Lithium-Ion Battery Fire

Toronto Pearson Airport
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…The Facts as I Know Them

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‘Equipment’:

- Li-ion battery assemblies – part of a kit to convert normal bicycle to electrical-power
- 52 cells per battery
- Batteries integrated into rigid padded plastic casing, with battery management system, status indicators and electrical connection points (*battery pack*)
Background:

- Shipment of two ~ 5x5x5 ft. cardboard boxes (*overpacks*) each containing 191 battery packs packaged individually.
- On a pallet, awaiting to be loaded into ‘below-floor’ (presumably class C) cargo compartment of a pax-carrying B-767-300.
- Shipment classified/packaged per UN 3481 – ‘Lithium-Ion batteries contained in equipment’.
- Batteries at approx. 80-90% charge.
Event:
• Smoke emanating from one of the overpacks
• Action by airport fire services – initially assessed that there were 2 separate fire sources within the overpack
• ‘Offending’ overpack torn open, majority of battery packs removed to get to the seat of the fire(s) (and beyond), and fire(s) extinguished
• Occurrence under investigation by Canadian TSB
Findings:
From currently available information, it appears that:

- There was probably only one source of fire
- A cell likely went into thermal runaway and auto-ignited, igniting adjacent cells within the battery pack and, subsequently, adjacent battery packs
Findings (cont’d):

• ‘Offending’ battery pack and number of adjacent ones were destroyed / nearby units suffered significant fire/heat damage (although many appeared still ‘functional’)

• Current views from dangerous goods ‘community’ that shipment was misclassified
Status:

• Root cause not yet determined – investigation on-going

• No indication of physical damage to cells, batteries, battery packs or overpacks prior to the event

• No issues identified re. design and manufacture of the batteries / battery packs, or re. how the ‘packages’ were loaded within the overpack

• Battery pack manufacturer/shipper has elected to:
  – Reduce the batteries’ level of charge for shipping by air to ~30-40%
  – Air ship battery packs by freighter aircraft (Class E cargo compartment)
2 Li-Ion Battery Fire Incidents
17 Apr 2012 – CRJ, Toronto to Minneapolis/St-Paul
25 Nov 2011 – S340B, Sydney Airport
Thank You..!