



ICAO

*International Civil Aviation Organization*

**Tenth Meeting of the FANS Interoperability Team – Asia  
(FIT-Asia/11)**

Video Teleconference, 23 – 27 August 2021

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

**DATA LINK PERFORMANCE REPORT FOR SINGAPORE FIR**

(Presented by Singapore)

**SUMMARY**

This paper presents data link performance data for Singapore FIR for 2020.

**1. INTRODUCTION**

1.1 This paper presents the data link performance for Singapore (WSJC) FIR from January to December 2020. This performance report is based on the Performance-Based Communications and Surveillance (PBCS) performance monitoring analysis reporting format.

1.2 The overall performance observed in 2020 against both RCP240 and RSP180 specifications is acceptable. Problem reports were raised against the small number of aircraft that did not meet the specifications while RGS/GES availability was mainly affected by time taken for aircraft avionics to transit between different media.

**2. DISCUSSION**

2.1 PBCS has been implemented within WSJC FIR with effect from 29 March 2018. Using the monitoring report format sent out by ICAO on March 2019, Singapore has submitted the data link post-implementation performance report for 2020 (listed in **Appendix A**) to ICAO APAC office on 31<sup>st</sup> March 2021.

2.2 In summary, CPDLC performance by SATCOM and VHF were able to meet the 95% criterion but failed for 99.9% criterion as shown in **Table 1** below. Although the assessment for CPDLC performance by HF was not statistically significant due to the low number of data points, Singapore had reminded the airline operators to use SATCOM and VHF in WSJC FIR.

Period	Jan - Jun 2020					Jul - Dec 2020				
Colour Key Meets Criteria 99.0%-99.84% Under Criteria	Message Counts	95%		99.9%		Message Counts	95%		99.9%	
		ACP	ACTP	ACP	ACTP		ACP	ACTP	ACP	ACTP
		% <= 180s	% <= 120s	% <= 210s	% <= 150s		% <= 180s	% <= 120s	% <= 210s	% <= 150s
By Media Type										
SATCOM	5,105	98.10%	97.79%	98.92%	98.51%	913	98.29%	98.34%	98.93%	98.74%
VHF	13,824	99.30%	99.31%	99.46%	99.51%	13,528	99.02%	99.15%	99.27%	99.36%
HF										
SV	136	100.00%	99.66%	100.00%	99.88%	246	98.43%	99.23%	98.64%	99.59%
VH	2	100.00%	100.00%	100.00%	100.00%					
VS	25	99.33%	98.80%	100.00%	100.00%	48	97.96%	96.38%	98.20%	97.87%
HV	20	68.59%	78.51%	76.47%	86.25%	23	78.93%	80.68%	81.44%	84.92%
HS	1	100.00%	100.00%	100.00%	100.00%					
ALL	19,113	98.94%	98.87%	99.29%	99.22%	14,758	98.93%	99.05%	99.20%	99.29%

Table 1: CPDLC performance by media type

2.3 In 2020, there is no RGS/GES failing the 95% criterion for CPDLC. Table 2 below summarize the aircraft operator/type which failed the 95% criterion for CPDLC.

Period	Jan - Jun 2020					Jul - Dec 2020						
Colour Key Meets Criteria 99.0%-99.84% Under Criteria	Msg Counts	95%		99.9%		95%	Msg Counts	95%		99.9%		95%
		ACP	ACTP	ACP	ACTP	PORT		ACP	ACTP	ACP	ACTP	PORT
		% <= 180s	% <= 120s	% <= 210s	% <= 150s	% <= 60s		% <= 180s	% <= 120s	% <= 210s	% <= 150s	% <= 150s
By Aircraft Operator / Type												
SLK/B738	216	94.07%	92.22%	95.50%	94.24%	94.91%						

Table 2: CPDLC performance by aircraft operator/type




2.4 As for the CPDLC differentiated by aircraft operator/type, there is 1 aircraft operator/type which failed the 95% and 99.9% criteria. Singapore has followed up with the aircraft operator through respective EMAs and filed problems with Boeing CRA.

2.5 As shown in Table 3 below, ADS-C performance by SATCOM was able to meet the 95% criterion but failed marginally for 99.9% criterion. Although the assessment for ADS-C performance by HF was not statistically significant due to the low number of data points, Singapore had notified the operators to use SATCOM and VHF in WSJC FIR.

