls placed on fissile material.

(c) These values do not apply to reprocessed uranium.

Symbol of radionuclide	Element and atomic number	A_1 TBq	A_2 TBq
^{42}Ar **(a)**		0.2	0.2
^{72}As	Arsenic (33)	0.2	0.2
^{73}As		40	40
^{74}As		1	0.5
^{76}As		0.2	0.2
^{77}As		20	0.5
^{211}At	Astatine (85)	30	2
^{193}Au	Gold (79)	6	6
^{194}Au		1	1
^{195}Au		10	10
^{196}Au		2	2
^{198}Au		3	0.5
^{199}Au		10	0.9
^{131}Ba	Barium (56)	2	2
$^{133}Ba^{m}$		10	0.9
^{133}Ba		3	3
^{140}Ba **(a)**		0.4	0.4
^{7}Be	Beryllium (4)	20	20
^{10}Be		20	0.5
^{205}Bi	Bismuth (83)	0.6	0.6
^{206}Bi		0.3	0.3
^{207}Bi		0.7	0.7
$^{210}Bi^{m}$ **(a)**		0.3	3×10^{-2}
^{210}Bi		0.6	0.5
^{212}Bi **(a)**		0.3	0.3
^{247}Bk	Berkelium (97)	2	2×10^{-4}
^{249}Bk		40	8×10^{-2}

(a) A1 and/or A2 value limited by daughter product decay.

(b) A1 and A2 are unlimited for radiation control purposes only. For nuclear criticality safety this material is subject to the controls placed on fissile material.

(c) These values do not apply to reprocessed uranium.

Symbol of radionuclide	Element and atomic number	A_1 TBq	A_2 TBq
^{76}Br	Bromine (35)	0.3	0.3
^{77}Br		3	3
^{82}Br		0.4	0.4
^{11}C	Carbon (6)	1	0.5
^{14}C		40	2
^{41}Ca	Calcium (20)	40	40
^{45}Ca		40	0.9
^{47}Ca		0.9	0.5
^{109}Cd	Cadmium (48)	40	1
$^{113}Cd^{m}$		20	9×10^{-2}
$^{115}Cd^{m}$		0.3	0.3
^{115}Cd		4	0.5
^{139}Ce	Cerium (58)	6	6
^{141}Ce		10	0.5
^{143}Ce		0.6	0.5
^{144}Ce **(a)**		0.2	0.2
^{248}Cf	Californium (98)	30	3×10^{-3}
^{249}Cf		2	2×10^{-4}
^{250}Cf		5	5×10^{-4}
^{251}Cf		2	2×10^{-4}
^{252}Cf		0.1	1×10^{-3}
^{253}Cf		40	6×10^{-2}
^{254}Cf		3×10^{-3}	6×10^{-4}
^{36}Cl	Chlorine (17)	20	0.5
^{38}Cl		0.2	0.2
^{240}Cm	Curium (96)	40	2×10^{-2}
^{241}Cm		2	0.9

(a) A1 and/or A2 value limited by daughter product decay.

(b) A1 and A2 are unlimited for radiation control purposes only. For nuclear criticality safety this material is subject to the controls placed on fissile material.

(c) These values do not apply to reprocessed uranium.

Symbol of radionuclide	Element and atomic number	A_1 TBq	A_2 TBq
^{242}Cm		40	1×10^{-2}
^{243}Cm		3	3×10^{-4}
^{244}Cm		4	4×10^{-4}
^{245}Cm		2	2×10^{-4}
^{246}Cm		2	2×10^{-4}
^{247}Cm		2	2×10^{-4}
^{248}Cm		4×10^{-2}	5×10^{-5}
^{55}Co	Cobalt (27)	0.5	0.5
^{56}Co		0.3	0.3
^{57}Co		8	8
$^{58}Co^{m}$		40	40
^{58}Co		1	1
^{60}Co		0.4	0.4
^{51}Cr	Chromium (24)	30	30
^{129}Cs	Caesium (55)	4	4
^{131}Cs		40	40
^{132}Cs		1	1
$^{134}Cs^{m}$		40	9
^{134}Cs		0.6	0.5
^{135}Cs		40	0.9
^{136}Cs		0.5	0.5
^{137}Cs[(a)]		2	0.5
^{64}Cu	Copper (29)	5	0.9
^{67}Cu		9	0.9
^{159}Dy	Dysprosium (66)	20	20
^{165}Dy		0.6	0.5
^{166}Dy[(a)]		0.3	0.3

(a) A1 and/or A2 value limited by daughter product decay.

