

**COMMITTEE OF EXPERTS ON THE TRANSPORT OF
DANGEROUS GOODS AND ON THE GLOBALLY
HARMONIZED SYSTEM OF CLASSIFICATION
AND LABELLING OF CHEMICALS**

Sub-Committee of Experts on the
Transport of Dangerous Goods

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**HARMONIZATION WITH THE INTERNATIONAL ATOMIC ENERGY AGENCY (IAEA)
REGULATIONS FOR THE SAFE TRANSPORT OF RADIOACTIVE MATERIAL**

Amendments to the 2005 edition of the IAEA regulations for the Safe Transport
of Radioactive Material.

Note by the secretariat

Attached is the list of changes to the 2005 version of the IAEA Regulations (still subject to endorsement by the IAEA Board of Governors in September 2008)

The secretariat will prepare the corresponding list of changes to the 15th revised edition of the UN Recommendations on the Transport of Dangerous Goods, Model Regulations, for the next session.

The 2009 Edition of the Agency's Regulations for the Safe Transport of Radioactive Material

Summary

The purpose of this document is to obtain the Board's approval of the 2009 Edition of the Regulations for the Safe Transport of Radioactive Material (the Transport Regulations) with the changes to the 2005 Edition that are presented in Annex 1, which have been approved by the Safety Standards Committees (TRANSSC, NUSSC, RASSC and WASSC) and endorsed by the Commission on Safety Standards (CSS).

Recommended Action

It is recommended that the Board approve the 2009 Edition of the Transport Regulations with the changes to the 2005 Edition that are presented in Annex 1 and authorize the Director General to promulgate the 2009 Edition as part of the Agency's safety standards.

Background

Transport Regulations are issued by the Agency pursuant to its statutory function to establish standards of safety and pursuant to a resolution in which the United Nations Economic and Social Council (ECOSOC) expressed the desire that the Agency be entrusted with the drafting of recommendations on the transport of radioactive substances within the general principles of the United Nations Committee of Experts on the Transport of Dangerous Goods and in consultation with the specialized agencies concerned.¹ They serve as the basis for part of the United Nations Recommendations on the Transport of Dangerous Goods: Model Regulations (the UN Model Regulations)², which in turn serve as the basis for the international 'modal' regulations for transport – i.e. the regulations covering specific 'modes' of transport that are issued by international organizations such as the International Civil Aviation Organization (ICAO), the International Maritime Organization (IMO), the United Nations Economic Commission for Europe (the Orange Book) and the Universal Postal Union. Since the Transport Regulations were first published, in 1961, revised editions have been published in 1964, 1967, 1973, 1985, 1996, 2000, 2003 and 2005.

The Board approved changes to the 2005 Edition of the Transport Regulations in June 2004. Subsequently, the Director General issued the Regulations for the Safe Transport of Radioactive Material, incorporating the changes. The requirements of the 2005 Edition have been incorporated into the current UN Model Regulations and are subsequently incorporated into the international 'modal' regulations for transport.

The Secretariat is now submitting to the Board the changes to the 2005 that were endorsed by the CSS in June 2008. If they are approved by the Board, a 2009 Edition of the Transport Regulations incorporating them will be issued. The United Nations Committee of Experts on the Transport of Dangerous Goods will be informed of the Board's decision at its December 2008 meeting, in time for the requirements of the 2009 Edition to be incorporated into the next edition of the UN Model Regulations. Changes to the 2005 Edition of the Transport Regulations as approved by the Safety Standards Committees and endorsed by CSS, are presented in the following pages. These changes are mostly related to the harmonization process with the UN Recommendations on the Transport of Dangerous Goods – Model Regulations.

¹ ECOSOC resolution 724 (XXVIII).C.3(g).

² The UN Model Regulations cover the transport of nine classes of dangerous goods; Class 1 - explosives; Class 2 - gases; Class 3 - flammable liquids; Class 4 - flammable solids; substances liable to spontaneous combustion; substances which, on contact with water, emit flammable gases; ; Class 5 - oxidizing substances and organic peroxides; Class 6 - toxic and infectious substances; Class 7 - radioactive material; Class 8 - corrosive substances; Class 9 - miscellaneous dangerous substances and articles.

Notes by the Secretariat:

1) A number of paragraphs were introduced for Sections I, II, III IV and V. Therefore, existing paragraphs on these sections had to be renumbered, as shown on the tables below.

Changed para	Orig. No.	New No.	Changed para	Orig. No.	New No.
109 i	109	110	517-520d	521-527	516-522
	110	111	528 d	529-548	523-542
243 i	243-248	244-249	549 d 543 i	550-553	544-547
314 i	314	315	554-555 d 548-551 i	556-583	552-579
505 d	506-516	505-515			

2) A number of paragraphs were moved from section II, V and VI into the Section IV. Those paragraphs are shown below.

Orig. No.	New No.	Orig. No.	New No.	Orig. No.	New No.	Orig. No.	New No.	Orig. No.	New No.	Orig. No.	New No.	Orig. No.	New No.	Orig. No.	New No.	Orig. No.	New No.	
none	401	404	405	409	426	none	416	412	410	413	428	416	433	none	422	none	427	
401	402	405	406	411	411	672	417	none	412	414	429	417	434	517+410	423		none	430
402	403	406	407		414	408	408	241	413	415	431	none	419	518+410	424			none
403	404	407	421	none	415	226	409	418	418		432	419	420	520	425	none	none	

3) Table 10 is a new table and table 1 is former table 8. Therefore tables had to be renumbered as shown below

Old table number	New table number	Old table number	New table number	Old table number	New table number	Old table number	New table number
Table 1	Table 2	Table 5	Table 7	Table 9	Table 11	Table 13	Table 14
Table 2	Table 3	Table 6	Table 8	Table 10	Table 12	None	Table 10
Table 3	Table 5	Table 7	Table 9	Table 11	Table 13		
Table 4	Table 6	Table 8	Table 1	Table 12	Table 4		

4) Part of paragraph 226 became new paragraph 409

5) Text removed from regulations appears in LIGHT-GRAY and strikethrough

6) Amendments to the original text appear in BOLD

7) In TABLE 2 the information related to Krypton 79 is a new entry.

8) From para 629 to 632, reference number [10] for ISO 7195 is replaced by [12].

9) There are few items marked in red for which your special attention is requested

TABLE OF CHANGES
2005 X 2009 Edition of TS-R-1

	2005 edition as published	2009 edition
	Section I INTRODUCTION	
101	<p>101. These Regulations establish standards of safety which provide an acceptable level of control of the radiation, criticality and thermal hazards to persons, property and the environment that are associated with the transport of radioactive material. These Regulations utilize the principles set forth in both the “Radiation Protection and the Safety of Radiation Sources”, Safety Series No. 120 [1] and the “International Basic Safety Standards for Protection against Ionizing Radiation and for the Safety of Radiation Sources”, Safety Series No. 115 [2], jointly sponsored by the Food and Agriculture Organization of the United Nations, the IAEA, the International Labour Organization, the OECD Nuclear Energy Agency, the Pan American Health Organization and the World Health Organization. Thus, compliance with these Regulations is deemed to satisfy the principles of the Basic Safety Standards in respect of transport.</p>	<p>101. These Regulations establish standards of safety which provide an acceptable level of control of the radiation, criticality and thermal hazards to persons, property and the environment that are associated with the transport of <i>radioactive material</i>. These Regulations utilize are based on the principles set forth in both the “Radiation Protection and the Safety of Radiation Sources”, Principles”, IAEA Safety Series Fundamentals No. 120 [1], jointly sponsored by the European Atomic Energy Community, the International Labour Organization, the International Maritime Organization, the OECD Nuclear Energy Agency, the Pan American Health Organization and the World Health Organization and the “International Basic Safety Standards for Protection against Ionizing Radiation and for the Safety of Radiation Sources”, Safety Series No. 115 [2], jointly sponsored by the Food and Agriculture Organization of the United Nations, the IAEA, the International Labour Organization, the OECD Nuclear Energy Agency, the Pan American Health Organization and the World Health Organization. Thus, compliance with these Regulations is deemed to satisfy the principles of the Basic Safety Standards in respect of transport.</p>
102	<p>This Safety Standard is supplemented by a hierarchy of Safety Guides including “Advisory Material for the IAEA Regulations for the Safe Transport of Radioactive Material (1996 Edition)”, IAEA Safety Standards Series No. TS-G-1.1 (ST-2) [3], “Planning and Preparing for Emergency Response to Transport Accidents</p>	<p>102. This Safety Standard is supplemented by a hierarchy of Safety Guides including “Advisory Material for the IAEA Regulations for the Safe Transport of Radioactive Material (1996 Edition)”, IAEA Safety Standards Series No. TS-G-1.1 (ST-2 2007 Edition) [3],</p>

	2005 edition as published	2009 edition
	Involving Radioactive Material”, IAEA Safety Standards Series No. TS-G-1.2 (ST-3) [4], “Compliance Assurance for the Safe Transport of Radioactive Material”, IAEA Safety Standards Series No. TS-G-1.4 [5] and “Quality Assurance for the Safe Transport of Radioactive Material”, IAEA Safety Standards Series No. TS-G-1.3 [6].	“Planning and Preparing for Emergency Response to Transport Accidents Involving Radioactive Material”, IAEA Safety Standards Series No. TS-G-1.2 (ST-3) [4], “Compliance Assurance for the Safe Transport of Radioactive Material”, IAEA Safety Standards Series No. TS-G-1.45 [5] (Currently DS 327), “ Quality Assurance Management System for the Safe Transport of Radioactive Material”, IAEA Safety Standards Series No. TS-G-1.34 [6], and “ Radiation Protection Programmes for the Transport of Radioactive Material ”, IAEA Safety Standards Series No TS-G-1.3 [6].
105	105. In the transport of radioactive material the safety of persons, who are either members of the public or workers, is assured when these Regulations are complied with. Confidence in this regard is achieved through quality assurance and compliance assurance programmes.	105. In the transport of <i>radioactive material</i> the safety of persons, who are either members of the public or workers, and protection of property and the environment is assured when these Regulations are complied with. Confidence in this regard is achieved through quality assurance and <i>compliance assurance</i> programmes
106	106. These Regulations apply to the transport of radioactive material by all modes on land, water or in the air, including transport which is incidental to the use of the radioactive material. Transport comprises all operations and conditions associated with and involved in the movement of radioactive material; these include the design, manufacture, maintenance and repair of packaging, and the preparation, consigning, loading, carriage including in-transit storage, unloading and receipt at the final destination of loads of radioactive material and packages. A graded approach is applied to the performance standards in these Regulations that is characterized by three general severity levels:	106. These Regulations apply to the transport of <i>radioactive material</i> by all modes on land, water or in the air, including transport which is incidental to the use of the <i>radioactive material</i> . Transport comprises all operations and conditions associated with and involved in the movement of <i>radioactive material</i> ; these include the <i>design</i> , manufacture, maintenance and repair of <i>packaging</i> , and the preparation, consigning, loading, carriage including in-transit storage, unloading and receipt at the final destination of loads of <i>radioactive material</i> and <i>packages</i> . A graded approach is applied to the performance standards in these Regulations that is are characterized by three general severity levels:
107	107. The Regulations do not apply to	107. The These Regulations do not apply to

