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

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HARMONIZATION WITH THE IAEA REGULATIONS FOR THE SAFE TRANSPORT OF RADIOACTIVE MATERIAL

Note by the secretariat

Introduction

The IAEA 2nd Review Panel for the 2002/2003 Review of the IAEA Regulations for the Safe Transport of Radioactive Material (Bonn, 10-14 November 2003) has adopted a number of changes to the IAEA Regulations (see also ST/SG/AC.10/C.3/2003/2, ST/SG/AC.10/C.3/2003/3 and ST/SG/AC.10/C.3/2003/24) for the results of the 1st Review Panel).

The secretariat has prepared a list of corresponding changes to the UN Model Regulations, for information of the Sub-Committee. These changes are still subject to approval by IAEA "TRANSSC IX" (22-26 March 2004). This document supersedes ST/SG/AC.10/C.3/2003/24.

IAEA change reference	UN para.	Proposed changes
61	1.1.2.2.3	Insert the following first sentence: "Doses to persons shall be below the relevant dose limits." At the end of the existing first sentence, add: ", within the restriction that the doses to individuals be subject to dose constraints."
10	1.1.2.2.4	Replace "to ensure restriction of their exposure and that " with "to control their occupational exposure and the exposure".
Minor	1.1.2.2.5	In the French version, replace "dose effective" with "dose efficace".
11		Delete indent (a) and renumber (b) and (c) as (a) and (b). In new indent (a), insert: ", both values inclusive" after "6mSv in a year".
55	1.1.2.4.2	Delete "international", in the last sentence.
Minor	2.7.1.2	(e) Replace "the values specified in 2.7.7.2. " with "the values specified in 2.7.7.2.1 (b), or calculated in accordance with 2.7.7.2.2 to 2.7.7.2.6"

IAEA change reference	UN para.	Proposed changes
1	2.7.2	<p>Amend the definitions of Multilateral approval to read as follows:</p> <p><i>“Multilateral approval</i> means approval by the relevant competent authority both of the country of origin of the design or shipment, as applicable and of each country through or into which the consignment is to be transported 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 ...” (rest unchanged).</p>
4		<p>Amend the definition of "Fissile material" to read as follows:</p> <p><i>“Fissile-Nuclides, Material</i> <i>Fissile nuclides</i> means uranium 233, uranium 235, plutonium 239 and plutonium 241. <i>Fissile material</i> means a material containing any of the fissile nuclides. Excepted from the definition of fissile material is : ...” (rest unchanged).</p>
Minor		<p>Amend the definition of "Freight container" to read as follows:</p> <p><i>“Freight</i> container in the case of radioactive material transport means an article ... without intermediate reloading which is It shall be of a permanent enclosed character,...” (rest unchanged)</p>
Minor		<p>In the definition of <i>“Specific activity of a radionuclide”</i>, delete: “or volume “</p> <p>Amend the definition of "Uranium-natural, depleted, enriched, to read:</p>
Minor		<p><i>“Uranium - natural, depleted, enriched</i> means the following:</p> <p><i>Natural uranium</i> means uranium (which may be chemically separated) containing the naturally occurring distribution of uranium ...” (rest unchanged).</p>
Minor	2.7.3.2	<p>(a) (ii) Amend to read: “Natural uranium, depleted uranium, natural thorium or their compounds or mixtures, providing they are unirradiated and in solid or liquid form;”</p>
	2.7.4.6 (a)	<p>Amend to read:</p>
39		<p>“(a) The tests prescribed in 2.7.4.5 (a) and 2.7.4.5 (b) provided the mass of the special form radioactive material</p> <p>(i) is less than 200 g and they are alternatively subjected to the Class 4 impact test prescribed in ISO 2919:1990 "Radiation protection - Sealed radioactive sources - General requirements and classification"; or</p> <p>(ii) is less than 500 g and they are alternatively subjected to the Class 5 impact test prescribed in ISO 2919: 1990: “Sealed Radioactive Sources – Classification”, and”</p>
27	2.7.7.1.7	<p>Amend the beginning to read:</p> <p>"Unless excepted by 6.4.11.2, packages... (remainder unchanged).</p>

