



WORKING PAPER

DANGEROUS GOODS PANEL (DGP)

TWENTY-FIRST MEETING

Montréal, 5 to 16 November 2007

Agenda Item 4: Amendments to the *Emergency Response Guidance for Aircraft Incidents involving Dangerous Goods* (Doc 9481) for incorporation in the 2009-2010 Edition

GUIDANCE FOR PORTABLE ELECTRONIC DEVICE FIRES IN AIRCRAFT CABINS

(Presented by M. Rogers)

SUMMARY

This paper proposes to amend the checklist for Dangerous Goods Incidents in the Passenger Cabin in Doc 9481, *Emergency Response Guidance for Aircraft Incidents involving Dangerous Goods*, to include guidance for fires involving passenger electronic devices.

Action by the DGP is in paragraph 22.

1. INTRODUCTION

1.1 At the DGP Working Group of the Whole Meeting in Memphis in May 2007, it was agreed to incorporate guidance into the *Emergency Response Guidance for Aircraft Incidents involving Dangerous Goods* (Doc 9481) for in-flight fires involving portable electronic devices. Subsequent to that meeting, further testing has indicated that cooling the device with water (or other non-flammable liquid) produced the best results and prevented ignition of cells in the battery pack not initially involved in the fire. The testing also indicated that moving the device before the fire was fully extinguished could prove to be extremely dangerous. The International Federation of Air Line Pilots' Associations (IFALPA) therefore proposes the following revisions to the guidance adopted at the last working group meeting.

2. ACTION BY THE DGP

2.1 The DGP is invited to:

- a) *amend* the Cabin Crew Checklist for Dangerous Goods Incidents in the Passenger Cabin During Flight as follows :

3.3 CABIN CREW CHECKLIST FOR DANGEROUS GOODS INCIDENTS IN THE PASSENGER CABIN DURING FLIGHT

INITIAL ACTION

- Notify pilot-in-command
- Identify the item

In case of fire:

- Use standard procedure / check use of water

In case of fire involving a portable electronic device:

- Use standard procedure / obtain and use Halon extinguisher
- Remove external electrical power from device (if applicable)
- Once fire has been suppressed, move device to an area without flammable material, such as a galley oven (if not adjacent to the cockpit), if possible
- Douse device with water (or other non-flammable liquid) to cool cells and prevent ignition of adjacent cells
- Do not move device
- Remove power to remaining electrical outlets until the aircraft's system can be determined to be free of faults, if the device was previously plugged in

In case of spillage or leakage:

- Collect emergency response kit or other useful items
- Don rubber gloves and smoke hood or smoke mask — portable oxygen
- Move passengers away from area and distribute wet towels or cloths
- Place dangerous goods item in polyethylene bags
- Stow polyethylene bags
- Treat affected seat cushions / covers in the same manner as dangerous goods item
- Cover spillage on carpet / floor
- Regularly inspect items stowed away / contaminated furnishings

AFTER LANDING

- Identify to ground personnel dangerous goods item and where stowed
- Make appropriate entry in maintenance log

- b) *amend* the Amplified Cabin Crew Checklist for Dangerous Goods Incidents in the Passenger Cabin During Flight as follows:

**3.4 AMPLIFIED CABIN CREW CHECKLIST FOR DANGEROUS GOODS INCIDENTS
IN THE PASSENGER CABIN DURING FLIGHT**

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IN CASE OF FIRE

USE STANDARD PROCEDURE / CHECK USE OF WATER

Standard emergency procedures must be used to deal with any fire. In general, water should not be used on a spillage or when fumes are present since it may spread the spillage or increase the rate of fuming. Consideration should also be given to the possible presence of electrical components when using water extinguishers.

IN CASE OF FIRE INVOLVING A PORTABLE ELECTRONIC DEVICE

**USE STANDARD PROCEDURE / OBTAIN AND USE HALON
EXTINGUISHER**

Standard emergency procedures must be used to deal with any fire. Although Halon has been shown to not be effective against lithium metal fires, Halon will be effective in fighting the subsequent fire of surrounding materials, or in fighting a lithium ion battery fire.

**REMOVE EXTERNAL ELECTRICAL POWER FROM DEVICE
(IF APPLICABLE)**

A battery has a higher likelihood of catching fire through thermal runaway during or immediately following a charging cycle, although the effects of thermal runaway may be delayed for some period of time. By removing external power from the device, it will be assured that additional energy is not being fed to the battery to promote a fire.

**ONCE FIRE HAS BEEN SUPPRESSED, MOVE DEVICE TO AN
AREA WITHOUT ANY FLAMMABLE MATERIAL, SUCH AS A
GALLEY OVEN (IF NOT ADJACENT TO COCKPIT), IF
POSSIBLE**

A battery fire that appears to have been extinguished may reignite after some period of time. Battery fires often emit sparks, flammable gasses or molten material several feet high, and may easily ignite surrounding materials. By moving the device to an area without flammable material, this risk may be reduced. The device should not be moved if it is too hot to safely handle, nor should it be placed adjacent to the cockpit.

DOUSE DEVICE WITH WATER (OR OTHER NON-FLAMMABLE LIQUID) TO COOL CELLS AND PREVENT IGNITION OF ADJACENT CELLS

If available, a water extinguisher should be used to cool the cells in a battery that have ignited, preventing the spread of heat to adjacent cells. If a water extinguisher is not available, any non-flammable liquid may be used to cool the cells and device.

DO NOT MOVE DEVICE

A battery pack involved in a fire has been shown to reignite and emit flames multiple times as heat is transferred to other cells in the pack. It is preferable to cool the device using water (or other non-flammable liquid); injuries may occur if the device reignites while it is being moved.

REMOVE POWER TO REMAINING ELECTRICAL OUTLETS UNTIL THE AIRCRAFT'S SYSTEM CAN BE DETERMINED TO BE FREE OF FAULTS, IF THE DEVICE WAS PREVIOUSLY PLUGGED IN

By removing power to the remaining electrical outlets it can be assured that a malfunctioning aircraft system does not contribute to additional failures of passenger portable electronic devices.

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— END —