

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

22 June 2012

Forty-first session

Geneva, 25 June – 4 July 2012

Item 4 (a) of the provisional agenda

Testing of lithium batteries

Testing of Lithium Battery Assemblies

Transmitted by PRBA - The Rechargeable Battery Association

Background

1. For many years Section 38.3 of the UN Manual of Tests and Criteria, which governs the design qualification testing of lithium cells and batteries, has included a provision in the final paragraph in 38.3.3 which exempts battery assemblies consisting of electrically connected lithium batteries that have passed all applicable tests from the need to be tested in accordance with the requirements of Section 38.3 as a “battery” - provided the following requirements are met:

The battery assembly is equipped with a system capable of monitoring the battery assembly and preventing short circuits, or over discharge between the batteries in the assembly and any overheat or overcharge of the battery assembly.

Initially this exception applied to battery assemblies with an aggregate lithium content of all anodes of more than 500 g, and, with the advent of lithium ion battery assemblies, the exception was later extended to apply also to such battery assemblies with a Watt-hour rating of more than 6200 Watt-hours (Wh).

2. In revisions to Section 38.3 incorporated into the Fifth Revised Edition of the Manual of Tests and Criteria, a new 38.3.3(f) to provide some relief from the testing for battery assemblies in which the aggregate lithium content of all anodes is not more than 500 g, or, in the case of lithium ion batteries, the Wh rating is not more than 6200 Wh. Under this provision, when testing such a battery assembly comprised of batteries that have passed all applicable tests, only one battery assembly in a fully charged state must be tested under tests T.3, T. 4 and T.5, and, for a rechargeable assembly, test T.7.

3. Unfortunately, the implementation of 38.3.3(f) has given rise to a number of questions and varying interpretations due to the wording of the provision and the definition of “Battery” in the Manual of Tests and Criteria, which includes a reference to “battery assembly” but does not specifically define it. It also has been PRBA’s experience that some battery assemblies are more accurately defined as equipment, rather than as battery assemblies. The attached interpretation letter issued by the U.S. Department of Transportation in December 2011 provides a good example of the confusion generated by 38.3.3(f).

4. The battery assemblies in question are sophisticated designs with numerous systems controls, redundant safety features and short circuit and overcharge protection. Many of these battery assemblies are designed for use in stationary applications or hybrid-electric vehicles (HEV) and often subject to stringent industry testing standards from such organizations as SAE, IEC, ISO and ANSI. For example, SAE's J2929 standard entitled, *Electric and Hybrid Vehicle Propulsion Battery System Safety Standard - Lithium-based Rechargeable Cells* is typically used in the automotive industry to validate lithium ion battery assemblies designed for HEVs, which in PRBA's view provides an equivalent level of safety to the tests required under 38.3.3(f).

5. This being the case, and given the questions that have arisen in connection with the intent of 38.3.3(f), PRBA now believes the language in 38.3.3(f) should be amended to more clearly explain the requirements of this provision and also include an alternative for testing the battery assemblies to industry standards that provide an equivalent level of safety to the Manual of Tests and Criteria.

Action by the Sub-Committee

6. In light of the foregoing, PRBA invites the views of the Sub-Committee regarding the requirements and wording of the current 38.3.3(f) and whether alternative testing for battery assemblies should be considered for incorporation into the Manual of Tests and Criteria.



U.S. Department
of Transportation

**Pipeline and Hazardous
Materials Safety
Administration**

1200 New Jersey Avenue SE
Washington, DC 20590

DEC 14 2011

Mr. George Kerchner
Wiley Rein LLP
1776 K Street, NW
Washington, DC 20006

Ref. No. 11-0268

Dear Mr. Kerchner:

This responds to your October 26, 2011 letter regarding the Hazardous Materials Regulations (HMR; 49 CFR Parts 171-180) applicable to design type testing of lithium batteries. The requirements you address are contained in Section 38.3 of the 5th Revised Edition of the United Nations (UN) Manual of Test and Criteria and are implemented through the provisions of § 173.185 of the HMR. Specifically, you request confirmation that paragraph (f) in Section 38.3.3 applies only to the testing of a battery assembly consisting of lithium batteries that have met the applicable tests in the UN Manual of Tests and Criteria and not to batteries which must be tested in accordance with paragraphs (a), (b) and (d) of Section 38.3.3.

Your understanding is correct. Paragraph (f) in 38.3.3 provides limited relief from the UN design type testing requirements for a battery assembly in which the lithium content of all anodes, when fully charged, is not more than 500 g, or in the case of a lithium ion battery assembly, a watt-hour rating of not more than 6200 Watt-hours, that is assembled from batteries that have passed all applicable design type tests.

I hope this information is helpful. If you have further questions, please contact this office.

Sincerely,

Ben Supko
Acting Chief, Standards Development
Office of Hazardous Materials Standards