

## **Subject: A350XWB Lithium Batteries - A guide for fire fighters**

### **Purpose**

The purpose of this document is to describe firefighting guidelines to follow when faced with an emergency involving a Lithium battery event on Airbus A350XWB aircraft.

Lithium battery event is characterized by intense heat/smoke generation (e.g. cell thermal runaway).

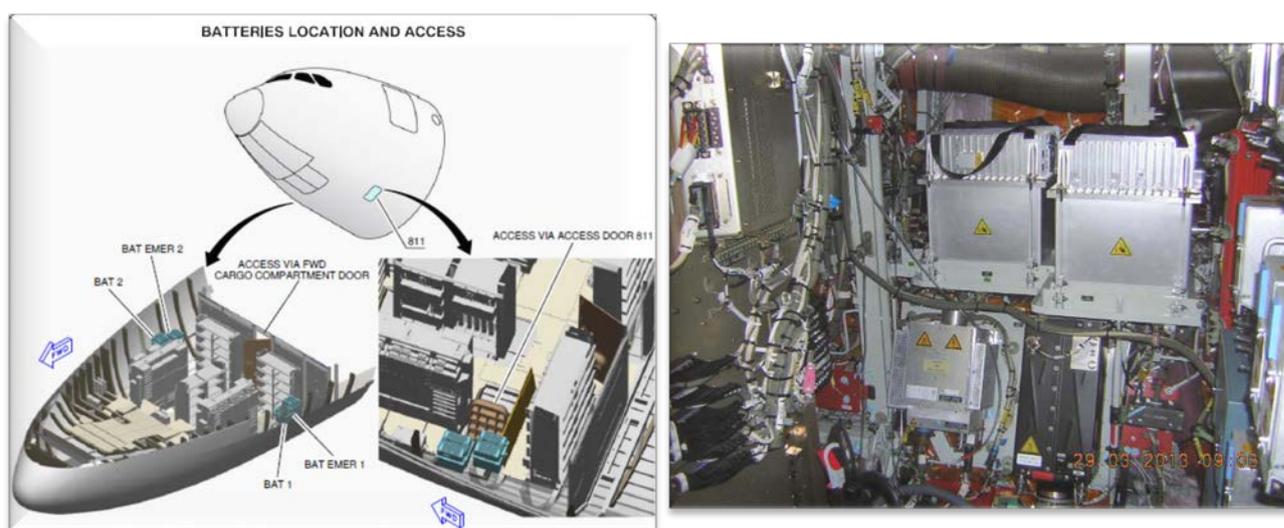
### **Scope**

The batteries described in this guide are the main aircraft batteries installed in the Electrical/Electronics Bay (E/E bay) and the batteries of the Emergency Locator Transmitter (ELT) installed in the Cabin Crew Rest Compartment (CCRC).

*For any question, please contact airport operations department  
[airport.compatibility@airbus.com](mailto:airport.compatibility@airbus.com)*

## 1 E/E BAY MAIN BATTERIES

The four main aircraft batteries are located in the E/E bay which is a pressurized area. There are two batteries installed on the left hand side of the E/E bay and two on the right hand side of the E/E bay (Figure 1).



Note: Picture taken from the right FWD cargo access door. The 2 other batteries are symmetrically installed.

