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**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****Fiftieth session**

Geneva, 28 November-6 December 2016

Item 2 (c) of the provisional agenda

**Recommendations made by the Sub-Committee  
on its forty-seventh, forty-eighth  
and forty-ninth sessions and pending issues:  
listing, classification and packing****Dangerous goods in machinery, apparatus or articles, N.O.S****Transmitted by the expert from the United Kingdom<sup>1</sup>****Introduction**

1. The forty-ninth session of the Sub-Committee held further discussion on the issue of articles containing various quantities of dangerous goods (or residues thereof) presented in ST/SG/AC.10/C.3/2016/34. This paper reflects the outcome of those discussions and the work done subsequently. The main change in this version of the proposal is, by way of a new special provision, to require competent authority approval of the packaging of articles containing in excess of limited quantities of:

- (a) Toxic gases; or
- (b) Oxidising substances liable to spontaneous combustion; or
- (c) Substances which, in contact with water, emit flammable gases; or
- (d) Oxidising substances; or

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<sup>1</sup> In accordance with the programme of work of the Sub-Committee for 2015–2016 approved by the Committee at its seventh session (see ST/SG/AC.10/C.3/92, paragraph 95 and ST/SG/AC.10/42, para. 15).

- (e) Organic peroxides; or
  - (f) Substances of Division 6.1 with an inhalation toxicity requiring Packing Group I.
2. Whereas, for more common articles containing other dangerous goods that are subject to these provisions it presents generic packing instructions. As we gain experience in dealing with articles containing the dangerous goods listed in paragraph 1, it might be possible to accommodate them within the generic packing instructions in subsequent Editions of the Model Regulations.
3. Other changes in this version of the proposal include:
- (a) The improvements presented in informal document INF.26 (forty-ninth session) by the Netherlands;
  - (b) A requirement to include the lithium battery mark when the article(s) contain larger lithium batteries; and
  - (c) A reference to special provision 274 for the new UN entries in the Dangerous Goods List.

## Discussion

4. This proposal loses its purpose if competent authority approval of the packaging of articles containing in excess of limited quantities of dangerous goods is required in all cases. A greater level of support for the generic packing instructions might be obtained if competent authority approval of the packaging is required just for articles containing in excess of limited quantities as listed in paragraph 1 above. This is achieved by special provision SP XXX in the relevant new UN entries in Chapter 3.2.
5. As a corollary, the generic packing instructions apply without competent authority approval of the packaging for articles containing in excess of limited quantities of:
- (a) Gases of Division 2.1, or Division 2.2; or
  - (b) Flammable liquids of Class 3; or
  - (c) Flammable solids of Division 4.1; or
  - (d) Substances of Division 6.1 (with the exception of substances with an inhalation toxicity requiring Packing Group I); or
  - (e) Corrosives of Class 8; or
  - (f) Miscellaneous dangerous goods of Class 9.

The majority of articles containing dangerous goods in excess of limited quantities are likely to fall into this grouping of dangerous goods. However, when an article contains more than one dangerous good that is either gases of Class 2, liquid desensitized explosives of Class 3 or self-reactive substances and solid desensitized explosives of Division 4.1 competent authority approval of the packaging is required.

6. This version also excludes items having the sole function of containing the dangerous goods from transport as articles. This has the effect of excluding an inner packaging or a fuel tank from being considered as an article and transported under the new UN numbers.

7. This version also allows the transport of robust articles such as gearboxes and axle units to be unpackaged without the need for competent authority approval if the articles are constructed and designed so that the receptacles containing the dangerous goods are afforded adequate protection such that an outer packaging is not required.
8. Taken together these changes lead to some simplification of the proposal making the flow diagram contained in ST/SG/AC.10/C.3/2016/34 unnecessary. More simply:
- (a) Articles containing dangerous goods are not subject to these regulations where the quantity of dangerous goods contained within each article is below the quantity permitted in Excepted Quantities as indicated in Column 7b of the Dangerous Goods List in Chapter 3.2 for all the dangerous goods contained;
  - (b) Items that have the sole function of containing the dangerous goods shall not be transported as articles;
  - (c) Articles containing one or more dangerous goods that are not an integral element of the article necessary for its function are to be classified according to Part 2;
  - (d) Articles having a more specific proper shipping name already in the Dangerous Goods List of Chapter 3.2 shall be assigned to that entry;
  - (e) Where the quantity of dangerous goods contained in the article is within the limited quantity amounts, the article shall be assigned to UN 3363;
  - (f) If the article contains Class 1, Division 6.2 or Class 7 the article shall not be transported in accordance with these new provisions;
  - (g) Competent authority approval of the packaging is required for articles containing dangerous goods of Division 2.3, Division 4.2, Division 4.3, Division 5.1, Division 5.2 or substances with a Packing Group I value of inhalation toxicity of Division 6.1; and
  - (h) Competent authority approval of the packaging is also required for articles containing more than one dangerous goods of the following types:
    - (i) Gases of Division 2.1 or 2.2; or
    - (ii) Liquid desensitized explosives of Class 3; or
    - (iii) Self-reactive substances and solid desensitized explosives of Division 4.1.

