

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

18 June 2014

Forty-fifth session

Geneva, 23 June – 2 July 2014

Item 5 (e) of the provisional agenda

Electric storage systems: miscellaneous

Comments on ST/SG/AC.10/C.3/2014/12

Transmitted by the expert from France

Introduction

1. The expert from France shares the concerns expressed by the expert from Germany in document ST/SG/AC.10/C.3/2014 /12. In France also several exemptions had to be granted in order to allow some transport of large equipments powered by lithium batteries
2. However we cannot fully support the proposal as it is drafted. As explained in document ST/SG/AC.10/C.3/2014/47 there are other issues related to the transport of prototypes especially related to the transport of prototype vehicles that need to be addressed. And it is not a good idea to address only one of them for the reason explained below. Therefore we prefer not to adopt that doesn't deal with the issue completely

Comments related to the issue of prototype batteries in vehicles

3. Vehicles are a specific type of equipment defined in special provision 240. When containing a lithium battery they have been separated from other equipment that have to be assigned to UN 3091 or UN3481 on the basis that they are mobility equipment designed to carry person. This allows to regulate these items differently in the land modes because they are also used as means of conveyance (see special, provision 123).
4. However from the point of view of safety related to the lithium battery contained they are not so different from other equipment especially when transported as goods. But because of their specific nature vehicles assigned to UN3171 or UN3166 are treated differently in different modes.
5. As vehicles they are not covered for instance in RID/ADR. The status of the contained battery is therefore not addressed. This is interpreted by some that the contained battery needs no design type testing and prototype batteries in vehicles are transported on the basis of that interpretation. Recent discussions in the Joint meeting have shown that this needed clarification and France has been invited to propose a special providing similar clarifications that, for instance, SP 962 does in the IMDG code. (see ECE/TRANS/WP.15/AC.1/134 par.25 to 27.)
6. They are regulated in the air and sea modes and special provisions require the battery contained in them to be in conformity with the manual of test and criteria 38,3. Currently there is no provision for the transport of vehicles containing prototype batteries although this is often more frequently needed than it is for the military application mentioned in the document from Germany.

7. To be consistent a regulation needs to deal with similar risk situations in a similar way. By introducing only requirements for the transport of prototypes in equipment neglecting the specific case of prototype vehicle we will create an ambiguity for operators concerning the entries to be used. It will not be clear if vehicles with prototype batteries may or not be transported or if they must be transported under UN 3091 or 3481 as equipments.

Comments related to the requirements of special provision 310 itself

8. This special provision has been drafted a long time ago. The Sub-Committee has gained considerable experience in between regarding the transport of batteries where the conformity to a design type cannot be verified. Especially when looking at the transport of damaged batteries which have this common point with prototypes.

9. It has become clear that the most crucial safety requirement for packaging is not an enhanced packing group but the fact that the packaging design provides protection from vibration shocks heat ... Basically the abuses that the battery has not be tested against.

10. Furthermore the current special provision does not take care of the transport of batteries that are too big to fit in a packaging. In addition experience has shown, that for prototypes of a greater size, but however small enough to fit in a packaging, that are very specific it was not easy to find a packing group I packaging on the market when this packaging had to be customized for that prototype. Therefore a multilateral agreement deviating from that requirement has been signed by many RID/ADR countries (M228).

11. The Sub-Committee has also got some experience concerning the transport of batteries in strong casings and suitable provisions have been drafted in different packing provisions concerning lithium batteries. We believe therefore that these could be used for prototypes also without requiring competent authority approval.

Proposals

12. To address all these different issues the expert from France would like to provide the following annexed proposals to complement those in document ST/SG/AC.10/C.3/2014/12:

(a) A proposal containing more substantial amendments to special provision 310. referring to packing instruction P908 and LP904, additional possibility for large batteries with strong casing and large equipment including a capability requirement to avoid competent authority approval as well as consequential amendments to P908 and LP904; (ANNEX 1)

(b) Some modification in special provisions 240 and 312 to first clarify that the batteries contained shall be in conformity with the classification requirements in 2.9.4, and secondly to allow the transport of vehicles assigned to UN3171 or UN3166 containing prototypes or low production runs batteries or cells.(ANNEX 2)

13. We tried to take care of the comments provided by RECHARGE and PRBA in INF 22 and we believe that the reference to packing instruction were the packaging types are mentioned takes care of the comment by Sweden in INF16.

Additional issue related to Electrical bicycles

14. An additional issue which has to be looked at separately from the one mentioned above has been brought to our attention when working on this subject.

For small vehicles such as E-bikes the battery in its casing is most of the time detachable from the bike in order to allow easier loading or using a spare battery.

Therefore, especially for high end products the battery is carried in its casing but detached from the bike itself and packaged together with it in an additional inner packaging. Although this is mainly done for product protection it provides supplementary protection and additional safety. In addition unintended operation of the battery is avoided.

In many cases also the Bicycle is delivered partly disassembled in a kit.

