Here's a **summary of the Lithium Battery Safety Seminar**:

Presenter

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Purpose

Discuss **risks, firefighting techniques, and crew challenges** related to lithium-ion batteries on aircraft.

Key Topics

1. Lithium-Ion Battery Basics

- Rechargeable batteries using lithium compounds; lightweight and high energy density.
- Advantages: high power-to-weight ratio, long life, no memory effect.
- Disadvantages: safety risks, sensitivity to heat, mechanical damage, and manufacturing defects.
- Batteries degrade over time (2–3 years lifespan).

2. Thermal Runaway

- Exothermic reaction causing rapid heat and energy release.
- Triggered by short circuits, punctures, overcharging, or dendrite formation.
- Can lead to fire or explosion.

3. Onboard Risk

- Narrow-body aircraft: 500–600 batteries; A380: 1000+ batteries.
- High likelihood of faulty devices among passengers.
- Smell of overheating electronics is often the first warning sign.

Firefighting Procedures

- Treat all fires as potential lithium battery fires.
- **Step 1:** Extinguish flames with Halon/Halotron.

- **Step 2:** Cool aggressively using non-alcoholic liquid (avoid ice – it insulates heat).
- **Step 3:** Contain device in fire containment bag or waterproof container (e.g., Atlas box, lined bin).
- **Caution:** Water used for cooling becomes contaminated (hydrogen fluoride risk).
- Never attempt to remove battery from device during fire.

Challenges

- Limited space and resources onboard.
- One-crew operations (e.g., Dash/Rex) require passenger assistance.
- Human factors: stress, decision-making under pressure.
- Importance of **scenario-based training** beyond annual revalidation.

Case Studies

- **UPS Flight 6 (Dubai, 2010):** Cargo fire from 81,000 lithium batteries; led to ICAO ban on lithium batteries in cargo holds.
- **Melbourne (2014):** Drone batteries ignited in cargo hold; reignited after 20 mins cooling.
- **Recent incidents:** Power bank fires in cabins; passenger injuries from exploding devices.

Preventive Measures

- Passenger education on risks and airline restrictions.
- Vigilance during check-in and boarding (removing devices from checked bags).
- Monitoring battery health: bulging, discoloration, leaks.
- Avoid 100% charge; batteries are most stable at ~30–70% charge.
- Power banks >160 Wh banned; smaller devices still pose risk.

Key Takeaways

- Lithium battery fires are **two-stage events**: extinguish flames, then cool and contain.
- Training should include **practical, non-jeopardy scenarios** to build confidence.
- Risk will increase as more devices and wireless charging become common.
- Collaboration and information sharing between airlines and emergency services is essential.

LITHIUM BATTERY SAFETY

LITHIUM-ION BATTERY BASICS

Rechargeable batteries using lithium compounds: having a safety risk

drawbacks like safety risks

THERMAL RUNAWAY

Exothermic reaction leading to heat and energy release

ONBOARD RISK

Number of batteris in passenger devices

First warning sign overheating electronics

FIREFIGHTING PROCEDURES

1. Extinguish flames with Halon
2. Cool with non-alcoholic liquid
3. Contain in a fire containment bag or waterproof container

PREVENTIVE MEASURES

- Educate passengers
- Monitor condition and charge
- Remove devices from check-ked bags
- Prohibit power banks ≥ 160 Wh