

Agenda Item #3

NZZO Feedback

ISPACG 36 - FIT 29
Virtual meeting
2100 UTC, 11-12 August 2022



1

| ISPACG FIT 29 2022



AIRWAYS
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CRA Website



CRA website

- CRA website at <https://www.fans-cra.com>
- On 5 August 2022 we had 2882 active accounts on the website.
 - Manufacturer: 21
 - CSP: 13
 - ANSP & CAA: 61
 - Aircraft Operator: 2777
 - CRA: 9
 - Website Administration: 1
- PBCS Charter membership is 2135

PBCS



PBCS status

Airline	Type	PBCS
ACA	B789	Y
ANZ	A20N	Y
ANZ	A21N	Y
ANZ	B77W	Y
ANZ	B789	Y
CAL	A359	Y
CES	A332	Y
CKS	B77L	Y
CPA	A359	Y
CPA	A35K	Y
CSN	B789	Y
DAL	A359	Y
FDX	B77L	Y
FJI	A332	Y
FJI	A359	Y
FJI	B38M	Y
GTI	B744	Y
HAL	A332	Y
KAL	B789	Y
PAC	B748	Y
QFA	B789	Y
QTR	B77L	Y
QTR	B77W	Y
SIA	A359	Y
THT	B789	Y
UAE	B77L	Y
UAE	B77W	Y
UAL	B77W	Y
UAL	B789	Y

- 69% of airline fleets and 46% of IGA and military aircraft were filing PBCS RCP240/RSP180 status in FPL during July 2022.

Airline	Type	PBCS
ACI	A20N	N
ACI	A339	N
FJI	A333	N
JST	A332	N
LAN	B789	N
MAS	A332	N
MAS	A359	N
QFA	A332	N
QFA	A333	N
QFA	B763	N
SQC	B744	N
THA	A359	N
TMN	B763	N

Military & IGA	Type	PBCS
ASY	A332	Y
DOD	GLF5	Y
FLC	CL60	Y
IGA13	GLEX	Y
IGA14	GLEX	Y
IGA17	GLF5	Y
IGA19	GLF6	Y
IGA21	GLF6	Y
IGA22	GLEX	Y
IGA4	F900	Y
IGA6	FA7X	Y
IGA7	FA7X	Y
IGA8	GL7T	Y
IGA9	GL7T	Y
QQE	GLF6	Y
VJT	GL7T	Y
ASY	C17	N
AZG	B748	N
BDJ	GLF6	N
DOD	B737	N
IGA1	CL60	N
IGA10	GLEX	N
IGA11	GLEX	N
IGA12	GLEX	N
IGA15	GLF5	N
IGA16	GLF5	N
IGA18	GLF6	N
IGA18	GLF6	N
IGA20	GLF6	N
IGA3	F2TH	N
IGA5	F900	N
KIW	B752	N
KIW	C130	N
NASA	B743	N
PEG	GLF6	N

PBCS status

- A monthly PBCS performance report is provided to the New Zealand CAA.
- The monthly report provides the regulator with:
 - A summary of the performance of all aircraft against RCP240 and RSP180 requirements for the current month and the previous 3 months.
 - A report and data analysis of aircraft not meeting RCP/RSP with recommendations and/or actions taken to resolve the degradation.
- PBCS aircraft not meeting 95% normal operating requirements are reported to RASMAG.



PBCS analysis

- PBCS analysis can be time consuming, and we rely heavily on an on-line tool at <https://pbcsanalysis.herokuapp.com> that assists with the process.
- The tool enables the import and processing of .csv CPDLC and ADS-C data files as specified in ICAO PBCS Manual guidance.
- Users can generate tabular and graphical displays of selected data.
- The tool can also generate combined reports of RCP240 and RSP180 performance for either an operator/aircraft type or individual tail numbers.
- A recent enhancement provides the capability to generate Google Earth plots of ADS-C data from either database selection or imported files.

PBCS analysis – ADS-C Plot from database

Creating ADS-C plots for Google Earth

1. Make selection

Aircraft Company: Aircraft Type: Tail Number: ATSP:

Date From: Date To:

GE points to be generated : 2091

Select CSV File to import: No file chosen

GE points to be generated : Select file to calculate

2. Select range, icon, and colour

File Name:

Latency:

Icon:

Icon Colour:

Icon:

Export GE File (Database)

