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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

Thirty-eighth session
Geneva, 29 November–7 December 2010
Item 5 of the provisional agenda
Electric storage systems

Quality management programme for the manufacturing of lithium batteries

Transmitted by the expert from France[1]

Introduction

1. The working group on the improvement of testing requirements for the classification of lithium cells and batteries has drafted a modified chapter 38.3 that is presented for adoption to the thirty-eighth session of the Sub-Committee. This proposal improves the safety of the design of the cells and batteries.

2. However it is equally important for transport safety that each cell or battery manufactured conforms to the design that has been successfully tested for classification purposes. In the view of the expert from France the current Model Regulations do not cover this aspect sufficiently.

3. In order to improve that situation the expert from France proposes to require a quality management programme for the manufacture of lithium cells or batteries to ensure conformity of each cell or battery with the design type.

4. The proposal has been discussed during the two last sessions of the working group and a majority of participants has welcomed it. However, as it was not part of the initial mandate it is made separately from the proposal concerning the classification testing regime under the initiative of France.

[1] In accordance with the programme of work of the Sub-Committee for 2009-2010 approved by the Committee at its fourth session (refer to ST/SG/AC.10/C.3/68, para. 118 (d) and ST/SG/AC.10/36, para. 14).

5. As the provisions concerning lithium cells and batteries are placed under special provision 230 the most straightforward way to do it is to add the new requirement at the end of that special provision as drafted in proposal 1.

6. This would lead to a rather long special provision. Considering the changes recently adopted under section 2.9.2 where different items belonging to class 9 are listed, it may appear more logical to transfer the text of special provision 230 to that section under the heading "***lithium batteries***".

7. Indeed, it is each transported cell or battery that has to be classified as conforming to a type proven to meet the testing requirement (see special provision 230 (a)), and one of the way to ascertain this conformity is the quality management programme. This justifies in our view the inclusion of that new text as well as the current text of special provision 230 under the chapter concerning classification.

8. The new text would then be added at the end, as shown in proposal 2. If the Sub-Committee adopts this change, special provision 230 could either be deleted or become a simple reference to section 2.9.2, whatever appears to be more user friendly.

9. In addition the Sub-Committee is invited to note that the first sentence of special provision 230 appears to be wrong since new specific entries have been introduced for lithium metal and lithium ion. The adoption of proposal 2 would automatically correct that mistake. If the Sub-Committee prefers proposal 1, it should be corrected as proposed in point (2) of proposal 1.

10. The two proposals are substantially equivalent. The Sub-Committee is invited to consider them for adoption and, if the principle is agreed, to decide which proposal is preferred.

11. To be consistent, a consequential amendment is needed in both cases in special provision 188 (c). It is clear from the text under (c) that the exemptions in this special provision are linked to transport conditions and not to classification, especially the fact that lithium cells and batteries shall or shall not conform to the tested type, and the way this is verified.

Proposal 1

(1) Add the following text at the end of special provision 230:

"(e) Cells and batteries shall be manufactured under a quality management programme that includes:

(i) a description of the organizational structure and responsibilities;

(ii) the relevant inspection and test, quality control, quality assurance, and process operation instructions that will be used;

(iii) process controls that should include relevant activities to prevent and detect internal short circuit failure

(iv) records, such as inspection reports, test data, calibration data and certificates;

(v) management reviews to ensure the effective operation of the quality management programme;

(vi) a process for control of documents and their revision;

(vii) a means for control of cells or batteries that are not conforming to the type tested as mentioned in (a) above;

(viii) training programmes and qualification procedures for relevant personnel; and

(ix) procedures to ensure that there is no damage to the final product

NOTE: *In house quality management programmes may be accepted. Third party certification is not required but the procedures listed in (i) to (ix) above shall be properly recorded and traceable. A copy of the quality management programme shall be made available to the competent authority upon request.*".

(2) Delete the first sentence in special provision 230.

(3) Consequential amendment:

In special provision 188 (c), add the following words at the end of the paragraph:

"and be manufactured under a quality management programme as defined in special provision 230 (e)".

Proposal 2

(1) Add the following text to section 2.9.2 under ***lithium batteries***:

"Cells and batteries, cells and batteries contained in equipment, or cells and batteries packed with equipment, containing lithium in any form shall be assigned to one of the above mentioned entries as appropriate. They may be transported under these entries if they meet the following provisions:

(a) Each cell or battery is of the type proved to meet the requirements of each test of the *Manual of Tests and Criteria*, Part III, sub-section 38.3;

(b) Each cell and battery incorporates a safety venting device or is designed to preclude a violent rupture under conditions normally incident to transport;

(c) Each cell and battery is equipped with an effective means of preventing external short circuits;

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.).

(e) Cells and batteries shall be manufactured under a quality management programme that includes:

(i) a description of the organizational structure and responsibilities;

(ii) the relevant inspection and test, quality control, quality assurance, and process operation instructions that will be used;

(iii) process controls that should include relevant activities to prevent and detect internal short circuit failure

(iv) records, such as inspection reports, test data, calibration data and certificates;

(v) management reviews to ensure the effective operation of the quality management programme;

(vi) a process for control of documents and their revision;

(vii) a means for control of cells or batteries that are not conforming to the type tested as mentioned in (a) above;

(viii) training programmes and qualification procedures for relevant personnel; and

(ix) procedures to ensure that there is no damage to the final product

NOTE: *In house quality management programmes may be accepted. Third party certification is not required, but the procedures listed in (i) to (ix) above shall be properly recorded and traceable. A copy of the quality management programme shall be made available to the competent authority upon request.*".

(2) Consequential amendment in special provision 230:

option 1: delete special provision 230

or

option 2: replace the text of special provision 230 by the following text:

"230 Lithium cells and batteries may be transported under this entry if they meet the provisions of 2.9.2 ***lithium batteries***".

Consequential amendment in special provision 188:

In special provision 188 (c), replace the current text by the following:

"(c) Each cell or battery meets the provisions of 2.9.2 ***lithium batteries*** (a) and (e)".