IAEA change reference	UN para.	Proposed changes
17	2.7.7.1.8	Amend to read as follows: "Packages containing uranium hexafluoride shall not contain: (a) a mass of uranium hexafluoride different from that authorized for the package design; (b) a mass of uranium hexafluoride greater than a value that would lead to an ullage smaller than 5 % at the maximum temperature of the package as specified for the plant systems where the package shall be used; or (c) uranium hexafluoride other than in solid form or at an internal pressure above atmospheric pressure when presented for transport."
Minor	Table 2.7.7.2.1	Amend the value in the right column for Te-121m to read " 1×10^6 " instead of " 1×10^5 ".
12	Table 2.7.7.2.1	Footnote (a) and (b); amend to read as follows: (a) A_1 and/or A_2 values for these parent radionuclides include contributions from daughter radionuclides with half-lives less than 10 days, as listed in the following: Mg 28 Al 28 Ar 42 K 42 Ca 47 Sc 47 Ti 44 Sc 44 Fe 52 Mn 52m Fe 60 Co 60m Zn 69m Zn 69 Ge 68 Ga 68 Rb 83 Kr 83m Sr 82 Rb 82 Sr 90 Y 90 Sr 91 Y 91m Sr 92 Y 92 Y 87 Sr 87m Zr 95 Nb 95m Zr 97 Nb 97m, Nb 97 Mo 99 Tc 99m Tc 95m Tc 95 Tc 96m Tc 96 Ru 103 Rh 103m Ru 106 Rh 106 Pd 103 Rh 103m Ag 108m Ag 108 Ag 110m Ag 110 Cd 115 In 115m In 114m In 114 Sn 113 In 113m Sn 121m Sn 121 Sn 126 Sb 126m Te 118 Sb 118 Te 127m Te 127 Te 129m Te 129 Te 131m Te 131 Te 132 I 132

IAEA change reference	UN para.	Proposed changes
		I 135 Xe 135m
		Xe 122 I 122
		Cs 137 Ba 137m
		Ba 131 Cs 131
		Ba 140 La 140
		Ce 144 Pr 144m, Pr 144
		Pm 148m Pm 148
		Gd 146 Eu 146
		Dy 166 Ho 166
		Hf 172 Lu 172
		W 178 Ta 178
		W 188 Re 188
		Re 189 Os 189m
		Os 194 Ir 194
		Ir 189 Os 189m
		Pt 188 Ir 188
		Hg 194 Au 194
		Hg 195m Hg 195
		Pb 210 Bi 210
		Pb 212 Bi 212, Tl 208, Po 212
		Bi 210m Tl 206
		Bi 212 Tl 208, Po 212
		At 211 Po 211
		Rn 222 Po 218, Pb 214, At 218, Bi 214, Po 214
		Ra 223 Rn 219, Po 215, Pb 211, Bi 211, Po 211, Tl 207
		Ra 224 Rn 220, Po 216, Pb 212, Bi 212, Tl 208, Po 212
		Ra 225 Ac 225, Fr 221, At 217, Bi 213, Tl 209, Po 213, Pb 209
		Ra 226 Rn 222, Po 218, Pb 214, At 218, Bi 214, Po 214
		Ra 228 Ac 228
		Ac 225 Fr 221, At 217, Bi 213, Tl 209, Po 213, Pb 209
		Ac 227 Fr 223
		Th 228 Ra 224, Rn 220, Po 216, Pb 212, Bi 212, Tl 208, Po 212
		Th 234 Pa 234m, Pa 234
		Pa 230 Ac 226, Th 226, Fr 222, Ra 222, Rn 218, Po 214
		U 230 Th 226, Ra 222, Rn 218, Po 214
		U 235 Th 231
		Pu 241 U 237
		Pu 244 U 240, Np 240m
		Am 242m Am 242, Np 238
		Am 243 Np 239
		Cm 247 Pu 243
		Bk 249 Am 245
		Cf 253 Cm 249"

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(b) Insert "Ag-108m Ag-108" after: "Ru-106 Rh-106".

