DANGEROUS GOODS
Chairman’s Opening Remarks

David Brennan,
Head of Cargo Safety and Standards, IATA
Introduction

- Housekeeping;
- Commitments from 2010;
- 2011 Objectives.
Housekeeping

- Turn off mobile devices;
- Breaks
- Participation;
- Feedback.
2010 Commitments

- Start implementation of e-freight for dangerous goods;
- Identify potential for development of supply chain safety management system for transport of dangerous goods by air.
Commitments - Results

- Start implementation of e-freight for dangerous goods:
  - Pilot project underway. XML e-Shipper’s Declaration available with EasyDGR.

- Identify potential for development of supply chain safety management system for transport of dangerous goods by air:
  - Expansion of safety management for dangerous goods raised with ICAO Dangerous Goods Panel.
2011 Objectives
Keynote: ICAO Regulatory Update

Geoff Leach, Mgr. Dangerous Goods Office, Civil Aviation Authority, UK Chairman, International Civil Aviation Organization
ICAO Regulatory Update

Geoff Leach
Manager, Dangerous Goods Office
UK Civil Aviation Authority
In the next hour or so . . . .

- A history lesson
- The challenges we face
- Significant aspects and outstanding issues of the 2011-2012 Technical Instructions
- Items under discussion for the 2013-2014 edition
- Special projects
- Questions
Keynote speech - a speech, *as at a political convention*, that presents important issues, principles, policies, etc.

**VOTE BRENNAN!**
"the future development of international civil aviation can greatly help to create and preserve friendship and understanding among the nations and peoples of the world"

“civil aviation may be developed in a safe and orderly manner..”
Objectives of ICAO

- To promote safety of flight
- To ensure harmonization across Contracting States
Dangerous Goods Panel
Where are our challenges?
The major players

1. Operators
2. Handling agents
3. Freight forwarders
4. Senders (post)
5. Passengers
6. Shippers (including COMAT)
The biggest risk...

3. Senders (post)
4. Freight forwarders
5. Handling agents
6. Operators
GALLIUM METAL 99.999% purity - 100 grams - lab quality

Liquid at room temperature - melts in your hand!

Meet the seller
Seller: sellernoden (387) 🌟
Feedback: 100% Positive
Member: since 15-Jul-03 in Austria
- Read feedback comments
- Ask seller a question
- Add to Favourite Sellers
- View seller’s other items

Buy safely
1. Check the seller’s reputation
Score: 137 | 100% Positive
- Read feedback comments
2. Learn how you are protected
- PayPal Buyer Protection
  Free Coverage now up to £500
  See eligibility

Description (revised)
Item Specifics - Item Condition
Condition: New

This translation is provided as a service. eBay cannot guarantee its accuracy.

Ordnungszahl : 31
Ga

Rel. Atommasse: 69.723

Gallium
The biggest risk…

2. Passengers
3. Senders (post)
4. Freight forwarders
5. Handling agents
6. Operators
14 passengers and pilot killed. “the practise of carrying kerosene and other fuels concealed in their baggage is "well known in PNG and difficult to detect"."
IATA Istanbul, 2011

Uni Airlines, Taiwan – June 2005
Uni Airlines, Taiwan – June 2005

1 fatality

13 serious injuries
Uni Airlines, Taiwan – June 2005
London, Gatwick Airport – June 2005
IATA Istanbul, 2011

Manchester Airport 2008
The biggest risk...

1. Shippers (particularly COMAT)
2. Passengers
3. Senders (post)
4. Freight forwarders
5. Handling agents
6. Operators
Valujet – May 1996

Photo by: J. Tegen
are your spares dangerous?

FURTHER INFORMATION:

Many items which have been removed from an aircraft, or are being shipped as replacements, are classified as ‘dangerous goods’ and must not be shipped onwards unless they comply with specific requirements for transport.

For more information go to www.caa.co.uk/dangerousgoods

CAA DANGEROUS GOODS OFFICE 0208 839 3200
Dubai – December 2007
Dubai – December 2007
Summary – Our Challenges:

- Target the highest risk areas:
  - Shippers
  - Senders (post)
  - Passengers

- Keep Valujet at the forefront of our minds
IATA Istanbul, 2011

The 2011-2012 Technical Instructions

Technical Instructions for the Safe Transport of Dangerous Goods by Air

Approved and published by
decision of the Council of ICAO

2009 – 2012 Edition

International Civil Aviation Organization
Part 4 – General Packing Requirements

- Hermetically sealed inner packagings not exceeding 500 mL do not have to be packed in accordance with orientation arrows

- Hermetic = “complete and air tight” (Oxford English Dictionary)
Part 7 – Operator Responsibilities

✈ Provision of information – Passengers
   ✈ Online ticket purchasers must indicate they have understood restrictions
   ✈ Remote/automated check-in
      ✈ Details of forbidden items to be displayed
      ✈ Passenger to confirm they understand
   ✈ Mandatory from 2013
Baggage to check in

More about...
- Checked baggage size and weight
- Hand baggage
- Sporting equipment

<table>
<thead>
<tr>
<th>Passenger</th>
<th>Free checked baggage allowance</th>
<th>Number of bags to check in</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mr John Smith</td>
<td>London - Manchester</td>
<td>2 bags</td>
</tr>
</tbody>
</table>

Important Message

Please ensure your baggage is not left unattended. If it is left unattended, or if you have been given something to carry by another person, you must inform British Airways staff.

