



International Civil Aviation Organization

The Thirteenth Meeting of the FANS Implementation Team, Bay of Bengal (FIT-BOB/13) and the Fifth Meeting of the Bay of Bengal Reduced Horizontal Separation Implementation Task Force (BOB-RHS/TF/5)

Bangkok, Thailand, 07 – 11 February 2011

Agenda Item 3: Review Bay of Bengal ADS/CPDLC Operations

**PROGRESS REPORT OF ADS-C/CPDLC OPERATION
WITHIN THE UJUNG PANDANG FIR**

(Presented by Indonesia)

SUMMARY

This working paper describes the system performance data of ADS-C/CPDLC operation within the Ujung Pandang FIR as a report to the FIT-BOB meeting as mentioned in the FIT-BOB Task List that States conducting operational trial to submit system performance data to FIT-BOB meeting as specified in FOM/GOLD.

1. INTRODUCTION

- 1.1 Since the publication of AIP Supp No. 10/10 concerning the ADS-C/CPDLC Procedure within Ujung Pandang FIR dated 29 July 2010, currently the Ujung Pandang ACC undergoing the ADS-C/CPDLC procedure within the Ujung Pandang FIR.
- 1.2 Formerly it was began with the trial operation of ADS-C/CPDLC on particular ATS routes A461, B462, B472, B473, B583, B584 and R340/R590, international flights operating on these routes shall use CPDLC for main communication and VHF voice communication as back up. This trial operation was extended several times (3 July 2008 to 3 June 2010) to made the syatem satisfaction and confidence.
- 1.3 The ADS-C/CPDLC problems had been evaluated and solved paralised by upgraded the ATS Erocat-X version 3.18 at the end of 2009.

2. ADS-C/CPDLC Operation Monitoring

2.1 System performance Data Analysis

Based on the data monitoring since September 2010 to December 2010, the System Performance Data including the uplink, down link and the success rate as follows:

2.1.1 SEPTEMBER 2010

a. Uplink Message Delivery Time

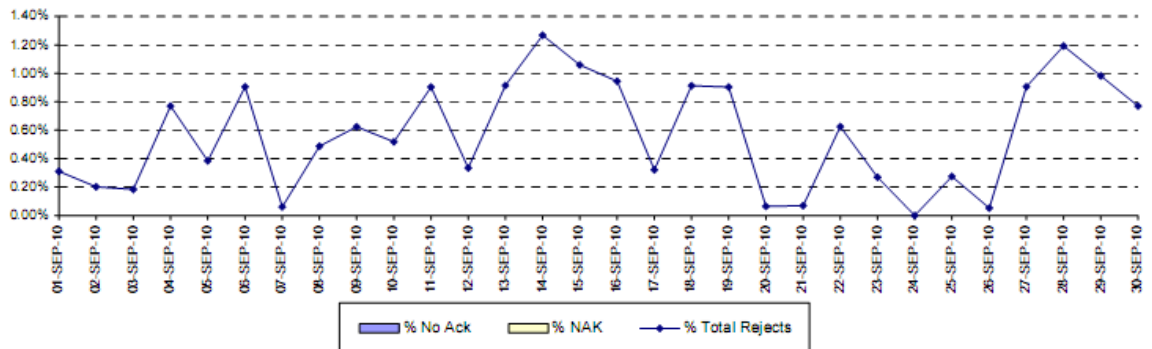
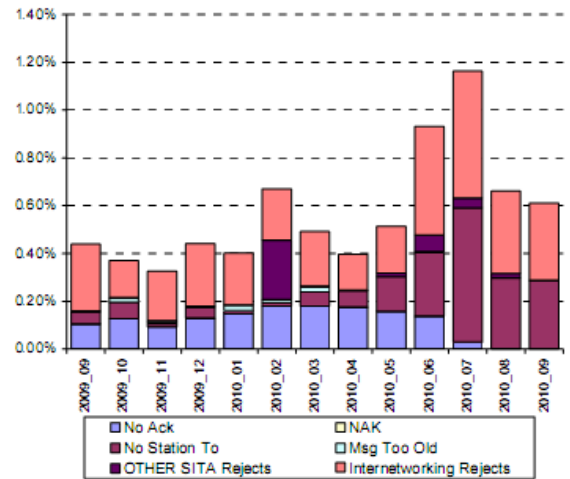
Uplink Message Delivery Time	10 s	20 s	30 s	40 s	60 s	120 s	180 s	360 s	>360 s
ATS Provider	59.41%	85.91%	91.47%	92.25%	94.81%	98.39%	99.57%	99.98%	100.00%
AFN (Log-on)	74.71%	87.75%	90.13%	91.04%	92.96%	98.84%	99.30%	99.91%	100.00%
CPDLC	67.31%	87.93%	91.13%	91.77%	93.75%	98.79%	99.82%	99.99%	100.00%
ADS	55.62%	85.11%	91.69%	92.51%	95.31%	98.23%	99.51%	99.98%	100.00%

