



*International Civil Aviation Organization*

**Future Air Navigation Systems Interoperability Team-Asia (FIT-ASIA)**

Bangkok, Thailand, 27 August 2012

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**Agenda Item 2: Central Reporting Agency Report**

**Singapore Central Reporting Agency Report**

(Prepared by the Central Reporting Agency, presented by Singapore)

**SUMMARY**

This paper presents a summary of the performance data received by the CRA from Singapore ACC.

**1. INTRODUCTION**

1.1 This paper provides observed performance measures from the operational data link systems at Singapore Oceanic Center. The purpose of this paper is to present the most recent observed performance of the data link system and to identify operations with observed performance which does not meet at least the 95% criteria levels.

1.2 The performance data observed from the Controller Pilot Data Link Communication (CPDLC) and Automatic Dependent Surveillance - Contract (ADS-C) systems are measured against the appropriate Required Communication Performance (RCP) and Required Surveillance Performance (RSP) specifications to demonstrate that safety objectives which rely on the communications infrastructure can be met by the aircraft and ground systems in the respective airspace.

**2. DISCUSSION**

2.1 The Global Operational Data Link Document (GOLD) provides the guidance material describing the required data points from the FANS 1/A aircraft communications addressing and reporting system (ACARS) messages. The GOLD also describes the calculation process for the actual communication performance (ACP), actual communication technical performance (ACTP), pilot operational response time (PORT), and surveillance latency and specifies the requirements for each performance measure at the 95% and 99.9% levels.

2.2 Attachment A contains the observed aggregate uplink data link performance by month in the Singapore for April 11 2012 through July 12 2012. Attachment B contains observed aggregate downlink data link performance by month in the Singapore for April 11 2012 through July 12 2012.

2.3 The data contained in Attachment A and B shows that the aggregate data link performance in the Singapore FIR meets the 95% RCP240 performance requirements.

2.4 Although aggregate performance data does provide some measure of overall system performance the system performance ANSPs are encouraged to provide separate performance data for actual communication performance (ACP), actual communication technical performance (ACTP), pilot operational response time (PORT), and surveillance latency as described in the GOLD.

**3. ACTION BY THE MEETING**

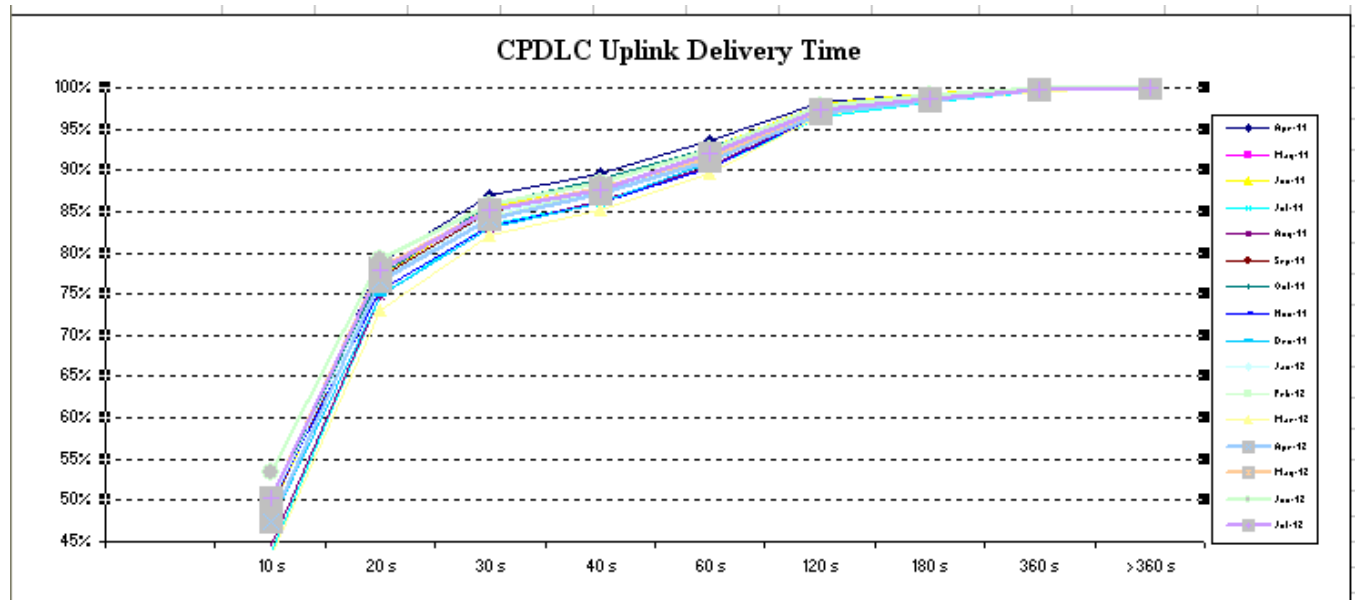
3.1 The meeting is invited to:

- a) Note the information contained in this paper and attached presentation; and
- b) comment on the contents of the paper.