Passenger baggage must not contain any articles or substances that may present a danger during transport, including those shown below. Some exceptions apply:

- Acids
- Poisons
- Flammable liquids
- Explosives
- Matches/Lighters
- Bleach
- Incapacitating sprays
- Ignitable gas devices
- Compressed gas

Download our guide to dangerous goods (PDF 20KB, English only)
Part 8 – Passenger Provisions

Market aids:

- Definition clarified
- Provision for lithium battery powered devices
- Must be carried so as to prevent:
  - Unintentional activation
  - Damage by movement of baggage/cargo
**IATA Istanbul, 2011**

---

**GALL THOMSON ENVIRONMENTAL LTD**  
POMMERS LANE  
GREAT YARMOUTH, NORFOLK NR30 3PE  
ENGLAND, U.K.

**Commodity**  
BARIVEN S.A/CVP-ORIENTE  
EDIFICO PDVSA, GUARAGUAO  
PUERTO LA CRUZ, ESTADIO ANZOATEGUI, PISO 4  
VENUEZUELA

---

**TRANSPORT DETAILS**

- **Shipment by**: Airlines named as per instructions prescribed for
- **Name of Shipment**: GALL THOMSON ENVIRONMENTAL LTD
- **Airport of Origin**: LONDON HEATHROW
- **Airport of Destination**: BARCELONA, VENEZUELA
- **Shipper's reference number**: GTM 1899
- **Consignment**: GALL THOMSON ENVIRONMENTAL LTD
- **Shipper's name**: GALL THOMSON ENVIRONMENTAL LTD

---

**WARNING**

Failure to comply with all requirements of the applicable Dangerous Goods Regulations may be in breach of the applicable law, subject to legal penalties.

---

**Name/title of signatory**

J Downes - Auth. Signatory

**Place and date**

Great Yarmouth, 20.05.10

**Signature**

(see warning above)

---

EXPORT SERVICES LTD. SITPRO APPROVED LICENSEE No. 17
### IATA Istanbul, 2011

#### NATURE AND QUANTITY OF DANGEROUS GOODS

<table>
<thead>
<tr>
<th>UN or ID No.</th>
<th>Proper Shipping Name</th>
<th>Class or Division (Subsidiary Risk)</th>
<th>Packing Group</th>
<th>Quantity and type of packing</th>
<th>Packing Inst.</th>
</tr>
</thead>
<tbody>
<tr>
<td>UN 1263</td>
<td>Paint</td>
<td>3</td>
<td>II</td>
<td>1 fibreboard box x 2L</td>
<td>305</td>
</tr>
<tr>
<td>UN 2810</td>
<td>Toxic liquid, organic nos (Sodium Ammonium Vanadate Mixture)</td>
<td>6.1</td>
<td>III</td>
<td>2 fibreboard boxes x 10L</td>
<td>611</td>
</tr>
<tr>
<td>UN 1993</td>
<td>Flammable liquid n.o.s. (Acetone mixture)</td>
<td>3</td>
<td>III</td>
<td>15 x fibreboard boxes x 1L</td>
<td>309</td>
</tr>
<tr>
<td>UN 2533</td>
<td>Methyl trichloroacetate</td>
<td>6.1</td>
<td>III</td>
<td>15 x jerrycans x 10 Litres</td>
<td>611</td>
</tr>
</tbody>
</table>
This should help:

- "Minor discrepancies …..if they do not compromise safety….. should not be considered as reason for rejecting a consignment.”

- "…..it is recommended that States should not penalize operators and handling agents who accept dangerous goods despite minor discrepancies being noted.”

- "The primary aim of any incident reporting system should be to further flight safety and not to punish."
IATA Istanbul, 2011

The 2013-2014 Technical Instructions

Technical Instructions for the Safe Transport of Dangerous Goods by Air

Approved and published by decision of the Council of ICAO

2013 - 2014 Edition

International Civil Aviation Organization
Issues for States:

- “High consequence” dangerous goods:
  - Annex 17 v Annex 18
  - Review with ICAO Aviation Security Panel (AVSECP)

- State oversight responsibilities:
  - Shippers
  - Freight forwarders

- Overflights:
  - Should they be removed from the exemption process?
Issues for States:

- Approval to carry dangerous goods:
  - No current requirement, although reference made in Annex 6 (Operation of aircraft)
  - Required in many parts of the world
  - May also include handling agents

- Competence framework for State Employees:
  - Shippers
  - Freight forwarders
Other issues:

- Dangerous goods “not subject to the Technical Instructions ….”
  - Only applicable to cargo?
  - Also applicable to passengers?