b. Down link Message Delivery Time

Downlink Message Delivery Time	10 s	20 s	30 s	40 s	60 s	120 s	180 s	360 s	>360 s
ATS Provider	47.18%	75.78%	86.86%	90.44%	95.04%	97.91%	98.58%	99.29%	100.00%
AFN (Log-on)	38.81%	72.11%	82.40%	89.33%	94.54%	98.07%	98.74%	99.40%	100.00%
CPDLC	54.92%	83.76%	90.55%	93.28%	96.81%	98.86%	99.23%	99.68%	100.00%
ADS	44.75%	72.57%	85.78%	89.27%	94.27%	97.44%	98.26%	99.09%	100.00%

c. Success rate

Uplink Performance	ATS Provider		
	Sep-10	Last 3 Month	Last 12 Month
Uplink Success Rate	99.39%	99.20%	99.41%
Total (No Ack + NAK) Reject Rate	0.00%	0.01%	0.11%
No Ack (VHF)	0.00%	0.00%	0.01%
NAK (VHF)	0.00%	0.00%	0.00%
No Ack (Satcom)	0.00%	0.02%	0.27%
NAK (Satcom)	0.00%	0.00%	0.00%
No Station to	0.29%	0.38%	0.16%
Not Logged On	0.00%	0.00%	0.00%
Msg Too Old	0.00%	0.00%	0.01%
Other SITA Rejects	0.00%	0.02%	0.03%
Internetworking Rejects	0.32%	0.40%	0.28%



2.1.2 OCTOBER 2010

a. Uplink Message Delivery Time

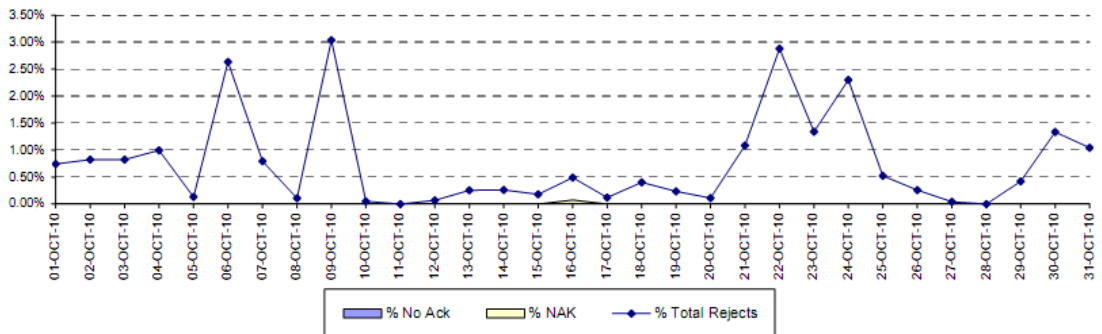
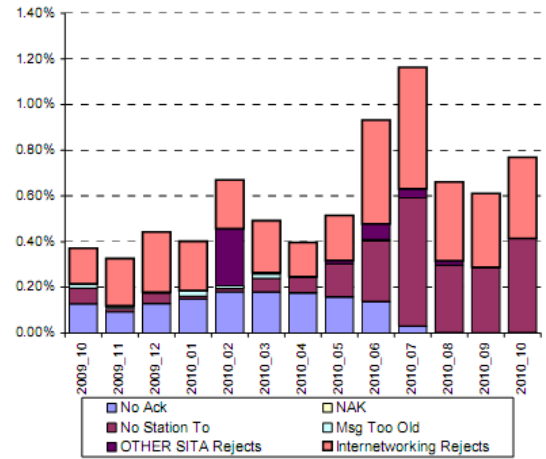
Uplink Message Delivery Time	10 s	20 s	30 s	40 s	60 s	120 s	180 s	360 s	>360 s
ATS Provider	56.86%	84.38%	90.39%	91.25%	94.25%	98.23%	99.54%	99.99%	100.00%
AFN (Log-on)	72.65%	87.04%	89.67%	90.49%	92.74%	98.72%	99.35%	100.00%	100.00%
CPDLC	64.54%	86.88%	90.42%	91.14%	93.43%	98.80%	99.78%	100.00%	100.00%
ADS	52.90%	83.31%	90.45%	91.36%	94.65%	98.00%	99.48%	99.99%	100.00%

