



Data link Network Operational Status Report

November 2021

This report is the monthly 'Data link Network Operational Status Report' as identified in the DPMF Report Catalogue available from the [DPMF OneSky team web site](#). It provides a summary of the operational status and technical performance of data link in Europe covering a rolling 12 month period for monthly statistics and a 15 week period for weekly statistics, ending in November 2021.

The report covers three main areas of the datalink operations in Europe:

1. Operational Status
2. Technical Performance
3. VDL Mode 2 Performance

For each of the three areas above different metrics are presented. A detailed definition of the metrics used in this report is available in the DPMF Report Catalogue. In the following report, the identifier for each metric used in the DPMF Report Catalogue is shown in angled brackets e.g. <N-1>.

Notes:

- As soon as new ANSPs are providing LISAT logs to DPMF, the metrics are updated accordingly (sometimes retroactively) and the values presented in this report might evolve from a report to another.
- As from Mid May 2021 this report now includes data from LDZO (Croatia).
- As from April 2021 Collins Aerospace (ARINC) is providing VGS logs for all their users and no longer filter the data provided for specific airlines.
- The performance reports from 2021 onwards assess the technical performance of data link above the level from which each ATSU provides the data link service, using a single level for each Centre as described in https://ext.eurocontrol.int/WikiLink/index.php/Implementation_Status_Table
- As from December 2020 this report now includes data from DSNA (LFEE, LFFF, LFMM, LFRR and LFBB) with data since January 2020.

1. Operational Status

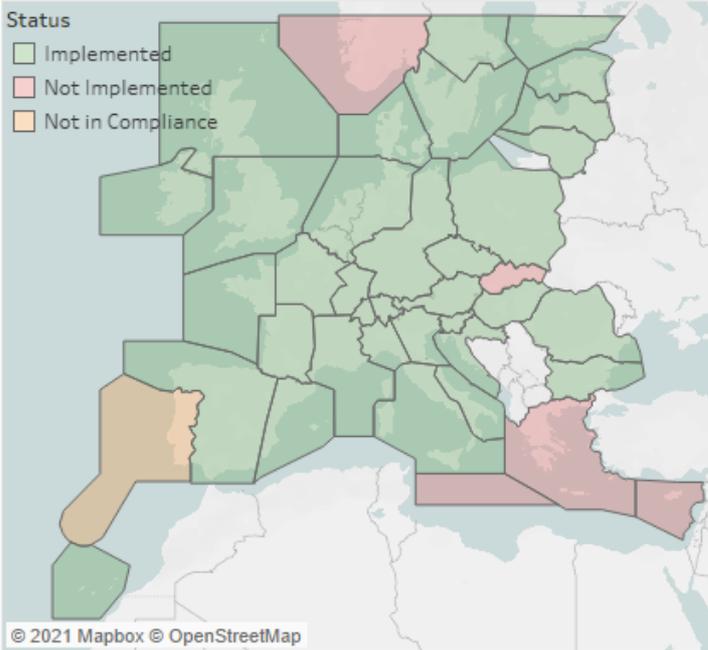
Figure 1-1 on the following page provides a status for each FIR/UIR covered by the DLS IR. The top map shows the operational status of each centre (<N-4>) as of end of the month. The map below shows which centres are providing LISAT data to NM as of end of month. The table on the right shows per centre for the month: i) the number of flights operating above FL285, ii) The Provider Abort rate (only for those centres providing LISAT data to NM), iii) what percentage of flights indicate that they are capable of performing CPDLC over the ATN (i.e. file 'J1') and iv) what percentage of the flights operating above FL285 are actually seen using CPDLC over the ATN

ANSPs with service limitations and operational restrictions

The table below identifies the current service limitations and operational restrictions.