Period	Jan - Jun 2020			Jul - Dec 2020		
Colour Key Meets Criteria 99.0%-99.84% Under Criteria	Message Counts	95%	99.9%	Message Counts	95%	99.9%
		ACP	ACP		ACP	ACP
		% <= 180s	% <= 210s		% <= 180s	% <= 210s
By Media Type						
SATCOM	71,612	96.52%	99.30%	8,225	96.27%	99.20%
VHF	228,076	99.64%	99.90%	158,030	99.39%	99.85%
HF	81	53.86%	76.96%	65	68.75%	89.08%
ALL	299,769	98.88%	99.75%	166,320	99.22%	99.82%

Table 3: ADS-C performance by media type

2.6 **Table 4** below summarize the RGS/GES and aircraft operator/type which failed the 95% criterion for ADS-C.

Period	Jan - Jun 2020			Jul - Dec 2020		
<b>Colour Key</b>  Meets Criteria  99.0%-99.84%  Under Criteria	Message Counts	95%	99.9%	Message Counts	95%	99.9%
		ACP % <= 180s	ACP % <= 210s		ACP % <= 180s	ACP % <= 210s
By Remote Ground Station (RGS) Ground Earth Station (GES)						
IG1	367	80.38%	97.57%	158	88.86%	100.00%
IGW1	7,230	94.91%	98.97%	1,850	96.02%	99.42%
By Aircraft Operator / Type						
N97/GLF5	118	92.65%	93.99%			
RMY/B762				136	72.52%	77.73%
UPS/B744	289	93.70%	96.54%			

**Table 4:** ADS-C by RGS/GES and aircraft operator/type

2.7 For ADS-C differentiated by RGS/GES, 2 stations had failed to meet 95% and 99.9% criteria. Singapore have filed problem reports with the CRA.

2.8 As for the ADS-C differentiated by aircraft operator/type, there are 3 aircraft operator/type which failed the 95% and 99.9% criteria. Singapore have followed up with the aircraft operators through respective EMAs and also filed problem reports with the CRA.




2.9 As recommended in FIT-Asia/9, Singapore also conducted monthly data analysis since June 2019. The analysis was done on data from current month and previous two months (rolling three-month data set). Problem reports were reported to CRA and non-compliance cases for aircraft were reported to respective aircraft operators through EMAs. Some of the more significant problems are listed in the table below:

S/N	Problem Description	Analysis / Findings
1	Aircraft from operator X failing RSP180 95% criterion for ADS-C downlink since Jun 2020.	Problem reported in 2020 of aircraft not meeting required datalink performance. Notified operator X to look into the low performance with recommended solutions and filed problem report with CRA. Operator X changed the VHF unit in the aircraft from “centered” to “left”. The performance has improved and complied with RSP180 in the rolling 3-month data since Oct 2020. Singapore to continue monitor its performance with Operator X.
2	Low data link performance of IG1 and IGW1	Submitted problem report to CRA, after CSPs informed Singapore that they will follow up through CRA. CRA updated that the low performance was due to time taken by the avionics to attempt but fail to deliver the messages via VHF when the aircraft was on the edge of VHF coverage, then changed to deliver the messages via SATCOM. CRA also identified the affected areas and aircraft operator/type pairs which were responsible for majority of the failed message exchanges. Suggested solutions were provided, with avionics implementation of Routing Airborne Timer 1 (RAT1) being advised as the most effective to resolve this performance issue. The recommended solution for the problem reported in 2020 is similar to 2019 recommendation.

