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Analysis Report of ADS-C/CPDLC Operations and Performance

DATA LINK PERFORMANCE REPORT FOR CHINA

(Presented by China)

SUMMARY

This report presents data link performance data for the Urumqi and Lanzhou FIR for the period of Jan. 2019 to Dec. 2019.

1. INTRODUCTION

1.1 Data-link communications and data-link performance requirements have been applied for CPDLC and ADS-C for a long period of time, during which relevant specifications and standards were also published in Doc 9869 and Doc 10037. States are invited to ensure that the appropriate data link performance monitoring is undertaken and reported to CRAs/FITs, as required, in a timely manner.

1.2 According to ICAO's requirement, PBCS was formally implemented in China on 29 March 2018. In the China mainland airspace, the datalink service, CPDLC/ADS-C, is applied to the following routes: L888 (SANLI-XKC), Y1 and Y2, operated by Lanzhou and Urumqi Air Control Center (ACC). The relevant ATS units among the routes also support FANS 1/A CPDLC/ADS-C applications under the framework of RCP 240 and RSP 180 specifications.

1.3 This report provides observed performance of the operational data link systems for the above-mentioned data link routes, collected from Lanzhou and Urumqi FIR for the period from Jan. 2019 to Dec. 2019.

		ADS-C		CPDLC	
Performance Measure	Percentage of Messages Required to Meet Criteria	**RSP180 Criteria(sec)**	RSP400 Criteria(sec)	**RCP240 Criteria(sec)**	RCP400 Criteria(sec)
ASP	95%	**90**	300		
	99.90%	**180**	400		
ACTP	95%			**120**	260
	99.90%			**150**	310
ACP	95%			**180**	320
	99.90%			**210**	370
	95%			60	60

1.4 The CPDLC and ADS-C systems performance data are measured against the Required Communication Performance (RCP) 240 specification and Required Surveillance Performance (RSP) 180 (please refer to the table above and the criteria highlighted in red).

2. DISCUSSION

2.1 **Attachment A** presents the data link performance monitoring result in Lanzhou and Urumqi FIR.

2.2 The analysis in Attachment A provided the discussion:

- ADS-C performance for Lanzhou and Urumqi FIR
- CPDLC performance for Lanzhou and Urumqi FIR
- ADS-C performance analyzed by media type for Lanzhou and Urumqi FIR
- ADS-C performance analyzed by operator for Lanzhou and Urumqi FIR
- CPDLC performance analyzed by media type for Lanzhou and Urumqi FIR
- CPDLC performance analyzed by operator for Lanzhou and Urumqi FIR

2.3 No problem report was received in 2019. China RMA will further strengthen the reporting mechanism and keep on collecting and reporting the problems and will continue to monitor the PBCS performance. More specifically, China RMA sends feedback to FIRs involved routinely and will keep track of the problems reported.

2.4 The Table A and Table B below demonstrates the implementation status of RSP 180 and RCP 240 respectively. As we can see in the tables , while the 95% TT/DT performance criteria requirements for RCP 240 and RSP 180 specifications respectively were met by most samples from Lanzhou FIR and Urumqi FIR, the ET/TT operational values were generally between 99.0%-99.84, slightly lower than the requirements of the RCP 240 and RSP 180 specifications. The results will be reported to the CAAC (Civil Aviation Administration of China) to take corrective actions as appropriate and start detailed investigation to identify and address the deficiency.

Table A ADS-C Downlink Latency Comparison against RSP 180

Title	DT/OT value comparison between 2018 and 2019 in ZLLL and ZWWW evaluated by RSP 180							
Time	2018 First Half		2018 Second Half		2019 First Half		2019 Second Half	
Criteria	**95%**	**99.9%**	**95%**	**99.9%**	**95%**	**99.9%**	**95%**	**99.9%**
ZLLL	97.59	99.29	97.7	99.38	97.92	99.55	97.83	99.47
ZWWW	97.84	99.35	97.89	99.43	98.08	99.57	98.08	99.55

Table B CPDLC Downlink Latency Comparison against RCP 240

Title	TT/ET value comparison between 2018 and 2019 in ZLLL and ZWWW evaluated by RCP 240							
Time	2018 First Half		2018 Second Half		2019 First Half		2019 Second Half	
Criteria	**95%**	**99.9%**	**95%**	**99.9%**	**95%**	**99.9%**	**95%**	**99.9%**
ZLLL	95.19	96.21	96.22	96.55	99.14	99.35	99.22	99.41
ZWWW	95.19	96.21	96.95	97.68	97.83	98.22	98.74	99.28

2.5 Besides the efforts above, other actions were also taken by China RMA last year to improve the overall data link performance as below.

a) [Completed] Establishment of the PBCS data analysis mechanism: the post-implementation analysis mechanism is currently online to secure that the performance criteria is met in a regional basis.

b) [Completed] Development and upgrade of the PBCS problem reporting system: the system is helpful by transmitting the reports from a local level to the regional level in standard PR format.

c) [On-going] Developing a PBCS real-time monitoring system: the PBCS real-time monitoring system is capable of real time monitoring for each transaction and surveillance report.

d) [On-going] Establishing a PBCS operational monitoring mechanism: the PBCS operational monitoring mechanism is designed to optimize the PBCS post-implementation analysis mechanism and greatly enhance its data analysis function as well as its visual presentation so that the stakeholders involved would be able to benefit from its improved integration and efficiency.

e) While the development of the post-implementation system is completed, the next step is to develop the real-time monitoring system.

f) [Completed] Establishment of a PR report tracking and resolution mechanism for the ATMB: When administering the PBCS monitoring programs, the ANSPs should consider investigating the problem reports. The China RMA has finished the establishment of the problem report and the resolution mechanism, boosting the corrective action in a regional basis.

g) [On-going] Establishing a PR report tracking and solution mechanism for operator: All stakeholders should be actively involved in the problem reporting and resolution process. It is essential that all aircraft operators in a region have the opportunity to become involved in the process. After completing the establishment of the PR report mechanism, China RMA is making efforts on the mechanism for the operators in a regional basis.

h) [Completed] Development and revision of the regulations according to ICAO PBCS provisions: the regulatory requirements for air traffic services and associated ground equipment, aircraft capability, and operations are needed to support the PBCS operation.

2.6 As a result, reflected by the rising performance values in Table A and Table B, the actions and efforts made last year have improved the PBCS capacities in Lanzhou FIR and Urumqi FIR in general. China RMA will complete the on-going actions as soon as possible to further strengthen the PBCS capacities in the FIRs.

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 – ANALYSIS

1. ADS-C DOWNLINK LATENCY

Table 1 present ADS-C Downlink Latency for messages sent within Lanzhou FIR (ZLLL) and Urumqi FIR (ZWWW) for the period Jan.2019 to Dec. 2019.

The green cells demonstrate that the performance meets the requirements; the yellow cells demonstrate that the performance is slightly below the requirements, and the red cells demonstrate that the performance is under the requirements.

Table 1 ADS-C Downlink Latency

REQUIRED SURVEILLANCE PERFORMANCE						
Region	FIT_Asia					
Performance Criteria	RSP180					
Time Period	2019 January-June			2019 July-December		
Colour Key Meets Criteria 99.0%-99.84% Under Criteria	No. Messages	Criteria		No. Messages	Criteria	
		95% % < = 90sec	99.90% % <= 180sec		95% % < = 90sec	99.90% % <= 180sec
Aggregate	*535415*			*477469*		
ZLLL	344490	97.92	99.55	301206	97.83	99.47
ZWWW	190925	98.08	99.57	176263	98.08	99.55

2. CPDLC COMMUNICATION PERFORMANCE

Table 2 presents the CPDLC actual communications performance (APC) and CPDLC actual communication technical performance (ACTP) for messages sent within Lanzhou FIR (ZLLL) and Urumqi FIR (ZWWW) for the period Jan.2019 to Dec. 2019.

Table 2 CPDLC Communication Performance

REQUIRED COMMUNICATIONS PERFORMANCE										
Region	FIT- Asia									
Performance Criteria	RCP240									
Time Period	2019 January-June					2019 July-December				
Colour Key Meets Criteria 99.0%-99.84% Under Criteria	No. Messages	ACP Criteria		ACTP Criteria		No. Messages	ACP Criteria		ACTP Criteria	
		95% % <= 180sec	99.90% % <= 210sec	95% % <= 120sec	99.90% % <= 150sec		95% % <= 180sec	99.90% % <= 210sec	95% % < = 120sec	99.90% % <=150sec
Aggregate	*3592*					*3638*				
ZLLL	2805	99.14	99.35	98.36	98.89	3080	99.22	99.41	98.4	99.18
ZWWW	787	97.83	98.22	96.56	97.2	558	98.74	99.28	97.13	97.84

3. ADS-C PERFORMANCE BY MEDIA TYPE / RGS /GES

Table 3 presents ADS-C Downlink Latency for messages sent within Lanzhou FIR (ZLLL) by different media type and GES for the period Jan.2019 to Dec. 2019.