Centre	Current datalink service operational restrictions
Portugal (LPPC)	DLIC service is provided, but ACM, AMC and ACL services are not provided.
France (LFEE, LFFF, LFMM, LFRR, LFBB)	All datalink services are provided with an operational restriction, expected to be lifted in Q2 2022: flight crew clearance requests are not supported and a systematic controller response "Unable" is uplinked.
Germany (EDUU)	Airspace control in the south-eastern part of Germany below FL315 is delegated to Munich ACC (EDMM). In this airspace, datalink services are available only after prior coordination (i.e. when EDUU agrees to take or maintain control of flight). Datalink services are provided only to Logon-List a/c
MUAC (EDYY)	Datalink services are provided only to Logon-List a/c
Switzerland (LSAG, LSAZ)	Datalink services are provided only to Logon-List a/c

Implementation Status



Statistics

ATSU Code	Total Flights	PA Rate	% J1 Capable
EDUU	109371	1.6	79%
EDYY	97907	2.6	79%
EETT	10424		72%
EFIN	6182		76%
EGPX	31591	5.9	77%
EGTT	80862	5.0	76%
EISN	22779		54%
EKDK	25917	8.4	81%
ENOR	15697		87%
EPWW	37888	4.2	83%
ESAA	28762		81%
EVRR	16042	6.2	70%
EYVL	14213		74%
GCCC	20321	62.2	92%
LBSR	39103		79%
LCCC	25990		71%
LDZO	31398	13.0	80%
LECB	36815	6.1	85%
LECM	73604	13.0	87%
LFBB	44143	1.0	84%
LFEE	54117	1.5	81%
LFFF	34702	1.9	76%
LFMM	47316	6.5	80%
LFRR	53834	6.7	84%
LGGG	33143		71%
LHCC	40197		81%
LIBB	18254		78%
LIMM	38423		83%
LIPP	34119		80%
LIRR	37410		83%
LJLA	15517	7.7	81%
LKAA	31761	3.6	81%
LMMM	5185		61%
LOVV	45341	8.7	81%
LPPC	35920		89%
LRBB	33191	3.0	79%
LSAG	25972	1.5	82%
LSAZ	27939	1.5	78%
LZBB	21776		79%

Providing Data to NM

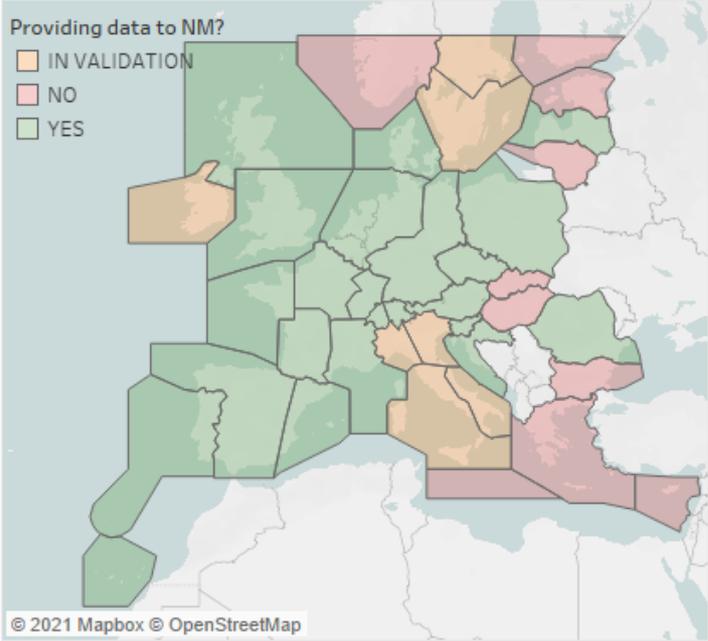


Figure 1-1: Current operational status of data link over the ATN

CPDLC / ATN Flights

Figure 1-2 presents data only for flights operating above FL285 in the DLS airspace. It shows what percentage of flights in that airspace¹ file 'J1' in their flight plan <N-1> and what percentage indicate in the flight plan that the aircraft is exempt. For this month, 79.3% of flights indicated the capability to perform CPDLC over ATN/VDL Mode 2. 17.7% indicate they are exempt. The remaining 3.0% filed neither capability, nor exemption. Considering the known exceptions, NM estimate that about 1.1% of the filed FPLs are likely contravening the DLS IR.