(b) A1 and A2 are unlimited for radiation control purposes only. For nuclear criticality safety this material is subject to the controls placed on fissile material.

(c) These values do not apply to reprocessed uranium.

Symbol of radionuclide	Element and atomic number	A_1 TBq	A_2 TBq
^{169}Er	Erbium (68)	40	0.9
^{171}Er		0.6	0.5
^{147}Eu	Europium (63)	2	2
^{148}Eu		0.5	0.5
^{149}Eu		20	20
^{150}Eu		0.7	0.7
$^{152}Eu^{m}$		0.6	0.5
^{152}Eu		0.9	0.9
^{154}Eu		0.8	0.5
^{155}Eu		20	2
^{156}Eu		0.6	0.5
^{18}F	Fluorine (9)	1	0.5
^{52}Fe **(a)**	Iron (26)	0.2	0.2
^{55}Fe		40	40
^{59}Fe		0.8	0.8
^{60}Fe		40	0.2
^{67}Ga	Gallium (31)	6	6
^{68}Ga		0.3	0.3
^{72}Ga		0.4	0.4
^{146}Gd **(a)**	Gadolinium (64)	0.4	0.4
^{148}Gd		3	3×10^{-4}
^{153}Gd		10	5
^{159}Gd		4	0.5
^{68}Ge **(a)**	Germanium (32)	0.3	0.3
^{71}Ge		40	40
^{77}Ge		0.3	0.3
^{172}Hf **(a)**	Hafnium (72)	0.5	0.3

(a) A1 and/or A2 value limited by daughter product decay.

(b) A1 and A2 are unlimited for radiation control purposes only. For nuclear criticality safety this material is subject to the controls placed on fissile material.

(c) These values do not apply to reprocessed uranium.

Symbol of radionuclide	Element and atomic number	A_1 TBq	A_2 TBq
^{175}Hf		3	3
^{181}Hf		2	0.9
^{182}Hf		4	3×10^{-2}
^{194}Hg **(a)**	Mercury (80)	1	1
$^{195}Hg^{m}$		5	5
$^{197}Hg^{m}$		10	0.9
^{197}Hg		10	10
^{203}Hg		4	0.9
^{163}Ho	Holmium (67)	40	40
$^{166}Ho^{m}$		0.6	0.3
^{166}Ho		0.3	0.3
^{123}I	Iodine (53)	6	6
^{124}I		0.9	0.9
^{125}I		20	2
^{126}I		2	0.9
^{129}I		Unlimited	Unlimited
^{131}I		3	0.5
^{132}I		0.4	0.4
^{133}I		0.6	0.5
^{134}I		0.3	0.3
^{135}I		0.6	0.5
^{111}In	Indium (49)	2	2
$^{113}In^{m}$		4	4
$^{114}In^{m}$ **(a)**		0.3	0.3
$^{115}In^{m}$		6	0.9
^{189}Ir	Iridium (77)	10	10
^{190}Ir		0.7	0.7

(a) A1 and/or A2 value limited by daughter product decay.

(b) A1 and A2 are unlimited for radiation control purposes only. For nuclear criticality safety this material is subject to the controls placed on fissile material.

(c) These values do not apply to reprocessed uranium.