The paradox is that this practice that is actually safer than carrying the same item unpackaged and with the battery connected may be considered as fully regulated under the “battery packed with an equipment” entry. (UN3091 or UN3841)

If the subcommittee agrees that there is an inconsistency here France would be ready to prepare some text clarifying the fact that in such case the “E-bike” may benefit from the same condition as UN3171

Comments on how to deal with that would be most welcome.

Examples of common industry practice are shown in Annex 3

Annex 1

Proposal to amend SP 310 and consequential amendments to P908 and LP904

Modify special provision 310 as follows:

310 The requirements in Chapter 38.3 of the *Manual of Tests and Criteria* do not apply to low production runs consisting of not more than 100 cells and batteries annual production or to pre-production prototypes of cells and batteries when these prototypes are transported for testing, including cells and batteries transported in an equipment, if:

(a) The cells batteries or equipments are transported in an outer packaging that is a metal, plastics or plywood drum or a metal, plastics or wooden box and that meets the criteria for packing group I packagings; and packaged in accordance with P908 of 4.1.4.1 and LP904 of 4.1.4.3 as applicable.

(b) each cell and battery is individually packed in an inner packaging inside an outer packaging and is surrounded by cushioning material that is non-combustible, and non-conductive~~In addition, for cells or batteries with a gross mass of 12 kg or more employing a strong, impact resistant outer casing, strong outer packagings constructed of suitable material and of adequate strength and design in relation to the packaging's capacity and its intended use, may be used. Packagings need not meet the requirements of 4.1.1.3, provided point (1) to (5) of P908 are met and the outer packaging contains only one cell, battery or equipment.~~

(c) When lithium cells or batteries prototypes or issued from a low production run are contained in a large equipment of a gross mass exceeding [100 kg] affording equivalent protection to the contained cells or batteries than the packing provisions mentioned in (a), that equipment may be transported unpackaged.

(d) prototype and small production runs cells or batteries identified as damaged or defective according to special provision 376 may not benefit from (b) and (c) and must be transported according to special provision 376.

(e) The word "PROTOTYPE" or "LOW PRODUCTION RUN" as appropriate shall be mentioned in the transport document according to 5.4.1 after the proper shipping name.

Comments:

- *The reference to annual production run in the first paragraph and the text of (b) are inspired by similar requirements in the ICAO technical instructions as well as the wording "low production run".*

- *The 100kg limit in (c) is proposed as thought starter. The subcommittee may wish not to adopt any limit but we think it is preferable to have one under which it would be difficult to justify that no packaging may be found.*

- *In relation with (d) the subcommittee may consider adding a cross-reference in SP376 for user-friendliness saying that:*

" this special provision also covers damaged prototype batteries and cells or those issued from low production runs as defined in special provision 310".

Consequential, amendment to P908

P908	PACKING INSTRUCTION	P908
<p>This instruction applies to prototypes or small production runs mentioned in special provision 310 and damaged or defective lithium ion cells and batteries and damaged or defective lithium metal cells and batteries, including those contained in equipment, of UN Nos. 3090, 3091, 3480 and 3481.</p>		
<p>The following packagings are authorized provided the general provisions of 4.1.1 and 4.1.3 are met:</p> <p>For cells and batteries and equipment containing cells and batteries:</p> <p style="padding-left: 40px;">Drums (1A2, 1B2, 1N2, 1H2, 1D, 1G)</p> <p style="padding-left: 40px;">Boxes (4A, 4B, 4N, 4C1, 4C2, 4D, 4F, 4G, 4H1, 4H2)</p> <p style="padding-left: 40px;">Jerricans (3A2, 3B2, 3H2)</p> <p>Packagings shall conform to the packing group II performance level.</p> <ol style="list-style-type: none"> 1. Each damaged or defective cell or battery or equipment containing such cells or batteries shall be individually packed in inner packaging and placed inside an outer packaging. The inner packaging or outer packaging shall be leak-proof to prevent the potential release of electrolyte. 2. Each inner packaging shall be surrounded by sufficient non-combustible and non-conductive thermal insulation material to protect against a dangerous evolution of heat. 3. Sealed packagings shall be fitted with a venting device when appropriate. 4. Appropriate measures shall be taken to minimize the effects of vibrations and shocks, prevent movement of the cells or batteries within the package that may lead to further damage, and a dangerous condition or further damage to a damaged battery during carriage. Cushioning material that is non-combustible and non-conductive may also be used to meet this requirement. 5. Non combustibility shall be assessed according to a standard recognized in the country where the packaging is designed or manufactured. <p>For leaking cells or batteries, sufficient inert absorbent material shall be added to the inner or outer packaging to absorb any release of electrolyte.</p> <p>A cell or battery with a net mass of more than 30 kg shall be limited to one cell or battery per outer packaging.</p>		
<p>Additional requirement:</p> <p>Cells or batteries shall be protected against short circuit.</p>		