**Figure 1: Main batteries location**

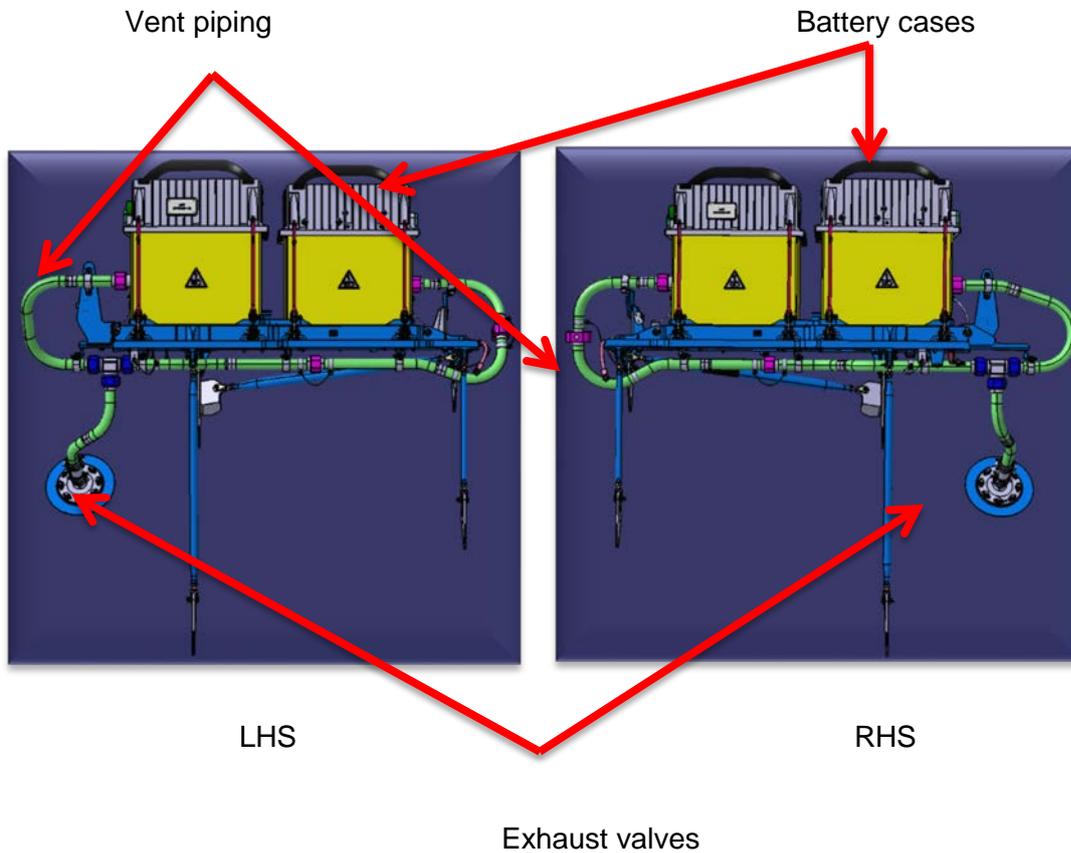
➤ For 3D animations please refer to “A350 main batteries access ebay” wrl attached in the file “Firemen guidelines 3D animations”.zip.

**Battery packaging:** the battery system (composed of 14 cells and battery management system) is embedded in an aluminium casing designed to sustain a thermal runaway event. This casing is connected to an exhaust system composed of a 1 inch piping ended by an exhaust valve mounted in the fuselage skin (Figure 2) to evacuate the gases outboard the A/C.

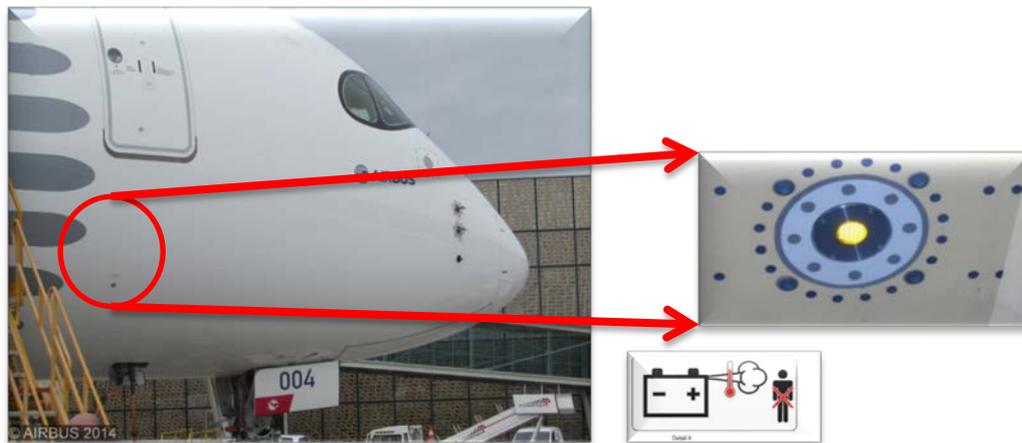
The two batteries installed on the left hand side of the E/E bay are connected to the exhaust valve on the left hand side of the aircraft. The two batteries on the right hand side of the E/E bay are connected to the exhaust valve on the right hand side of the aircraft.

The exhaust valves are normally closed by an orange coloured burst disk.

In the event of one of the Lithium-ion cells overheating, the gas produced will create an excessive internal pressure. The excessive internal pressure will burst the orange disk, allowing gasses to be vented to the outside of the aircraft.