FIR		ZLLL					
Criteria		RSP180					
Period		Jan-June 2019			July-December 2019		
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							
VHF		209552	99.08	99.64	181203	99.09	99.64
HF		32	40.62	65.62	47	31.91	48.93
SAT		134906	96.14	99.42	119956	95.96	99.22
By Remote Ground Station (RGS) Ground Earth Station (GES)							
Designator	Type	(only RGS/GES with message counts >100 recorded)					
GES1	VHF	524	99.42	99.61	185	98.91	99.45
GES2	VHF	323	99.69	100	165	99.39	100
GES3	VHF				196	100	100
GES4	VHF				102	99.01	100
GES5	VHF	119	99.15	100	140	97.85	97.85
GES6	VHF	736	100	100	493	99.79	100
GES7	VHF	958	99.89	99.89	753	100	100
GES8	VHF	1054	99.43	99.9	841	99.4	99.52
GES9	VHF	703	99	99.28	375	98.93	99.2
GES10	VHF	2352	99.14	99.78	1805	98.5	99.61
GES11	VHF	116	99.13	99.13	167	100	100
GES12	SAT	58591	97.48	99.53	56409	97.13	99.37

GES13	VHF	16305	97.51	99.54	8857	96.65	99.4
GES14	VHF				230	99.13	99.56
GES15	VHF	1840	99.29	99.67	1335	98.12	98.87
GES16	VHF	526	98.85	99.42	624	98.39	98.87
GES17	VHF	152	99.34	99.34	140	100	100
GES18	VHF	2547	99.84	99.92	1547	99.93	99.93
GES19	VHF	181	100	100	136	99.26	100
GES20	VHF	167	98.2	98.8			
GES21	VHF	2849	99.71	99.89	2244	99.86	99.91
GES22	VHF				313	99.04	100
GES23	VHF				198	100	100
GES24	VHF	386	100	100			
GES25	VHF	340	99.11	100	153	100	100
GES26	VHF	219	100	100	219	100	100
GES27	VHF	106	99.05	100			
GES28	VHF	278	100	100	332	99.69	100
GES29	VHF				324	99.07	99.38
GES30	VHF	4941	97.87	99.33	3047	97.83	99.01
GES31	VHF	960	99.79	100	1458	99.1	99.65
GES32	VHF	102	100	100	134	99.25	100
GES33	VHF	125	100	100			
GES34	VHF	279	98.56	100	234	98.29	99.57
GES35	VHF	142	99.29	100			
GES36	VHF	125	96	98.4			
GES37	VHF				215	100	100
GES38	VHF				148	96.62	98.64
GES39	VHF	109	93.57	96.33	103	98.05	98.05
GES40	VHF	5921	99.15	99.52	5567	99.02	99.55
GES41	VHF	794	100	100	1070	100	100

GES42	VHF	544	100	100	101	100	100
GES43	VHF	11932	99.43	99.71	8314	99.26	99.73
GES44	VHF	1661	100	100	2707	100	100
GES45	VHF	1003	99.3	99.3	776	99.61	99.74
GES46	VHF	116	100	100	118	100	100
GES47	VHF				1701	99.11	99.29
GES48	VHF	249	97.99	100	143	97.9	97.9
GES49	VHF	299	98.32	99.66	298	98.99	99.66
GES50	VHF	145	100	100			
GES51	VHF	114	98.24	99.12	141	99.29	100
GES52	VHF	6269	99.76	99.82	4550	99.6	99.75
GES53	VHF	145	100	100	173	100	100
GES54	VHF	173	100	100	144	100	100
GES55	VHF				109	100	100
GES56	VHF	277	100	100	292	100	100
GES57	VHF	363	99.72	99.72	647	99.53	100
GES58	VHF	114	98.24	100			
GES59	VHF	1058	99.81	100	753	99.73	100
GES60	VHF	705	99.43	99.57	2721	99.44	99.7
GES61	VHF	618	99.83	100	489	99.79	100
GES62	SAT	16083	93.28	98.75	14060	92.91	98.6
GES63	VHF	1853	97.84	99.56	3107	98.06	99.48
GES64	VHF	195	100	100	124	98.38	99.19
GES65	VHF				220	100	100
GES66	VHF	133	100	100	349	99.71	99.71
GES67	VHF	316	100	100	284	98.94	98.94
GES68	VHF	160	99.37	100	395	100	100
GES69	VHF	702	99.85	100	870	99.77	99.88
GES70	VHF	564	99.82	100	396	98.73	100

GES71	VHF	13890	99.43	99.64	11671	99.3	99.58
GES72	VHF				201	99	100
GES73	VHF	1526	98.95	99.34	1867	99.03	99.41
GES74	VHF	1757	97.83	98.63	1331	98.94	99.47
GES75	VHF	1299	98.3	99.61	1058	99.24	99.52
GES76	VHF	305	98.03	99.34	296	98.64	99.32
GES77	VHF	130	99.23	99.23			
GES78	VHF	151	100	100	132	100	100
GES79	VHF	1104	99.54	99.81	1001	99.8	100
GES80	VHF	2417	97.47	98.71	1320	97.8	98.63
GES81	VHF	156	79.48	80.76	155	90.32	90.96
GES82	VHF	518	96.52	98.45	412	96.84	99.27
GES83	VHF	1772	99.2	99.54	1227	99.75	99.91
GES84	VHF	1256	99.2	99.76	1057	99.14	99.33
GES85	VHF	1436	99.44	99.86	2123	99.29	99.52
GES86	VHF	4400	99.81	99.9	5065	99.78	99.92
GES87	VHF				349	100	100
GES88	VHF	1712	99.88	99.94	1433	99.79	99.86
GES89	VHF				136	98.52	99.26
GES90	VHF	245	97.55	100	246	98.37	100
GES91	VHF	1042	99.9	99.9	966	100	100
GES92	VHF				108	98.14	98.14
GES93	VHF	409	99.75	99.75	430	99.76	100
GES94	VHF	473	97.46	97.88	424	99.76	99.76
GES95	SAT	9968	92.16	98.68	7590	89.23	96.96
GES96	SAT	8045	99.11	99.82	5139	97.58	99.43
GES97	VHF	1093	99.54	99.72	1016	99.7	99.8
GES98	VHF	1681	98.21	99.46			
GES99	VHF	102	98.03	100			

GES100	VHF	109	100	100	101	99	100
GES101	VHF	488	99.59	100	328	100	100
GES102	VHF	145	98.62	100			
GES103	VHF	218	100	100	394	99.49	100
GES104	VHF	118	99.15	99.15			
GES105	VHF				352	98.57	99.14
GES106	VHF	8030	99.8	99.88	7263	99.72	99.87
GES107	VHF	1383	98.62	99.34	1412	98.37	99.43
GES108	VHF	587	99.14	99.48	475	99.36	99.57
GES109	VHF	222	99.54	99.54			
GES110	VHF	383	99.73	100	410	99.51	99.75
GES111	VHF	1622	99.93	99.93	1047	99.9	100
GES112	VHF	674	99.85	100	551	99.81	100
GES113	VHF	204	93.13	99.5	219	95.43	100
GES114	VHF	268	99.25	99.62	200	99	99.5
GES115	VHF	224	100	100	419	100	100
GES116	VHF	973	99.79	100	249	100	100
GES117	VHF	7596	99.53	99.78	6355	99.52	99.71
GES118	VHF				410	100	100
GES119	VHF	137	99.27	100			
GES120	VHF	279	99.64	99.64	1008	99.8	99.9
GES121	VHF	168	100	100	197	97.96	100
GES122	VHF				265	100	100
GES123	VHF				583	100	100
GES124	VHF	551	97.45	97.82	388	97.93	98.96
GES125	VHF	544	99.63	100	408	98.03	99.26
GES126	VHF	179	99.44	100	378	99.73	100
GES127	VHF	562	100	100	346	99.71	100
GES128	VHF	772	98.96	99.61	426	98.59	99.06

GES129	VHF	181	95.58	96.68			
GES130	VHF				121	99.17	100
GES131	VHF	156	99.35	100			
GES132	VHF	9207	99.13	99.64	7429	99.13	99.67
GES133	VHF				123	100	100
GES134	VHF				231	100	100
GES135	VHF	434	99.07	100	346	98.84	99.71
GES136	VHF				409	100	100
GES137	VHF				174	98.27	100
GES138	VHF				148	100	100
GES139	VHF	1422	98.17	99.15	1112	98.56	99.64
GES140	VHF	559	99.1	99.82	401	99.5	99.75
GES141	VHF				126	100	100
GES142	VHF	278	98.56	99.28	463	98.05	98.92
GES143	VHF	227	100	100	144	100	100
GES144	VHF				422	99.28	99.52
GES145	VHF	174	100	100			
GES146	VHF	5028	98.94	99.5	4327	98.79	99.42
GES147	VHF	381	100	100	671	99.25	99.85
GES148	VHF	231	100	100	252	100	100
GES149	VHF	332	98.19	99.09	157	99.36	100
GES150	VHF	160	88.75	94.37			
GES151	VHF	114	100	100	107	97.19	100
GES152	VHF	1811	99.5	100	1656	99.39	100
GES153	VHF				543	99.63	99.81
GES154	VHF	159	100	100			
GES155	VHF	150	100	100			
GES156	VHF	165	100	100	147	100	100
GES157	VHF	226	99.55	100	236	98.72	100

