

Electronic Flight Bag (EFB) Hazard Assessment

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Background

- EFBs are electronic devices used to replace the paper materials typically found in the pilot's Flight Bag.
- They are divided into three classes:
 - **Class I** – Portable electronic device (PED), Commercial off the Shelf (COTS) equipment, used as loose equipment and stowed during portions of flight
 - **Class II** – PED, can be COTS equipment, mounted and connected to aircraft power during flight for use and charging.
 - **Class III** – Considered installed equipment, these are not PED, or COTS equipment, but rather are pieces of equipment built and tested specifically for aircraft EFB use.

Background

- Class I EFBs are considered portable electronic devices (PEDs) and are not subject to airworthiness standards.
- Class II EFBs are also considered PEDs, and are not subject to airworthiness standards, however their mounting/charging connection hardware are.
- Class III EFBs are subject to airworthiness standards, as they are considered installed equipment.
- Responsibility for class I and class II EFBs falls under FAA flight standards

Proposed Testing

- A brief set of tests is planned to assess the potential hazard posed by class I and class II EFBs.
- Laptop outfitted with a high capacity (7.2 Ah) Li-Ion battery will be installed in cockpit of FAA Fire Safety 737.
- Battery has been modified, replacing one of the battery cells with a small cartridge heater, used to initiate thermal runaway.
- Thermocouples placed on the cartridge heater, and one adjacent battery cell.
- Smoke meter installed across pilot and co-pilot stations.
- Gas sampling (CO, CO₂, O₂) locations at pilot and co-pilot stations.

Proposed Testing

- Laptop will be placed in the cockpit within a mesh cage to prevent any damage to aircraft. In addition, all flammable material (carpeting, seat cushions, etc) from the cockpit has been removed.
- Two test scenarios will be conducted and documented (filmed):
 - Resulting fire will be extinguished immediately following first battery event. Subsequent events of adjacent batteries will be monitored.
 - Resulting fire will be allowed to continue for as long as possible without endangering the aircraft.
- Video of test, along with smoke and gas concentration data should provide a good assessment of what hazard is being introduced into the cockpit through the use of EFBs.