



International Civil Aviation Organization

The 3rd Meeting of the Future Air Navigation Systems Interoperability Team-Asia (FIT-Asia/3)

Pattaya, Thailand, 26 – 27 May 2014

Agenda Item 3: Review of ADS/CPDLC Operations

FANS1/A Performance in Chennai FIR

(Presented by Airports Authority of India)

SUMMARY

This paper presents the observed performance of the ADS/CPDLC data link within the Chennai Flight Information Region during a five month period from December 2013 to April 2014.

1. INTRODUCTION

1.1 Airports Authority of India in May 2013 mandated BOBASMA to be the nodal point for conducting the End-to-End Safety and system performance monitoring of the four ATS Data link ground systems in Chennai, Mumbai, Delhi and Kolkata.

1.2 The ATM automation systems at Mumbai, Delhi and Kolkata are currently being upgraded and the provision of data link performance monitoring tool in the new system will enable conducting data link performance monitoring of the ATS data link ground system at these Air Control Centers.

1.3 The purpose of this paper is to present the observed performance of FANS1/A system in the Chennai FIR. Data extracted from the data link system recordings for the months of December 2013 to April 2014 is used to measure FANS1A System performance against the Required Communication Performance (RCP) and Required Surveillance Performance (RSP) as per the guidelines contained in the Global Operational Data-Link Document (GOLD).

2. DISCUSSION

VOMF FIR CPDLC Actual Communications Performance (ACP).

2.1 We used the GPAT tool version 3 for monitoring Chennai FIR data link performance for 5 months starting from Dec2013 to April 2014. **Figure 1** comprises of ACP for SAT-COM and VHF media that provides data link services to FANS 1/A aircraft. There were 25235 messages in which 9792 messages were from SATCOM and 15443 VHF messages in the data set. As per the GOLD document the RCP-240 requirement is 99.9%

transactions to be completed within 210 seconds and 95% to be completed within 180 seconds. The ACP for CPDLC messages sent via satellite and VHF meet the 95 percentage but fall just below the 99.9 percentage criteria. **Table 1** summarizes the ACP for messages sent within VOMF FIR of SAT-COM, VHF media.

VOMF FIR CPDLC ACP				
Messages		% >180 sec (Target 95%)	% >210 sec (Target 99.9%)	Remarks
SAT	12,689	99.27%	99.62%	
VHF	19,331	99.73%	99.82%	
All	32,020	99.54%	99.73%	

