



Agenda Item 2: Air traffic management (ATM) (by the ATM Working Group)

AF 447 Accident Final Report

(Presented by the Secretariat)

SUMMARY	
<p>This working paper presents information on the AF 447 Final Report and proposes actions to be taken by SAT States regarding the Safety Recommendation addressed in the mentioned report that deals with Air Navigation Services in South Atlantic.</p>	
References:	
<ul style="list-style-type: none"> • Final Report of the AF 447 (F-GZCP) accident • Doc. 7030 - Regional Supplementary Procedures 	
<i>ICAO Strategic Objectives:</i>	<i>A - Safety</i>

1. Introduction

1.1 The Final Report of the AF 447 (F-GZCP) accident, occurred on June 01, 2009, was published by Bureau d'Enquêtes et d'Analyses (BEA) on July 2012.

1.2 The BEA AF 447 Accident Final Report has addressed 41 Safety Recommendations to the DGAC, EASA, the FAA, ICAO and to the Brazilian and Senegalese authorities related to flight recorders, certification, training and recurrent training of pilots, relief of the Captain, SAR and ATC, flight simulators, cockpit ergonomics, operational feedback and oversight of operators by the national oversight authority. Some of these Safety Recommendations involve ICAO, as well as Brazilian and Senegalese authorities, and have a possible impact on the SAT flight operations.

2. Discussion

2.1 The following Safety Recommendations on Final Report of the AF 447 Accident involve Air Navigation Services in South Atlantic and could be used as guidance for the work to be done by SAT States:

BEA Final Report Item 4.3.1 SAR coordination plans over maritime and remote areas

Those responsible for Brazilian SAR stated that they did not know what means were available in the neighboring SAR areas and had not tried to obtain information on the subject. Contrary to ICAO standards and recommended practices, there is no SAR coordination plan between Brazil and Senegal. This lack of a plan caused a considerable delay in the start of SAR operations. Consequently, the BEA recommends that:

- ICAO ensure the implementation of SAR coordination plans or regional protocols covering all of the maritime or remote areas for which international coordination would be required in the application of SAR procedures, including in the South Atlantic area. [Recommendation FRAN-2012-032]

BEA Final Report Item 4.3.4 Air Traffic Control

The investigation showed that the use of HF as a means of communication between ground and airplane is limited. Link outages were frequent in this area, especially on the day of the accident. A simulation of the use of ADS-C and CPDLC functions showed that the loss of altitude would have generated an alert on the DAKAR controller's screen. There are numerous areas in the world where HF remains the only means of communication between ground and airplane, though more reliable means are available today.

Consequently, the BEA recommends that:

- *The Brazilian and Senegalese authorities make mandatory the utilization, by airplanes so equipped, of ADS-C and CPDLC functions in the zones in question; [Recommendation FRAN-2012-037].*
- *ICAO request the involved States to accelerate the operational implementation of air traffic control and communication systems that allow a permanent and reliable link to be made between ground and airplane in all of the areas where HF remains the only means of communication between the ground and airplanes. [Recommendation FRAN-2012-038]*

BEA Final Report Item 4.3.1 SAR coordination plans over maritime and remote areas

2.2 Regarding the Safety Recommendation item 4.3.1 of the BEA final Report, Brazil has developed the following SAR Letter of Agreement Proposals:

- **DAKAR/SENEGAL RCC AND ATLÂNTICO/BRAZIL RCC**
- **CAYENNE/FRENCH GUIANA RCC AND ATLÂNTICO/BRAZIL RCC**
- **JOHANNESBURG/SOUTH AFRICA RCC AND ATLÂNTICO/BRAZIL RCC**
- **LUANDA/ANGOLA RCC AND ATLÂNTICO/BRAZIL RCC**

2.3 These SAR Letter of Agreement Proposals were forwarded by Lima ICAO Office to French Guiana, Dakar ICAO Office and Nairobi ICAO Office, on December 11, 2013, via the following letters:

- SA497/2013 – French Guiana
- SA498/2013 – Dakar ICAO Office
- SA499/2013 – Nairobi ICAO Office

2.4 Taking into consideration that no answers to these letter were received, a reminder was sent by Lima ICAO Office to French Guiana, Dakar ICAO Office and Nairobi ICAO Office, on December 23 May, 2013, via the following letters:

- SA231/2014 – French Guiana
- SA232/2014 – Dakar ICAO Office
- SA233/2014 – Nairobi ICAO Office

2.5 Taking into consideration the high priority that must be given to this safety recommendation, States involved are highly encouraged to analyse, make the appropriated change proposals, if necessary, and sign the Brazilian proposals of SAR Letters of Agreement. It is recommended that States not directly involved on AF 447 accident use these Letters of Agreement as a model, if suitable, in order to develop and sign similar Letters of Agreement.

BEA Final Report Item 4.3.4 Air Traffic Control

2.6 The ADS-C/CPDLC implementation analysis in SAT meetings normally is related to the Flight Operations **Efficiency**. However, the Safety recommendation made by BEA links the ADS-C/CPDLC use to the Flight Operations **Safety**. The mandatory utilization of ADS-C/CPDLC by airplanes so equipped should not be made by Brazilian and Senegalese Authorities as indicated in the Safety Recommendation issued by BEA, taking into considerations that the airspace involved is over high seas. The most suitable mechanism to establish the mentioned mandatory utilization of ADS-C/CPDLC is an amendment to the Doc. 7030 – Regional Supplementary Procedures. Taking into consideration also that this procedure should be suitable for another portions of the South Atlantic, all SAT States should analyse the application of this procedure and the convenience of developing a Doc. 7030 amendment proposal.

2.7 It is important to recall that after the Malaysia 370 Accident, there is a significant trend to the massive use of Data Link Communications related to the Flight Operations Safety. The studies being conducted by ICAO regarding Flight Tracking could be verified in the Conclusions and Recommendations of the Special Meeting on Global Flight Tracking, held in Montréal, 12-13 may 2014, in the following web link:

<http://www.icao.int/Meetings/GTM/Documents/Final%20Global%20Tracking%20Meeting%20Conclusions%20and%20%20Recommendations.pdf>.

3. Suggested action

3.1 The Meeting is invited to:

- a) Take note of the information contained in this working paper;
- b) encourage States involved to analyse, make the appropriated change proposals, if necessary, and sign the SAR Letter of Agreement Proposals developed by Brazil;
- c) encourage SAT States to analyse and use, if suitable, the SAR Letter of Agreement Proposals developed by Brazil as a model to develop similar Letters of Agreement to be used between all SAT States;
- d) analyse the convenience of developing an amendment proposal to mandate the application of ADS-C/CPDLC by airplanes so equipped in South Atlantic.