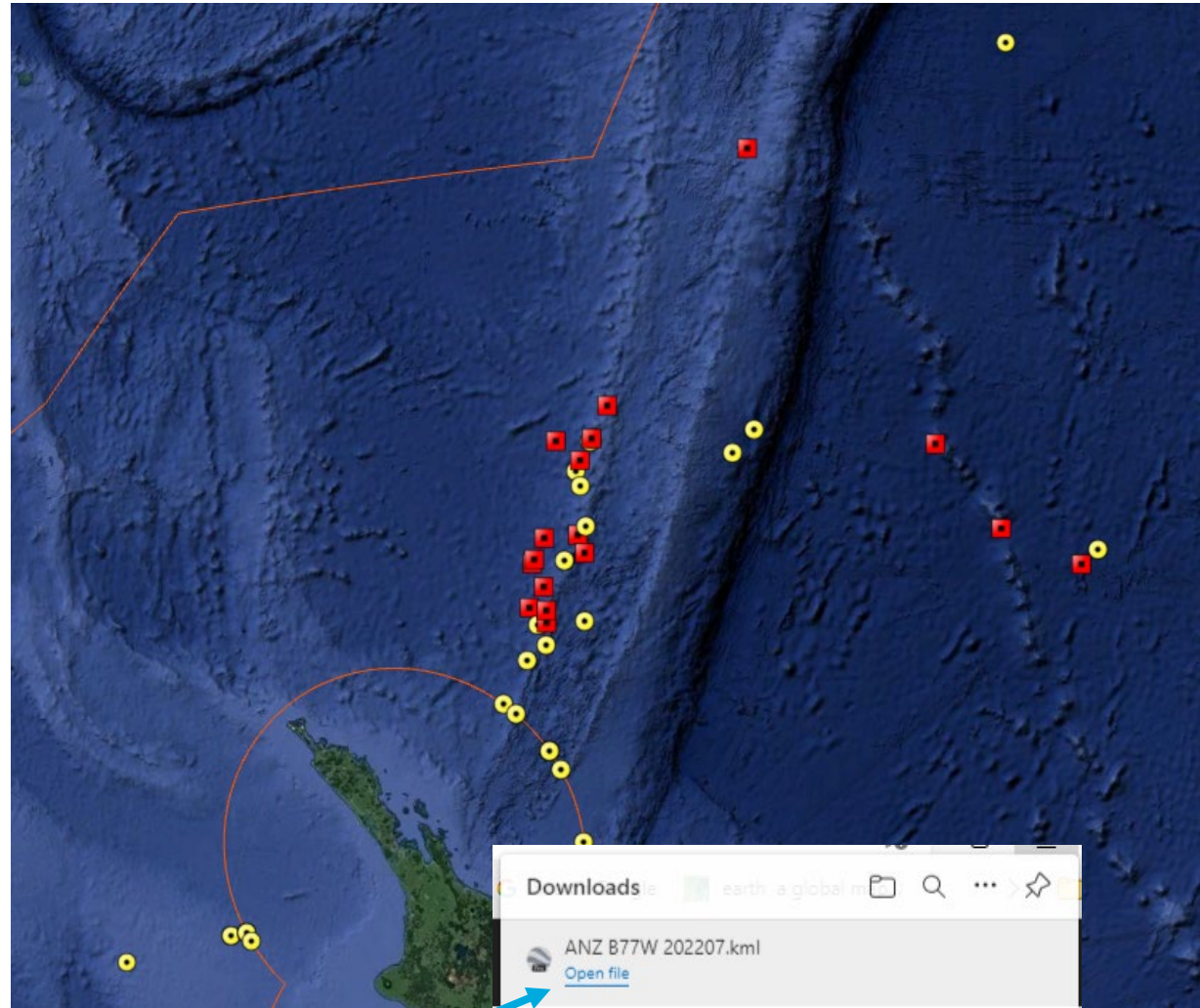
Stop

GE points generated: 45 / 2091 completed.
Preparing for retrieval...

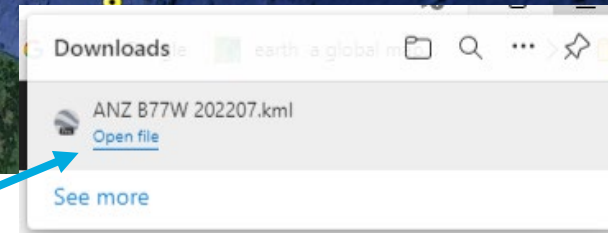
3. Name file and select export

Downloads:

PBCS analysis – ADS-C Plot



4. Open file in Google Earth



PBCS analysis – ADS-C Plot from file

1. Make selection

Select CSV File to import: CPA B748 Iridium 202203_05.csv ☒

GE points to be generated : 6513

File Name	Latency	Icon	Icon Colour	Icon
CPA B748 202203_05 .kmz	Less than 90 (secs)	Circle	Green	
<input type="button" value="Export GE File (CSV)"/>	Between 90 and 180 (secs)	Push Pin	Yellow	
	Greater than 180 (secs)	Paddle	Red	

GE points generated: 6513 / 6513. Ready for download...

2. Select range, icon, and colour

3. Name file and select export

Latency Monitor

- NZZO implemented the latency monitor uplink on 21 June 2018.
- The latency monitor supports PBCS safety requirement #15 on aircraft - mitigating late message receipt at the aircraft.
- The latency monitor message is sent by CPDLC free text when NZZO is confirmed as CDA requesting aircraft set the latency monitor at 300 seconds.
- On receipt of an uplink exceeding the 300 second monitored value Airbus aircraft send a reject message to ATC.
- The 300 second latency value has been used in NZZO for four years. No significant issues have been found since implementation, and we consider our implementation has been successful