Attachment A

Aggregate Uplink Performance Data

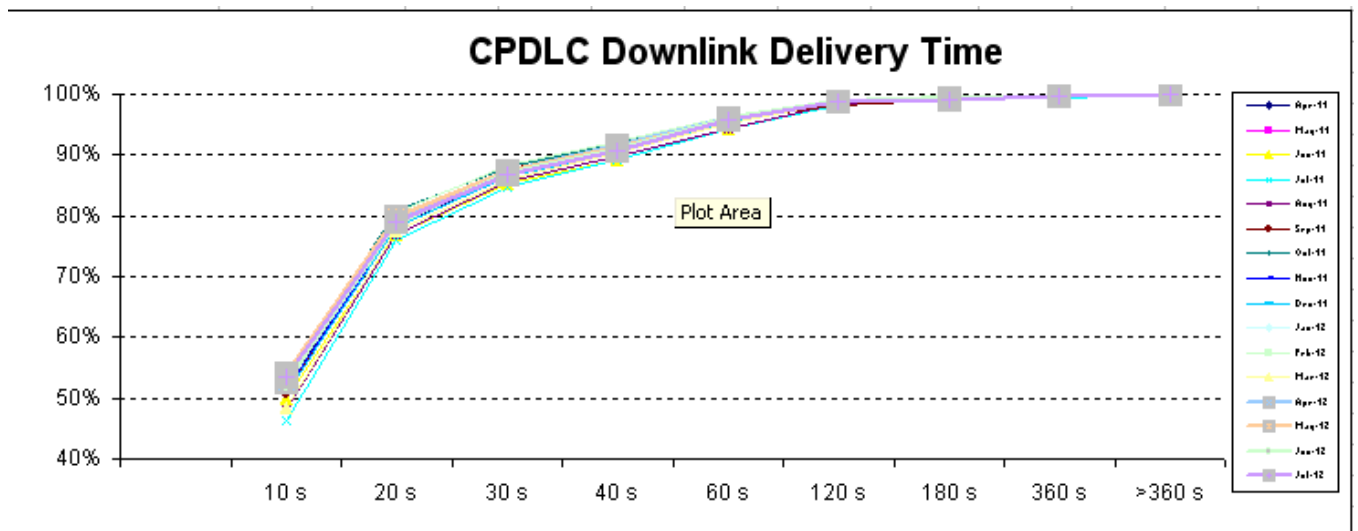
Uplink Message Delivery Time	10 s	20 s	30 s	40 s	60 s	120 s	180 s	360 s	>360 s
Apr-11	49.12%	78.75%	86.97%	89.71%	93.57%	98.25%	99.36%	99.96%	100.00%
May-11	49.84%	77.75%	85.67%	88.60%	92.61%	97.95%	99.38%	99.95%	100.00%
Jun-11	48.96%	77.26%	85.34%	88.47%	92.71%	98.04%	99.28%	99.89%	100.00%
Jul-11	43.64%	74.85%	83.38%	86.06%	90.39%	96.49%	98.25%	99.65%	100.00%
Aug-11	44.50%	74.76%	83.01%	86.21%	90.52%	96.89%	98.66%	99.71%	100.00%
Sep-11	49.21%	77.04%	84.95%	87.78%	91.93%	97.25%	98.88%	99.83%	100.00%
Oct-11	49.97%	77.31%	85.78%	88.91%	92.76%	97.76%	99.07%	99.86%	100.00%
Nov-11	49.56%	75.55%	83.26%	86.11%	90.30%	96.79%	98.39%	99.62%	100.00%
Dec-11	47.27%	74.73%	83.06%	86.17%	90.88%	96.91%	98.56%	99.61%	100.00%
Jan-12	49.53%	76.90%	84.67%	87.46%	91.38%	97.37%	98.85%	99.72%	100.00%
Feb-12	47.24%	76.30%	84.36%	87.53%	91.72%	97.56%	98.92%	99.75%	100.00%
Mar-12	43.23%	73.10%	82.17%	85.25%	89.65%	96.59%	98.43%	99.66%	100.00%
Apr-12	47.39%	76.59%	84.02%	87.15%	91.19%	96.85%	98.50%	99.67%	100.00%
May-12	50.26%	78.11%	85.21%	87.75%	91.51%	97.24%	98.73%	99.72%	100.00%
Jun-12	53.31%	79.34%	85.97%	88.52%	92.46%	97.82%	99.13%	99.92%	100.00%
Jul-12	50.29%	77.82%	85.12%	87.73%	91.94%	97.26%	98.65%	99.70%	100.00%
Average %	48.33%	76.64%	84.56%	87.46%	91.60%	97.31%	98.82%	99.76%	100.00%