- Recurrent training:
  - Calendar date introduced
  - What is required if training has expired?

- Special provision A70:
  - Bench tested internal combustion engines
Other issues:

- Mercury in manufactured articles
  - No requirement for article to be described
  - Only 1 proper shipping name ("Mercury")

- Chemical oxygen generators:
  - Incident with aspects of the Valujet accident
  - Means of preventing actuation specified

- Secondary means of closure:
  - Only applicable to inners of combination packagings
Other issues:

- Obstructed labels and markings
  - Labels must not be obscured during transport
Other issues:

- Compartment v hold
  - “Hold”, “Compartment”, “Bay”, “Section”, “Bunker!?!”
  - No standard term used by ICAO

- Reporting forbidden dangerous goods in crew baggage
  - Not currently addressed
  - Will be subject to same restrictions as passengers

- Carriage of cryogenic liquids:
  - Boeing recommend loading near outflow valves
  - Other manufacturers not concerned
Other issues:

- Passenger & crew provisions
  - Currently in text form
  - To be made more “user friendly”
Lithium batteries:

- Outreach
  - UK to produce educational video material
  - Targeting the public, shippers, senders (post) and operators

- ICAO State Letter
  - Advising of the importance of enforcing Technical Instructions
  - Urging engagement with industry
Lithium batteries:

- Safety Bulletins
  - FAA Safety Alert for Operators (SAFO)
  - GCAA Safety Recommendation
  - EASA Safety Information Bulletin
  - CAA Flight Operations Department Communication (FODCOM):

  www.caa.co.uk/docs/33/FOD201030.pdf
NOTOC review:

✈ Currently required:

✈ Air waybill
✈ Proper shipping name
✈ Technical name for n.o.s.
✈ UN number
✈ Class or division
✈ Packing group
✈ Number of packages
NOTOC review:

- Currently required:
  - Exact loading location
  - Net quantity or gross mass of each package
  - Radioactive category and transport index
  - Whether the package must be carried on cargo aircraft only
  - The aerodrome where the package(s) is to be unloaded
  - State exemption
## NOTOC questionnaire

1. How useful are the following elements:
   1. Very useful, 2. Quite useful, 3. No strong feeling, 4. little use, 5. no use
   a. Air waybill number
   b. Proper shipping name
   c. Technical name of a substance to supplement a generic “n.o.s.” (not otherwise specified) proper shipping name
   d. UN number
   e. Class or division
   f. Packing group
   g. Number of packages
   h. Exact loading location
      i. Net quantity or gross mass of each package
   j. For radioactive material the transport index
   k. For radioactive material the category (i.e. I, II or III)
   l. Whether the package must be carried on cargo aircraft only
   m. The aerodrome where the package(s) is to be unloaded
   n. Where applicable an indication that the dangerous goods are carried under a State exemption
   o. The emergency response drill code

2. How many times have you had to transmit NOTOC information to ATC?
   Never, 1, 2, 3, More than 3

3. Which of the following 5 NOTOCs do you prefer?
<table>
<thead>
<tr>
<th>Station of unloading</th>
<th>Air waybill no.</th>
<th>No. of packages</th>
<th>UN no.</th>
<th>Proper shipping name</th>
<th>Class or division</th>
<th>Subsidiary risk</th>
<th>Net quantity or TI &amp; category of each package</th>
<th>Packing group</th>
<th>CAO (X)</th>
<th>Carried under State exemption (X)</th>
<th>Loading position</th>
</tr>
</thead>
<tbody>
<tr>
<td>MME</td>
<td>010-1845 5841</td>
<td>10</td>
<td>UN 1263</td>
<td>Paint</td>
<td>3</td>
<td></td>
<td>5L</td>
<td>III</td>
<td></td>
<td></td>
<td>31R</td>
</tr>
<tr>
<td>MME</td>
<td>010-1845 1231</td>
<td>20</td>
<td>UN 1263</td>
<td>Paint</td>
<td>3</td>
<td></td>
<td>6L</td>
<td>III</td>
<td></td>
<td></td>
<td>31R</td>
</tr>
<tr>
<td>MME</td>
<td>010-1845 1234</td>
<td>15</td>
<td>UN 1263</td>
<td>Paint</td>
<td>3</td>
<td></td>
<td>5L</td>
<td>III</td>
<td></td>
<td></td>
<td>22L</td>
</tr>
<tr>
<td>MME</td>
<td>010-1845 5678</td>
<td>5</td>
<td>UN 1263</td>
<td>Paint</td>
<td>3</td>
<td></td>
<td>10L</td>
<td>III</td>
<td></td>
<td></td>
<td>22L</td>
</tr>
<tr>
<td>MME</td>
<td>010-1845 9991</td>
<td>45</td>
<td>UN 1263</td>
<td>Paint</td>
<td>3</td>
<td></td>
<td>20L</td>
<td>III</td>
<td></td>
<td></td>
<td>22L</td>
</tr>
<tr>
<td>MME</td>
<td>010-1845 5841</td>
<td>10</td>
<td>UN 1263</td>
<td>Paint</td>
<td>3</td>
<td></td>
<td>5L</td>
<td>III</td>
<td></td>
<td></td>
<td>31R</td>
</tr>
<tr>
<td>MME</td>
<td>010-1845 0000</td>
<td>25</td>
<td>UN 1263</td>
<td>Paint</td>
<td>3</td>
<td></td>
<td>5L</td>
<td>III</td>
<td></td>
<td></td>
<td>31R</td>
</tr>
<tr>
<td>MME</td>
<td>010-1845 4003</td>
<td>20</td>
<td>UN 1263</td>
<td>Paint</td>
<td>3</td>
<td></td>
<td>5L</td>
<td>III</td>
<td></td>
<td></td>
<td>22L</td>
</tr>
<tr>
<td>MME</td>
<td>010-1845 5768</td>
<td>30</td>
<td>UN 1263</td>
<td>Paint</td>
<td>3</td>
<td></td>
<td>10L</td>
<td>III</td>
<td></td>
<td></td>
<td>22L</td>
</tr>
<tr>
<td>MME</td>
<td>010-1845 1991</td>
<td>10</td>
<td>UN 1263</td>
<td>Paint</td>
<td>3</td>
<td></td>
<td>20L</td>
<td>III</td>
<td></td>
<td></td>
<td>22L</td>
</tr>
</tbody>
</table>