### 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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FIR		WSJC					
Criteria		RSP180					
Period		January-June 2020			July-December 2020		
<b>Colour Key</b>  Meets Criteria  99.0%-99.84%  Under Criteria	Message Counts	95% % <= 90sec	99.90% % <= 180sec	Message Counts	95% % <= 90sec	99.90% % <= 180sec	
	<b>By Media Type</b>						
	SATCOM	71,612	96.52%	99.30%	8,225	96.27%	99.20%
VHF	228,076	99.64%	99.90%	158,030	99.39%	99.85%	
HF	81	53.86%	76.96%	65	68.75%	89.08%	
ALL	299,769	98.88%	99.75%	166,320	99.22%	99.82%	
<b>By Remote Ground Station (RGS) Ground Earth Station (GES)</b>							
Designator	Type	(only RGS/GES with message counts >100 recorded)					
APK1	SAT	35,966	96.75%	99.41%	14,308	97.51%	99.71%
APK2	SAT	13,401	96.89%	99.24%	5,072	97.79%	98.97%
BKI	VHF	4,689	99.60%	99.92%	1,465	99.93%	99.96%
BKI1	VHF	4,169	99.91%	99.98%	864	99.96%	100.00%
BTH1	VHF	5,229	99.26%	99.71%	1,437	94.29%	98.12%
BTU	VHF	2,469	99.65%	99.92%	865	99.76%	100.00%
BTU1	VHF	9,725	99.82%	99.91%	3,964	99.65%	99.74%
BWN	VHF	502	99.73%	100.00%	107	100.00%	100.00%
BWN1	VHF	7,915	99.81%	99.96%	1,338	100.00%	100.00%
CGK2	VHF				108	100.00%	100.00%
CXR	VHF	1,785	99.10%	99.86%	764	99.48%	100.00%
CXR1	VHF	4,150	99.10%	99.86%	833	99.78%	100.00%
CXRV	VHF	152	99.08%	99.67%			
DLI1	VHF	801	98.88%	100.00%	152	97.37%	99.48%
HDY	VHF	198	99.18%	100.00%	196	99.76%	100.00%
IG1	SAT	367	80.38%	97.57%	158	88.86%	100.00%
IGW1	SAT	7,230	94.91%	98.97%	1,850	96.02%	99.42%
JHB	VHF	115	100.00%	100.00%			
KBR	VHF	174	99.55%	100.00%			
KBR1	VHF	3,593	99.79%	99.91%	2,244	99.78%	99.95%
KCH	VHF	941	98.35%	99.04%	936	99.18%	99.88%
KCH1	VHF	6,690	99.33%	99.81%	2,818	99.46%	99.73%
KUA	VHF	598	99.44%	100.00%	378	98.77%	100.00%
KUA1	VHF	9,904	99.62%	99.91%	5,886	99.49%	99.85%
KUL	VHF	128	100.00%	100.00%	236	100.00%	100.00%
KUL1	VHF	723	99.22%	100.00%	323	99.46%	99.69%
KUL2	VHF	309	99.84%	100.00%	165	100.00%	100.00%
KULA	VHF	442	99.81%	99.92%	278	99.95%	100.00%
LBU	VHF	4,958	99.97%	100.00%	1,262	99.88%	100.00%
MYY	VHF	5,085	99.29%	99.85%	1,466	99.90%	100.00%
MYY1	VHF	6,654	99.96%	100.00%	860	100.00%	100.00%
NAW	VHF	636	99.27%	99.45%	563	99.49%	99.99%
PEN	VHF	165	100.00%	100.00%			
PLM1	VHF	396	98.79%	99.73%	167	100.00%	100.00%
PPS	VHF	1,892	99.63%	99.97%	1,323	99.91%	99.96%
PQC	VHF	266	97.85%	99.33%	445	99.78%	100.00%

SBW	VHF	1,084	99.91%	99.93%	386	100.00%	100.00%
SBW1	VHF	105	100.00%	100.00%			
SDK	VHF	459	100.00%	100.00%	187	100.00%	100.00%
SDK1	VHF	887	100.00%	100.00%	257	100.00%	100.00%
SGN	VHF	1,445	99.82%	99.95%	1,391	99.55%	99.90%
SGN1	VHF	1,171	99.92%	99.99%	308	100.00%	100.00%
SGN7	VHF	1,612	100.00%	100.00%	1,293	99.99%	100.00%
SGNV	VHF	189	99.77%	100.00%	152	100.00%	100.00%
SIN	VHF	40,329	99.81%	99.94%	37,930	99.86%	99.98%
SIN1	VHF	672	99.86%	99.92%	777	99.96%	100.00%
SIN2	VHF	13,322	99.64%	99.85%	9,271	99.77%	99.88%
SIN7	VHF	1,722	99.96%	100.00%	1,431	100.00%	100.00%
SIN8	VHF	35,164	99.93%	99.98%	24,268	99.97%	99.99%
SIN9	VHF	7,952	99.89%	99.98%	6,987	99.84%	99.95%
SINA	VHF	2,079	99.84%	99.91%	1,917	99.99%	100.00%
SINV	VHF	5,467	99.85%	99.97%	2,381	99.89%	99.93%
SZB	VHF	174	98.98%	100.00%	152	100.00%	100.00%
SZB1	VHF				124	99.43%	100.00%
TGG	VHF	1,398	97.93%	99.14%	807	98.46%	99.23%
TGG1	VHF	321	100.00%	100.00%	280	99.53%	100.00%
USM	VHF	954	99.45%	99.91%	289	100.00%	100.00%
VCA1	VHF	3,067	99.62%	99.88%	1,566	99.53%	99.88%
VCS	VHF	14,948	99.37%	99.91%	8,603	99.06%	99.83%
VCSV	VHF	2,211	99.28%	99.91%	1,115	98.92%	99.73%
XSP	VHF	4,292	99.79%	99.96%	2,679	99.97%	100.00%
XXA	SAT	8,240	96.54%	99.40%	1,524	96.56%	99.30%
XXP	SAT	6,339	96.23%	99.02%	3,182	95.96%	98.94%
XXQ	SAT	402	98.09%	100.00%	3,361	96.81%	99.38%

