Dangerous Goods Symposium for Instructors

Training implications of ICAO TI changes 2007-2008

Introduced by: Dick Elbourne

Training implications

- Recognition of change
- Background of change
- Introduction of change
- Continual process of development
- Not always the final situation
- Who do the changes affect?

ICAO on DG Training

- Instructor qualifications
  - Some States have requirements
  - New minimum requirements encompass these
  - Likely to be further developed

ICAO on DG Training

- DG Instructor qualifications:
  - Adequate instructional skills
  - Successfully completed the relevant category of DG course
  - Every 24 months conduct the relevant DG course or attend the refresher

DG Training

- This is the minimum!
- What DG Instructor qualifications would you include as vital?
- How important is experience?
- How important is knowledge?
- How important is enthusiasm?
- Prime objective – Aviation safety

ICAO on DG Training

- Competency standards for DG staff
  - Existing ICAO method in other areas
  - Current ‘verify understanding following training’ is academic not ‘practical’
  - ICAO Working Group to be formed
  - How ‘practical’ is our training?

ICAO on DG Training

- Handlers of ‘Cargo’, ‘Mail’ and ‘Stores’ require training.
- New Definitions of these in TI

ICAO on DG Training

- **Cargo** - Any property carried on an aircraft other than mail, stores and accompanied or mishandled baggage
- **Mail -** Dispatches of correspondence and other items tendered by and intended for delivery to postal services in accordance with the rules of the Universal Postal Union (UPU).
- **Stores (Supplies**
- a) **Stores (Supplies) for consumption.** Goods, whether or not sold, intended for consumption by the passengers and the crew on board aircraft, and goods necessary for the operation and maintenance of aircraft; and
- b) **Stores (Supplies) to be taken away**. Goods for sale to the passengers and the crew of aircraft with a view to being landed.
- *Note: The word "landed" in this context generally means duty free or tax free goods that will be declared to Customs by passengers and crew and which may be subject to excise duty.*

ICAO on DG Training

- Record of training – not necessarily a certificate

Batteries

- Source of large number of DG incidents
- Basic safety concept
  - Prevent short circuits
  - Prevent activation
- Quality control

Lufthansa

Investigators in Chicago *examine a computer case that burst into flames before a May 15 Lufthansa flight to Germany.*

Of the more than 60 incidents of batteries overheating since 1991:

- **Short circuits** appear to be the primary cause
- **Unexplained fires/explosions** usually involve lithium-based batteries
- **Almost all incidents** involve unlabeled "nonregulated" or "excepted" batteries
- **No incident involved** batteries in retail packaging
- **Almost all incidents** detected on the ground

Source: Federal Aviation Administration

"Batteries were bought on eBay!"

Hidden hazards

- New emphasis for training:
  - Provision of information
  - General descriptions which may conceal DG in cargo and baggage
  - Other indicators of DG – labels – markings
  - DG permitted in passenger/crew baggage

Crew & Passenger Baggage

- Important as all students travel by air!
- All categories require this training
- Outside of security restrictions

Crew & Passenger Baggage

- Dry Ice
  - Now 2.5 kg
  - Checked must have PSN & net quantity
  - Optional tag
- Matches – one small packet!
  - Enforcement ?

Crew & Passenger baggage

- Fuel cell systems
  - Many conditions
  - Fuel - flammable liquids (inc. Methanol), formic acid and butane
  - Carry-on baggage only
  - Maximum fuel limits
  - 2 spare fuel cell cartridges maximum
  - Approved for carriage - English marking

DG in Air Mail

- No Category A Infectious substances. Only:
  - Exempt patient specimens
  - Category B Infectious substances
  - Dry ice only to refrigerate Category B infectious substances
  - Plus existing Class 7.

No DGD!

Several State and Operator variations!

DG in Excepted Quantities

- Inner packaging or gas receptacle…. Clarification of containers for Div 2.2 permitted substances.
  - UN1950 and UN2037

Classification changes

- Important for shippers
- Important for DG Specialists
- Technical expertise
- Not all DG Instructors have this expertise
- Does it matter?

Don’t teach what you don’t know!