Attachment B

Aggregate Downlink Performance Data

Downlink Message Delivery Time	10 s	20 s	30 s	40 s	60 s	120 s	180 s	360 s	>360 s
Apr-11	51.96%	78.52%	86.74%	90.55%	95.15%	98.67%	99.23%	99.70%	100.00%
May-11	53.66%	79.65%	87.41%	91.10%	95.48%	98.82%	99.24%	99.65%	100.00%
Jun-11	49.92%	76.95%	85.35%	89.35%	94.22%	98.19%	99.02%	99.70%	100.00%
Jul-11	46.26%	76.15%	84.76%	89.22%	94.15%	98.29%	98.97%	99.54%	100.00%
Aug-11	47.99%	77.02%	85.67%	89.68%	94.42%	98.50%	99.15%	99.59%	100.00%
Sep-11	50.84%	79.10%	87.58%	91.44%	95.69%	98.05%	99.02%	99.61%	100.00%
Oct-11	52.89%	80.73%	88.01%	91.78%	96.23%	99.07%	99.49%	99.78%	100.00%
Nov-11	51.36%	78.46%	87.20%	91.00%	95.84%	98.88%	99.37%	99.67%	100.00%
Dec-11	50.78%	78.22%	86.42%	90.43%	95.52%	98.96%	99.41%	99.80%	100.00%
Jan-12	53.45%	79.68%	87.11%	90.84%	95.74%	98.94%	99.52%	99.83%	100.00%
Feb-12	51.73%	80.57%	88.26%	92.12%	96.48%	99.14%	99.56%	99.80%	100.00%
Mar-12	48.27%	77.58%	85.91%	90.35%	95.29%	98.76%	99.41%	99.76%	100.00%
Apr-12	52.58%	79.47%	87.41%	91.50%	96.08%	98.83%	99.25%	99.65%	100.00%
May-12	54.11%	79.84%	87.41%	91.38%	95.77%	98.86%	99.33%	99.79%	100.00%
Jun-12	52.73%	78.79%	86.95%	91.04%	95.97%	98.80%	99.36%	99.74%	100.00%
Jul-12	53.47%	78.94%	86.92%	90.83%	95.72%	98.77%	99.19%	99.70%	100.00%
Average %	51.38%	78.73%	86.82%	90.79%	95.48%	98.72%	99.28%	99.71%	100.00%



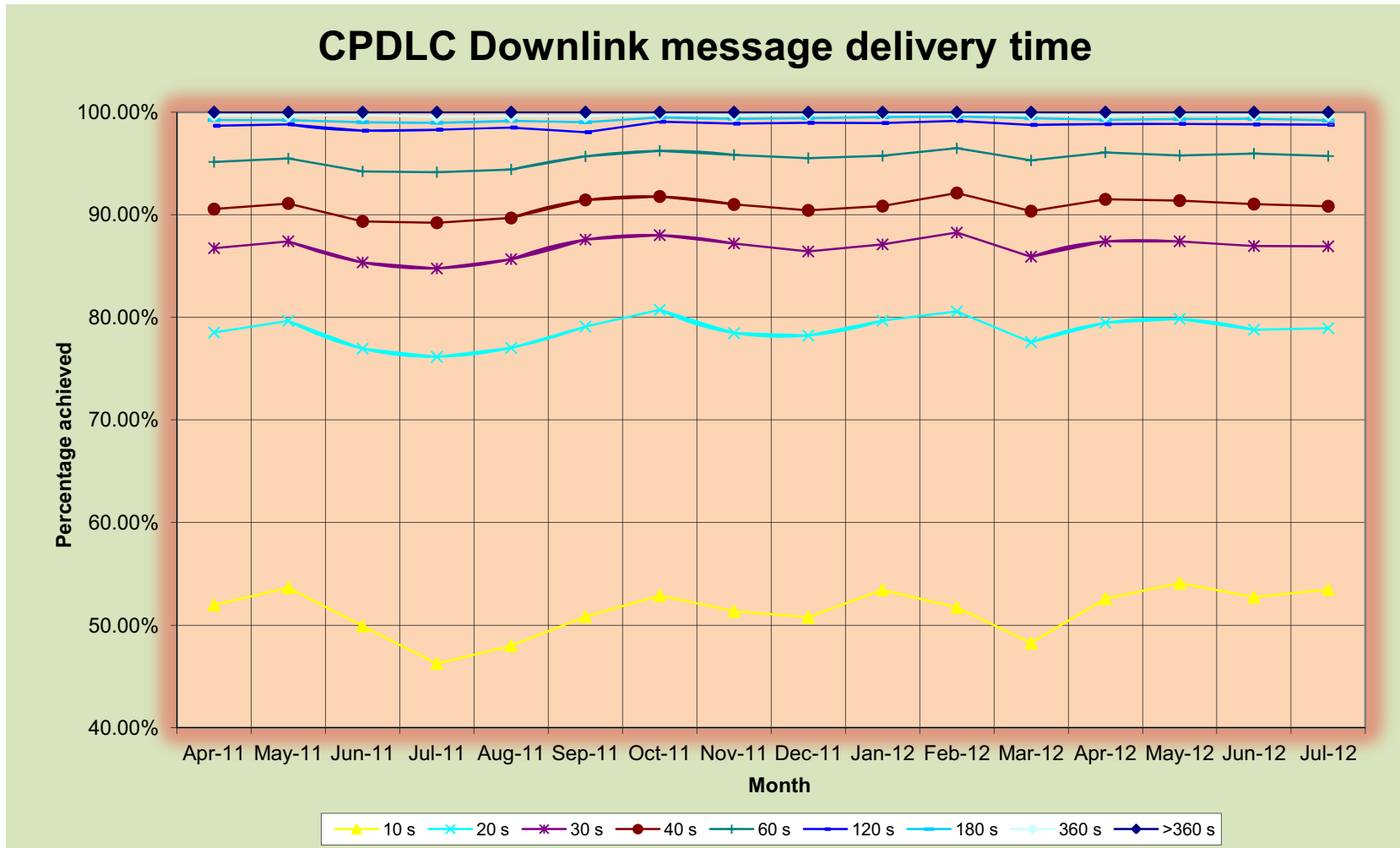
# Data link System Performance Analysis Singapore

