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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****Forty-eighth session**

Geneva, 30 November – 9 December 2015

Item 4 (d) of the provisional agenda

**Electric storage systems: miscellaneous****Provisions for lithium batteries installed in closed cargo  
transport units****Transmitted by The Rechargeable Battery Association (PRBA)<sup>1</sup>****Introduction**

1. Very large assembled lithium ion batteries are now commonly being manufactured and transported. These units generally consist of banks of lithium ion batteries, electrically connected and with the necessary battery management systems, which are secured to racks, cabinets, or similar structures. These structures are in turn securely attached to the interior structure of closed cargo transport units, in particular, freight containers and freight vehicles. Thus, in effect, the closed cargo transport unit is the casing for a very large lithium battery. These battery systems are used in a variety of electric grid and similar applications, such as storage of energy generated by farms of large wind turbines.

2. These large systems frequently are fitted with fixed fire suppression systems (fire extinguishers) and internal cooling systems (refrigerating machines) that, owing to being charged with liquefied gases, are themselves items of dangerous goods. At present, the Model Regulations do not clearly address the transport of large lithium battery systems that may contain other dangerous goods within the battery casing for safety or operational purposes (e.g., cooling). Thus, it is unclear how such large assembled lithium ion batteries are to be transported in terms of marking, labelling, placarding and description on transport documents. To resolve this uncertainty, and to specifically provide for the transport of such

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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).

large lithium batteries, this document proposes new provisions for large assembled lithium battery systems installed within closed cargo transport units (such as freight containers and freight vehicles), including when fire suppression and/or air conditioning systems are also installed.

3. In terms of packing, the manner in which the lithium batteries are carried within the closed cargo transport conforms generally to the requirements of P903(2), with the transport unit itself affording additional protection during transport. Further, both “fire extinguishers” (UN1044) and “refrigerating machines” (UN2857) are permitted to be transported when packed in “suitable outer packagings” not meeting the requirements of 4.1.1.3 as provided for under P003. When these fire extinguishers and refrigerating machines are securely installed within a closed cargo transport unit, the body of the transport unit is considered to afford a degree of protection equivalent to that afforded by packagings as permitted by P903. However, in the case of fire extinguishers, and consistent with the requirements of Special Provision 225, it is proposed that the pressure receptacle in the fixed fire suppression system meet the requirements of Chapter 6.2.

4. When the fire extinguisher and refrigerating system is installed within or integral to a closed cargo transport unit and will not be loaded or handled separately in the course of transport, marking and labeling of these articles as required by Chapter 5.2 is considered unnecessary. Therefore, the proposed new Special Provision XXX exempts these articles from the requirements of Chapter 5.2. Further, because it is unclear how these articles should be described on the transport document when contained within another article, that is, the large lithium battery (e.g., in terms of identifying the number and kind of packages), it is further proposed that the fire extinguisher and refrigerating machine be exempted from the standard dangerous goods transport document requirements and alternate provision be made, as proposed in Special Provision XXX, to communicate the presence of these articles and their potential hazard to transporters, transport workers and emergency responders. Further in that connection, in addition to the Class 9 placard the closed cargo transport unit would be required to display the Division 2.2 placard in the manner prescribed in 5.3.1.1.4. However, since according to Special Provision 119 refrigerating machines containing less than 12 kg of Division 2.2 gas are exempted from the provisions of the Model Regulations, the alternative documentation and placarding requirements would apply only to an installed refrigerating machine containing 12 kg or more of Division 2.2 gas.

## Proposal

5. In the Dangerous Goods List in Chapter 3.2, for UN3090 and UN3480 add special provision “XXX” in column (6) and packing instruction “P911” in column (8).

6. In Chapter 3.3, add new Special Provision XXX to read:

“XXX When assembled lithium ion batteries or lithium metal batteries installed within or integral to a closed cargo transport unit are transported in accordance with packing instruction P911 of 4.1.4.1, the transport document shall include the statement: ‘Transport in accordance with SP XXX and P911.’ Fire extinguishers (systems) and refrigerating machines (air conditioning units) also installed in such closed cargo transport units are not subject to the requirements of Chapters 5.2, 5.3 and 5.4 of these Regulations provided:

(a) If a fire extinguisher is installed, the transport document shall include the statement: ‘Fixed fire extinguishing system installed employing Division 2.2 gas:’ followed by the UN number, proper shipping name (including technical name, if required) and total quantity of the gas. In addition, a Division 2.2 placard shall be displayed on the closed cargo transport unit as required by 5.3.1.1.4.

(b) If a refrigerating machine containing 12 kg or more of refrigerant gas is installed, the transport document shall include the statement: ‘Refrigerating machine installed employing Division 2.2 gas:’ followed by the UN number, proper shipping name (including technical name, if required) and total quantity of the gas. In addition, a Division 2.2 placard shall be displayed on the closed cargo transport unit as required by 5.3.1.1.4.”

7. In 4.1.4.1, add new Packing instruction P911 to read:

| <b>P911</b>  | <b>PACKING INSTRUCTION</b> | <b>P911</b> |
|--|----------------------------|-------------|
| This instruction applies to assembled lithium ion batteries and lithium metal batteries installed within a closed cargo transport unit, UN3480 and UN3090  |                            |             |
| Assembled lithium ion and lithium metal batteries are authorized for transport when installed within a closed cargo transport unit (e.g., a freight container or freight vehicle) provided the following requirements are met:   |                            |             |
| <p>The assembled batteries and the batteries of which they are comprised shall be secured within the closed cargo transport unit (e.g., by means of placement in racks, cabinets, etc.) in such a manner as to prevent short circuits, accidental operation, and significant movement relative to the closed cargo transport unit under the shocks, loadings and vibrations normally incident to transport.</p>  |                            |             |
| <p>The closed cargo transport unit may also include an installed fire extinguishing system employing a Division 2.2 gas provided the pressure receptacle in which the gas is contained meets the requirements of Chapter 6.2 and the pressure receptacle and other components of the system are secured such that significant movement relative to the closed cargo transport unit under the shocks, loadings and vibrations normally incident to transport is prevented. Pressure receptacles may remain manifolded to the extinguishing system, and the system may remain active in transport. The requirements of P003 do not apply to such installed fire extinguishing systems.</p> |                            |             |
| <p>The closed cargo transport unit may also include a refrigerating machine (air conditioning unit) employing a Division 2.2 refrigerant gas provided that the system is secured such that significant movement relative to the closed cargo transport unit under the shocks, loadings and vibrations normally incident to transport is prevented. The requirements of P003 do not apply to such installed refrigerating machines.</p>   |                            |             |