b. Down link Message Delivery Time

Downlink Message Delivery Time	10 s	20 s	30 s	40 s	60 s	120 s	180 s	360 s	>360 s
ATS Provider	45.04%	74.11%	85.45%	89.73%	94.58%	97.73%	98.42%	99.22%	100.00%
AFN (Log-on)	40.07%	72.50%	81.52%	88.26%	94.27%	97.87%	98.62%	99.49%	100.00%
CPDLC	52.33%	82.35%	89.40%	93.09%	96.37%	98.70%	99.08%	99.54%	100.00%
ADS	42.20%	70.28%	84.11%	88.31%	93.75%	97.23%	98.06%	99.02%	100.00%

c. Success Rate

Uplink Performance	ATS Provider		
	Oct-10	Last 3 Month	Last 12 Month
Uplink Success Rate	99.23%	99.32%	99.38%
Total (No Ack + NAK) Reject Rate	0.00%	0.00%	0.10%
No Ack (VHF)	0.00%	0.00%	0.00%
NAK (VHF)	0.00%	0.00%	0.00%
No Ack (Satcom)	0.00%	0.00%	0.24%
NAK (Satcom)	0.00%	0.00%	0.00%
No Station to	0.41%	0.33%	0.19%
Not Logged On	0.00%	0.00%	0.00%
Msg Too Old	0.00%	0.00%	0.01%
Other SITA Rejects	0.00%	0.01%	0.03%
Internetworking Rejects	0.36%	0.34%	0.29%



2.1.3 NOVEMBER 2010

a. Uplink Message Delivery Time

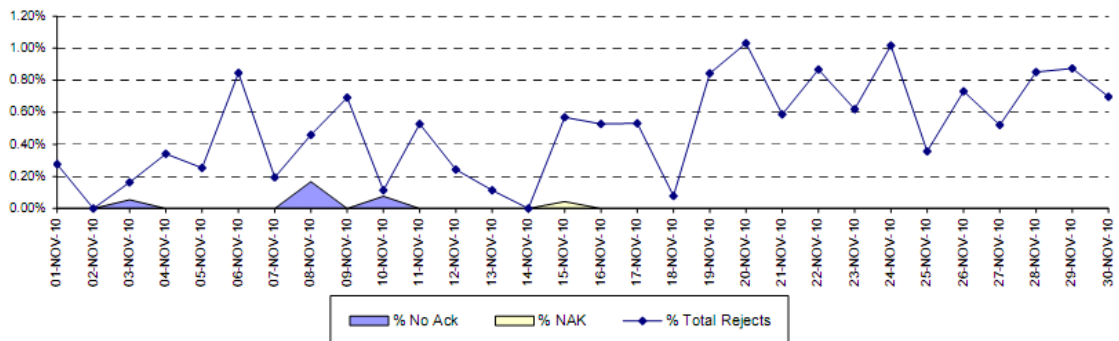
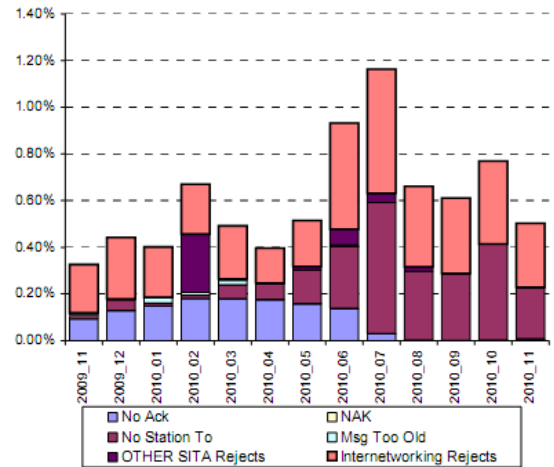
Uplink Message Delivery Time	10 s	20 s	30 s	40 s	60 s	120 s	180 s	360 s	>360 s
ATS Provider	56.92%	84.10%	90.25%	91.07%	94.10%	98.19%	99.52%	99.99%	100.00%
AFN (Log-on)	73.39%	88.07%	90.59%	91.39%	93.55%	98.81%	99.51%	99.98%	100.00%
CPDLC	66.13%	87.37%	90.88%	91.66%	93.61%	98.77%	99.79%	100.00%	100.00%
ADS	52.06%	82.56%	89.99%	90.84%	94.33%	97.92%	99.42%	99.98%	100.00%