27th August 2012

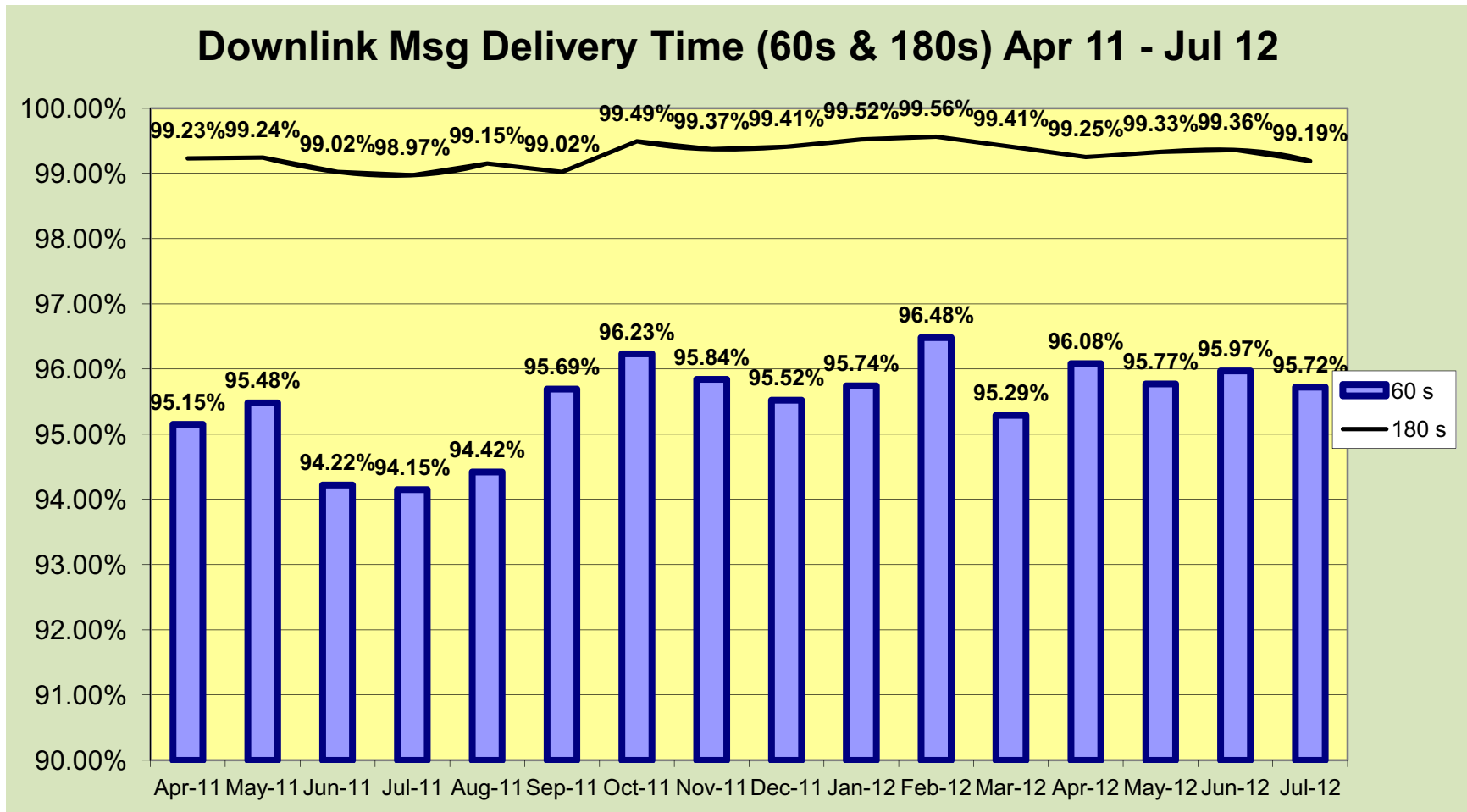
# CPDLC System Performance

- The following CPDLC system performance is analyzed:
  - CPDLC Downlink performance
  - CPDLC Uplink performance
  - Uplink success rate
  - Data link availability
  - Auto Transfer Success Rate