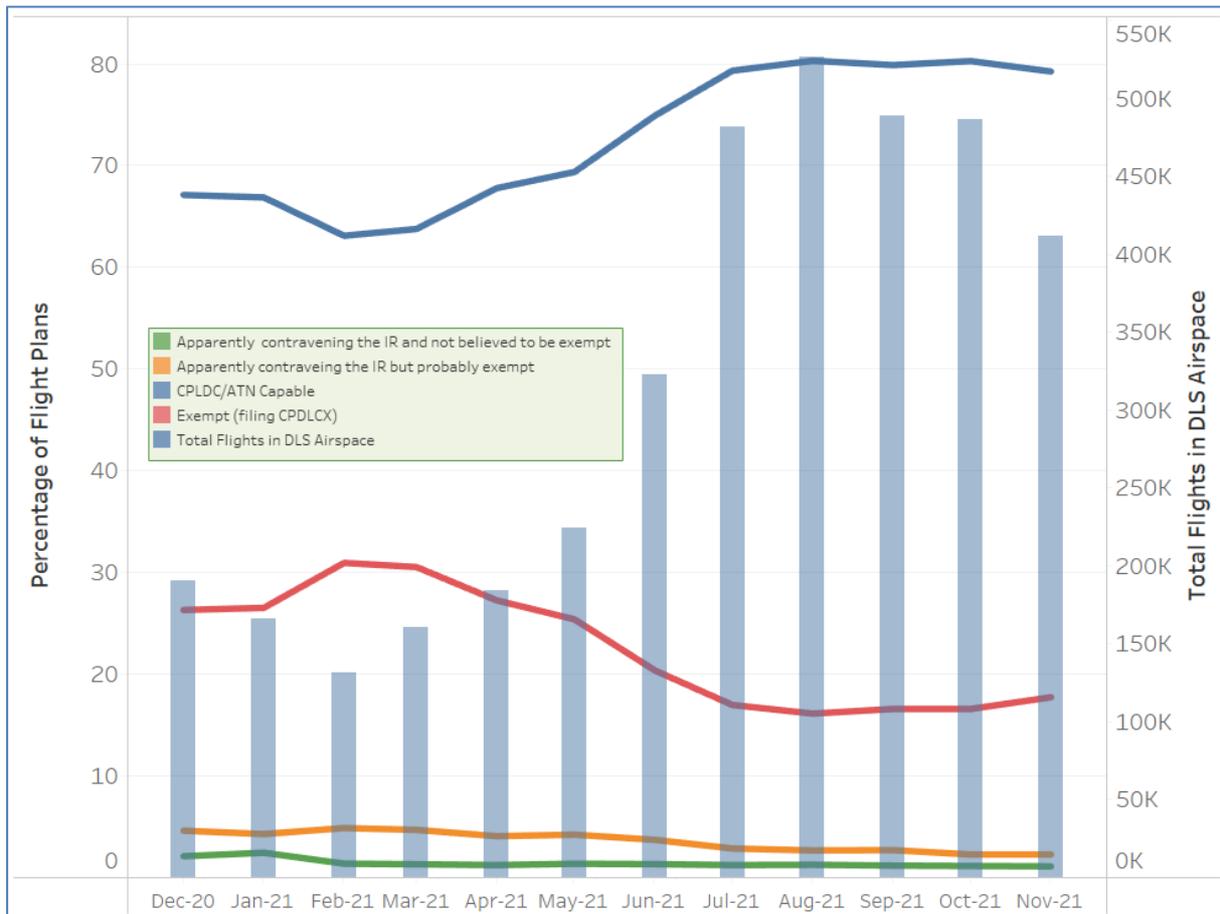


Figure 1-2: Proportion of flights capable of using CPDLC over ATN/ VDL Mode 2

¹ EHAAFIR, LOVV FIR, LECBUIR, LIBBUIR, EBURUIR, GCCCUIRN, GCCCUIRS, LFFFUIR, EDVVUIR, LPPCFIR, EGGTUIR, LECMUIR, LIMMUIR, EDUUUIR, LIRRUUIR, EGPXUIR, EISNUUIR, LZBBFIR, LRBBFIR, LHCCFIR, EKDKFIR, LJLAFIR, LCCCFIR, LKAAFIR, LBSRFIR, EPWWFIR, EFINFIR, LGGGUIR, LMMMUIR, EVRRUIR, ESAAUIR, EETTUIR, EYVLUIR.

2. Technical Performance

Overall Monthly Provider Abort Rate