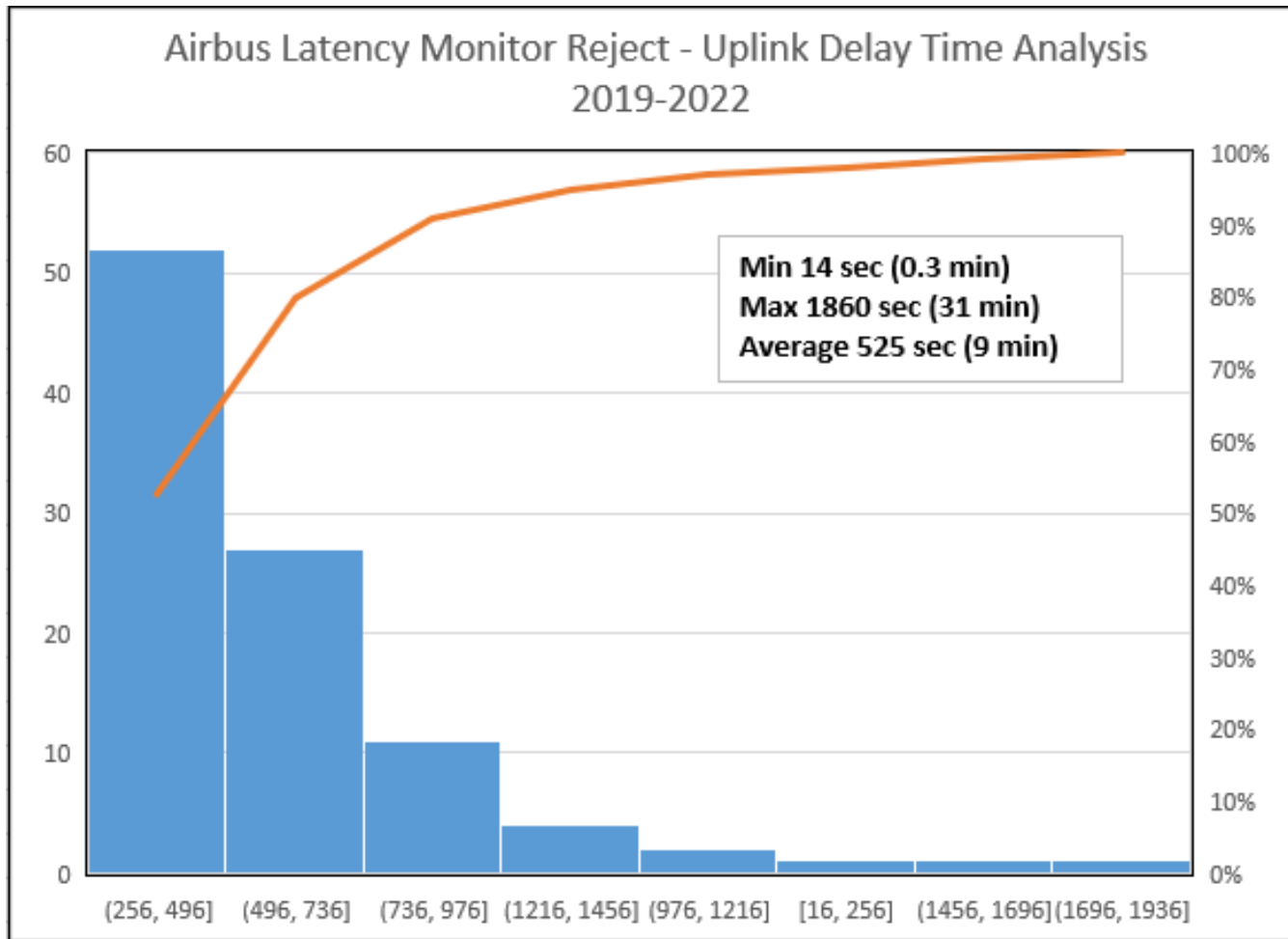
Latency Monitor

- In the year to June 2022, we sent 22,633 latency monitor messages.
- 5% of traffic is responding as unable to set the latency monitor.
- In the 12-month period 106,378 CPDLC messages were initiated with 34,975 (33%) sent to Airbus aircraft.

Month	# Set Latency Monitor	# Monitor not Available	# Rejects
Jul-21	1,908	125	0
Aug-21	1,594	96	0
Sep-21	1,411	83	1
Oct-21	1,537	74	0
Nov-21	1,708	69	0
Dec-21	1,867	62	3
Jan-22	1,709	53	1
Feb-22	1,721	62	3
Mar-22	2,192	100	0
Apr-22	2,319	109	2
May-22	2,384	91	0
Jun-22	2,283	97	10
Total	22633	1021	20
Average	1886	85	2

Note: Two reject messages have been received that had an uplink latency of less than 300 seconds (one with a latency of 14 seconds, the other 16 seconds). These rejects are caused by a software bug where the uplink is sent across the hour and Airbus have confirmed that this bug will be fixed in their software with the CSB10 release scheduled late 2022 or early 2023.

Latency Monitor



Note: Histogram depicts all latency rejects received since implementation in August 2018.