b. Down link Message Delivery Time

Downlink Message Delivery Time	10 s	20 s	30 s	40 s	60 s	120 s	180 s	360 s	>360 s
ATS Provider	45.21%	74.11%	85.20%	89.63%	94.58%	97.82%	98.55%	99.39%	100.00%
AFN (Log-on)	37.98%	70.60%	80.81%	88.29%	94.11%	98.03%	98.75%	99.54%	100.00%
CPDLC	52.50%	82.21%	89.55%	93.01%	96.56%	98.66%	99.16%	99.66%	100.00%
ADS	42.86%	70.74%	83.81%	88.20%	93.70%	97.38%	98.21%	99.24%	100.00%

c. Success Rate

Uplink Performance	ATS Provider		
	Nov-10	Last 3 Month	Last 12 Month
Uplink Success Rate	99.50%	99.37%	99.37%
Total (No Ack + NAK) Reject Rate	0.01%	0.00%	0.09%
No Ack (VHF)	0.00%	0.00%	0.00%
NAK (VHF)	0.00%	0.00%	0.00%
No Ack (Satcom)	0.02%	0.01%	0.21%
NAK (Satcom)	0.00%	0.00%	0.00%
No Station to	0.22%	0.31%	0.20%
Not Logged On	0.00%	0.00%	0.00%
Msg Too Old	0.00%	0.00%	0.01%
Other SITA Rejects	0.00%	0.00%	0.03%
Internetworking Rejects	0.27%	0.32%	0.30%



2.1.4 DECEMBER 2010

a. Uplink Message Delivery Time

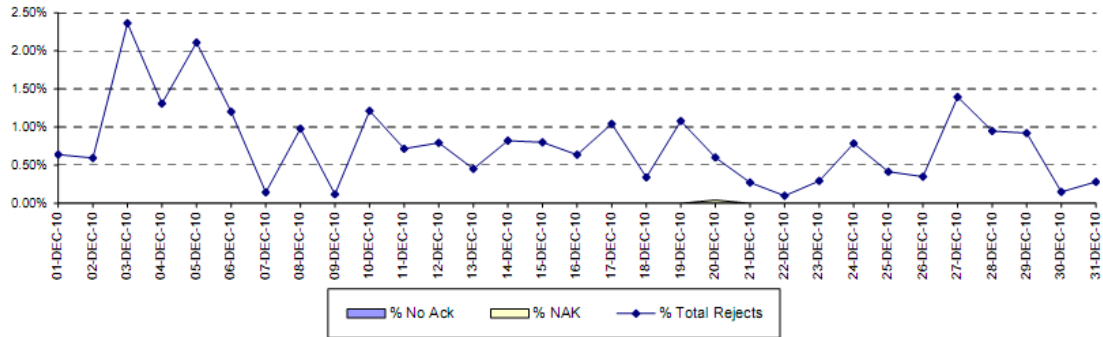
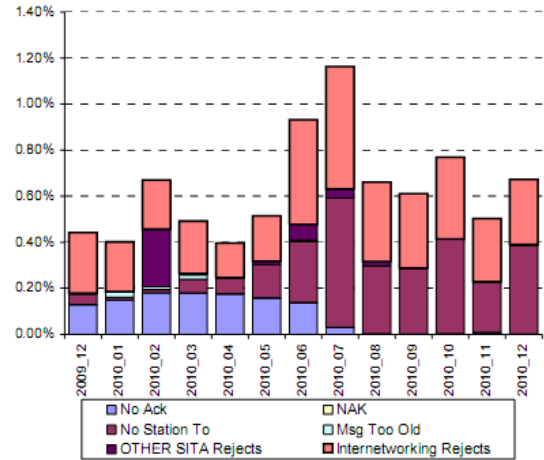
Uplink Message Delivery Time	10 s	20 s	30 s	40 s	60 s	120 s	180 s	360 s	>360 s
ATS Provider	55.65%	83.29%	89.67%	90.59%	93.68%	97.94%	99.37%	99.99%	100.00%
AFN (Log-on)	71.56%	86.38%	89.35%	90.19%	92.24%	98.59%	99.33%	99.93%	100.00%
CPDLC	65.28%	86.73%	90.26%	91.01%	93.27%	98.44%	99.61%	99.99%	100.00%
ADS	50.71%	81.77%	89.49%	90.48%	93.96%	97.70%	99.29%	99.99%	100.00%