Figure 2-1 below shows the monthly PA rate <0-23> aggregated for all ANSPs providing data to LISAT. The target value is 1 PA per 100 hours CPDLC (shown as a dashed line on the graph below). The overall average rate for the month was 4.5 PAs per 100 hours.

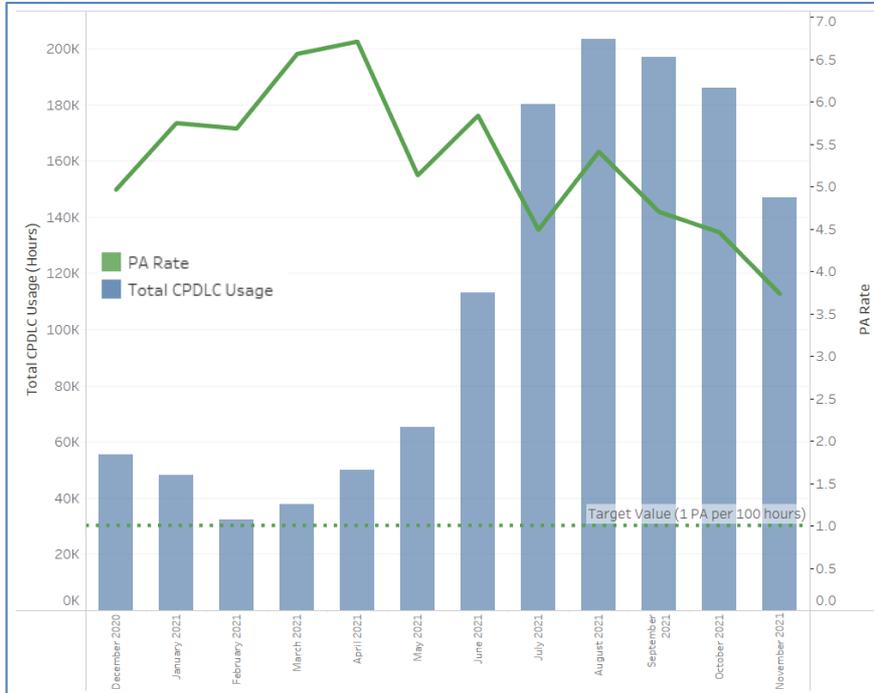


Figure 2-1: PA rate

Figure 2-2 below shows the monthly PA rate of aircraft on the [Logon List](#) against aircraft not on the Logon List using only data from centers that do not support the Logon List².