	2005 edition as published	2009 edition
107 (e)	(e) natural material and ores containing naturally occurring radionuclides that are either in their natural state, or have been processed only for purposes other than for the extraction of the radionuclides, and that are not intended to be processed for use of these radionuclides, provided that the activity concentration of the material does not exceed 10 times the values specified in para. 401(b), or calculated in accordance with paras 402–406;	(e) natural material and ores containing naturally-occurring radionuclides that which are either in their natural state, or have only been processed only for purposes other than for the extraction of the radionuclides, and that which are not intended to be processed for use of these radionuclides, provided that the activity concentration of the material does not exceed 10 times the values specified in para. 402 401 (b), or calculated in accordance with paras 403 402 – 407 406 ;
109	None	109. Measures should be taken to ensure that radioactive material is kept secure in transport so as to prevent theft, or damage and to ensure that control of the material is not relinquished inappropriately.
109	109. For <i>radioactive material</i> having subsidiary risks, and for transport of <i>radioactive material</i> with other dangerous goods, the relevant transport regulations for dangerous goods of each of the countries through or into which the material is to be transported shall apply in addition to these Regulations.	109 110 . For <i>radioactive material</i> having subsidiary risks, and for transport of <i>radioactive material</i> with other dangerous goods, the relevant transport regulations for dangerous goods of each of the countries through or into which the material is to be transported shall apply in addition to these Regulations.
203	203. Passenger aircraft shall mean an aircraft that carries any person other than a crew member, a carrier’s employee in an official capacity, an authorized representative of an appropriate national authority, or a person accompanying a consignment.	203. <i>Passenger aircraft</i> shall mean an aircraft that carries any person other than a crew member, a <i>carrier’s</i> employee in an official capacity, an authorized representative of an appropriate national authority, or a person accompanying a <i>consignment</i> or other cargo.
204	204. Multilateral approval shall mean approval by the relevant competent authority of the country of origin of the design or shipment, as applicable, and also, where the consignment is to be transported through or into any other country, approval by the competent authority of that country. The term “through or into” specifically excludes “over”, i.e. the approval and notification requirements shall not apply to a country over which radioactive material is carried in an aircraft, provided that there is no scheduled	204. <i>Multilateral approval</i> shall mean approval by the relevant <i>competent authority</i> of the country of origin of the <i>design</i> or <i>shipment</i> , as applicable, and also, where the <i>consignment</i> is to be transported <i>through or into</i> any other country, approval by the <i>competent authority</i> of that country. The term “through or into” specifically excludes “over”, i.e. the approval and notification requirements shall not apply to a country over which radioactive material is carried in an aircraft, provided that there is no scheduled

	2005 edition as published	2009 edition
	stop in that country.	stop in that country.
207	207. Competent authority shall mean any national or international regulatory body or authority designated or otherwise recognized as such for any purpose in connection with these Regulations.	207. <i>Competent authority</i> shall mean any national or international regulatory body or authority designated or otherwise recognized as such for any purpose in connection with these Regulations.
210	210. Consignee shall mean any person, organization or government which receives a consignment.	210. <i>Consignee</i> shall mean any person, organization or government which receives is entitled to take delivery of a consignment.
222 sub title	Fissile material	<i>Fissile Nuclide and Fissile Material</i>
222	222. Fissile material shall mean uranium-233, uranium-235, plutonium-239, plutonium-241, or any combination of these radionuclides. Excepted from this definition is:	222. <i>Fissile nuclides</i> shall mean uranium-233, uranium-235, plutonium-239 and plutonium-241, or any combination of these radionuclides. Fissile material shall mean a material containing any of the fissile nuclides. Excluded from this the definition of fissile material is:
223	223. Freight container shall mean an article of transport equipment designed to facilitate the transport of goods, either packaged or unpackaged, by one or more modes of transport without intermediate reloading which is of a permanent enclosed character, rigid and strong enough for repeated use, and must be fitted with devices facilitating its handling, particularly in transfer between conveyances and from one mode of transport to another. A small freight container is that which has either any overall outer dimension less than 1.5 m, or an internal volume of not more than 3 m ³ . Any other freight container is considered to be a large freight container.	223. <i>Freight container</i> shall mean an article of transport equipment that designed to facilitate the transport of goods, either packaged or unpackaged, by one or more modes of transport without intermediate reloading which is of a permanent enclosed character, rigid and strong enough for repeated use, and must be fitted with devices facilitating its handling, particularly in transfer between <i>conveyances</i> and from one mode of transport to another. A small <i>freight container</i> is that which has either any overall outer dimension less than 1.5 m, or an internal volume of not more than 3 m ³ . Any other <i>freight container</i> is considered to be a large <i>freight container</i>
224 (b)	(b) is designed for mechanical handling, (c) is resistant to the stresses produced in handling and transport, as determined by performance tests, and	(b) is designed for mechanical handling, and (c) is resistant to the stresses produced in handling and transport, as determined by performance tests, and

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	(d) is designed to conform to the standards in the chapter on Recommendations on Intermediate Bulk Containers (IBCs) of the United Nations Recommendations on the Transport of Dangerous Goods [7].	(d) is designed to conform to the standards in the chapter on Recommendations on Intermediate Bulk Containers (IBCs) of the United Nations Recommendations on the Transport of Dangerous Goods [7].
226	<p>226. Low specific activity (LSA) material shall mean radioactive material which by its nature has a limited specific activity, or radioactive material for which limits of estimated average specific activity apply. External shielding materials surrounding the LSA material shall not be considered in determining the estimated average specific activity. LSA material shall be in one of three groups:</p> <p>(a) LSA-I</p> <p>(i) Uranium and thorium ores and concentrates of such ores, and other ores containing naturally occurring radionuclides which are intended to be processed for the use of these radionuclides;</p> <p>(ii) Natural uranium, depleted uranium, natural thorium or their compounds or mixtures, providing they are unirradiated and in solid or liquid form;</p> <p>(iii) Radioactive material for which the A2 value is unlimited, excluding fissile material in quantities not excepted under para. 672; or</p> <p>(iv) Other radioactive material in which the activity is distributed throughout and the estimated average specific activity does not exceed 30 times the values for activity concentration specified in paras 401–406, excluding fissile material in quantities not excepted under para. 672.</p> <p>(b) LSA-II</p> <p>(i) Water with tritium concentration up to 0.8 TBq/L; or</p> <p>(ii) Other material in which the activity is distributed throughout and the estimated average specific activity does not exceed 10–4A2/g for solids and gases, and 10–5A2/g for liquids.</p>	<p>226. Low specific activity (LSA) material shall mean radioactive material which by its nature has a limited specific activity, or radioactive material for which limits of estimated average specific activity apply. External shielding materials surrounding the LSA material shall not be considered in determining the estimated average specific activity. LSA material shall be in one of three groups:-</p> <p>(a) LSA-I</p> <p>(i) Uranium and thorium ores and concentrates of such ores, and other ores containing naturally occurring radionuclides which are intended to be processed for the use of these radionuclides;</p> <p>(ii) Natural uranium, depleted uranium, natural thorium or their compounds or mixtures, providing they are unirradiated and in solid or liquid form;</p> <p>(iii) Radioactive material for which the A2 value is unlimited, excluding fissile material in quantities not excepted under para. 672; or</p> <p>(iv) Other radioactive material in which the activity is distributed throughout and the estimated average specific activity does not exceed 30 times the values for activity concentration specified in paras 401–406, excluding fissile material in quantities not excepted under para. 672.</p> <p>(b) LSA-II</p> <p>(i) Water with tritium concentration up to 0.8 TBq/L; or</p> <p>(ii) Other material in which the activity is distributed throughout and the estimated average specific activity does not exceed 10–4A2/g for solids and gases, and 10–5A2/g for liquids.</p>

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	<p>(c) LSA-III Solids (e.g. consolidated wastes, activated materials), excluding powders, in which:</p> <p>(i) The radioactive material is distributed throughout a solid or a collection of solid objects, or is essentially uniformly distributed in a solid compact binding agent (such as concrete, bitumen, ceramic, etc.);</p> <p>(ii) The radioactive material is relatively insoluble, or it is intrinsically contained in a relatively insoluble matrix, so that, even under loss of packaging, the loss of radioactive material per package by leaching when placed in water for seven days would not exceed 0.1A2; and</p> <p>(iii) The estimated average specific activity of the solid, excluding any shielding material, does not exceed $2 \times 10^{-3}A2/g$.</p>	<p>(c) LSA-III Solids (e.g. consolidated wastes, activated materials), excluding powders, in which:</p> <p>(i) The radioactive material is distributed throughout a solid or a collection of solid objects, or is essentially uniformly distributed in a solid compact binding agent (such as concrete, bitumen, ceramic, etc.);</p> <p>(ii) The radioactive material is relatively insoluble, or it is intrinsically contained in a relatively insoluble matrix, so that, even under loss of packaging, the loss of radioactive material per package by leaching when placed in water for seven days would not exceed 0.1A2; and</p> <p>(iii) The estimated average specific activity of the solid, excluding any shielding material, does not exceed $2 \times 10^{-3}A2/g$.</p>
229	<p>229. Overpack shall mean an enclosure such as a box or bag which is used by a single consignor to facilitate as a handling unit a consignment of one or more packages for convenience of handling, stowage and carriage.</p>	<p>229. <i>Overpack</i> shall mean an enclosure such as a box or bag which is used by a single <i>consignor</i> to facilitate as a handling unit a consignmentcontain one or more <i>packages</i> and to form one unit for convenience of handling and stowage and carriageduring transport.</p>
230	<p>Package shall mean the packaging with its radioactive contents as presented for transport. The types of packages covered by these Regulations, which are subject to the activity limits and material restrictions of Section IV and meet the corresponding requirements, are:</p>	<p><i>Package</i> shall mean the complete product of the packing operation, consisting of the packaging with and its radioactive contents as presentedprepared for transport. The types of <i>packages</i> covered by these Regulations, which are subject to the activity limits and material restrictions of Section IV and meet the corresponding requirements, are:</p>
231	<p>231. Packaging shall mean the assembly of components necessary to enclose the radioactive contents completely. It may, in particular, consist of one or more receptacles, absorbent materials, spacing structures, radiation shielding and service equipment for filling, emptying, venting and pressure relief; devices for cooling,</p>	<p>231. <i>Packaging</i> shall mean the assembly of one or more receptacles and any other components or materials necessary for the receptacles to encloseperform the radioactive contents completely. It may, in particular, consist of one or more receptacles, absorbent materials, spacing structures, radiation</p>

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	absorbing mechanical shocks, handling and tie-down, and thermal insulation; and service devices integral to the package. The packaging may be a box, drum or similar receptacle, or may also be a freight container, tank or intermediate bulk container.	shielding and service equipment for filling, emptying, venting containment and pressure relief; devices for cooling, absorbing mechanical shocks, handling and tie-down, and thermal insulation; and service devices integral to the package. The packaging may be a box, drum or similar receptacle, or may also be a freight container, tank or intermediate bulk other safety functions.
232	232. Quality assurance shall mean a systematic programme of controls and inspections applied by any organization or body involved in the transport of radioactive material which is aimed at providing adequate confidence that the standard of safety prescribed in these Regulations is achieved in practice.	232. <i>Quality assurance</i> shall mean a systematic programme of controls and inspections applied by any organization or body involved in the transport of radioactive material which is aimed at providing adequate confidence that the standard of safety prescribed in these Regulations is achieved in practice.
241	241. Surface contaminated object (SCO) shall mean a solid object which is not itself radioactive but which has radioactive material distributed on its surfaces. SCO shall be in one of two groups: (a) SCO-I: A solid object on which: (i) the non-fixed contamination on the accessible surface averaged over 300 cm ² (or the area of the surface if less than 300 cm ²) does not exceed 4 Bq/cm ² for beta and gamma emitters and low toxicity alpha emitters, or 0.4 Bq/cm ² for all other alpha emitters; and (ii) the fixed contamination on the accessible surface averaged over 300 cm ² (or the area of the surface if less than 300 cm ²) does not exceed 4 × 10 ⁴ Bq/cm ² for beta and gamma emitters and low toxicity alpha emitters, or 4 × 10 ³ Bq/cm ² for all other alpha emitters; and (iii) the non-fixed contamination plus the fixed contamination on the inaccessible surface averaged over 300 cm ² (or the area of the surface if less than 300 cm ²) does not exceed 4 × 10 ⁴ Bq/cm ² for beta and gamma emitters and low toxicity alpha emitters, or 4 × 10 ³ Bq/cm ² for all other alpha emitters.	241. <i>Surface contaminated object (SCO)</i> shall mean a solid object which is not itself radioactive but which has <i>radioactive material</i> distributed on its surfaces. SCO shall be in one of two groups: (a) SCO-I: A solid object on which: (i) the non-fixed contamination on the accessible surface averaged over 300 cm² (or the area of the surface if less than 300 cm²) does not exceed 4 Bq/cm² for beta and gamma emitters and low toxicity alpha emitters, or 0.4 Bq/cm² for all other alpha emitters; and (ii) the fixed contamination on the accessible surface averaged over 300 cm² (or the area of the surface if less than 300 cm²) does not exceed 4 × 10⁴ Bq/cm² for beta and gamma emitters and low toxicity alpha emitters, or 4 × 10³ Bq/cm² for all other alpha emitters; and (iii) the non-fixed contamination plus the fixed contamination on the inaccessible surface averaged over 300 cm² (or the area of the surface if less than 300 cm²) does not exceed 4 × 10⁴ Bq/cm² for beta and gamma emitters and low toxicity alpha emitters, or 4 × 10³ Bq/cm² for all other alpha emitters.