Explosives

- ‘Orange Book’ 2.1.3.5 provides the basis for classification of Fireworks.

Flammable Liquids

- Class 3 definition change
- Now **60^{0}C** or **140^{0}F** Closed Cup minimum

Toxic substances

- Table 2.8 (3.6.A in IATA) has changes in packing group criteria:
- Oral PG III now >50 but <300
- Dermal PG I now <50
- Dermal PG II >50 but <200
- Inhalation PG I < 0.2
- Inhalation PG II > 0.2 but < 2.0
- Inhalation PG II > 2.0 but < 4.0

DG List

- Aerosols, most now have SP 145 and SP 153
  - 145 Waste aerosols prohibited from air
  - 153 provisions for plastic aerosols

DG List

- 5 ‘Chlorosilane’ entries no longer permitted in Limited Quantities

DG List

- **Paint** or **Paint related material, flammable, corrosive** (UN 3469)
- **Paint** or **Paint related material, corrosive, flammable** (UN 3470)
- **Paint** or **Paint related material** (UN1263) (classified as ‘flammable’)
- **Paint** or **Paint related material**, corrosive (UN3066)
- Special provision A3 (except UN 3470)

DG List

- **Hydrogendifluorides solution** (UN 3471) *(replaces UN1740 which covered solids and solutions)*
- **Crotonic acid, liquid** (UN 3472) (*replaces UN 2823 which covered solids and liquids)*

