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# 787 Lithium-ion Battery Events

## A Guide for Fire Fighters

# Discussion

• The 787 is equipped with two primary lithium-ion batteries, which are contained in a stainless steel enclosure with a vent tube leading overboard.

• Each lithium-ion cell contains flammable electrolyte.  If the cell has a short circuit or is exposed to high temperatures, it can swell and the electrolyte may vaporize creating internal pressure which then may vent overboard.

• The Boeing Aircraft Rescue and Fire Fighting Information document has been updated to clarify 787 battery information.

• Boeing has developed recommended fire fighting procedures to follow if a lithium-ion battery event occurs.

# 787 Battery locations

## Lithium-ion Batteries

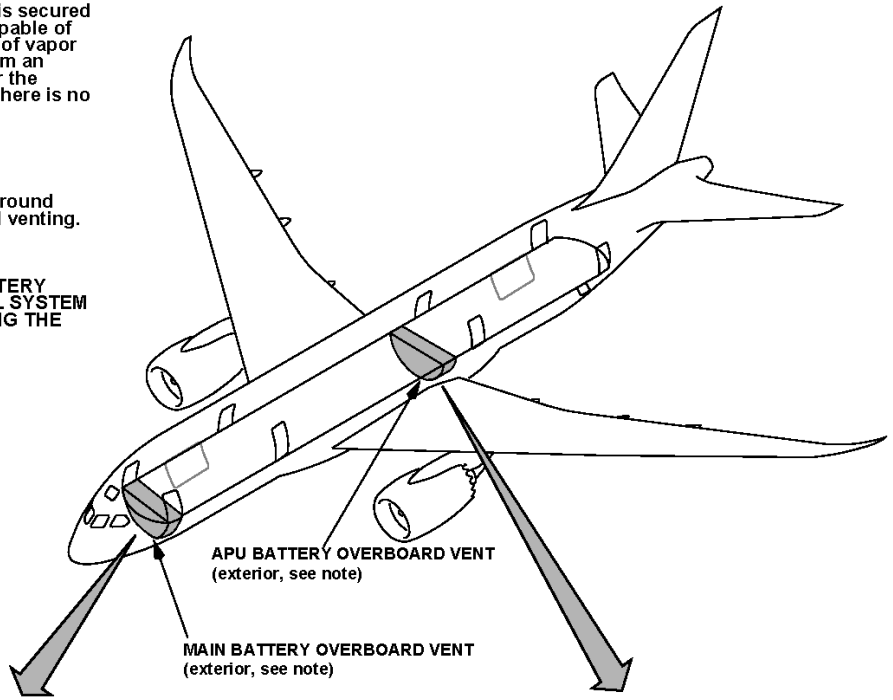
For additional information on recommended fire fighting procedures related to the lithium-ion batteries on the 787, please see data posted in the “Fire & Rescue” section at the following website: www.boeing.com/airports.

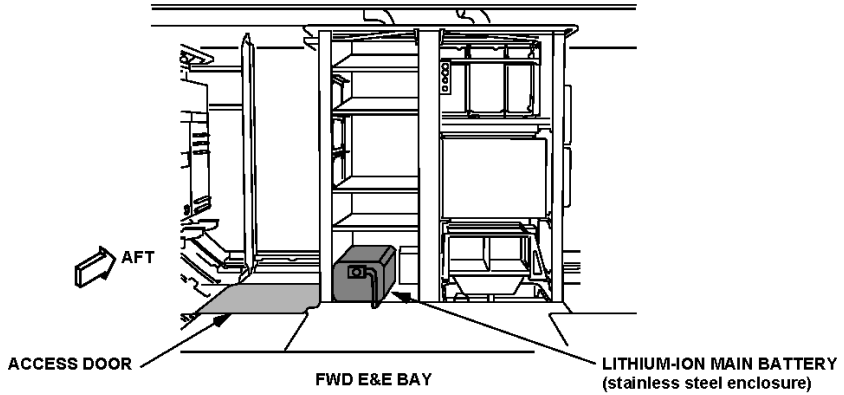
NOTE: The box containing the lithium-ion battery cells is secured inside a reinforced stainless steel enclosure capable of containing a lithium-ion battery event. Venting of vapor during a battery failure event may be visible from an exterior vent on the bottom of the aircraft under the forward or aft E&E bay. During active venting, there is no reason to make access to the E&E bay.

