



ICAO

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

DATA LINK PERFORMANCE REPORT FOR UJUNG PANDANG FIR

(Presented by Indonesia)

SUMMARY

This paper presents data link performance data for 1 January to 31 December 2021 for the Ujung Pandang FIR and information on actions taken to identify and rectify the causes of performance issues

1. INTRODUCTION

1.1 **Tables 1 to 6** summarize 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) do not meet the criteria stated in ICAO Doc 4444 – Procedures for Air Navigation Services – Air Traffic Management (PANS-ATM). Actions and their outcomes to mitigate these cases are also presented on this paper.

1.2 In addition, Indonesia also submits the survey of the status of current and planned implementation of performance-based horizontal separation minima in Ujung Pandang FIR.

2. DISCUSSION

Ujung Pandang 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 Ujung Pandang FIR during 2021, when performance did not meet the RSP180 performance criteria.

Criteria		RSP180						
Period		Jan-June 2021			July-Des 2021			
Colour Key ■ Meets Criteria ■ 99.0%-99.94% ■ Under Criteria	Message	95%	99,90%	Message	95%	99,90%		
	Counts	% <=90sec	<=180sec	Counts	% <=90sec	% <=180sec		
FIR	By Media Type							
WAAF	SATCOM	17047	98,60%	99,65%	21918	98,79%	99,76%	
	HF	100	76,50%	89,28%	86	50,00%	63,41%	
	VHF	49682	99,61%	99,81%	62027	99,66%	99,85%	
	ALL	66829	99,31%	99,75%	84031	99,38%	99,79%	
By Remote Ground Station (RGS) Ground Earth Station (GES)								
FIR	Designator	Type	(only RGS/GES with message counts >100 reacorded)					
	CGK	VHF	114	99,40%	100,00%	131	97,79%	98,00%
	IG1	VHF	657	93,30%	97,92%	632	93,20%	98,35%
	MDC1	VHF	441	90,39%	96,63%	1252	98,24%	99,20%

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

2.2 Concisely, ADS-C performance by SATCOM and VHF were able to meet the 95% criterion but failed for 99.9% criterion as shown in **Table 1** above. However, ADS-C performance by HF failed to meet the 95% and 99 % criterion. For ADS-C differentiated by RGS/GES, 2 stations had failed to meet 95% and 99.9% criteria (IG1 and MDC1).

2.3 The assessment for ADS-C performance by HF could not be statistically significant due to the low number of data points.

2.4 To recognize the causes of the issue, ANSP has monitored RGS/GES performance since 2020 until the latest 2021 period.

2.5 Based on the monitoring action, there was no improvement on the performances recorded. ANSP expect CSP identify the issues of poor performance of RGS/GES (IG1 and MDC1).

Ujung Pandang 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 Ujung Pandang FIR during 2021, when performance did not meet the RSP180 performance criteria.




FIR	WAAF					
Criteria	RSP180					
Period	Jan-June 2021			July-December 2021		
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 Aircraft Operator / Type (only message counts >100 recorded)					
AIC/B788	163	99,52%	100,00%	119	96,77%	97,41%
CPA/B77W	1590	95,72%	98,36%	1673	95,64%	98,71%
GIA/B77W	128	96,27%	97,88%	152	99,30%	100,00%
PAL/A21N	324	96,30%	98,96%	447	96,87%	98,96%
PEA/K35R	414	97,34%	98,37%			
THA/A359	100	100,00%	100,00%	177	97,32%	97,80%
THA/B77W	552	98,20%	98,70%	1190	98,78%	99,54%
XAX/A333	166	100,00%	100,00%	587	97,42%	98,21%

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

2.7 ADS-C performance by aircraft operator/type able to meet the 95% criteria but unable to meet the 99.9% criteria. Whereas, the ADS-C differentiated by aircraft operator/type, there are 8 aircraft operators/types that were unable to meet the 99.9% criteria in 2021 period.

2.8 The aircraft captured with low performance shows that there was a data link connection problem.

2.9 ANSP will check whether this appears to be a problem with this flight or is an ongoing problem. If this problem is not observed on later periods, the issue might have been addressed.

2.10 The ANSP will continue the monitoring to determine the problem, if it is still occurred the ANSP will take action to notify the aircraft operator.

Ujung Pandang FIR CPDLC RCP240 Performance – Media Type, RGS and GES

2.11 **Table 3A** and **3B** summarize overall CPDLC performance per Media Type, RGS and GES for messages sent within the Ujung Pandang FIR during 2021, when performance did not meet the RCP240 performance criteria.