GES158	VHF	176	100	100	113	100	100
GES159	VHF				198	98.98	99.49
GES160	VHF	261	99.61	100	319	98.74	100
GES161	VHF	137	99.27	100			
GES162	VHF	234	99.14	100	308	97.4	98.37
GES163	VHF	107	99.06	100	108	100	100
GES164	VHF	124	100	100			
GES165	VHF	347	100	100	156	100	100
GES166	VHF	1307	99.77	99.77	938	99.14	99.68
GES167	VHF	254	100	100	391	100	100
GES168	VHF				162	100	100
GES169	VHF	299	100	100			
GES170	VHF	133	100	100			
GES171	VHF				292	98.97	100
GES172	VHF	1373	98.98	99.63	360	99.44	100
GES173	VHF	141	93.61	95.03			
GES174	VHF	208	95.19	95.67	242	95.45	97.93
GES175	VHF	163	99.38	100			
GES176	VHF	108	99.07	99.07			
GES177	VHF	241	100	100	684	99.85	99.85
GES178	VHF				179	100	100
GES179	VHF	256	100	100	168	100	100
GES180	VHF				154	100	100
GES181	VHF	2967	97.16	99.19	2346	98.55	99.65
GES182	VHF	282	99.64	100	502	97.21	99.8
GES183	VHF	281	100	100	358	98.88	99.16
GES184	VHF	114	100	100			
GES185	VHF	2718	99.59	99.59	1926	99.48	99.68
GES186	VHF	377	99.46	99.46	259	99.22	99.61

GES187	VHF	2282	99.51	99.82	2254	99.2	99.42
GES188	VHF				192	100	100
GES189	VHF	773	98.44	99.22	325	99.69	100
GES190	VHF	202	100	100	138	100	100
GES191	VHF	1576	99.55	99.68	1207	99.58	99.75
GES192	VHF	195	100	100	188	98.93	100
GES193	VHF				126	96.82	99.2
GES194	VHF	509	99.8	100	607	99.83	100
GES195	VHF	175	100	100	180	100	100
GES196	VHF	199	99.49	100	123	100	100
GES197	VHF	767	99.08	99.47	612	99.5	99.83
GES198	VHF	1686	99.58	99.82	993	99.39	99.69
GES199	VHF	413	99.51	100	279	99.64	100
GES200	VHF	487	99.58	100	600	100	100
GES201	VHF				132	99.24	100
GES202	VHF	360	100	100			
GES203	VHF	131	100	100			
GES204	VHF	239	98.74	100	125	100	100
GES205	VHF	214	100	100			
GES206	VHF	3573	99.63	99.86	2942	99.49	99.72
GES207	VHF	172	98.83	100			
GES208	VHF	141	100	100	115	100	100
GES209	VHF	145	98.62	99.31			
GES210	VHF	129	98.44	100	179	97.2	99.44
GES211	VHF	1014	99.7	100	739	99.72	99.86
GES212	VHF	314	99.04	99.68	255	99.21	100
GES213	VHF	1125	99.37	99.64	846	99.52	99.76
GES214	VHF	1038	98.74	99.51	1225	98.77	99.34
GES215	VHF	243	99.58	99.58	146	99.31	100

GES216	VHF	451	99.33	99.55			
GES217	VHF	372	100	100	395	100	100
GES218	VHF	197	98.98	100	194	98.45	99.48
GES219	VHF				107	98.13	100
GES220	VHF	205	100	100	192	100	100
GES221	VHF	1232	99.83	99.83	901	99.44	99.66
GES222	SAT	17301	94.5	99.7	17319	95.62	99.81
GES223	SAT	11797	97.67	99.52	8342	97.74	99.53
GES224	SAT	3748	96.5	99.7	3190	97.68	99.65
GES225	SAT	9373	95.28	99.53	7907	96.56	99.55
GES226	VHF	124	100	100	164	99.39	100
GES227	VHF	2415	99.71	99.79	1847	99.89	99.94

Table 4 presents ADS-C Downlink Latency for messages sent within Urumqi FIR (ZWWW) by different media type and GES for the period Jan.2019 to Dec. 2019.

Table 3 ADS-C Performance by Media Type in ZLLL

FIR	ZLLL					
Criteria	RSP180					
Period	Jan-June 2019			July-December 2019		
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						
VHF	209552	99.08	99.64	181203	99.09	99.64
HF	32	40.62	65.62	47	31.91	48.93
SAT	134906	96.14	99.42	119956	95.96	99.22

By Remote Ground Station (RGS) Ground Earth Station (GES)							
Designator	Type	(only RGS/GES with message counts >100 recorded)					
GES1	VHF	524	99.42	99.61	185	98.91	99.45
GES2	VHF	323	99.69	100	165	99.39	100
GES3	VHF				196	100	100
GES4	VHF				102	99.01	100
GES5	VHF	119	99.15	100	140	97.85	97.85
GES6	VHF	736	100	100	493	99.79	100
GES7	VHF	958	99.89	99.89	753	100	100
GES8	VHF	1054	99.43	99.9	841	99.4	99.52
GES9	VHF	703	99	99.28	375	98.93	99.2
GES10	VHF	2352	99.14	99.78	1805	98.5	99.61
GES11	VHF	116	99.13	99.13	167	100	100
GES12	SAT	58591	97.48	99.53	56409	97.13	99.37
GES13	VHF	16305	97.51	99.54	8857	96.65	99.4
GES14	VHF				230	99.13	99.56
GES15	VHF	1840	99.29	99.67	1335	98.12	98.87
GES16	VHF	526	98.85	99.42	624	98.39	98.87
GES17	VHF	152	99.34	99.34	140	100	100
GES18	VHF	2547	99.84	99.92	1547	99.93	99.93
GES19	VHF	181	100	100	136	99.26	100
GES20	VHF	167	98.2	98.8			
GES21	VHF	2849	99.71	99.89	2244	99.86	99.91
GES22	VHF				313	99.04	100
GES23	VHF				198	100	100
GES24	VHF	386	100	100			
GES25	VHF	340	99.11	100	153	100	100
GES26	VHF	219	100	100	219	100	100
GES27	VHF	106	99.05	100			

GES28	VHF	278	100	100	332	99.69	100
GES29	VHF				324	99.07	99.38
GES30	VHF	4941	97.87	99.33	3047	97.83	99.01
GES31	VHF	960	99.79	100	1458	99.1	99.65
GES32	VHF	102	100	100	134	99.25	100
GES33	VHF	125	100	100			
GES34	VHF	279	98.56	100	234	98.29	99.57
GES35	VHF	142	99.29	100			
GES36	VHF	125	96	98.4			
GES37	VHF				215	100	100
GES38	VHF				148	96.62	98.64
GES39	VHF	109	93.57	96.33	103	98.05	98.05
GES40	VHF	5921	99.15	99.52	5567	99.02	99.55
GES41	VHF	794	100	100	1070	100	100
GES42	VHF	544	100	100	101	100	100
GES43	VHF	11932	99.43	99.71	8314	99.26	99.73
GES44	VHF	1661	100	100	2707	100	100
GES45	VHF	1003	99.3	99.3	776	99.61	99.74
GES46	VHF	116	100	100	118	100	100
GES47	VHF				1701	99.11	99.29
GES48	VHF	249	97.99	100	143	97.9	97.9
GES49	VHF	299	98.32	99.66	298	98.99	99.66
GES50	VHF	145	100	100			
GES51	VHF	114	98.24	99.12	141	99.29	100
GES52	VHF	6269	99.76	99.82	4550	99.6	99.75
GES53	VHF	145	100	100	173	100	100
GES54	VHF	173	100	100	144	100	100
GES55	VHF				109	100	100
GES56	VHF	277	100	100	292	100	100

GES57	VHF	363	99.72	99.72	647	99.53	100
GES58	VHF	114	98.24	100			
GES59	VHF	1058	99.81	100	753	99.73	100
GES60	VHF	705	99.43	99.57	2721	99.44	99.7
GES61	VHF	618	99.83	100	489	99.79	100
GES62	SAT	16083	93.28	98.75	14060	92.91	98.6
GES63	VHF	1853	97.84	99.56	3107	98.06	99.48
GES64	VHF	195	100	100	124	98.38	99.19
GES65	VHF				220	100	100
GES66	VHF	133	100	100	349	99.71	99.71
GES67	VHF	316	100	100	284	98.94	98.94
GES68	VHF	160	99.37	100	395	100	100
GES69	VHF	702	99.85	100	870	99.77	99.88
GES70	VHF	564	99.82	100	396	98.73	100
GES71	VHF	13890	99.43	99.64	11671	99.3	99.58
GES72	VHF				201	99	100
GES73	VHF	1526	98.95	99.34	1867	99.03	99.41
GES74	VHF	1757	97.83	98.63	1331	98.94	99.47
GES75	VHF	1299	98.3	99.61	1058	99.24	99.52
GES76	VHF	305	98.03	99.34	296	98.64	99.32
GES77	VHF	130	99.23	99.23			
GES78	VHF	151	100	100	132	100	100
GES79	VHF	1104	99.54	99.81	1001	99.8	100
GES80	VHF	2417	97.47	98.71	1320	97.8	98.63
GES81	VHF	156	79.48	80.76	155	90.32	90.96
GES82	VHF	518	96.52	98.45	412	96.84	99.27
GES83	VHF	1772	99.2	99.54	1227	99.75	99.91
GES84	VHF	1256	99.2	99.76	1057	99.14	99.33
GES85	VHF	1436	99.44	99.86	2123	99.29	99.52