## Proposal

9. The proposal that follows makes the assertion that articles generally possess properties that ought to earn some credit in how they are treated by the Model Regulations. Many articles are mass-produced under a quality management system incorporating the elements listed in 2.9.4 (e). They often have to pass consumer product tests to show that they are safe for use before placement on the market. Consequently, this proposal offers a pragmatic and simpler set of provisions for articles. For example, it assigns the use of packaging associated with the Packing Group II level of performance. Even if this assertion and this proposal win the support of the Sub-Committee, further work may be required to review Chapter 6.1 so that it deals more explicitly with articles and to update the guiding principles.

10. Insert the following new section into Chapter 2.0 of the Model Regulations:

**“2.0.5 Transport of dangerous goods in articles not listed in the Dangerous Goods List**

**NOTE 1:** For articles which do not have an existing proper shipping name and which contain only dangerous goods within the permitted limited quantity amounts specified in Column 7a of the Dangerous Goods List, see UN No. 3363 and special provision 301.

2.0.5.1 For the purposes of this section an ‘article’ means machinery, apparatus or other devices containing one or more dangerous goods (or residues thereof) that are an integral element of the article, necessary for its functioning and that cannot be removed for the purpose of transport. An inner packaging shall not be an article.

2.0.5.2 Such articles may in addition contain batteries. Lithium batteries that are integral to the article shall be of a type proven to meet the testing requirements of the Manual of Tests and Criteria, part III, sub-section 38.3, except when otherwise specified by these Regulations (e.g. for pre-production prototype articles containing lithium batteries or for a small production run, consisting of not more than 100 such articles).

2.0.5.3 This section does not apply to articles for which a more specific proper shipping name already exists in the Dangerous Goods List of Chapter 3.2.

2.0.5.4 This section does not apply to dangerous goods of Class 1, Division 6.2, Class 7 or radioactive material contained in articles.

2.0.5.5 Dangerous goods contained in articles shall be assigned to the appropriate Class or Division determined by the primary hazard in accordance with the Precedence of Hazards table in 2.0.3.3 for each of the dangerous goods contained in the article. If dangerous goods classified as Class 9 are contained within the article, all other dangerous goods present in the article shall be considered to present a higher hazard.

2.0.5.6 Subsidiary hazards shall be representative of the primary hazard posed by the other dangerous goods contained within the article or they shall be the subsidiary hazard(s) identified in column 4 of the Dangerous Goods List when only one dangerous good is present in the article. If the article contains more than one dangerous good and these could react dangerously with one another during transport, each of the dangerous goods shall be separately enclosed (see 4.1.1.6).

11. Amend section 3.1.2.8.1.2 and .3 as follows (new text underlined, deleted text strikethrough):

“3.1.2.8.1.2 When a mixture of dangerous goods or dangerous goods in articles are described by one of the “N.O.S” or “generic” entries to which special provision 274 has been allocated in the Dangerous Goods List,” [*the remainder of text is to remain the same*].

“3.1.2.8.1.3 Examples illustrating the selection of the proper shipping name supplemented with the technical name of the goods for such N.O.S entries are:

UN 2902	PESTICIDE, LIQUID, TOXIC, N.O.S. (drazoxolon)
UN 3394	ORGANOMETALLIC SUBSTANCE, LIQUID, PYROPHORIC, WATER REACTIVE (trimethylgallium)
<u>UN 35DD</u>	<u>DANGEROUS GOODS IN ARTICLES, N.O.S. (pyrrolidine)</u>

12. Add a new special provision into Chapter 3.3:

“XXX Articles containing dangerous goods of Division 2.3, or Division 4.2, or Division 4.3, or Division 5.1, or Division 5.2 or Division 6.1 for substances of inhalation toxicity requiring Packing Group I and articles containing more than one of the hazards listed in 2.0.3.1 (b), (c), or (d) may be transported under this entry as approved by the competent authority.”