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	<p>(b) SCO-II: A solid object on which either the fixed or non-fixed contamination on the surface exceeds the applicable limits specified for SCO-I in (a) above and on which:</p> <p>(i) the non-fixed contamination on the accessible surface averaged over 300 cm² (or the area of the surface if less than 300 cm²) does not exceed 400 Bq/cm² for beta and gamma emitters and low toxicity alpha emitters, or 40 Bq/cm² for all other alpha emitters; and</p> <p>(ii) the fixed contamination on the accessible surface, averaged over 300 cm² (or the area of the surface if less than 300 cm²) does not exceed 8×10^5 Bq/cm² for beta and gamma emitters and low toxicity alpha emitters, or 8×10^4 Bq/cm² for all other alpha emitters; and</p> <p>(iii) the non-fixed contamination plus the fixed contamination on the inaccessible surface averaged over 300 cm² (or the area of the surface if less than 300 cm²) does not exceed 8×10^5 Bq/cm² for beta and gamma emitters and low toxicity alpha emitters, or 8×10^4 Bq/cm² for all other alpha emitters.</p>	<p>(b) SCO-II: A solid object on which either the fixed or non-fixed contamination on the surface exceeds the applicable limits specified for SCO-I in (a) above and on which:</p> <p>(i) the non-fixed contamination on the accessible surface averaged over 300 cm² (or the area of the surface if less than 300 cm²) does not exceed 400 Bq/cm² for beta and gamma emitters and low toxicity alpha emitters, or 40 Bq/cm² for all other alpha emitters; and</p> <p>(ii) the fixed contamination on the accessible surface, averaged over 300 cm² (or the area of the surface if less than 300 cm²) does not exceed 8×10^5 Bq/cm² for beta and gamma emitters and low toxicity alpha emitters, or 8×10^4 Bq/cm² for all other alpha emitters; and</p> <p>(iii) the non-fixed contamination plus the fixed contamination on the inaccessible surface averaged over 300 cm² (or the area of the surface if less than 300 cm²) does not exceed 8×10^5 Bq/cm² for beta and gamma emitters and low toxicity alpha emitters, or 8×10^4 Bq/cm² for all other alpha emitters.</p>
242	<p>242. Tank shall mean a tank container, a portable tank, a road tank vehicle, a rail tank wagon or a receptacle with a capacity of not less than 450 litres to contain liquids, powders, granules, slurries or solids which are loaded as gas or liquid and subsequently solidified, and of not less than 1000 litres to contain gases. A tank container shall be capable of being carried on land or on sea and of being loaded and discharged without the need of removal of its structural equipment, shall possess stabilizing members and tie-down attachments external to the shell, and shall be capable of being lifted when full.</p>	<p>242. <i>Tank</i> shall mean a tank container, a portable tank (including a tank container), a road tank <i>vehicle</i>, a rail tank wagon or a receptacle with a capacity of not less than 450 litres to contain solids, liquids, powders, granules, slurries or solids which are loaded as gas or liquid and subsequently solidified, and of not less than 1000 litres to contain gases. A tank container shall be capable of being carried on land or on sea and of being loaded and discharged without the need of removal of its structural equipment, shall possess stabilizing members and tie-down attachments external to the shell, and shall be capable of being lifted when full., having a capacity of not less than 450 litres when used for the transport of gases.</p>

	2005 edition as published	2009 edition
243 Sub title	Transport index	<i>Through or into</i>
243	None	243. <i>Through or into</i> shall mean through or into the countries in which a <i>consignment</i> is transported but specifically excludes countries “over” which a <i>consignment</i> is carried by air, provided that there are no scheduled stops in those countries.
247	247. Vehicle shall mean a road vehicle (including an articulated vehicle, i.e. a tractor and semi-trailer combination) or railroad car or railway wagon. Each trailer shall be considered as a separate vehicle.	247. Vehicle shall mean a road vehicle (including an articulated vehicle, i.e. a tractor and semi-trailer combination), or railroad car or railway wagon. Each trailer shall be considered as a separate vehicle.
302	302. A Radiation Protection Programme shall be established for the transport of radioactive material. The nature and extent of the measures to be employed in the programme shall be related to the magnitude and likelihood of radiation exposures. The programme shall incorporate the requirements of paras 301, 303_305 and 311. Programme documents shall be available, on request, for inspection by the relevant competent authority.	302. A <i>Radiation Protection Programme</i> shall be established for the transport of <i>radioactive material</i> . The nature and extent of the measures to be employed in the programme shall be related to the magnitude and likelihood of radiation exposures. The programme shall incorporate the requirements of paras 301, 303-305 and 559 . Programme documents shall be available, on request, for inspection by the relevant <i>competent authority</i> .
314	none	314. Records of all safety training undertaken shall be kept by the employer and made available to the employee if requested.
Sec tion IV title	ACTIVITY LIMITS AND MATERIAL RESTRICTIONS	ACTIVITY LIMITS AND MATERIAL RESTRICTIONS CLASSIFICATION
401 Sub title	BASIC RADIONUCLIDE VALUES	BASIC RADIONUCLIDE VALUES - GENERAL PROVISIONS

	2005 edition as published	2009 edition
	none	<p>401. Radioactive material shall be assigned to one of the UN numbers specified in Table 1 depending on the activity level of the radionuclides contained in a <i>package</i>, the fissile or non-fissile properties of these radionuclides, the type of <i>package</i> to be presented for transport, and the nature or form of the contents of the <i>package</i>, or <i>special arrangements</i> governing the transport operation, in accordance with the provisions laid down in 407 to 435 below.</p> <p>TABLE 1.</p>
	None ¹	<p>Krypton (36)</p> <p>Kr-79 4 × 10⁰ 2 × 10⁰ 1 × 10³ 1 × 10⁵</p>
407	<p>CONTENTS LIMITS FOR PACKAGES</p> <p>407 The quantity of radioactive material in a package shall not exceed the relevant limits specified in paras 408-419</p>	<p>CLASSIFICATION OF CONTENTS LIMITS FOR PACKAGE</p> <p>421. The quantity of <i>radioactive material</i> in a <i>package</i> shall not exceed the relevant limits for the <i>package type</i> as specified in paras 408-419 below.</p>
408	<p>408. For radioactive material other than articles manufactured of natural uranium, depleted uranium or natural thorium, an excepted package shall not contain activities greater than the following:</p> <p>(a) where the radioactive material is enclosed in or is included as a component part of an instrument or other manufactured article, such as a clock or electronic apparatus, the limits specified in columns 2 and 3 of Table 3 for each individual item and each package, respectively; and</p> <p>(b) where the radioactive material is not so enclosed in or is not</p>	<p>CLASSIFICATION OF MATERIAL</p> <p><i>Low specific activity (LSA) material</i></p> <p>408. <i>Radioactive material</i> may only be classified as LSA material if the conditions of paras 226, 409 -411 and 516-520 are met.</p> <p>For radioactive material other than articles manufactured of natural</p>

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	included as a component of an instrument or other manufactured article, the package limits specified in column 4 of Table 3.	uranium, depleted uranium or natural thorium, an excepted package shall not contain activities greater than the following: (a) where the radioactive material is enclosed in or is included as a component part of an instrument or other manufactured article, such as a clock or electronic apparatus, the limits specified in columns 2 and 3 of Table 3 for each individual item and each package, respectively; and (b) where the radioactive material is not so enclosed in or is not included as a component of an instrument or other manufactured article, the package limits specified in column 4 of Table 3.
409	409. For articles manufactured of natural uranium, depleted uranium or natural thorium, an excepted package 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 material.	426409. For . Articles manufactured of <i>natural uranium, depleted uranium</i> or natural thorium, an excepted package may contain any quantity of and articles in which the sole <i>radioactive material provided</i> that is unirradiated natural uranium, unirradiated depleted uranium or unirradiated natural thorium may be classified under UN 2909, RADIOACTIVE MATERIAL, EXCEPTED PACKAGE - ARTICLES MANUFACTURED FROM NATURAL URANIUM or DEPLETED URANIUM or NATURAL THORIUM, only if the outer surface of the <i>uranium</i> or thorium is enclosed in an inactive sheath made of metal or some other substantial material.
226	226. Low specific activity (LSA) material shall mean radioactive material which by its nature has a limited specific activity, or radioactive material for which limits of estimated average specific activity apply. External shielding materials surrounding the LSA material shall not be considered in determining the estimated average specific activity. LSA material shall be in one of three groups:	409. Low specific activity (LSA) material shall mean radioactive material which by its nature has a limited specific activity, or radioactive material for which limits of estimated average specific activity apply. External shielding materials surrounding the LSA material shall not be considered in determining the estimated average specific activity. LSA material shall be in one of three groups:

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226 (a) (ii)- (iv)	<p>(ii) Natural uranium, depleted uranium, natural thorium or their compounds or mixtures, providing they are unirradiated and in solid or liquid form;</p> <p>(iii) Radioactive material for which the A₂ value is unlimited, excluding fissile material in quantities not excepted under para. 672; or</p> <p>(iv) Other radioactive material in which the activity is distributed throughout and the estimated average specific activity does not exceed 30 times the values for activity concentration specified in paras 401–406, excluding fissile material in quantities not excepted under para. 672.</p>	<p style="text-align: right;"><i>[new 409 (a) (ii)-(iv)]</i></p> <p>(ii) Natural uranium, depleted uranium, natural thorium or their compounds or mixtures, providing that are unirradiated and in solid or liquid form;</p> <p>(iii) <i>Radioactive material</i> for which the A₂ value is unlimited, excluding <i>fissile material</i> in quantities not excepted under para. 417; or</p> <p>(iv) Other <i>radioactive material</i> in which the activity is distributed throughout and the estimated average <i>specific activity</i> does not exceed 30 times the values for activity concentration specified in paras 402–407, excluding <i>fissile material</i> in quantities not excepted under para. 417.</p>
226 (c)	(c) LSA-III Solids (e.g. consolidated wastes, activated materials), excluding powders, in which:	<p style="text-align: right;"><i>[new 409 (c)]</i></p> <p>(c) LSA-III Solids (e.g. consolidated wastes, activated materials), excluding powders, meeting the requirements of para 601, in which:</p>
410	410. For transport by post, the total activity in each excepted package shall not exceed one tenth of the relevant limit specified in Table 3.	<p style="text-align: right;"><i>[new 424.(c)]</i></p> <p>(c) for transport by post, the total activity in each <i>excepted package</i> shall not exceed one tenth of the relevant limits specified in Table 3 column 4 of Table 5.</p>
411	Type IP-1, Type IP-2 and Type IP-3 411. The radioactive contents in a single package of LSA material or in a single package of SCO shall be so restricted that the radiation level specified in para. 521 shall not be exceeded, and the	<p>Type IP-1, Type IP-2 and Type IP-3</p> <p>411. The <i>radioactive contents</i> in a single <i>package</i> of <i>LSA material</i> or in a single package of SCO shall be so restricted that the <i>radiation level</i> specified in para. 516 shall not be exceeded,</p>

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	activity in a single package shall also be so restricted that the activity limits for a conveyance specified in para. 525 shall not be exceeded.	and the activity in a single <i>package</i> shall also be so restricted that the activity limits for a <i>conveyance</i> specified in para. 520 shall not be exceeded.
	None	<i>Surface contaminated object (SCO)</i> 412. Radioactive material may be classified as SCO if the conditions of paras 241, 413, 414 and 516-520 are met.
241	Surface contaminated object 241. Surface contaminated object (SCO) shall mean a solid object which is not itself radioactive but which has radioactive material distributed on its surfaces. SCO shall be in one of two groups:	Surface contaminated object 241. Surface contaminated object (SCO) shall mean a solid object which is not itself radioactive but which has radioactive material distributed on its surfaces. 413. SCO shall be in one of two groups:
411	Type IP-1, Type IP-2 and Type IP-3 411. The radioactive contents in a single package of LSA material or in a single package of SCO shall be so restricted that the radiation level specified in para. 521 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 para. 525 shall not be exceeded.	Type IP-1, Type IP-2 and Type IP-3 411. 414. The <i>radioactive contents</i> in a single <i>package</i> of LSA material or in a single package of SCO shall be so restricted that the <i>radiation level</i> specified in para. 521 516 shall not be exceeded, and the activity in a single <i>package</i> shall also be so restricted that the activity limits for a <i>conveyance</i> specified in para. 525 520 shall not be exceeded.
	None	<i>Special form radioactive material</i> 415. Radioactive material may be classified as special form radioactive material, only if it meets the requirements of paras 602 to 604 and 802.

