International Civil Aviation Organization

The 11th Meeting of the Future Air Navigation Systems Interoperability Team-Asia (FIT-Asia/11)

Video Teleconference, 23 – 27 August 2021

Agenda Item 4: Review of ADS/CPDLC Operations and Performance

DATA LINK PERFORMANCE REPORT FOR PHILIPPINES

(Presented by PHILIPPINES)

SUMMARY

This paper presents data link performance data for year 2020 for the Manila FIR, and information on actions taken to identify and rectify the causes of performance issues

1. INTRODUCTION

1.1 **Tables 1 to Table 4B** summarizes Automatic Dependent Surveillance – Contract (ADS-C) and Controller-Pilot Data Link Communications (CPDLC) performance where the Required Surveillance Performance (RSP) and Required Communications Performance (RCP) criteria stipulated in ICAO Doc 4444 – Procedures for Air Navigation Services – Air Traffic Management (PANS-ATM) were not met. Actions taken to address performance not meeting the criteria are discussed, together with the outcomes of such actions.

1.2 Philippines are using ADS-C/CPDLC for quite some time and it has become the primary means of communication in the category R airspace of Manila FIR. The distance-based lateral and longitudinal separations employed by Manila ACC are still monitored thru radar surveillance in most part of the Manila FIR but in the near future will be planning to introduce separations that will be supported by the use of ADS-C/CPDLC. Thus, continuous monitoring and extraction of data for performance analysis is being performed to evaluate if PBCS implementation could be considered.

2. DISCUSSION

Manila FIR ADS-C RSP180 Performance – Media Type, RGS and GES

2.1 **Table 1** summarizes overall ADS-C performance per media type, Remote Ground Station (RGS) and Ground Earth Station (GES) for downlinks sent within the Manila FIR during 2020, where performance did not meet the RSP180 performance criteria.

FIR	RPHI					
Criteria	RSP180					
Period	Jan-June 2020			July-December 2020		
Colour Key Meets Criteria 99.0%-99.84% Under Criteria	Message Counts	95% % < = 90sec	99.90% % <= 180sec	Message Counts	95% % < = 90sec	99.90% % <= 180sec
By Media Type						
SATCOM	106716	97.31%	99.65%	75496	97.81%	99.66%
VHF	158941	99.25%	99.74%	118475	99.40%	99.81%

HF		581	75.39%	91.79%	411	74.94%	88.44%
ALL		266238	98.97%	99.71%	194382	99.13%	99.76%
By Remote Ground Station (RGS) Ground Earth Station (GES)							
Designator	**Type**	(only RGS/GES with message counts >100 recorded)					
H16	HF	397	79.60%	93.11%	320	77.97%	91.09%
IG1	SAT	814	79.24%	94.47%	680	81.47%	96.08%
IGW1	SAT	4310	96.87%	98.85%	2186	98.44%	99.62%
CXR1	VHF	317	94.16%	94.74%	264	93.97%	95.07%
OKA1	VHF	1125	97.42%	99.45%	409	93.15%	99.97%
SYX	VHF	3661	97.65%	98.73%	3475	98.13%	98.86%
TTE1	VHF	423	97.35%	98.28%	359	99.83%	100.00%

Table 1: Philippine FIR ADS-C Downlink Latency per Media Type, RGS and GES

2.2 For ADS-C differentiated by media type only HF communication failed in the criteria while both the VHF and SATCOM in the 95% were able to meet the criteria compared to the 99.9% both were below criteria. On the other hand, in the RGS/GES three stations that did not meet on both the 95% and 99.9% criteria each for individual type of media while the rest it failed only in the 99.9% criteria

2.3 For HF medium it is expected to have lower performance than the other media and for the other station especially IG1 and CXR1 a possible weak transmission performance

2.4 To continue monitor these stations at the same time requesting for data with regards to the performance of these above stations to the communication service provider

2.5 Philippines have followed up to communication service provider

Manila FIR ADS-C RSP180 Performance – Aircraft Operator/Type

2.6 **Table 2** summarizes overall ADS-C performance per Aircraft Operator/Type for downlinks sent within the Manila FIR during 2020, where performance did not meet the RSP180 performance criteria.