Latency Monitor

- Latency rejects by month and classification

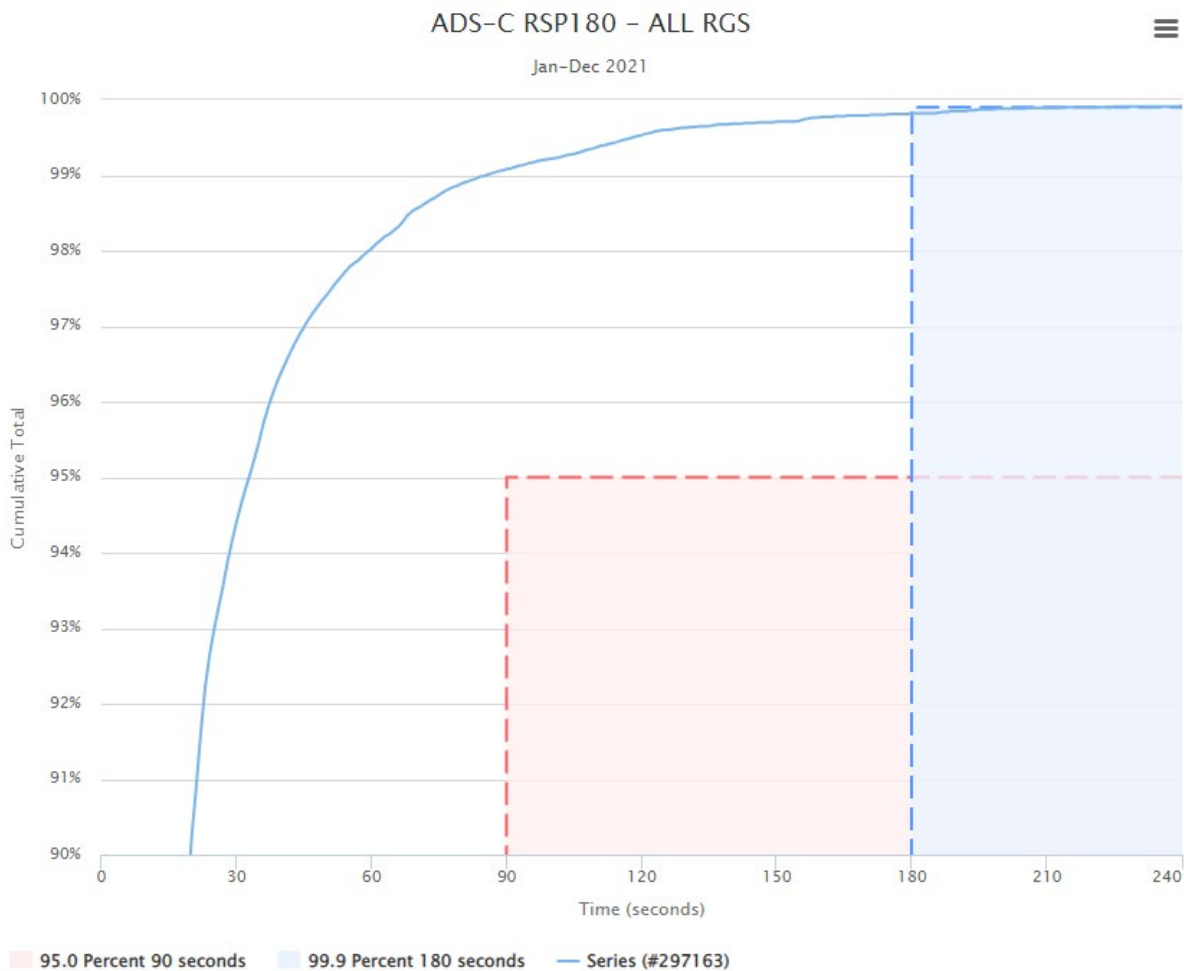
Month	# Rejects	Latency Reject Classification						
		Unknown	Time Source	Inmarsat	Iridium	HFDL no SATCOM	Inmarsat sent HFDL	Unable SATCOM via VDL
Jul-21	0	0	0	0	0	0	0	0
Aug-21	0	0	0	0	0	0	0	0
Sep-21	1	0	0	0	0	0	1	0
Oct-21	0	0	0	0	0	0	0	0
Nov-21	0	0	0	0	0	0	0	0
Dec-21	3	0	0	1	0	0	0	2
Jan-22	1	0	0	1	0	0	0	0
Feb-22	3	0	0	2	0	0	1	0
Mar-22	0	0	0	0	0	0	0	0
Apr-22	2	0	0	0	1	0	1	0
May-22	0	0	0	0	0	0	0	0
Jun-22	10	0	0	5	0	0	5	0
Totals	20	0	0	9	1	0	8	2

The significant number of rejects in June 2022 is because HFDL was used to uplink the CPDLC messages. A CRA problem report determined the cause as a CSP software issue which is now resolved.

