

Lithium Battery Systems for Aerospace Applications: Benefits, Issues, and Mitigation

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The current FAA regulations do not adequately address the installation of lithium batteries in aircraft, both airplanes and rotorcraft. Lithium batteries are novel and unusual with respect to the state of technology. These batteries introduce higher energy levels through new chemical compositions in various battery cell sizes and construction. Interconnection of these cells (in battery packs) introduces failure modes that require unique design considerations, such as provisions for thermal management and containment.

Several recent incidents involving rechargeable and non-rechargeable lithium batteries have prompted the FAA to initiate a broad evaluation of these energy storage technologies. In January 2013, two independent events involving rechargeable lithium-ion batteries surfaced several unanticipated failure modes that have great safety concerns. These events are described in a National Transportation Safety Board (NTSB) safety Recommendation report number AIR-14/01 dated December 1, 2014.

On July 12, 2013, an event involving a non-rechargeable lithium battery in an emergency locator transmitter (ELT) installation surfaced other unanticipated failure modes. This event is described in report on the serious incident to Boeing B787-8, ET-AOP London Heathrow Airport on 12 July 2013

This presentation is intended to provide an awareness of the benefits and considerations that are associated with the installation of rechargeable and non-rechargeable lithium battery and battery systems on aircraft. It is also to provide the FAA's current and future efforts on certification guidance.