



International Civil Aviation Organization

**The Twentieth Meeting of the APANPIRG ATM/AIS/SAR Sub-Group
(ATM/AIS/SAR/SG/20)**

Singapore, 05 – 09 July 2010

Agenda Item 6: Review of ATS Coordination Group Meetings

**SUMMARY REPORT OF THE 12TH MEETING OF THE FANS IMPLEMENTATION TEAM
(FIT) FOR THE BAY OF BENGAL**

(Presented by the Secretariat)

SUMMARY

This paper presents summary report of the 12th Meeting of the FIT for the Bay of Bengal (FIT-BOB/12, February 2010).

This paper relates to

Strategic Objectives:

A: Safety – Enhance global civil aviation safety

D: Efficiency – Enhance the efficiency of aviation operations

Global Plan Initiatives:

GPI-5 Performance based navigation

GPI-7 Dynamic and flexible ATS route management

GPI-8 Collaborative airspace design and management

GPI-9 Situational awareness

GPI-16 Decision support and alerting systems

GPI-17 Implementation of data link applications

1. INTRODUCTION

1.1 FIT-BOB/12 was held at ICAO Asia and Pacific Office, Bangkok, Thailand on 22 and 26 February 2010 in conjunction with the Second Meeting of the Bay of Bengal Reduced Horizontal Separation Implementation Task Force.

2. DISCUSSION

Review of Data Link Seminar 2009

2.1 The meeting reviewed outcomes of the Data Link Seminar (August 2009, Bangkok) which was held at ICAO Asia and Pacific Office, Bangkok, Thailand in conjunction with FIT-BOB/11.

Central Reporting Agency

2.2 The meeting reviewed the Terms of Reference (TOR) of BOB-Central Reporting Agency (CRA) as follows:

Objective

1) *The objective of the Bay of Bengal Central Reporting Agency (BOB-CRA) operated by BOEING is to assist the members of the FANS Implementation Team for the Bay of Bengal (FIT-BOB) to plan and implement FANS 1/A based ADS and CPDLC systems in the Indonesian, Bay of Bengal and Arabian Sea FIRs (including ASIOACG member States) in accordance with the TOR of FIT-BOB.*

Terms of Reference

- 2) *To meet the above objective the BOB-CRA shall:*
- a) *share technical and operational information with the FIT-BOB members on the planning and implementation of ADS and CPDLC systems;*
 - b) *process the ADS/CPDLC problem reports (PR) received from the FIT-BOB members in the manner prescribed in the FANS 1/A Operations Manual (FOM) and the Guidance Material for End-to-End Safety and Performance of ATS Data Link Systems in the Asia and Pacific Region;*
 - c) *disseminate de-identified information on individual problem reports to the FIT-BOB members to enable airborne and ground system enhancement/ remediation; and*
 - d) *prepare periodic reports for the FIT-BOB and RASMAG.*

Area of Responsibility

3) *The area of responsibility of the BOB CRA is defined as follows:*

The BOB CRA will provide CRA services for the international oceanic airspace of the FIT-BOB member States, where implementation of ADS/CPDLC technologies is undertaken to enhance surveillance and communications capability, leading to significant benefits for operational efficiency and regularity of flights.

(last updated by FIT-BOB/7, July 2006)

Review Bay of Bengal ADS/CPDLC Operations

ADS/CPDLC Trial Progress in the Kuala Lumpur FIR over the Bay of Bengal Area

Result of ADS/CPDLC Operational Trial in the Kuala Lumpur FIR

2.3 From sample statistics and data collection during the operational trial period, Malaysia had found the figures for the downlink and round trip time as shown below:

- 97.6% downlink and 95.9% round trip were recorded less than 60 seconds; and
- 99.1% downlink and 98.2% round trip was recorded less than 120 seconds.

Problem Reports and Analysis

2.4 ADS/CPDLC systems had faced problems relating to ground flight data processing (FDP) system database and the trial was suspended for several days for software analysis. These problems were solved on 26 January 2010 and the operational trial was continued as before.

Problem Resolution and Future System Enhancement

2.5 To prevent the ADS/CPDLC ground system problems from happening again in future, the ADS/CPDLC systems in Kuala Lumpur Area Control Centre (ACC) was now undergoing software upgrades, updates and customization to fulfil the requirements towards more advance setting. After a slight delay, the upgrading project that had been supposed to start in early December 2009 was expected to begin on 1 March 2010 where the latest software updates and upgrades would be uploaded into the current ADS/CPDLC systems and targeted to be completed in May 2010.

ADS/CPDLC Trial Progress in the Ujung Pandang FIR

Progress of ADS-C/CPDLC Trial Operation

2.6 Since the trial operation of ADS-C/CPDLC was effected on ATS routes A461, B462, B472, B473, B583, B584 and R340/R590, international flights operating on these routes shall use CPDLC as a primary means of communication and VHF as backup. Since August 2009 at the 25th meeting of AUSINDO (annually meeting between Indonesia and Airservices Australia), ADS-C/CPDLC problems had been evaluated and some actions had been taken to solve the problems.