I confirm that the packages listed above were loaded as shown and there was no evidence of any damaged or leaking packages.

Signed: ________________________________  Status: ________________________________

Captains Signature: ____________________________________________________________
IATA Istanbul, 2011

<table>
<thead>
<tr>
<th>Loading position</th>
<th>No. of packages</th>
<th>UN no.</th>
<th>Proper shipping name</th>
<th>Class or division</th>
<th>Subsidiary risk</th>
<th>Total quantity</th>
<th>Maximum Packing group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forward hold</td>
<td>126</td>
<td>UN 1263</td>
<td>PAINT</td>
<td>3</td>
<td></td>
<td>1625L</td>
<td>III</td>
</tr>
<tr>
<td>Rear hold</td>
<td>65</td>
<td>UN 1263</td>
<td>PAINT</td>
<td>3</td>
<td></td>
<td>325L</td>
<td>III</td>
</tr>
</tbody>
</table>

I CONFIRM THAT THE PACKAGES LISTED ABOVE WERE LOADED AS SHOWN AND THERE WAS NO EVIDENCE OF ANY DAMAGED OR LEAKING PACKAGES.

CAPTAINS SIGNATURE:

Signed: .......................................................... Status: ..........................................................
# IATA Istanbul, 2011

Do we need the technical name?

<table>
<thead>
<tr>
<th>STATION OF LOADING</th>
<th>FLIGHT NO.</th>
<th>AIRCRAFT REGN.</th>
<th>DATE</th>
<th>PREPARED BY:</th>
</tr>
</thead>
<tbody>
<tr>
<td>London Gatwick</td>
<td>IC 811</td>
<td>G-PIGN</td>
<td>15 June 2010</td>
<td>Signed: ...........................................</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Loading position</th>
<th>No. of packages</th>
<th>UN no.</th>
<th>Proper shipping name</th>
<th>Class or division</th>
<th>Subsidiary risk</th>
<th>Total quantity</th>
<th>Maximum Packing group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forward hold</td>
<td>125</td>
<td>UN1993</td>
<td>Flammable liquid n.o.s. (1,2,3,4,5-Pentamethycyclopentadiene)</td>
<td>3</td>
<td>1625L</td>
<td></td>
<td>III</td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>UN2734</td>
<td>Amines, liquid, corrosive, flammable, n.o.s. (N,N,N,N-Pentamethyldiethyleneetriamine)</td>
<td>8</td>
<td>3</td>
<td>10L</td>
<td>II</td>
</tr>
<tr>
<td>Rear hold</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### IATA Istanbul, 2011

**Do we need the technical name?**

<table>
<thead>
<tr>
<th>STATION OF LOADING</th>
<th>FLIGHT NO.</th>
<th>AIRCRAFT REGN.</th>
<th>DATE</th>
<th>PREPARED BY:</th>
</tr>
</thead>
<tbody>
<tr>
<td>London Gatwick</td>
<td>IC 511</td>
<td>G-PIGN</td>
<td>15 June 2010</td>
<td>Signed</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Loading position</th>
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<td>3</td>
<td></td>
<td>1625L</td>
<td>III</td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>UN2734</td>
<td>Amines, liquid, corrosive, flammable, n.o.s.</td>
<td>8</td>
<td>3</td>
<td>10L</td>
<td>II</td>
</tr>
<tr>
<td>Rear hold</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Dangerous goods on helicopters