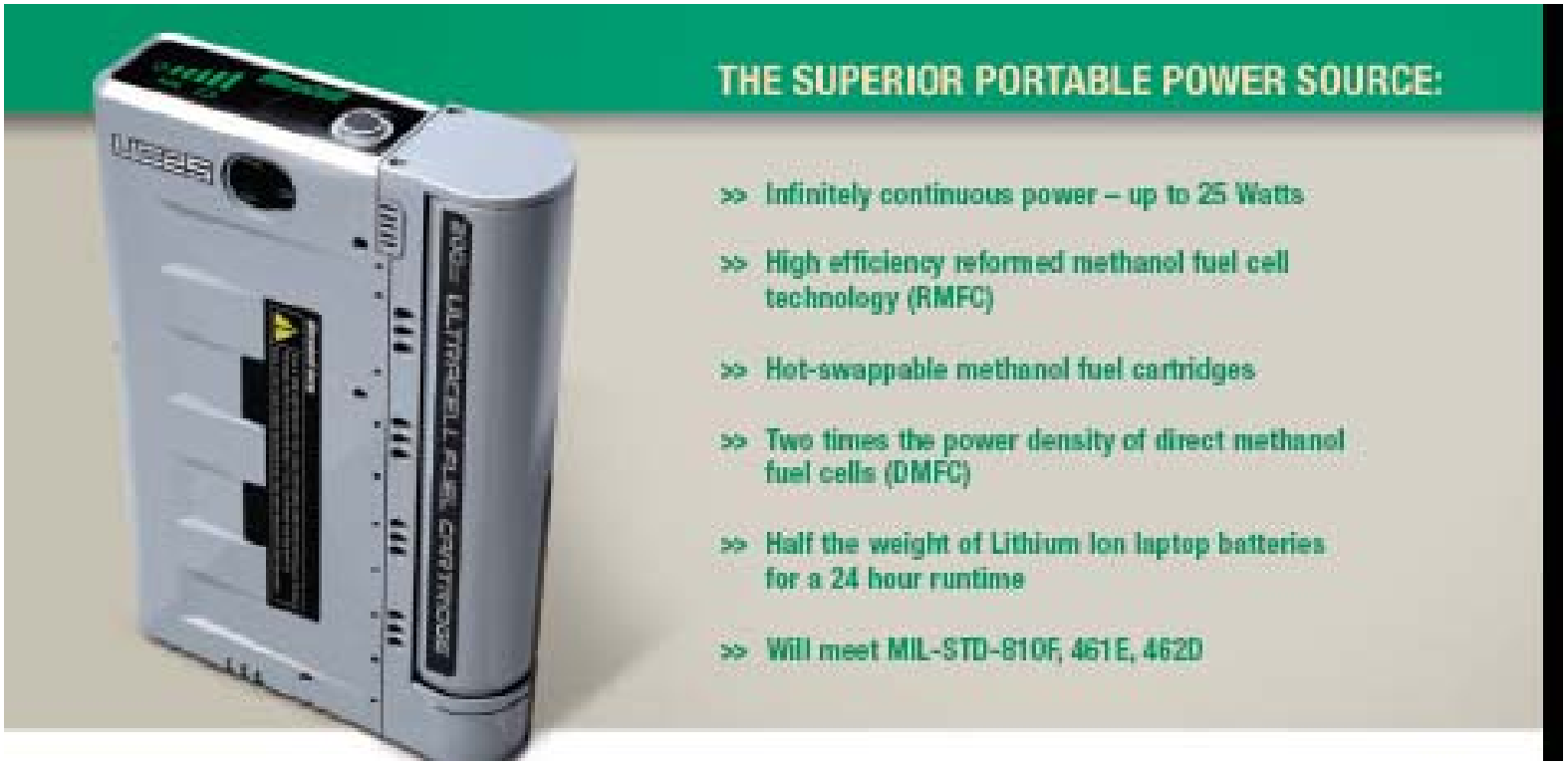
DG List

- Hydrogen in metal hydride storage system
  - Was forbidden
  - Now permitted on CAO

DG List

- **Fuel cell cartridges** (UN 3473)
  - ***A146*** *This entry applies to fuel cell cartridges containing flammable liquids including methanol or methanol/water solutions. Fuel cell cartridge means a container that stores fuel for discharge into fuel cell powered equipment through a valve(s) that controls the discharge of fuel into such equipment and is free of electric charge generating components. The cartridge must be designed and constructed to prevent the fuel from leaking during normal conditions of transport.*
  - ***This entry applies to fuel cell cartridge design types shown without their packaging to pass an internal pressure test at a pressure of 100 kPa (gauge).***

Fuel cell system



Special Provisions

- Deletions:
  - A7 now A147
  - A63 now A147
  - A126 deleted – Ammonia anhydrous, etc (forbidden/forbidden)
  - A127 now A147
  - A142 deleted – Aluminium alkyl halides and hydrides also deleted.

Special Provision – A20

- During the course of transport this substance must be protected from direct sunlight and all sources of heat and be placed in adequately ventilated areas……
  - *Statement on DGD is not specified in detail!*

Special Provision – A32

- Air bags or seat-belts installed in conveyances or in completed conveyance components …. which are not capable of inadvertent activation are not subject to these Instructions
  - *'Conveyances' (boats, light aircraft, etc.) for 'vehicles'*

Special Provision – A44

- Chemical kits or first aid kits include boxes, cases, etc. containing small amounts of one or more compatible items of dangerous goods which are used **for example for** medical, analytical or testing **or repair** purposes

Special Provision – A46

- ……Small inner packagings consisting of sealed packets **or articles** containing less than 10 mL of a PG II or III flammable liquid absorbed into a solid material are not subject to these Instructions provided there is no free liquid in the packet **or articles**

Special Provision – A66

- Consist of two components: a base material (Class 3, II or III) and an activator (Division 5.2)
- Only organic peroxides that are authorized for transport on passenger aircraft are permitted in the kits
- Packing group is assigned according to the criteria for Class 3, applied to the base material

Special Provision – A67

- No free liquid to flow – to - no free or unabsorbed liquid
- Use of non-conductive caps covering terminals to prevent short circuit

Special Provision – A70

- Revised to include internal combustion engines being shipped either separately or incorporated into a machine or other apparatus

  Editorial

Special Provision A93

- **Environmentally hazardous substances**
- These entries may be used for substances which are hazardous to the environment but do not meet the classification criteria of any other class or another substance within Class 9. This must be based on the criteria in the Regulations of other modes of transport or criteria recognized by the appropriate authority of the State of origin, transit or destination……

Special Provisions

- **Calcium hypochlorite**
- **A138** This entry applies only to calcium hypochlorite, dry, when transported in non-friable tablet form (UN 1748)
- **(New) A8** When transported in non-friable tablet form, these goods are assigned to Packing Group III (UN 2880)

Non-friable = not easy to crumble!

