



**THE FORTY-THIRD MEETING OF THE
INFORMAL PACIFIC ATC CO-ORDINATING GROUP
(IPACG/43)**

(Tokyo, Japan 27 – 28 September 2017)

Agenda Item 6: ATM Issues

Deep Water or Icepack Ditching in the Event of a Lithium Ion Battery Fire

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SUMMARY

A briefing on the work being done to establish a procedure necessitated by the increased number of lithium batteries being transported.

1. Introduction

1.1. In accordance with the action from IPACG/43, this paper provides an overview of the conceptualized deep water or icepack ditching procedures in the event of an on-board lithium ion battery fire.

1.2. From 2006 till now, 3 airframes (Asiana in Korea, a United Parcel Service (UPS) in Philadelphia and another UPS in the United Arab Emirates (UAE) have been lost due to (suspected) lithium ion battery fires in their cargo holds.

1.3. Thinking proactively, UPS began working on a standardized ditching protocol over the ocean or remote ice packs. UPS engaged the FAA to assist with this procedure.

2. Discussion

2.1. The advanced technology used in lithium ion batteries allows for an incredibly high charge capacity relative to their size and weight making them highly suitable for consumer electronics (laptops, iPads, cell phones) and very much in demand.

2.2. A cargo plane may carry as many as 300,000 batteries in a single load. An internal short circuit of a lithium ion battery can cause self-discharge which can generate temperatures in excess of 900 degrees Fahrenheit. This causes a rapid and fiery disintegration of the cell. An FAA report found "the uncontrollability of lithium battery fires can ultimately negate the capability of current aircraft cargo fire suppression systems, and can lead to a catastrophic failure of the airframe." FAA testing later found that the halon gas used to suppress fires on planes doesn't work well on batteries because of a chemical reaction called thermal-runaway where temperatures can reach nearly 1500 degrees Fahrenheit.

2.3 From the time of ignition, pilots have about 16 minutes before the plane is overwhelmed. Value Jet (cargo hold fire in south Florida in the '90's) lasted 7 minutes before loss of flight control. Swiss Air

111 (electrical fire in the a/c ducting near Halifax, Nova Scotia) crashed 16 minutes after first detecting smoke.

2.4 Getting the right information- surface winds, wave heights, altimeter, and nearby ships, to the flight crew is critical. A typical approach speed for a B737 is 155 knots. Just 15 knots of surface wind, used to their advantage, can make a difference. Japan Air (DC8) ditched in 1968 at 137 knots, all survived.

2.5 Shipping lanes underlie many transoceanic flight paths. Ships are usually spaced 25-50 nautical miles apart. With 16+/- minutes of flying time, a ship will usually be in range of an aircraft in distress. A streamlined checklist was developed that starts with the controller, is handed off to the front line manager who gets critical information from the Coast Guard and then returns it to the controller for relay to the aircraft.

Controller-

If you are notified of an onboard fire or other emergency necessitating oceanic ditching, notify the front line manager or CIC with the following information:

Aircraft call sign _____ **Present position (lat/long)** _____

Heading _____ **Speed** _____ **Time alerted of emergency** _____

If an onboard fire is discovered, the pilots usually have less than 20 minutes to land or ditch the aircraft.

Front line manager or CIC-

Call Coast Guard Anchorage at **907-463-2000** and ask for ships in the vicinity of the aircraft, surface winds, sea state, and altimeter setting. **Alternative number- 907-428-4100.**

Transmit the following to the distressed aircraft ASAP!

Surface winds _____ Altimeter _____

Wave height _____ Frequency 156.800 MHz (This is the maritime distress frequency.)

Ships in the vicinity:

Name _____ Position _____ Heading _____ Color _____

Name _____ Position _____ Heading _____ Color _____

Name _____ Position _____ Heading _____ Color _____

For search and rescue purposes, record:

Estimated position of ditching- lat/long _____ based on: (check one) Last position report, speed, and trajectory actual report.

SOB _____ Aircraft type _____ Departure point _____ Destination _____

Route of flight _____

Coast Guard Anchorage - **907-463-2000**

Alternative - **907-428-4100**

2.6 The delivery of this information to the pilots should enhance survivability and ensure that rescue operation responders are immediately involved.

3. Conclusion

3.1 We are currently ready to run test scenarios involving Anchorage ARTCC and Coast Guard Anchorage and additional resources.