IATA Istanbul, 2011
That's all folks!
Networking Coffee Break

Sponsored by:

Mercator
Panel: Approvals & Exemptions

Ralph Doersam, Coordinator Cargo & Mail Handling, Cargolux
Dennis Kampman, Manager DG Compliance Center, KLM
Keynote:
UN Subcommittee of Experts Update

David Brennan,
Head of Cargo Safety and Standards, IATA
Introduction

- The UN Model Regulations;
- How they are developed;
- Significant changes adopted for 17th revised edition;
- Future UN work.
UN Model Regulations

- First published in 1957 establishing minimum requirements;
- Applicable for transport by all modes;
- Globally accepted through adoption as the basis for most international, regional and national modal transport regulations;
- Enhance safety, improve enforcement capability, ease training requirement and enhance global trade and economic development.
UN Model Regulations

- Safety is enhanced because harmonized requirements simplify the complexity of the regulations and decrease the likelihood of non-compliance;
- Economic benefits are realised by eliminating the costs of having to comply with differing national, regional and modal regulations;
- Facilitates compatibility between modal regulations so that a consignment may be transported by more than one mode without having to be reclassified, marked or labelled, most of the time…
Participants in the UNSCETDG

- Representatives from 30 countries with voting “expert” status, e.g. Australia, Canada, China, Norway, UK, etc.;
- Participants from countries with non-voting “observer” status;
- Intergovernmental organisations, e.g. EC, IAEA, ICAO, etc.;
- Non-governmental organisations, e.g. IATA, COSTHA, CEFIC, IME, PRBA, etc.
UN Model Regulations - Status

- 16th revised edition, adopted 1 January 2011 in:
  - 2011-2012 edition ICAO Technical Instructions (52nd edition DGR);
  - IMDG Code, Amendment 35;
  - ADR/RID;
  - US DOT 49 CFR (HM-215K);
  - Other national regulations…

- 17th revised edition completed December 2010
  - Implementation schedule 1 January 2013 in international modal regulations.
Revision to high consequence dangerous goods:
- Class 7 revised to now have a list of radionuclides with transport security threshold activity limits, or where not listed 3,000 A$_2$. 
Classification

- Division 6.2 – Provision for “used medical device”, “used medical equipment”:
  - Applies to devices being shipped for the purposes of disinfection, cleaning, sterilization, repair of equipment evaluation;
  - Devices or equipment contaminated with Cat A not permitted.

- Class 9 – Lithium batteries:
  - Inclusion of a requirement that cells and batteries must be manufactured under a quality management program as specified.
Dangerous Goods List

- New/revised entries in dangerous goods list:
  - UN 0014 – new PSN, Cartridges for tools, blank;
  - UN 2809 – Mercury now assigned 6.1 sub risk;
  - UN 3496 – Batteries, nickel-metal hydride, 9 (maritime use only);
  - UN 3497 – Krill meal, 4.2;
  - UN 3498 – Iodine monochloride, liquid, 8;
  - UN 3499 – Capacitor (electric double-layer), 9;
  - UN 3500 – 3505 Chemical under pressure, 2.2 / 2.1 (6.1 / 8);
  - UN 3506 – Mercury in manufactured articles, 8 (6.1).
Special Provisions

296 – Life-saving appliances, revised:

- New paragraph adopted that life-saving appliances packed in strong, rigid outer packagings with a total net mass of 40 kg containing no dangerous goods other than Division 2.2 gas in receptacles not exceeding 120 mL for inflation of the device are not regulated.
361 – electric double layer capacitors (ultracapacitors):
- Specifies storage capacity / transport conditions;
- < 10 Wh not regulated;
- When contained in equipment, not regulated.

362 – chemicals under pressure:
- Classification based on propellant, solid or liquid components;
- Determination of sub risk;
- Limits substances permitted, i.e. no Class 4, 5, Div. 6.2, Class 7.
363 – Applies to fuel entries, e.g. UN 1202, 1203, 1868, etc. to address generators, compressors being transported:

- Fuel containment must be closed to prevent leakage;
- Machinery / equipment must be labelled or placarded (dependent upon capacity of fuel containment).
Limited Quantities

- Provision for some Division 1.4S explosives to be shipped as LQ:
  - Limited to UN 0012, UN 0014 and UN 0055 only;
  - Must still be in UN specification packagings;
  - Other LQ provisions apply.
“De Minimus” Quantities

- Included as a subset within excepted quantities:
  - Applies to substances assigned to E1, E2, E4 and E5 (E3 – Class 3, PG I excluded);
  - Maximum of 1 mL / 1 g per inner packaging;
  - Maximum of 100 mL / 100 g per package;
  - Packaging and packaging test requirements apply;
  - No marking requirements;
  - Not regulated.
Packing Instructions