Symbol of radionuclide	Element and atomic number	A_1 TBq	A_2 TBq
^{192}Ir		1	0.5
$^{193}Ir^{m}$		10	10
^{194}Ir		0.2	0.2
^{40}K	Potassium (19)	0.6	0.6
^{42}K		0.2	0.2
^{43}K		1	0.5
^{81}Kr	Krypton (36)	40	40
$^{85}Kr^{m}$		6	6
^{85}Kr		20	10
^{87}Kr		0.2	0.2
^{137}La	Lanthanum (57)	40	2
^{140}La		0.4	0.4
	LSA	Low specific activity material (See definition in regulation 2)	
^{172}Lu	Lutetium (71)	0.5	0.5
^{173}Lu		8	8
$^{174}Lu^{m}$		20	8
^{174}Lu		8	4
^{177}Lu		30	0.9
	MFP	For Mixed Fission Products, use formula for mixtures or Table II	
^{28}Mg[(a)]	Magnesium (12)	0.2	0.2
^{52}Mn	Manganese (25)	0.3	0.3
^{53}Mn		Unlimited	Unlimited
^{54}Mn		1	1
^{56}Mn		0.2	0.2

(a) A1 and/or A2 value limited by daughter product decay.

(b) A1 and A2 are unlimited for radiation control purposes only. For nuclear criticality safety this material is subject to the controls placed on fissile material.

(c) These values do not apply to reprocessed uranium.

Symbol of radionuclide	Element and atomic number	A_1 TBq	A_2 TBq
^{93}Mo	Molybdenum (42)	40	7
^{99}Mo		0.6	0.5
^{13}N	Nitrogen (7)	0.6	0.5
^{22}Na	Sodium (11)	0.5	0.5
^{24}Na		0.2	0.2
$^{92}Nb^{m}$	Niobium (41)	0.7	0.7
$^{93}Nb^{m}$		40	6
^{94}Nb		0.6	0.6
^{95}Nb		1	1
^{97}Nb		0.6	0.5
^{147}Nd	Neodymium (60)	4	0.5
^{149}Nd		0.6	0.5
^{59}Ni	Nickel (28)	40	40
^{63}Ni		40	30
^{65}Ni		0.3	0.3
^{235}Np	Neptunium (93)	40	40
^{236}Np		7	1×10^{-3}
^{237}Np		2	2×10^{-4}
^{239}Np		6	0.5
^{185}Os	Osmium (76)	1	1
$^{191}Os^{m}$		40	40
^{191}Os		10	0.9
^{193}Os		0.6	0.5
^{194}Os[(a)]		0.2	0.2
^{32}P	Phosphorus (15)	0.3	0.3
^{33}P		40	0.9
^{230}Pa	Protactinium (91)	2	0.1

(a) A1 and/or A2 value limited by daughter product decay.

(b) A1 and A2 are unlimited for radiation control purposes only. For nuclear criticality safety this material is subject to the controls placed on fissile material.

(c) These values do not apply to reprocessed uranium.

Symbol of radionuclide	Element and atomic number	A_1 TBq	A_2 TBq
^{231}Pa		0.6	6×10^{-5}
^{233}Pa		5	0.9
^{201}Pb	Lead (82)	1	1
^{202}Pb		40	2
^{203}Pb		3	3
^{205}Pb		Unlimited	Unlimited
^{210}Pb[(a)]		0.6	9×10^{-3}
^{212}Pb[(a)]		0.3	0.3
^{103}Pd	Palladium (46)	40	40
^{107}Pd		Unlimited	Unlimited
^{109}Pd		0.6	0.5
^{143}Pm	Promethium (61)	3	3
^{144}Pm		0.6	0.6
^{145}Pm		30	7
^{147}Pm		40	0.9
$^{148}Pm^{m}$		0.5	0.5
^{149}Pm		0.6	0.5
^{151}Pm		3	0.5
^{208}Po	Polonium (84)	40	2×10^{-2}
^{209}Po		40	2×10^{-2}
^{210}Po		40	2×10^{-2}
^{142}Pr	Praseodymium (59)	0.2	0.2
^{143}Pr		4	0.5
^{188}Pt[(a)]	Platinum (78)	0.6	0.6
^{191}Pt		3	3
$^{193}Pt^{m}$		40	9
^{193}Pt		40	40

(a) A1 and/or A2 value limited by daughter product decay.

