

FAA Dangerous Goods Program: Incidents and Undeclared

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**Federal Aviation
Administration**

- **Is there indifference today to lithium battery incidents and accidents in air transportation?**



- **Accident and incident information involving the transport of lithium batteries by air is still useful and valid**
- **But is more incident data needed to establish a trend of the safety concerns with lithium batteries?**



Incidents Involving Lithium Batteries

- As of August 1, 2019, FAA has 265 lithium battery incidents listed (mainly US based)

LITHIUM BATTERIES & LITHIUM BATTERY-POWERED DEVICES

Events Involving Smoke, Fire, Extreme Heat or Explosion Involving Lithium Batteries

As of August 1, 2019, 265 air/airport incidents involving lithium batteries carried as cargo or baggage that have been recorded since March 20, 1991

Note: These are recent events that the FAA is aware of; this should not be considered a complete listing of all such incidents. The incident summaries included here are intended to be brief and objective. They do not represent all information the FAA has collected, nor do they include all investigative or enforcement actions taken. This list does not include three major aircraft accidents where lithium battery cargo shipments were implicated but not proven to be the source of the fire: An Asiana Airlines 747 near South Korea on July 28, 2011, a UPS 747 in Dubai, UAE on September 3, 2010 and a UPS DC-8 in Philadelphia, PA on February 7, 2006

Date	Source	Type of Battery	Device (if applicable)	Carrier	Aircraft Type (Passenger or Cargo)	Incident Summary
7/15/2019	Airline	Li-ion	Laptop/Tablet / iPad	N/A	N/A	At JFK Airport, a Unit Load Device (ULD) was inadvertently dropped as it was being transported from the warehouse to the tarmac. Shortly after it a package inside of it began to emit smoke and soon after was on fire. The ULD contained several boxes of used laptops.
6/19/2019	TSA	Li-ion	Battery Charger/ Battery Pack	N/A	N/A	While going through TSA screening, a passenger's carry on bag caught fire and was put out by a fire extinguisher. The cause of the fire appeared to have come from items in a pouch, which included a Power Bank.

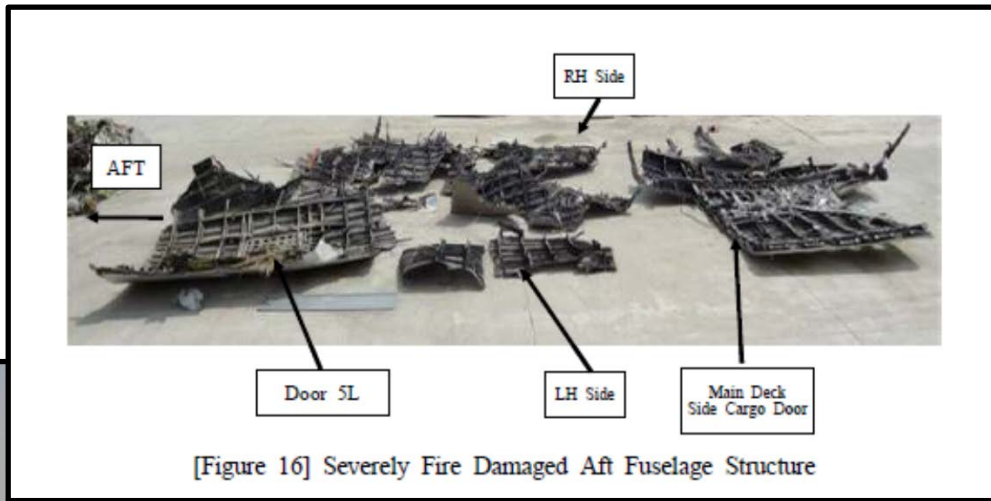
https://www.faa.gov/hazmat/resources/lithium_batteries/media/Battery_incident_chart.pdf