Performance

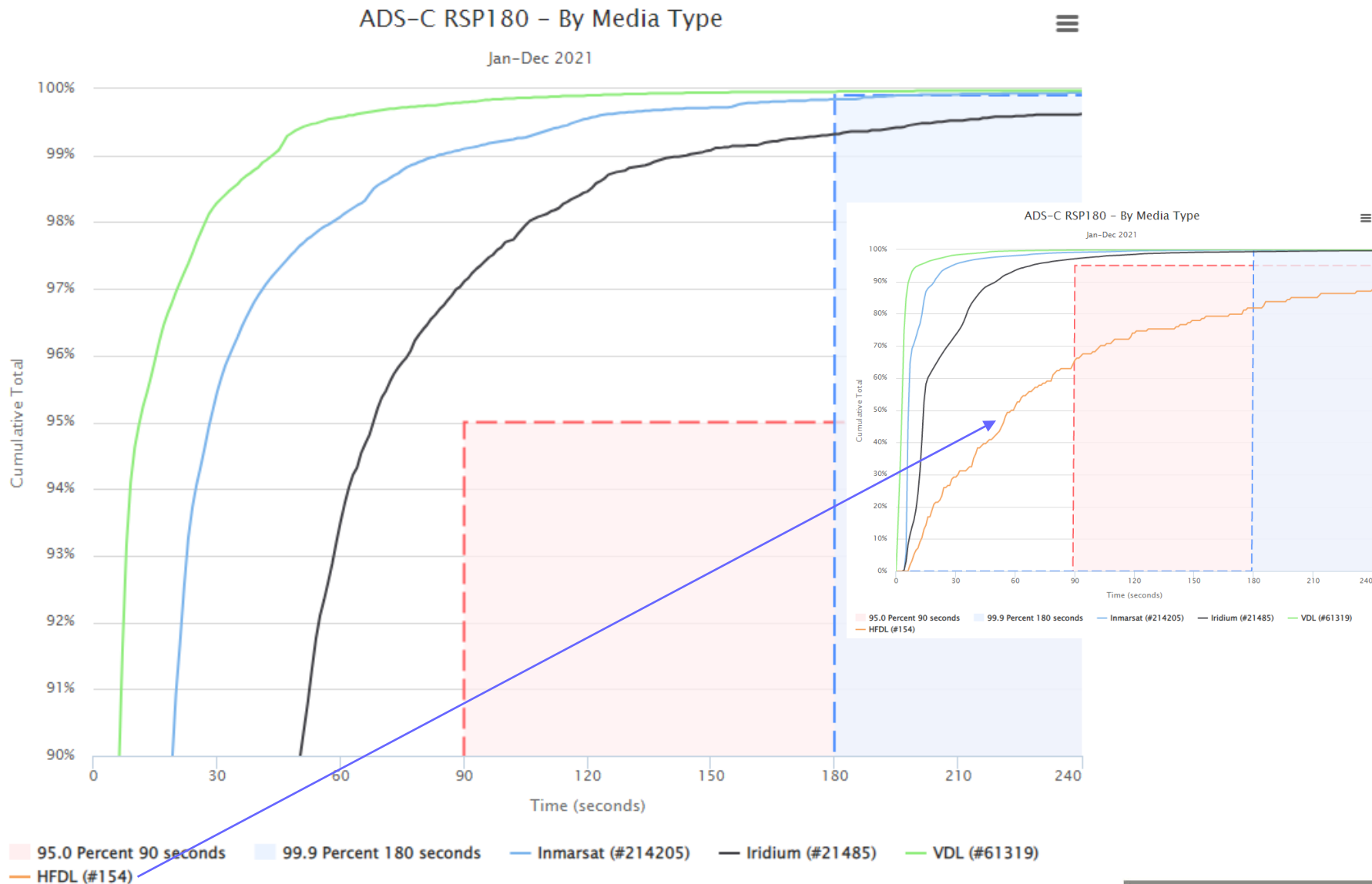


ADS-C RSP180 – All RGS 2021






95% RSP180 Benchmark	99.9% RSP180 Benchmark
RSP <= 90 sec	RSP <= 180 sec
99.08	99.82

ADS-C RSP180 – By Media Type 2021



ADS-C RSP180 – By Media Type 2021

ADS-C Performance								
Colour Key  Meets Criteria  99.0%-99.84%  Under Criteria		Period 1 Jan 2021 - 31 Dec 2021					95% RSP180 Benchmark	99.9% RSP180 Benchmark
Media Type	RGS	Aircraft Type	Operating Company	Tail Number	ATSP	Message Count	RSP <= 90 sec	RSP <= 180 sec
Analysis by ADS-C RSP180 Media Type NZZO								
SATCOM I4	All	All	All	All	NZZO	214205	99.1	99.84
SATCOM Iridium	All	All	All	All	NZZO	21485	97.11	99.32
VHF All	All	All	All	All	NZZO	61319	99.8	99.95
HF All	All	All	All	All	NZZO	154	65.58	81.81
All	All	All	All	All	NZZO	297163	99.08	99.82

