



International Civil Aviation Organization
ICAO Thirteenth Meeting of the FANS Interoperability Team – Asia
(FIT-Asia/13)

Bangkok, Thailand, 06 – 09 June 2023

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

DATA LINK PERFORMANCE REPORT FOR INDIA

(Presented by India)

SUMMARY

This paper presents the Data Link performance data for 2022 for the Chennai and Kolkata FIRs and information on actions taken to identify and rectify the causes of performance issues.

1. INTRODUCTION

1.1. **Tables 1A to 6A** 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) 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.

2. DISCUSSION

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

2.1 **Table 1A & 1B** summarizes overall ADS-C performance per media type, Remote Ground Station (RGS) and Ground Earth Station (GES) for downlinks sent within VOMF & VECF FIRs during 2022, where performance did not meet the RSP 180 performance criteria.

FIR	VOMF						
Criteria	RSP180						
Period	JANUARY 2022 - JUNE 2022			JULY 2022 - DECEMBER 2022			
	Message Counts	95%	99.90%	Message Counts	95%	99.90%	
		% <= 90sec	% <= 180sec		% <= 90sec	% <= 180sec	
By Media Type			By Media Type				
SATCOM	64350	98.00%	99.15%	SATCOM	95639	97.80%	99.07%
VHF	118163	98.73%	99.45%	VHF	145595	98.72%	99.42%

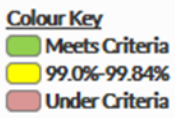
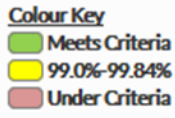
FIR		VOMF							
Criteria		RSP180							
Period		JANUARY 2022 - JUNE 2022			JULY 2022 - DECEMBER 2022				
	Message Counts	95%	99.90%	Message Counts		95%	99.90%		
		% <= 90sec	% <= 180sec			% <= 90sec	% <= 180sec		
	HF	86	30.23%	59.42%	HF	388	25.26%	40.98%	
	ALL	182599	98.44%	99.32%	ALL	241622	98.24%	99.19%	
By Remote Ground Station (RGS) Ground Earth Station (GES)				By Remote Ground Station (RGS) Ground Earth Station (GES)					
Designator	Type	(only RGS/GES with message counts >100 recorded)		Designator	Type	(only RGS/GES with message counts >100 recorded)			
EUA1	SAT	1951	97.10%	98.90%	EUA1	SAT	2582	96.67%	98.80%
IG1	SAT	650	59.38%	76.15%	IG1	SAT	1075	58.79%	75.35%
IGW1	SAT	3595	94.91%	98.54%	IGW1	SAT	7591	94.10%	97.58%
XXF	SAT	660	93.56%	97.69%	XXF	SAT	589	89.13%	95.88%
APK2	VHF	9092	97.10%	98.59%	BOM	VHF	787	95.85%	98.44%
BOM1	VHF	845	95.03%	98.64%					
BTJ1	VHF	2069	98.80%	98.99%					
					HYD1	VHF	455	95.45%	96.39%
KDT	VHF	194	82.47%	85.24%	KDT	VHF	188	69.78%	73.77%
					NAG1	VHF	138	87.75%	90.06%
					PNQ1	VHF	310	96.94%	97.32%
XXI	VHF	265	95.09%	98.63%	XXI	VHF	293	93.66%	96.72%
XXP	VHF	3005	96.14%	97.59%	XXP	VHF	2078	95.07%	97.37%

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

FIR		VECF						
Criteria		RSP180						
Period		JANUARY 2022 - JUNE 2022			JULY 2022 - DECEMBER 2022			
	Message Counts	95%	99.90%	Message Counts		95%	99.90%	
		% <= 90sec	% <= 180sec			% <= 90sec	% <= 180sec	
By Media Type				By Media Type				
	SATCOM	101401	98.33%	99.50%	SATCOM	104340	98.21%	99.33%
	VHF	247608	99.24%	99.68%	VHF	259913	99.24%	99.65%
	HF	170	47.06%	68.29%	HF	230	51.09%	67.50%
	ALL	349179	98.95%	99.61%	ALL	364483	98.92%	99.54%

