

B787 ELT Battery Fire Investigation

In July 2013 a ground fire occurred on a parked and unoccupied B787 at London Heathrow Airport. The resulting UK AAIB investigation determined that the fire initiated due to a thermal runaway within the non-rechargeable lithium-metal battery of the aircraft's Emergency Locator Transmitter (ELT). The battery decomposition products impinged directly on the composite fuselage structure, acting as an ignition source. A slow-burning fire became established in the composite structure and continued to propagate, long after the thermal energy released by the battery failure had been exhausted.

The energetic nature of the battery failure reduced much of the forensic evidence to dust. The investigation therefore relied upon alternative techniques to identify the most likely causes of the battery failure and the effects of that failure on the aircraft. This presentation will describe the collaborative investigation approach, including the extensive test campaign undertaken by the aircraft and component manufacturers in support of the investigation. It will explore the certification landscape relating to lithium-batteries in installed aviation equipment and consider how, despite comprehensive certification and safety assessment efforts, relatively well understood battery failure modes had not been identified as potential hazards to the aircraft.

Lastly, the presentation will describe the safety actions and recommendations emerging from this investigation, which are predominantly aimed at improving certification and safety assessment requirements for non-rechargeable lithium batteries in aviation equipment.