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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****Fifty-second session**

Geneva, 27 November-6 December 2017

Item 3 of the provisional agenda

**Listing, classification and packing****Revision of packing instruction P801****Transmitted by the expert from Canada\*****Objectives**

1. To modify packing instruction P801 in an effort to improve compliance and the safe transport of batteries (UN Nos. 2794, 2795 or 3028).
2. To clarify the requirements for the transport of used batteries in what is currently referred to as “battery boxes”.

**Introduction**

3. At the forty-ninth and fifty-first sessions of the Sub-Committee, the expert from Canada submitted a formal document (ST/SG/AC.10/C.3/2016/25) and an informal document INF.32 (51st session) proposing modifications to packing instruction P801. Based on comments received during the two sessions, the expert from Canada is now submitting a revised formal proposal.

4. The goal of this proposal is to address three aspects of the current P801 packing instruction that need attention because they are either unclear or have not been addressed:

- (a) **Release of electrolyte:** Packing instruction P801 does not currently address batteries that are likely to leak electrolyte. Batteries may be likely to leak electrolyte

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\* In accordance with the programme of work of the Sub-Committee for 2017-2018 approved by the Committee at its eighth session (see ST/SG/AC.10/C.3/100, paragraph 98 and ST/SG/AC.10/44, paragraph 14)

because of damage to their casing or by design if they are of the flooded type with vented caps. The potential release of electrolyte should be minimized to promote the safe handling and transport of batteries.

(b) **Concept of “battery boxes”:** Packing instruction P801 puts forward the notion of transporting used batteries loosely in “battery boxes”. It is not clear to the expert of Canada how used batteries can be transported loose and still meet the additional requirements listed in P801 (e.g., packaged or secured to prevent inadvertent movement). Also, it was noted by many experts that this concept of “battery box” is not consistent with the definition of a box found in sub-section 1.2.1 of the Recommendations.

(c) **Protection against short-circuits:** Packing instruction P801 also requires that every battery transported under this packing instruction be protected against short-circuits. However, this requirement might be overly stringent for used batteries transported for disposal or recycling.

## Context

5. It is the experience of the expert of Canada, as well as other sub-committee members as noted at the fifty-first session, that persons have trouble understanding and complying with the existing requirements of packing instruction P801. For instance, in Canada, there have been cases where persons have transported batteries loosely in open top bins, believing they were compliant with P801, yet not adhering to the additional requirements. This paper proposes changes to clarify and strengthen existing requirements. Note that it is recognized that used non-spillable wet batteries (UN2800) may be mixed in shipment of the dangerous goods that are the subject of this proposal but since new non-spillable wet batteries (UN2800) are assigned to another packing instruction (P003) the transport of used non-spillable wet batteries should be addressed in a separate proposal.

## Release of electrolyte

6. Packing instruction P801 does not currently address batteries that are likely to leak electrolyte. However, in Canada and the United States, major battery distributors have prepared detailed guidance on packing and handling used batteries on pallets for the purpose of shipping them for the reclamation of the valuable lead contained in the batteries. For batteries that may leak, these distributors recommend using heavyweight clear polyethylene plastic bags that are securely closed to limit the potential for leaking electrolyte<sup>1</sup>.

7. Building on industry practice, the expert from Canada proposed, in informal document INF.32 (51st session), to mitigate battery leaks by individually packaging the batteries likely to leak before transporting them on pallets or in packagings not capable of retaining liquids. The term “leakproof” had been used in the packing instruction; however, it was not meant to invoke the leakproofness test requirements. The document also proposed to recognize other equally effective methods, such as draining the electrolyte from the battery. However, the document did not include a similar provision for metal or solid plastic boxes,

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<sup>1</sup> *Packing and Securing Used Stationary Batteries/Cells*, [www.eastpenmanufacturing.com/wp-content/uploads/Stationary-Power-Packaging-and-Securing-Stationary-Batteries-Cells.pdf](http://www.eastpenmanufacturing.com/wp-content/uploads/Stationary-Power-Packaging-and-Securing-Stationary-Batteries-Cells.pdf)

as other additional provisions were proposed (e.g. making the boxes resistant to electrolyte and capable of containing any electrolyte that had leaked). With these additional provisions in place, individually packaging batteries to limit the potential to leak electrolyte was deemed unnecessary.

8. Despite a lack of consensus on this issue at the end of the fifty-first session, the expert believes that the potential for battery leaks should be addressed and the additional provision proposed in informal document INF.32 (51st session) should be included in this formal paper. With an eye to developing a more multimodal packing instruction, the expert would like to note that the IMDG (International Maritime Dangerous Goods) Code's packing instruction P801 is very similar to packing instruction P801 of the Model Regulations except for one additional requirement. The packing instruction requires that batteries of UN Nos. 2794 and 2795 be capable of passing a tilt test at an angle of 45° with no spillage of liquid. The additional provision proposed in informal document INF.32 (51st session) and the additional provision found in packing instruction P801 of the IMDG Code are essentially trying to achieve the same goal. However, requiring individual packaging of potentially leaking batteries in plastic bags might achieve a higher rate of compliance than asking individuals to make a determination of whether a battery is capable of passing the tilt test at 45° without leaking.

### **Battery boxes**

9. Packing instruction P801 currently authorizes the transport of loose used batteries in "battery boxes". The expert from Canada understands that the intended use for "battery boxes" is to provide an efficient means for the transport of used batteries from points of collection (e.g. retail stores selling batteries, automotive repair shops and auto parts distributors) to sorting and repackaging facilities where the batteries are sorted and prepared for transport to disposal or recycling facilities. The use of "battery boxes" minimizes the need for sorting and handling batteries at the collection points, as these sites are generally not appropriate for such activities.