FIR		VECF							
Criteria		RSP180							
Period		JANUARY 2022 - JUNE 2022			JULY 2022 - DECEMBER 2022				
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 Remote Ground Station (RGS) Ground Earth Station (GES)				By Remote Ground Station (RGS) Ground Earth Station (GES)					
Designator	Type	(only RGS/GES with message counts >100 recorded)			Designator	Type	(only RGS/GES with message counts >100 recorded)		
					AOR1	VHF	259	98.55%	98.71%
					APK1	SAT	79687	98.92%	99.62%
					APK2	VHF	16290	97.91%	98.94%
					EUA1	SAT	9927	97.71%	99.33%
IG1	SAT	1135	92.42%	97.85%	IG1	SAT	1755	91.51%	97.21%
IGW1	SAT	6415	95.46%	98.43%	IGW1	SAT	4195	88.72%	94.34%
					IXZ1	VHF	767	98.10%	98.31%
					MDL	VHF	1104	98.01%	98.71%
NYT	VHF	728	94.07%	95.63%	NYT	VHF	639	94.37%	95.44%
RGN	VHF	1096	97.24%	97.68%	RGN	VHF	887	96.53%	96.81%
RGN1	VHF	1730	96.36%	97.20%	RGN1	VHF	1045	96.24%	97.26%
SZF7	VHF	166	98.63%	98.96%					
TAS	VHF	143	97.90%	97.96%					

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

2.2 In both Chennai and Kolkata FIRs, SATCOM and VHF performance met the 95% criteria and marginally satisfied the 99.9% criteria. The performance of HF data link did not meet both the 95% and 99.9% criteria. However, the overall ADS Performance in both Chennai and Kolkata met the 95% criteria and marginally satisfied the 99.9% criteria.

VOMF and VECF FIR ADS-C RSP180 Performance – Aircraft Operator/Type

2.3 **Table 2A & 2B** summarizes overall ADS-C performance per Aircraft Operator/Type for downlinks sent within VOMF & VECF FIRs during 2022, where performance did not meet the RSP180 performance criteria.

FIR	VOMF						
Criteria	RSP180						
Period	Jan-June 2021			Period	July-December 2021		
<div style="border: 1px solid black; padding: 2px;"> Colour Key Meets Criteria 99.0%-99.84% Under Criteria </div>	Message Counts	95%	99.90%	Message Counts	95%	99.90%	
		% <= 90sec	% <= 180sec		% <= 90sec	% <= 180sec	
By Aircraft Operator / Type (only message counts >100 recorded)							
				ABD/B744	366	96.60%	98.19%
ABD/B744	267	88.30%	95.48%				
				ABW/B748	360	97.00%	98.13%
ABW/B748	394	95.84%	97.46%				
AIC/B788	1643	99.13%	99.62%				
AZG/B744	137	90.66%	97.76%				
AZG/B748	380	100.00%	100.00%	AZG/B744	152	94.89%	96.42%
CES/A333	535	93.18%	95.08%				
CLX/B744	297	97.66%	98.01%	CLX/B744	620	97.20%	98.26%
CPA/A333	291	96.08%	98.00%				
CPA/B744	1755	92.71%	96.32%	CPA/A333	1417	95.27%	97.29%
CPA/B77W	136	92.43%	100.00%	CPA/B744	1708	93.68%	96.53%
				CPA/B77W	132	92.55%	96.42%
				EXV/A320	354	93.71%	98.85%
				GEC/B77L	288	97.83%	100.00%
GIA/B77W	109	98.28%	98.91%				
				GIA/B77W	320	97.19%	98.30%
				ICV/B748	456	98.30%	98.52%
				KAC/A20N	157	88.68%	99.83%
MAS/A333	4271	97.92%	99.21%				
				MAS/A359	687	98.39%	99.34%
MMD/F2TH	104	93.23%	96.91%				
QTR/B77L	1355	98.16%	99.04%	OMA/A332	131	97.82%	98.04%
QTR/B77W	10831	96.80%	98.65%	OMA/A333	226	100.00%	100.00%
QTR/B789	205	100.00%	100.00%				
				QQE/GLF6	131	97.64%	98.68%
				QTR/A332	898	100.00%	100.00%
				QTR/B77L	2228	95.50%	98.40%
				QTR/B77W	5059	95.08%	97.93%
				SIA/B744	2597	95.34%	96.87%
SVA/B77W	510	96.23%	98.69%	SVA/B77W	699	98.86%	99.93%
SVA/B789	250	97.66%	97.97%	SVA/B789	506	98.62%	99.69%