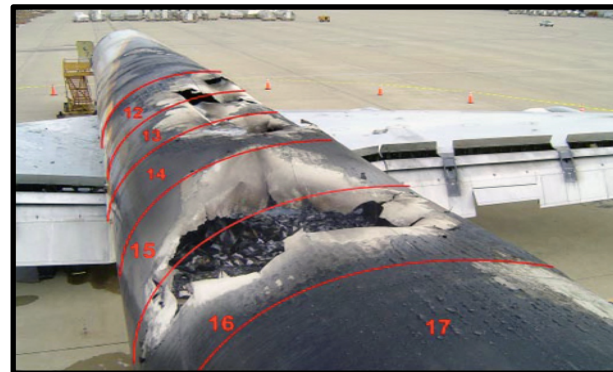
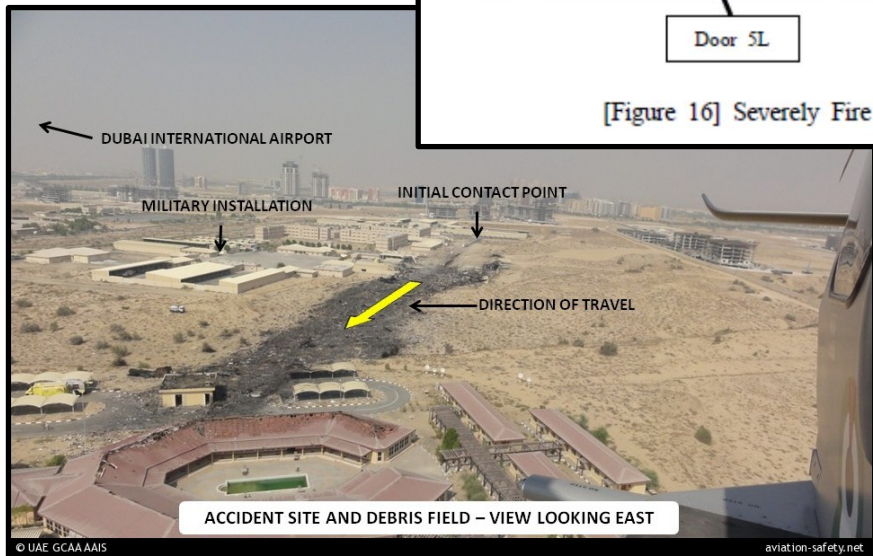
Accidents Involving Lithium Batteries

- **UPS Flight 1307, Feb. 7, 2006, Philadelphia**
 - DC-8 aircraft, lands OK, no fatalities, total hull loss
- **UPS Flight 6, Sep. 3, 2010, Dubai, UAE**
 - B747-400F, 2 fatalities, total hull loss
- **Asiana Flight 991, July 28, 2011, S. China Sea**
 - B747-400F, 2 fatalities, total hull loss





[Figure 16] Severely Fire Damaged Aft Fuselage Structure



- **What are the tools that are available today to try and reduce the risks in the transport of lithium batteries by air?**
- **Regulations / Standards**
- **Business Practices**
- **Safety Management Systems**
- **Industry Standards**
- **Safety Risk Assessments**
- **Safety ideas/products**



- **Goal: To be able to reduce the risks associated with the transport of lithium batteries by air to an acceptable level of safety**



- **Some of the key component areas in reducing the risk involved in the transport of lithium batteries in cargo by air**
 - Trust
 - Accountability
 - Reliability



Operator / Air Carrier Perspective



Operator / Air Carrier Perspective

- **BACKGROUND:**
- **Ten (10) Years ago – Accepting dangerous goods shipments by ensuring each package was in compliance with the regulations.**



Operator / Air Carrier Perspective

- **BACKGROUND:**
- **By 2010, ICAO is working on Safety Management.**
- **In 2013, Annex 19 – *Safety Management* is published and *Safety Management Manual (SMM)* (Doc 9859) is updated.**



Operator / Air Carrier Perspective

- **BACKGROUND:**
- **Incidents in transportation were occurring involving lithium batteries that were in full compliance with the UN Manual of Tests and Criteria, Part III, sub-section 38.3.**



Operator / Air Carrier Perspective

- **BACKGROUND:**
- **In 2015, The Boeing Company, Airbus, and Embraer issue bulletins to existing owners of their transport aircraft that cargo compartments were not designed to deal with a fire involving lithium batteries.**



Operator / Air Carrier Perspective

- **BACKGROUND:**
- **In 2016, the FAA Technical Center published Technical Note DOT/FAA/TC-TN16/34.**
 - Title: Impact of Lithium Battery Vent Gas Ignition on Cargo Compartment Fire Protection

<https://www.fire.tc.faa.gov/pdf/TC-TN-16-34.pdf>

Operator / Air Carrier Perspective

- **Safety Risk Assessment (SRA)**
 - Annex 6 – Part I, new Chapter 15: Cargo Compartment Safety
- **There is much more information and data today from 10 years ago for this SRA process regarding lithium batteries, but it is still a complex task that involves many variables**