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	None	<p><i>Low dispersible radioactive material</i></p> <p>416. Radioactive material may be classified as low dispersible radioactive material only if it meets the requirements of para. 605 taking into account the requirements of paras 663 and 802.</p>
	None	<p><i>Classification as Type B(U), Type B(M) or Type C packages</i></p> <p>430. Type B(U), Type B(M) and Type C packages shall be classified in accordance with the competent authority approval certificate for the package issued by the country of origin of design.</p>
415	<p>Type B(U) and Type B(M) packages</p> <p>415. Type B(U) and Type B(M) packages shall not contain: (a) activities greater than those authorized for the package design, (b) radionuclides different from those authorized for the package design, or (c) contents in a form, or a physical or chemical state, different from those authorized for the package design, as specified in their certificates of approval.</p>	<p>Type B(U) and Type B(M) packages</p> <p>431415. A Type B(U) and Type B(M) packages shall not contain:</p> <p>(a) Activities greater than those authorized for the <i>package design</i>;</p> <p>(b) Radionuclides different from those authorized for the <i>package design</i>; or</p> <p>(c) Contents in a form, or a physical or chemical state, different from those authorized for the <i>package design</i>;</p> <p>as specified in theirthe certificate of approval.</p>
415	<p>415. Type B(U) and Type B(M) packages shall not contain: (a) activities greater than those authorized for the package design, (b) radionuclides different from those authorized for the package design, or (c) contents in a form, or a physical or chemical state, different from those authorized for the package design, as specified</p>	<p>432415. Type B(U) andA Type B(M) packages shall not contain:</p> <p>(a) Activities greater than those authorized for the package design;</p> <p>(b) Radionuclides different from those authorized for the package design; or</p>

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	in their certificates of approval.	(c) Contents in a form, or a physical or chemical state, different from those authorized for the package design; as specified in the ^{their} certificates of approval.
416	416. Type B(U) and Type B(M) packages, if transported by air, shall meet the requirements of para. 415 and shall not contain activities greater than the following:	433 <i>Type B(U) and Type B(M) packages</i> , if transported by air, shall meet the requirements of paras 431 or 432 and shall not contain activities greater than the following:
417	Type C packages 417. Type C packages shall not contain: (a) activities greater than those authorized for the package design, (b) radionuclides different from those authorized for the package design, or (c) contents in a form, or a physical or chemical state, different from those authorized for the package design, as specified in their certificates of approval.	Type C packages 417.434. A <i>Type C packages</i> shall not contain: (a) Activities greater than those authorized for the <i>package design</i> ; (b) Radionuclides different from those authorized for the <i>package design</i> ; or (c) Contents in a form, or a physical or chemical state different from those authorized for the <i>package design</i> ; as specified in the ^{their} certificates of approval.
672	672. Fissile material meeting one of the provisions (a)–(d) of this paragraph is excepted from the requirement to be transported in packages that comply with paras 673–682 as well as the other requirements of these Regulations that apply to fissile material. Only one type of exception is allowed per consignment: (a) A mass limit per consignment such that: mass of uranium-235 (g) X mass of other fissile material (g +) Y <	<i>Fissile material</i> 417.672 <i>Packages containing fissile material shall be classified under the relevant entry of Table 1 for fissile material unless one of the following conditions is met and those in para 672:</i> Fissile material meeting one of the provisions (a)–(d) of this

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1	<p>where X and Y are the mass limits defined in Table 12, provided that the smallest external dimension of each package is not less than 10 cm and that either:</p> <p>(i) each individual package contains not more than 15 g of fissile material; for unpackaged material, this quantity limitation shall apply to the consignment being carried in or on the conveyance; or</p> <p>(ii) the fissile material is a homogeneous hydrogenous solution or mixture where the ratio of fissile nuclides to hydrogen is less than 5% by mass; or</p> <p>(iii) there are not more than 5 g of fissile material in any 10 litre volume of material. Neither beryllium nor deuterium shall be present in quantities exceeding 1% of the applicable consignment mass limits provided in Table 12, except for deuterium in natural concentration in hydrogen.</p> <p>(b) 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. In addition, if uranium-235 is present in metallic, oxide or carbide forms, it shall not form a lattice arrangement. mass of uranium-235 (g) X mass of other fissile material (g +) Y < 1</p> <p>(c) 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 0.002% of the mass of uranium, and with a minimum nitrogen to uranium atomic ratio (N/U) of 2.</p> <p>(d) Packages containing, individually, a total plutonium mass not more than 1 kg, of which not more than 20% by mass may consist of plutonium-239, plutonium-241 or any combination of those radionuclides.</p>	<p>paragraph is excepted from the requirement to be transported in packages that comply with paras 673-682 as well as the other requirements of these Regulations that apply to fissile material. Only one type of exception is allowed per consignment:</p> <p>(a) A mass limit per <i>consignment</i> provided that the smallest external dimension of each package is not less than 10 cm, such that:</p> $\frac{\text{mass of uranium-235 (g)}}{X} + \frac{\text{mass of other fissile nuclides (g)}}{Y} < 1$ <p>where X and Y are the mass limits defined in Table 4, provided that the smallest external dimension of each package is not less than 10 cm and that either:</p> <p>(i) each individual <i>package</i> contains not more than 15 g of <i>fissile material</i> material nuclides; for unpackaged material, this quantity limitation shall apply to the <i>consignment</i> being carried in or on the <i>conveyance</i>; or</p> <p>(ii) the <i>fissile material</i> is a homogeneous hydrogenous solution or mixture where the ratio of <i>fissile nuclides</i> to hydrogen is less than 5% by mass; or</p> <p>(iii) there are not more than 5 g of <i>fissile material</i> material nuclides in any 10 litre volume of material.</p> <p>Neither beryllium nor deuterium Beryllium shall not be present in quantities exceeding 1% of the applicable <i>consignment</i> mass limits provided in Table 12,4 4 except where the concentration of beryllium in the material does not exceed 1 gram beryllium in</p>

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		<p>any 1000 grams for deuterium in natural concentration in hydrogen.</p> <p>Deuterium shall also not be present in quantities exceeding 1% of the applicable <i>consignment</i> mass limits provided in Table 4 except where deuterium occurs up to natural concentration in hydrogen.</p> <p>(b) 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 <i>fissile material is</i> nuclides are distributed essentially homogeneously throughout the material. In addition, if uranium-235 is present in metallic, oxide or carbide forms, it shall not form a lattice arrangement.</p> <p>(c) 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 0.002% of the mass of uranium, and with a minimum nitrogen to uranium atomic ratio (N/U) of 2.</p> <p>(d) Plutonium packages containing, individually, a total plutonium mass not more than 1 kg, of which not more than 20% of fissile nuclides by mass up to a maximum of 1kg of plutonium per consignment. Shipments under this exception shall be under exclusive use. may consist of plutonium-239, plutonium-241 or any combination of those radionuclides.</p> <p>TABLE 4.</p>
418 sub title	Packages containing fissile material	Deleted

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418 (a)	(a) a mass of fissile material different from that authorized for the package design,	(a) a mass of <i>fissile material</i> (or mass of each <i>fissile nuclide</i> for mixtures when appropriate) different from that authorized for the package <i>design</i> ,
419 sub title	Packages containing uranium hexafluoride	Packages containing <i>Uranium hexafluoride</i>
	None	419. Uranium hexafluoride shall only be assigned to UN Nos 2977, RADIOACTIVE MATERIAL, URANIUM HEXAFLUORIDE, FISSILE, or 2978, RADIOACTIVE MATERIAL, URANIUM HEXAFLUORIDE, non-fissile or fissile-excepted and shall meet the requirements of para. 420.
518 + 410	<p>518. Radioactive material in forms other than those specified in para. 517, with an activity not exceeding the limit specified in column 4 of Table 3, may be transported in an excepted package provided that:</p> <p>(a) the package retains its radioactive contents under routine conditions of transport; and</p> <p>(b) the package bears 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.</p> <p>410. For transport by post, the total activity in each excepted package shall not exceed one tenth of the relevant limit specified in Table 3.</p>	<p>424518. <i>Radioactive material</i> in forms other than those as specified in para. 517423 and with an activity not exceeding the limits specified in column 4 of Table 35, may be transported in an excepted packageclassified under UN 2910, RADIOACTIVE MATERIAL, EXCEPTED PACKAGE – LIMITED QUANTITY OF MATERIAL, provided that:</p> <p>(a) the <i>package</i> retains its <i>radioactive contents</i> under routine conditions of transport; and</p> <p>(b) the <i>package</i> bears the marking “RADIOACTIVE” on an internal surface in such a manner that a warning of the presence of <i>radioactive material</i> is visible on opening the <i>package</i>; and</p> <p>410.(c) for transport by post, the total activity in each <i>excepted package</i> shall not exceed one tenth of the relevant limits specified in column 4 of Table 35.</p>
	None	<i>Classification as excepted package</i>

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		<p>422. Packages may be classified as <i>excepted packages</i> if:</p> <p>(a) they are empty <i>packages</i> having contained <i>radioactive material</i>;</p> <p>(b) they contain instruments or articles in limited quantities as specified in Table 5;</p> <p>(c) they contain articles manufactured of natural uranium, <i>depleted uranium</i> or natural thorium; or</p> <p>(d) they contain <i>radioactive material</i> in limited quantities as specified in Table 5.</p> <p>TABLE 5.</p>
517	<p>517. Radioactive material which is enclosed in or is included as a component part of an instrument or other manufactured article, with activity not exceeding the item and package limits specified in columns 2 and 3 respectively of Table 3, may be transported in an excepted package provided that:</p> <p>(a) The radiation level at 10 cm from any point on the external surface of any unpackaged instrument or article is not greater than 0.1 mSv/h; and</p> <p>(b) Each instrument or article bears the marking “RADIOACTIVE” except:</p> <p>(i) radioluminescent timepieces or devices,</p> <p>(ii) consumer products that either have received regulatory approval according to para. 107(d) or do not individually exceed the activity limit for an exempt consignment in Table 1 (column 5), provided</p>	<p>423⁵¹⁷. <i>Radioactive material</i> which is enclosed in or is included as a component part of an instrument or other manufactured article, with activity not exceeding the item and package limits specified in columns 2 and 3 respectively of Table 3, may be transported in an excepted package provided that classified under UN 2911, RADIOACTIVE MATERIAL, EXCEPTED PACKAGE – INSTRUMENTS or ARTICLES, only if:</p> <p>(a) The <i>radiation level</i> at 10 cm from any point on the external surface of any unpackaged instrument or article is not greater than 0.1 mSv/h; and</p> <p>(b) Each instrument or article bears the marking “RADIOACTIVE” except:</p> <p>(i) radioluminescent time-pieces or devices, or</p> <p>(ii) consumer products that either have received regulatory</p>

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	<p>such products are transported in a package that bears the marking “RADIOACTIVE” on an internal surface in such a manner that warning of the presence of radioactive material is visible on opening the package, and</p> <p>(c) The active material is completely enclosed by non-active components (a device performing the sole function of containing radioactive material shall not be considered to be an instrument or manufactured article).</p>	<p>approval according to para. 107(d) or do not individually exceed the activity limit for an exempt <i>consignment</i> in Table 42 (column 5), provided such products are transported in a <i>package</i> that bears the marking “RADIOACTIVE” on an internal surface in such a manner that warning of the presence of <i>radioactive material</i> is visible on opening the <i>package</i>; and</p> <p>(c) The active material is completely enclosed by non-active components (a device performing the sole function of containing <i>radioactive material</i> shall not be considered to be an instrument or manufactured article); and</p> <p>(d) The limits specified in column 2 and 3 of Table 5 are met for each individual item and each <i>package</i>, respectively; and</p> <p>(e) For transport by post, the total activity in each <i>excepted package</i> shall not exceed one tenth of the relevant limits specified in Column 3 of Table 5.</p>
518	<p>518. Radioactive material in forms other than those specified in para. 517, with an activity not exceeding the limit specified in column 4 of Table 3, may be transported in an excepted package provided that:</p> <p>(a) the package retains its radioactive contents under routine conditions of transport; and</p> <p>(b) the package bears 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.</p>	<p>424518. Radioactive material in forms other than thoseas specified in para. 517,423 and with an activity not exceeding the limits specified in column 4 of Table 35, may be transported in an excepted packageclassified under UN 2910, RADIOACTIVE MATERIAL, EXCEPTED PACKAGE – LIMITED QUANTITY OF MATERIAL, provided that:</p> <p>(a) the <i>package</i> retains its <i>radioactive contents</i> under routine conditions of transport; and</p> <p>(b) the <i>package</i> bears the marking “RADIOACTIVE” on an internal surface in such a manner that a warning of the presence of <i>radioactive material</i> is visible on opening the <i>package</i>; and</p> <p>(c) for transport by post, the total activity in each <i>excepted package</i> shall not exceed one tenth of the relevant limits specified in column 4 of Table 5.</p>

