

CETDG/21/INF/31

**COMMITTEE OF EXPERTS ON THE
TRANSPORT OF DANGEROUS GOODS
(Twenty first session)
Geneva, 4-13 December 2000,
agenda item 2(b)**

Draft Amendments to the Recommendations on the Transport of Dangerous Goods

Model Regulations on the Transport of Dangerous Goods Lithium Batteries

Comments on ST/SG/AC.10/ 2000/13 - 2000/25 - 2000/40

Transmitted by the Expert from France

Introduction

The expert from France welcomes the work being carried out by the experts from Japan and the United States to produce revised model regulations on the transport of lithium batteries, based on the work of the Ottawa working group.

France participated in the work done during this biennium as well as during the last biennium and is ready to support the adoption of the new provisions for lithium batteries at this committee. As a matter of fact, the proposal contains many improvements consisting mainly in a clarification of test procedures and increase of safety.

Nevertheless, after the Ottawa working group some disagreements were remaining about the relevance of some tests, especially T6. Besides that, some other aspects like the exemptions have been to shortly discussed to reach a consensus, and need some clarification. Therefore, we would like to make following comments, and propose some changes to the text for adoption by the committee.

Test T6

Discussion

This test is supposed to simulate an internal short circuit. An internal short circuit happens when the cathode and the anode are directly connected inside the battery, for instance because of a rupture of the separator.

This event can be of various severity, but if the connection is so complete that there is practically no resistance between the cathode and the anode the energy liberated will produce an effect such as heat, fire, etc, which would lead to exclude the battery from transport. And this for any battery type (excepted maybe for a very small low power battery).

That means that the « internal short circuit criteria » by itself is not relevant to discriminate between safe and unsafe batteries.

In fact the T6 test does not check the ability of a battery to resist an internal short circuit, but the fact that a battery, when crushed in a certain way, does or does not produce an internal short circuit. It is a crush test.

In the same way when a battery fails during tests T1 to T4 it is often due to an internal short circuit produced by the abuse factor (vibration, pressure, shock ...)

Secondly, the test procedure as drafted is very questionable :

- The criteria for stopping the crush can be easily interpreted in such a way that the test is stopped before a serious event has happened (what means « once the voltage drops abruptly » ?);
- The crushing speed is not defined. It is yet a very important factor influencing the results. To succeed in the test it is sometimes sufficient to crush slow enough.

In conclusion, the T6 « internal short circuit/crush » test, as proposed, just gives an illusory feeling of safety. Therefore, we think that it should not be adopted in the new revised manual of test and criteria.

Nevertheless taking in account the L.A. accident, one must admit that the issue which this test addresses is real. Mishandling happens during transport operations and it is a legitimate concern to check whether batteries are capable of resisting such treatment. But if the committee decides to adopt a test for that purpose, it should be an appropriate test, which enables to clearly discriminate between safe and unsafe batteries, in relation with the issue.

We propose to replace the procedure of the crush test by an impact test as defined in the UL1642 standard which is well known in the industry.

The advantages of this procedure are that it is less subject to interpretations and that it is closer to what may happen during mishandling.

Proposal 1.

Replace the test procedure under 38.3.6.4.2 by the following :

« A test sample cell or component cell is to be placed on a flat surface. A 7,9 mm diameter bar is to be placed across the centre of the sample. A 9,1 kg weight is to be dropped from a height of 61 cm onto the sample.

A cylindrical or prismatic cell is to be impacted with its longitudinal axis parallel to the flat surface and perpendicular to the longitudinal axis of the 7,9 mm diameter curved surface lying across the centre of the test sample. A prismatic cell is also to be rotated 90 degrees around its longitudinal axis so that both the wide and narrow sides will be subjected to the impact. Each sample is to be subjected to only a single impact. Separate samples are to be used for each impact.

A coin or button cell is to be impacted with the flat surface of the sample parallel to the flat surface and the 7,9 mm diameter curved surface lying across its centre. »

Exemption from testing for large battery assembly (2000/13 points 6. And 7. And chap 38.3.3 last sentence).

Discussion

We thank the experts of the USA and Japan for introducing this new idea in the revised text. It addresses a real problem. But we think that it should be clearly mentioned that this exemption only applies to sophisticated assemblies which are monitored by an appropriate system (such as a hardware and software, or equivalent battery management systems) capable of avoiding hazardous events. The proposed sentence is too vague.

Proposal 2

Replace the last sentence of 38.3.3 by :

« When batteries having passed all applicable tests are offered for transport electrically connected to form a large battery assembly, the battery assembly does not need to be tested provided it is equipped with an appropriate monitoring system capable of avoiding :

- short circuits
- over charge
- over discharge
- over heat
- and any other event hazardous to the health of the battery »

Transport of batteries by individuals for their own use (2000/40 SP188 (d) (iii))

Discussion

We support the idea, presented by the expert from Japan, that individuals shall be able to carry spare batteries for their own use. But we think this should apply to all batteries mentioned in SP188 which are currently used by people for computers, cameras ...

To be simple the limit should not refer to the weight of the batteries carried but to their number. A small number of 5 should be enough and of no threat to safety.

Proposal 3

Add a paragraph (f) to SP188 as drafted in the US proposal of 2000/25:

« (f) cells and batteries as specified in paragraphs (a), (b) and (c) are not subject to the provisions of these regulations when carried by individuals for their own use provided that the total number of cells and batteries carried does not exceed 5 for each person. »

Transport of prototypes

Discussion

Prototypes need to be transported for testing purposes. Some batteries are also produce in very small amounts for specific clients. The testing regime proposed in 2000/13 will require a sample of about 80 batteries or cells that may not be available in those cases. Testing will therefore be impossible.

We propose that those prototypes and small production runs shall be exempted from testing but subject to very restrictive transport conditions.

Proposal 4

Add a special provision as follows :

« xxx Pre-production prototypes and small production runs (not to exceed [100]) of lithium and lithium ion cells and batteries are exempted from testing requirement of Chap. 38.3 of the manual of test and criteria, provided they are packed individually in packing group I :

- metal plastic or plywood drums
- metal or wooden boxes

and surrounded by incombustible absorbent cushioning material.

Each package shall be marked with the words « lithium battery prototype »

The transport document shall mention « prototype » after the proper shipping name.

Miscellaneous

1. The distinction between liquid and solid cathode is obsolete. The lithium equivalent content mentioned in SP188 (a) and (b) shall be 1g for cells and 2g for batteries in both cases.

2. We do not support the deletion of SP287 proposed in 2000/25 . New uncycled and uncharged lithium cells or batteries can be considered as inert and non hazardous.

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Creation Date: 24/11/00 14.06
Change Number: 3
Last Saved On: 24/11/00 14.07
Last Saved By: UN/ECE
Total Editing Time: 1 Minute
Last Printed On: 24/11/00 17.31
As of Last Complete Printing
Number of Pages: 4
Number of Words: 1,180 (approx.)
Number of Characters: 6,728 (approx.)