



**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**

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Item 6 of the provisional agenda

**New proposals for amendments to the
Model Regulations on the Transport
of Dangerous Goods****Amendments to section 2.9.4 - lithium batteries and Special
Provision 310****Transmitted by the Rechargeable Battery Association (PRBA) and the
European Association for Advanced Rechargeable Batteries
(RECHARGE)¹****Introduction**

1. There are several provisions in section 2.9.4 of the Model Regulations that appear to overlap with other provisions in the Model Regulations and Section 38.3 of the Manual of Tests and Criteria. Removing these redundant provisions would help to simplify the lithium battery regulations. Therefore, PRBA and RECHARGE are proposing to remove several provisions in section 2.9.4 and amend Special Provision 310 accordingly as more fully explained below.

2. The Manual of Tests and Criteria and Model Regulations have evolved over the years to account for changes in lithium ion and lithium metal cell and battery technology and designs. For example, prior to the introduction of lithium ion batteries in the early

¹ 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).h

1990's, the lithium battery tests in Section 38.3 of the Manual of Tests and Criteria did not account for the unique design characteristics of lithium ion batteries. As a result, the Subcommittee made sweeping changes to the Model Regulations and Manual of Tests and Criteria in the 1990's.

3. The requirements in section 2.9.4 of the Model Regulations, which were previously contained in Special Provision 230, include the following provisions and requirements:

- (a) Each cell and battery incorporates a safety venting device or is designed to preclude a violent rupture under conditions normally incident to transport;
- (b) Each cell and battery is equipped with an effective means of preventing external short circuits;
- (c) Each battery containing cells or series of cells connected in parallel is equipped with effective means as necessary to prevent dangerous reverse current flow (e.g., diodes, fuses, etc.).

4. The requirement in paragraph in 2.9.4(b) that no violent rupture should occur "under conditions normally incident to transport" are tested out when a cell or battery passes the T.3 Vibration test and T.4 Shock test in the Manual of Tests and Criteria. That is, when cells and batteries are subject to the T.3 and T.4 tests, there can be no leakage, no venting, no disassembly, no rupture, no fire, and the open circuit voltage may not be less than 90%. These pass criteria are consistent with the "no violent rupture" requirement in 2.9.4(b).

5. The requirement in paragraph in 2.9.4(c) that cells and batteries have an effective means of preventing an external short circuit is a requirement in all of the lithium battery packing instructions and Special Provisions 188 and 310. In addition, cells and batteries are subject to the T.5 External short circuit test in the Manual of Tests and Criteria.

6. The requirement in paragraph 2.9.4(d) that certain cells be designed to prevent dangerous reverse current flow is accounted for in the T.8 Forced discharge test in the Manual of Tests and Criteria. The T.8 test evaluates the ability of a primary or rechargeable cell to withstand a forced discharge condition without disassembly or fire during the test and within seven days after the test. Therefore, the reverse currents values that could be seen in a battery are fully covered by the specific value stated in the T.8 test.

7. To account for cells and batteries that have not been subject to the lithium battery tests in Section 38.3 of the Manual of Tests and Criteria (i.e., prototype and low production cells and batteries), we also are proposing to add paragraphs (b) and (d) from section 2.9.4 to Special Provision 310.

Proposal

8. To simplify the regulations and remove the redundancy found in section 2.9.4 of the Model Regulations, PRBA and RECHARGE propose to delete paragraphs (b), (c), and (d) in section 2.9.4 and renumber the remaining paragraphs accordingly. In addition, we propose to add paragraphs (b) and (d) from Section 2.9.4 to Special Provision 310 as noted below.

310 Each cell and battery shall incorporate a safety venting device or be designed to preclude a violent rupture under conditions normally incident to transport. In addition, each battery containing cells or series of cells connected in parallel shall be equipped with effective means as necessary to prevent dangerous reverse current flow (e.g., diodes, fuses, etc.).