13. Add a new section into Chapter 5.2 as follows:

“5.2.2.1.13 *Labels for articles containing dangerous goods transported as UN Nos. 35AA, 35BB, 35CC, 35DD, 35EE, 35FF, 35GG, 35HH, 35II, 35JJ, 35KK and 35LL*

5.2.2.1.13.1 Packages containing dangerous goods in articles and dangerous goods in articles transported unpackaged shall bear labels according to 5.2.2.1.2 reflecting the primary hazard and subsidiary hazards established according to 2.0.5. If the article contains one or more lithium batteries with an aggregate lithium content of more than 2 g, and for lithium ion batteries, the Watt-hour rating is more than 100Wh, the lithium battery mark (figure 5.2.5) shall be affixed to the package or unpackaged article.

5.2.2.1.13.2 When it is required to ensure articles containing liquid dangerous goods remain in their intended orientation, orientation marks meeting 5.2.1.7.1 shall be affixed and visible on at least two opposite vertical sides of the packaged or unpackaged article where possible, with the arrows pointing in the correct upright direction.”

14. Add the following new UN entries to Chapter 3.2 Dangerous Goods List and amend existing UN entries as follows (new text underlined, ~~deleted text strikethrough~~):

UN No.	Name and description	Class or division	Subsidiary risk hazard	UN packing group	Special provisions	Limited and excepted quantities		Packagings and IBCs		Portable tanks and bulk containers	
						(7a)	(7b)	Packing instruction	Special packing provisions	Instructions	Special provisions
(1)	(2)	(3)	(4)	(5)	(6)	(7a)	(7b)	(8)	(9)	(10)	(11)
-	<u>3.1.2</u>	<u>2.0</u>	<u>2.0</u>	<u>2.0.1.3</u>	<u>3.3</u>	<u>3.4</u>	<u>3.5</u>	<u>4.1.4</u>	<u>4.1.4</u>	<u>4.2.5 / 4.3.2</u>	<u>4.2.5</u>
<u>35AA</u>	<u>FLAMMABLE GAS IN ARTICLES, N.O.S.</u>	<u>2.1</u>	<u>See [2.0.5.5]</u>		<u>274</u> <u>XXX</u>	<u>0</u>	<u>E0</u>	<u>P00X</u> <u>LP00X</u>			

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35BB	NON- FLAMMABLE, NON TOXIC GAS IN ARTICLES, N.O.S.	2.2	See [2.0.5.5]	274 XXX	0	E0	P00X LP00X
35CC	TOXIC GAS IN ARTICLES N.O.S.	2.3	See [2.0.5.5]	274 XXX	0	E0	P00X LP00X
35DD	FLAMMABLE LIQUID IN ARTICLES, N.O.S.	3	See [2.0.5.5]	274 XXX	0	E0	P00X LP00X
35EE	FLAMMABLE SOLID IN ARTICLES, N.O.S.	4.1	See [2.0.5.5]	274 XXX	0	E0	P00X LP00X
35FF	SUBSTANCE LIABLE TO SPONTANEOUSLY COMBUST IN ARTICLES, N.O.S.	4.2	See [2.0.5.5]	274 XXX	0	E0	P00X LP00X
35GG	SUBSTANCE LIABLE TO EMIT FLAMMABLE GAS IN CONTACT WITH WATER IN ARTICLES, N.O.S.	4.3	See [2.0.5.5]	274 XXX	0	E0	P00X LP00X
35HH	OXIDIZING SUBSTANCE IN ARTICLES, N.O.S.	5.1	See [2.0.5.5]	274 XXX	0	E0	P00X LP00X
35II	ORGANIC PEROXIDE IN ARTICLES, N.O.S.	5.2	See [2.0.5.5]	274 XXX	0	E0	P00X LP00X
35JJ	TOXIC SUBSTANCE IN ARTICLES, N.O.S.	6.1	See [2.0.5.5]	274 XXX	0	E0	P00X LP00X
35KK	CORROSIVE SUBSTANCE IN ARTICLES, N.O.S.	8	See [2.0.5.5]	274 XXX	0	E0	P00X LP00X
35LL	MISCELLANEOUS DANGEROUS GOODS IN ARTICLES, N.O.S.	9	See [2.0.5.5]	274 XXX	0	E0	P00X LP00X
3363	DANGEROUS GOODS IN MACHINERY, or DANGEROUS GOODS IN APPARATUS ARTICLES, N.O.S. in limited quantities	9		301	0	E0	P907