(b) A1 and A2 are unlimited for radiation control purposes only. For nuclear criticality safety this material is subject to the controls placed on fissile material.

(c) These values do not apply to reprocessed uranium.

Symbol of radionuclide	Element and atomic number	A_1 TBq	A_2 TBq
$^{195}Pt^{m}$		10	2
$^{197}Pt^{m}$		10	0.9
^{197}Pt		20	0.5
^{236}Pu	Plutonium (94)	7	7×10^{-4}
^{237}Pu		20	20
^{238}Pu		2	2×10^{-4}
^{239}Pu		2	2×10^{-4}
^{240}Pu		2	2×10^{-4}
^{241}Pu		40	1×10^{-2}
^{242}Pu		2	2×10^{-4}
^{244}Pu[(a)]		0.3	2×10^{-4}
^{223}Ra[(a)]	Radium (88)	0.6	3×10^{-2}
^{224}Ra[(a)]		0.3	6×10^{-2}
^{225}Ra[(a)]		0.6	2×10^{-2}
^{226}Ra[(a)]		0.3	2×10^{-2}
^{228}Ra[(a)]		0.6	4×10^{-2}
^{81}Rb	Rubidium (37)	2	0.9
^{83}Rb		2	2
^{84}Rb		1	0.9
^{86}Rb		0.3	0.3
^{87}Rb		Unlimited	Unlimited
Rb (natural)		Unlimited	Unlimited
^{183}Re	Rhenium (75)	5	5
$^{184}Re^{m}$		3	3
^{184}Re		1	1
^{186}Re		4	0.5
^{187}Re		Unlimited	Unlimited

(a) A1 and/or A2 value limited by daughter product decay.

(b) A1 and A2 are unlimited for radiation control purposes only. For nuclear criticality safety this material is subject to the controls placed on fissile material.

(c) These values do not apply to reprocessed uranium.

Symbol of radionuclide	Element and atomic number	A_1 TBq	A_2 TBq
^{188}Re		0.2	0.2
^{189}Re		4	0.5
Re (natural)		Unlimited	Unlimited
^{99}Rh	Rhodium (45)	2	2
^{101}Rh		4	4
$^{102}Rh^{m}$		2	0.9
^{102}Rh		0.5	0.5
$^{103}Rh^{m}$		40	40
^{105}Rh		10	0.9
^{222}Rn **(a)**	Radon (86)	0.2	4×10^{-3}
^{97}Ru	Ruthenium (44)	4	4
^{103}Ru		2	0.9
^{105}Ru		0.6	0.5
^{106}Ru **(a)**		0.2	0.2
^{35}S	Sulphur (16)	40	2
^{122}Sb	Antimony (51)	0.3	0.3
^{124}Sb		0.6	0.5
^{125}Sb		2	0.9
^{126}Sb		0.4	0.4
^{44}Sc	Scandium (21)	0.5	0.5
^{46}Sc		0.5	0.5
^{47}Sc		9	0.9
^{48}Sc		0.3	0.3
	SCO	Surface Contaminated Objects (see definition in regulation 2)	
^{75}Se	Selenium (34)	3	3
^{79}Se		40	2

(a) A1 and/or A2 value limited by daughter product decay.

(b) A1 and A2 are unlimited for radiation control purposes only. For nuclear criticality safety this material is subject to the controls placed on fissile material.

(c) These values do not apply to reprocessed uranium.