GES86	VHF	4400	99.81	99.9	5065	99.78	99.92
GES87	VHF				349	100	100
GES88	VHF	1712	99.88	99.94	1433	99.79	99.86
GES89	VHF				136	98.52	99.26
GES90	VHF	245	97.55	100	246	98.37	100
GES91	VHF	1042	99.9	99.9	966	100	100
GES92	VHF				108	98.14	98.14
GES93	VHF	409	99.75	99.75	430	99.76	100
GES94	VHF	473	97.46	97.88	424	99.76	99.76
GES95	SAT	9968	92.16	98.68	7590	89.23	96.96
GES96	SAT	8045	99.11	99.82	5139	97.58	99.43
GES97	VHF	1093	99.54	99.72	1016	99.7	99.8
GES98	VHF	1681	98.21	99.46			
GES99	VHF	102	98.03	100			
GES100	VHF	109	100	100	101	99	100
GES101	VHF	488	99.59	100	328	100	100
GES102	VHF	145	98.62	100			
GES103	VHF	218	100	100	394	99.49	100
GES104	VHF	118	99.15	99.15			
GES105	VHF				352	98.57	99.14
GES106	VHF	8030	99.8	99.88	7263	99.72	99.87
GES107	VHF	1383	98.62	99.34	1412	98.37	99.43
GES108	VHF	587	99.14	99.48	475	99.36	99.57
GES109	VHF	222	99.54	99.54			
GES110	VHF	383	99.73	100	410	99.51	99.75
GES111	VHF	1622	99.93	99.93	1047	99.9	100
GES112	VHF	674	99.85	100	551	99.81	100
GES113	VHF	204	93.13	99.5	219	95.43	100
GES114	VHF	268	99.25	99.62	200	99	99.5

GES115	VHF	224	100	100	419	100	100
GES116	VHF	973	99.79	100	249	100	100
GES117	VHF	7596	99.53	99.78	6355	99.52	99.71
GES118	VHF				410	100	100
GES119	VHF	137	99.27	100			
GES120	VHF	279	99.64	99.64	1008	99.8	99.9
GES121	VHF	168	100	100	197	97.96	100
GES122	VHF				265	100	100
GES123	VHF				583	100	100
GES124	VHF	551	97.45	97.82	388	97.93	98.96
GES125	VHF	544	99.63	100	408	98.03	99.26
GES126	VHF	179	99.44	100	378	99.73	100
GES127	VHF	562	100	100	346	99.71	100
GES128	VHF	772	98.96	99.61	426	98.59	99.06
GES129	VHF	181	95.58	96.68			
GES130	VHF				121	99.17	100
GES131	VHF	156	99.35	100			
GES132	VHF	9207	99.13	99.64	7429	99.13	99.67
GES133	VHF				123	100	100
GES134	VHF				231	100	100
GES135	VHF	434	99.07	100	346	98.84	99.71
GES136	VHF				409	100	100
GES137	VHF				174	98.27	100
GES138	VHF				148	100	100
GES139	VHF	1422	98.17	99.15	1112	98.56	99.64
GES140	VHF	559	99.1	99.82	401	99.5	99.75
GES141	VHF				126	100	100
GES142	VHF	278	98.56	99.28	463	98.05	98.92
GES143	VHF	227	100	100	144	100	100

GES144	VHF				422	99.28	99.52
GES145	VHF	174	100	100			
GES146	VHF	5028	98.94	99.5	4327	98.79	99.42
GES147	VHF	381	100	100	671	99.25	99.85
GES148	VHF	231	100	100	252	100	100
GES149	VHF	332	98.19	99.09	157	99.36	100
GES150	VHF	160	88.75	94.37			
GES151	VHF	114	100	100	107	97.19	100
GES152	VHF	1811	99.5	100	1656	99.39	100
GES153	VHF				543	99.63	99.81
GES154	VHF	159	100	100			
GES155	VHF	150	100	100			
GES156	VHF	165	100	100	147	100	100
GES157	VHF	226	99.55	100	236	98.72	100
GES158	VHF	176	100	100	113	100	100
GES159	VHF				198	98.98	99.49
GES160	VHF	261	99.61	100	319	98.74	100
GES161	VHF	137	99.27	100			
GES162	VHF	234	99.14	100	308	97.4	98.37
GES163	VHF	107	99.06	100	108	100	100
GES164	VHF	124	100	100			
GES165	VHF	347	100	100	156	100	100
GES166	VHF	1307	99.77	99.77	938	99.14	99.68
GES167	VHF	254	100	100	391	100	100
GES168	VHF				162	100	100
GES169	VHF	299	100	100			
GES170	VHF	133	100	100			
GES171	VHF				292	98.97	100
GES172	VHF	1373	98.98	99.63	360	99.44	100

GES173	VHF	141	93.61	95.03			
GES174	VHF	208	95.19	95.67	242	95.45	97.93
GES175	VHF	163	99.38	100			
GES176	VHF	108	99.07	99.07			
GES177	VHF	241	100	100	684	99.85	99.85
GES178	VHF				179	100	100
GES179	VHF	256	100	100	168	100	100
GES180	VHF				154	100	100
GES181	VHF	2967	97.16	99.19	2346	98.55	99.65
GES182	VHF	282	99.64	100	502	97.21	99.8
GES183	VHF	281	100	100	358	98.88	99.16
GES184	VHF	114	100	100			
GES185	VHF	2718	99.59	99.59	1926	99.48	99.68
GES186	VHF	377	99.46	99.46	259	99.22	99.61
GES187	VHF	2282	99.51	99.82	2254	99.2	99.42
GES188	VHF				192	100	100
GES189	VHF	773	98.44	99.22	325	99.69	100
GES190	VHF	202	100	100	138	100	100
GES191	VHF	1576	99.55	99.68	1207	99.58	99.75
GES192	VHF	195	100	100	188	98.93	100
GES193	VHF				126	96.82	99.2
GES194	VHF	509	99.8	100	607	99.83	100
GES195	VHF	175	100	100	180	100	100
GES196	VHF	199	99.49	100	123	100	100
GES197	VHF	767	99.08	99.47	612	99.5	99.83
GES198	VHF	1686	99.58	99.82	993	99.39	99.69
GES199	VHF	413	99.51	100	279	99.64	100
GES200	VHF	487	99.58	100	600	100	100
GES201	VHF				132	99.24	100

GES202	VHF	360	100	100			
GES203	VHF	131	100	100			
GES204	VHF	239	98.74	100	125	100	100
GES205	VHF	214	100	100			
GES206	VHF	3573	99.63	99.86	2942	99.49	99.72
GES207	VHF	172	98.83	100			
GES208	VHF	141	100	100	115	100	100
GES209	VHF	145	98.62	99.31			
GES210	VHF	129	98.44	100	179	97.2	99.44
GES211	VHF	1014	99.7	100	739	99.72	99.86
GES212	VHF	314	99.04	99.68	255	99.21	100
GES213	VHF	1125	99.37	99.64	846	99.52	99.76
GES214	VHF	1038	98.74	99.51	1225	98.77	99.34
GES215	VHF	243	99.58	99.58	146	99.31	100
GES216	VHF	451	99.33	99.55			
GES217	VHF	372	100	100	395	100	100
GES218	VHF	197	98.98	100	194	98.45	99.48
GES219	VHF				107	98.13	100
GES220	VHF	205	100	100	192	100	100
GES221	VHF	1232	99.83	99.83	901	99.44	99.66
GES222	SAT	17301	94.5	99.7	17319	95.62	99.81
GES223	SAT	11797	97.67	99.52	8342	97.74	99.53
GES224	SAT	3748	96.5	99.7	3190	97.68	99.65
GES225	SAT	9373	95.28	99.53	7907	96.56	99.55
GES226	VHF	124	100	100	164	99.39	100
GES227	VHF	2415	99.71	99.79	1847	99.89	99.94

Table 4 ADS-C Performance by Media Type in ZWWW

FIR	ZWWW					
Criteria	RSP180					
Period	Jan-June 2019			July-December 2019		
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						
VHF	116153	99.21	99.67	105899	99.2	99.67
HF	34	41.17	67.64	28	25	35.71
SAT	74738	96.34	99.43	70336	96.42	99.4
By Remote Ground Station (RGS) Ground Earth Station (GES)						
Designator	Type	(only RGS/GES with message counts >100 recorded)				
GES1	VHF	558	99.64	99.82	269	99.25	100
GES2	VHF	131	99.23	100	131	97.7	98.47
GES3	VHF	407	100	100	236	99.57	99.57
GES4	VHF	3230	99.75	99.87	2500	99.64	99.88
GES5	VHF	532	98.87	99.62	411	98.54	99.02
GES6	VHF	570	100	100	471	99.78	99.78
GES7	VHF	3077	99.61	99.9	2475	99.11	99.71
GES8	SAT	31823	97.64	99.55	33098	97.67	99.56
GES9	VHF	6490	97.96	99.55	4000	96.3	99.15
GES10	VHF	934	99.46	99.78	645	99.68	99.84
GES11	VHF	268	98.5	99.62	309	98.38	99.67
GES12	VHF	142	99.29	99.29	133	100	100