10. As it currently reads, packing instruction P801 would require a person to meet all four additional requirements regardless of the type of packaging used. If the intent of packing instruction P801 is to allow the transport of loose used batteries in battery boxes, then meeting the additional requirements may be unachievable. For instance, additional requirement (4) currently requires batteries to be packaged or secured so as to prevent inadvertent movement. This contradicts the notion that batteries can be transported loose.

11. Building on the European Agreement concerning the international carriage of dangerous goods by road (ADR) existing P801 and P801a packing instructions, the expert from Canada proposed a similar approach at the fifty-first session in informal document INF.32 (51st session), which involved creating a separate packing instruction for used batteries (P801a) and referring to the term "box" to describe a packaging with incomplete faces. However, the proposal raised some concerns among sub-committee members as they thought, rightly, that:

- (a) Having two packing instructions for used batteries could create confusion, as individuals may have difficulty selecting which instruction to use, and
- (b) Referring to a "box" for a packaging which does not have a cover introduces a discrepancy between the definition of "box" set out in subsection 1.2.1 and the P801 packing instruction, which is not desirable.

12. Consequently, this formal paper is proposing only one packing instruction for UN Nos. 2794, 2795 and 3028, and is referring to "bins" ("bac" in French) instead of "box". The expert also considered using other words already defined in the Model Regulations

instead of introducing a new term. The word "crate" was considered but discarded because the packaging must have at least five complete surfaces (sides and bottom) to prevent electrolyte from leaking outside the packaging under normal conditions of transport. Referring to a "crate" in this case would introduce another non-desirable discrepancy.

### Protection against short-circuits

13. The expert from Canada had already submitted a formal proposal (ST/SG/AC.10/C.3/2016/25) during the forty-ninth session of the Sub-Committee in 2016. At the time, the proposal did not include a protection against short-circuits for used batteries transported in battery boxes. Unfortunately, the rationale behind this non-inclusion was insufficiently detailed in the proposal and some Sub-Committee members expressed concerns about the risk of fire. At the end of the session, the expert from Canada had offered to submit a revised proposal for the next session that would include a protection against short-circuits.

14. The informal document INF.32 (51st session) submitted at the fifty-first session addressed these concerns. Building on ADR's existing P801a packing instruction, the expert from Canada proposed that a protection against short-circuits for batteries transported in battery boxes be required. However, during the session, some sub-committee members noted that this proposal may be overly stringent. Indeed, used batteries that are transported for disposal or recycling are generally discarded because they no longer hold a charge. The risk of short-circuits causing fire is assessed as low. For this reason, the expert from Canada is recommending returning to the original proposal by removing the requirement for protection against short-circuits.

### Proposal

15. The proposed revised P801 packing instruction is divided in two parts;
- (a) The first part establishes the provisions applicable to batteries transported in rigid outer packagings, wooden slatted crates or on pallets; and
  - (b) The second part establishes the provisions applicable to used batteries transported in metal or solid plastic bins.

The proposed Packing instruction P801 would read as follows with new text underline and deleted text ~~strikethrough~~:

P801	PACKING INSTRUCTION	P801
This instruction applies to batteries assigned to UN Nos. 2794, 2795 or 3028.		
<p>(1) <u>Batteries shall be packed in accordance with the following:</u></p> <ul style="list-style-type: none"> <li>(a) The following packagings are authorized, provided that the general provisions of <b>4.1.1</b> (except <b>for 4.1.1.3</b>) <u>and 4.1.3</u> are met: <ul style="list-style-type: none"> <li>1) Rigid outer packagings;</li> <li>2) Wooden slatted crates;</li> <li>3) Pallets.</li> </ul> </li> <li>(b) Batteries shall be protected against short circuits;</li> <li>(c) Batteries stacked shall be adequately secured in tiers separated by a layer of non-conductive material;</li> <li>(d) Battery terminals shall not support the weight of other superimposed elements;</li> <li>(e) Batteries shall be packaged or secured to prevent inadvertent movement; and</li> <li>(f) <u>Batteries must not leak in any position and inclination expected in normal conditions of transport or must be</u></li> </ul>		

made leakproof by individually packaging them or by any other equally effective method to prevent the release of electrolyte.

~~Used storage batteries may also be transported loose in stainless steel or plastics battery boxes capable of containing any free liquid.~~

(2) In addition, used batteries may be transported in metal or solid plastic bins provided that the general provisions of 4.1.1 (except for 4.1.1.3) and 4.1.3 and these additional provisions are met:

- (a) The bins shall be resistant to the electrolyte contained in the batteries;
- (b) The outside of the bins shall be free of residues of electrolyte contained in the batteries;
- (c) The bins shall not be filled to a height greater than the height of their sides;
- (d) Under normal conditions of transport, no electrolyte shall leak from the bins; and
- (e) The bins shall be either:
  - (i) Covered; or
  - (ii) Transported inside a closed cargo transport unit.

**Additional requirements:**

- ~~1) Batteries shall be protected against short circuits.~~
- ~~2) Batteries stacked shall be adequately secured in tiers separated by a layer of non-conductive material.~~
- ~~3) Battery terminals shall not support the weight of other superimposed elements.~~
- ~~4) Batteries shall be packaged or secured to prevent inadvertent movement.~~