# CPDLC Downlink Performance

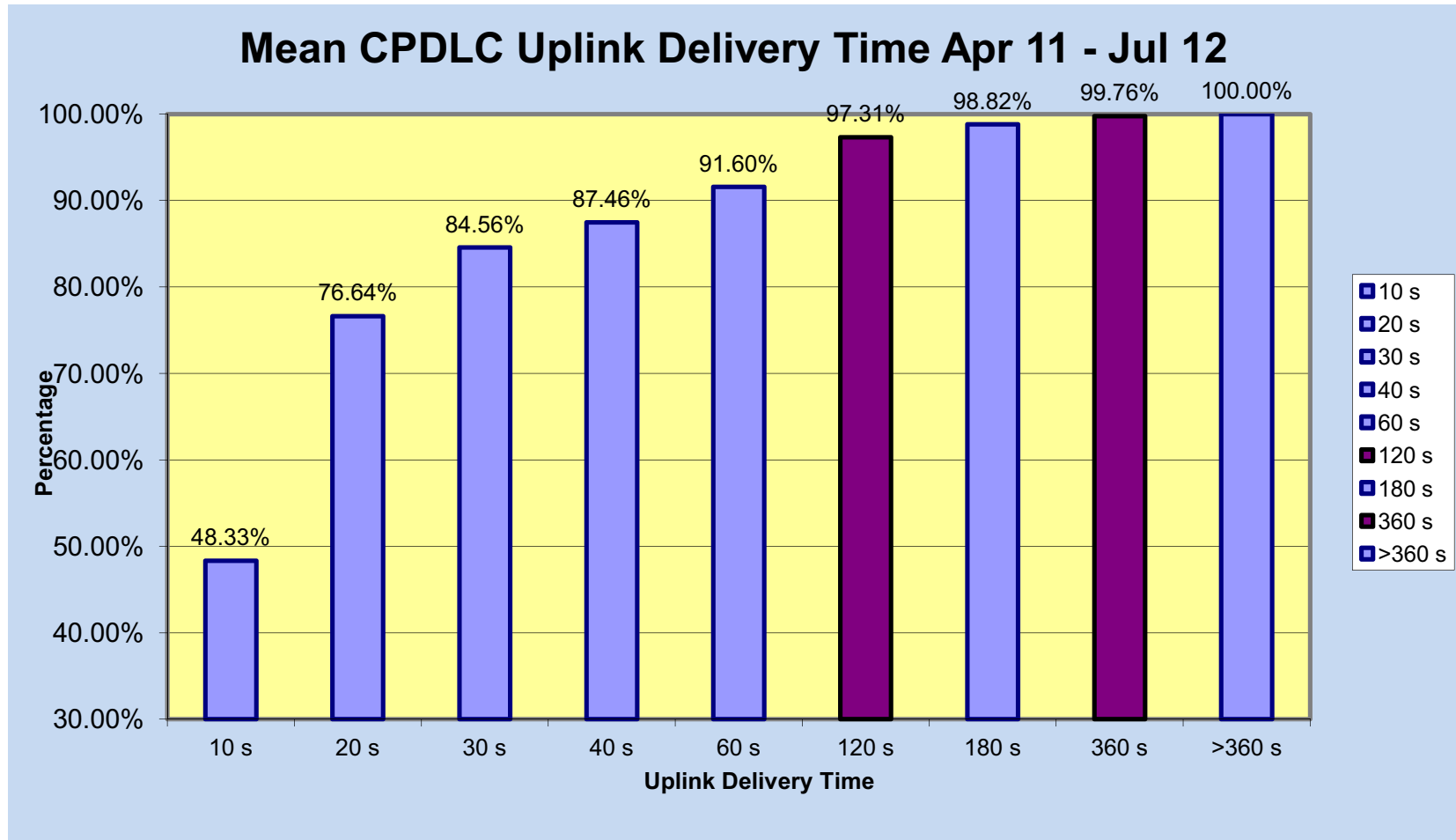


# CPDLC Downlink Performance

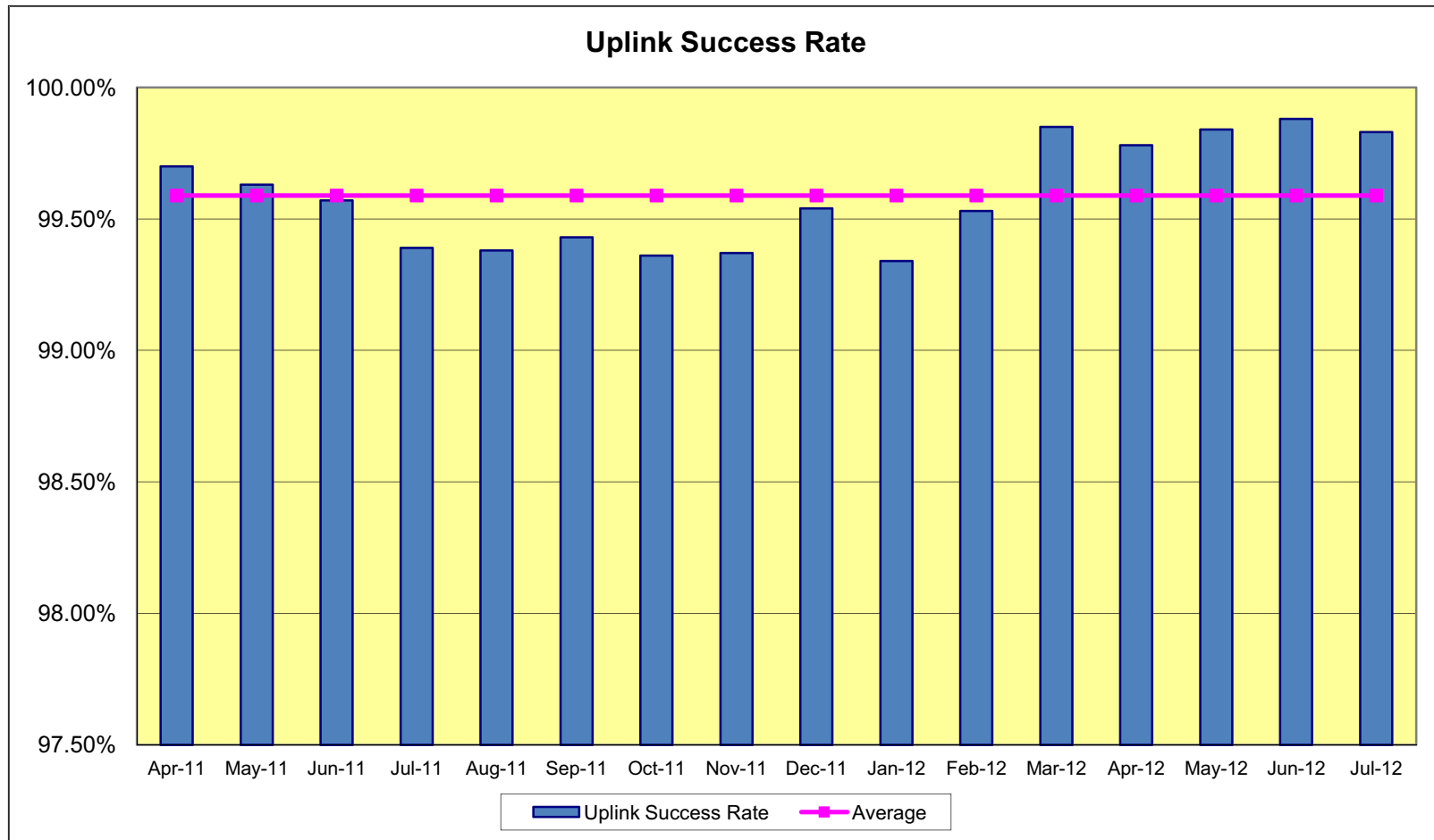