New Special Provisions

- A8 Calcium hypochlorite
- A14 New organic peroxide label
- A23 & A76 Uranium Hexafluoride
- A145 Waste Aerosols
- A146 Fuel cell cartridges
- A147 Subrisk of Flammable Liquid
- A148 Petroleum products in alcohols
- A150 An additional subrisk for some Organic peroxides
- A151 Dry Ice as refrigerant in ULDs
- A152 Dry dewars (old IATA A800)
- A153 Plastic aerosol restrictions

New Special Provision A147

- Where substances have a flash point of 60°C or less, the package(s) must bear a “FLAMMABLE LIQUID” subsidiary risk label in addition to the hazard label(s) required by these Instructions

Packing Instructions

- PI 203 & PI Y203
  - Plastic Aerosols – IP.7C specifications
- PI 214
  - Hydrogen in metal hydride storage system – individually or in equipment or apparatus

Packing Instructions

- PI 313
  - Fuel cell cartridges – individual (UN outer packaging required) or as integral component of equipment or packed with equipment

Packing Instructions

- PI 900
- Internal combustion engines shipped separately
  - Fuel, coolant & hydraulics to be drained;
  - Pipes to be sealed with leak-proof caps

Packing Instructions

- PI 904
- Dry Ice used as refrigerant for other than dangerous goods in a ULD
  - Prepared by a single shipper
  - Advance arrangement with operator
  - ULD must allow venting of the gas
  - Total quantity of dry ice to be advised by shipper
  - Package quantity limits do not apply SP151
  - ULD must be identified to the operator SP151

Packing Instruction

- PI 905 – Life saving appliances
  - Division 2.2 gases only in cylinders that meet the requirements of appropriate national authority of the country in which they are approved and filled

All packed in one – Limited Quantity

- Dry ice may be packed with other dangerous goods in one outer package
- Gross mass must not exceed 30 kg G
- Not included in calculation of “Q” value

Marking

- Overpacks
  - “Limited quantity” mark not required

Marking

- Limited Quantity packages
  - UN number placed in Diamond
  - Mandatory in 2009

Labelling

- Subsidiary risk labelling - clarification that special provisions may require or exempt subsidiary risk label, regardless of indication in Dangerous Goods List

Labelling

- Division 5.2
  - Current label may be used until 31 December 2010
  - New labels permissible 1 January 2007 – mandatory 1 January 2011

Labelling

- Overpacks must bear “This way up” labels
  - if they contain liquid dangerous goods in single packagings with end closures
  - If they contain liquid dangerous goods in combination packagings

Documentation

- Affects all DG shippers and operator DG acceptance staff
- Single sequence of information –
  - **UN 1717 Acetyl chloride 3 (8) II**
  - **UN 1717 Acetyl chloride, Class 3, Class (8), II**
- Description of the package - in words.
  - May be supplemented with UN Spec. Code e.g. "**One steel drum (1A1)**"

State Variations

- CAG-20 Shipping Document as per TI but with red hatchings
- GB-05 same Division 6.2 restrictions by mail modified by revised classification
- USG-01 Emphasises that 49CFR Part 175 applies to passengers and crew
- USG-08 (liquid toxics PG I inhalation toxicity) now included in USG-02

State Variations

- USG-13
  - Clearer presentation of loading restrictions
  - High hopes dashed! (personal comment!)

Operator variations

- Six more operators make variations
- Huge problem for shippers
- Great opportunity for instructors!
- GHA variations? Lack of facilities cause restrictions.
- TACT rules have “Information by Country”

Operator Variations

- DG in Air Mail
  - Some leave a grey area
  - Increase in operator restrictions
  - Often state related
- Emergency telephone number
  - Increasing requirement
  - One state requires English speaker
  - Lack uniformity
  - How effective is this requirement?
  - Emergency Response Guides – Internet – trained emergency responders

Summary

- Update all courses with relevant changes
- Incorporate changes in final tests especially recurrent training
- Get an clearer understanding of the background of the changes
- Discuss changes with other instructors
- Don’t work in isolation!
- Provide feedback to Regulators and Regulation Providers
- Maintain the Highest Quality DG Training