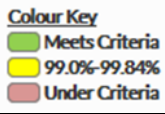
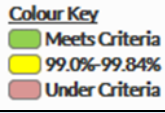
FIR	VOMF						
Criteria	RSP180						
Period	Jan-June 2021			Period	July-December 2021		
	Message Counts	95%	99.90%	Message Counts	95%	99.90%	
		% <= 90sec	% <= 180sec		% <= 90sec	% <= 180sec	
By Aircraft Operator / Type (only message counts >100 recorded)							
TGW/B788	106	99.77%	100.00%				
THY/A333	1141	96.03%	97.55%				
THY/B77L	266	95.18%	97.82%				
				THY/A333	1229	97.03%	98.43%
				THY/B77L	204	93.46%	96.03%
				VTI/A20N	432	95.37%	98.61%
VTI/A20N	387	91.47%	95.43%				

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

FIR	VECF						
Criteria	RSP180						
Period	JANUARY 2022 - JUNE 2022			JULY 2022 - DECEMBER 2022			
	Message Counts	95%	99.90%	Message Counts	95%	99.90%	
		% <= 90sec	% <= 180sec		% <= 90sec	% <= 180sec	
By Aircraft Operator / Type (only message counts >100 recorded)				By Aircraft Operator / Type (only message counts >100 recorded)			
				ABW/B748	780	96.79%	97.85%
				AFR/B77L	109	96.42%	98.28%
AIC/A20N	168	90.03%	91.69%	AIC/A20N	134	85.57%	89.09%
AZG/B744	1013	97.93%	98.82%				
				ATG/B744	231	96.06%	97.74%
				AZG/B744	554	96.57%	98.53%
CLX/B744	2636	97.14%	97.95%				
				CLX/B744	2176	95.36%	97.17%
CPA/B744	1099	93.84%	97.31%	CPA/B77W	1677	94.99%	97.60%
CPA/B77W	204	94.97%	99.14%				
				DHX/B763	540	97.75%	98.53%
HIM/A320	640	97.07%	98.50%	HIM/A320	1240	92.90%	95.76%
ICV/B748	128	98.46%	98.53%	ICV/B744	514	96.64%	98.16%
				IRM/A346	174	89.22%	92.89%
				KAL/A332	360	98.29%	98.65%
KZU/A333	452	97.35%	98.73%				







FIR		VECF					
Criteria		RSP180					
Period		JANUARY 2022 - JUNE 2022			JULY 2022 - DECEMBER 2022		
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)				By Aircraft Operator / Type (only message counts >100 recorded)			
LGT/B744	106	94.09%	95.75%				
				MAS/B738	4943	95.12%	97.72%
				MSR/A332	1477	98.27%	98.74%
N95/GLF6	144	98.63%	98.72%				
				PIA/B772	548	98.40%	98.89%
				PIA/B77L	204	97.32%	98.09%
				QQE/GLF6	207	97.68%	98.74%
SAZ/CL60	100	95.27%	95.95%				
SIA/B38M	3066	96.31%	98.10%	SIA/B38M	1172	93.84%	95.67%
TAX/A333	1582	97.65%	98.07%				
				TVR/B744	459	96.98%	98.71%
UPS/B763	167	96.44%	98.50%				
				UZB/A21N	392	92.93%	96.95%
				VJT/GLEX	248	97.33%	98.39%
				VSV/B38M	112	93.39%	95.92%
VTI/A20N	2736	95.14%	97.33%	VTI/A20N	2249	94.78%	97.67%
VTI/A320	174	96.08%	98.12%				
XAX/A333	324	98.46%	98.67%	XAX/A333	613	97.44%	98.03%

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

VOMF and VECF FIR CPDLC RCP240 Performance – Media Type, RGS and GES

2.4 **Tables 3A to 3D** summarizes overall CPDLC performance per Media Type, RGS and GES for messages sent within the VOMF FIR and VECF FIR during 2022, where performance did not meet the RCP240 performance criteria.

FIR		VOMF				
Criteria		RCP240				
Period		JANUARY 2022 - JUNE 2022				
Colour Key  Meets Criteria  99.0%-99.84%  Under Criteria	Message Counts	95% benchmark		99.9% Benchmark		
		ACP % <= 180sec	ACTP % <= 120sec	ACP % <= 210sec	ACTP % <= 150sec	
By Media Type						
SAT	SAT	18664	99.75%	99.79%	99.87%	99.85%

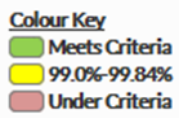
FIR		VOMF				
Criteria		RCP240				
Period		JANUARY 2022 - JUNE 2022				
		Message Counts	95% benchmark		99.9% Benchmark	
			ACP % <= 180sec	ACTP % <= 120sec	ACP % <= 210sec	ACTP % <= 150sec
By Media Type						
VHF	VHF	47573	99.86%	99.91%	99.91%	99.96%
HF	HF	63	94.05%	93.22%	96.98%	97.96%
All	All	66300	99.82%	99.87%	99.89%	99.92%

Table 3A: VOMF FIR CPDLC Performance Latency per Media Type, RGS and GES.