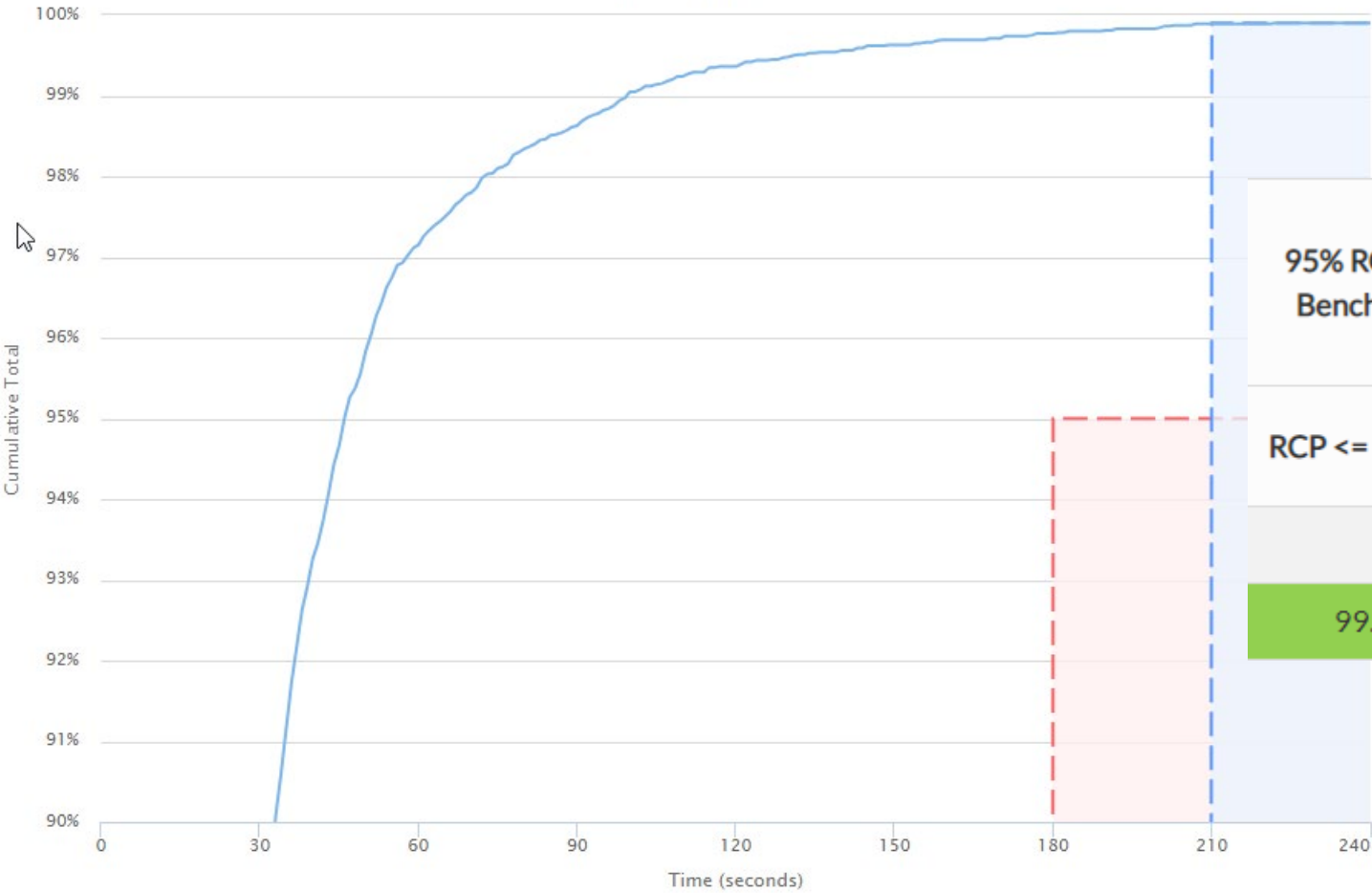
ADS-C RSP180 – By Operating Company and Aircraft Type

ADS-C Performance RSP180 - Top 20 by message count									
Period 1 Jan 2021 - 31 Dec 2021					Period 1 Jan 2022 - 31 Jun 2022				
Operating Company	Aircraft Type	Message Count	RSP<=90 sec	RSP<=180 sec	Operating Company	Aircraft Type	Message Count	RSP<=90 sec	RSP<=180 sec
QFA	B763	2955	98.92%	99.90%	FJI	B38M	2574	97.28%	98.33%
QTR	B77W	3220	99.57%	99.91%	QFA	A333	2808	99.29%	99.68%
ACA	B77W	3657	99.37%	99.67%	TMN	B763	3505	96.75%	98.60%
AAL	B77W	4259	99.53%	99.72%	UAE	B77W	3611	98.92%	99.92%
FJI	A359	4467	99.51%	99.98%	CAL	A359	3615	99.92%	100.00%
CSN	B789	4513	99.96%	100.00%	LAN	B789	3640	99.26%	99.86%
QFA	A332	5410	99.45%	99.70%	QFA	A388	3656	100.00%	100.00%
CAL	A359	5858	99.91%	100.00%	FJI	A359	4012	99.20%	99.93%
QFA	B789	6230	99.89%	99.98%	ANZ	B77W	4022	98.33%	99.23%
TMN	B763	6879	96.98%	98.62%	QFA	A332	4122	99.34%	99.68%
QFA	A333	6986	99.36%	99.70%	AAL	B789	4454	99.93%	100.00%
AAL	B789	7122	99.99%	100.00%	CKS	B77L	4717	99.36%	99.72%
UAE	B77W	7754	98.99%	99.99%	UAL	B789	5478	99.89%	99.98%
DAL	A359	9459	99.42%	99.83%	ANZ	A20N	5665	98.34%	99.91%
ANZ	A20N	9803	97.03%	99.08%	DAL	A359	5957	99.45%	99.97%
CKS	B77L	9942	99.26%	99.66%	UAL	B77W	6233	99.65%	99.98%
ANZ	A21N	11537	98.11%	99.75%	SIA	A359	6507	99.82%	99.98%
SIA	A359	12980	99.81%	99.98%	ANZ	A21N	9200	98.88%	99.80%
UAL	B789	23812	99.94%	99.99%	QFA	B789	12260	99.81%	99.99%
ANZ	B789	107000	99.08%	99.97%	ANZ	B789	66420	99.13%	99.97%