FIR	WSJC					
Criteria	RSP180					
Period	January-June 2020			July-December 2020		
Colour Key <span style="color: green;">■</span> Meets Criteria <span style="color: yellow;">■</span> 99.0%-99.84% <span style="color: red;">■</span> Under Criteria	Message Counts	95% % <= 90sec	99.90% % <= 180sec	Message Counts	95% % <= 90sec	99.90% % <= 180sec
<b>By Aircraft Operator / Type (only message counts &gt;100 recorded)</b>						
AAR/A333	301	99.67%	100.00%	586	98.41%	100.00%
AAR/A359	1,684	99.57%	100.00%	114	100.00%	100.00%
AAR/B744	2,270	96.34%	99.21%	1,970	98.46%	99.95%
AAR/B772				169	96.06%	99.19%
ABW/B748	182	99.30%	100.00%			
ACA/A333	142	100.00%	100.00%			
ACA/B77W	112	98.45%	98.90%			
AHK/A333				899	99.99%	100.00%
AIC/A20N	162	100.00%	100.00%			
AIC/B77L	131	99.42%	100.00%			
AIC/B788	360	100.00%	100.00%			
AJX/B789	3,373	99.38%	99.86%	2,712	99.76%	100.00%
AJX/B78X	147	99.64%	100.00%			
ANA/B763	2,042	98.48%	99.10%	3,813	99.08%	99.49%
ANA/B77W	2,582	98.14%	99.37%			
ANA/B788	163	98.14%	98.80%			
ANA/B789	8,332	99.23%	99.83%	1,950	99.64%	99.94%
B82/GLF4	105	100.00%	100.00%	150	100.00%	100.00%
B90/GLF5	108	99.18%	99.78%			
BOX/B77L	100	100.00%	100.00%			
CAL/A333	8,614	99.61%	99.82%	8,114	99.40%	99.61%
CAL/A359	269	99.47%	99.97%	679	99.74%	99.86%
CAL/B744	5,981	98.68%	99.90%	5,358	99.53%	99.96%
CAL/B77W	1,881	98.43%	99.97%	2,282	98.58%	100.00%
CCA/A332	153	100.00%	100.00%			
CCA/A333	410	99.08%	99.86%	1,094	99.33%	100.00%
CCA/A359	1,787	99.63%	100.00%	2,292	99.97%	100.00%
CCA/B789	1,513	99.47%	99.99%	1,121	98.44%	99.99%
CEB/A333				182	99.61%	99.99%
CES/A332	1,210	99.47%	99.69%	719	99.73%	99.81%
CES/A333	744	99.05%	100.00%	1,014	99.74%	99.96%
CES/A359	100	100.00%	100.00%			
CES/B789	769	99.74%	99.89%	338	99.91%	100.00%
CFG/B763	104	99.51%	100.00%			
CKK/B744	1,444	99.79%	100.00%	707	99.32%	99.80%
CKK/B77L	257	99.81%	100.00%	734	99.16%	100.00%
CKS/B77L	348	97.00%	98.88%	689	97.90%	98.96%
CLX/B744	232	98.73%	99.64%			
CLX/B748	426	100.00%	100.00%	1,245	99.42%	100.00%
CNV/B737	161	99.51%	99.97%	389	100.00%	100.00%
CPA/A333	4,259	99.64%	99.87%	1,641	99.87%	99.99%
CPA/A359	2,029	99.76%	99.99%	998	99.63%	99.92%