Table 1: VOMF FIR CPDLC ACP per media type

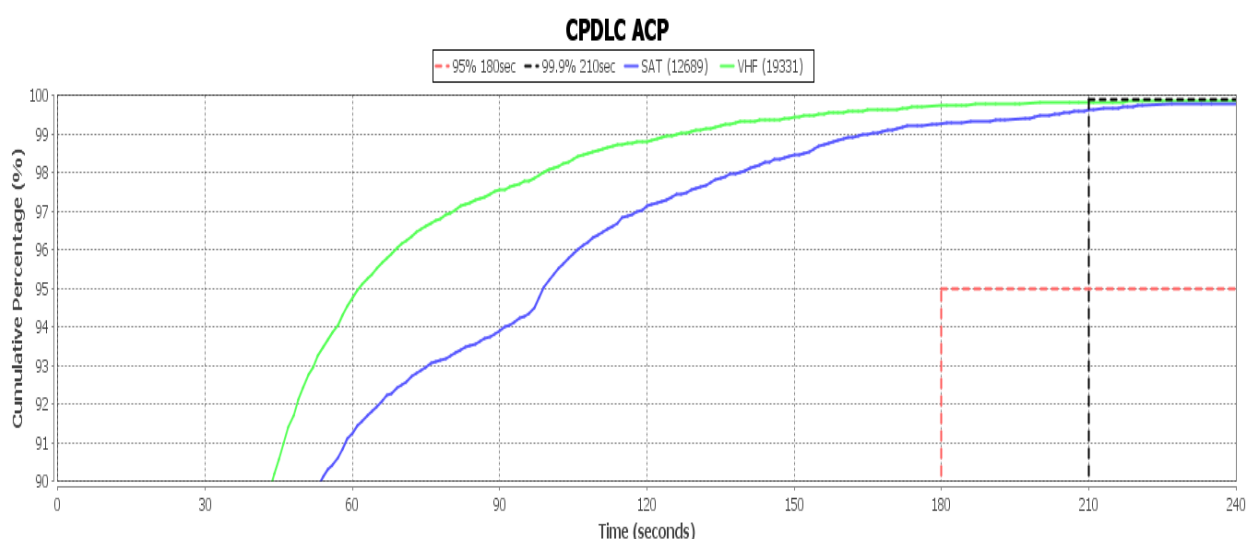


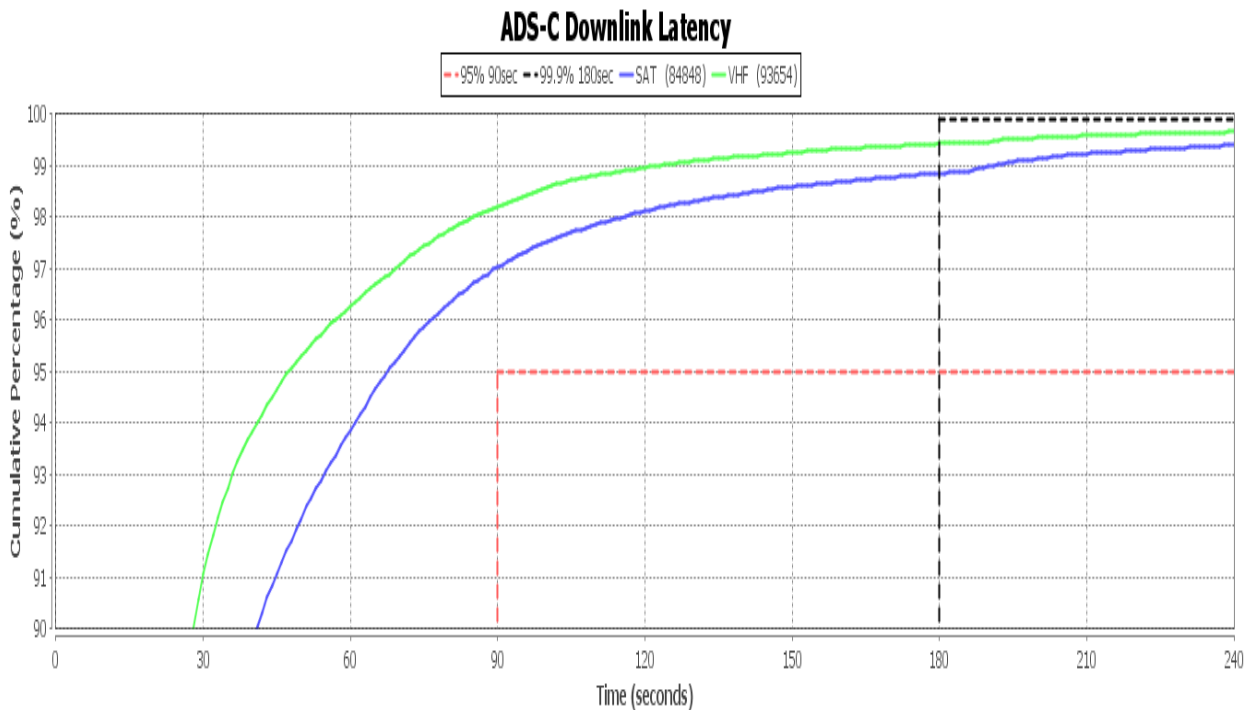
Figure 1: VOMF FIR ACP by Data Link Media Type

VOMF FIR ADS-C downlink latency.

2.2 **Figure 2** presents ADS- C downlink latency of Chennai FIR for SAT-COM and VHF media for the period of December 2013 TO April 2014. The data set contains a total of 140673 ADS messages in which 67644 messages were through SATCOM and 73029 through VHF media. GOLD describes the RSP-180 criteria as 95percent transactions to be completed within 90 sec and 99.9 percentage transactions to be completed within 180 seconds. **Table 2** summarizes the VOMF FIRs ADS-C downlink latency of SAT-COM and VHF media. It is observed that the RSP ADS-C data link messages sent via satellite and VHF meet the 95 percentage but fall below the 99.9 percentage criteria.

