



**U.S. Department
of Transportation
Federal Aviation
Administration**

SAFO

Safety Alert for Operators

SAFO 25002

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Flight Standards Service
Washington, DC

http://www.faa.gov/other_visit/aviation_industry/airline_operators/airline_safety/safo/all_safos

A SAFO contains important safety information and may include recommended action. Besides the specific action recommended in a SAFO, an alternative action may be as effective in addressing the safety issue named in the SAFO. This is a guidance document. Its content is not legally binding in its own right and will not be relied upon by the Department as a separate basis for affirmative enforcement action or other administrative penalty. Conformity with the guidance document is voluntary only. Nonconformity will not affect rights and obligations under existing statutes and regulations.

Subject: Managing the Risks of Lithium Batteries Carried by Passengers and Crewmembers.

Purpose: This SAFO highlights the risks associated with the carriage of lithium batteries in aircraft passenger compartments. In addition, it emphasizes the importance of identifying all potential hazards and implementing appropriate risk mitigation strategies to manage lithium battery thermal runaway events, which are self-sustaining uncontrolled increases in pressure and temperature.

NOTE: Throughout this SAFO the term “lithium batteries” applies to passenger and crewmember Portable Electronic Devices (PED) and spare lithium batteries, unless further specified.

Background: Federal Aviation Administration (FAA) data shows a number of safety events involving lithium batteries¹. Lithium batteries (including power banks and portable chargers²) can act as ignition sources and potentially start onboard fires. Lithium batteries stored in passenger overhead bins and or in carry-on baggage, may be obscured, difficult to access, or not readily monitored by passengers or crewmembers. Because of this, detection of thermal runaway and firefighting measures may be delayed in flight, increasing the risk to safety.

Discussion: FAA data underscores the critical need for operators to adhere to their safety risk management processes. Operators, per Title 14 of the Code of Federal Regulations (14 CFR) Part 5, Subpart C, must identify and mitigate potential hazards and related risks associated with the carriage of lithium batteries transported in the passenger compartment. Traditional firefighting methods should be revised to accommodate the appropriate response to a thermal runaway event. Use of Halon extinguishers can briefly suppress open flames, however they do not halt the thermal runaway process. The primary response involves using large amounts of water to cool the battery and suppress flames. Cooling the device with water is essential to prevent the reaction from continuing until all cells have discharged their energy. The FAA recommends taking the following actions:

¹The FAA publishes regularly updated data on lithium battery incidents at https://www.faa.gov/hazmat/resources/lithium_batteries/incidents.

² Power banks and portable chargers contain lithium batteries and provide power or charge to portable electronic devices, such as cell phones and laptops.

- Follow safety risk management or equivalent process to ensure all potential hazards have been identified and implement risk mitigations for carrying lithium batteries. Safety risk assessments should consider the hazard posed by the stowage of lithium batteries in areas not visible or easily accessible to passengers or crewmembers, such as in overhead bins or in carry-on baggage.
- Review lithium battery firefighting processes, procedures, and training. Operators should:
 - Ensure crewmembers recognize the different lithium battery thermal runaway stages (e.g., smoke versus flame) and can respond appropriately.
 - Assess onboard safety equipment, such as fire extinguishers, water sources, and fire containment products, to ensure they have the capability to mitigate onboard fires from lithium batteries.
 - Evaluate aircraft components, emergency equipment, and passenger items that may become involved in a thermal runaway event.
 - Review procedures that minimize the potential for smoke inhalation by passengers and crewmembers.
- Review passenger safety messaging, including websites, notification systems, cabin announcements, and safety videos. This safety messaging should:
 - Advise passengers on what lithium batteries are, where they are found, how thermal runaway occurs, and the associated risks.
 - Instruct passengers and crewmembers to carry lithium batteries in locations where a potential thermal runaway is visible and accessible by passengers or crewmembers.
 - Provide passengers and crewmembers with information on the safe handling, stowage, and carriage of lithium batteries, including how to prevent those batteries from being crushed or damaged.
 - Educate passengers in the prevention of short-circuiting, such as storing lithium batteries in plastic bags, taping and covering terminals, or keeping lithium batteries in protective cases.
 - Inform passengers to notify a crewmember immediately if their lithium battery begins to overheat or smoke.

References: Existing guidance and information to consider when conducting safety risk management processes and developing programs, policies, and procedures include (but are not limited to):

- [AC 120-92](#), Safety Management Systems for Aviation Service Providers, as resources to support this analysis;
- [AC 120-80](#), Firefighting of General and High-Energy In-Flight Fires;
- [SAFO 15010](#), Carriage of Spare Lithium Batteries in Carry-on and Checked Baggage;
- [SAFO 09013](#), Fighting Fires Caused by Lithium Type Batteries in Portable Electronic Devices;
- [InFO 17021](#), Risk Associated with the Use of Fire Containment Products by Title 14 of the Code of Federal Regulations (14 CFR) Part 91 Subpart K (91K), 121, 125, and 135 Operators; and

- Air Carrier Safety Training Videos on PED Firefighting in the Cabin/Flight Deck available at https://www.faa.gov/hazmat/air_carriers/resources

Recommended Action: Operators and designated personnel (e.g., Directors of Safety, Directors of Operations, Program Managers, and Directors of Training) should consider the information provided in this SAFO when developing or reviewing their programs, policies, and procedures for managing the risks associated with lithium batteries carried by passengers and crewmembers.

Contact: Direct questions or comments regarding hazardous materials to the Office of Hazardous Materials Safety at HazMatInfo@faa.gov or (405) 954-0088. General questions or comments regarding this SAFO should be directed to the Air Transportation Division at 9-AFS-200-Correspondence@faa.gov.