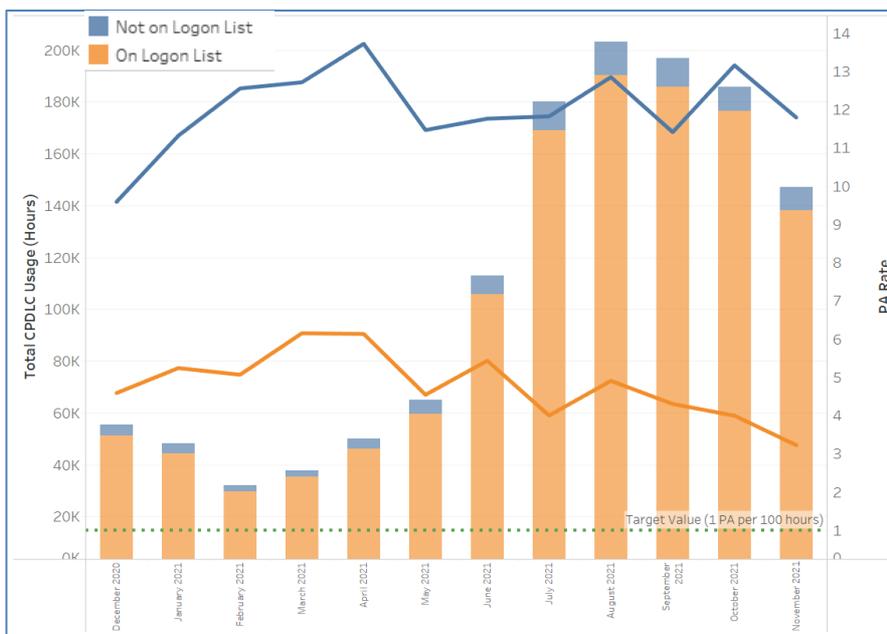


Figure 2-2: Logon Listed Aircraft PA rate

Monthly PA rate per ACSP

Figure 2-3 below shows the monthly PA rate per ACSP for aircraft on the Logon List.³ The ACSP information is taken from the declarations made by the aircraft operators when adding their aircraft to the Logon List; 'BOTH' implies that the aircraft may use ARINC or SITA.

