STATUS OF SAE G-27 LITHIUM BATTERY PACKAGING PERFORMANCE COMMITTEE

Presented to International Aircraft Systems Fire Protection Working Group
Toulouse, France
May 19, 2016

Doug Ferguson, Co-Chair G-27 Committee
Claude Chanson, Co-Chair G-27 Committee
SAE Technical Committee Members:

- Function as individuals and not as agents or representatives of any organization with which they may be associated.

- Governmental employees participate in accordance with government regulations.

- Maintain balance among various interest groups (user, producer, general interest)
Committee Charter

Standards Development Process

- Writing Team develops strawman (~20 people)

- Draft standard circulated to entire G-27 committee (over 160 people) for review

- Balloting process involves all stakeholders with opportunity to comment on draft
Standards Development Process

- One telephone conference meeting/month since February
- Draft standard writing team of ~20 people met for one week face-to-face in March.
- Preliminary draft of AS6413 on SAE G-27 website for comments
- Face to face meeting of G-27 committee May 19-20 in Toulouse, France
- Writing team meeting in June at FAA Tech Center to finalize draft with incorporation of G-27 comments and lessons learned from Tech Center testing.
Writing Team

Approximately 20 individuals with standards and test experience balanced with geographic representation from the following stakeholders:

– Aircraft cargo fire protection specialists
– Regulatory authorities
– Operators
– Pilots
– Packaging manufacturers
– Battery manufacturers
– Test houses
Optimistic Projected Timeline

1) Initial G-27 meeting
   2) Document Development
      (face to face followed by virtual)
      3a) Tests feasibility verification
      3b) Document Review
         (face to face and virtual)
   4) Document finalization
   5) Committee Balloting
   6) Resolve Comments
      7) Affirmation Balloting
      8) Council Balloting
      9) Publication
The specific aircraft level hazards addressed within this standard would be:

- a) uncontrolled fire; and
- b) rapid overpressure pulse within a cargo compartment.

- The package will be placed in a transparent box with a \([0.3] \text{ m}^3\) free volume that will contain the gases generated from Thermal Runaway (TR). The box will have a rapid overpressure opening that will be sealed with a rupture foil. A spark ignition source will be energized continuously within the box volume, capable of igniting vapors reaching a flammable concentration within the box.

- For testing individual cells, use a heat source (tape, cartridge, etc) to create a temperature rise at a [terminal base] at [5 to 10 C/minute]. Monitor [both terminals] and hold at 200 C as measured at the [coldest terminal base] for 1 hour, unless there is clear external evidence of cell (TR).

- For testing batteries, the goal is to use the same methodology applied to a single cell within the battery, but there may be more than one single method for triggering TR, depending on the battery type and construction.
• The pass test criteria shall include evidence of:
  – Non-hazardous flame:
    • A flame exiting the package under test that does not contain sufficient energy to ignite adjacent packages.
    • Evidence a flame is non-hazardous may include a short duration [less than 3 seconds] flame not capable of igniting cardboard or fibreboard at a distance of [5] cm from the source of the flame.
  – Non-hazardous Fragment:
    • A fragment that has exited the package with insufficient energy to pass through or ignite adjacent packaging.
    • Evidence of a non-hazardous fragment may include a fragment not capable of igniting or passing through a UN Packaging cardboard or fibreboard package at a distance of [5] cm from the package under test.
  – Non-hazardous Surface temperature:
    • Temperature measured at center of each package surface will not exceed a peak maximum temperature of 200 C for [3] minutes with a tbd minute integrated average not to exceed 150 C.
  – Non-Hazardous Quantity of Flammable Vapor:
    • Evidence of a non-hazardous quantity of flammable vapor will be no rupture of the foil panel of the containment box.
QUESTIONS?

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