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15. Amend Special Provision 301 in Chapter 3.3 as follows (new text underlined, deleted text strikethrough):

“301 This entry only applies to ~~machinery, articles or apparatus~~ containing dangerous ~~substances~~ goods as a residue or an integral element of the ~~machinery, article or apparatus~~. It shall not be used for ~~machinery, articles~~ performing the sole function of containing the dangerous good nor for ~~articles or apparatus~~ for which a more specific proper shipping name already exists in the Dangerous Goods List of Chapter 3.2. ~~Machinery, Articles and apparatus~~ transported under this entry shall only contain dangerous goods, which are authorized to be transported in accordance with the provisions of Chapter 3.4 (Limited quantities). The quantity of dangerous goods in ~~machinery, articles or apparatus~~ shall not exceed the quantity specified in Column 7a of the Dangerous Goods List of Chapter 3.2 for each item of dangerous goods contained. If the ~~machinery, article or apparatus~~ contains more than one item of dangerous goods, the individual substances shall ~~not be~~ enclosed to prevent them reacting dangerously with one another during transport (see 4.1.1.6). When it is required to ensure liquid dangerous goods remain in their intended orientation, package orientation labels meeting 5.2.1.7.1 shall be affixed and visible on at least two opposite vertical sides where possible, with the arrows pointing in the correct upright direction.

The competent authority may exempt from regulation ~~machinery, articles or apparatus~~ which would otherwise be transported under this entry. ~~The transport of dangerous goods in machinery or apparatus where the quantity of dangerous goods exceeds the quantity specified in Column 7a of the Dangerous Goods List of Chapter 3.2 is authorized when approved by the competent authority, except where special provision 363 applies.”~~

16. Insert the following new packing instruction into 4.1.4.1 as follows:

P00X	PACKING INSTRUCTION	P00X
This instruction applies to UN Nos.: 35AA, 35BB, 35CC, 35DD, 35EE, 35FF, 35GG, 35HH, 35II, 35JJ, 35KK and 35LL		
<p>(1) The following packagings are authorized, provided that the general provisions of 4.1.1 and 4.1.3 are met:            Drums (1 A2, 1B2, 1N2, 1H2, 1D, 1G)            Boxes (4A, 4B, 4N, 4C1, 4C2, 4D, 4F, 4G, 4H1, 4H2)            Jerricans (3A2, 3B2, 3H2)</p> <p>Packagings shall conform to the packing group II performance level.</p> <p>(2) In addition, for robust articles the following packagings are authorized:            Strong outer packagings constructed of suitable material and of adequate strength and design in relation to the packaging capacity and its intended use. The packagings shall meet the provisions of 4.1.1.1, 4.1.1.2, 4.1.1.8 and 4.1.3. Articles may be transported unpackaged or on pallets when the dangerous goods contained in the article are afforded equivalent protection by the article in which they are contained.</p> <p>Additionally, the following conditions have to be met:</p> <p>(a) Receptacles within articles containing liquids or solids shall be constructed of suitable materials and secured in the article in such a way that, under normal conditions of transport, they cannot break, be punctured or leak their contents into the article itself or the outer packaging.</p> <p>(b) Receptacles containing liquids with closures shall be packed with their closures correctly oriented. If the receptacle is not leak-tight in all orientations, all openings/closures/valves shall be sealed.</p> <p>(c) Receptacles that are liable to break or be punctured easily, such as those made of glass, porcelain or stoneware or of certain plastics materials shall be properly secured. Any leakage of the contents shall not substantially impair the protective properties of the article or of the outer packaging.</p> <p>(d) Receptacles within articles containing gases shall meet the requirements of 4.1.6 and chapter 6.2 as appropriate or be capable of providing an equivalent level of protection as P200 or P208.</p> <p>(e) Where there is no receptacle within the article, the article shall fully enclose the dangerous substances and prevent their release under normal conditions of transport.</p> <p>(3) Articles shall be packaged to prevent movement and inadvertent operation during normal conditions of transport.</p>		