CPA/A35K	236	100.00%	100.00%	240	99.69%	100.00%
CPA/B744	1,252	99.26%	99.90%	1,329	99.49%	99.76%
CPA/B773	614	99.37%	100.00%			
CPA/B77W	1,824	97.42%	98.91%			
CRK/A333				909	99.50%	100.00%
CSC/A332				195	98.89%	100.00%
CSH/B789				107	99.37%	100.00%
CSN/A21N	256	99.42%	99.93%			
CSN/A332	153	100.00%	100.00%			
CSN/A333	274	100.00%	100.00%			
CSN/B789				814	98.82%	99.88%
CSS/B744	207	99.12%	99.87%			
CSZ/A333	877	98.81%	99.82%	1,492	99.11%	100.00%
CXA/N789				387	98.63%	100.00%
DAL/B763	124	100.00%	100.00%			
DLH/A388	138	98.14%	100.00%			
DKH/B789	337	99.16%	100.00%	161	100.00%	100.00%
EAU/GLEX	574	99.55%	100.00%	385	99.41%	100.00%
ETD/B77L	160	98.60%	100.00%			
ETD/B789				154	99.70%	100.00%
EVA/A332	628	99.41%	99.77%			
EVA/A333	919	99.20%	99.83%	307	99.73%	99.96%
EVA/B77L	2,411	99.07%	99.95%	2,055	98.68%	100.00%
EVA/B77W	5,405	98.85%	99.95%	6,257	99.25%	99.97%
EVA/B78X	404	99.80%	100.00%	107	99.34%	100.00%
FDX/B763	1,875	98.17%	99.40%	970	98.30%	99.87%
FDX/B77L	3,074	97.76%	99.75%	2,771	98.23%	99.54%
FDX/MD11	1,273	97.95%	99.04%	764	98.85%	99.53%
GIA/A333	177	99.35%	100.00%	246	99.05%	100.00%
GIA/B77W				159	99.58%	100.00%
HDA/A333	1,165	99.90%	100.00%	332	99.24%	99.95%
HKC/A332	2,920	99.34%	99.87%	3,398	99.35%	99.72%
HVN/A359	2,329	99.84%	100.00%	162	100.00%	100.00%
HVN/B789	5,162	98.68%	99.79%	747	99.39%	99.85%
HVN/B78X				124	100.00%	100.00%
ICV/B748				115	100.00%	100.00%
JAI/A333						
JAL/B763						
JAL/B772	7,136	98.46%	99.77%	1,812	99.67%	100.00%
JAL/B77W				1,525	99.37%	99.97%
JAL/B788				169	100.00%	100.00%
JAL/B789	1,487	99.94%	99.98%	1,753	99.52%	100.00%
JST/B788	2,455	98.82%	99.77%			
KAL/A333	1,353	98.15%	99.70%	2,476	98.61%	99.70%
KAL/B744	2,864	98.57%	99.74%	3,571	98.61%	99.53%
KAL/B748	1,876	98.08%	98.97%			
KAL/B772	284	98.20%	99.65%			
KAL/B773	1,258	98.97%	99.90%			
KAL/B77L	922	98.48%	99.29%	575	99.51%	100.00%
KAL/B77W	1,373	97.67%	99.45%	2,772	97.43%	99.20%

KLM/B772	104	98.49%	99.55%			
KLM/B77W	828	99.90%	100.00%	112	100.00%	100.00%
KLM/B789				258	100.00%	100.00%
LNI/A333	341	100.00%	100.00%			
LNI/A339	698	100.00%	100.00%			
MAS/A332	4,552	99.56%	98.91%	3,191	99.88%	100.00%
MAS/A333	4,427	99.52%	99.85%	3,611	99.84%	99.97%
MAS/A359	1,737	99.78%	99.94%			
MAS/A388	114	99.70%	100.00%			
MAS/B738	25,365	99.12%	99.78%	10,006	99.25%	99.79%
N89/GLEX	158	100.00%	100.00%			
N97/GLF5	118	92.65%	93.99%			
NCA/B748	1,189	99.39%	99.65%	1,572	99.51%	99.85%
PAC/B748	296	98.93%	99.45%	384	98.47%	99.45%
PAL/A21N	318	99.74%	99.89%	182	100.00%	100.00%
PAL/A321	2,594	98.19%	99.14%	873	98.93%	99.75%
PAL/A333	993	98.29%	99.76%	646	98.95%	100.00%
PAL/A359	151	100.00%	100.00%	171	99.95%	100.00%
PAL/B77W	1,258	98.76%	99.97%			
PEA/K35R	148	99.46%	100.00%			
QFA/A333	2,216	99.04%	99.79%			
QFA/A388	171	100.00%	100.00%			
QFA/B748	231	99.27%	99.66%			
QQE/GLF6				103	100.00%	100.00%
QTR/A359	252	100.00%	100.00%	649	100.00%	100.00%
QTR/A35K	529	99.87%	99.96%	276	100.00%	100.00%
QTR/B77L	1,161	99.21%	99.83%	1,358	99.15%	99.94%
QTR/B77W	774	99.27%	100.00%	296	100.00%	100.00%
QTR/B788	303	99.70%	99.83%	360	100.00%	100.00%
RBA/A20N	7,862	98.60%	99.80%	870	99.76%	100.00%
RBA/A320	1,894	98.21%	99.60%			
RBA/A339	1,138	99.95%	100.00%			
RBA/B788	3,850	99.30%	99.72%	1,065	99.58%	99.88%
RCH/C17	407	98.89%	99.67%			
RCH/C5M	154	100.00%	100.00%			
RCH/K35R	123	100.00%	100.00%			
RMY/B762				136	72.52%	77.73%
SDM/B77W	396	100.00%	100.00%			
SHE/FA8X				105	100.00%	100.00%
SIA/A320	671	99.11%	99.43%			
SIA/A333	1,901	99.76%	99.94%			
SIA/A359	22,644	99.59%	99.86%	13,328	99.90%	99.99%
SIA/A388	3,097	99.72%	100.00%			
SIA/B738				219	99.58%	99.90%
SIA/B744	4,371	99.80%	99.90%	4,864	99.76%	99.96%
SIA/B772	324	98.87%	100.00%			
SIA/B773	5,265	98.94%	99.83%			
SIA/B77W	13,340	97.02%	99.26%	3,008	98.70%	99.62%
SIA/B78X	22,528	98.47%	99.92%	17,361	98.94%	99.96%
SLK/A320	2,231	99.34%	99.58%			