FIR	**RPHI**					
Criteria	**RSP180**					
Period	**Jan-June 2020**			**July-December 2020**		
Colour Key Meets Criteria 99.0%-99.84% Under Criteria	**Message Counts**	**95%**	**99.90%**	**Message Counts**	**95%**	**99.90%**
		% <= 90sec	**% <= 180sec**		**% <= 90sec**	**% <= 180sec**
By Aircraft Operator / Type (only message counts >100 recorded)						
CCA/B77W	356	96.21%	98.83%			
CPA/B773	1981	96.01%	99.46%	274	93.89%	98.33%
CPA/B77W	5536	93.75%	98.59%	4441	93.94%	98.56%
CSN/A21N	824	94.90%	99.57%			
FDX/B77L	1298	98.07%	99.70%	1188	97.90%	98.91%
GIA/A333	5061	99.48%	99.66%	1813	97.99%	98.40%

GIA/B77W	1745	96.05%	98.50%	403	97.99%	98.79%
HKC/A332	187	97.37%	98.47%	1283	98.78%	99.47%
MAG/C560	130	92.31%	98.08%			
OMA/A333	984	99.61%	99.67%	263	96.61%	96.80%
PAL/A321	2254	92.52%	94.65%	535	92.64%	94.71%
PEA/K35R				157	96.32%	96.75%
RBA/A320	1064	98.06%	98.77%			
RBA/B788	173	98.30%	98.48%	122	99.24%	99.57%
RCH/K35R	271	97.72%	98.50%			
THA/A359				267	97.40%	97.54%
THA/B772	102	96.57%	98.84%			
THA/B773	272	91.91%	96.84%			

Table 2: Manila FIR ADS-C Downlink Latency per Aircraft Operator/Type

2.7 Under the ADS-C differentiated by aircraft operator/type data there were four that completely failed in the 95% and 99.9% criteria, whereas CPA/B77W and PAL/A321 was completely under criteria for the whole year monitoring.

2.8 Aside from possible weak transmission from our service provider which we are relying on our telco, operation in ATMC just started three years ago and there were issues in the software level that might also a factor on low performance in the ADS-C/CPDLC operation.

2.9 Philippines is on the verge of upgrading Topsky software from Thales and hopefully when all things are in place this might improve the performance of its ADS-C/CPDLC communication.

2.10 Thales and Philippines are still in the framework of negotiation

Manila FIR CPDLC RCP240 Performance – Media Type, RGS and GES

2.11 **Tables 3A and 3B** summarizes overall CPDLC performance per Media Type, RGS and GES for messages sent within the Manila FIR during 2020, where performance did not meet the RCP240 performance criteria.

FIR	**RPHI**					
Criteria	**RCP240**					
Period	**Jan - Jun 2020**					
Colour Key Meets Criteria 99.0%-99.84% Under Criteria	**Message Counts**	95% benchmark		99.9% Benchmark		95%
		ACP	**ACTP**	**ACP**	**ACTP**	**PORT**
		% < = 180sec	**% <= 120sec**	**% < = 210sec**	**% <= 150sec**	**%<60secs**
By Media Type						
SATCOM	2420	98.52%	100.00%	98.78%	100.00%	93.72%
VHF	2105	98.00%	99.53%	98.21%	99.58%	95.58%
HF	130	79.38%	74.19%	81.31%	85.21%	74.62%
ALL	4655	97.59%	98.91%	97.84%	99.24%	94.76%

By Remote Ground Station (RGS) Ground Earth Station (GES)							
Designator	**Type**	(RGS/GES with message counts >100)					
APK1	SAT	1291	98.50%	99.78%	98.76%	99.86%	95.74%
APK2	SAT	177	98.90%	100.00%	98.92%	100.00%	94.35%
DVO	VHF	167	95.38%	99.75%	96.61%	99.89%	94.67%
LAO	VHF	133	99.18%	98.88%	99.31%	98.89%	98.01%
XXA	SV	302	98.60%	100.00%	98.68%	100.00%	95.03%
XXP	SAT	161	97.47%	100.00%	97.78%	100.00%	92.55%

Table 3A: Manila FIR CPDLC Performance Latency per Media Type, RGS and GES – Jan-Jun 2020.

FIR	**RPHI**					
Criteria	**RCP240**					
Period	**Jul - Dec 2020**					
Colour Key Meets Criteria 99.0%-99.84% Under Criteria	**Message Counts**	95% benchmark		99.9% Benchmark		95%
		ACP	**ACTP**	**ACP**	**ACTP**	**PORT**
		% < =180sec	**% <= 120sec**	**% < = 210sec**	**% <= 150sec**	**%<60secs**
By Media Type						
SATCOM	4942	99.35%	99.97%	99.48%	100.00%	93.98%
VHF	3806	98.39%	98.76%	98.52%	98.85%	95.81%
HF	296	88.34%	84.46%	89.48%	89.54%	76.35%
ALL	9044	98.24%	98.58%	98.40%	98.82%	94.04%
By Remote Ground Station (RGS) Ground Earth Station (GES)						
Designator	**Type**	(RGS/GES with message counts >100)				
APK1	SAT	2422	98.22%	98.78%	98.41%	98.94%	95.33%
CRK	VHF	223	99.35%	98.65%	99.44%	98.97%	98.73%
H16	HV	184	89.45%	86.41%	90.18%	91.20%	77.04%
LAO	VHF	340	96.85%	95.06%	96.96%	95.21%	95.53%
MNL	VHF	285	98.55%	97.73%	98.64%	97.73%	97.89%
PPS	VHF	175	96.77%	99.88%	96.87%	100.00%	96.06%
SYX	VHF	172	95.52%	93.97%	95.65%	94.17%	92.25%
XXA	SAT	357	98.52%	99.91%	98.65%	100.00%	93.00%
XXQ	SV	391	98.80%	100.00%	98.87%	100.00%	96.53%

Table 3B: Manila FIR CPDLC Performance Latency per Media Type, RGS and GES – Jul-Dec 2020.