CPDLC RCP240 – Actual Communications Performance (ACP) – All RGS 2021

CPDLC RCP240 – ALL RGS

Jan-Dec 2021

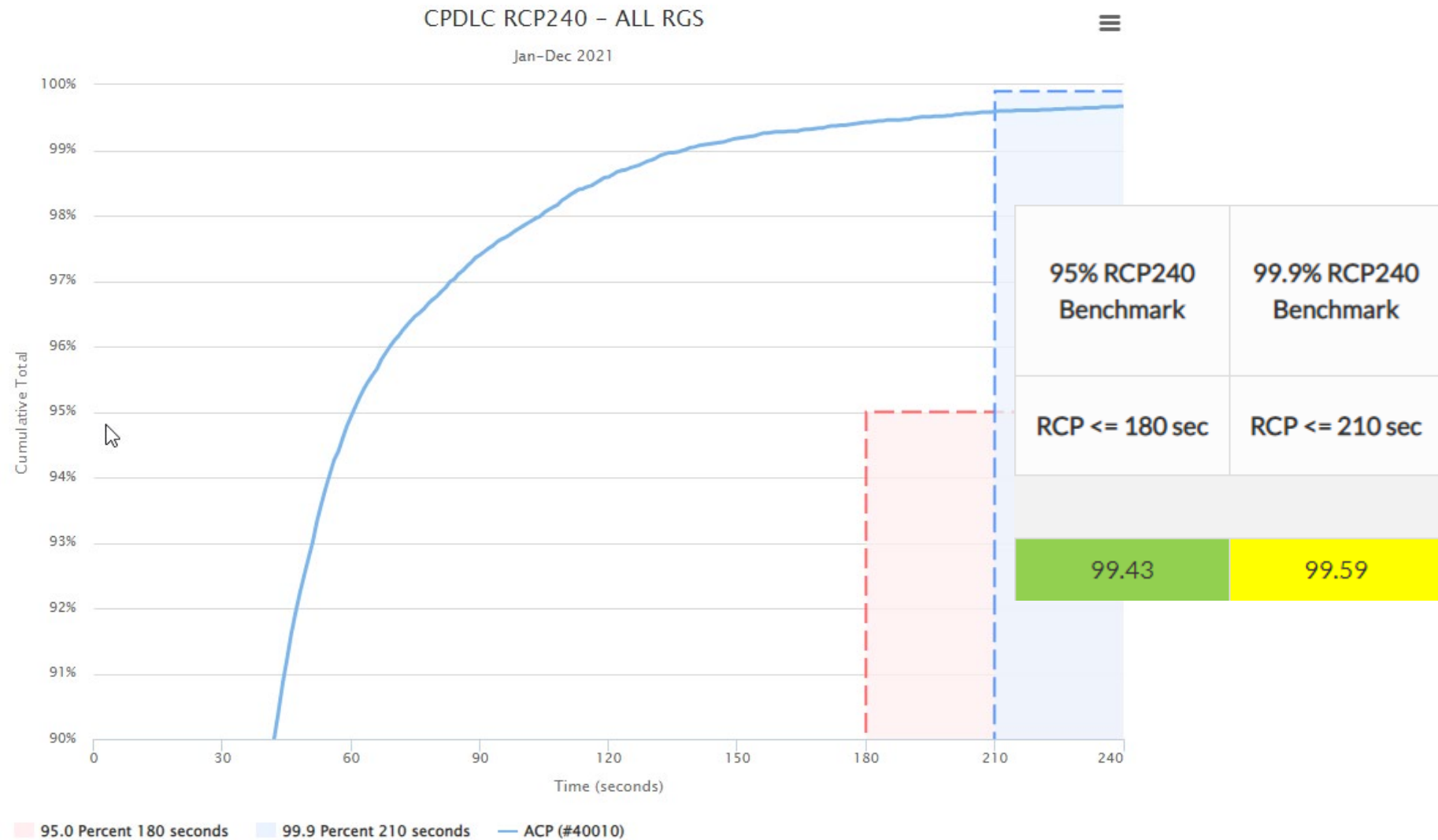


95% RCP240 Benchmark	99.9% RCP240 Benchmark
RCP <= 180 sec	RCP <= 210 sec
99.77	99.89

95.0 Percent 180 seconds 99.9 Percent 210 seconds ACP (#6653)



CPDLC RCP240 – Actual Communications Performance (ACP) – All RGS 2021



CPDLC RCP240 – Actual Communications Performance – 2021- By Operator and Type (top 20)