Delete the entries for: "Ce-134, La 134"; "Rn-220, Po 216"; "Th-226, Ra-222, Ru-218, Po-214"; and "U-240, Np-240".

IAEA change reference	UN para.	Proposed changes
14	2.7.7.2.2	<p>Amend to read as follows:</p> <p>“For individual radionuclides which are not listed in Table 2.7.7.2.1 the determination of the basic radionuclide values referred to in 2.7.7.2.1 shall require competent authority approval or, for international transport, multilateral approval. Where the chemical form of each radionuclide is known, it It is permissible to use an A₂ value calculated using a dose coefficient for the appropriate lung absorption type as recommended by the International Commission on Radiological Protection, if the chemical forms of each radionuclide under both normal...”...”(rest unchanged).</p>
15	Table 2.7.7.2.2	<p>Amend the second entry in the first column to read:</p> <p><i>“Alpha emitting nuclides but no neutron emitters</i> are known to be present”</p> <p>Amend the third entry in the first column to read:</p> <p><i>"Neutron emitting nuclides are known to be present or no relevant data are available."</i></p>
62	2.7.8.4 (d) and (e)	Add: "except under the provisions of 2.7.8.5".
62	2.7.8.5	<p>Add a new 2.7.8.5 to read:</p> <p>"In case of international transport of packages requiring competent authority design or shipment approval, for which different approval types apply in the different countries concerned by the shipment, assignment to the category as required in 2.7.8.4 shall be in accordance with the certificate of the country of origin of design."</p>
20, 59	Chapter 3.2	<p>In column 6, assign special provision XXX to UN Nos 2912, 2915, 2916, 2917, 3321, 3322, 3323; special provision XXY to UN Nos 3324, 3325, 3327, 3328, 3329, 3330.</p>
20, 59	Chapter 3.3	<p>Add new special provisions XXX and XXY to read as follows:</p> <p>"XXX In the case of non-fissile or fissile excepted uranium hexafluoride, the material shall be classified under UN No 2978.</p> <p>XXY In the case of fissile uranium hexafluoride, the material shall be classified under UN No. 2977."</p>
	4.1.9.1.3	Amend to read:
19		<p>“A package may only contain other items that are necessary for the use of the radioactive material. The interaction between these other items and the package under the conditions of transport applicable to the design, shall not reduce the safety of the package.”</p>

IAEA change reference	UN para.	Proposed changes
Minor	4.1.9.2.2	Amend to read: “ For LSA material and SCO which is or contains fissile material shall meet the applicable requirements of 6.4.11.1, 7.1.7.4.1 and 7.1.7.4.2 shall be met. ”
18	5.1.5.1.2 (c)	Amend to read: “(c) For each package requiring competent authority approval, it shall be ensured that all the requirements specified in the approval certificates have been satisfied;”
54	5.1.5.2.2 (c)	Amend to read: “The shipment of packages containing fissile materials if the sum of the criticality safety indexes of the packages in a single freight container or in a single conveyance exceeds 50. Excluded from this requirement shall be shipments by seagoing vessels, if the sum of the criticality safety indexes does not exceed 50 for any hold, compartment or defined deck area and the distance of 6 m between groups of packages or overpacks as required in table 7.1.7.4.2 is met; and ”
Minor	5.1.5.2.4 (d)	(ii) Replace “routing” with “routeing”. Insert a new section 5.1.5.3 to read as follows:
47	"5.1.5.3	Approval of radionuclide values 5.1.5.3.1 When approval of radionuclide values is required according to 2.7.7.2.2, an application for approval shall include: (a) the effective dose rate coefficient to the skin for external dose due to photons calculated at 1m; (b) the equivalent dose rate coefficient for external dose due to beta emission calculated at 1 m; (c) the effective dose coefficient for the inhalation of a 1 µm AMAD aerosol of the radionuclide by workers, in the most restrictive lung absorption category; (d) the equivalent dose coefficient to the skin for skin contamination; (e) if the radionuclide is a noble gas, the effective dose coefficient or the equivalent dose coefficient to the skin for submersion dose; and (f) the calculated values for A1 and A2 in TBq, the activity concentration for exempt material in Bq/g; and the activity limits for exempt <i>consignments</i> in Bq. 5.1.5.3.2 The <i>competent authority</i> shall establish an approval stating that the calculated radionuclide values are approved." Renumber existing 5.1.5.3 as 5.1.5.4
47	5.1.5.3.1	(renumbered as 5.1.5.4.1): Insert a new sub-paragraph (b) to read: "(b) Unlisted radionuclide values for which approval is required according to 2.7.7.2.2."