SLK/B738	4,196	98.76%	99.54%	678	99.41%	100.00%
T7T/F2TH	115	96.76%	97.89%	115	98.34%	100.00%
T7T/GL5T				119	100.00%	100.00%
T7V/GLEX				115	100.00%	100.00%
TAX/A339	883	97.34%	99.72%			
TGW/B788	4,169	98.83%	99.95%	242	98.93%	100.00%
TGW/B789	6,222	99.44%	99.93%	5,247	99.71%	99.92%
THA/A359	1,615	99.31%	100.00%	141	100.00%	100.00%
THA/B744	2,407	97.26%	99.40%			
THA/B772	1,332	98.72%	99.87%			
THA/B77W	109	97.38%	98.10%			
THA/B789	1,766	97.87%	99.83%			
THY/B77W	227	99.00%	99.84%			
THY/B789	500	99.40%	100.00%	259	100.00%	100.00%
TRE/C17	110	99.33%	100.00%			
UAE/A388	248	99.38%	100.00%			
UAE/B77L	239	97.70%	99.39%			
UAE/B77W	1,415	98.83%	100.00%	1,789	97.92%	99.45%
UAL/B788				177	100.00%	100.00%
UAL/B789	4,248	99.21%	99.93%	1,523	99.39%	99.92%
UPS/B744	289	93.70%	96.54%	207	98.55%	99.41%
UPS/B752	172	98.26%	100.00%			
UPS/B763	4,242	98.56%	99.61%	3,802	99.00%	99.78%
V8M/B762	165	100.00%	100.00%			
VJT/GLEX	584	97.77%	99.40%	222	99.46%	100.00%
VPC/GLEX	125	99.21%	99.80%			
VPC/GLF6	150	98.30%	99.94%			
XAX/A333	3,108	99.54%	99.98%			