Symbol of radionuclide	Element and atomic number	A_1 TBq	A_2 TBq
^{31}Si	Silicon (14)	0.6	0.5
^{32}Si		40	0.2
^{145}Sm	Samarium (62)	20	20
^{147}Sm		Unlimited	Unlimited
^{151}Sm		40	4
^{153}Sm		4	0.5
^{113}Sn[(a)]	Tin (50)	4	4
$^{117}Sn^{m}$		6	2
$^{119}Sn^{m}$		40	40
$^{121}Sn^{m}$		40	0.9
^{123}Sn		0.6	0.5
^{125}Sn		0.2	0.2
^{126}Sn[(a)]		0.3	0.3
^{82}Sr[(a)]	Strontium (38)	0.2	0.2
$^{85}Sr^{m}$		5	5
^{85}Sr		2	2
$^{87}Sr^{m}$		3	3
^{89}Sr		0.6	0.5
^{90}Sr[(a)]		0.2	0.1
^{91}Sr		0.3	0.3
^{92}Sr[(a)]		0.8	0.5
T (all forms)	Tritium (1)	40	40
^{178}Ta	Tantalum (73)	1	1
^{179}Ta		30	30
^{182}Ta		0.8	0.5
^{157}Tb	Terbium (65)	40	10
^{158}Tb		1	0.7

(a) A1 and/or A2 value limited by daughter product decay.

(b) A1 and A2 are unlimited for radiation control purposes only. For nuclear criticality safety this material is subject to the controls placed on fissile material.

(c) These values do not apply to reprocessed uranium.

Symbol of radionuclide	Element and atomic number	A_1 TBq	A_2 TBq
^{160}Tb		0.9	0.5
$^{95}Tc^{m}$	Technetium (43)	2	2
$^{96}Tc^{m}s$ **(a)**		0.4	0.4
^{96}Tc		0.4	0.4
$^{97}Tc^{m}$		40	40
^{97}Tc		Unlimited	Unlimited
^{98}Tc		0.7	0.7
$^{99}Tc^{m}$		8	8
^{99}Tc		40	0.9
^{118}Te **(a)**	Tellurium (52)	0.2	0.2
$^{121}Te^{m}$		5	5
^{121}Te		2	2
$^{123}Te^{m}$		7	7
$^{125}Te^{m}$		30	9
$^{127}Te^{m}$ **(a)**		20	0.5
^{127}Te		20	0.5
$^{129}Te^{m}$ **(a)**		0.6	0.5
^{129}Te		0.6	0.5
$^{131}Te^{m}$		0.7	0.5
^{132}Te **(a)**		0.4	0.4
^{227}Th	Thorium (90)	9	1×10^{-2}
^{228}Th **(a)**		0.3	4×10^{-4}
^{229}Th		0.3	3×10^{-5}
^{230}Th		2	2×10^{-4}
^{231}Th		40	0.9
^{232}Th		Unlimited	Unlimited
^{234}Th **(a)**		0.2	0.2

(a) A1 and/or A2 value limited by daughter product decay.

(b) A1 and A2 are unlimited for radiation control purposes only. For nuclear criticality safety this material is subject to the controls placed on fissile material.

(c) These values do not apply to reprocessed uranium.

Symbol of radionuclide	Element and atomic number	A_1 TBq	A_2 TBq
Th (natural)		Unlimited	Unlimited
^{44}Ti[(a)]	Titanium (22)	0.5	0.2
^{200}Tl	Thallium (81)	0.8	0.8
^{201}Tl		10	10
^{202}Tl		2	2
^{204}Tl		4	0.5
^{167}Tm	Thulium (69)	7	7
^{168}Tm		0.8	0.8
^{170}Tm		4	0.5
^{171}Tm		40	10
^{230}U	Uranium (92)	40	1×10^{-2}
^{232}U		3	3×10^{-4}
^{233}U		10	1×10^{-3}
^{234}U		10	1×10^{-3}
^{235}U		Unlimited[(b)]	Unlimited[(b)]
^{236}U		10	1×10^{-3}
^{238}U		Unlimited	Unlimited
U (natural		Unlimited	Unlimited[(c)]
U (enriched 5% or less)		Unlimited[(b)]	Unlimited[(b)(c)]
U (enriched more than 5%)		10	1×10^{-3}[(c)]
U (depleted)		Unlimited	Unlimited[(c)]
^{48}V	Vanadium (23)	0.3	0.3
^{49}V		40	40
^{178}W[(a)]	Tungsten (74)	1	1
^{181}W		30	30
^{185}W		40	0.9

(a) A1 and/or A2 value limited by daughter product decay.