**Figure 2: Battery exhaust system**



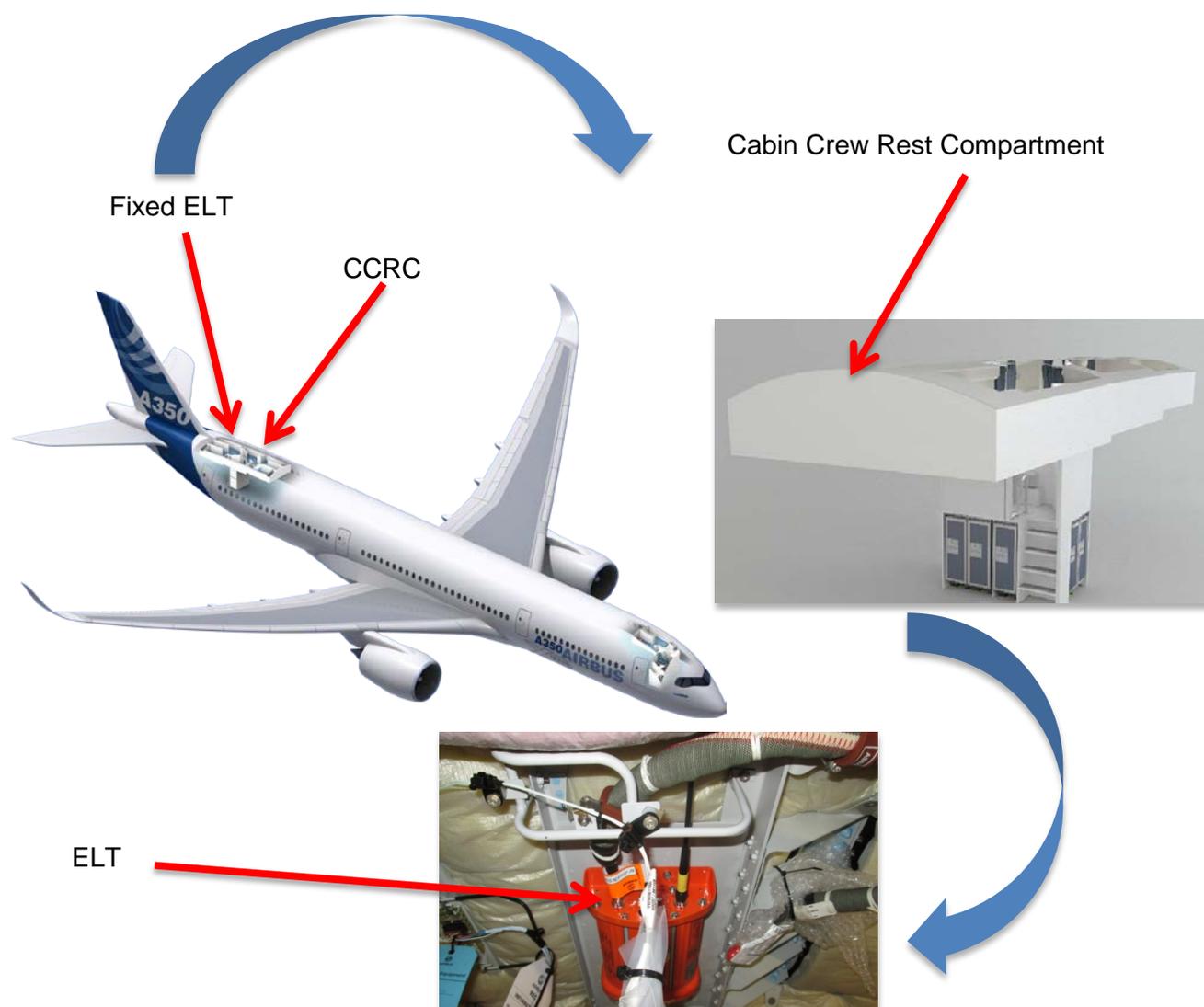
**Figure 3: Exhaust valve (on each side of the aircraft)**

- For 3D animations please refer to “A350 Batteries Burst disk blown”wrl attached in the file “Firemen guidelines 3D animations”.zip.
- For 3D animations please refer to “A350 Batteries Burst disk intact ”wrl attached in the file “Firemen guidelines 3D animations”.zip.