CPDLC Performance RCP240 - Top 20 by message count									
Period 1 Jan 2021 - 31 Dec 2021 (ALL OPERATIONAL RESPONSES)					Period 1 Jan 2021 - 31 Dec 2021 (INTERVENTION RESPONSES)				
Operating Company	Aircraft Type	Message Count	RCP<=180 sec	RCP<=210 sec	Operating Company	Aircraft Type	Message Count	RCP<=180 sec	RCP<=210 sec
SQC	B744	440	99.54%	99.54%	SQC	B744	28	100.00%	100.00%
QFA	B763	478	100.00%	100.00%	QFA	B763	32	100.00%	100.00%
QTR	B77W	487	97.33%	97.74%	QTR	B77W	34	100.00%	100.00%
AAL	B77W	495	99.59%	99.59%	AAL	B77W	141	100.00%	100.00%
AAL	B789	600	100.00%	100.00%	AAL	B789	210	100.00%	100.00%
FJI	A359	695	100.00%	100.00%	FJI	A359	91	100.00%	100.00%
CSN	B789	712	99.71%	99.85%	CSN	B789	82	100.00%	100.00%
QFA	B789	742	99.86%	100.00%	QFA	B789	149	100.00%	100.00%
QFA	A332	866	98.84%	99.42%	QFA	A332	51	98.04%	100.00%
CAL	A359	882	99.77%	99.88%	CAL	A359	43	100.00%	100.00%
CKS	B77L	1023	99.51%	99.51%	CKS	B77L	203	100.00%	100.00%
QFA	A333	1031	98.73%	98.93%	QFA	A333	85	100.00%	100.00%
DAL	A359	1139	99.56%	99.73%	DAL	A359	393	100.00%	100.00%
TMN	B763	1182	99.15%	99.23%	TMN	B763	75	100.00%	100.00%
ANZ	A20N	1214	98.10%	98.51%	ANZ	A20N	133	100.00%	100.00%
UAE	B77W	1222	99.59%	99.67%	UAE	B77W	109	100.00%	100.00%
ANZ	A21N	1382	98.33%	98.62%	ANZ	A21N	229	99.56%	99.56%
UAL	B789	2749	100.00%	100.00%	UAL	B789	840	100.00%	100.00%
SIA	A359	2873	99.65%	99.68%	SIA	A359	204	99.51%	99.51%
ANZ	B789	13720	99.72%	99.89%	ANZ	B789	2600	99.81%	99.96%

CPDLC RCP240 – Actual Communications Performance – 2022- By Operator and Type(top 20)

CPDLC Performance RCP240 - Top 20 by message count									
Period 1 Jan 2022 - 31 Jun 2022 (ALL OPERATIONAL RESPONSES)					Period 1 Jan 2022 - 31 Jun 2022 (INTERVENTION RESPONSES)				
Operating Company	Aircraft Type	Message Count	RCP<=180 sec	RCP<=210 sec	Operating Company	Aircraft Type	Message Count	RCP<=180 sec	RCP<=210 sec
FJI	A333	499	99.20%	99.60%	FJI	A333	26	100.00%	100.00%
FJI	B38M	537	96.65%	97.39%	FJI	B38M	61	91.80%	95.08%
QFA	A388	561	100.00%	100.00%	QFA	A388	103	100.00%	100.00%
ANZ	B77W	685	99.56%	99.71%	ANZ	B77W	161	100.00%	100.00%
CAL	A359	695	98.27%	98.56%	CAL	A359	26	100.00%	100.00%
QFA	A333	707	99.58%	99.58%	QFA	A333	46	100.00%	100.00%
QFA	A332	756	98.94%	99.47%	QFA	A332	77	98.70%	98.70%
AAL	B789	760	99.74%	99.74%	AAL	B789	143	100.00%	100.00%
CKS	B77L	761	99.47%	99.61%	CKS	B77L	86	100.00%	100.00%
FJI	A359	826	100.00%	100.00%	FJI	A359	107	100.00%	100.00%
TMN	B763	843	98.81%	99.29%	TMN	B763	33	100.00%	100.00%
UAL	B77W	875	99.54%	99.54%	UAL	B77W	237	99.16%	99.16%
UAL	B789	894	99.89%	99.89%	UAL	B789	216	100.00%	100.00%
DAL	A359	1014	99.21%	99.41%	DAL	A359	239	99.58%	100.00%
UAL	B77W	1089	99.17%	99.27%	UAL	B77W	237	99.16%	99.16%
ANZ	A20N	1175	98.81%	99.06%	ANZ	A20N	74	98.65%	100.00%
SIA	A359	1487	97.24%	97.98%	SIA	A359	97	97.94%	97.94%
QFA	B789	1813	100.00%	100.00%	QFA	B789	370	100.00%	100.00%
ANZ	A21N	1946	98.92%	99.28%	ANZ	A21N	160	100.00%	100.00%
ANZ	B789	12114	99.57%	99.84%	ANZ	B789	1892	99.89%	99.95%

Availability



Availability

- RCP240/RSP180 specifications call for a safety availability of 0.999. This is specified as a:
 - ☐ Maximum of *48* unplanned outages
 - ☐ Maximum accumulated outage of *520* minutes
 - ☐ Unplanned outage notification within *5* minutes
- In 2021 an assessment based on reported outages to NZZO that could have operational impact in NZZO shows:
 - ☐ *26* unplanned outages
 - ☐ The accumulated outage was *2280* minutes
 - ☐ Outage notification delay was variable ranging between 11 minutes and 9 hours.
- A review of the 2021 outages and assessing if an operational impact was felt in NZZO shows:
 - ☐ *4* unplanned outages had operational impact
 - ☐ The accumulated outage time where there was operational impact was *280* minutes.

Thank you

