Regulatory Update

Changes to Lithium Battery Regulations

- Changes adopted in the 17th revised edition of the UN Recommendations;
- Changes to the 5th revised edition of the UN Manual of Tests and Criteria; and
- Changes agreed to the 2013 – 2014 ICAO Technical Instructions for the Safe Transport of Dangerous Goods by Air

UN Recommendations

- 17th revised edition published June 2011;
- Available in Arabic, Chinese, English, French, Russian & Spanish;
- Progressively made available in PDF for download for UN website. English, French and Spanish now available at: http://www.unece.org/trans/danger/publi/unrec/rev17/17files_e.html
- Adopted into international modal regulations (road, rail, sea and air) becoming effective starting from 1 January 2013.

UN Recommendations Changes

- New provisions adopted into Chapter 2, paragraph 2.9.4 addressing classification of lithium batteries permitted for transport. The provisions reinforce:
  - lithium batteries must be of a design type proved to meet the requirements of the UN Manual of Tests and Criteria irrespective or whether the cells in the battery are a tested design type, i.e. both cells and batteries must be tested.
- New requirement requiring that lithium cells and batteries must be manufactured under a quality management program that includes:
  - Process controls, quality records, management reviews, document management, training.

UN Manual of Tests and Criteria

- 5th revised edition published 2009;
- Available in Arabic, Chinese, English, French, Russian & Spanish;
- Also available in PDF for download for UN website in the same languages:
- http://www.unece.org/trans/danger/publi/manual/rev5/manrev5-files_e.html
- Further revision published as Amendment 1 adopted effective the 17th revised edition of the UN Recommendations.

UN Manual of Tests and Criteria Changes

- Scope revised;
- Definitions revised and new definitions added;
- Test requirements revised.

Scope

- Changed to more clearly specify tests required:
  - all lithium cells must meet tests T.1 to T.6 and T.8;
  - all non-rechargeable battery types, including those composed of previously tested cells, must meet tests T.1 to T.5;
  - all rechargeable battery types, including those composed of previously tested cells, must meet tests T.1 to T.5 and T.7;
  - in addition, rechargeable single cell batteries with overcharge protection must meet test T.7.
- Additional clarification in scope to provide indication of what type of design change will require re-testing as a new design type.

Definitions

- **Battery** means two or more cells which are electrically connected together and fitted with devices necessary for use, for example, case, terminals, marking and protective devices. A single cell battery is considered a “cell” and shall be tested according to the testing requirements for “cells” for the purposes of the Model Regulations and this Manual (see also the definition for “cell”).

  Note.— Units that are commonly referred to as “battery packs”, “modules” or “battery assemblies” having the primary function of providing a source of power to another piece of equipment are for the purposes of the Model Regulations and the UN Manual of Tests and Criteria *treated as batteries.*

Definitions (cont.)

- **Cell** A single encased electrochemical unit (one positive and one negative electrode) which exhibits a voltage differential across its two terminals. Under the Model Regulations and the *UN Manual of Tests and Criteria*, to the extent the encased electrochemical unit meets the definition of “cell” herein, it is a “cell”, not a “battery”, regardless of whether the unit is termed a “battery” or a “single cell battery” outside of the Model Regulations and the *UN Manual of Tests and Criteria.*
- **Large cell** means a cell with a gross mass of more than 500 g. [previously was 12 g for lithium metal and 150 Wh for lithium ion.]

Definitions (cont.)

- **Mass Loss** revised to simply refer to being in excess of that shown in table. Table values have been revised to be:

Mass M of cell or battery	Mass loss limit
M < 1 g	0.5%
I g ≤ M ≤ 75 g	0.2%
M > 75 g	0.1%

Definitions (cont.)

- **Small cell** means a cell with a gross mass of not more than 500 g;
- New definition added for:
  - **Single cell battery** means a single electrochemical unit fitted with devices necessary for use, for example, case, terminals, marking and protective devices.