Operator / Air Carrier Perspective

- **It is the Operator that has the responsibility to determine the acceptable level of risk surrounding lithium battery shipments in cargo on their aircraft**



Operator / Air Carrier Perspective

- **What type of information do operators need to ask for and gather in this process?**



Operator / Air Carrier Perspective

- **How many lithium battery shipments or lithium batteries are the operators currently accepting and transporting on the aircraft?**
- **Declared packages of lithium batteries in full compliance with the regulations?**
- **Prevention of undeclared or under declared shipments of lithium batteries?**



Operator / Air Carrier Perspective

Even if the operator has a good understanding of the number/quantity of lithium batteries they are accepting:

- **How many lithium batteries can operators load onto their aircraft in each cargo compartment?**
- **Where should the lithium battery packages be located on the aircraft?**



Operator / Air Carrier Perspective

- **Are there additional mitigation measures available that the operator could implement in going forward with allowing lithium batteries on the aircraft?**



Operator / Air Carrier Perspective

- **Does information about safer lithium battery chemistries help in the current transport system?**
- **What are the concerns and risks with the potential for accepting counterfeit and non-UN 38.3 tested cells and batteries?**



Operator / Air Carrier Perspective

- **How do operators identify the lithium batteries that are the safer chemistries?**
- **How do operators identify the lithium batteries that are counterfeit or non-UN 38.3 tested?**
- **How do operators ensure that they do not accept any undeclared shipments?**



Operator / Air Carrier Perspective

- **Operators are utilizing their Safety Management Systems (SMS) process to get to the end goal:**
 - Operate the aircraft at an acceptable level of safety
- **The operator then makes critical decisions and develops policies and procedures to facilitate that goal**



Operator / Air Carrier Perspective

- **The operator needs to understand their risk and make a determination.**
- **Is there enough Accountability and Reliability in their system to be able to accept lithium battery shipments?**
- **Could mitigations be implemented to be able to move to a point where the system would be acceptable?**



Operator / Air Carrier Perspective

- **If operators decide to accept and transport lithium battery shipments without making any changes to their system, then that is a decision.**
- **By making that choice, the operators are stating that they have evaluated the risk and determined that they are willing to accept that level of risk.**



Operator / Air Carrier Perspective

- **Operators can no longer state that they are accepting lithium battery packages in compliance with the regulations and therefore that their operation is safe.**
- **That is not conducting a safety risk assessment.**
- **The risk cannot be managed at the package level.**



Operator / Air Carrier Perspective

- **What are recent decisions being made by operators?**
- **What could be expected in the future?**



Operator / Air Carrier Perspective

- **The Safety Risk Assessment (SRA) process is not a one time activity.**
- **An SRA is something that needs to be reviewed and reevaluated.**
- **New information, changes, additional mitigations, new technologies, etc. that can be considered in the updated SRA.**



- **In moving forward, we need to be looking for incremental increases in safety.**
- **The only way to remove 100% of the risk on lithium battery transportation of cargo by air, is to keep cargo compartments completely empty.**



- **Prescriptive regulations are not going to solve the concerns involving the shipment of lithium batteries in cargo by air.**
- **They are the minimum standard and just one element of an overall system for safety.**



Accountability, Reliability & Trust

- **Lithium batteries are unprecedented in the quantity manufactured, quantity transported, & global level of reliance / importance over any other dangerous goods experienced in the past.**



Accountability, Reliability & Trust

- **How do operators, shippers, the battery industry, freight forwarders, industry standards groups, industry assoc. groups, aircraft manufacturers, etc. all work together to increase the accountability, reliability, and trust of the lithium battery shipments offered for cargo by air?**



Accountability, Reliability & Trust

- **By support efforts and participation in the development and implementation of industry standards, working groups, processes, etc. that increase the trust/accountability of what is actually being offered in air transport.**



Summary

- **It is going to take more than the regulations or the operators to solve all these concerns.**



Summary

- **Everyone involved in the process from the battery industry, transportation supply chain, regulators, industry standards groups, industry assoc. groups, airline manufacturers and the consumers will need to be actively involved and committed to reducing this risk of transporting lithium batteries on aircraft for us to be successful.**



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QUESTIONS?

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