Operational Planning for after 7 April 2010

2.7 ADS-C/CPDLC trial operations for all international routes within the Ujung Pandang FIR will take effect on 7 April and continue until 6 May 2010.

ADS/CPDLC Trial Progress in the Male FIR

2.8 Maldives informed the meeting that training for controllers was conducted in early September 2009 and trials commenced in October 2009 on oceanic routes between Maldives, Melbourne and Mumbai, and with Emirates Airline aircraft. After a month, the downlink performance was found to be unsatisfactory and the trials had to be discontinued after experiencing some equipment problem. The equipment supplier had been contacted and was expected to fix the problem by end of February 2010. If all goes well, the trials could commence again in March 2010.

Data Link Environment of the Arabian Sea and the Bay of Bengal

2.9 Emirates Airline reported a summary of data for the period of 14 days, 3 – 16 January 2010 for the data link environment of the Arabian Sea and the Bay of Bengal.

Report on ADS-C/CPDLC Bench Testing with Chennai and Mumbai Centres

2.10 Boeing informed the meeting that the avionics suite or “bench” simulates full aircraft systems capabilities from an ADS and CPDLC standpoint. Once connected to either ARINC or SITA’s ACARS network, the bench can logon to any FANS ground automation system around the world. Once connected, test bench aircraft appear just like any other flight operating in that airspace.

Overview of Testing Conducted and of the CPDLC Connection Transfer Process

2.11 The connection transfer process is not complex, however the transfer sequence must be followed exactly as described below, or the automatic handoff to the next downstream centre will not be successful. The ADS connection does not get transferred. Only the CPDLC connection gets transferred or handed off to the next downstream centre. The CPDLC connection transfer sequence is:

- 1 – The Active Centre or the centre that currently holds the CPDLC connection nominates the next downstream centre by up-linking a Next Data Authority (NDA) message.

2 –A FN_CAD (AFN Contact Advisory) message is sent to the airplane which includes the seven character address for the next centre.

3 – Once the aircraft receives an FN_CAD message the CPDLC application automatically forwards a connection request message, FN_CON (connect request message), to next centre identified by the seven character address in the FN_CAD message.

4 – If the data in the down-linked FN_CON matches the data in the filed flight then the ground system responds to the aircraft with a FN_RESR (AFN Response) message acknowledging the logon request.

5 – Once the aircraft receives the FN_RESP message from the next centre the aircraft sends a complete message to the Active Centre.

6 – The Active centre sends the End Service message to the aircraft.

Results of ADS/CPDLC Bench Testing with Chennai and Mumbai Centres

2.12 Following is a detailed list of the issues identified from dedicated bench test sessions. In addition to issues identified relating directly to auto handoffs, a couple of other related issues were identified as noted below.

1 – The End Service from Mumbai to try to transfer to Chennai had the um159 (error message) in it.

2 – Incrementing Message Identification Number (MIN)

Some systems continue to use the same MIN over and over each time a message dialog is closed (response received to an uplinked message such as Roger or Unable).

3 – Including time stamp in uplinks

It is recommended to include the optional time stamp with each up-link.

4 – Use of free text that looks like a report request

Although being in a test environment and controllers were not strictly following required procedures to facilitate testing, some free text messages were up-linked requesting reports which could have been requested using standard FANS report messages.

ADS/CPDLC Problem Reports in the Bay of Bengal

Problems and Analysis

2.13 Boeing advised the meeting that the CRA group 88 PRs into categories after reviewing and decoding audit data from the subject PRs. Automatic CPDLC handoff connection failures were:

1. ATSU's not following the proper connection sequence.
2. Ground automation systems not able to process full seven character flight number.
3. Ground automation systems appending "error" message to the end-service message.

Recommendations

2.14 ATSU's are encouraged to automate the connection sequence. If the connections must be managed manually, ATSU's are encouraged to develop and document local procedures to help ensure the connection handoff steps are followed correctly.

2.15 The CPDLC connection response from the aircraft should be used to provide connection status. The connection with the aircraft is not established until the Connection Confirm (CC1) is received from the aircraft.

2.16 Ground automation systems should use the uplink message assurance (MAS) messages to inform controllers that a message was not received by the aircraft.

2.17 ATSU's are encouraged to increment the uplink Message Identification Number (MIN) from zero to sixty three.

2.18 ATSU's are encouraged to include the optional UTC time stamp with uplink messages.

Data Link Guidance Materials

Global Operational Data Link Document

2.19 The current status on the *Global Operational Data Link Document* (GOLD) was presented and the meeting began planning and implementation for its use.

Remaining GOLD Work

2.20 Except for a few comments from NAT Region, the Ad Hoc Working Group has resolved all comments received on the GOLD. Based on any feedback from comment authors and the ATS regional coordinating groups, the Ad Hoc Working Group is planning to complete the GOLD by 1 June 2010 and release it to participating ICAO Regional Offices.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

- a) note the information and support the work and initiatives taken by FIT-BOB to progress implementation of data link service in the area; and
- b) identify matters arising from FIT-BOB for action by the Sub-Group.

.....