FIR		WSJC									
Criteria		RCP240									
Period		Jan - Jun 2020					Jul - Dec 2020				
<b>Colour Key</b> <span style="color: green;">■</span> Meets Criteria <span style="color: yellow;">■</span> 99.0%-99.84% <span style="color: red;">■</span> Under Criteria	Message Counts	95% benchmark		99.9% Benchmark		Message Counts	95% benchmark		99.9% Benchmark		
		ACP	ACTP	ACP	ACTP		ACP	ACTP	ACP	ACTP	
		% <= 180sec	% <= 120sec	% <= 210sec	% <= 150sec		% <= 180sec	% <= 120sec	% <= 210sec	% <= 150sec	
<b>By Media Type</b>											
SATCOM	5,105	98.10%	97.79%	98.92%	98.51%	913	98.29%	98.34%	98.93%	98.74%	
VHF	13,824	99.30%	99.31%	99.46%	99.51%	13,528	99.02%	99.15%	99.27%	99.36%	
HF											
SV	136	100.00%	99.66%	100.00%	99.88%	246	98.43%	99.23%	98.64%	99.59%	
VH	2	100.00%	100.00%	100.00%	100.00%						
VS	25	99.33%	98.80%	100.00%	100.00%	48	97.96%	96.38%	98.20%	97.87%	
HV	20	68.59%	78.51%	76.47%	86.25%	23	78.93%	80.68%	81.44%	84.92%	
HS	1	100.00%	100.00%	100.00%	100.00%						
ALL	19,113	98.94%	98.87%	99.29%	99.22%	14,758	98.93%	99.05%	99.20%	99.29%	
<b>By Remote Ground Station (RGS) Ground Earth Station (GES)</b>											
Designator	Type	(RGS/GES with message counts >100)									
APK1	SAT	4,257	98.61%	97.86%	99.20%	98.64%	3,170	99.20%	99.41%	99.43%	99.63%
APK2	SAT	1,356	98.18%	97.52%	99.15%	98.62%	1,113	98.40%	98.32%	98.88%	98.89%
BKI	VHF	657	99.58%	99.42%	99.63%	99.46%	721	99.41%	99.81%	99.54%	99.86%
BKI1	VHF	375	99.76%	99.80%	99.91%	99.87%	314	99.20%	99.77%	99.57%	100.00%
BTH1	VHF	725	99.25%	99.64%	99.47%	99.75%	238	97.42%	98.11%	97.53%	98.19%
BTU	VHF	254	99.62%	99.61%	99.62%	99.61%	177	100.00%	100.00%	100.00%	100.00%
BTU1	VHF	2,097	99.83%	100.00%	99.91%	100.00%	1,737	99.35%	99.49%	99.50%	99.52%
BWN1	VHF	629	99.58%	99.83%	99.70%	99.86%	495	100.00%	99.80%	100.00%	100.00%
IGW1	SAT	832	97.48%	97.24%	97.81%	98.20%	330	95.33%	96.36%	96.86%	97.50%
KCH	VHF	216	98.51%	98.69%	98.67%	98.75%	262	99.47%	100.00%	99.56%	100.00%
KCH1	VHF	2,093	99.74%	99.92%	99.80%	99.96%	1,273	99.15%	99.08%	99.26%	99.23%
KUA1	VHF	120	100.00%	99.95%	100.00%	100.00%	120	100.00%	99.87%	100.00%	100.00%
LBU	VHF	394	99.42%	99.70%	99.51%	99.75%	426	100.00%	100.00%	100.00%	100.00%
MYY	VHF	569	99.52%	99.56%	99.56%	99.69%	557	100.00%	99.84%	100.00%	100.00%
MYY1	VHF	254	100.00%	99.75%	100.00%	100.00%	164	100.00%	100.00%	100.00%	100.00%
PPS	VHF	154	98.26%	98.16%	98.37%	98.27%	148	99.90%	100.00%	100.00%	100.00%
SBW	VHF	197	100.00%	100.00%	100.00%	100.00%	113	100.00%	100.00%	100.00%	100.00%
SIN	VHF	717	98.43%	98.55%	98.64%	98.65%	458	98.23%	98.57%	98.50%	98.71%
SIN2	VHF	327	99.59%	99.88%	99.72%	100.00%	440	96.23%	95.32%	97.42%	96.10%
SIN8	VHF	287	98.59%	98.43%	99.10%	98.80%	246	99.50%	98.45%	99.77%	99.62%
VCS	VHF	770	99.87%	99.81%	99.90%	99.86%	657	99.65%	99.85%	99.79%	99.85%
VCSV	VHF	102	100.00%	100.00%	100.00%	100.00%					
XSP	VHF										
XXA	SAT	728	98.99%	98.35%	99.59%	99.19%	216	100.00%	100.00%	100.00%	100.00%
XXP	SAT	520	97.50%	96.96%	98.69%	97.46%	503	97.88%	98.19%	98.45%	98.56%
XXQ	SAT						366	98.19%	98.57%	98.96%	99.21%