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520	<p>Additional requirements and controls for transport of empty packagings</p> <p>520. An empty packaging which had previously contained radioactive material may be transported as an excepted package provided that:</p> <p>(a) It is in a well maintained condition and securely closed;</p> <p>(b) The outer surface of any uranium or thorium in its structure is covered with an inactive sheath made of metal or some other substantial material;</p> <p>(c) The level of internal non-fixed contamination does not exceed one hundred times the levels specified in para. 508; and</p> <p>(d) Any labels which may have been displayed on it in conformity with para. 542 are no longer visible.</p>	<p>Additional requirements and controls for transport of empty packagings</p> <p>425520. An empty <i>packaging</i>, which had previously contained <i>radioactive material</i>, may be transported as an excepted package provided that classified under UN 2908, RADIOACTIVE MATERIAL, EXCEPTED PACKAGE – EMPTY PACKAGING, only if:</p> <p>(a) It is in a well maintained condition and securely closed;</p> <p>(b) The outer surface of any uranium or thorium in its structure is covered with an inactive sheath made of metal or some other substantial material;</p> <p>(c) The level of internal <i>non-fixed contamination</i> does not exceed one hundred times the levels specified in para. 508507; and</p> <p>(d) Any labels which may have been displayed on it in conformity with para. 542536 are no longer visible.</p>
	None	<p><i>Classification as Type A package</i></p> <p>427. Packages containing radioactive material may be classified as Type A packages provided that the conditions of paras 428 and 429 are met:</p>
	None	<p>430. Type B(U), Type B(M) and Type C packages shall be classified in accordance with the <i>competent authority</i> approval certificate for the package issued by the country of origin of <i>design</i>.</p>
	None	SPECIAL ARRANGEMENTS

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		435. Radioactive material shall be classified as transported under <i>special arrangement</i> when it is intended to be carried in accordance with para. 310.
501	501. Before the first shipment of any package, the following requirements shall be fulfilled:	501. Before thea packaging is first shipment of any package used to transport radioactive material , the following requirements shall be fulfilled:
504	504. Tanks and intermediate bulk containers used for the transport of radioactive material shall not be used for the storage or transport of other goods unless decontaminated to below the level of 0.4 Bq/cm ² for beta and gamma emitters and low toxicity alpha emitters and 0.04 Bq/cm ² for all other alpha emitters.	504. Tanks Packagings, including IBCs, and intermediate bulk containers tanks used for the transport of <i>radioactive material</i> shall not be used for the storage or transport of other goods unless decontaminated to below the level of 0.4 Bq/cm ² for beta and gamma emitters and <i>low toxicity alpha emitters</i> and 0.04 Bq/cm ² for all other alpha emitters.
505	505. 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 other regulations.	<i>deleted</i>
515	515. Excepted packages shall be subject only to the following provisions in Sections V and VI:	514 515 . <i>Excepted packages</i> shall be subject only to the following provisions in Sections V and VI: All relevant provisions of the other sections shall also apply.
515 (a)	(a) The requirements specified in paras 507, 508, 511, 516, 534–537, 550(c), 555 and, as applicable, 517–520;	(a) The requirements specified in paras 506, 507, 510, 515, 528–531 507, 508, 511, 516, 534–537, and 550 544 (c), 555 and, as applicable, 517–520;
517 - 520	517. Radioactive material which is enclosed in or is included as a component part of an instrument or other manufactured article, with activity not exceeding the item and package limits specified in columns 2 and 3 respectively of Table 3, may be transported in an excepted package provided that:	<i>deleted</i>

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	<p>(a) The radiation level at 10 cm from any point on the external surface of any unpackaged instrument or article is not greater than 0.1 mSv/h; and</p> <p>(b) Each instrument or article bears the marking “RADIOACTIVE” except:</p> <p>(i) radioluminescent timepieces or devices,</p> <p>(ii) consumer products that either have received regulatory approval according to para. 107(d) or do not individually exceed the activity limit for an exempt consignment in Table 1 (column 5), provided such products are transported in a package that bears the marking “RADIOACTIVE” on an internal surface in such a manner that warning of the presence of radioactive material is visible on opening the package, and</p> <p>(c) The active material is completely enclosed by non-active components (a device performing the sole function of containing radioactive material shall not be considered to be an instrument or manufactured article).</p> <p>518. Radioactive material in forms other than those specified in para. 517, with an activity not exceeding the limit specified in column 4 of Table 3, may be transported in an excepted package provided that:</p> <p>(a) the package retains its radioactive contents under routine conditions of transport; and</p> <p>(b) the package bears 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.</p> <p>519. A manufactured article in which the sole radioactive material is unirradiated natural uranium, unirradiated depleted uranium or unirradiated natural thorium may be transported as an excepted package provided that the outer surface of the uranium or thorium is enclosed in an inactive sheath made of metal or some other substantial material.</p>	

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	<p>Additional requirements and controls for transport of empty packagings</p> <p>520. An empty packaging which had previously contained radioactive material may be transported as an excepted package provided that:</p> <p>(a) It is in a well maintained condition and securely closed;</p> <p>(b) The outer surface of any uranium or thorium in its structure is covered with an inactive sheath made of metal or some other substantial material;</p> <p>(c) The level of internal non-fixed contamination does not exceed one hundred times the levels specified in para. 508; and</p> <p>(d) Any labels which may have been displayed on it in conformity with para. 542 are no longer visible.</p> <p>REQUIREMENTS AND CONTROLS FOR TRANSPORT OF LSA MATERIAL AND SCO IN INDUSTRIAL PACKAGES OR UNPACKAGED</p> <p>521. The quantity of LSA material or SCO in a single Type IP-1, Type IP-2, Type IP-3, or object or collection of objects, whichever is appropriate, shall be so restricted that the external radiation level at 3 m from the unshielded material or object or collection of objects does not exceed 10 mSv/h.</p>	
		<p style="text-align: right;"><i>[After new 518]</i></p> <p>TABLE 6.</p>
525	<p>525. The total activity in a single hold or compartment of an inland watercraft, or in another conveyance, for carriage of LSA material or SCO in Type IP-1, Type IP-2, Type IP-3 or unpackaged, shall not exceed the limits shown in Table 5.</p>	<p>520525. The total activity in a single hold or compartment of an inland waterway craft, or in another <i>conveyance</i>, for carriage of <i>LSA material</i> or SCO in <i>Type IP-1, Type IP-2, Type IP-3</i> or unpackaged, shall not exceed the limits shown in Table 7.</p>

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		<i>[After new 521]</i>
		<i>[After new 522]</i>
528 sub title	DETERMINATION OF CRITICALITY SAFETY INDEX	DETERMINATION OF CRITICALITY SAFETY INDEX FOR CONSIGNMENTS, FREIGHT CONTAINERS AND OVERPACKS
528	528. The criticality safety index (CSI) for packages containing fissile material shall be obtained by dividing the number 50 by the smaller of the two values of N derived in paras 681 and 682 (i.e. $CSI = 50/N$). The value of the criticality safety index may be zero, provided that an unlimited number of packages is subcritical (i.e. N is effectively equal to infinity in both cases).	deleted
531	531. Except for packages or overpacks transported under exclusive use by rail or by road under the conditions specified in para. 573(a), or under exclusive use and special arrangement by vessel or by air under the conditions specified in paras 575 or 579 respectively, the maximum radiation level at any point on the external surface of a package or overpack shall not exceed 2 mSv/h.	525 531 . Except for <i>packages</i> or <i>overpacks</i> transported under <i>exclusive use</i> by rail or by road under the conditions specified in para. 569 573 (a), or under <i>exclusive use</i> and <i>special arrangement</i> by <i>vessel</i> or by air under the conditions specified in paras 570 575 or 574 579 respectively, the maximum <i>radiation level</i> at any point on the external surface of a <i>package</i> or <i>overpack</i> shall not exceed 2 mSv/h.
533 (c)- (e)	(c) If the surface radiation level is greater than 2 mSv/h, the package or overpack shall be transported under exclusive use and under the provisions of paras 573(a), 575 or 579, as appropriate. (d) A package transported under a special arrangement shall be assigned to category III-YELLOW except under the provisions of para. 534. (e) An overpack which contains packages transported under special	(c) If the surface <i>radiation level</i> is greater than 2 mSv/h, the <i>package</i> or <i>overpack</i> shall be transported under <i>exclusive use</i> and under the provisions of paras 573 569 (a), 575 570 or 579 574 , as appropriate. (d) A <i>package</i> transported under a <i>special arrangement</i> shall be assigned to category III-YELLOW except under the provisions of para. 534 533 .

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	arrangement shall be assigned to category III-YELLOW except under the provisions of para. 534.	(e) An <i>overpack</i> which contains <i>packages</i> transported under <i>special arrangement</i> shall be assigned to category III-YELLOW except under the provisions of para. 534 533 .
		TABLE 9.
536	536. For each package, other than excepted packages, the United Nations number (see Table 8), preceded by the letters “UN”, and the proper shipping name (see Table 8) shall be legibly and durably marked on the outside of the packaging. In the case of excepted packages, other than those accepted for international movement by post, only the United Nations number, preceded by the letters “UN”, shall be required. For packages accepted for international movement by post the requirement of para. 581 shall apply.	530 536 . For Each <i>package</i> , other than excepted packages, the United Nations number (see Table 8), preceded by the letters “UN”, and <i>overpack</i>the proper shipping name (see Table 8) shall be legibly and durably marked on the outside of the packaging. In the case of excepted packages, other than those accepted for international movement by post, only the United Nations number, preceded by the letters “UN”, shall be required. For packages accepted for international movement by post the requirement of para. 581 shall apply with the UN marking as specified in Table 10. Additionally each <i>overpack</i> shall be legibly and durably marked with the word “OVERPACK”.
		TABLE 10.
541	541. Where LSA-I or SCO-I material is contained in receptacles or wrapping materials and is transported under exclusive use as permitted by para. 523, the outer surface of these receptacles or wrapping materials may bear the marking ‘RADIOACTIVE LSA-I’ or ‘RADIOACTIVE SCO-I’ as appropriate.	535 541 . Where <i>LSA-I</i> or <i>SCO-I</i> material is contained in receptacles or wrapping materials and is transported under <i>exclusive use</i> as permitted by para. 522 523 , the outer surface of these receptacles or wrapping materials may bear the marking ‘RADIOACTIVE LSA-I’ or ‘RADIOACTIVE SCO-I’ as appropriate.
544 (b)	(b) Activity: The maximum activity of the radioactive contents during transport expressed in units of becquerels (Bq) with the appropriate SI prefix symbol (see Annex II). For fissile material, the mass of fissile material in units of grams (g), or multiples thereof, may be used in place of activity.	(b) Activity: The maximum activity of the <i>radioactive contents</i> during transport expressed in units of becquerels (Bq) with the appropriate SI prefix symbol (see Annex II). For <i>fissile material</i> , the mass of <i>fissile material (or mass of each fissile nuclide for mixtures when appropriate)</i> in units of grams (g), or multiples thereof, may be used in place of activity.