FIR		RCP240					
Criteria		RCP240					
Period		Jan - Jun 2021					
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		
By Media Type							
SATCOM	3.677	98,88%	99,87%	99,16%	99,89%	95,43%	
SV	403	98,14%	100,00%	98,63%	100,00%	95,91%	
VHF	7.201	98,80%	99,76%	98,82%	99,80%	96,82%	
ALL	11281	98,78%	99,76%	98,99%	99,80%	96,33%	
By Remote Ground Station (RGS) Ground Earth Station (GES)							
Designator	Type	(RGS/GES with message counts >100)					
APK2	VHF	304	97,50%	100,00%	97,65%	100,00%	93,09%
DPS	VHF	218	97,96%	99,08%	98,06%	99,35%	97,76%
IG1	VHF	183	98,09%	100,00%	98,58%	100,00%	85,25%
MDC1	VHF	105	98,11%	100,00%	98,18%	100,00%	92,38%
XXA	SV	366	98,27%	100,00%	98,56%	100,00%	96,04%
XXP	SAT	569	98,79%	99,88%	98,81%	99,90%	97,25%

Table 3A: Ujung Pandang FIR CPDLC Performance Latency per Media Type, RGS and GES – January - June 2021

FIR							
Criteria							
Period		Jul - Dec 2021					
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		
By Media Type							
SATCOM	4668	99,29%	99,94%	99,40%	99,94%	96,94%	
SV	426	98,75%	100%	98,82%	100%	97,12%	
VHF	8747	99,30%	99,80%	99,44%	99,85%	97,63%	
ALL	13841	99,27%	99,85%	99,40%	99,88%	97,38%	
By Remote Ground Station (RGS) Ground Earth Station (GES)							
Designator	Type						
IG1	VHF	153	95,93%	100,00%	97,87%	100,00%	89,80%
SUB	VHF	247	97,86%	97,65%	98,06%	98,15%	96,49%
XXA	SV	378	98,79%	100,00%	98,84%	100,00%	97,55%

Table 3B: Ujung Pandang FIR CPDLC Performance Latency per Media Type, RGS and GES – July - December 2021

2.12 The Actual Communications Performance (ACP) measurement for CPDLC messages sent within Ujung Pandang FIR for the period from 1 January 2021 to 31 December 2021 are categorized by data link media type, RGS GES, and Aircraft Operator/Type. The ACP for messages sent via Satellite and VHF meet the 95% criteria but marginally fall below the 99.9% criteria. As for

CPDLC differentiated by RGS and GES, 7 stations had failed to meet 99.9% criteria as follows APK2, DPS, IG1, MDC1, XXA, XXP (from period of January to June 2021) and IG1, SUB and XXA (from period of July to December 2021).

2.13 The CPDLC differentiations from both of RGS/GES stations were caused by the delay related to specific VHF station, it happened when the delayed CPDLC messages are observed via a specific VHF ground station.

2.14 Indonesia has identified the differentiations based on the observation during the period of 2021, the result showed the ACP which did not meet the criteria is caused by the low percentages from pilot operational response time (PORT).

2.15 According to the result, ANSP expecting CSP to identify the issues of RGS/GES delay.

Ujung Pandang 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 Ujung Pandang FIR during 2021, where performance did not meet the RCP240 performance criteria.

FIR	WAAF					
Criteria	RCP240					
Period	Jan - Jun 2021					
Colour Key ■ Meets Criteria ■ 99.0%-99.84% ■ Under Criteria	Message Counts	95% benchmark		99.9% Benchmark		95%
		ACP % <= 180sec	ACTP % <= 120sec	ACP % <= 210sec	ACTP % <= 150sec	PORT % <60secs
By Aircraft Operator / Type (only message counts >100 recorded)						
CAL/A333	722	98,33%	100,00%	98,44%	100,00%	96,54%
CAL/A359	338	98,82%	100,00%	98,83%	100,00%	97,34%
CCA/A333	388	96,66%	100,00%	97,21%	100,00%	90,98%
CES/A332	307	97,59%	99,74%	97,90%	99,88%	92,83%
CES/B789	495	98,99%	99,81%	99,48%	99,85%	92,53%
CHH/A333	250	98,47%	100,00%	98,81%	100,00%	96,00%
CPA/A35K	1073	97,06%	99,83%	97,26%	99,85%	95,06%
CPA/B77W	309	96,60%	99,10%	98,10%	99,27%	88,35%
CRK/A333	409	97,96%	100,00%	98,54%	100,00%	96,60%
CSN/A333	403	98,40%	99,66%	98,80%	99,86%	93,80%
CSN/A359	317	97,09%	99,81%	97,56%	99,95%	91,80%
CSN/A388	131	97,00%	99,26%	97,21%	99,40%	94,05%
CSN/B789	584	98,00%	98,14%	98,16%	98,44%	97,43%
FDX/B77L	309	98,25%	99,60%	98,63%	100,00%	89,97%
MAS/A333	484	98,04%	100,00%	98,37%	100,00%	96,99%
SIA/A359	1155	97,27%	97,88%	97,42%	98,32%	96,13%

Table 4A: Ujung Pandang FIR CPDLC Performance Latency per Aircraft Operator/Type – Jan-Jun 2021