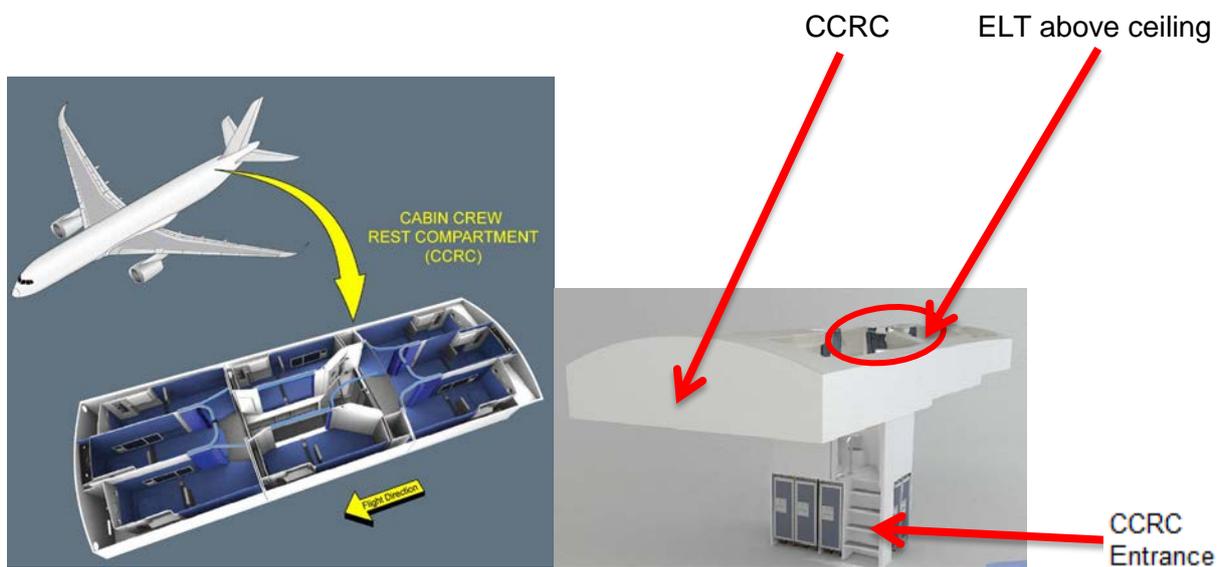
## 2 ELT BATTERY

The Emergency Locator transmitter (ELT) has two Lithium batteries.

The ELT transmitter is located in the AFT fuselage area above the Cabin Crew Rest Compartment (CCRC).



**Figure 4: ELT location**



**Figure 5: Access to ELT**

## **Guide for Fire Fighters**

Each Lithium-ion cell stores energy that can generate intense heat/smoke in the event of a thermal runaway.

Hot gases and smoke generated in case of battery failure with cell venting may be visible from exterior exhaust valve. This fume exhaust is visible on each side of forward fuselage of the airplane.

Ground personnel should avoid the E/E bay external exhaust valve and exhausted gases.

Here below are the guidelines to be followed by firemen in case of a lithium battery event on the A350XWB.

Please refer to the battery manufacturer documentation for further guidance on Lithium battery events.

## **Recommended guidelines (Main batteries)**

- Ensure no personnel is downwind of the aircraft.
  - The security perimeter around the aircraft should be of at least 10 meters.
  - Firemen must wear protective Equipment including Breathing Apparatus when approaching the affected Zone.
  - Check the status of the burst disk.
  - If the burst disk is blown, confirm that gasses are produced by the battery and are vented over-board through the exhaust valve on the A/C skin.
  - Communicate with the flight crew to confirm that the cabin is no longer pressurised.
  - Confirm Aircraft main power is shut down by communicating with the flight crew.
  - Open the E/E bay external “hatch (avionics compartment access door)” on the forward left hand side of the aircraft.
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- For 3D animations please refer to “A350 Cabin Cargo AFT Operation Normal”.wrl attached in the file “Firemen guidelines 3D animations”.zip.
  - For 3D animations please refer to “A350 Cabin Cargo Operation Manual”.wrl attached in the file “Firemen guidelines 3D animations”.zip.