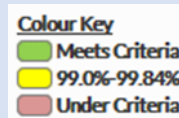

FIR		VOMF				
Criteria		RCP240				
Period		JULY 2022 - DECEMBER 2022				
		Message Counts	95% benchmark		99.9% Benchmark	
			ACP % <= 180sec	ACTP % <= 120sec	ACP % <= 210sec	ACTP % <= 150sec
By Media Type						
SAT	SAT	31211	99.83%	99.80%	99.91%	99.85%
VHF	VHF	64672	99.82%	99.93%	99.87%	99.95%
HF	HF	6	86.94%	80.86%	89.64%	85.28%
All	All	95889	99.82%	99.88%	99.88%	99.92%
By Remote Ground Station (RGS) Ground Earth Station (GES)						
Designator	Type	(RGS/GES with message counts >100)				

Table 3B: VOMF FIR CPDLC Performance Latency per Media Type, RGS and GES.

FIR		VECF				
Criteria		RCP240				
Period		JANUARY 2022 - JUNE 2022				
		Message Counts	95% benchmark		99.9% Benchmark	
			ACP % <= 180sec	ACTP % <= 120sec	ACP % <= 210sec	ACTP % <= 150sec
By Media Type						
SAT	SAT	7996	98.67%	99.06%	98.92%	99.39%
VHF	VHF	12327	99.49%	99.71%	99.62%	99.81%
All	All	20325	99.15%	99.44%	99.35%	99.64%

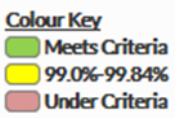
FIR		VECF				
Criteria		RCP240				
Period		JANUARY 2022 - JUNE 2022				
	Message Counts	95% benchmark		99.9% Benchmark		
		ACP % <= 180sec	ACTP % <= 120sec	ACP % <= 210sec	ACTP % <= 150sec	
By Remote Ground Station (RGS) Ground Earth Station (GES)						
Designator	Type	(RGS/GES with message counts >100)				
IG1	SAT	56	90.91%	96.84%	95.00%	98.21%
IGW1	SAT	560	94.41%	95.36%	95.13%	96.90%
UP	VHF	2	100.00%	0.00%	100.00%	100.00%

Table 3C: VECF FIR CPDLC Performance Latency per Media Type, RGS and GES.

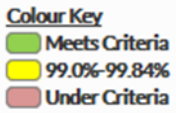
FIR		VECF				
Criteria		RCP240				
Period		JULY 2022 - DECEMBER 2022				
	Message Counts	95% benchmark		99.9% Benchmark		
		ACP % <= 180sec	ACTP % <= 120sec	ACP % <= 210sec	ACTP % <= 150sec	
By Media Type						
SAT	SAT	11914	98.58%	98.98%	99.04%	99.28%
VHF	VHF	15709	99.49%	99.74%	99.63%	99.83%
HF	HF	6	44.17%	38.16%	49.03%	52.04%
All	All	27629	99.08%	99.40%	99.36%	99.58%
By Remote Ground Station (RGS) Ground Earth Station (GES)						
Designator	Type	(RGS/GES with message counts >100)				
IGW1	SAT	573	86.56%	88.83%	90.46%	92.41%

Table 3D: VECF FIR CPDLC Performance Latency per Media Type, RGS and GES.

2.5 The overall CPDLC performance per Media Type, RGS and GES for messages sent within the VOMF FIR during 2022, met the RCP240 performance criteria. However, in few cases it was between 99.85% - 99.87%.

2.6 The overall CPDLC performance per Media Type, RGS and GES for messages sent within the VECF FIR during 2022, met the 95% benchmark of RCP240 performance criteria. However, for the 99% benchmark it was between 99.35% - 99.64%.

VOMF and VECF FIR CPDLC RCP240 Performance – Aircraft Operator/Type

2.7 **Tables 4A and 4B** summarize overall CPDLC performance per Aircraft Operator/Type for messages sent within the VOMF FIR during 2022, where performance did not meet the RCP240 performance criteria.