GES13	VHF	487	99.79	100	460	100	100
GES14	VHF	1656	99.81	99.87	1507	99.73	99.86
GES15	VHF				144	98.61	100
GES16	VHF	136	100	100			
GES17	VHF	186	100	100			
GES18	VHF	127	99.21	99.21			
GES19	VHF	136	100	100	156	99.35	99.35
GES20	VHF				245	99.59	99.59
GES21	VHF	2008	97.5	99.35	1386	97.83	99.06
GES22	VHF	259	98.84	99.61	491	98.98	99.59
GES23	VHF	129	100	100	113	99.11	100
GES24	VHF				109	100	100
GES25	VHF	135	99.25	99.25	174	98.85	98.85
GES26	VHF				118	100	100
GES27	VHF	2232	99.23	99.59	2171	99.49	99.86
GES28	VHF	196	100	100	322	100	100
GES29	VHF	3864	99.12	99.45	2919	98.97	99.45
GES30	VHF	368	100	100	752	100	100
GES31	VHF	141	99.29	99.29	121	100	100
GES32	VHF	130	100	100	134	98.5	99.25
GES33	VHF				727	99.03	99.44
GES34	VHF	123	99.18	99.18			
GES35	VHF	150	98.66	99.33	153	98.03	99.34
GES36	VHF	3713	99.73	99.78	2744	99.7	99.78
GES37	VHF				108	100	100
GES38	VHF	103	100	100			
GES39	VHF	281	99.64	99.64	348	99.42	100
GES40	VHF	254	100	100	374	99.73	100
GES41	VHF	126	100	100			

GES42	VHF	935	100	100	807	99.75	100
GES43	VHF	437	99.77	100	1354	99.4	99.7
GES44	VHF	359	99.72	100	238	99.57	100
GES45	SAT	11193	94.54	98.99	10276	94.56	98.99
GES46	VHF	1339	97.61	99.85	2550	98.39	99.64
GES47	VHF	105	100	100			
GES48	VHF				192	99.47	100
GES49	VHF	121	100	100	110	98.18	99.09
GES50	VHF				191	100	100
GES51	VHF	704	99.85	100	849	100	100
GES52	VHF	219	99.08	100	154	97.4	100
GES53	VHF	4296	99.37	99.6	3860	99.27	99.53
GES54	VHF	845	99.28	99.52	952	99.26	99.47
GES55	VHF	868	97.11	98.04	623	99.03	99.35
GES56	VHF	449	99.1	99.55	374	100	100
GES57	VHF	128	96.87	99.21	122	97.54	99.18
GES58	VHF	829	99.87	100	851	99.76	99.88
GES59	VHF	1062	97.26	98.68	668	96.85	98.5
GES60	VHF	229	94.32	95.63	171	96.49	98.83
GES61	VHF	775	99.48	99.74	497	99.79	99.79
GES62	VHF	378	98.67	99.47	379	99.47	99.73
GES63	VHF	349	99.71	99.71	699	98.85	99.57
GES64	VHF	3156	99.71	99.8	3468	99.76	99.88
GES65	VHF				215	100	100
GES66	VHF	3087	99.96	99.96	3112	99.93	99.93
GES67	VHF	1017	99.9	100	1170	99.74	99.91
GES68	VHF	445	98.2	99.32	432	99.3	99.76
GES69	VHF	236	98.72	99.57	220	99.09	100
GES70	SAT	4412	92.56	98.54	3242	88.61	97.59

GES71	SAT	3471	98.7	99.59	2026	97.63	99.16
GES72	VHF	378	99.73	99.73	387	99.48	99.74
GES73	VHF	1679	98.33	99.7			
GES74	VHF	248	99.19	100	170	100	100
GES75	VHF	125	100	100	204	99.5	100
GES76	VHF				292	98.63	99.65
GES77	VHF	2986	99.79	99.93	2962	99.72	99.79
GES78	VHF	416	99.27	99.51	462	98.26	99.35
GES79	VHF	281	99.64	99.64	198	100	100
GES80	VHF	106	99.05	99.05			
GES81	VHF	216	100	100	189	98.41	99.47
GES82	VHF	2356	99.53	99.87	1708	98.88	99.35
GES83	VHF	1527	99.86	99.86	1424	99.92	99.92
GES84	VHF	169	98.22	98.81			
GES85	VHF	127	100	100	232	100	100
GES86	VHF	166	99.39	99.39			
GES87	VHF	8162	99.49	99.69	7632	99.46	99.73
GES88	VHF				427	100	100
GES89	VHF	168	98.21	98.8	550	99.81	99.81
GES90	VHF	107	100	100			
GES91	VHF				105	99.04	99.04
GES92	VHF				284	98.94	99.64
GES93	VHF	207	99.51	100	153	99.34	100
GES94	VHF	259	98.84	100	179	96.64	99.44
GES95	VHF				103	99.02	100
GES96	VHF	224	100	100	135	100	100
GES97	VHF	451	99.33	99.77	240	100	100
GES98	VHF	116	94.82	94.82			
GES99	VHF	2959	98.95	99.56	2722	99.08	99.63

GES100	VHF	181	97.79	99.44	158	100	100
GES101	VHF				415	100	100
GES102	VHF	534	96.44	98.87	430	98.6	100
GES103	VHF	244	97.54	99.59	205	99.02	100
GES104	VHF	162	98.14	100	231	99.13	99.13
GES105	VHF				259	98.84	99.61
GES106	VHF	1906	98.63	99.26	1737	98.56	99.48
GES107	VHF	123	100	100	194	100	100
GES108	VHF	226	100	100	288	100	100
GES109	VHF	1819	99.5	99.94	1684	99.94	100
GES110	VHF				501	99.6	100
GES111	VHF	207	99.03	99.51	180	99.44	100
GES112	VHF	162	100	100	149	97.31	100
GES113	VHF	111	99.09	99.09	158	97.46	99.36
GES114	VHF	138	100	100			
GES115	VHF	680	99.41	99.85	467	99.14	99.35
GES116	VHF	316	100	100	397	100	100
GES117	VHF				107	100	100
GES118	VHF	617	99.18	99.67	142	99.29	99.29
GES119	VHF	139	100	100	362	99.72	99.72
GES120	VHF	120	100	100	264	100	100
GES121	VHF	120	99.16	100			
GES122	VHF				106	100	100
GES123	VHF	1101	97.36	98.81	899	97.77	99.33
GES124	VHF				167	98.8	99.4
GES125	VHF	293	99.65	100	388	100	100
GES126	VHF	1345	99.85	99.85	1005	99.1	99.6
GES127	VHF	200	100	100	119	100	100
GES128	VHF	2056	99.56	99.75	1889	99.36	99.68

GES129	VHF				213	100	100
GES130	VHF	245	97.14	98.77	131	100	100
GES131	VHF	1582	99.43	99.55	1188	99.57	99.74
GES132	VHF	218	99.54	100	252	99.6	99.6
GES133	VHF	168	100	100	203	100	100
GES134	VHF	153	99.34	100			
GES135	VHF	432	99.3	99.3	299	100	100
GES136	VHF	957	99.68	99.79	487	99.58	99.79
GES137	VHF	396	99.74	100	311	100	100
GES138	VHF	228	100	100	263	99.61	100
GES139	VHF	207	100	100			
GES140	VHF	269	98.51	99.62			
GES141	VHF	4309	99.79	99.95	3491	99.77	99.88
GES142	VHF	512	99.8	99.8	345	100	100
GES143	VHF	170	98.23	100	101	100	100
GES144	VHF	560	99.28	99.64	436	98.62	99.08
GES145	VHF	548	99.27	99.63	651	99.38	99.53
GES146	VHF	133	100	100			
GES147	VHF	241	99.17	100			
GES148	VHF	165	100	100	144	100	100
GES149	VHF	216	100	100	232	99.56	99.56
GES150	VHF	460	99.56	99.56	396	99.74	99.74
GES151	SAT	9214	94.01	99.75	10177	95.52	99.72
GES152	SAT	8118	97.65	99.58	6176	97.55	99.61
GES153	SAT	2458	97.03	99.55	1978	97.62	99.64
GES154	SAT	4049	95.4	99.55	3363	96.63	99.52
GES155	VHF	130	100	100	187	100	100
GES156	VHF	2861	99.65	99.75	2284	99.69	99.78

4. ADS-C PERFORMANCE BY OPERATOR

Table 5 presents ADS-C Downlink Latency for messages sent within Lanzhou FIR (ZLLL) by different media type and GES for the period Jan.2019 to Dec. 2019.