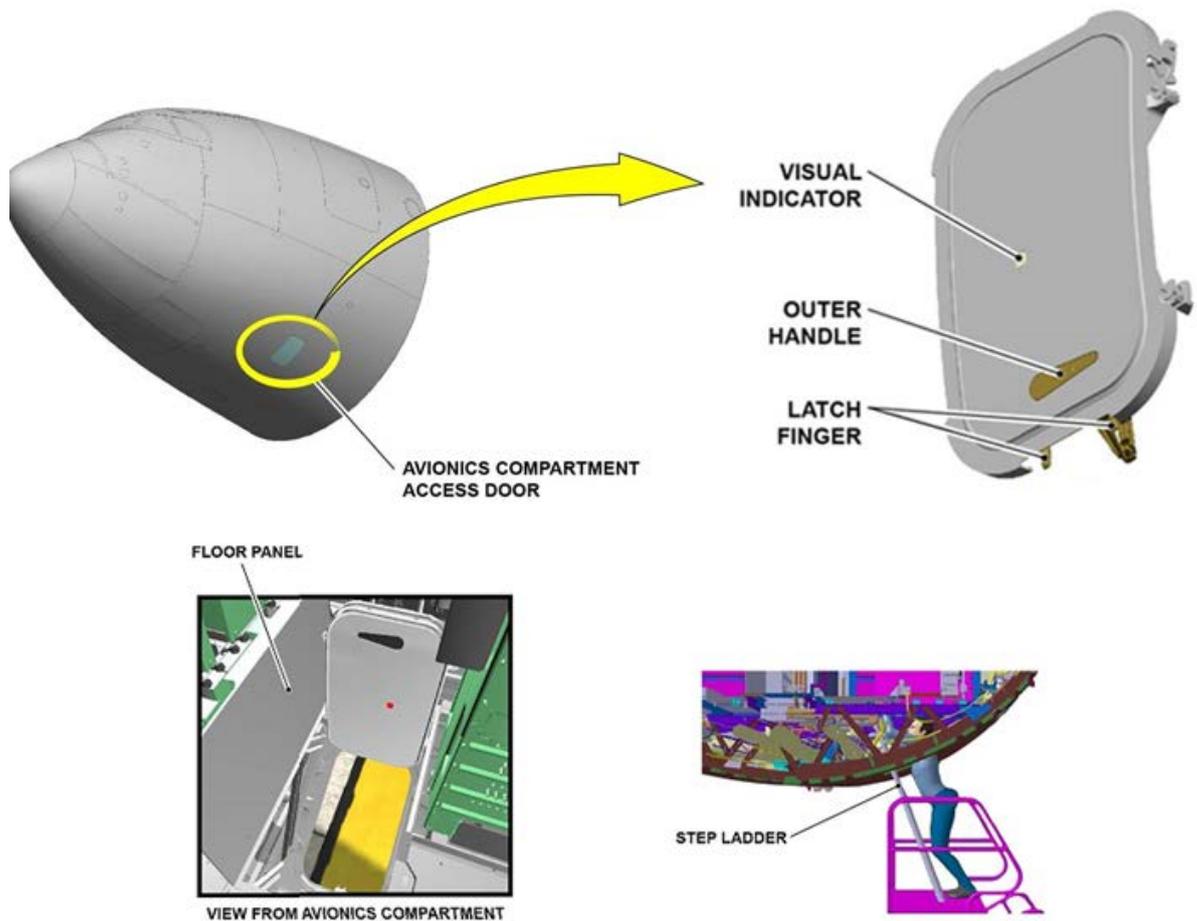


Figure 6: Access to avionic compartment



**Figure 7: Ground Hatch Kinematics**

In the event of overheating with dense smoke:

- Flood the E/E bay with Halon extinguisher agent (or a suitable Halon replacement) using fire hose.
- After Halon is spread, close the hatch to optimise the extinction.
- 3 to 5 minutes after the diffusion of the Halon, access the E/E bay by the door in the forward cargo compartment or the hatch.
  - For 3D animations please refer to “A350 main batteries access cargo”.wrl in the file “Firemen guidelines 3D animations”.zip.
- If required, complete the extinction using CO2 extinguishing agent directly on the aluminium battery case.
- After extinction open the E/E bay hatch and the door in the forward cargo compartment to vent the E/E bay (do not open the cockpit hatch).
- If fire still present flood with water fog.
- Make sure there is no hazardous gases in the E/E bay by using appropriate means.

### **Recommended guidelines (ELT guidelines)**

- Ensure no personnel is downwind of the aircraft.
- The security perimeter around the aircraft **should** be at least **10 meters**.
- Firemen must wear protective Equipment including Breathing Apparatus when entering the affected Zone.
- Communicate with the flight crew to confirm that the cabin is no longer pressurised.
- Confirm Aircraft main power is shut down by communicating with the flight crew.
- Access the Cabin Crew Rest Compartment (CCRC) via the AFT cabin galley area using the stairs (refer to figure 6).
  - Please refer to “A350 ELT access”.wrl attached in the file “Firemen guidelines 3D animations”.zip.
- Once in the CCRC, if necessary, break the CCRC ceiling panel in order to stop the fire reaction.
- Flood the ELT with CO2 and/or water fog.



2, Rond-point Dewoitine  
31703 Blagnac Cedex  
France

**FROM: Airport Operations**

DATE: 18h of June 2019

REF: V00ME1916319

ISSUE: Issue 2.0

**If flames are still visible use specific foam (e.g. one seven).**

Open AFT Passengers doors (4 left /4 right) and FWD doors (1 left/ 1 right) to vent (evacuation of hazardous smokes and gases).