2.12 For CPDLC differentiated with media type, HF medium totally failed in all criteria as compared to other media which randomly failed in the ACP and PORT criteria. As for RGS/GES, designator H16 totally failed in all criteria and only six stations for Jan-Jun that has failed mark in some criteria and nine stations for the period Jul-Dec.

2.13 For HF medium it is expected to have lower performance than the other media and for the other stations a possible weak transmission performance

2.14 To continue monitor these stations at the same time requesting for data with regards to the performance of these above stations to the communication service provider

2.15 Philippines have followed up to communication service provider

MANILA FIR CPDLC RCP240 Performance – Aircraft Operator/Type

2.16 **Tables 4A and 4B** summarize overall CPDLC performance per Aircraft Operator/Type for messages sent within the Manila FIR during 2020, where performance did not meet the RCP240 performance criteria.

FIR	RPHI					
Criteria	RCP240					
Period	Jan - Jun 2020					
Colour Key: Meets Criteria / 99.0%-99.84% / Under Criteria	Message Counts	95% benchmark		99.9% Benchmark		95%
		ACP	ACTP	ACP	ACTP	PORT
		% < = 180sec	% <= 120sec	% < = 210sec	% <= 150sec	%<60secs
By Aircraft Operator / Type (only message counts >100 recorded)						
ANA/B789	106	98.09%	97.89%	98.27%	98.10%	97.25%
CAL/A359	127	89.81%	90.39%	90.28%	93.40%	87.95%
CCA/A333	144	98.78%	100.00%	98.85%	100.00%	98.61%
CPA/A359	139	98.40%	100.00%	98.86%	100.00%	93.09%
CPA/A35K	160	98.13%	100.00%	98.16%	100.00%	93.13%
CSN/B789	243	96.46%	96.02%	97.13%	97.82%	95.03%
PAL/A333	130	89.27%	99.34%	89.45%	99.47%	86.15%
SIA/A359	210	96.27%	95.91%	96.63%	97.59%	96.19%
SIA/B78X	112	96.26%	96.25%	96.59%	96.59%	94.25%

Table 4A: Manila FIR CPDLC Performance Latency per Aircraft Operator/Type – Jan-Jun 2020

FIR	RPHI					
Criteria	RCP240					
Period	Jul - Dec 2020					
Colour Key: Meets Criteria / 99.0%-99.84% / Under Criteria	Message Counts	95% benchmark		99.9% Benchmark		95%
		ACP	ACTP	ACP	ACTP	PORT
		% < = 180sec	% <= 120sec	% < = 210sec	% <= 150sec	%<60secs
By Aircraft Operator / Type (only message counts >100 recorded)						
ANA/B789	156	96.95%	97.08%	97.03%	97.24%	95.57%

CAL/A359	188	92.70%	91.09%	92.94%	91.91%	86.93%
CPA/B77W	406	98.03%	99.01%	98.25%	99.75%	91.13%
CSN/A333	362	97.64%	97.94%	98.04%	98.33%	92.54%
CSN/B789	652	95.42%	93.56%	96.12%	94.50%	93.40%
PAL/A333	108	93.52%	97.33%	94.62%	98.89%	88.79%
SIA/A359	242	97.61%	96.82%	97.72%	97.15%	95.08%
SIA/B78X	391	96.82%	95.18%	97.06%	95.54%	94.02%

Table 4B: Manila FIR CPDLC Performance Latency per Aircraft Operator/Type – July-Dec 2020

2.17 Under the ADS-C differentiated by aircraft operator/type data there is only one that completely failed in the 95% and 99.9% criteria for the whole year and everything failed in the 99.9% benchmark for the ACP criteria

2.18 Aside from possible weak transmission to/from our service provider which we are relying on our telco, operation in ATMC just started three years ago and there were issues in the software level that might also a factor to low performance in the ADS-C/CPDLC operation

2.19 Philippines is on the verge of upgrading Topsky software from Thales and hopefully when all things are in place this might improve the performance of its ADS-C/CPDLC communication

2.20 Thales and Philippines are still in the framework of negotiation

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.

……