(b) A1 and A2 are unlimited for radiation control purposes only. For nuclear criticality safety this material is subject to the controls placed on fissile material.

(c) These values do not apply to reprocessed uranium.

Symbol of radionuclide	Element and atomic number	A_1 TBq	A_2 TBq
^{187}W		2	0.5
^{188}W **(a)**		0.2	0.2
^{122}Xe **(a)**	Xenon (54)	0.2	0.2
^{123}Xe		0.2	0.2
^{127}Xe		4	4
$^{131}Xe^{m}$		40	40
^{133}Xe		20	20
^{135}Xe		4	4
^{87}Y	Yttrium (39)	2	2
^{88}Y		0.4	0.4
^{90}Y		0.2	0.2
$^{91}Y^{m}$		2	2
^{91}Y		0.3	0.3
^{92}Y		0.2	0.2
^{93}Y		0.2	0.2
^{169}Yb	Ytterbium, (70)	3	3
^{175}Yb		30	0.9
^{65}Zn	Zinc (30)	2	2
$^{69}Zn^{m}$ **(a)**		2	0.5
^{69}Zn		4	0.5
^{88}Zr	Zirconium (40)	3	3
^{93}Zr		40	0.2
^{95}Zr		1	0.9
^{97}Zr		0.3	0.3

(a) A1 and/or A2 value limited by daughter product decay.

(b) A1 and A2 are unlimited for radiation control purposes only. For nuclear criticality safety this material is subject to the controls placed on fissile material.

(c) These values do not apply to reprocessed uranium.

TABLE II

GENERAL VALUES FOR A_1 AND A_2

Contents	A_1 TBq	A_2 TBq
Only beta or gamma emitting nuclides are known to be present	0.2	0.02
Alpha emitting nuclides are known to be present or no relevant data are available	0.1	2×10^{-5}

TABLE III

LIMITS OF NON-FIXED CONTAMINATION ON SURFACES

Type of package, overpack, freight container, tank or conveyance and its equipment	Contaminant	
	Applicable limit[(a)] of beta and gamma emitters and low toxicity alpha emitters Bq/cm^2	Applicable limit[(a)] of all other alpha emitters Bq/cm^2
External surfaces of:		
excepted packages	0.4	0.04
packages other than excepted packages	4	0.4
External and internal surfaces of overpacks, freight containers, and conveyances and their equipment, when used in or when being prepared for, the carriage of:		
—loads consisting only of radioactive material in packages other than excepted packages	4	0.4
—loads including excepted packages and/or non-radioactive consignments	0.4	0.04
External surfaces of freight containers, tanks and conveyances and their equipment, used in the carriage	4	0.4

(a) The limits are applicable when averaged over any area of 300 cm^2 of any part of the surface.

Type of package, overpack, freight container, tank or conveyance and its equipment	Contaminant	
	Applicable limit[(a)] of beta and gamma emitters and low toxicity alpha emitters Bq/cm^2	Applicable limit[(a)] of all other alpha emitters Bq/cm^2
of unpacked radioactive material		

(a) The limits are applicable when averaged over any area of 300 cm^2 of any part of the surface.

TABLE IV

ACTIVITY LIMITS FOR EXCEPTED PACKAGES

	Physical state of contents	Instruments and articles	
		Item limits[(a)]	Package limits[(a)] Materials Package limits[(a)]
Solids:			
special form	10^{-2} A_1	A_1	10^{-3} A_1
other forms	10^{-2} A_2	A_2	10^{-3} A_2
Liquids:	10^{-3} A_2	10^{-1} A_2	10^{-4} A_2
Gases:			
tritium	2×10^{-2} A_2	2×10^{-1} A_2	2×10^{-2} A_2
special form	10^{-3} A_1	10^{-2} A_1	10^{-3} A_1
other forms	10^{-3} A_2	10^{-2} A_2	10^{-3} A_2

(a) For mixtures of radionuclides, see paragraphs 4–6 of Schedule 1.

