INTERNATIONAL CIVIL AVIATION ORGANIZATION

FIRST MEETING OF THE REGIONAL AVIATION SAFETY GROUP - ASIA AND PACIFIC REGIONS (RASG-APAC/1)

Noumea, New Caledonia, 10 - 11 October 2011

Agenda Item 4: Member State Presentations

NEW SAFETY DATA HANDLING TECHNOLOGIES

(Presented by France)

SUMMARY

The investigation into the accident to flight AF 447 (Rio-Paris accident on 1 June 2009) confirmed the importance of data from the flight recorders in order to establish the circumstances and causes of an accident and to propose safety measures that are substantiated by the facts.

The difficulties encountered have raised questions about the adequacy of existing flight data recovery technology, when considering accidents over oceanic or remote areas.

The BEA issued safety recommendations and created international working groups to look into new technologies to safeguard flight data and/or to facilitate the localization and recovery of on-board recorders.

This paper aims to inform the participants about the results of the various works undertaken in that field.

1. INTRODUCTION

1.1 On 1 June 2009, Air France flight AF447, an Airbus A330-200 registered F-GZCP, disappeared over the ocean while flying en route between Rio de Janeiro (Brazil) and Paris (France).

1.2 In the following weeks, a variety of acoustic detection means were deployed to try to localize the aircraft's **Underwater Locator Beacons (ULB)**. In July and August 2009, another search team endeavoured to locate the wreckage by using side scan sonar imagery and a **Remotely Operated Vehicle (ROV)**. In March and April 2010, two ships were mobilized to locate the wreckage, using deep towed sonar, two ROVs and three **Autonomous Underwater Vehicles (AUV)**. The search for the wreckage and the flight recorders was finally successful during phase 4 in March 2011, by using three Autonomous Underwater Vehicles (AUV) Remus.

1.3. Both recorders and parts of the wreckage were recovered from the sea floor at the beginning of May 2011, i.e. nearly two years after the accident.

2. TRANSMISSION OF FLIGHT DATA

2.1 Prompted by the difficulties experienced in the current case, as well as by other difficult sea recovery operations[1], in October 2009 the BEA created a **Flight Data Recovery** international working group. Its aim was to look into new technology to safeguard flight data and/or to facilitate the localization and recovery of on-board recorders.

2.2 This working group met twice in 2009, and areas such as flight data transmission via satellite as well as new flight recorder or ULB technology were evaluated.

2.3 The results[2] of the working group were presented on 19 November 2009 to the ICAO Air Navigation Commission, and were used by the BEA in its second interim report (17 December 2009) to recommend that EASA and ICAO:

a) extend as rapidly as possible to 90 days the regulatory transmission time for ULBs installed on flight recorders on airplanes performing public transport flights over maritime areas;

b) make it mandatory, as rapidly as possible, for airplanes performing public transport flights over maritime areas to be equipped with an additional ULB capable of transmitting on a frequency (for example between 8.5 kHz and 9.5 kHz) and for a duration adapted to the pre-localization of wreckage;

c) study the possibility of making it mandatory for airplanes performing public transport flights to regularly transmit basic flight parameters (for example position, altitude, speed, heading).

In addition, the BEA recommended that ICAO:

d) ask the FLIRECP 3 group to establish proposals on the conditions for implementing deployable recorders of the Eurocae ED-112 type for airplanes performing public transport flights.

2.4 In March 2010 the BEA created the **Triggered Transmission of Flight Data Working Group**[4]. The latter completed its work in March 2011 and concluded that it is technically feasible to significantly reduce the search area for wreckage by:

- Triggering transmission of appropriate data via SatCom prior to impact, and/or
- Automatically activating next generation ELTs prior to impact, and/or
- Increasing the frequency of position reports.

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[1] On 30 June 2009 (same month as the Rio-Paris crash), an Airbus A310 registered 7O-ADJ, operated by Yemenia as a scheduled international flight (Flight 626) from Sana'a, Yemen, to Moroni, (Comoros) crashed into the Indian Ocean while on approach to Prince Said Ibrahim International Airport (Comoros) killing all but one of the 153 passengers and crew on board. The survivor was recovered the day after the accident and she reported hearing other survivors right after the impact. It took another eight days to recover the memory modules at a depth of approximately 1,200 m.
There have been other examples of extremely costly and long lasting searches for recorders and wreckage, such as the crash of a Boeing 747 operated by South African Airways (Flight 295) on 28 November 1987 in Indian Ocean near Mauritius.

[2] These results are summarized in a document available on the BEA's website:
http://www.bea.aero/en/enquetes/flight.af.447/flight.data.recovery.working.group.final.report.pdf

[3] Flight Recorder Panel

[4] These results are summarized in a document available on the BEA's website:
http://www.bea.aero/en/enquetes/flight.af.447/triggered.transmission.of.flight.data.pdf

3. DEPLOYABLE RECORDERS

3.1 The technology of free floating deployable combined recorders (CVR/FDR) equipped with integrated ELT already exists and is certified. The installation of such a device will allow the removal of a fixed ELT. The deployable ELT signal will provide immediate notification and can be tracked providing vital drift data to assist in locating survivors and wreckage. The ED-112 MOPS defines the specifications for a deployable recorder and includes the requirement for a radio location beacon as part of the deployable package.

3.2 A benefit of recovering data from the deployable recorder would be that, within days of an accident, critical information would be available allowing safety actions to be taken. Additionally, this data could allow the investigation to concentrate on certain systems thus eliminating the need to recover the complete wreckage.

3.3 Only forward fit is considered by the amendment when the design of the aircraft includes the installation because the cost of retrofitting an aircraft to install a deployable recorder was considered too expensive by the Flight Data Recovery Working Group.

4. AMENDMENT PROPOSALS

4.1 The Flight Recorder Panel of ICAO met in July 2011 in Reykjavik, Iceland, to propose amendments to the flight recorder chapter of Annex 6. The amendment proposals herewith include the follow up of the **AF447 Interim Reports 2 and 3 recommendations**:

All aeroplanes on long range over-water flights and on flights over designated land areas of a MCTO[5] mass of over 27,000 kg for which the application for type certification is submitted to a Contracting State on or after 1 January 2018 or for which the individual certificate of airworthiness is first issued on or after 1 January 2020 shall have **a means to establish the position of an accident over water within 6 NM.**

4.2 Here are examples of means of compliance:

- deployable recorder,
- ELT automatically activated in flight,
- regular transmission of position,
- triggered transmission of flight data.

5. ACTION BY THE MEETING

5.1 The Meeting is invited to note the information contained in this paper.

5.2 The States of the Region are invited to support:

a) ICAO in its efforts to evaluate the necessary changes in the field of flight data recording, and

b) FLIRECP amendment proposals to the appropriate Annex.

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[5] MCTO: Maximum Certificated Take-Off