UN Tests

- Test T.3: Vibration revised to:
  - differentiate between batteries up to 12 kg and those with a mass of 12 kg or greater.
- Test T.6: Impact changed to become “Impact / Crush
  - Impact test applies to cylindrical cells > 20 mm in diameter;
  - Crush test applies to prismatic, pouch, coin/button cells and cylindrical cells not more than 20 mm in diameter.
- Test T.8: Forced discharge revised to require additional cells to be part of test procedure:
  - 10 primary component cells fully discharged;
  - 10 rechargeable component cells at 1st cycle fully discharged;
  - 10 rechargeable component cells after 50 cycles.

ICAO Technical Instructions

- ICAO Dangerous Goods Panel agreed to adopt UN changes into 2013-2014 edition of the Technical Instructions:
  - New classification requirements in Part 2;9.3 including the requirements for a quality assurance program for battery manufacture;
  - Revised definitions for “lithium battery”, “lithium cell” and “single cell battery”.
- Additional changes adopted by the DGP for lithium batteries:
  - Revisions to quantity limits;
  - Packing instructions 965 – 970 revised;
  - Amended provisions for passengers.

Lithium Battery Quantity Limits

- Quantities revised to remove “G” limitation. All lithium batteries limited based on net mass of lithium batteries per package:
  - Lithium ion batteries 5 kg pax / 35 kg CAO (PI 965);
  - Lithium ion batteries packed with equipment 5 kg pax / 35 kg CAO (PI 966);
  - Lithium ion batteries contained in equipment 5 kg pax / 35 kg CAO (net mass of batteries per package (PI 967);
  - Lithium metal batteries 2.5 kg pax / 35 kg CAO (PI 968);
  - Lithium metal batteries packed with equipment 5 kg pax / 35 kg CAO (PI 969);
  - Lithium metal batteries contained in equipment 5 kg pax / 35 kg CAO (net mass of batteries per package (PI 970)

Packing Instructions

- Section II of lithium battery packing instructions:
  - Clarification that lithium batteries under Section II are still subject to the provisions applicable to dangerous goods in post, reporting of dangerous goods accidents & incidents (including undeclared / misdeclared) and limitations in passenger / crew baggage;
  - Clarification that defective and waste batteries are prohibited from transport.
  - “not restricted” has been removed from statement on the AWB. New statement will read:
    “lithium (ion or metal) batteries, in compliance with Section II of PI 9xx (65 to 70 as applicable)”.

Provisions for Passengers & Crew

- Portable electronic devices containing lithium batteries. Recommendation that items placed in checked baggage be turned off and measures must be taken to prevent unintentional activation;
- Lithium ion powered mobility aids:
  - provision for lightweight mobility aids (collapsible) to have lithium battery removed and carried in the cabin;
  - battery protected from short circuit and damage;
  - maximum of one lithium ion battery up to 300 Wh or two lithium ion batteries each not exceeding 160 Wh;
  - Pilot-in-Command must be advised of the location of the battery.

Still to Come…

- ICAO DGP have agreed to a working group meeting to be held in Montreal in January 2012. Possible issues for consideration:
  - removal or further limitation on lithium ion and lithium metal batteries shipped under Section II of PI 965 / PI 968;
  - limitation on quantities of lithium batteries loaded on an aircraft / cargo hold;
  - etc.
- Concerns based on:
  - Large quantities (bulk shipments) of Section II batteries not being advised to Pilot-in-Command;
  - potential fire risk.

Questions?

Thank You

David Brennan
International Air Transport Association
email: brennand@iata.org

George Kerchner
PRBA
email: Gkerchner@wileyrein.com

中國東方航空
CHINA EASTERN

东航锂电池运输政策

Lithium Battery Transportation Policy

China Eastern Airlines

东航锂电池运输政策

1. 东航锂电池运输流程简介

   MU's Lithium Battery Acceptance Policy

2. 鉴定报告样例

   Sample of Cert. on Safe Air Transport DG

3. 东航认可的鉴定机构

   DG Classification Labs recognized by MU

中國東方航空 CHINA EASTERN

Questions？

联系电话：0086-21-22331011

0086-21-22331017

传　　真：0086-21-22331042

电子邮箱：chenj@ceair.com

yhzhang@ceair.com

中國東方航空
CHINA EASTERN

谢谢！

中国东方航空股份有限公司

二O一一年十一月