

**COMMITTEE OF EXPERTS ON THE
TRANSPORT OF DANGEROUS GOODS
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**WORK OF THE SUB-COMMITTEE OF EXPERTS
ON THE TRANSPORT OF DANGEROUS GOODS**

**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

Transmitted by the Expert from the United Kingdom

Introduction

1. The expert from the United Kingdom welcomes the continuing work being carried out by the experts from Japan and the United States to produce revised model regulations on the transport of lithium batteries to reflect the changes in battery technology. The United Kingdom participated in the Working Group convened in Ottawa in March of this year and notes the contents of the 3 working papers before the Committee of Experts which are based on the discussions at Ottawa and the 18th session of the Sub-Committee of Experts. The proposal submitted by the experts from the USA and Japan (ST/SG/AC.10/2000/13) contains many improvements over the current text of the Manual of Tests and Criteria, foremost amongst which are the sequencing of the tests, reduction in sample quantities and clarification of the methods. However the United Kingdom still has doubts on some of the proposals contained in ST/SG/AC.10/2000/13, and questions whether they are ready for inclusion in the Model Regulations at this time. The expert from the United Kingdom offers the following comments and proposals which are set out below.

2. Tests 6, 7 and 8 (38.3.4.6 onwards)

The expert from the UK believes that Tests 6, 7 and 8 in the paper should be deleted for the following reasons:

a) There was substantial disagreement in Ottawa on the relevance of the internal short circuit, overcharge and forced discharge tests and no agreement was reached as to their inclusion or omission.

b) The principal justification offered for the inclusion of what are essentially abuse-in-service (rather than transport) tests is flawed, in that the charging of batteries in equipment carried on to an aircraft by passengers is outside the scope of regulations addressed to transport of dangerous goods in packages. Furthermore, except for those items carried as passenger cabin baggage, the air transport regulations imply that equipment containing batteries is required to be non-operational in transport.

c) The fact that the tests in question appear (in some form) in the current Manual of Tests and Criteria does not make them any more appropriate or relevant. The current tests are believed to originate from methods used to assess safety for the purpose of product liability indemnity, a remit which places significant emphasis on use and abuse by consumers. It is argued that this is much broader than is sensibly necessary to ensure safety in transport.

d) The (T-Series) tests are classification tests intended to determine whether batteries are sufficiently safe to be transported. It may be desirable to perform appropriate tests at significantly greater levels than those found in normal conditions of transport but that should not be confused with the proposal to introduce and/or perpetuate tests which have no relevance to the transport operation. Testing for situations that do not arise for dangerous goods in packages, even in instances of gross mis-handling or accident, add substantially to the burden on industry but add nothing to safety.

3. Other Comments: See 38.3.2 onwards.

a) Definition of batteries; It is desirable that the definition of battery be harmonised with international standards. It is usual practice, in battery standards, to define batteries as follows;

Battery means one or more cells which are electrically connected together by a permanent means, including internal safety devices such as fuses, case, terminals, and marking

This convention is followed in IEC Standards, and Underwriters Laboratories Standards. We agree that battery packs should be treated as batteries.

b) Definition of disassembly; Solid matter escaping from the battery is sufficient evidence of disassembly. Reference to a wire mesh screen should be deleted as it is superfluous and makes the testing over elaborate and expensive to set up. The definition should read as follows;

Disassembly means a vent or rupture where solid matter is ejected from any part of a cell or battery.

c) Definition of fully discharged; The UK sees no reason for a separate definition for primary and secondary batteries.

The definition should read as follows;

Fully discharged means a primary or rechargeable cell or battery which has been electrically discharged to its endpoint voltage as specified by the manufacturer

d) Definition of Prismatic, If Test 6 were to be retained, Prismatic is an undefined term used in the text of Test 6. A definition is offered below:

Prismatic means a cell or battery whose two ends are similar, equal, and parallel rectilinear figures, and whose sides are parallelograms.

e) *Para 38.3.2.1* For absolute clarity, add the words "or more" after "one" in the final sentence, the suggested wording is:

In the event that a lithium cell or battery type does not meet one or more of the test requirements, steps should be taken to correct the deficiency or deficiencies that caused the failure before such cell or battery type is re-tested.

f) *Para 38.3.3 b(v) & (vi), c(iv), d(ii), e(iii)*. Remove the word “*deep*” and use only the word ‘*cycle*’. The term ‘*deep*’ is confusing, and is not needed because the term ‘*cycle*’ is already unambiguously defined as a regime with one sequence of full charging and full discharging.

g) *Para 38.3.4.1.2 Test 1 – Altitude simulation* is not adequately defined. The UK proposes that the wording be changed to define the “ambient” temperature as $+20^{\circ}\text{C}\pm 5^{\circ}\text{C}$ *throughout*.’

h) *Para 38.3.4.2.2 Test 2-thermal test* is not adequately defined. The UK proposes replacing ‘at least six hours’ with ‘between six and twelve hours’ and ‘at least twelve hours’ with ‘between twelve and twenty four hours’. The suggested wording is below;

38.3.4.2.2 Test Procedure

Test cells and batteries are to be stored for between six and twelve hours at a test temperature equal to $75 (\pm 2)^{\circ}\text{C}$, followed by storage for between six and twelve hours at a test temperature equal to $40 (\pm 2)^{\circ}\text{C}$. The maximum time interval between test temperature extremes is 30 minutes. This procedure is to be repeated 10 times, after which all test cells and batteries are to be stored for 24 hours at $20 \pm 5^{\circ}\text{C}$. For large cells and batteries the duration of exposure to the test temperature extremes should be between twelve and twenty four hours.