# CPDLC Uplink Performance

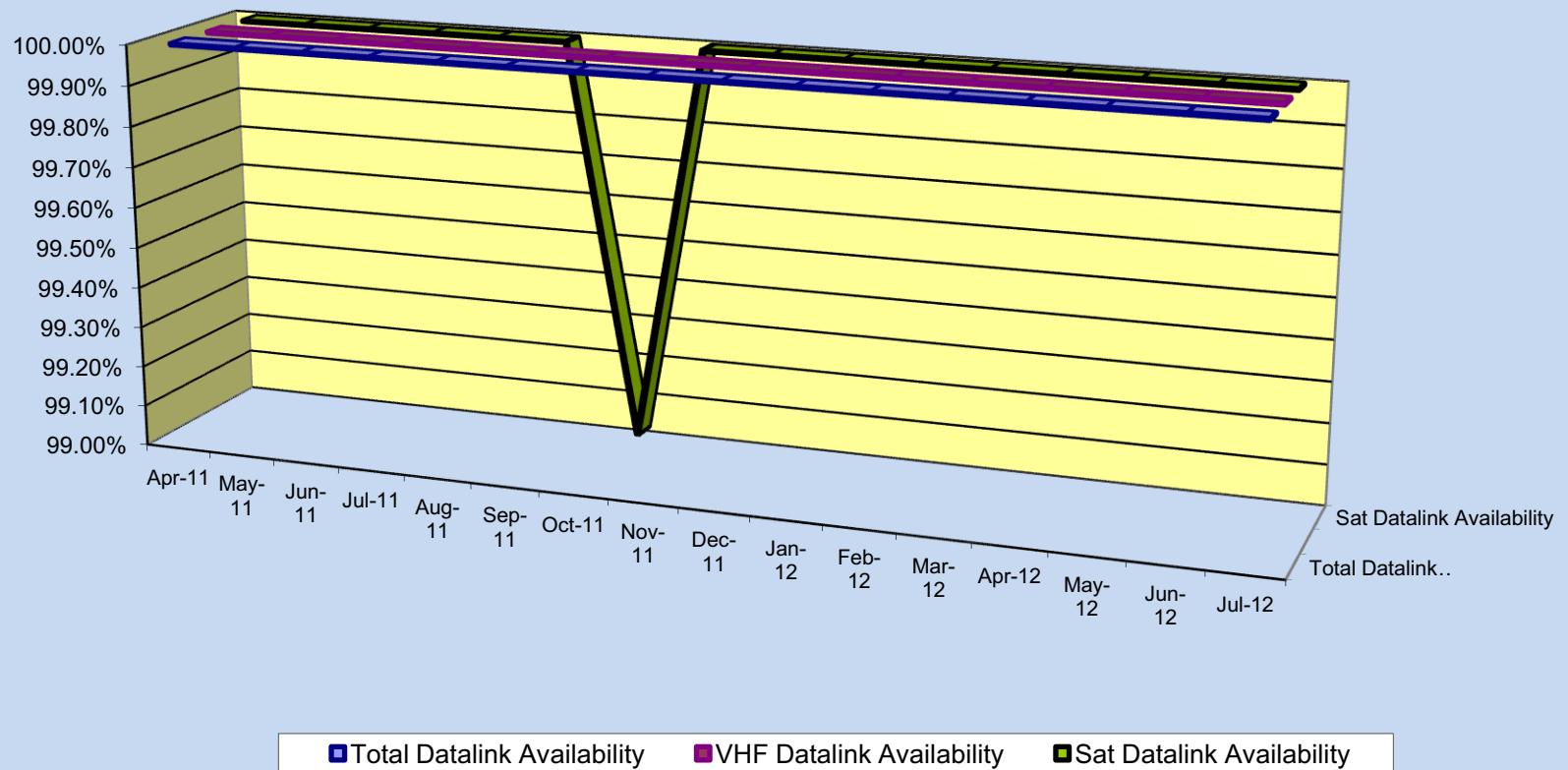


# Uplink success rate



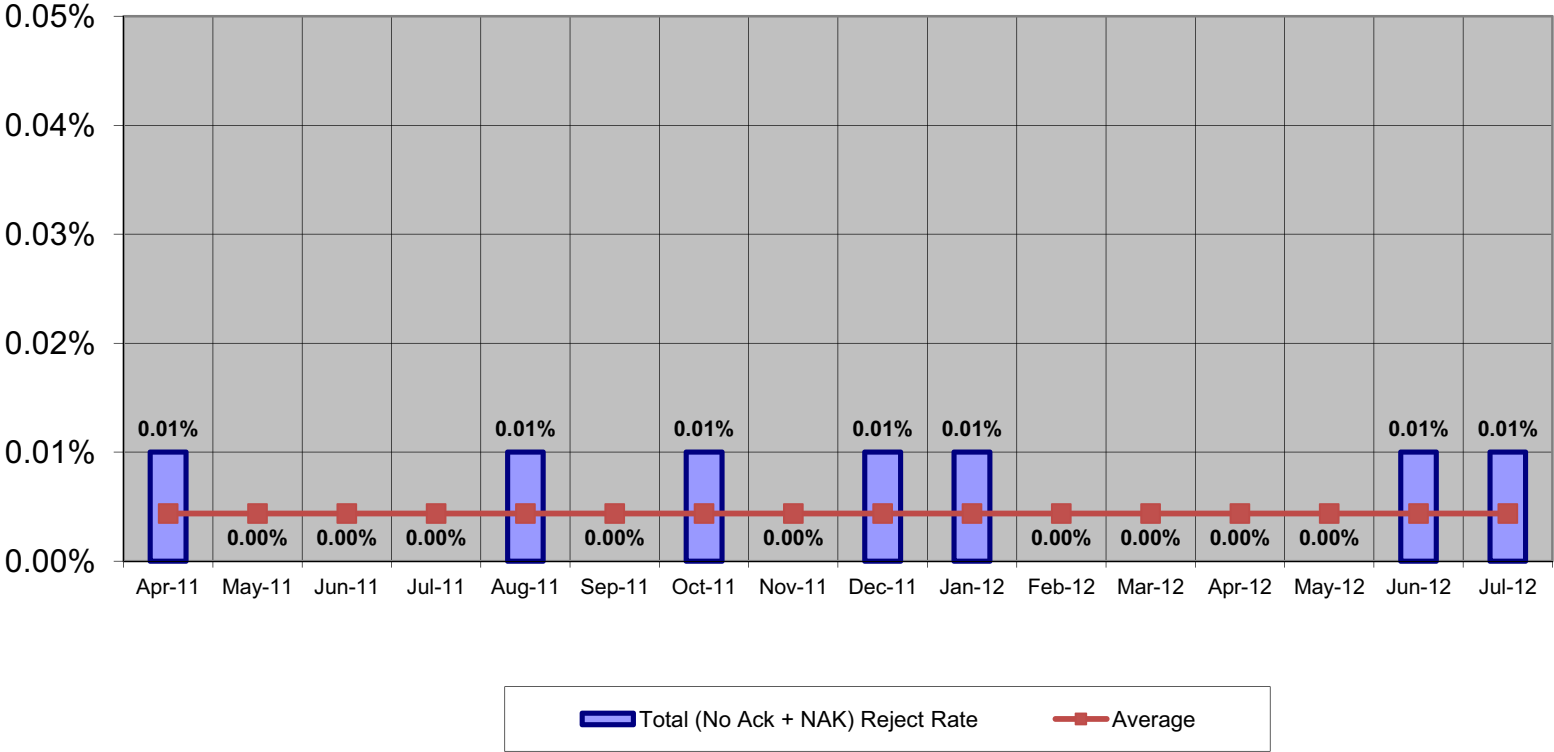