5. FIR	ZLLL					
Criteria	RSP180					
Period	Jan-June 2019			July-December 2019		
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)						
OP1/T1				101	97.02	98.01
OP2/T1	733	99.45	100	496	99.79	100
OP2/T2				224	99.1	100
OP3/T1	2190	98.63	99.31	486	97.73	98.76
OP3/T2	3122	98.59	99.42	1583	99.05	99.74
OP4/T1				291	99.31	99.31
OP5/T1	968	99.58	99.89	160	100	100
OP5/T2	1170	94.95	98.71	302	96.35	99.33
OP5/T3	101	95.04	98.01			
OP6/T1	933	98.49	100	1348	97.77	100
OP6/T2	1324	94.71	99.84	2649	93.05	99.58
OP6/T3	117	99.14	100	186	98.38	99.46
OP7/T1				118	100	100
OP8/T1	481	97.5	98.96	476	97.05	98.1
OP8/T2	5300	98.26	99.79	5727	97.99	99.23

OP9/T1	735	99.72	99.86	340	99.7	100
OP9/T2	207	98.06	100	176	99.43	100
OP10/T1	7773	99.26	99.94	7100	99.43	99.92
OP11/T1	323	99.69	100	122	100	100
OP11/T2				123	95.12	98.37
OP11/T3	389	98.71	99.74	189	98.41	100
OP12/T1	455	99.12	100	663	99.69	99.84
OP12/T2	487	98.97	100	176	98.86	100
OP13/T1				271	98.52	98.52
OP14/T1	1559	96.47	99.87	1375	97.01	99.34
OP15/T1				119	98.31	100
OP15/T2	2355	97.36	99.83	2139	97.19	99.39
OP16/T1	1088	98.43	99.9	1280	98.98	100
OP17/T1	7356	98.38	99.23	6786	97.3	98.52
OP17/T2	13067	98.95	99.9	10020	99.17	99.92
OP18/T1	15062	98.76	99.94	11804	98.75	99.95
OP18/T2	571	98.59	99.82	717	99.02	99.86
OP18/T3	843	97.98	99.16	714	98.59	99.15
OP18/T4	583	95.19	98.97	454	94.27	96.91
OP18/T5	40234	96.59	98.93	31029	96.36	98.65
OP19/T1	2132	99.62	99.95	1948	99.33	99.94
OP20/T1				491	99.59	100
OP21/T1	5486	98.39	99.92	5968	98.59	100
OP21/T2	13298	97.56	99.95	10367	97.67	99.97
OP21/T3	6917	98.48	99.86	5307	98.66	99.86
OP22/T1	231	99.56	100			
OP23/T1	890	96.4	99.1	890	99.43	99.88
OP24/T1				2308	99.65	99.74

OP24/T2				162	98.76	100
OP24/T3	781	98.71	99.61	776	98.19	99.09
OP25/T1	765	98.03	100	650	98.3	100
OP25/T2	130	99.23	100			
OP25/T3	440	99.09	99.77	152	98.02	100
OP25/T4	373	98.65	100	870	99.19	99.77
OP25/T5	2146	98.55	99.3	2843	97.99	99.05
OP26/T1	661	99.84	100	637	99.68	100
OP27/T1	18198	95.32	98.6	23634	95.37	98.41
OP28/T1	3053	99.73	99.9	1101	99.81	100
OP28/T2	5310	98.51	99.96	3890	98.74	99.94
OP29/T1	876	99.2	99.88	1040	98.36	100
OP29/T2	6360	97.46	99.65	3251	96.49	98.95
OP30/T1	1295	98.3	99.61	1679	97.91	99.46
OP30/T2	491	98.16	99.79	192	97.39	98.95
OP31/T1	470	99.36	100	593	98.48	99.66
OP32/T1	502	98.8	99.8	115	100	100
OP33/T1	1719	98.25	99.01	1275	98.5	99.29
OP34/T1	1432	98.32	99.86	1713	98.07	99.7
OP34/T2	1035	99.42	99.9	216	100	100
OP34/T3	221	99.54	100	164	100	100
OP34/T4	1962	97.91	98.47	377	98.14	98.67
OP34/T5	544	96.69	98.89	880	98.63	99.09
OP34/T6				111	100	100
OP34/T7	115	99.13	99.13			
OP34/T8	142	98.59	100			
OP34/T9	268	97.01	98.13	403	99.25	100
OP34/T10	117	97.43	98.29			

OP34/T11	496	97.98	99.59	279	98.92	99.64
OP34/T12	312	98.71	100	190	98.94	100
OP35/T1	4351	98.39	99.9	1895	98.15	99.89
OP35/T2	225	97.77	100	513	99.22	100
OP35/T3	346	99.13	99.71	386	98.96	99.48
OP35/T4	7090	97.88	99.57	9248	98.36	99.71
OP35/T5				206	99.51	100
OP35/T6	282	97.16	99.64	435	99.08	100
OP36/T1	3657	97.29	99.26	2236	96.6	99.06
OP36/T2	7710	94.42	99.75	9055	94.75	99.79
OP36/T3	3347	95.87	99.7	4650	96.34	99.95
OP36/T4	1126	98.84	99.64	2709	98.41	99.18
OP37/T1				802	99.25	99.75
OP38/T1	140	100	100	237	100	100
OP38/T2	420	96.42	99.52	181	98.89	99.44
OP39/T1	419	100	100	299	99.66	100
OP40/T1	968	97.72	99.79	522	99.04	99.61
OP41/T1	3829	98.25	99.71	1763	97.22	99.48
OP41/T2	600	97.83	99	250	98.8	99.6
OP42/T1	190	98.94	99.47	152	94.73	98.02
OP42/T2				207	99.51	100
OP43/T1	112	100	100			
OP44/T1	161	100	100			
OP44/T2				175	99.42	99.42
OP45/T1	1500	98.73	99.4	215	99.06	99.06
OP45/T2	506	98.22	98.41	344	100	100
OP45/T3				142	100	100
OP45/T4	2171	98.01	99.72	1829	98.63	99.72

OP45/T5	13027	97.39	99.14	14946	97.27	99.04
OP46/T1	473	97.46	98.3	182	96.15	96.7
OP47/T1	2378	99.28	100	398	99.24	100
OP47/T2	360	98.33	99.72	102	100	100
OP48/T1	2806	96.61	99.21	2388	97.31	99.62
OP49/T1	109	99.08	100			
OP50/T1	182	99.45	100			
OP50/T2	222	99.54	100	319	99.68	100
OP51/T1	949	98.41	99.89	1072	98.6	99.81
OP52/T1	137	96.35	98.54			
OP53/T1	8685	99.5	99.7	8794	99.73	99.88
OP53/T2	5816	98.41	99.69	5253	98.93	99.54
OP53/T3	30233	98.46	99.67	21165	98.65	99.78
OP54/T1	23709	99.04	99.96	24732	99.21	99.93
OP54/T2				121	94.21	97.52
OP54/T3	301	98.33	100	321	100	100
OP54/T4	822	98.78	99.75	404	99.5	100
OP55/T1	413	95.88	99.75	503	97.81	100
OP56/T1	13581	98.37	99.58	10301	98.01	99.8
OP56/T2	4140	98.64	99.32	1661	98.97	99.75
OP57/T1	2719	99.08	99.92	1275	98.19	99.52
OP58/T1	2727	99	99.7	2247	98.88	99.37
OP59/T1	432	99.53	100	743	99.19	100

Table 6 presents ADS-C Downlink Latency for messages sent within Urumqi FIR (ZWWW) by different media type and GES for the period Jan.2019 to Dec. 2019.

Table 5 ADS-C Performance by Operator in ZLLL

FIR	ZLLL					
Criteria	RSP180					
Period	Jan-June 2019			July-December 2019		
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)						
OP1/T1				101	97.02	98.01
OP2/T1	733	99.45	100	496	99.79	100
OP2/T2				224	99.1	100
OP3/T1	2190	98.63	99.31	486	97.73	98.76
OP3/T2	3122	98.59	99.42	1583	99.05	99.74
OP4/T1				291	99.31	99.31
OP5/T1	968	99.58	99.89	160	100	100
OP5/T2	1170	94.95	98.71	302	96.35	99.33
OP5/T3	101	95.04	98.01			
OP6/T1	933	98.49	100	1348	97.77	100
OP6/T2	1324	94.71	99.84	2649	93.05	99.58
OP6/T3	117	99.14	100	186	98.38	99.46
OP7/T1				118	100	100
OP8/T1	481	97.5	98.96	476	97.05	98.1
OP8/T2	5300	98.26	99.79	5727	97.99	99.23
OP9/T1	735	99.72	99.86	340	99.7	100
OP9/T2	207	98.06	100	176	99.43	100