b. Down link Message Delivery Time

Downlink Message Delivery Time	10 s	20 s	30 s	40 s	60 s	120 s	180 s	360 s	>360 s
ATS Provider	45.21%	75.32%	85.94%	89.98%	94.49%	97.85%	98.54%	99.34%	100.00%
AFN (Log-on)	39.85%	74.35%	83.09%	88.93%	94.18%	97.92%	98.77%	99.61%	100.00%
CPDLC	53.36%	83.32%	89.96%	93.32%	96.53%	98.81%	99.21%	99.65%	100.00%
ADS	41.80%	71.31%	84.28%	88.40%	93.47%	97.35%	98.16%	99.14%	100.00%

c. Success Rate

Uplink Performance	ATS Provider		
	Dec-10	Last 3 Month	Last 12 Month
Uplink Success Rate	99.33%	99.35%	99.35%
Total (No Ack + NAK) Reject Rate	0.00%	0.00%	0.08%
No Ack (VHF)	0.00%	0.00%	0.00%
NAK (VHF)	0.00%	0.00%	0.00%
No Ack (Satcom)	0.00%	0.01%	0.19%
NAK (Satcom)	0.00%	0.00%	0.00%
No Station to	0.39%	0.34%	0.23%
Not Logged On	0.00%	0.00%	0.00%
Msg Too Old	0.00%	0.00%	0.00%
Other SITA Rejects	0.00%	0.00%	0.03%
Internetworking Rejects	0.28%	0.30%	0.30%



2.2 Overall System Performance Data 2010

a. AVAILABILITY NETWORK

Availability network	Standard	2010 (%)											
		Jan	Feb	Mar	Apr	May	June	July	August	Sept	Oct	Nov	Des
vhf access	99.90%	99.99	98.70	99.53	94.96	96.57	98.30	98.71	94.11	99.99	99.74	99.60	99.24
SATCOM access	99.90%	100	99.98	100	100	100	99.98	100	100	100	100	100	100

b. DATALINK TRAFFIC (GROUND TRAFFIC, UPLINK-DOWNLINK)

Customer	2010											
	Jan	Feb	Mar	Apr	May	June	July	August	Sept	Oct	Nov	Des
LOG-ON	12,566	11,623	12,725	12,117	12,213	11,717	13,181	12,156	12,480	14,466	15,976	15,156
CPDLC	54,266	44,606	49,381	48,822	52,958	48,827	49,581	49,537	49,723	55,989	59,313	61,876
ADS	134,017	140,812	142,808	148,457	143,181	132,670	136,549	150,446	150,058	162,265	173,583	173,441

c. RELIABILITY PERFORMANCE

Success message delivery	2010 (%)											
	Jan	Feb	Mar	Apr	May	June	July	August	Sept	Oct	Nov	Des
LOG-ON	99.49	99.26	99.89	99.33	98.83	97.69	97.15	97.99	98.54	97.78	98.80	97.94
CPDLC	99.53	99.18	99.45	99.52	99.45	98.65	97.91	98.75	98.73	98.56	99.15	98.70
ADS	99.64	99.38	99.59	99.66	99.56	99.37	99.84	99.66	99.69	99.61	99.66	99.65
TOTAL	99.55	99.27	99.64	99.50	99.28	98.57	98.30	98.80	98.99	98.65	99.20	98.76

d. UPLINK TIME PERFORMANCE (VHF DL + SATCOM)