- Packing instructions revised to explicitly identify permitted packagings;
- Addition of “Other Metal Boxes” (4N);
- New P206 for “chemical under pressure” entries;
- New P207 for UN 1950.
Consignment Procedures

Marking of the UN number on packages, minimum size requirements:
- 12 mm, unless quantity is 30 L / 30 kg or less;
- Then must be 6 mm, unless 5 L / 5 kg or less;
- Then must be an appropriate size;
- Mandatory from 1 January 2014.
Consignment Procedures

- **Documentation:**
  - Fireworks (UN nos. 0333, 0334, 0335, 0336, 0337) must have a classification reference issued by the competent authority shown on the dangerous goods transport document.
Introduction of special provisions for dry ice, etc. when used as a refrigerant / conditioning of non-dangerous goods:

- Specific marking on packages, PSN with words “as coolant” or “as conditioner”;
- New mark for cargo transport units;
- Documentation requirements – add words “as coolant” or “as conditioner” with UN number/PSN.
Future Work

- Criteria for corrosivity and alignment with GHS;
- Transport of waste, damaged, defective lithium batteries;
- Description of the dimensions and shape of labels or marks;
- Transport of large lithium batteries;
- Revisions to the test criteria for lithium batteries.
More Information

- UN Subcommittee Agenda: http://www.unece.org/trans/main/dgdb/dgs dbc/c3age.html
Networking Luncheon

Sponsored by:
Panel: Training For Acceptance

Moderator: Richard Elbourne, Training Consultant

Panel: David Ambridge, General Manager,
Bangkok Flight Services - Cargo

Mehmet Erdikler, Export Cargo Supervisor, Turkish Airlines

Chris Notter, Cargo Hub Operations Manager, Etihad Airways
Networking Coffee Break

Sponsored by:

EurTradeNet

KEWILL®
Panel: Lithium Batteries

George Kerchner, Executive Director, PRBA - The Rechargeable Battery Association

Pat Oppenheimer, Senior Manager, FedEx Corporation
Lessons Learned from 20 Years of Global Production and Transportation of Lithium ion Batteries

George A. Kerchner
Executive Director
PRBA – The Rechargeable Battery Association
PRBA – The Rechargeable Battery Association

- Diverse membership
  - Manufacturers of rechargeable cells and batteries, notebook computers, cellular phones, power tools and medical devices
  - Retailers
  - Battery test labs
  - Automobile manufacturers

- Represent industry at UN Subcommittee of Experts and ICAO Dangerous Goods Panel

- Industry priority: Safe transport of lithium ion cells, batteries and equipment
The Production Numbers

<table>
<thead>
<tr>
<th></th>
<th>2002</th>
<th>2009</th>
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<tbody>
<tr>
<td>Li ion cells</td>
<td>800 M</td>
<td>3.20 B</td>
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<tr>
<td>Notebooks</td>
<td>40 M</td>
<td>165 M</td>
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<tr>
<td>Cell phones</td>
<td>420 M</td>
<td>1.30 B</td>
</tr>
</tbody>
</table>

Number of lithium ion cell and battery manufacturers continues to grow
Applications for Lithium ion Batteries Continue to Grow

- Transferable to many portable and stationary applications
  - Notebooks, cellular phones, power tools, medical devices, toys
  - Electric vehicles, E-bikes
  - Aircraft
  - Electric grid stabilization, energy storage
Why Lithium ion Batteries?

- Introduced by Sony in 1991
- High energy density compared to other rechargeable technologies (e.g., NiCd, NiMH)
- Light weight
- No heavy metals (e.g., cadmium, lead)
- Low self-discharge
Korea, Japan and China leading manufacturers of lithium ion cells
Step 1
Lithium ion cells shipped to battery pack assemblers/manufacturers
Step 2: Battery pack assemblers/manufacturers ship to portable electronic equipment manufacturers
Step 3:
Equipment manufacturers ship products packed with lithium ion batteries to distribution centers.
Step 4: Distribution centers ship to retail stores or Internet sellers

Step 5: Retail stores/Internet sellers ship to consumers

Step 6: Consumers ship to consumers; return products to retail stores/Internet sellers
What’s Next…?
...More Cells and Batteries

LIB cell demand (Million cells/CY)

HEV
Others
BT
Game
MP3
CAM
DSC
PT
NBPC
Cellular

03CY
04CY
05CY
06CY
07CY
08CY
09CY
10CY
11CY
12CY
13CY
14CY
15CY
16CY

Courtesy of Hideo Takeshita
Institute of Information Technology, Ltd.
What’s next…?

…New Lithium ion Technologies

…More Applications

- Lithium ion batteries
  - Lithium cobalt oxide
  - Lithium iron phosphate
  - Lithium manganese oxide
  - Nickel cobalt manganese
  - Lithium ion “polymer” batteries

- All regulated as “Lithium ion batteries” (UN3480)

- Applications for lithium ion batteries continues to grow
What’s Next…?