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544 (d)	(d) Transport index: See paras 526 and 527. (No transport index entry is required for category I-WHITE.)	(d) <i>Transport index</i> : See The number determined in accordance with paras 526 521 and 527 522 . (No <i>transport index</i> entry is required for Category I-WHITE.)
548	548. 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 with a single United Nations number, the appropriate United Nations number for the consignment (see Table 8) shall also be displayed, in black digits not less than 65 mm high, either:	542 548 . Where the <i>consignment</i> in the <i>freight container</i> or <i>tank</i> is unpackaged <i>LSA-I</i> or <i>SCO-I</i> or where an exclusive use <i>consignment</i> in a <i>freight container</i> is required to be shipped under exclusive use and is packaged <i>radioactive material</i> with a single United Nations number, the appropriate United Nations number for the <i>consignment</i> (see Table 1) shall also be displayed, in black digits not less than 65 mm high, either:
549	549. Compliance with the requirements of paras 520(d) and 534–548 for marking, labelling and placarding shall be the responsibility of the consignor.	deleted
	none	543. Except as otherwise provided in these Regulations, no person may offer <i>radioactive material</i> for transport unless it is properly marked, labelled, placarded, described and certified on a transport document, and otherwise in a condition for transport as required by these Regulations.
550 sub title	None	Particulars of consignment
	None	<i>[New 544 (a)]</i> (a) The United Nations number assigned to the material as specified in accordance with the provisions of paras. 401 and 528, preceded by the letters “UN”;
550 (a)- (c)	(a) The proper shipping name, as specified in accordance with the provisions of para. 534; (b) The United Nations Class number “7”;	<i>[New 544 (b)-(c)]</i> (a) (b) The proper shipping name, as specified in accordance with

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	(c) The United Nations number assigned to the material as specified in accordance with the provisions of para. 534, preceded by the letters “UN”;	the provisions of para.s 401 and 534528 ; (b) (c) The United Nations Class number “7”; (e) The United Nations number assigned to the material as specified in accordance with the provisions of para. 534, preceded by the letters “UN”;
550 (f)	(f) The maximum activity of the radioactive contents during transport expressed in units of becquerels (Bq) with the appropriate SI prefix symbol (see Annex II). For fissile material, the mass of fissile material in units of grams (g), or appropriate multiples thereof, may be used in place of activity;	<i>[New 554 (f)]</i> (f) The maximum activity of the <i>radioactive contents</i> during transport expressed in units of becquerels (Bq) with the appropriate SI prefix symbol (see Annex II). For <i>fissile material (or mass of each fissile nuclide for mixtures when appropriate)</i> , the mass of <i>fissile material</i> in units of grams (g), or appropriate multiples thereof, may be used in place of activity;
550 (m)	(m) For LSA-II, LSA-III, SCO-I and SCO-II, the total activity of the consignment as a multiple of A ₂ .	<i>[New 554 (m)]</i> (m) For LSA-II, LSA-III, <i>SCO-I</i> and <i>SCO-II</i> , the total activity of the <i>consignment</i> as a multiple of A ₂ . For radioactive material for which the A₂ value is unlimited, the multiple of A₂ shall be zero.
551 sub title	Consignor’s declaration	Consignor’s certification or declaration
551	551. The consignor shall include in the transport documents a declaration 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 the proper shipping name and are classified, packed, marked and labelled, and are in all respects in proper condition for transport by (insert mode(s) of transport involved) according to the applicable international and national governmental regulations.”	545551 . The <i>consignor</i> shall include in the transport documents a certification or declaration in the following terms or in terms having an equivalent meaning : “I hereby declare that the contents of this <i>consignment</i> are fully and accurately described above by the proper shipping name and are classified, packed packaged , marked and labelled/ placarded , and are in all respects in proper condition for transport by (insert mode(s) of transport involved) according to the applicable international and national governmental regulations.”

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554 - 555	<p>554. The declaration shall be made on the same transport document which contains the particulars of consignment listed in para. 550.</p> <p>Removal or covering of labels</p> <p>555. When an empty packaging is transported as an excepted package under the provisions of para. 520, the previously displayed labels shall not be visible. Information for carriers</p>	Deleted
	none	<p>548. If the dangerous goods documentation is presented to the carrier by means of electronic data processing (EDP) or electronic data interchange (EDI) transmission techniques, the signature(s) may be replaced by the name(s) (in capitals) of the person authorized to sign.</p> <p>549. When <i>radioactive material</i>, other than when carried in tanks, is packed or loaded into any <i>freight container</i> or <i>vehicle</i> which will be transported by sea, those responsible for packing of the container or <i>vehicle</i> shall provide a “container/<i>vehicle</i> packing certificate” specifying the container/<i>vehicle</i> identification number(s) and certifying that the operation has been carried out in accordance with the applicable conditions of the IMDG Code [8].</p> <p>550. The information required in the transport document and the container/<i>vehicle</i> packing certificate may be incorporated into a single document, if not, these documents shall be attached one to the other. If the information is incorporated into a single document, the document shall include a signed declaration such as “It is declared that the packing of the goods into the container/<i>vehicle</i> has been carried</p>

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		<p>out in accordance with the applicable provisions". This declaration shall be dated and the person signing this declaration shall be identified on the document. Facsimile signatures are acceptable where applicable laws and regulations recognize the legal validity of facsimile signatures.</p> <p>551. The declaration shall be made on the same transport document which contains the particulars of <i>consignment</i> listed in para. 544.</p>
558	<p>558. Before the first shipment of any package requiring competent authority approval, the consignor shall ensure that copies of each applicable competent authority certificate applying to that package design have been submitted to the competent authority of each country through or into which the consignment is to be transported. The consignor is not required to await an acknowledgement from the competent authority, nor is the competent authority required to make such acknowledgement of receipt of the certificate.</p>	<p>554558. Before the first <i>shipment</i> of any <i>package</i> requiring <i>competent authority</i> approval, the <i>consignor</i> shall ensure that copies of each applicable <i>competent authority</i> certificate applying to that <i>package design</i> have been submitted to the <i>competent authority</i> of the country of origin of the shipment and to the competent authority of each country <i>through or into</i> which the <i>consignment</i> is to be transported. The <i>consignor</i> is not required to await an acknowledgement from the <i>competent authority</i>, nor is the <i>competent authority</i> required to make such acknowledgement of receipt of the certificate.</p>
559	<p>559. For each shipment listed in (a), (b), (c) or (d) below, the consignor shall notify the competent authority of each country through or into which the consignment is to be transported. This notification shall be in the hands of each competent authority prior to the commencement of the shipment, and preferably at least 7 days in advance.</p>	<p>555559. For each <i>shipment</i> listed in (a), (b), (c) or (d) below, the <i>consignor</i> shall notify the <i>competent authority</i> of the country of origin of the shipment and to the competent authority of each country <i>through or into</i> which the <i>consignment</i> is to be transported. This notification shall be in the hands of each <i>competent authority</i> prior to the commencement of the <i>shipment</i>, and preferably at least 7 days in advance.</p>
560	<p>560. The consignment notification shall include: (e) The maximum activity of the radioactive contents during transport expressed in units of becquerels (Bq) with the appropriate SI prefix symbol (see Annex II). For fissile material, the mass of</p>	<p style="text-align: right;"><i>[New 556 (e)]</i></p> <p>(e) The maximum activity of the <i>radioactive contents</i> during transport expressed in units of becquerels (Bq) with the appropriate SI prefix symbol (see Annex II). For <i>fissile material</i>, the mass of</p>

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	fissile material in units of grams (g), or multiples thereof, may be used in place of activity.	<i>fissile material (or the mass of each fissile nuclide for a mixture, when appropriate)</i> in units of grams (g), or multiples thereof, may be used in place of activity.
564	564. Category II-YELLOW or III-YELLOW packages or overpacks shall not be carried in compartments occupied by passengers, except those exclusively reserved for couriers specially authorized to accompany such packages or overpacks.	560. Category II-YELLOW or III-YELLOW <i>packages or overpacks</i> shall not be carried in compartments occupied by passengers, except those exclusively reserved for couriers specially authorized to accompany such <i>packages or overpacks</i> .
		<i>[After new 563]</i> TABLE 11.
		<i>[After new 565]</i> TABLE 12.
572	572. Where the consignment in or on the vehicle is unpackaged LSA-I material or SCO-I or where an exclusive use consignment is packaged radioactive material with a single United Nations number, the appropriate United Nations number (see Table 8) shall also be displayed, in black digits not less than 65 mm high, either:	568 572 . Where the <i>consignment</i> in or on the <i>vehicle</i> is unpackaged <i>LSA-I</i> material or <i>SCO-I</i> or where an exclusive use consignment is required to be shipped under exclusive use and is packaged <i>radioactive material</i> with a single United Nations number, the appropriate United Nations number (see Table 18) shall also be displayed, in black digits not less than 65 mm high, either:
603 (c)	(c) The activity in the water from the leaching tests specified in paras 710 and 711 would not exceed 2 kBq; or alternatively for sealed sources, the leakage rate for the volumetric leakage assessment test specified in the International Organization for Standardization document ISO 9978: “Radiation Protection — Sealed Radioactive Sources — Leakage Test Methods” [8], would not exceed the applicable acceptance threshold acceptable to the competent authority.	(c) The activity in the water from the leaching tests specified in paras 710 and 711 would not exceed 2 kBq; or alternatively for sealed sources, the leakage rate for the volumetric leakage assessment test specified in the International Organization for Standardization document ISO 9978: “Radiation Protection — Sealed Radioactive Sources — Leakage Test Methods” [9], would not exceed the applicable acceptance threshold acceptable to the <i>competent authority</i> .
614	614. All valves through which the radioactive contents could otherwise escape shall be protected against unauthorized operation.	614. All valves through which the <i>radioactive contents</i> could otherwise escape shall be protected against unauthorized operation.

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622 (b)	(b) a more than 20% increase in the maximum radiation level at any external surface of the package.	(b) a more than a 20% increase in the maximum <i>radiation level</i> at any external surface of the <i>package</i> .
624 (b)	(b) They are designed to conform to the standards prescribed in the chapter on General Recommendations on Packing of the United Nations Recommendations on the Transport of Dangerous Goods [7], or other requirements at least equivalent to those standards; and	(b) They are designed to satisfy conform to the requirements standards prescribed for UN Packing Group I or II in Chapter 6.1 the chapter on General Recommendations on Packing of the United Nations Recommendations on the Transport of Dangerous Goods, Model Regulations [10] [7] , or other requirements at least equivalent to those standards; and
625	625. Tank containers may also be used as Type IP-2 or Type IP-3, provided that:	625. Portable tanks Tank containers may also be used as <i>Type IP-2</i> or <i>Type IP-3</i> , provided that:
625 (b)	(b) They are designed to conform to the standards prescribed in the chapter on Recommendations on Multimodal Tank Transport of the United Nations Recommendations on the Transport of Dangerous Goods [7], or other requirements at least equivalent to those standards, and are capable of withstanding a test pressure of 265 kPa; and	(b) They are designed to satisfy conform to the requirements standards prescribed in Chapter 6.7 the chapter on Recommendations on Multimodal Tank Transport of the United Nations Recommendations on the Transport of Dangerous Goods, Model Regulations [10] [7] , or other requirements at least equivalent to those standards, and are capable of withstanding a test pressure of 265 kPa; and
625 (c)	(c) They are designed so that any additional shielding which is provided shall be capable of withstanding the static and dynamic stresses resulting from handling and routine conditions of transport and of preventing more than a 20% increase in the maximum radiation level at the external surface of the tank containers.	(c) They are designed so that any additional shielding which is provided shall be capable of withstanding the static and dynamic stresses resulting from handling and routine conditions of transport and of preventing more than a 20% increase in the maximum <i>radiation level</i> at the external surface of the portable tank containers .
626	626. Tanks, other than tank containers, may also be used as Type IP-2 or Type IP-3 for transporting LSA-I and LSA-II liquids and gases as prescribed in Table 4, provided that they conform to standards at least equivalent to those prescribed in para. 625.	626. <i>Tanks</i> , other than portable tanks tank containers , may also be used as <i>Type IP-2</i> or <i>Type IP-3</i> for transporting <i>LSA-I</i> and <i>LSA-II</i> liquids and gases as prescribed in Table 64 , provided that that they conform to standards at least equivalent to those prescribed in para. 625. :