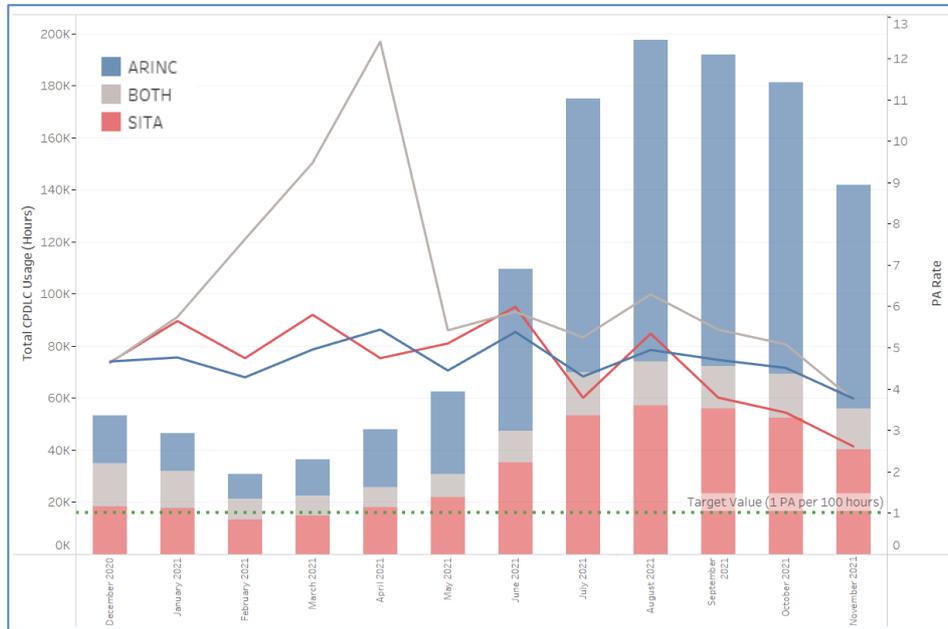


Figure 2-3: ACSP PA rate

Monthly PA rate per Centre

Atsu Code	December 2020	January 2021	February 2021	March 2021	April 2021	May 2021	June 2021	July 2021	August 2021	September 2021	October 2021	November 2021
EDUU	3.9	4.3	3.5	3.6	3.1	5.2	5.6	3.2	2.9	2.8	2.2	1.6
EDYY	6.1	5.3	8.2	10.7	13.4	3.9	4.6	3.9	3.8	3.1	2.9	2.6
EGPX	6.9	10.7	11.0	7.6	7.6	8.8	7.0	6.0	7.2	7.1	5.6	5.8
EGTT	6.3	8.4	8.8	5.8	9.5	6.8	5.8	5.4	6.1	6.5	5.5	5.0
EKDK	12.0	11.4	13.0	13.0	12.4	14.8	13.5		10.5		7.2	8.4
EPWW	4.8	3.9	6.0	6.2	5.1	4.2	4.4	3.0	2.3	3.3	3.4	3.5
ESMM						8.6	7.9	5.7	5.4	5.7	5.5	5.0
EVRR	11.0	8.7	9.6	9.1	6.3	7.4	5.5	5.5	5.8	7.3	6.7	6.3
GCCC	32.6	45.6	47.1	71.1	38.2	55.7	42.1	49.2	28.8	30.3	40.2	50.8
LDZO		18.6	13.9	13.1	14.4	18.2	33.1	16.6	22.2	17.8	16.0	12.5
LECB	2.5	2.1	3.1	4.1	3.0	2.9	2.2	2.5	2.6	2.5	2.3	1.9
LECM	3.2	3.5	3.3	4.1	3.7	3.4	3.2	2.9	2.7	2.7	3.2	4.5
LFBB	0.9	1.1	1.1	1.4	1.2	1.3	1.0	1.2	1.5	1.7	0.9	0.8
LFEE	3.8	4.2	5.3	4.9	8.5	3.8	3.1	3.5	4.5	5.1	3.9	1.1
LFFF	2.4	2.2	2.3	2.4	2.5	1.8	1.4	4.0	2.0	1.6	1.3	0.7
LFMM	6.1	6.4	6.6	6.6	5.8	4.5	4.1	5.6	5.8	5.3	4.4	3.4
LFRR	6.7	6.8	2.7	4.7	5.1	3.4	3.4	3.7	4.9	5.1	5.1	5.7
LJLA	16.2	16.7	11.7	13.0	10.6	28.4	18.5	16.8	28.9	9.3	19.0	7.7
LKAA	11.6	12.0	8.8	7.5	7.6	8.3	7.5	4.9	6.1	5.8	4.7	3.7
LOVV								8.7	11.8	11.2	8.5	8.2
LRBB	4.5	4.5	4.2	13.3	15.4	3.2	5.5	6.5	10.4	3.1	2.7	2.4
LSAG	2.3	2.7	3.8	3.5	2.9	2.4	2.0	2.9	2.6	2.3	1.5	1.4
LSAZ	3.6	3.5	4.9	2.1	3.8	4.1	17.1	5.7	6.3	3.3	1.7	1.4

Figure 2-4: Monthly PA Rate per Centre

³ At the beginning of 2021, RYR changed in the logon list the ACSP they were declaring to be connected to ("BOTH" was used before). As there is no time information in the logon list for the change of ACSP by an airline operator, any change affects all the statistics retroactively. A filter is then applied while processing the data that sets the ACSP for RYR to "BOTH" before 21/02/2021 and to the current one afterward.

PA Rate for Major Aircraft Operators

Figure 2-5 below shows the PA rate for the top 30 aircraft operators in terms of usage of CPDLC/ATN over the month. The column “Total CPDLC” displays the total CPDLC session duration in hours while the column “Total Flights” displays the total amount of flights performed during the month.