IAEA change reference	UN para.	Proposed changes
22	5.2.1.5.4 (c)	(c) Replace the end of the sentence with "either the name of the manufacturer or other identification of the packaging specified by the competent authority of the country of origin of design." Add:
62	"5.2.1.5.8	In case of international transport of packages requiring competent authority design or shipment approval, for which different approval types apply in the different countries concerned, marking shall be in accordance with the certificate of the country of origin of the design."
Minor	5.2.2.1.12.2 (b) 5.4.1.5.7.1(c) 5.1.5.2.4(d)(v)	Insert "symbol" after "SI prefix". Add:
62	"5.2.2.1.1.2.5	In case of international transport of packages requiring competent authorities design or shipment approval, for which different approval types apply in the different countries concerned, labelling shall be in accordance with the certificate of the country of origin of design."
Minor	5.3.1.1.5.1	Replace: "which conform with the model 7D" with "which conform to the model 7D".
Minor	5.4.1.5.7.2(b)	Replace "routing" with "routeing" Add:
62	"5.4.1.5.7.3	In case of international transport of packages requiring competent authorities design or shipment approval, for which different approval types apply in the different countries concerned, the UN number and proper shipping name required in 5.4.1.4.1 shall be in accordance with the certificate of the country of origin of design."
	6.4.5.2	Amend sub-paragraph (b) to read:
24		"(b) more than a 20% increase in the maximum radiation level at any external surface of the package." Consequential changes in 6.4.5.4.1(c) (ii), 6.4.5.4.2(i), 6.4.5.4.4(c) (ii), 6.4.5.4.5(b) (ii) and 6.4.7.14(b).
Minor	6.4.7.16	Amend the beginning as follows: "A Type A package designed to contain liquids liquid radioactive material shall, in addition:".
	6.4.8.3	Amend to read:
26		"Except as required in 6.4.3.1 for a package transported by air, a A package shall be so designed that, under the ambient condition specified in 6.4.8.5 and in the absence of insolation , the temperature of the accessible surfaces of a package shall not exceed 50 °C, unless the package is transported under exclusive use."

IAEA change reference	UN para.	Proposed changes
26	6.4.8.13	Delete this paragraph and replace it with 6.4.8.4 as follows:
26	"6.4.8.4	Except as required in 6.4.3.1 for a package transported by air, the maximum temperature of any surface readily accessible during transport of a package under exclusive use shall not exceed 85 °C in the absence of insolation under the ambient conditions specified in 6.4.8.5. The package shall be carried under exclusive use, as specified in 6.4.8.3, if this maximum temperature exceeds 50 °C. Account may be taken of barriers or screens intended to give protection to persons without the need for the barriers or screens being subject to any test."
26	6.4.8.4 to 6.4.8.12	Renumber as 6.4.8.5 to 6.4.8.13. Amend all cross-references accordingly.
32	6.4.11.2 (a)	Amend the end of the introductory sentence to read: "provided that the smallest external dimension of each package is not less than 10 cm and that either : "
31		Amend (a) (iii) to read as follows: "(iii) there is not more than 5 g of <i>fissile material</i> 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 6.4.11.2, except for deuterium in natural concentration in hydrogen. "
38	6.4.11.7	(b) Amend the beginning to read: "For packages containing uranium hexafluoride with maximum enrichment of 5 mass percent uranium-235: "
42	6.4.22.1	(a) and (b) Amend to read as follows: "(a) Each design that meets the requirements of 6.4.6.4 shall require multilateral approval; (b) Each design that meets the requirement of 6.4.6.1 to 6.4.6.3 shall require unilateral approval by the competent authority of the country of origin of the design, unless multilateral approval is otherwise required by these Regulations."
Minor	6.4.23.3 (a)	Replace "the consignment" with "the shipment".
Minor	6.4.23.12 (e)	Replace "routing" with "routeing".
	6.4.23.14	Insert new paragraphs, (l) (bis), (m) (i) (bis) and (n) (bis) and renumber accordingly:
57	"(l) (bis)	A description of the containment system;"
57	"(m) (i) (bis)	A description of the confinement system;"