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		<p>(a) They satisfy the requirements for <i>Type IP-1</i> specified in para. 621;</p> <p>(b) They are designed to satisfy the requirements prescribed in regional or national regulations for the transport of dangerous goods and are capable of withstanding a test pressure of 265 kPa; and</p> <p>(c) They are designed so that any additional shielding which is provided shall be capable of withstanding the static and dynamic stresses resulting from handling and routine conditions of transport and of preventing an increase of more than 20% in the maximum <i>radiation level</i> at any external surface of the <i>tanks</i>.</p>
627	627. Freight containers may also be used as Type IP-2 or Type IP-3, provided that:	627. <i>Freight containers with the characteristics of a permanent enclosure</i> may also be used as <i>Type IP-2</i> or <i>Type IP-3</i> , provided that:
627	(c) They are designed to conform to the standards prescribed in the International Organization for Standardization document ISO 1496/1: “Series 1 Freight Containers — Specifications and Testing — Part 1: General Cargo Containers” [9] excluding dimensions and ratings. They shall be designed such that if subjected to the tests prescribed in that document and to the accelerations occurring during routine conditions of transport they would prevent: (i) loss or dispersal of the radioactive contents; and (ii) more than a 20% increase in the maximum radiation level at the external surface of the freight containers.	(c) They are designed to conform to the standards prescribed in the International Organization for Standardization document ISO 1496/1: “Series 1 <i>Freight Containers</i> — Specifications and Testing — Part 1: General Cargo Containers” [119] excluding dimensions and ratings. They shall be designed such that if subjected to the tests prescribed in that document and to the accelerations occurring during routine conditions of transport they would prevent: (i) loss or dispersal of the radioactive contents; and (ii) more than a 20% increase in the maximum <i>radiation level</i> at any the external surface of the <i>freight containers</i> .
628	(b) They are designed to conform to the standards prescribed in the chapter on Recommendations on Intermediate Bulk Containers (IBCs) of the United Nations Recommendations on the Transport	(b) They are designed to conform— to satisfy the standards requirements prescribed for UN Packing Group I or II in the chapter on Recommendations on Intermediate

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	of Dangerous Goods [7], for Packing Group I or II, and if they were subjected to the tests prescribed in that document, but with the drop test conducted in the most damaging orientation, they would prevent: (i) loss or dispersal of the radioactive contents; and (ii) more than a 20% increase in the maximum radiation level at the external surface of the intermediate bulk container.	Bulk Containers (IBCs) Chapter 6.5 of the United Nations Recommendations on the Transport of Dangerous Goods [7], for Packing Group I or II, Model Regulations [10] , and if they were subjected to the tests prescribed in that document, but with the drop test conducted in the most damaging orientation, they would prevent: (i) loss or dispersal of the radioactive contents; and (ii) more than a 20% increase in the maximum <i>radiation level</i> at any the external surface of the <i>intermediate bulk container</i> .
648 (b) (ii)	(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.	(ii) Be provided with a <i>containment system</i> composed of primary inner and secondary outer containment components designed to ensure retention of enclose the liquid contents completely and ensure their retention within the secondary outer containment components, even if the primary inner components leak.
657 afte r (ii)	Where mixtures of different radionuclides are present, the provisions of paras 404–406 shall apply except that for krypton-85 an effective A ₂ (i) value equal to 10A ₂ may be used. For case (a) above, the assessment shall take into account the external contamination limits of para. 508.	Where mixtures of different radionuclides are present, the provisions of paras 403–407 404–406 shall apply except that for krypton-85 an effective A ₂ (i) value equal to 10A ₂ may be used. For case (a) above, the assessment shall take into account the external <i>contamination</i> limits of para. 507 508 .
669 afte r (ii)	Where mixtures of different radionuclides are present, the provisions of paras 404–406 shall apply, except that for krypton-85 an effective A ₂ (i) value equal to 10A ₂ may be used. For case (a) above, the assessment shall take into account the external contamination limits of para. 508.	Where mixtures of different radionuclides are present, the provisions of paras 403–407 404–406 shall apply, except that for krypton-85 an effective A ₂ (i) value equal to 10A ₂ may be used. For case (a) above, the assessment shall take into account the external <i>contamination</i> limits of para. 507 508 .
671 (b) (iii)	(iii) specified in paras 673–682, unless excepted by para. 672.	(iii) specified in paras 635 and 673 - 683 682, unless excepted by para. 672.
672	672. Fissile material meeting one of the provisions (a)–(d) of this	672. Fissile material meeting one of the provisions (a) to- (d) of

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	<p>paragraph is excepted from the requirement to be transported in packages that comply with paras 673–682 as well as the other requirements of these Regulations that apply to fissile material. Only one type of exception is allowed per consignment:</p> <p>(a) A mass limit per consignment such that: where X and Y are the mass limits defined in Table 12, provided that the smallest external dimension of each package is not less than 10 cm and that either:</p> <p>(i) each individual package contains not more than 15 g of fissile material; for unpackaged material, this quantity limitation shall apply to the consignment being carried in or on the conveyance; or</p> <p>(ii) the fissile material is a homogeneous hydrogenous solution or mixture where the ratio of fissile nuclides to hydrogen is less than 5% by mass; or</p> <p>(iii) there are not more than 5 g of fissile material in any 10 litre volume of material. Neither beryllium nor deuterium shall be present in quantities exceeding 1% of the applicable consignment mass limits provided in Table 12, except for deuterium in natural concentration in hydrogen.</p> <p>(b) 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. In addition, if uranium-235 is present in metallic, oxide or carbide forms, it shall not form a lattice arrangement. mass of uranium-235 (g) X mass of other fissile material (g +) Y < 1</p> <p>(c) 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 0.002% of the mass of uranium, and with a minimum nitrogen to uranium atomic ratio (N/U) of 2.</p> <p>(d) Packages containing, individually, a total plutonium mass not more than 1 kg, of which not more than 20% by mass may consist of plutonium-239, plutonium-241 or any combination of those</p>	<p>para 417this paragraph is excepted from the requirement to be transported in packages that comply with paras 673 – 683682 as well as the other requirements of these Regulations that apply to fissile material. Only one type of exception is allowed per consignment.</p> <p>(a) A mass limit per consignment such that: where X and Y are the mass limits defined in Table 12, provided that the smallest external dimension of each package is not less than 10 cm and that either:</p> <p>(i) each individual package contains not more than 15 g of fissile material; for unpackaged material, this quantity limitation shall apply to the consignment being carried in or on the conveyance; or</p> <p>(ii) the fissile material is a homogeneous hydrogenous solution or mixture where the ratio of fissile nuclides to hydrogen is less than 5% by mass; or</p> <p>(iii) there are not more than 5 g of fissile material in any 10 litre volume of material. Neither beryllium nor deuterium shall be present in quantities exceeding 1% of the applicable consignment mass limits provided in Table 12, except for deuterium in natural concentration in hydrogen.</p> <p>(b) 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. In addition, if uranium-235 is present in metallic, oxide or carbide forms, it shall not form a lattice arrangement. mass of uranium-235 (g) X mass of other fissile material (g +) Y < 1</p> <p>(c) 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 0.002% of the mass of uranium, and with a minimum nitrogen to uranium atomic ratio (N/U) of 2.</p> <p>(d) Packages containing, individually, a total plutonium mass not more than 1 kg, of which not more than 20% by mass may consist</p>

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	radionuclides.	of plutonium-239, plutonium-241 or any combination of those radionuclides.
673 Sub title	Contents specification for assessments of packages containing fissile material	Contents specification for assessments of packages designs containing fissile material
673	673. Where the chemical or physical form, isotopic composition, mass or concentration, moderation ratio or density, or geometric configuration is not known, the assessments of paras 677–682 shall be performed assuming that each parameter that is not known has the value which gives the maximum neutron multiplication consistent with the known conditions and parameters in these assessments.	673. Where the chemical or physical form, isotopic composition, mass or concentration, moderation ratio or density, or geometric configuration is not known, the assessments of paras 677 - 683 682 shall be performed assuming that each parameter that is not known has the value which gives the maximum neutron multiplication consistent with the known conditions and parameters in these assessments.
674	674. For irradiated nuclear fuel the assessments of paras 677–682 shall be based on an isotopic composition demonstrated to provide:	674. For irradiated nuclear fuel the assessments of paras 677 - 683 682 shall be based on an isotopic composition demonstrated to provide:
675	675. The package, after being subjected to the tests specified in paras 719–724, must prevent the entry of a 10 cm cube.	675. The <i>package</i> , after being subjected to the tests specified in paras 719–724, shall must: (a) preserve the minimum overall outside dimensions of the package to at least 10 cm, and (b) prevent the entry of a 10 cm cube.
677 (a)	(a) Multiple high standard water barriers, each of which would remain watertight if the package were subject to the tests prescribed in para. 682(b), a high degree of quality control in the manufacture, maintenance and repair of packagings, and tests to demonstrate the closure of each package before each shipment; or	(a) Multiple high standard water barriers, each not less than two of which would remain watertight if the <i>package</i> were subject to the tests prescribed in para. 682 681 (b), a high degree of quality control in the manufacture, maintenance and repair of <i>packagings</i> , and tests to demonstrate the closure of each <i>package</i> before each <i>shipment</i> ; or
677 (b)	(i) packages where, following the tests prescribed in para. 682(b), there is no physical contact between the valve and any other	(i) <i>packages</i> where, following the tests prescribed in para. 682 683 (b), there is no physical contact between the valve and any

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(i)	component of the packaging other than at its original point of attachment and where, in addition, following the test prescribed in para. 728 the valves remain leaktight; and	other component of the <i>packaging</i> other than at its original point of attachment and where, in addition, following the test prescribed in para. 728 the valves remain leaktight; and
678	678. It shall be assumed that the confinement system shall be closely reflected by at least 20 cm of water or such greater reflection as may additionally be provided by the surrounding material of the packaging. However, when it can be demonstrated that the confinement system remains within the packaging following the tests prescribed in para. 682(b), close reflection of the package by at least 20 cm of water may be assumed in para. 679(c).	678. It shall be assumed that the <i>confinement system</i> shall be closely reflected by at least 20 cm of water or such greater reflection as may additionally be provided by the surrounding material of the <i>packaging</i> . However, when it can be demonstrated that the <i>confinement system</i> remains within the <i>packaging</i> following the tests prescribed in para. 682 683 (b), close reflection of the <i>package</i> by at least 20 cm of water may be assumed in para. 679(c).
679 (b)	(b) the tests specified in para. 681(b);	(b) the tests specified in para. 682 (b);
679 (c)	(c) the tests specified in para. 682(b).	(c) the tests specified in para. 683 (b).
682 (c)	(c) Where any part of the fissile material escapes from the containment system following the tests specified in para. 682(b), it shall be assumed that fissile material escapes from each package in the array, and all of the fissile material shall be arranged in the configuration and moderation that results in the maximum neutron multiplication with close reflection by at least 20 cm of water.	(c) Where any part of the <i>fissile material</i> escapes from the <i>containment system</i> following the tests specified in para. 682 683 (b), it shall be assumed that <i>fissile material</i> escapes from each <i>package</i> in the array, and all of the <i>fissile material</i> shall be arranged in the configuration and moderation that results in the maximum neutron multiplication with close reflection by at least 20 cm of water.
683	None	Determination of <i>criticality safety index for packages</i> 683. The <i>criticality safety index (CSI)</i> for packages containing <i>fissile material</i> shall be obtained by dividing the number 50 by the smaller of the two values of N derived in paras 682 and 683 (i.e. $CSI = 50/N$). The value of the <i>criticality safety index</i> may be

