

**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

Twenty-eighth session  
Geneva, 28 November – 7 December 2005  
Item 7 of the provisional agenda

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

Transmitted by the expert from the United Kingdom

1. The Sub-Committee will recall that the expert from the United Kingdom presented ST/SG/AC.10/C.3/2005/19 at the 27<sup>th</sup> session in July. The expert from the United Kingdom has long believed that as the IAEA has moved to a biennial review of its regulations and as the UN Sub-Committee is often asked to comment on proposals for amendment, it makes sense to review the differences between the two sets of regulations to see what can be harmonized. The paper that the United Kingdom presented in July was intended to start this process.
2. The expert from the United Kingdom was disappointed that that the proposed consultant meeting that IAEA indicated it would organize in October of this year (see paragraph 76 of the Official report, ST/SG/AC.10/C.3/54) did not take place. Nevertheless the United Kingdom has produced this Information paper as a means of ensuring that this work continues to develop.
3. The United Kingdom continues to strongly believe that further development needs to be undertaken by the UN Sub-Committee and IAEA. It is to be hoped that a joint meeting could be held before July 2006 so that the United Kingdom's papers could be reviewed and consolidated into formal proposals for both the UN Model Regulations and those for the IAEA.
4. The current information paper is laid out as follows:

Annex A contains proposed revisions to Annex 5 of 2005/19.

Annex B contains new proposed changes to Part 5 of the Model Regulations.

Annex C contains comments on Chapter 6.4 of the Model Regulations which covers packaging of Class 7.

Annex D Part 7 of the Model Regulations suggests that no changes are necessary to the Model Regulations.

Annex E contains proposed changes to Annex 6 of 2005/19 which lists possible consequential amendments following adoption of the UK proposals.
5. The expert from the United Kingdom proposes that:
  - (1) The Sub-Committee and the IAEA work together inter-sessionally to review the UK proposals in order to submit new text for adoption by the next session of each parent body.
  - (2) Members of the Sub-Committee now review the proposed texts put forward in 2005/19 and this paper and either comment verbally during the current session or in writing to the Expert from the United Kingdom by the end of January 2006

**Annex A Revision to Annex 5 of 2005/19****PART 4****Chapter 4.1 Packagings, IBCs and large packagings**

The text in Chapter 4.1.9 along with some provisions in Part 5 can form packing instructions.

**Class 7 Packing instructions**

Add to 4.1.4.1

<b>P 701</b>		<b>P 701</b>
This instruction applies to: LSA material and SCO		
Packagings are authorised provided the provisions of 4.1.9 are met.		
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 4.1.9.2.1 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 7.1.7.2 shall not be exceeded. A single package of non-combustible solid LSA-II or LSA-III material, if carried by air, shall not contain an activity greater than 3000 A <sub>2</sub> .		
The quantity of LSA material or SCO in a single Type IP-1 package, Type IP-2 package, Type IP-3 package, 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.		
LSA material and SCO, except as otherwise specified in 4.1.9.2.3, shall be packaged in accordance with the table below		
<i>Industrial package requirements for LSA material and SCO</i>		
Radioactive contents	Industrial package type	
	Exclusive use	Not under exclusive use
LSA-I		
Solid <sup>a</sup>	Type IP-1	Type IP-1
Liquid	Type IP-1	Type IP-2
LSA-II		
Solid	Type IP-2	Type IP-2
Liquid and gas	Type IP-2	Type IP-3
LSA-III	Type IP-2	Type IP-3
SCO-I <sup>a</sup>	Type IP-1	Type IP-1
SCO-II	Type IP-2	Type IP-2
<sup>a</sup> Under the conditions specified in 4.1.9.2.3, LSA-I material and SCO-I may be transported unpackaged.		

<b>P 702</b>	<b>P 702</b>
This instruction applies to: Type A Packagings	
Packagings are authorised provided the provisions of 4.1.9 are met.	
<p>Type A packages shall not contain activities greater than the following:</p> <p>(a) For special form radioactive material - A<sub>1</sub>; or</p> <p>(b) For all other radioactive material - A<sub>2</sub>.</p> <p>For mixtures of radionuclides whose identities and respective activities are known, the following condition shall apply to the radioactive contents of a Type A package:</p> $\sum_i \frac{B(i)}{A_1(i)} + \sum_j \frac{C(j)}{A_2(j)} \leq 1$ <p>where B(i) is the activity of radionuclide i as special form radioactive material and A<sub>1</sub>(i) is the A<sub>1</sub> value for radionuclide i; and</p> <p>C(j) is the activity of radionuclide j as other than special form radioactive material and</p> <p>A<sub>2</sub>(j) is the A<sub>2</sub> value for radionuclide</p>	