TABLE V

INDUSTRIAL PACKAGE REQUIREMENTS FOR LSA MATERIAL AND SCO

Contents	Industrial package type Exclusive use	Not under exclusive use
LSA-I[(a)]		
Solid	IP-1	IP-1
Liquid	IP-1	IP-2
LSA-II		

(a) Under the conditions specified in paragraph 3 of Schedule 10, LSA-I material and SCO-I may be transported unpackaged.

Contents	Industrial package type Exclusive use	Not under exclusive use
Solid	IP-2	IP-2
Liquid and gas	IP-2	IP-3
LSA-III	IP-2	IP-3
SCO-I[(a)]	IP-1	IP-1
SCO-II	IP-2	IP-2

(a) Under the conditions specified in paragraph 3 of Schedule 10, LSA-I material and SCO-I may be transported unpackaged.

TABLE VI

CONVEYANCE ACTIVITY LIMITS FOR LSA MATERIAL AND SCO IN INDUSTRIAL PACKAGES OR UNPACKED

Nature of material	Activity limit for conveyances
LSA-I	No limit
LSA-II and LSA-III non-combustible solids	No limit
LSA-II and LSA-III combustible solids, and all liquids and gases	$100 \times A_2$
SCO	$100 \times A_2$

TABLE VII

MULTIPLICATION FACTORS FOR LARGE DIMENSION LOADS

Size of load[(a)]	Multiplication factor
size of load $\leq 1\ m^2$	1
$1\ m^2 <$ size of load $\leq 5\ m^2$	2
$5\ m^2 <$ size of load $\leq 20\ m^2$	3
$20\ m^2 <$ size of load	10

(a) Largest cross-sectional area of the load being measured.

TABLE VIII

DETERMINATION OF TRANSPORT INDEX (T)

Item	Contents	Method of determining Transport Index (TI)
Packages	Non-fissile material	TI for radiation exposure control
	Fissile material	The larger of the TI for radiation exposure control or

Item	Contents	Method of determining Transport Index (TI)
		the TI for nuclear criticality control
Non-rigid overpacks	Packages	Sum of TI's of all packages contained
Rigid overpacks	Packages	The sum of the TI's of all packages contained, or for the original consignor, either the TI for radiation exposure control or the sum of the TI's of all packages
Freight containers	Packages or overpacks	Sum of the TI's of all packages and overpacks contained
	LSA material or SCO	Either the sum of the TI's or the larger of the TI for radiation exposure control or the TI for nuclear criticality control
Freight containers under exclusive use	Packages or overpacks	Either the sum of the TI's or the larger of the TI for radiation exposure control or the TI for nuclear criticality control
Tanks	Non-fissile material	TI for radiation exposure control
	Fissile material	The larger of the TI for radiation exposure control or the TI for nuclear criticality control
Unpackaged	LSA-I and SCO-I	The TI for radiation exposure control

TABLE IX

CATEGORIES OF PACKAGES

Conditions Transport index	Maximum radiation level at any point on external surface	Category
0[(a)]	Not more than 0.005 mSv/h	I-WHITE
More than 0 but not more than 1[(a)]	More than 0.005 mSv/h but not more than 0.5 mSv/h	II-YELLOW

(a) If the measured TI is not greater than 0.05, the value quoted may be zero in accordance with paragraph 1(c) of Schedule 17.

Conditions Transport index	Maximum radiation level at any point on external surface	Category
More than 1 but not more than 10	More than 0.5 mSv/h but not more than 2 mSv/h	III-YELLOW
More than 10	More than 2 mSv/h but not more than 10 mSv/h	III-YELLOW and also under exclusive use

(a) If the measured TI is not greater than 0.05, the value quoted may be zero in accordance with paragraph 1(c) of Schedule 17.