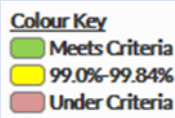
FIR	VOMF					
Criteria	RCP240					
Period	JANUARY 2022 - JUNE 2022					
	Message Counts	95% benchmark		99.9% Benchmark		95%
		ACP % <= 180sec	ACTP % <= 120sec	ACP % <= 210sec	ACTP % <= 150sec	PORT %<60secs
By Aircraft Operator / Type (only message counts >100 recorded)						
AFR/A359	194	100.00%	100.00%	100.00%	100.00%	94.44%
AIC/A20N	102	97.93%	99.43%	98.21%	99.81%	96.20%
XAX/A333	151	97.22%	97.50%	98.90%	98.05%	99.05%

Table 4A: VOMF FIR CPDLC Performance Latency per Aircraft Operator/Type

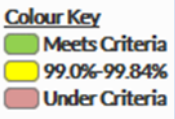
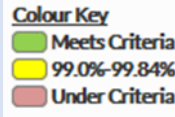
FIR	VOMF					
Criteria	RCP240					
Period	JULY 2022 - DECEMBER 2022					
	Message Counts	95% benchmark		99.9% Benchmark		95%
		ACP % <= 180sec	ACTP % <= 120sec	ACP % <= 210sec	ACTP % <= 150sec	PORT %<60secs
By Aircraft Operator / Type (only message counts >100 recorded)						
KAC/A20N	103	97.68%	100.00%	97.91%	100.00%	95.98%
SVA/A333	164	98.81%	100.00%	98.92%	100.00%	92.53%
TGW/A21N	796	97.73%	98.95%	98.51%	99.39%	95.18%

Table 4B: VOMF FIR CPDLC Performance Latency per Aircraft Operator/Type

2.8 Tables 5A and 5B summarizes overall CPDLC performance per Aircraft Operator/Type for messages sent within the VECF FIR during 2022.

FIR	VECF					
Criteria	RCP240					
Period	JANUARY 2022 - JUNE 2022					
	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)						
CLX/B744	290	96.48%	97.49%	97.51%	98.14%	95.29%
FDX/B77L	152	91.27%	94.01%	93.33%	94.61%	89.10%
MAS/B738	434	97.43%	97.49%	98.05%	97.73%	98.16%




FIR		VECF				
Criteria		RCP240				
Period		JANUARY 2022 - JUNE 2022				
Colour Key   	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)						
QTR/B77W	551	94.96%	96.27%	96.19%	97.64%	94.37%
SIA/B38M	120	95.68%	97.50%	96.53%	98.74%	96.75%
SIA/B78X	254	98.08%	98.09%	98.14%	98.24%	97.18%
SVA/B77W	296	97.34%	98.38%	97.73%	98.78%	96.00%
TAX/A333	121	98.39%	100.00%	98.50%	100.00%	92.25%
THY/A333	285	95.82%	95.57%	96.47%	96.37%	93.10%
VTI/A20N	287	91.79%	96.20%	94.49%	97.05%	90.07%
VTI/A21N	201	99.00%	100.00%	99.79%	100.00%	95.52%

Table 5A: VECF FIR CPDLC Performance Latency per Aircraft Operator/Type




FIR		VECF				
Criteria		RCP240				
Period		JULY 2022 - DECEMBER 2022				
Colour Key   	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)						
CLX/B744	383	96.46%	97.16%	98.18%	97.45%	97.71%
HIM/A320	212	84.91%	86.32%	87.63%	90.84%	80.19%
MAS/B738	465	94.73%	94.12%	96.77%	96.72%	96.13%
QTR/A333	174	98.68%	98.89%	98.87%	99.02%	98.28%
QTR/B77L	970	98.61%	98.83%	98.97%	99.34%	98.20%
QTR/B77W	1144	96.88%	97.80%	97.66%	98.02%	96.85%
QTR/B788	561	98.88%	99.30%	99.33%	99.36%	98.10%
QTR/B789	101	97.92%	98.21%	98.25%	98.41%	98.56%
THY/A333	411	97.91%	98.56%	98.45%	99.00%	97.08%
VTI/A20N	310	92.70%	96.09%	95.59%	97.99%	88.39%
VTI/A21N	435	96.36%	99.58%	97.30%	99.63%	94.25%

Table 5B: VECF FIR CPDLC Performance Latency per Aircraft Operator/Type

2.9 The issues related to ADS & CPDLC performance not meeting the criteria in some of the cases are being taken up with SITA to identify the causes and rectify the same.

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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