<b>P 703</b>	<b>P 703</b>
This instruction applies to: Type B(U) and Type B(M) packages	
Packagings are authorised provided the provisions of 4.1.9 are met.	
<p>Type B(U) and 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> <p>(c) Contents in a form, or a physical or chemical state different from those authorized for the package design</p> <p>as specified in their certificates of approval.</p> <p>Type B(U) and Type B(M) packages, if transported by air, shall in addition not contain activities greater than the following:</p> <p>(a) For low dispersible radioactive material - as authorized for the package design as specified in the certificate of approval;</p> <p>(b) For special form radioactive material - 3000 A<sub>1</sub> or 100 000 A<sub>2</sub>, whichever is the lower; or</p> <p>(c) For all other radioactive material - 3000 A<sub>2</sub>.</p>	

<b>P 704</b>	<b>P 704</b>
This instruction applies to Type C packages	
Packagings are authorised provided the provisions of 4.1.9 are met.	
<p style="text-align: center;">Type C packages shall not contain:</p> <ul style="list-style-type: none"> <li>(a) Activities greater than those authorized for the package design;</li> <li>(b) Radionuclides different from those authorized for the package design; or</li> <li>(c) Contents in a form, or physical or chemical state different from those authorized for the package design;</li> </ul> <p>as specified in their certificates of approval</p>	

<b>P 705</b>	<b>P 705</b>
This instruction applies to packages for fissile material	
Packagings are authorised provided the provisions of 4.1.9 are met.	
<p style="text-align: center;">Packages containing fissile material shall not contain:</p> <ul style="list-style-type: none"> <li>(a) A mass of fissile material different from that authorized for the package design;</li> <li>(b) Any radionuclide or fissile material different from those authorized for the package design; or</li> <li>(c) Contents in a form or physical or chemical state, or in a spatial arrangement, different from those authorized for the package design;</li> </ul> <p>as specified in their certificates of approval where appropriate.</p>	

<b>P 706</b>	<b>P 706</b>
This instruction applies to packages containing uranium hexafluoride	
Packagings are authorised provided the provisions of 4.1.9 are met.	
<p>The mass of uranium hexafluoride in a package shall not exceed 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. The uranium hexafluoride shall be in solid form and the internal pressure of the package shall be below atmospheric pressure when presented for transport.</p>	

Amend 4.1.9 as follows:

**“4.1.9 Special packing provisions for Class 7**  
**4.1.9.1 General**

4.1.9.1.1 to 5 **Unchanged but add new**

4.1.9.1.6 from 5.1.5.1.1 Before the first shipment of any package, the following requirements shall be fulfilled:

- (a) If the design pressure of the containment system exceeds 35 kPa (gauge), it shall be ensured that the containment system of each package conforms to the approved design requirements relating to the capability of that system to maintain its integrity under that pressure;
- (b) For each Type B(U), Type B(M) and Type C package and for each package containing fissile material, it shall be ensured that the effectiveness of its shielding and containment and, where necessary, the heat transfer characteristics and the effectiveness of the confinement system, are within the limits applicable to or specified for the approved design;
- (c) For packages containing fissile material, where, in order to comply with the requirements of 6.4.11.1, neutron poisons are specifically included as components of the package, checks shall be performed to confirm the presence and distribution of those neutron poisons.

4.1.9.1.7 from 5.1.5.12 Before each shipment of any package, the following requirements shall be fulfilled:

- (a) For any package it shall be ensured that all the requirements specified in the relevant provisions of these Regulations have been satisfied;
- (b) It shall be ensured that lifting attachments which do not meet the requirements of 6.4.2.2 have been removed or otherwise rendered incapable of being used for lifting the package, in accordance with 6.4.2.3;
- (c) For each package requiring competent authority approval, it shall be ensured that all the requirements specified in the approval certificates have been satisfied;
- (d) Each Type B(U), Type B(M) and Type C package shall be held until equilibrium conditions have been approached closely enough to demonstrate compliance with the requirements for temperature and pressure unless an exemption from these requirements has received unilateral approval;
- (e) For each Type B (U), Type B (M) and Type C package, it shall be ensured by inspection and/or appropriate tests that all closures, valves, and other openings of the containment system through which the radioactive contents might escape are properly closed and, where appropriate, sealed in the manner for which the demonstrations of compliance with the requirements of 6.4.8.8 and 6.4.10.3 were made;
- (f) For each special form radioactive material, it shall be ensured that all the requirements specified in the approval certificate and the relevant provisions of these Regulations have been satisfied;
- (g) For packages containing fissile material the measurement specified in 6.4.11.4(b) and the tests to demonstrate closure of each package as specified in 6.4.11.7 shall be performed where applicable;

- (h) For each low dispersible radioactive material, it shall be ensured that all the requirements specified in the approval certificate and the relevant provisions of these Regulations have been satisfied.

4.1.9.1.8 from 5.1.5.3.2 The consignor shall also have a copy of any instructions with regard to the proper closing of the package and any preparation for shipment before making any shipment under the terms of the certificates.

4.1.9.1.9 from 5.1.5.3.3 For package designs where a competent authority issued certificate is not required, the consignor shall, on request, make available for inspection by the relevant competent authority, documentary evidence of the compliance of the package design with all the applicable requirements.