FIR		WAAF				
Criteria		RCP 240				
Period		Jul - Dec 2021				
Colour Key Meets Criteria 99.0%-99.84% Under Criteria	Message Counts	95% benchmark		99.9% Benchmark		95%
		ACP % <=180sec	ACTP % <= 120sec	ACP % <= 210sec	ACTP % <= 150sec	PORT %<60secs
By Aircraft Operator / Type (only message counts >100 recorded)						
CCA/A332	120	95,86%	100,00%	95,94%	100,00%	93,40%
CES/B789	151	98,57%	100,00%	98,78%	100,00%	93,87%
CPA/B77W	318	97,52%	99,48%	98,52%	99,72%	91,01%
CRK/A333	604	98,28%	99,84%	98,76%	99,84%	96,94%
CSN/A333	630	98,75%	99,47%	98,93%	99,69%	96,03%
FDX/B77L	265	98,93%	100,00%	99,30%	100,00%	92,68%
SIA/A359	1183	97,98%	98,41%	98,26%	98,85%	97,00%

Table 4B: Ujung Pandang FIR CPDLC Performance Latency per Aircraft Operator/Type – July - December 2021

2.17 The Actual Communications Performance (ACP) measurement for CPDLC messages sent within Ujung Pandang FIR for the period from 1 January 2021 to 31 December 2021 are categorized by aircraft operator/type, there are 16 pairs of aircraft operator/type which failed 99.9% criteria for the period from January 2021 to June 2021 and 7 pairs of aircraft operator/type which failed 99.9% criteria for the period July to December 2021.

2.18 The CPDLC differentiations from both of Aircraft Operator/Type were caused by the delay related to specific VHF station, it happened when the delayed CPDLC messages are observed via a specific VHF ground station. Therefore, the ACP which did not meet the criteria also caused by the low percentages from pilot operational response time (PORT).

2.19 Based on the performance monitoring, we analyzed that the delayed CPDLC transactions are caused by high large pilot operational response time (PORT).

2.20 ANSP will notify the airline operators, therefore they are expected to review procedures to reduce the pilot operational response time (PORT).

Additional Information

2.21 **Attachment A** shows the survey of the status of current and planned implementation of performance-based horizontal separation minima in Ujung Pandang FIR. It represents the actual condition in 2021

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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ATTACHMENT A

SURVEY OF THE STATUS OF CURRENT AND PLANNED IMPLEMENTATION OF PERFORMANCE-BASED HORIZONTAL SEPARATION MINIMA

				Y/N	If NO, Planned Date
1. Has your State completed any of the following preparations for PBCS implementation?					
PBCS Implementation Task List	Task Group	Task ID	TASK descriptor		
	Group A	A-1	AIP (Prescription of an RCP/RSP specification. Also see B-3 below)	Y	
		A-2	PBCS policies, objectives supporting safety oversight of ANSP PBCS operations	Y	
		A-3	PBCS policies, objectives supporting safety oversight of Aircraft Operator and Aircraft System PBCS operations	Y	
		A-4	Proposal for Amendment to ICAO Doc 7030 - <i>Regional Supplementary Procedures</i> for PBCS operations, if applicable	Y	
	Group B	B-1	PBCS Implementation Plan	Y	
		B-2	Target dates for PBCS and relevant ATM operations	Y	
		B-3	RCP/RSP specifications	Y	
		B-4	PBCS awareness	Y	
	Group C	C-1	Operational concepts and procedures for PBCS operations	Y	
		C-2	ATM automation system changes to use flight plan RCP/RSP indicators	Y	
		C-3	ATM automation changes for PBCS monitoring	Y	
		C-4	Confirm initial ANSP compliance with RCP/RSP specifications	Y	
	Group D	D-1	Aircraft operator readiness	Y	
		D-2	Confirm initial operator and/or aircraft type/system compliance with RCP/RSP	Y	
	Group E	E-1	PBCS monitoring, analysis and reporting - post implementation	Y	
					Y/N
1. Does your State submit data link problem reports to a recognized Central Reporting Agency (CRA)				Y	

3. Does your state monitor and analyse data link performance in accordance with the following specifications and report the analysis to a recognized FANS Interoperability Team (FIT)?					
Communication Specifications & Interoperability Standards	Normal	RCP240	FANS1/A CPDLC	Y	
	Alternate	RCP400	SATVOICE	N	
		RCP400	HF	Y	
Surveillance Specifications & Interoperability Standards	Normal	RSP180	FANS1/A ADS-C	Y	
	Alternate	RSP400	SATVOICE	N	
		RSP400	HF	Y	
4. Has your State implemented or planned to implement the following performance-based horizontal separation minima?					
Navigation Specifications & Applicable ATM Operations	RNAV/RNP	RNAV/RNP 10	50 NM Lateral Separation	Y	
			50 NM Longitudinal Separation	Y	
		RNP 4	30 NM Longitudinal Separation	Y	
			30 NM Lateral Separation	Y	
			23 NM Lateral Separation	Y	
		RNP2	30NM Climb-Descend Through	Y	