Uplink. End to end round trip	Standard	2010 (%)											
		Jan	Feb	Mar	Apr	May	June	July	August	Sept	Oct	Nov	Des
in 120 seconds	95%	98.18	97.64	97.42	97.50	97.98	98.01	98.31	98.31	98.39	98.23	98.19	97.74
in 360 seconds	99%	99.88	99.66	99.81	99.83	99.89	99.89	99.98	99.98	99.98	99.99	99.99	99.97

e. DOWNLINK TIME PERFORMANCE (VHF DL + SATCOM)

Downlink	Standard	2010 (%)											
		Jan	Feb	Mar	Apr	May	June	July	August	Sept	Oct	Nov	Des
in 60 seconds	95%	94.33	93.36	93.80	93.37	94.08	94.39	94.64	94.49	95.04	94.58	94.58	94.49
in 180 seconds	99%	98.14	97.67	97.91	97.60	98.02	98.12	98.28	98.29	98.58	98.42	98.55	98.54

2.3 the System Performance Data that is shown above are satisfaction and meet the FANS 1-A Document and the standard of the contract as follows:

- a. **Performances** for End-to-end round trip time for uplinks per delivery media (VHF, SATCOM, or HFDL). The Values is:
 - i. Round trip time of 2 minutes, 95% of the messages
 - ii. Round trip time of 6 minutes, 99% of the message
- b. Performances for End-to-end one way time for downlinks per delivery media (VHF, SATCOM, or HFDL). The value is:
 - i. One way time of 1 minute, 95% of the messages
 - ii. One way time of 3 minutes, 99% of the messages
- c. Uplink messages only for un-delivered messages determined by Message assurance failure are received. The values is Less than 1% of all attempted messages undelivered.
- d. **Availability** for the ability of the network data link service to perform a required function under given conditions at a given time is 99.9%.

3. AIDC/CPDLC

3.1 An update on the AIDC trial between Brisbane and Makassar which was restarted in July. Normal voice coordination will be maintained during the trial period. The trial includes the following messages: Transfer of Coordination (TOC), Acceptance of Coordination (AOC), Advance Boundary Information (ABI), Coordination Estimate (EST) and Preactivation (PAC). When it is working well the AIDC messaging is providing benefits at both centres and Airservices would like to extend the trial for a further six months.

3.2 A number of issues have been identified: Cannot yet modify coordination; Further data on controller acceptance at each side is required; There have been significant outages (for 36 hours and seven days), while other ICAO AFTN messages seemed to be unaffected; A number of failed TOC messages may indicate some controller training issues in Makassar.

4. OTHER CONSIDERATION

- 4.1 The Supplementary Letter of Agreement (SLOA) on transfer of ADS-C/CPDCL between Ujung Pandang ACC and Brisbane ACC has been revised and signed in May 2010 and carried on by signing the updated LOA between Makasar ACC and Brisbane ACC on AUSINDO/27 dated 26 October 2010 in Sydney.
- 4.2 The LOA agreed that the implementation of ADS-C/CPDLC between Ujung Pandang and Brisbane FIR and conduct the 50/50 NM longitudinal separation for south bound traffic only (from Ujung Pandang FIR to Brisbane FIR) .
- 4.3 Refreshment briefing and sosialisasi of the ADS-C/CPDLC conducted on beginning of December 2010 before the effective date on 16 December 2010, while training for the personnel has been done in 2007 for Trained of trainer in Brisbane, In house training in 2008 and the socialization within trial period in 2009.

5. CONCLUSION

- 5.1 The system performances since the AIP Supp was published is satisfaction and confidence with refer to the Uplink and downlink messages time delivery performance as well as the network availability is meet the designated standard time.
- 5.2 The Airservices (Australia) and AP1 (Indonesia) to extend the AIDC trial for a further six months and review progress at AUSINDO28.

6. ACTION BY THE MEETING

The meeting is invited to review and discuss the operational pocess of ADS-C/CPDLC within th Ujung Pandang FIR and take note of the information provided in this paper.

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