...New U.S. Lithium Battery DG Regulations

- U.S. Department of Transportation (DOT) January 11, 2010 proposed lithium battery rulemaking

- DOT proposed:
  - Eliminate exception for air shipments of small lithium ion and lithium metal **cells and batteries**
  - Eliminate exception for air shipments of **equipment** with small lithium ion and lithium metal cells and batteries
  - Aircraft stowage limitations on lithium ion and lithium metal cells and batteries

- $1 billion first-year impact on battery, equipment manufacturers

- Final rule expected in March 2011
Outreach, Education and Enforcement

- Non-compliance with DG regulations is significant concern
- PRBA has worked with ICAO, IATA and battery associations in China, Japan and Europe on outreach materials and educating shippers
- Enforcement by government agencies is lacking
- Can more be done?
  - Improve communication between shippers, freight forwarders and airlines
  - Improve communication between industry and enforcement and customs agencies
CONTACT INFORMATION

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Lithium Batteries / An Operator’s Perspective

Patrick N. Oppenheimer
Senior Manager Corporate Safety Health and Fire Prevention
WHAT WON’T BE COVERED.....

• Details of Proposed HM224F Regulation

• Volume of Lithium Batteries/ and or equipment containing Lithium Batteries in commerce

• Battery incident database

• Speculation about accidents of unknown causes
WHAT WILL BE INCLUDED....

• Brief overview of our experience on battery incidents

• Internal and External communications on batteries

• Development of Fire Suppression technologies

• Impact or changes due to current Proposed Rulemaking
INCIDENTS..

- Prototype lithium ion vehicle battery packs on aircraft at MEM employee smelled electrical burning as freight container being loaded onto aircraft

- Freight container off loaded from aircraft at which time smoke and fire erupted in freight container

- NTSB and FAA investigated and determined shipper had CA but shipper was not in compliance with the CA (loose tools in package unprotected and believed to have short circuited battery)
INCIDENTS..

• E Cigarette shipment loaded in lower belly compartment initiated smoke/fire warning on FedEx Express MD 11 while on approach to MSP (powered by primary lithium batteries)

• Flight crew deployed halon fire suppression and landed safely

• Crash Fire met the aircraft and upon off loading freight container at FedEx Express gate, container was smoldering and some packages were scorched

• Incident reported to FAA and NTSB. $168K penalty imposed on shipper
INCIDENTS..

- Package after being picked up at University in Massachusetts was being processed at origin FedEx Express terminal.

- On sort belt package observed smoking and removed to outside parking lot/ drive lane. Local Fire Department responded and used fire extinguishers on smoldering package.

- Contents was “cell phone components” to be used on “Prototype smart trash can” to communicate when trash can had been emptied.

- Cell phone components had exposed wires which short circuited with other hardware within the package.
Shipping Batteries Safely: What FedEx Wants You to Know

Transporting Batteries by Air.

At FedEx, we understand the importance of ensuring the safe transport of batteries throughout our system. Charged batteries may short-circuit and cause a fire and some batteries contain corrosive liquid. Therefore, if proper packaging requirements are not met, these shipments may cause a variety of problems during transport. FedEx is providing this information guide to assist you in safely packaging batteries for shipment.

Wet Batteries:
- UN2794 Batteries, Wet filled with acid, (electric storage).
- UN2800 Batteries, Wet (electric storage).
- UN2795 Batteries, Wet filled with alkali, (electric storage).

Packaging Requirements:
Outer packaging must be UN Specification Packaging, as pictured in Fig. 1 at below left. These containers must incorporate an acid/alkali leak-proof liner adequately sealed to prevent leakage in the event of a spill.

Securely fasten the batteries with the fill openings and vents facing upward. This will prevent short-circuiting. Check the orientation labels on the outside of the packaging to determine the upright position; the words “This End Up” or “This Side Up” may be displayed on top of the package.

Nonspillable Batteries:
In accordance with 49CFR§173.159 and USG-11, an IATA (USG-11) nonspillable wet electric storage battery may be regarded as not subject to the Regulations if the battery and its outer packaging are plainly and durably marked “NONSPILLABLE” or “NONSPILLABLE BATTERY” and the battery meets the conditions for being regarded as not subject to the Regulations as prescribed in Special Provision A67 (No shipper’s declaration required).
Lithium Batteries:

- UN3090 Lithium Metal Batteries (including lithium alloy batteries).
- UN3091 Lithium Metal Batteries Contained in Equipment (including lithium alloy batteries).
- UN3091 Lithium Metal Batteries Packaged with Equipment (including lithium alloy batteries).
- UN3480 Lithium Ion Batteries (including Li-ion polymer batteries).
- UN3481 Lithium Ion Batteries Contained in Equipment (including Li-ion polymer batteries).
- UN3481 Lithium Ion Batteries Packaged with Equipment (including Li-ion polymer batteries).

