INTERNATIONAL CIVIL AVIATION ORGANIZATION

FIFTH MEETING OF THE SAT FANS I/A INTEROPERABILITY TEAM (SAT FIT/5)

(Lisbon, Portugal, 17 to 18 May 2010)

Agenda Item 3: Review of ADS-C/CPDLC programme and implementation activities in SAT FIRs

(Presented by ASECNA

SUMMARY

This document aims at presenting a summary of the ADS-C and CPDLC implementation activities in Dakar ACC and highlighting problems encountered in the framework of the provision of ADS and CPDLC services. The paper proposes also recommendations for enhancement of safety in the EUR-SAM corridor.

Action: The meeting is invited to:
a) note the discussions presented in section 4 of this working paper; and
b) consider the recommended actions detailed in section 5.

1. INTRODUCTION

1.1 In accordance with SAT/FIT/4 conclusion, ADS-C/CPDLC system is implemented and fully operational in Dakar Oceanic FIR since September 24th, 2009.

1.2 Dakar ADS-C/CPDLC system includes some functionality such as Flight Data Processing System (FDPS), Automatic Flight Data Processing **(AFDP)**, Flight Plan Air Situation Display **(FPASD)**, Flight Data Processing System **(FDPS)** and controller's decision making tools [Cleared Level Adherence Monitoring (CLAM), Route Adherence Monitoring (RAM), Flight Plan Conflict Probe (FPCP), Estimates Time Over (ETO) and ADS Route Conformance Warning (ARCW)].

1.3 In addition to, the system includes a Flight Data Operator (FDO) position dedicated for the corrections of wrong filed flight plans.

1.4 The following ADS-C contracts are established:

a) Periodic contract with reporting frequency every 15 minutes;
b) Event contract which is established when one of the following events is detected by the ADS function of the aircraft:

- At significant waypoints,
- 05 Nautical Miles (NM) lateral deviation and
- 200 feet (ft) altitude deviation.

2. ACTIONS TAKEN BY DAKAR ACC

2.1 All air traffic controllers have been trained for equipment handling and on ADS-C/CPDLC procedures (theory and simulations).

2.2 Safety assessment was successfully conducted.

2.3 An AIP Supplement NR13/A/09GO was issued to indicate the main ADS/CPDLC procedures to be applied as well as by pilots and controllers. These procedures are in accordance with current FANS 1/A Operational Manual (FOM).

2.4 Letter of Agreement (LoA) between Dakar ACC and Atlantico ACC has been updated taking into account the provision of ADS-C and CPDLC services within the corresponding area.

3. STATISTICS

3.1 The tables below give an indication on the FANS services performances recorded on February 2010:

Customer (ASECNA)	Ground traffic (uplink+downlink)	Percentage (%)	Air-ground traffic (uplink+downlink)	Percentage (%)
ATS provider	192812	100	148464	100
FANS Services				
AFN (log on)	18924	9.81	13976	9.41
CPDLC	53389	27.69	40434	27.23
ADS	120499	62.5	94054	63.35

Table 1: Global FANS datalink traffic

Availability	Feb 2010
VHF FANS AIRCOM Processor Availability	99.85%
Satellite FANS AIRCOM Processor Availability	99.85%
VHF Access Network Availability	97.92%
Satellite Access Network Availability	100%
FANS Service Availability via VHF	97.78%
FANS Service Availability via Satellite	99.85%

Table2: FANS systems performance

FANS Services	AFN (Log on)	CPDLC	ADS	TOTAL
Messages delivered	98.56%	97.68%	98.48%	98.21%
No Ack+NAK	0.06%	0.05%	0.04%	0.05%
No Ack	0.06%	0.05%	0.04%	0.05%
Nak	0.00%	0.00%	0.00%	0.00%
No station to	0.08	0.09%	0.03%	0.06%
Not logged on	0.00%	0.00%	0.00%	0.00%
Message too old	0.02	0.01%	0.02%	0.02%
Other SITA rejects	1.00%	1.92%	1.23%	1.45%
Internetworking rejects	0.28%	0.24%	0.20%	0.22%

Table3: FANS reliability performance

As it is shown, the system meets ICAO requirements regarding FANS services performances.

3.2 About sixty per cent (66%) of the traffic operating within Dakar Oceanic airspace are ADS-C/CPDLC equipped.

3.3 The rates (*December 2009*) of equipped fleet per airline are as follows:

Airlines	AFR	AEA	AAW	ARG	AZA	BRS	BAW	DLH	DAL	IBE	KLM	LAN	MPD	SWR	SAA	TAP	TAM
Percentage	81.5	100	100	0	77.8	0	50	87	100	93	100	100	100	100	100	75	100

4. DISCUSSIONS

4.1 ADS-C/CPDLC implementation within Dakar Oceanic FIR has permitted to gain significant benefits such as availability of accurate estimates, aircraft routes visualization (particularly when lateral and height deviation occur), subsequent reliability and availability of air-ground communications.
It is also noted that ATC workload has decreased.

4.2 However, these benefits are moderated by the important amount (34%) of non equipped aircraft, this result in the simultaneous use of HF and CPDLC communications (uncomfortable for ATC) and then loss of efficiency.

4.3 In addition to, it is noted that ADS procedures (ref. FOM) aren't fully applied particularly the one which states that pilots should transmit the initial AFN logon between 15 and 45 minutes prior to FIR boundary estimate. This procedure could minimize wrong coordination impacts.

4.4 Due to the important number of wrong filed flight plans, Flight Data Operator (FDO) position is overloaded.

5. RECOMMENDATIONS

5.1 That airlines should take appropriate measures to equip with ADS-C and CPDLC all aircraft operating within the EUR-SAM corridor. This will enhance the level of safety in the mentioned area.

5.2 That the meeting, due to the importance of the availability of flight plans in ATM system, recalls for the absolute need to fill FPL accordingly to ICAO format and to deliver FPL to concerned ACC.