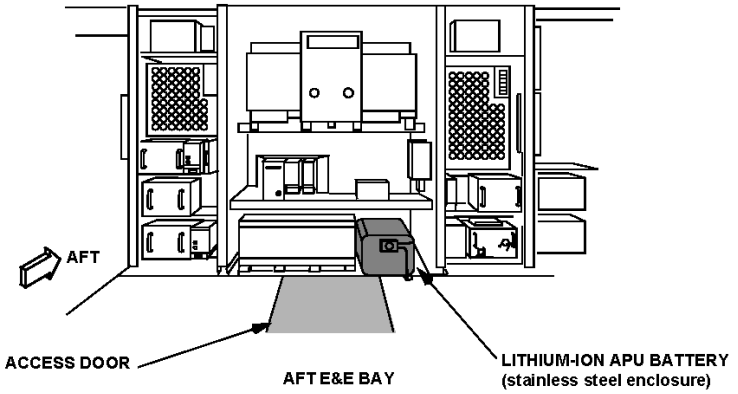
NOTE: If vapor is visible or odors are noticed, advise ground personnel to stay clear of vapor if battery is still venting.

CAUTION: MAKE NO ATTEMPT TO DISCONNECT BATTERY PACK FROM THE AIRCRAFT'S ELECTRICAL SYSTEM USING QUICK DISCONNECT OR BY CUTTING THE BATTERY CABLES.