TABLE X

CATEGORIES OF OVERPACKS INCLUDING FREIGHT CONTAINERS WHEN USED AS OVERPACKS

Transport Index (TI)	Category
0	I-WHITE
TI greater than 0 but less than or equal to 1	II-YELLOW
TI greater than 1	III-YELLOW

TABLE XI

INSOLATION DATA

Form and location of surface	Insolation in W/m^2 for 12 hours per day
Flat surfaces transported horizontally:	
—base	none
—other surfaces	800
Flat surfaces not transported horizontally:	
—each surface	200[(a)]
Curved surfaces	400[(a)]

(a) Alternatively, a sine function may be used, with an absorption coefficient adopted and the effects of possible reflection from neighbouring objects neglected.

TABLE XII

LIMITATIONS ON HOMOGENEOUS HYDROGENOUS SOLUTIONS OR MIXTURES OF FISSILE MATERIAL

Parameters	Uranium-235 only	Any other fissile material (including mixtures)
Minimum H/X[(a)]	5200	5200

(a) Where H/X is the ratio of the number of hydrogen atoms to the number of atoms of fissile nuclide.

(b) With a total plutonium and uranium-233 content of not more than 1% of the mass of uranium-235.

Parameters	Uranium-235 only	Any other fissile material (including mixtures)
Maximum concentration of fissile material (g/L)	5	5
Maximum mass of fissile material in a package or conveyance (g)	800[(b)]	500

(a) Where H/X is the ratio of the number of hydrogen atoms to the number of atoms of fissile nuclide.

(b) With a total plutonium and uranium-233 content of not more than 1% of the mass of uranium-235.

TABLE XIII

FREE-DROP DISTANCE FOR TESTING PACKAGES
TO NORMAL CONDITIONS OF TRANSPORT

Package mass (kg)	Free-drop distance (m)
package mass<5,000	1.2
5,000≤package mass<10,000	0.9
10,000≤package mass<15,000	0.6
15,000≤package mass	0.3

SCHEDULE 37

Schedules 18 & 20

EXCERPTS FROM LIST OF UNITED NATIONS NUMBERS, PROPER SHIPPING NAME AND DESCRIPTION AND SUBSIDIARY RISKS

Number	Name and description	Subsidiary risks
2910	RADIOACTIVE MATERIAL, EXCEPTED PACKAGE, — INSTRUMENTS OR ARTICLES, — LIMITED QUANTITY OF MATERIAL, —ARTICLES MANUFACTURED FROM NATURAL URANIUM OR DEPLETED URANIUM OR NATURAL THORIUM, — EMPTY PACKAGING	
2912	RADIOACTIVE MATERIAL, LOW SPECIFIC ACTIVITY (LSA), NOS[(a)]	
2913	RADIOACTIVE MATERIAL, SURFACE CONTAMINATED OBJECTS (SCO)	

(a) NOS=not otherwise specified.

Number	Name and description	Subsidiary risks
2918	RADIOACTIVE MATERIAL, FISSILE, NOS[(a)]	
2974	RADIOACTIVE MATERIAL, SPECIAL FORM, NOS[(a)]	
2975	THORIUM METAL, PYROPHORIC	Liable to spontaneous combustion
2976	THORIUM NITRATE, SOLID	Oxidising substance
2977	URANIUM HEXAFLUORIDE, FISSILE containing more than 1.0 per cent uranium-235	Corrosive
2978	URANIUM HEXAFLUORIDE, fissile excepted or non-fissile	Corrosive
2979	URANIUM METAL, PYROPHORIC	Liable to spontaneous combustion
2980	URANYL NITRATE HEXAHYDRATE SOLUTION	Corrosive
2981	URANYL NITRADE, SOLID	Oxidising substance
2982	RADIOACTIVE MATERIAL, NOS[(a)]	

(a) NOS=not otherwise specified.