# Data link availability

## Datalink Service Availability Apr 11 - Jul 12



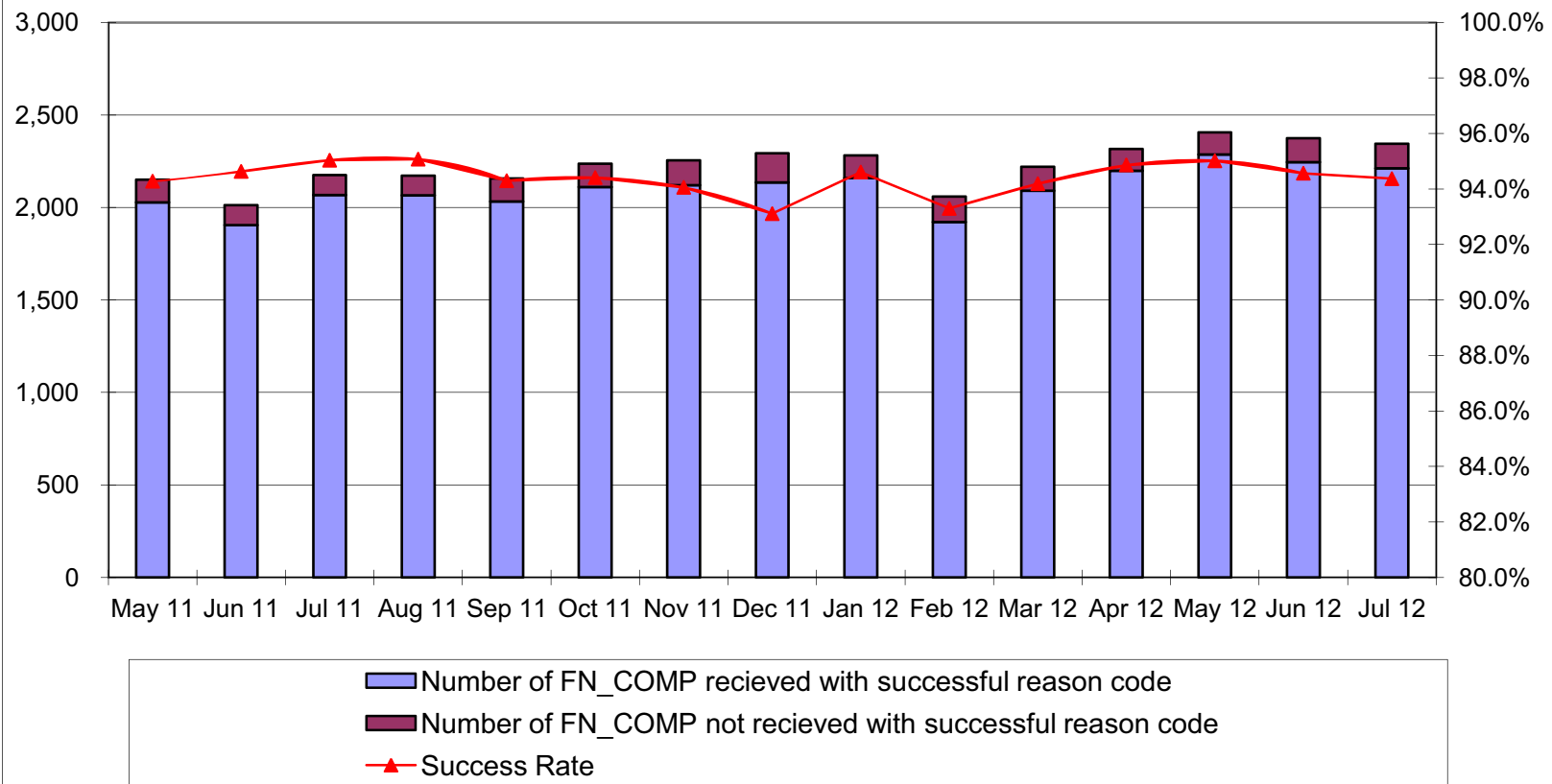
# No Ack + NAK Reject rate

Total (No Ack + NAK) Reject Rate Apr 11 - Jul 12



# Auto Transfer Success Rate

(Fig.) Auto Transfer Success Rate  
(From Singapore FIR - To HoChiMinh FIR)



**Thank you**