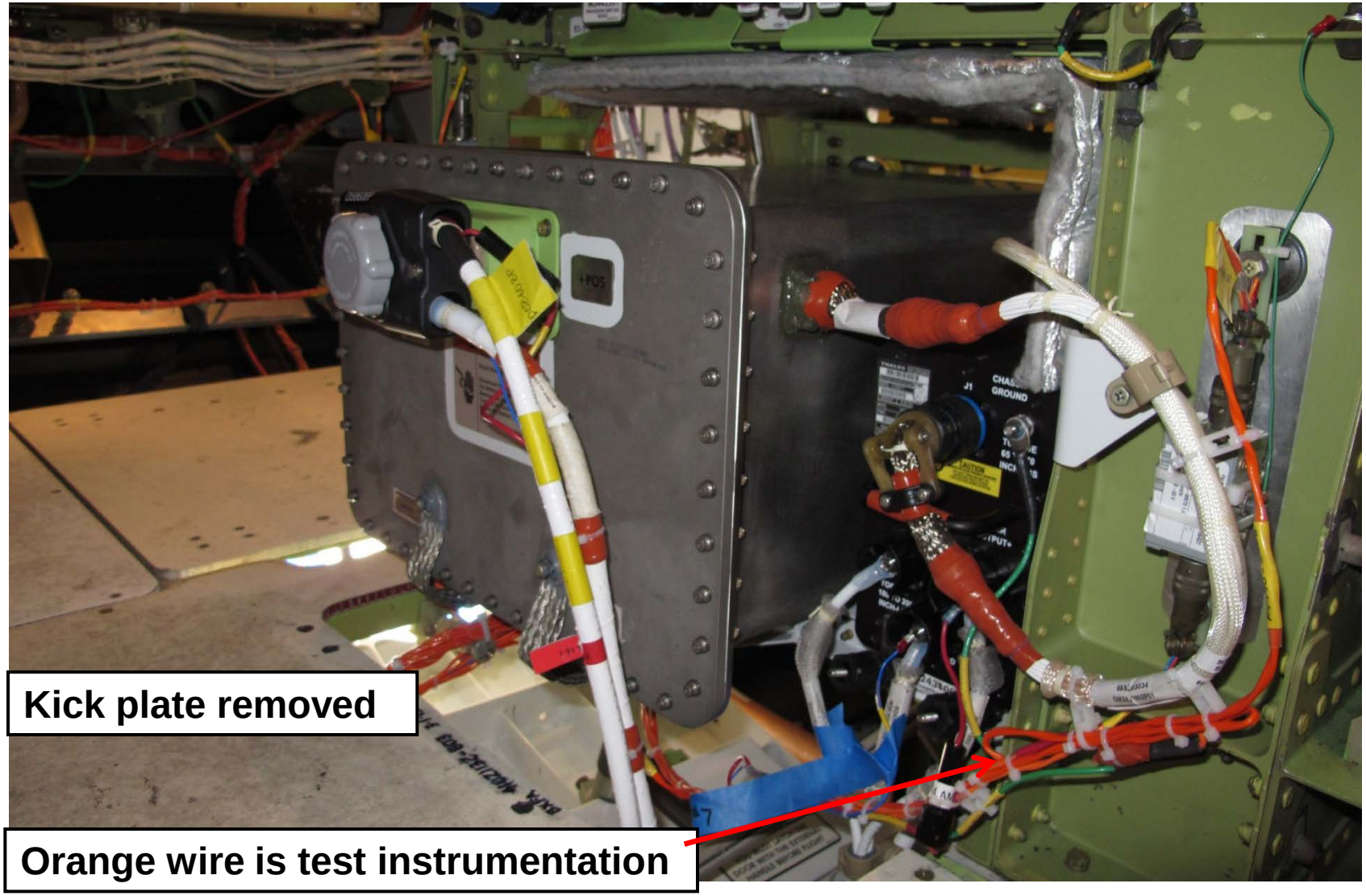
Updated Chart



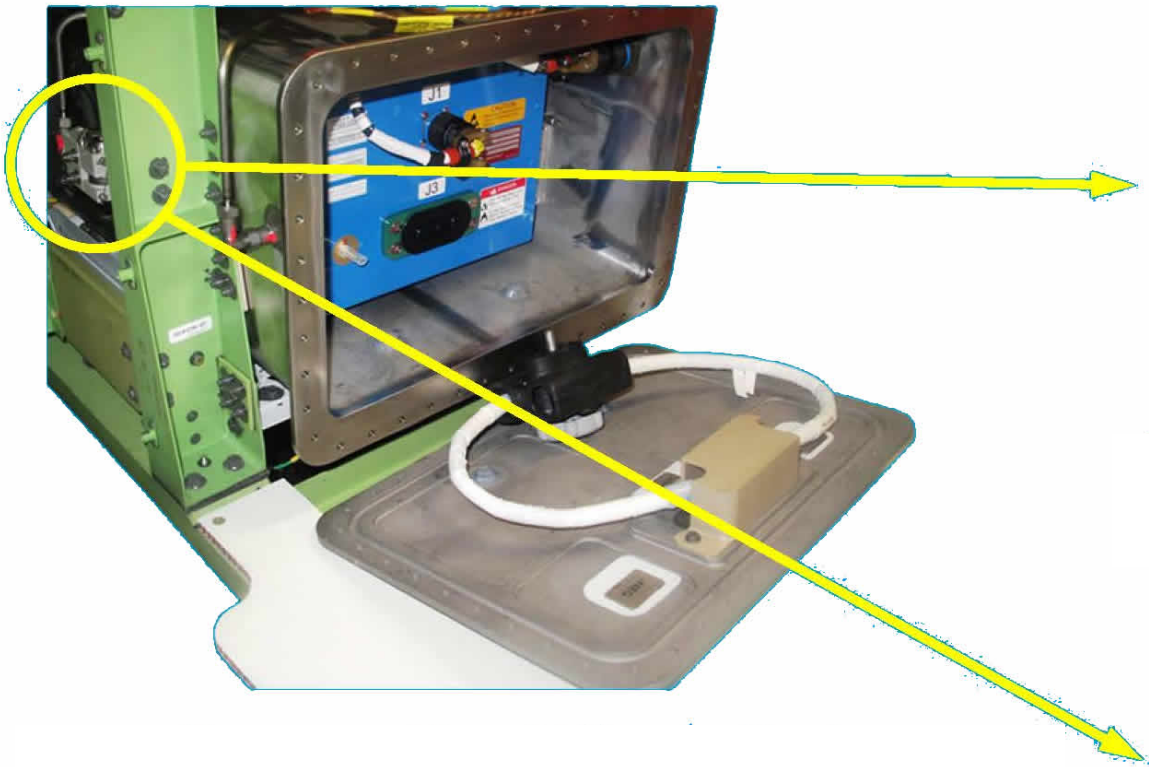



# 787 Main Battery Enclosure



# 787 Main Battery Enclosure Pressure Burst Disc




**Pressure Burst Disc Indicator**

**Main Battery Pressure Burst Disc Indicator shown, APU Battery Pressure Burst Disc Indicator is the same**

**Pressure Burst Disc Indictor-**

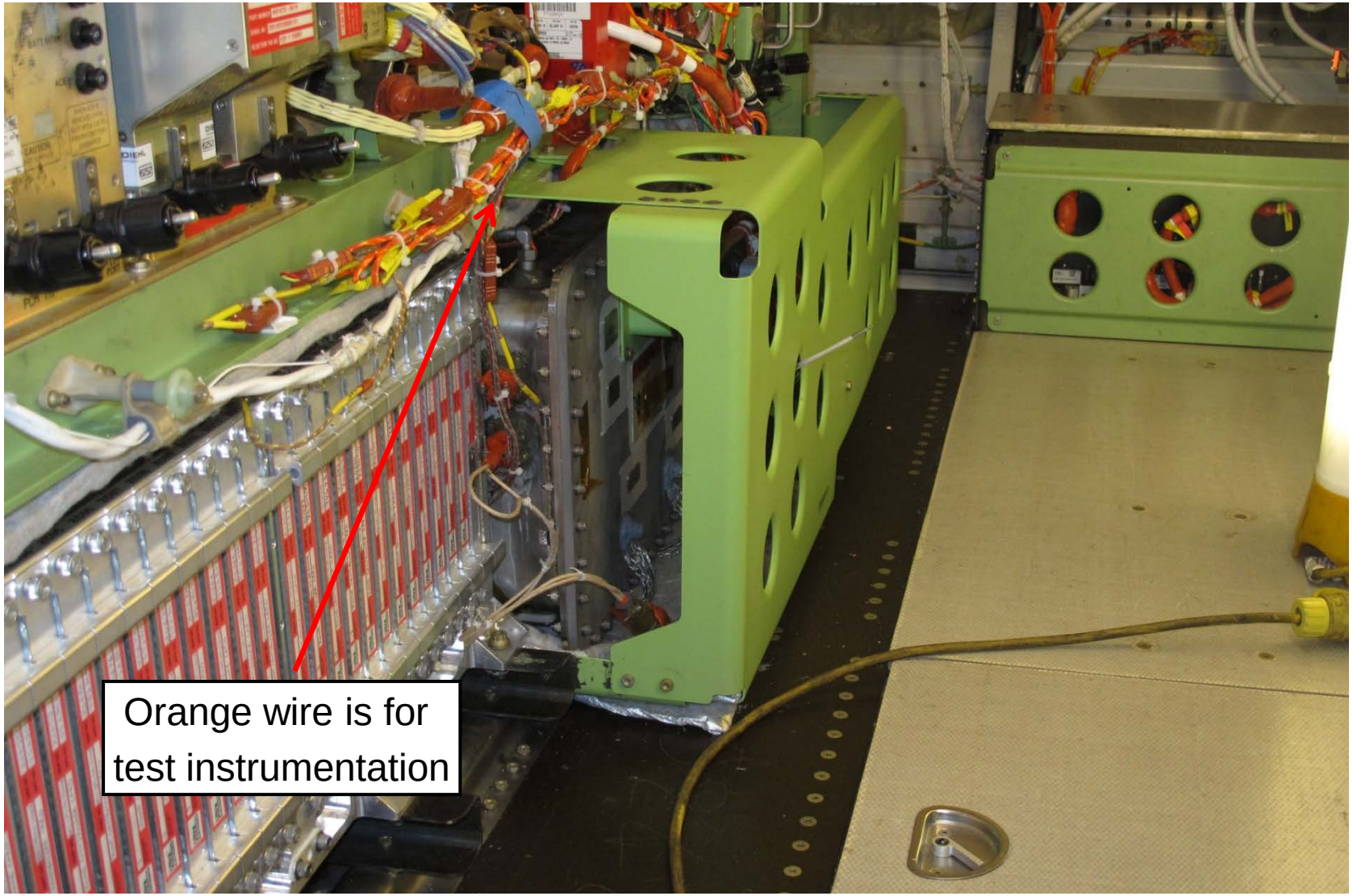
**Actuated**

**Pressure Burst Disc Indictor-**

**Not Actuated**

# 787 Main Battery Vent Port

# 787 APU Battery Enclosure

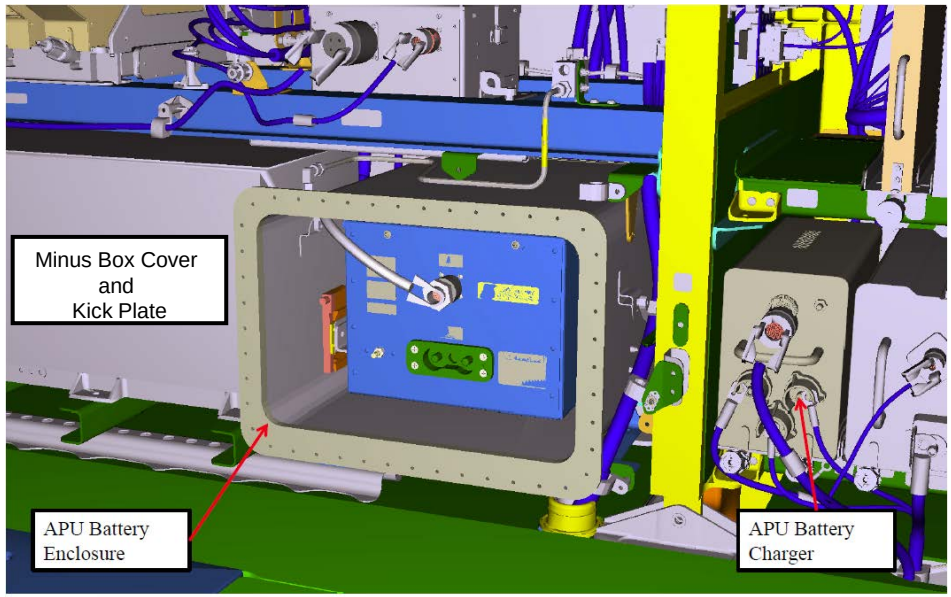


# 787 APU Battery Vent Port

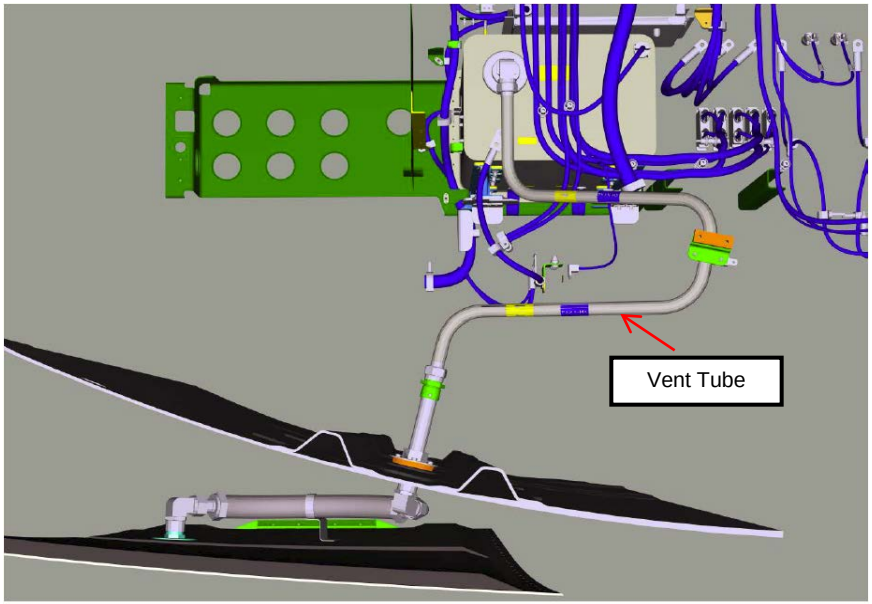
# The Response Hazard

The box containing the lithium-ion battery cells is secured inside a reinforced stainless steel enclosure capable of containing a lithium-ion battery event. Venting of vapor during a battery failure event may be visible from an exterior vent on the bottom of the airplane under the forward or aft Electrical and Electronic (E&E) bay.

**<u>During active venting, there is no reason to make access to the E&E bay.</u>**




View Looking Aft