OP10/T1	7773	99.26	99.94	7100	99.43	99.92
OP11/T1	323	99.69	100	122	100	100
OP11/T2				123	95.12	98.37
OP11/T3	389	98.71	99.74	189	98.41	100
OP12/T1	455	99.12	100	663	99.69	99.84
OP12/T2	487	98.97	100	176	98.86	100
OP13/T1				271	98.52	98.52
OP14/T1	1559	96.47	99.87	1375	97.01	99.34
OP15/T1				119	98.31	100
OP15/T2	2355	97.36	99.83	2139	97.19	99.39
OP16/T1	1088	98.43	99.9	1280	98.98	100
OP17/T1	7356	98.38	99.23	6786	97.3	98.52
OP17/T2	13067	98.95	99.9	10020	99.17	99.92
OP18/T1	15062	98.76	99.94	11804	98.75	99.95
OP18/T2	571	98.59	99.82	717	99.02	99.86
OP18/T3	843	97.98	99.16	714	98.59	99.15
OP18/T4	583	95.19	98.97	454	94.27	96.91
OP18/T5	40234	96.59	98.93	31029	96.36	98.65
OP19/T1	2132	99.62	99.95	1948	99.33	99.94
OP20/T1				491	99.59	100
OP21/T1	5486	98.39	99.92	5968	98.59	100
OP21/T2	13298	97.56	99.95	10367	97.67	99.97
OP21/T3	6917	98.48	99.86	5307	98.66	99.86
OP22/T1	231	99.56	100			
OP23/T1	890	96.4	99.1	890	99.43	99.88
OP24/T1				2308	99.65	99.74
OP24/T2				162	98.76	100
OP24/T3	781	98.71	99.61	776	98.19	99.09

OP25/T1	765	98.03	100	650	98.3	100
OP25/T2	130	99.23	100			
OP25/T3	440	99.09	99.77	152	98.02	100
OP25/T4	373	98.65	100	870	99.19	99.77
OP25/T5	2146	98.55	99.3	2843	97.99	99.05
OP26/T1	661	99.84	100	637	99.68	100
OP27/T1	18198	95.32	98.6	23634	95.37	98.41
OP28/T1	3053	99.73	99.9	1101	99.81	100
OP28/T2	5310	98.51	99.96	3890	98.74	99.94
OP29/T1	876	99.2	99.88	1040	98.36	100
OP29/T2	6360	97.46	99.65	3251	96.49	98.95
OP30/T1	1295	98.3	99.61	1679	97.91	99.46
OP30/T2	491	98.16	99.79	192	97.39	98.95
OP31/T1	470	99.36	100	593	98.48	99.66
OP32/T1	502	98.8	99.8	115	100	100
OP33/T1	1719	98.25	99.01	1275	98.5	99.29
OP34/T1	1432	98.32	99.86	1713	98.07	99.7
OP34/T2	1035	99.42	99.9	216	100	100
OP34/T3	221	99.54	100	164	100	100
OP34/T4	1962	97.91	98.47	377	98.14	98.67
OP34/T5	544	96.69	98.89	880	98.63	99.09
OP34/T6				111	100	100
OP34/T7	115	99.13	99.13			
OP34/T8	142	98.59	100			
OP34/T9	268	97.01	98.13	403	99.25	100
OP34/T10	117	97.43	98.29			
OP34/T11	496	97.98	99.59	279	98.92	99.64
OP34/T12	312	98.71	100	190	98.94	100

OP35/T1	4351	98.39	99.9	1895	98.15	99.89
OP35/T2	225	97.77	100	513	99.22	100
OP35/T3	346	99.13	99.71	386	98.96	99.48
OP35/T4	7090	97.88	99.57	9248	98.36	99.71
OP35/T5				206	99.51	100
OP35/T6	282	97.16	99.64	435	99.08	100
OP36/T1	3657	97.29	99.26	2236	96.6	99.06
OP36/T2	7710	94.42	99.75	9055	94.75	99.79
OP36/T3	3347	95.87	99.7	4650	96.34	99.95
OP36/T4	1126	98.84	99.64	2709	98.41	99.18
OP37/T1				802	99.25	99.75
OP38/T1	140	100	100	237	100	100
OP38/T2	420	96.42	99.52	181	98.89	99.44
OP39/T1	419	100	100	299	99.66	100
OP40/T1	968	97.72	99.79	522	99.04	99.61
OP41/T1	3829	98.25	99.71	1763	97.22	99.48
OP41/T2	600	97.83	99	250	98.8	99.6
OP42/T1	190	98.94	99.47	152	94.73	98.02
OP42/T2				207	99.51	100
OP43/T1	112	100	100			
OP44/T1	161	100	100			
OP44/T2				175	99.42	99.42
OP45/T1	1500	98.73	99.4	215	99.06	99.06
OP45/T2	506	98.22	98.41	344	100	100
OP45/T3				142	100	100
OP45/T4	2171	98.01	99.72	1829	98.63	99.72
OP45/T5	13027	97.39	99.14	14946	97.27	99.04
OP46/T1	473	97.46	98.3	182	96.15	96.7

OP47/T1	2378	99.28	100	398	99.24	100
OP47/T2	360	98.33	99.72	102	100	100
OP48/T1	2806	96.61	99.21	2388	97.31	99.62
OP49/T1	109	99.08	100			
OP50/T1	182	99.45	100			
OP50/T2	222	99.54	100	319	99.68	100
OP51/T1	949	98.41	99.89	1072	98.6	99.81
OP52/T1	137	96.35	98.54			
OP53/T1	8685	99.5	99.7	8794	99.73	99.88
OP53/T2	5816	98.41	99.69	5253	98.93	99.54
OP53/T3	30233	98.46	99.67	21165	98.65	99.78
OP54/T1	23709	99.04	99.96	24732	99.21	99.93
OP54/T2				121	94.21	97.52
OP54/T3	301	98.33	100	321	100	100
OP54/T4	822	98.78	99.75	404	99.5	100
OP55/T1	413	95.88	99.75	503	97.81	100
OP56/T1	13581	98.37	99.58	10301	98.01	99.8
OP56/T2	4140	98.64	99.32	1661	98.97	99.75
OP57/T1	2719	99.08	99.92	1275	98.19	99.52
OP58/T1	2727	99	99.7	2247	98.88	99.37
OP59/T1	432	99.53	100	743	99.19	100

Table 6 ADS-C Performance by Operator in ZWWW

FIR	ZWWW					
Criteria	RSP180					
Period	Jan-June 2019			July-December 2019		
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)						
OP1/T1	657	99.69	100	366	99.72	99.72
OP1/T2	166	99.39	100	287	98.25	100
OP2/T1	697	98.27	98.85	129	97.67	98.44
OP2/T2	1627	98.03	99.38	1142	99.12	99.82
OP3/T1	908	97.9	100	594	98.48	100
OP3/T2	1084	94.37	99.44	1595	94.29	99.74
OP4/T1	470	98.08	98.51	333	94.89	96.69
OP4/T2	2896	98.65	99.86	2690	98.51	99.55
OP5/T1	442	99.77	99.77	425	99.05	100
OP5/T2	233	100	100	179	100	100
OP6/T1	2912	99.17	99.89	2437	99.34	99.75
OP7/T1	334	98.5	99.7	170	99.41	100
OP7/T2	540	96.85	99.81	351	99.14	100
OP8/T1	1666	99.27	99.93	1460	99.65	100
OP8/T2	1683	99.16	99.88	960	99.58	100
OP9/T1	1030	97.86	99.61	1109	98.28	99.81
OP10/T1	359	98.6	99.72	483	98.96	100
OP11/T1				325	98.76	99.07
OP12/T1	3198	98.4	99.09	2661	97.63	98.83
OP12/T2	5912	98.95	99.96	4719	99.1	99.91

OP13/T1	7162	99.24	99.95	5870	99.21	99.94
OP13/T2	303	98.01	100	404	99	99.75
OP13/T3	402	98.25	99	328	98.78	99.39
OP13/T4	282	95.39	97.51	289	95.5	98.61
OP13/T5	19491	96.91	98.9	14995	96.49	98.74
OP14/T1	1221	99.91	100	1238	99.27	99.67
OP15/T1	2248	99.02	100	2112	98.86	99.95
OP15/T2	4424	97.46	100	3788	98.12	99.94
OP15/T3	2375	99.03	99.91	2077	99.13	99.95
OP16/T1				589	99.49	99.83
OP17/T1	136	100	100			
OP18/T1	425	95.29	99.52	767	99.47	100
OP19/T1	564	99.82	99.82	580	98.79	99.31
OP19/T2				1491	99.53	99.66
OP19/T3				130	99.23	100
OP20/T1	596	96.64	100	599	98.33	100
OP20/T2	276	98.55	99.63	240	99.16	100
OP20/T3	639	99.37	99.37	277	98.91	99.63
OP20/T4	807	99.25	99.87	1290	98.44	99.76
OP20/T5	2695	98.73	99.51	3533	98.75	99.54
OP21/T1	769	99.73	100	570	100	100
OP22T1	9787	95.84	98.78	11777	95.96	98.59
OP23/T1	1186	98.31	100	1374	98.9	99.78
OP24/T1	479	98.74	100	550	98.54	100
OP25/T1	2084	98.27	99.95	1010	96.53	99.8
OP26/T1	1683	98.81	99.94	1675	98.14	99.7
OP26/T2	322	99.06	100	283	99.29	100
OP27/T1	256	99.21	99.6	366	98.08	99.18
OP28/T1	400	97.75	98.25	382	98.42	99.73