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		zero; provided that an unlimited number of <i>packages</i> is subcritical (i.e. N is effectively equal to infinity in both cases).
704	709. A different specimen may be used for each of the tests. Following each test, a leaching assessment or volumetric leakage test shall be performed on the specimen by a method no less sensitive than the methods given in para. 710 for indispersible solid material or in para. 711 for encapsulated material.	709-708 . A different specimen may be used for each of the tests. Following each test, a leaching assessment or volumetric leakage test shall be performed on the specimen by a method no less sensitive than the methods given in para. 710 for indispersible solid material or in para. 711 for encapsulated material.
709 (a) (i)- (iii)	(i) is less than 200 g and they are alternatively subjected to the Class 4 impact test prescribed in the International Organization for Standardization document ISO 2919: “Sealed Radioactive Sources — Classification” [11], or (ii) is less than 500 g and they are alternatively subjected to the Class 5 impact test prescribed in the International Organization for Standardization document ISO 2919: “Sealed Radioactive Sources — Classification” [11], and	(i) is less than 200 g and they are alternatively subjected to the Class 4 impact test prescribed in the International Organization for Standardization document ISO 2919: “Sealed Radioactive Sources — Classification” [11], or (ii) is less than 500 g and they are alternatively subjected to the Class 5 impact test prescribed in the International Organization for Standardization document ISO 2919: “Sealed Radioactive Sources — Classification” [11], and
709 (b)	(b) The test prescribed in para. 708 provided they are alternatively subjected to the Class 6 temperature test specified in the International Organization for Standardization document ISO 2919: “Sealed Radioactive Sources — Classification” [11].	(b) The test prescribed in para. 708 provided they are alternatively subjected to the Class 6 temperature test specified in the International Organization for Standardization document ISO 2919: “Sealed Radioactive Sources — Classification” [11].
711 (b)	(b) The alternative volumetric leakage assessment shall comprise any of the tests prescribed in the International Organization for Standardization document ISO 9978: “Radiation Protection — Sealed Radioactive Sources — Leakage Test Methods” [8] which are acceptable to the competent authority.	(b) The alternative volumetric leakage assessment shall comprise any of the tests prescribed in the International Organization for Standardization document ISO 9978: “Radiation Protection — Sealed Radioactive Sources — Leakage Test Methods” [8] which are acceptable to the <i>competent authority</i> .
716 (c)	(c) For packages containing fissile material, it shall be determined whether the assumptions and conditions used in the assessments required by paras 671–682 for one or more packages are valid.	(c) For <i>packages</i> containing <i>fissile material</i> , it shall be determined whether the assumptions and conditions used in the assessments required by paras 671 - 683 682 for one or more <i>packages</i> are valid.
723	723. Stacking test: Unless the shape of the packaging effectively	723. Stacking test: Unless the shape of the <i>packaging</i> effectively

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	prevents stacking, the specimen shall be subjected, for a period of 24 h, 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 typically rest.	prevents stacking, the specimen shall be subjected, for a period of 24 h, to a compressive load equal to the greater of the following: (a) The equivalent of A total weight equal to 5 times the mass maximum weight of the actual package; and (b) The equivalent of 13 kPa multiplied by the vertically projected area of the <i>package</i> . The load shall be applied uniformly to two opposite sides of the specimen, one of which shall be the base on which the <i>package</i> would typically rest.
		<i>[After 725]</i> TABLE 14.
727	727. Mechanical test: The mechanical test consists of three different drop tests. Each specimen shall be subjected to the applicable drops as specified in para. 657 or para. 682. 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 maximum damage in the thermal test which follows:	727. Mechanical test: The mechanical test consists of three different drop tests. Each specimen shall be subjected to the applicable drops as specified in para. 657 or para. 682 683 . 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 maximum damage in the thermal test which follows:
727 (c)	(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 m onto the specimen. The mass shall consist of a solid mild steel plate 1 m by 1 m and shall fall in a horizontal attitude. The height of the drop shall be measured from the underside of TEST PROCEDURES 107 the plate to the highest point of the specimen. The target on which the specimen rests shall be as defined in para. 717.	(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 m onto the specimen. The mass shall consist of a solid mild steel plate 1 m by 1 m and shall fall in a horizontal attitude. The height of the drop shall be measured from the underside of TEST PROCEDURES 107 TEST PROCEDURES 107 the plate to the highest point of the specimen. The target on which the specimen rests shall be as defined in para. 717.
731	731. 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 paras 677–682 shall be excepted	731. <i>Packages</i> for which water in-leakage or out-leakage to the extent which results in greatest reactivity has been assumed for purposes of assessment under paras 677– 682 683 shall be excepted

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	from the test.	from the test.
732	732. Before the specimen is subjected to the water leakage test specified below, it shall be subjected to the tests in para. 727(b), and either para. 727(a) or (c) as required by para. 682, and the test specified in para. 728.	732. Before the specimen is subjected to the water leakage test specified below, it shall be subjected to the tests in para. 727(b), and either para. 727(a) or (c) as required by para.s 682,681 - 683 and the test specified in para. 728.
828 (d)	(d) For package design and special form radioactive material approval certificates, other than those issued under the provisions of paras 816_818, and for low dispersible radioactive material approval certificates, the symbols “-96” shall be added to the type code.	(d) For <i>package design</i> and <i>special form radioactive material</i> approval certificates, other than those issued under the provisions of paras 816-818, and for <i>low dispersible radioactive material</i> approval certificates, the symbols “ -0996 ”
829 (a)	829. These type codes shall be applied as follows: (a) Each certificate and each package shall bear the appropriate identification mark, comprising the symbols prescribed in paras 828(a), (b), (c) and (d) above, except that, for packages, only the applicable design type codes including, if applicable, the symbols ‘-96’ shall appear following the second stroke, that is, the ‘T’ or ‘X’ shall not appear in the identification marking on the package. Where the design approval and shipment approval are combined, the applicable type codes do not need to be repeated. For example:	(a) Each certificate and each <i>package</i> shall bear the appropriate identification mark, comprising the symbols prescribed in paras 828(a), (b), (c) and (d) above, except that, for <i>packages</i> , only the applicable <i>design</i> type codes including, if applicable, the symbols ‘ -0996 ’ shall appear following the second stroke, that is, the ‘T’ or ‘X’ shall not appear in the identification marking on the <i>package</i> . Where the <i>design</i> approval and <i>shipment</i> approval are combined, the applicable type codes do not need to be repeated. For example:
831 (j)	(j) A specification of the authorized radioactive contents, including any restrictions on the radioactive contents which might not be obvious from the nature of the packaging. This shall include the physical and chemical forms, the activities involved (including those of the various isotopes, if appropriate), amounts in grams (for fissile material), and whether special form radioactive material or low dispersible radioactive material, if applicable.	(j) A specification of the authorized radioactive contents, including any restrictions on the <i>radioactive contents</i> which might not be obvious from the nature of the <i>packaging</i> . This shall include the physical and chemical forms, the activities involved (including those of the various isotopes, if appropriate), amounts in grams (for <i>fissile material</i> or for each fissile nuclide when appropriate), and whether <i>special form radioactive material</i> or <i>low dispersible radioactive material</i> , if applicable.
832	(j) A specification of the actual radioactive contents, including any	(j) A specification of the actual radioactive contents, including any

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(j)	restrictions on the radioactive contents which might not be obvious from the nature of the packaging. This shall include the physical and chemical forms, the total activities involved (including those of the various isotopes, if appropriate), amounts in grams (for fissile material), and whether special form radioactive material or low dispersible radioactive material, if applicable.	restrictions on the <i>radioactive contents</i> which might not be obvious from the nature of the <i>packaging</i> . This shall include the physical and chemical forms, the total activities involved (including those of the various isotopes, if appropriate), amounts in grams (for <i>fissile material</i> or for each <i>fissile nuclide</i> when appropriate), and whether <i>special form radioactive material</i> or <i>low dispersible radioactive material</i> , if applicable.
833 (l)	(j) Description of the packaging by a reference to the drawings or specification of the design. If deemed appropriate by the competent authority, a reproducible illustration not larger than 21 cm by 30 cm, showing the make-up of the package, should also be provided, accompanied by a brief description of the packaging, including materials of manufacture, gross mass, general outside dimensions and appearance.	(l) A specification of the authorized radioactive contents, including any restrictions on the <i>radioactive contents</i> which might not be obvious from the nature of the <i>packaging</i> . This shall include the physical and chemical forms, the activities involved (including those of the various isotopes, if appropriate), amounts in grams (for <i>fissile material</i> or for each <i>fissile nuclide</i> when appropriate), and whether <i>special form radioactive material</i> or <i>low dispersible radioactive material</i> , if applicable.
	<p>REFERENCES</p> <p>The editions of the publications cited as references in these Regulations are current at the time of publication. The most recent editions should be consulted in defining requirements established in these Regulations.</p>	<p>REFERENCES</p> <p>The editions of the publicationsdocuments cited as references in these Regulations are, as noted below, those which were current at the time of publication. The most recent editions should be consulted in defining requirements established in these Regulations.</p> <p>[1] EUROPEAN ATOMIC ENERGY COMMUNITY, FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS, INTERNATIONAL ATOMIC ENERGY AGENCY, INTERNATIONAL LABOUR ORGANIZATION, INTERNATIONAL MARITIME ORGANIZATION, OECD NUCLEAR</p>

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		<p>ENERGY AGENCY, PAN AMERICAN HEALTH ORGANIZATION, UNITED NATIONS ENVIRONMENT PROGRAMME, WORLD HEALTH ORGANIZATION, , Fundamental Safety Principles, IAEA Safety Fundamentals No. 1, IAEA, Vienna, (2006) INTERNATIONAL ATOMIC ENERGY AGENCY, Radiation Protection and the Safety of Radiation Sources, Safety Series No. 120, IAEA, Vienna (1996)</p> <p>[2] FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS, INTERNATIONAL ATOMIC ENERGY AGENCY, INTERNATIONAL LABOUR ORGANISATION, OECD NUCLEAR ENERGY AGENCY, PAN AMERICAN HEALTH ORGANIZATION, WORLD HEALTH ORGANIZATION, International Basic Safety Standards for Protection against Ionizing Radiation and for the Safety of Radiation Sources, Safety Series No. 115, IAEA, Vienna (1996).</p> <p>[3] INTERNATIONAL ATOMIC ENERGY AGENCY, Advisory Material for the IAEA Regulations for the Safe Transport of Radioactive Material (2005 Edition), IAEA Safety Standard Series No. TS-G-1.1 (ST-2) Revision 1 (to be published), IAEA, Vienna (20022007).</p> <p>[4] INTERNATIONAL ATOMIC ENERGY AGENCY, Planning and Preparing for Emergency Response to Transport Accidents Involving Radioactive Material, IAEA Safety Standards Series No. TS-G-1.2 (ST-3), IAEA, Vienna (2002).</p> <p>[5] INTERNATIONAL ATOMIC ENERGY AGENCY, Compliance Assurance for the Safe Transport of Radioactive Material, IAEA Safety Standards Series No. TS-G-1.54,</p>

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		<p>IAEA, Vienna (in preparation to be published).</p> <p>[6] INTERNATIONAL ATOMIC ENERGY AGENCY, Management SystemsQuality Assurance for the Safe Transport of Radioactive Material, IAEA Safety Standards Series No. TS-G-1.43, IAEA, Vienna (to be published in preparation).</p> <p>[7] UNITED NATIONS, Recommendations on the Transport of Dangerous Goods, Ninth Revised Edition (ST/SG/AC.10/1/Rev.9), UN, New York and Geneva (1995).</p> <p>[7] INTERNATIONAL ATOMIC ENERGY AGENCY, “Radiation Protection Programmes for the Transport of Radioactive Material”, IAEA Safety Standards Series No TS-G-1.3, IAEA, Vienna, (2007)</p> <p>[8] INTERNATIONAL MARITIME ORGANIZATION, International Maritime Dangerous Goods Code, IMDG-IMO, London (2006)</p> <p>[98] INTERNATIONAL ORGANIZATION FOR STANDARDIZATION, Radiation Protection — Sealed Radioactive Sources — Leakage Test Methods, (ISO 9978:1992(E)), ISO, Geneva (1992).</p> <p>[10] UNITED NATIONS, Recommendations on the Transport of Dangerous Goods, Fifteenth Revised Edition (ST/SG/AC.10/1/Rev.15), UN, New York and Geneva (2007).</p> <p>[119] INTERNATIONAL ORGANIZATION FOR STANDARDIZATION, Series 1 Freight Containers – Specifications and Testing – Part 1: General Cargo Containers for General Purposes, ISO 1496:+1990(E),</p>

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		<p>ISO, Geneva (1990); and subsequent Amendments 1:1993, 2:1998, 3:2005, 4:2006 and 5:2006.</p> <p>[12+0] INTERNATIONAL ORGANIZATION FOR STANDARDIZATION, Nuclear Energy - Packaging of Uranium Hexafluoride (UF6) for Transport, ISO 7195:2005 (E), ISO, Geneva (2005+1993).</p> <p>[13+1] INTERNATIONAL ORGANIZATION FOR STANDARDIZATION, Radiation Protection - Sealed Radioactive Sources – General Requirements and Classification, ISO 2919:2005+1980 (E), ISO, Geneva (2005+1980)."</p>