View Looking Fwd

# Recommended Procedures:

## Fire Fighting Tactics for E&E bay events containing Lithium-Ion Battery Packs

1. A battery failure reaction should be fully contained within the stainless steel enclosure with any gasses vented overboard.
2. Passengers and crew are safe inside the airplane. Passenger evacuation is not expected for a battery failure.
3. Evacuate area around exterior of the airplane upwind to at least 18m/ 60 ft. from airplane.
4. While venting, make no attempt to access E&E bay.
5. Confirm airplane power is shut down by communicating with the flight deck prior to making access.
6. Don all fire fighting Personal Protective Equipment including Self Contained Breathing Apparatus (SCBA) when entering the Hot Zone (9m/30 ft).

# Recommended Procedures (cont.)

7. If battery is not venting or venting is complete, access the E&E bay to ensure there is no other visible fire source.
   a) **In the event of visible flame** Halon (or Halon replacement) is the recommended agent to suppress a fire. If Halon, or Halon replacement is unavailable, then CO2 would be the recommended agent. Do not use dry chemical or powder of any kind..
   b) Flood the E&E bay with appropriate agent for approximately 20 to 30 seconds and then close the bay hatch for at least 60 seconds.
   c) Open E&E hatch to confirm fire is out. If flame is present repeat step #7b.
8. Make no attempt to disconnect the battery pack from the airplane's electrical system using the quick disconnect or by cutting the battery cables.
9. Use heat detecting equipment to monitor temperature of reinforced box. Temperatures may reach as high as 338 degrees Celsius/640 degrees Fahrenheit.
10. Once the external temperature of the reinforced box is below 49 degrees Celsius/120 degrees Fahrenheit and atmosphere is clear of hazardous vapors, then the airplane can be turned over to maintenance.

# Contact Information

Additional questions regarding issues related to Aircraft Rescue and Fire Fighting (ARFF) and Boeing aircraft can be directed to the following:

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