Regulations.
The regulations pertaining to transporting lithium cells and batteries have changed significantly. The batteries or cells must be tested in accordance with the UN Manual of Tests and Criteria. See 49CFR§173.185, the ICAO Technical Instructions and the IATA (DGR) Special Provisions. The U.S. Department of Transportation Pipeline and Hazardous Materials Safety Administration (DOT PHMSA), implemented a prohibition of lithium metal batteries on passenger-carrying aircraft.

FedEx Express has implemented additional packaging requirements on lithium metal batteries as outlined below. This policy applies to:
- Lithium batteries and cells shipped fully marked, labeled and certified in accordance with the International Air Transport Association (IATA) dangerous-goods regulations.
- Lithium batteries and cells shipped under "Competent Authority" granted by any national authority.
- Lithium batteries and cells previously excepted from other regulatory requirements in the IATA dangerous-goods regulations Special Provisions.

Packaging Requirements for Lithium Metal Batteries:
- Lithium batteries and cells must be individually packaged in fully enclosed inner packaging consisting of plastic blister wrap, pasteboard or other fully enclosed packaging that will protect each battery and cell from making contact with another lithium battery or cell, or any item that is capable of conducting electricity, in order to prevent short-circuiting. Please note: Multiple batteries enclosed in a single form-fitting "retail ready" blister pack are acceptable.
- FedEx Express will accept shipments containing lithium batteries and cells provided they are offered in accordance with the IATA (DGR) and Title 49 CFR. Shippers are required to contact FedEx Express for preapproval authorization at 1.800.GoFedEx 1.800.463.3339, option 81 and certify their compliance with this lithium battery and cell standard.

Fig. 3 Sample Packaging:
- Lithium Metal Battery in Blister Pack
- Dividing
- Sturdy Outer Container

Fig. 4 Sample Packaging:
- Lithium Metal Batteries
- Individually Packaged
- UN Specification Packaging
- Sample of Lithium Metal Battery (Prior to Packaging)
IATA Lithium Battery Label

Packages with this label contain Lithium batteries. They may catch fire if damaged. **DO NOT LOAD** a damaged package on any truck, aircraft or ULD. Report the damaged package to a manager and a DG Spill Cleanup Specialist.

**CAUTION!**

- Fragile (Handle with care)
- Contains Batteries
- Information phone number provided by the shipper
- May Catch Fire if Damaged

**DO NOT LOAD OR TRANSPORT PACKAGE IF DAMAGED**

For more information, call 123.456-7890

Battery type, entered on the label by the shipper. It will say:
- Lithium Ion Battery or
- Lithium Metal Battery

FedEx Express

This document is an uncontrolled, reference-only copy.

rev. 4/2010
HANDLE WITH CARE

- Package all batteries separately
- Recognize potential hazards
- Short circuits may occur

Direct customer questions on non-hazardous batteries to the FedEx Packaging Lab at (800) 463-3339

Think Safety, Act Safely, Be Safe

http://safety.fedex.com
NOT AVAILABLE AT 30,000 FEET.

CUSTOMERS DEPEND ON OUR DISCIPLINED PACKAGE HANDLING.

If you see a damaged package with this label, do not load the package. Immediately notify a manager and a Dangerous Goods Spill Cleanup Specialist.

For more information, call (001) 434-95557.
Development of Aircraft Fire Suppression Technologies (beyond Halon)

- Development started approximately 9 years ago
- FAA issue Aircraft Engineering Modification
- FedEx Express FSS only works with AMJ type ULD’s
- Fire Blanket “Peltz Bag’s” also being developed for use on pallets or aircraft not FSS modified

http://news.van.fedex.com/firesuppressionvideo
Impact of Proposed Rulemaking

- Volume increase of DG volume could be significant
- If Rulemaking primarily eliminates current exceptions for “bulk” batteries, should be manageable
- Loading restrictions may be problematic
  - Bulk batteries would be difficult but should exceptions for equipment containing or packed with be made, would be challenging
- Our current training and operational protocols follow DG class ie., all class 9 are loaded inaccessible. Rulemaking “may” require loading in “class c” compartment or “accessible”
Impact of Proposed Rulemaking

- Other current “accessible” loaded DG include Class/ div 1 Explosives, Class 3 Flammable Liquids, Class/ div 4 Flammable Solids, Class/ div 5 Oxidizers or Organic Peroxides, Class 8 Corrosives

- Volume loading considerations for “batteries” alone would be challenging and require considerable programming changes with cargo load systems

- Would 1,000 kg of batteries be safer if loaded in one location or spread out with 200 kg per location in five positions?
Summary

• In our experience, virtually all incidents were not due to inadequate regulation but were due to shippers not following regulations that already existed

• Lithium battery regulations and advancements have been evolving over the last ten years

• It would be more effective to focus resources on consumer and company “Outreach” than imposing additional regulations
Working Together to Build a Better, Safer Tomorrow

Patrick Oppenheimer
Sr Manager Safety Programs/
Dangerous Goods

Thank You