OP29/T1	550	98.9	100	770	98.44	99.74
OP29/T2	138	99.27	100	112	99.1	100
OP29/T3	732	98.22	98.77			
OP29/T4	183	97.26	99.45	344	99.7	100
OP29/T5	194	96.9	99.48	373	97.31	99.19
OP29/T6	279	98.56	100	299	98.66	99.66
OP29/T7	240	98.75	99.16			
OP29/T8				104	97.11	100
OP30/T1	3269	97.79	99.9	1840	98.09	100
OP30/T2	800	98.62	99.87	655	98.93	99.84
OP30/T3	3960	98.28	99.36	5615	98.3	99.69
OP30/T4	132	97.72	100	318	98.11	100
OP30/T5				149	99.32	100
OP30/T6				322	99.37	100
OP31/T1	1650	96.48	99.45	1092	96.79	99.17
OP31/T2	3495	95.53	99.65	3947	95.13	99.69
OP31/T3	1288	96.04	99.68	1926	97.19	99.94
OP31/T4	440	98.86	99.54	1022	98.33	99.7
OP32/T1	116	97.41	100	146	98.63	100
OP32/T2	398	98.74	99.74	220	99.09	100
OP33/T1	249	100	100	147	100	100
OP34/T1				543	98.52	99.63
OP35/T1	2963	98.85	99.76	1634	98.4	99.87
OP35/T2	520	99.03	99.61	272	100	100
OP36/T1	220	96.36	97.27	242	97.1	98.34
OP36/T2				137	100	100
OP35/T2	722	99.16	99.72	118	99.15	100
OP37/T1	206	95.63	96.6	242	100	100
OP37/T2	1281	97.97	99.53	824	98.66	100

OP37/T3	8534	97.71	99.27	11117	96.96	99.18
OP38/T1	374	97.59	98.12	102	99.01	99.01
OP39/T1	1471	96.39	98.64	1049	97.23	99.33
OP40/T1	247	99.59	100			
OP40/T2	486	98.97	100	409	99.51	100
OP41/T1	788	98.35	99.87	313	97.76	99.36
OP42/T1	3610	99.44	99.77	4003	99.75	99.85
OP42/T2	4738	98.58	99.72	3229	98.35	99.13
OP42/T3	23357	98.32	99.67	17805	98.74	99.82
OP43/T1	18446	98.38	99.95	21102	98.84	99.94
OP43/T2	112	99.1	99.1	131	96.18	99.23
OP43/T3	388	98.45	100	256	99.21	99.6
OP43/T4	985	98.68	99.89	834	98.8	100
OP44/T1	6104	98.23	99.63	4896	98.22	99.73
OP44/T2	1971	98.47	99.44	598	97.32	99.16
OP45/T1	2750	98.98	99.81	1555	98.39	99.42
OP46/T1	2091	99.09	99.71	1633	99.2	99.51
OP47/T1	334	99.4	100	679	98.82	100

6. CPDLC PERFORMANCE BY MEDIA TYPE / RGS /GES

Table 7 presents the CPDLC actual communications performance (APC) and CPDLC actual communication technical performance (ACTP) for messages sent within Lanzhou FIR (ZLLL) by different media type and GES for the period Jan.2019 to Dec. 2019.

Table 8 presents the CPDLC actual communications performance (APC) and CPDLC actual communication technical performance (ACTP) for messages sent within Urumqi FIR (ZWWW) by different media type and GES for the period Jan.2019 to Dec. 2019.

Table 7 CPDLC Performance by Media Type in ZLLL

FIR		ZLLL									
Criteria		RCP240									
Period		Jan - Jun 2019					Jul - Dec 2019				
Colour Key Meets Criteria 99.0%-99.84% 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
By Media Type											
VHF		808	99.38	99.5	99.38	99.5	912	99.56	99.67	99.56	99.78
SV		470	98.93	98.51	98.93	98.72	412	99.27	98.05	99.75	99.27
SAT		1502	99.13	97.93	99.53	98.8	1704	99.23	98.29	99.41	99.06
By Remote Ground Station (RGS) Ground Earth Station (GES)											
Designator	Type	(RGS/GES with message counts >100)									
GES1	SAT	611	98.85	99.01	99.5	99.01	930	98.92	98.92	99.03	99.13
GES2	SAT	177	97.74	92.09	98.3	94.91	111	100	92.79	100	98.19
GES3	SAT	299	100	97.65	100	99.66	292	99.31	96.57	100	98.28
GES4	SAT	235	100	99.57	100	99.57	224	100	100	100	100
GES5	SV	210	100	100	100	100	204	100	100	100	100
GES6	VHF	165	98.18	98.18	98.18	98.18	155	99.35	99.35	99.35	99.35
GES7	VHF	277	100	100	100	100	430	99.3	99.53	99.3	99.76
GES8	VHF	358	99.44	99.72	99.44	99.72	320	100	100	100	100
GES9	SAT	130	98.46	100	99.23	100					

GES10	SV	128	96.87	95.31	96.87	95.31					

Table 8 CPDLC Performance by Media Type in ZWWW

FIR		ZWWW									
Criteria		RCP240									
Period		Jan - Jun 2019					Jul - Dec 2019				
Colour Key Meets Criteria 99.0%-99.84% 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
By Media Type											
SAT		420	97.61	95.23	98.33	96.42	309	98.7	96.76	99.35	97.41
SV		295	98.98	98.98	98.98	98.98	202	100	99	100	99.5
	By Remote Ground Station (RGS) Ground Earth Station (GES)										
Designator	Type	(RGS/GES with message counts >100)									
GES1	SAT	123	98.37	100	98.37	100	124	100	99.19	100	100
GES2	SV	162	99.38	100	99.38	100	113	100	99.11	100	100

7. CPDLC PERFORMANCE BY OPERATOR

8.

Table **9** presents the CPDLC actual communications performance (APC) and CPDLC actual communication technical performance (ACTP) for messages sent within Lanzhou FIR (ZLLL) by operator/type for the period Jan.2019 to Dec. 2019.

9. FIR	ZLLL											
Criteria	RCP240											
Period	Jan - Jun 2019						Jul - Dec 2019					
Colour Key Meets Criteria 99.0%-99.84% 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
By Aircraft Operator / Type (only message counts >100 recorded)												
OP1/T1	222	99.09	96.84	99.09	97.74	99.09	121	98.34	95.86	99.17	100	98.34
OP2/T1	125	100	99.2	100	100	100	106	98.11	94.33	100	95.28	100
OP2/T2	269	100	97.39	100	99.62	100	232	100	99.13	100	99.56	100
OP2/T3	126	100	100	100	100	100	135	100	98.51	100	100	100
OP3/T1	308	98.7	96.42	98.7	97.07	99.02	294	98.29	96.25	98.29	97.95	98.63
OP3/T2	125	100	100	100	100	99.2	137	100	100	100	100	100
OP4/T1	182	100	100	100	100	100	141	100	100	100	100	100
OP4/T2							110	97.27	98.18	97.27	98.18	93.63
OP5/T1	138	100	100	100	100	100						
/	652	99.07	98.92	99.38	99.23	99.38	1120	99.37	98.66	99.46	99.19	99.19

Table 10 presents the CPDLC actual communications performance (APC) and CPDLC actual communication technical performance (ACTP) for messages sent within Urumqi FIR (ZWWW) by operator/type for the period Jan.2019 to Dec. 2019.

Table 9 CPDLC Performance by Operator/Type in ZLLL

FIR	ZLLL											
Criteria	RCP240											
Period	Jan - Jun 2019						Jul - Dec 2019					
Colour Key Meets Criteria 99.0%-99.84% 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
By Aircraft Operator / Type (only message counts >100 recorded)												
OP1/T1	222	99.09	96.84	99.09	97.74	99.09	121	98.34	95.86	99.17	100	98.34
OP2/T1	125	100	99.2	100	100	100	106	98.11	94.33	100	95.28	100
OP2/T2	269	100	97.39	100	99.62	100	232	100	99.13	100	99.56	100
OP2/T3	126	100	100	100	100	100	135	100	98.51	100	100	100
OP3/T1	308	98.7	96.42	98.7	97.07	99.02	294	98.29	96.25	98.29	97.95	98.63
OP3/T2	125	100	100	100	100	99.2	137	100	100	100	100	100
OP4/T1	182	100	100	100	100	100	141	100	100	100	100	100
OP4/T2							110	97.27	98.18	97.27	98.18	93.63
OP5/T1	138	100	100	100	100	100						
/	652	99.07	98.92	99.38	99.23	99.38	1120	99.37	98.66	99.46	99.19	99.19

Table 10 CPDLC Performance by Operator/Type in ZWWW

FIR	ZWWW											
Criteria	RCP240											
Period	Jan - Jun 2019						Jul - Dec 2019					
Colour Key Meets Criteria 99.0%-99.84% 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
By Aircraft Operator / Type (only message counts >100 recorded)												
OP1/T1	138	99.27	100	99.27	100	95.65	107	100	98.13	100	100	100
/	144	97.91	99.3	97.91	99.3	97.91	158	98.73	97.46	99.36	98.1	97.46