17. Insert the following new large packing instruction into 4.1.4.1 as follows:

LP00X	PACKING INSTRUCTION	LP00X
This instruction applies to UN Nos.: 35AA, 35BB, 35CC, 35DD, 35EE, 35FF, 35GG, 35HH, 35II, 35JJ, 35KK and 35LL		
<p>The following large packagings are authorized, provided that the general provisions of 4.1.1 and 4.1.3 are met:</p> <p>Rigid large packagings conforming to the packing group II performance level made of            steel (50A);            aluminium (50B);            metal other than steel or aluminium (50N);            rigid plastics (50H);            natural wood (50C);            plywood (50D);            reconstituted wood (50F)            rigid fibreboard (50G)</p>		

## Consequential amendments

18. Add a new paragraph to Chapter 1.1 as follows:

“1.1.1.10 **Dangerous goods in articles**

Articles containing dangerous goods shall not be subject to these regulations where the quantity of dangerous goods contained within each article is below the quantity permitted in Excepted Quantities as indicated in Column 7b of the Dangerous Goods List in Chapter 3.2 for all the dangerous goods contained.”

19. Amend the proper shipping name for UN3363 in the Dangerous Goods List of Chapter 3.2 as follows (new text underlined, deleted text strikethrough):

“3363 DANGEROUS GOODS IN MACHINERY ~~or DANGEROUS GOODS IN APPARATUS~~ ARTICLES, N.O.S. in limited quantities”

(Amendment would also need to be made to the alphabetical index, to Appendix A, the List of Generic and N.O.S. Proper Shipping Names and to Chapter 2.9).

20. Amend 4.1.3.8.1 as follows (new text underlined, deleted text strikethrough):

“4.1.3.8.1 Where large and robust articles cannot be packaged in accordance with the requirements of Chapters 6.1 or 6.6 and they have to be carried transported empty, uncleaned and unpackaged or they cannot be packaged in accordance with P00X or LP00X, the competent authority of the country of origin may approve such carriage-transport. In doing so the competent authority shall take into account that:”  
[the remainder of text is to remain the same].

21. Amend Packing Instruction P907 in 4.1.4.1 as follows (new text underlined, deleted text strikethrough):

“P907 If the article ~~machinery or apparatus~~ is constructed and designed so that the receptacles containing the dangerous goods are afforded adequate protection, an outer packaging is not required. Dangerous goods in articles ~~machinery or apparatus~~ shall otherwise be packed in outer packagings constructed of suitable material, and of adequate strength and design in relation to the packaging capacity and its intended use, and meeting the applicable requirements of 4.1.1.1.

Receptacles containing dangerous goods shall conform to the general provisions in 4.1.1, except that 4.1.1.3, 4.1.1.4, 4.1.1.12 and 4.1.1.14 do not apply. For Division 2.2 gases, the inner cylinder or receptacle, its contents and filling density shall be to the satisfaction of the competent authority of the country in which the cylinder or receptacle is filled.

In addition, the manner in which receptacles are contained within the article ~~machinery or apparatus~~, shall be such that under normal conditions of transport, damage to receptacles containing the dangerous goods is unlikely; and in the event of damage to receptacles containing solid or liquid dangerous goods, no leakage of the dangerous goods from the article ~~machinery or apparatus~~ is possible (a leak proof liner may be used to satisfy this requirement).

Receptacles containing dangerous goods shall be installed, secured or cushioned so as to prevent their breakage or leakage and so as to control their movement within the article ~~machinery or apparatus~~ during normal conditions of transport. Cushioning material shall not react dangerously with the content of the receptacles. Any leakage of the contents shall not substantially impair the protective properties of the cushioning material.”

22. Amend the first sentence of 2.0.3.1 to read (new text underlined):

“2.0.3.1 Precedence of hazard characteristics

The table below shall be used to determine the class of a substance, mixture or solution having more than one ~~risk-hazard~~, when it is not named in the Dangerous Goods List in Chapter 3.2 or to assign the appropriate entry for dangerous goods in articles N.O.S (UN Nos. 35AA to 35LL, see 2.0.5)”. *[The rest is to remain unchanged]*.

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