Consequential amendments to LP904

LP904	PACKING INSTRUCTION	LP904
	<p>This instruction applies to single prototypes and small production runs mentioned in special provision 310 damaged or defective batteries of UN Nos. 3090, 3091, 3480 and 3481, including those contained in equipment.</p>	
	<p>The following large packagings are authorized for a single damaged or defective battery and for a single damaged or defective battery contained in equipment, provided the general provisions of 4.1.1 and 4.1.3 are met</p> <p>For batteries and equipment containing batteries, large packagings made of:</p> <ul style="list-style-type: none"> steel (50A) aluminium (50B) metal other than steel or aluminium (50N) rigid plastics (50H) plywood (50D) <p>Packagings shall conform to the packing group II performance level.</p> <ol style="list-style-type: none"> 1. Each damaged or defective battery or equipment containing such a battery shall be individually packed in an inner packaging and placed inside an outer packaging. The inner packaging or outer packaging shall be leak-proof to prevent the potential release of electrolyte. 2. Each inner packaging shall be surrounded by sufficient non-combustible and non-conductive thermal insulation material to protect against a dangerous evolution of heat. 3. Sealed packagings shall be fitted with a venting device when appropriate. 4. Appropriate measures shall be taken to minimize the effects of vibrations and shocks, prevent movement of the battery within the package that may lead to further damage, and a dangerous condition during carriage or further damage to damaged battery. Cushioning material that is non-combustible and non-conductive may also be used to meet this requirement. 5. Non combustibility shall be assessed according to a standard recognized in the country where the packaging is designed or manufactured. <p>For leaking batteries, sufficient inert absorbent material shall be added to the inner or outer packaging to absorb any release of electrolyte.</p>	
	<p>Additional requirement:</p> <p>Batteries shall be protected against short circuit.</p>	

Annex 2

Proposals to modify Special Provisions 240 and 312 in relation with the transport of vehicles containing prototypes or low production runs

Proposal 1

Modify special provision 240 as follows:

“240 This entry only applies to vehicles powered by wet batteries, sodium batteries, lithium metal batteries or lithium ion batteries and equipment powered by wet batteries or sodium batteries transported with these batteries installed.

For the purpose of this special provision, vehicles are self-propelled apparatus designed to carry one or more persons or goods. Examples of such vehicles are electrically-powered cars, motorcycles, scooters, three- and four-wheeled vehicles or motorcycles, e-bikes, wheel-chairs, lawn tractors, [forklift trucks](#), boats and aircraft.

[Lithium metal batteries or lithium ion batteries installed in the above mentioned vehicles shall meet the requirements of 2.9.4 \(a\) to \(e\).](#)

[Vehicles containing prototype batteries or small production runs as defined in special provision 310 may be transported under this entry provided they afford protection to the contained batteries equivalent to that defined in the applicable packing instruction. The words “CONTAINS A LITHIUM BATTERY PROTOTYPE” or “CONTAINS A LOW PRODUCTION RUN LITHIUM BATTERY” shall be mentioned, as appropriate, in the transport document according to 5.4.1 after the proper shipping name.](#)

Examples of equipment are lawnmowers, cleaning machines or model boats and model aircraft. Equipment powered by lithium metal batteries or lithium ion batteries shall be consigned under the entries UN 3091 LITHIUM METAL BATTERIES CONTAINED IN EQUIPMENT or UN 3091 LITHIUM METAL BATTERIES PACKED WITH EQUIPMENT or UN 3481 LITHIUM ION BATTERIES CONTAINED IN EQUIPMENT or UN 3481 LITHIUM ION BATTERIES PACKED WITH EQUIPMENT, as appropriate.

Hybrid electric vehicles powered by both an internal combustion engine and wet batteries, sodium batteries, lithium metal batteries or lithium ion batteries, transported with the battery(ies) installed shall be consigned under the entries UN 3166 VEHICLE, FLAMMABLE GAS POWERED or UN 3166 VEHICLE, FLAMMABLE LIQUID POWERED, as appropriate. Vehicles which contain a fuel cell shall be consigned under the entries UN 3166 VEHICLE, FUEL CELL, FLAMMABLE GAS POWERED or UN 3166 VEHICLE, FUEL CELL, FLAMMABLE LIQUID POWERED, as appropriate.”

Proposal 2

At the end of special provision 312 add the following paragraphs:

“Lithium metal batteries or lithium ion batteries installed in the above mentioned vehicles shall meet the requirements of 2.9.4 (a) to (e).

Vehicles containing prototype batteries or small production runs as defined in special provision 310 may be transported under this entry provided they afford protection to the contained batteries equivalent to that defined in the applicable packing instruction. The words “CONTAINS A LITHIUM BATTERY PROTOTYPE” or “CONTAINS A LOW PRODUCTION RUN LITHIUM BATTERY” shall be mentioned, as appropriate, in the transport document according to 5.4.1 after the proper shipping name.”

Annex 3

Examples concerning E Bikes in relation with paragraph 15