FIR	WSJC													
Criteria	RCP240													
Period	Jan - Jun 2020							Jul - Dec 2020						
<b>Colour Key</b> <span style="color: green;">■</span> Meets Criteria <span style="color: yellow;">■</span> 99.0%-99.84% <span style="color: red;">■</span> Under Criteria	Message Counts	95% benchmark		99.9% Benchmark		95%	Message Counts	95% benchmark		99.9% Benchmark		95%		
		ACP	ACTP	ACP	ACTP	PORT		ACP	ACTP	ACP	ACTP	PORT		
		% <= 180sec	% <= 120sec	% <= 210sec	% <= 150sec	% <= 60secs		% <= 180sec	% <= 120sec	% <= 210sec	% <= 150sec	% <= 60secs		
<b>By Aircraft Operator / Type (only message counts &gt;100 recorded)</b>														
AAR/B744	123	99.64%	100.00%	99.96%	100.00%	97.56%	186	98.51%	99.55%	98.73%	99.82%	94.44%		
AJX/B789	320	99.11%	99.00%	99.14%	99.15%	99.04%								
ANA/B763	146	100.00%	99.88%	100.00%	100.00%	95.21%	463	98.17%	99.86%	98.47%	100.00%	91.51%		
ANA/B77W	202	98.05%	97.94%	98.07%	98.03%	98.02%								
ANA/B789	733	98.80%	98.71%	99.59%	98.99%	99.05%	346	100.00%	100.00%	100.00%	100.00%	99.04%		
CAL/A333	416	99.58%	99.63%	99.72%	99.82%	96.64%	677	98.55%	98.55%	99.08%	99.08%	97.93%		
CAL/B744	309	99.27%	99.71%	99.47%	100.00%	97.25%	506	99.12%	99.12%	99.44%	99.44%	96.44%		
CAL/B77W	144	99.22%	99.82%	99.97%	100.00%	98.73%	282	100.00%	100.00%	100.00%	100.00%	99.41%		
CES/A333							139	100.00%	100.00%	100.00%	100.00%	98.13%		
CPA/A333	235	100.00%	100.00%	100.00%	100.00%	96.17%								
CPA/A359							124	100.00%	100.00%	100.00%	100.00%	99.52%		
EVA/B77W	176	99.26%	99.05%	100.00%	99.20%	100.00%	234	100.00%	100.00%	100.00%	100.00%	100.00%		
FDX/B77L	134	97.76%	96.83%	98.40%	97.83%	94.63%	239	98.52%	98.11%	99.01%	98.45%	96.23%		
HVN/A359	143	100.00%	100.00%	100.00%	100.00%	98.92%								
HVN/B789	409	98.94%	98.14%	99.76%	98.66%	98.78%								
JAL/B772	697	99.76%	98.71%	100.00%	99.56%	99.35%								
JAL/B789	183	100.00%	100.00%	100.00%	100.00%	99.48%	309	99.52%	99.64%	99.70%	99.76%	99.15%		
JST/B788	201	98.90%	98.33%	99.15%	98.88%	98.51%								
KAL/A333							148	99.76%	100.00%	100.00%	100.00%	98.42%		
KAL/B748							201	95.79%	97.14%	96.38%	97.30%	90.05%		
KAL/B77W							223	100.00%	99.65%	100.00%	100.00%	100.00%		
MAS/A332	363	99.73%	99.54%	99.73%	99.59%	98.28%	420	99.62%	100.00%	99.74%	100.00%	98.57%		
MAS/A333	168	99.66%	100.00%	99.84%	100.00%	98.71%	533	99.82%	100.00%	99.84%	100.00%	98.03%		
MAS/B738	3,679	99.10%	99.31%	99.30%	99.46%	98.45%	2,627	98.73%	98.87%	99.18%	99.15%	98.40%		
NCA/B748							128	99.43%	99.61%	99.52%	99.80%	99.25%		
PAL/A321	293	100.00%	100.00%	100.00%	100.00%	96.52%	174	98.94%	97.70%	99.11%	98.51%	98.28%		
PAL/A333							101	100.00%	100.00%	100.00%	100.00%	99.13%		
PAL/B77W	122	100.00%	99.59%	100.00%	100.00%	98.36%								
QFA/A333	131	98.35%	99.72%	100.00%	100.00%	97.71%								
QTR/B77L							102	99.36%	99.11%	99.54%	99.29%	100.00%		
RBA/A20N	739	99.68%	99.46%	99.87%	99.84%	97.56%	196	98.11%	99.13%	99.05%	99.92%	95.24%		
RBA/A320	177	100.00%	100.00%	100.00%	100.00%	98.50%								
RBA/B788	349	97.82%	97.65%	99.31%	98.31%	99.25%	180	100.00%	99.17%	100.00%	99.85%	99.55%		
SIA/A359	1,721	98.75%	98.81%	99.25%	99.07%	97.91%	1,158	99.49%	99.55%	99.53%	99.64%	98.45%		
SIA/A388	160	100.00%	100.00%	100.00%	100.00%	99.51%								
SIA/B773	442	99.38%	98.36%	99.78%	99.34%	99.59%								
SIA/B77W	578	98.83%	96.89%	99.16%	98.47%	98.70%	111	97.56%	96.96%	99.20%	97.27%	99.10%		
SIA/B78X	1,550	99.16%	98.89%	99.58%	99.38%	98.74%	1,418	99.67%	99.53%	99.76%	99.66%	99.33%		
SLK/A320	115	99.92%	100.00%	100.00%	100.00%	97.39%								
SLK/B738	216	94.07%	92.22%	95.50%	94.24%	94.91%								
TGW/B788	137	99.62%	98.39%	100.00%	99.50%	98.85%								
TGW/B789	115	99.49%	99.28%	100.00%	99.47%	96.89%	151	99.71%	99.39%	100.00%	99.66%	100.00%		
THA/A359	231	99.17%	97.84%	99.21%	99.23%	98.83%								
THA/B744	304	98.80%	98.89%	98.93%	99.12%	96.55%								
THA/B772	133	98.85%	100.00%	99.25%	100.00%	98.55%								
THA/B789	169	100.00%	97.63%	100.00%	98.87%	99.47%								
UAE/B77W							231	98.86%	98.62%	99.67%	99.51%	99.14%		
UAL/B789	339	99.90%	100.00%	100.00%	100.00%	98.71%	195	100.00%	99.81%	100.00%	99.99%	99.33%		