#### **4.1.9.2 Requirements and controls for transport of LSA material and SCO**

4.1.9.2.1 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.

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

- (a) All unpackaged material other than ores containing only naturally occurring radionuclides shall be transported in such a manner that under routine conditions of transport there will be no escape of the radioactive contents from the conveyance nor will there be any loss of shielding;
- (b) Each conveyance shall be under exclusive use, except when only transporting SCO-I on which the contamination on the accessible and the inaccessible surfaces is not greater than ten times the applicable level specified in 2.7.2; and
- (c) For SCO-I where it is suspected that non-fixed contamination exists on inaccessible surfaces in excess of the values specified in 2.7.5(a) (i), measures shall be taken to ensure that the radioactive material is not released into the conveyance.

Remainder of text now in P701

#### **Chapter 4.2 Portable tanks**

4.2.1.16.2 *This should be deleted as it repeats TP4 which is shown in Column 11*

#### **Chapter 4.3 Bulk**

*No changes*

## Annex B Part 5

### Chapter 5.1

5.1.3 Empty packagings

*No Changes proposed*

**5.1.5 General provisions for Class 7**

**5.1.5.1 Requirements before shipments**

5.1.5.1.1 *First shipment of a package*

*Moved to a new 4.1.9.1.6*

5.1.5.1.2 *Each shipment*

*Moved to a new 4.1.9.7*

*The remainder of the Chapter is unchanged but the paragraphs will need to be renumbered and some cross references updated as follows:*

**5.1.5.1 Approval of shipments and notification**

**5.1.5.1.1 General**

**5.1.5.1.2 Shipment approvals**

**5.1.5.1.3 Shipment approval by special arrangement**

**5.1.5.1.4 Notifications**

**5.1.5.2 Certificates issued by Competent Authority**

5.1.5.2.1

5.1.5.3.2 The consignor shall be in possession of a copy of each applicable certificate.  
*2<sup>nd</sup> sentence moved to 4.1.9.1.8*

5.1.5.3.3 *Moved to 4.1.9.1.9*

### Chapter 5.2

5.2.1.5.2 *Delete the first sentence as it is already dealt with in 5.2.1.1*

5.2.1.5.4 to 8 *Should really be in Chapter 6.4 as it is a specification mark for the packaging but it is not practical to do this within the current exercise*

### Chapter 5.3

*No changes proposed*

### Chapter 5.4

In 5.4.1.5.7.2 (c) add "(see 5.4.3)"

### **Annex C Chapter 6.4**

To undertake work on this chapter will be a major exercise

The packaging arrangements for class 7 are quite different from the other provisions for example some UN packagings (6.1, 6.5 and 6.6) can be used but at the same time a freight container can be a package and an overpack.

Not all the testing arrangements and procedures appear in Chapter 6.4 they are further defined in the Guidance material and some of this text would be found for other packaging types in the relevant Chapters of the Recommendations.

For example:

the water spray test procedures and reasons to exempt package types from this test are detailed in the guidance or

the drop test procedures are supplemented by the guidance where it says that “light” packages may have to be dropped several times.

Finally the marking scheme for approved packages is currently in 5.2.1.5.4 to 6.



**Annex D Part 7**

No proposals are necessary in this area.

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**Annex E; Amended Annex 6 from 2005/19**

**Consequential changes that need to be checked**

**Part 1**

Chapter 1.1 1.1.1.6 (b) “2.7.9.1 becomes 3.4.2.1”, “Table 2.7.7.1.2.1 becomes 2.7.6.1.2.1”

Chapter 1.2 Consider adding a new definition:

*Radioactive materials* see chapter 1.5.3 for definitions

**Part 2**

**Part 3**

Chapter 3.2 For UN 2912, 2913, 3321 and 3322 in columns 8-11 replace the text “See Chapters 2.7 and 4.1.9” with “See Chapters 2.7, 4.1.9 and 4.1.2.16”

This is a change that should be adopted immediately. The current references do not address portable tank requirements.

**Part 4**

Chapter 4.1 4.1.9.1.1 reference to 2.7.7.1 becomes 3.4.2  
4.1.9.2.3(b) reference to 2.7.2 becomes 1.5.3  
4.1.9.2.3(c) reference to 2.7.5 (a) (i) becomes 2.7.4. (a) (i)

**Part 5**

Chapter 5.1 5.1.5.2.3 reference to 1.1.2.4 becomes 1.5.2.4

**Part 6**

Chapter 6.4 6.4.4 references to 6.4.2 and 6.4.3 becomes 3.4  
6.4.10.3(ii) references to 2.7.7.2.4 to 2.7.7.2.6 become 2.7.6.2.4 to 2.7.6.2.6  
6.4.14 reference to 2.7.4.5 becomes 2.7.3.5  
6.4.24.1 reference to 2.7.7 becomes 2.7.6.1  
6.4.24.2 reference to 2.7.7 becomes 2.7.6.1

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