VOMF FIR ADS-C Downlink Latency				
Messages		% >90 sec (Target 95%)	% >180sec (Target 99.9%)	Remarks
SAT	84,848	97.02%	98.85%	
VHF	93,654	98.19%	99.42%	
All	178,502	97.63%	99.15%	

Table2: VOMF FIR ADS-C Downlink latency per Media Type



GoldFrameApplication ADS-C file ads_vomm_combined_dec13_apr14.csv

Figure2: VOMF FIR ADS-C Downlink Latency

VOMF FIR CPDLC ACP per operator.

2.3 **Figure 3** presents CPDLC ACP per operator within Chennai FIR for the period of December 2013 TO April 2014. The data set contains a total of 26069 CPDLC messages for available media with system like HF, SAT-COM, VHF or a combination of any. **Table 3** shows the top 10 operators transactions which utilized the data link system with in the FIR. All the operators satisfies RCP-240criteria of 95 percentage transactions within 180 seconds and only few operators satisfied the criteria of 99.9 percentage transitions within 210seconds and others could not satisfy.

VOMF FIR CPDLC ACP per Operator				
Operator	Messages	% >180 sec (Target 95%)	% >210 sec (Target 99.9%)	Remarks
UAE	7,883	99.82%	99.86%	
SIA	6,456	99.42%	99.67%	
QTR	4,549	99.31%	99.59%	
ETD	3,017	99.77%	99.92%	
MAS	2,897	99.90%	99.97%	
CPA	1,059	98.90%	99.23%	
THA	987	99.00%	99.25%	
SLK	595	97.44%	98.57%	
XAX	559	99.59%	99.75%	
ALK	532	99.93%	100.00%	
ALL	33,084	99.48%	99.68%	

Table 3: VOMF FIR CPDLC ACP per operator

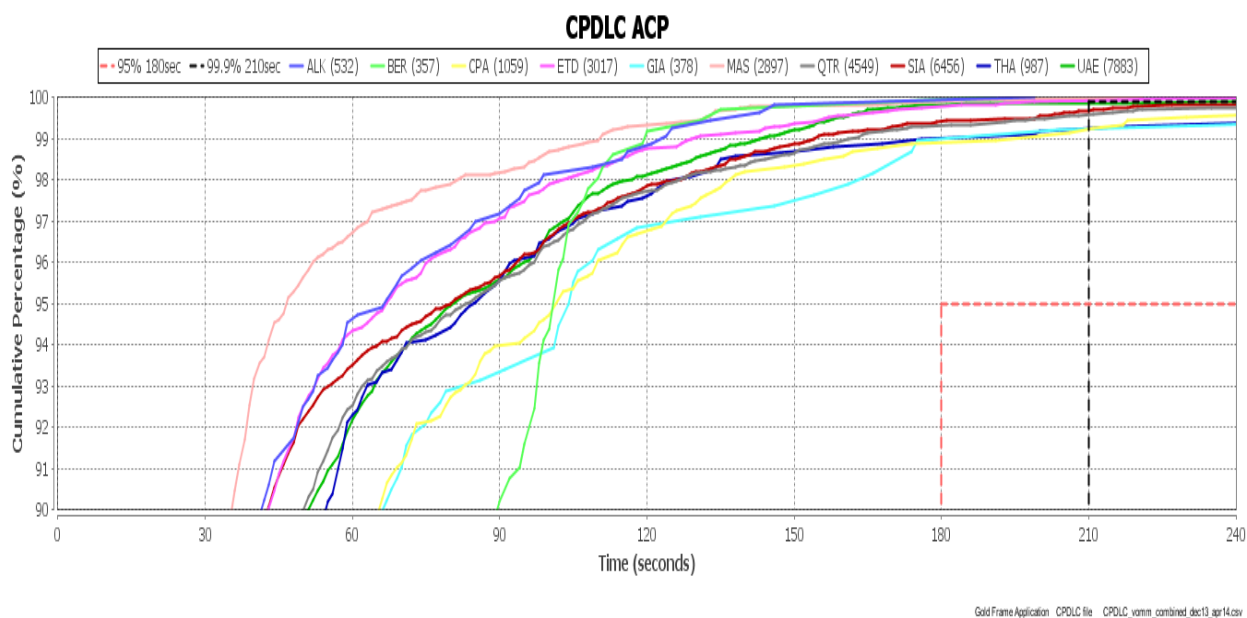


Figure 3: VOMF FIR CPDLC ACP per operator

3. ACTION BY THE MEETING

- 3.1 The meeting is invited to:
- a) note the information contained in this paper; and
 - b) discuss any relevant matters as appropriate.

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