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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

#### Sixty-third session

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Item 4 (c) of the provisional agenda

#### Electric storage systems:

#### Transport provisions

## Transport of articles containing lithium batteries and other dangerous goods

Submitted by the expert from China\*

### I. Introduction

1. In 2011, the expert from the United Kingdom submitted the document ST/SG/AC.10/C.3/2011/43, describing a “Torch” cigarette lighter with a lithium metal battery installed and requesting the Sub-Committee to clarify if there were any existing provisions for such products.
2. Entries from UN 3537 to UN 3548 have been introduced into the *Model Regulations* since the twentieth revised edition. By allowing to contain dangerous goods which exceed the permitted limited quantity amounts and which are not permitted to be transported in limited quantities, these twelve entries make the appropriate classification for such articles possible. However, with the rapid development of lithium batteries, recent years have witnessed their application in an increasing variety of commercial products, considering the relatively low cost and extremely high energy density. It becomes more and more common for lithium batteries to be placed in the same article with other dangerous goods, just as in the “Torch” cigarette lighter. Examples can be found in the annex of this document. In some articles, lithium batteries and other dangerous goods cannot even be enclosed separately. This forced us to reconsider the transport provisions for such products.
3. First, is it necessary to add some restrictions on the transport of articles containing both lithium batteries and certain classes/divisions of dangerous goods?
4. In the *Technical Instructions* for air transport, packing instructions 965 and 968 have regulated that UN 3480 and UN 3090 shall not be packed in the same outer packaging with dangerous goods classified in Class 1 other than Division 1.4S, Division 2.1, Class 3, Division 4.1 and Division 5.1. Part 7: 2.2.1.2 also specifies that UN 3480 and UN 3090 shall also not be stowed together with these dangerous goods. Certainly, the *Model Regulations* covers a broader range of transport modes, so segregation requirements in these *Regulations*

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\* A/77/6 (Sect. 20), table 20.6



do not have to be the same as those in air transport. However, the prohibition of lithium batteries from being packaged/stowed together with dangerous goods of these classes/divisions in air transport indicates that risk of such combination is relatively high. Should some additional restrictions be made on the transport of articles that contain both lithium batteries and these classes/divisions of dangerous good?

5. Besides, there are now two paragraphs in the *Model Regulations* dealing with the situations where an article contains more than one item of dangerous goods, provision 2.0.5.6 and special provision (SP) 301. However, descriptions in the two paragraphs are slightly different. Provision 2.0.5.6 states “If the article contains more than one item of dangerous goods and these could react dangerously with one another during transport, each of the dangerous goods shall be enclosed separately (see 4.1.1.6)”, which indicates that only dangerous goods that can react dangerously should be enclosed separately. But SP 301 states “If the articles contain more than one item of dangerous goods, the individual dangerous goods shall be enclosed to prevent them reacting dangerously with one another during transport (see 4.1.1.6)”, which indicates that different dangerous goods in the same article should be enclosed separately anyway, regardless of whether they will undergo dangerous reactions.

6. On one hand, although provision 2.0.5.6 and SP 301 are set for different UN numbers, there seems to be no sufficient reason to support the existing differences in regulations when the articles assigned to these UN numbers contain more than one item of dangerous goods. The experts from China invite the Sub-Committee to consider whether it is necessary to make the two paragraphs consistent.

7. On the other hand, lithium batteries are not allowed to be transported in limited quantities. So, articles containing lithium batteries and other dangerous goods cannot be assigned to UN 3363, no matter which class or division the other dangerous goods belong to. It is 2.0.5.6 that should be applied, instead of SP 301, which means only items with the potential to react dangerously shall be enclosed separately. While it is easy to tell whether two substances can undergo dangerous reactions, it becomes challenging when it comes to manufactured articles such as lithium batteries. If only items which can react dangerously should be enclosed separately, what kinds of dangerous goods should be considered as capable of reacting dangerously with lithium batteries?

8. An additional question is how the word “enclosed” should be understood in the context. Does it mean air-tight, water-tight or simply ensuring that the contents do not leak out of the case or jacket under normal transport conditions?

## **II. Actions to be taken by the Sub-Committee**

9. The experts from China would like to remind the Sub-Committee of the potential danger of the increasing number of products with both lithium batteries and other dangerous goods. This poses a great threat, urging us to take action to regulate their transport as soon as possible. The Sub-Committee is invited to consider:

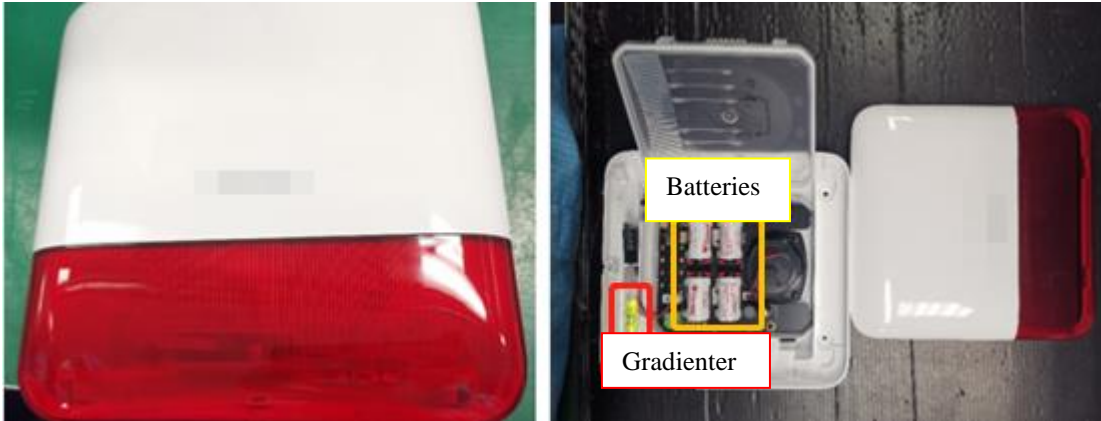
- (a) whether it is necessary to add some restrictions on the transport of articles containing both lithium batteries and certain classes/divisions of dangerous goods (e.g. Class 1 other than Division 1.4S, Division 2.1, Class 3, Division 4.1 and Division 5.1);
- (b) whether the enclosure requirements of dangerous goods in the same article in SP 301 and 2.0.5.6 should be aligned;
- (c) according to the current text in 2.0.5.6, which classes/divisions of dangerous goods shall be enclosed separately with lithium batteries when installed in the same article; and
- (d) how individual dangerous goods in the same article can be regarded as “enclosed separately”.

### III. Annex

#### A. Example 1

1. A wireless outdoor siren containing four primary lithium metal single-cell batteries and a gradienter with a flammable liquid (Class 3) inside.

Lithium content in each cell: 0.47 g



#### B. Example 2:

2. An electronic mouth spray containing a rechargeable lithium-ion battery and a flammable breath freshener (Class 3).
3. The breath freshener can also be packed in the same inner packaging with the spray instead of installed in it.

Watt-hour rating of each battery: 0.74 Wh



**C. Example 3:**

4. A “million match” with a lithium-ion battery and flammable kerosene (Class 3) inside.
5. There is a lithium battery ignition device inside the product, as well as a cotton core soaked in kerosene. When the power is turned on, the ignition device will start immediately when the cotton core is pulled up, igniting the cotton core.
6. In some cases, the kerosene may also be replaced by liquefied butane gas (Division 2.1).