IAEA change reference	UN para.	Proposed changes
56		“(n) (bis) For <i>packages</i> containing more than 0.1 kg of uranium hexafluoride, a statement specifying those prescriptions of 6.4.6.4 that apply if any and any amplifying information which may be useful to other competent authorities.”
52	6.4.23.15	Delete the last sentence
49	6.4.24.3	In the first sentence, read: “...to be used until 31 December 2003 , subject to: multilateral approval of package design , the mandatory programme of <i>quality assurance</i> ...” Delete: “After this date use may continue subject, additionally, to multilateral approval of package design. “
61	7.1.7.1.1	Amend to read as follows: "Packages, overpacks and <i>freight containers</i> containing <i>radioactive material</i> and unpackaged radioactive material shall be segregated during transport and during storage in transit: (a) from workers in regularly occupied working areas by distances calculated using a dose criterion of 5 mSv in a year and conservative model parameters; (b) from members of the critical group of the public, in areas where the public has regular access, by distances calculated using a dose criterion of 1 mSv in a year and conservative model parameters; (c) from undeveloped photographic film by distances calculated using a radiation exposure criterion for undeveloped photographic film due to the transport of radioactive material fo 0.1 mSv per consignment of such film; and (d) from other dangerous goods in accordance with [7.1.2 and 7.1.3.2].
61	7.1.7.1.3	Delete.
	7.1.7.3.3 (a)	Amend the beginning to read:
23		“Except under the condition of exclusive use, and for consignments of LSA-I material, the total number of packages, ...” (rest unchanged) Delete the last sentence. (g) Delete. (Renumber (c) and (d) as (b) and (c)).

Additional consequential changes due to the new definition "Fissile-Nuclide, Material" :

Section, Para. or location (number of occurrences)	Change
2.7.7.1.7 Contents (3)	“(a) quantities of fissile material and/or fissile nuclides not authorized...” “(b) any radionuclide different from ...”
5.2.2.1.12.2 (b) Activity (2)	“For fissile material, the mass of fissile nuclides ...”
5.4.1.5.7.1 (c) (2)	“For fissile material, the mass of fissile nuclides ...”
5.1.5.2.4 (d) (v) Notification (2)	“For fissile material, the mass of fissile nuclides ...”
6.4.11.2 (a) Formula	Mass of other fissile nuclides
6.4.11.2 (a)(i) 15 g	15 g of fissile nuclides
6.4.11.2 (a)(iii) 5 g/10 l	5 g of fissile nuclides ?
6.4.11.2 (b) 1% enrichm.	provided that the fissile nuclides
Table 6.4.11.2, body (3)	"fissile nuclides " "other fissile nuclides" "fissile nuclides mass" (twice)
6.4.23.12 (j) Special arr. App. cert. Contents	(for fissile material and/or fissile nuclides)
6.4.23.13 (j) Shipm. Appr.	(for fissile material and/or fissile nuclides)
6.4.23.14 (l) Package design, Contents	(for fissile material and/or fissile nuclides)