Aircraft Op..	Total CPDLC ..	Total Flights	PA Rate ..
RYR	30452.50	29'382	4.1
WZZ	7946.01	8'810	1.4
DLH	7727.87	10'152	1.7
AFR	5695.97	7'684	2.0
EZY	5671.69	6'236	2.9
EJU	5433.52	6'629	2.4
TAP	5117.49	3'904	10.1
EWG	4013.52	4'341	2.6
EXS	3710.16	3'007	4.2
VLG	3616.57	4'436	4.5
SAS	3531.62	3'306	3.1
THY	3408.25	3'444	3.6
BAW	2765.23	3'308	6.7
IBE	2733.40	2'775	2.3
KLM	2362.03	3'026	4.7
TRA	2336.74	1'841	2.2
PGT	2336.11	2'074	1.7
RAM	1858.65	1'244	2.5
BEL	1823.99	2'335	1.4
TUI	1814.51	1'124	2.1
SWR	1733.26	2'368	2.9
EZS	1705.79	1'975	1.3
FIN	1512.32	1'055	2.4
NOZ	1483.29	1'164	2.2
AUA	1447.52	2'080	1.4
BTI	1319.41	1'377	3.3
EIN	1192.83	1'453	2.2
QTR	1170.49	1'153	5.8
NJE	1146.88	1'294	3.6
AEE	909.79	1'109	5.1

Figure 2-5: PA Rate for the top 30 Aircraft Operators (CPDLC/ATN use)

Monthly PA Rate for various avionics configurations

The figure below shows the monthly PA rate for various avionics configurations for aircraft on the logon list based on the information declared by the airline operators.

Vdr Make	Vdr Model	Cmu Make	Cmu Model	November 2020	December 2020	January 2021	February 2021	March 2021	April 2021	May 2021	June 2021	July 2021	August 2021	September 2021	October 2021	November 2021	
Garmin	GDR66	Garmin	GIA63W	11.7	12.4	9.8	14.1	9.7	6.2	5.5	5.8	8.4	9.6	8.1	6.8	4.3	
			GIA64E							0.0	4.3	13.3	9.4	13.3	9.8	10.9	3.6
Honeywell	EPIC VDR	Honeywell	EPIC CMF	7.0	2.8	8.8	7.9	4.7	3.8	7.7	11.8	11.3	20.5	9.2	8.7	6.6	
			KTR2280A	Honeywell	EPIC CMF	13.1	2.8	0.0	7.0	10.1	5.9	4.2	3.4	9.9	12.2	5.9	6.4
	RTA44D	Airbus	FANS-B+	4.5	4.3	4.2	3.7	4.5	1.7	4.8	7.5	3.3	5.1	3.9	2.8	2.4	
			Honeywell	777 AIMS2	82.2									80.8	145.4		
			Honeywell	Mk2+	3.3	3.6	2.3	2.0	3.3	2.7	2.4	2.1	2.9	3.8	3.5	4.5	2.1
			Rockwell Collins	CMU900	9.0	9.5	6.8	3.7	7.2	12.1	0.7	4.2	6.4	4.5	3.5	2.9	1.9
	RTA50D	Airbus	FANS-B+	1.4	2.7	2.1	1.4	6.0	7.2	2.9	6.2	3.1	4.8	3.6	2.7	2.0	
			FANS-C	1.4	3.2	3.3	2.6	2.9	4.5	5.2	10.5	5.0	6.6	5.7	4.9	3.4	
			Honeywell	777 AIMS2	68.1	68.6	19.6	28.8	65.2	57.7	84.6	80.9	74.3	74.2	80.4	70.2	64.5
			Honeywell	Mk2+	2.5	3.8	3.9	3.1	4.5	4.5	4.0	4.2	3.9	4.6	4.9	5.1	4.2
		Rockwell Collins	CMU900							5.3	2.3	4.1	2.1	1.7	2.9	6.9	
Rockwell Collins	920	Airbus	FANS-B+	3.7	4.3	2.6	2.9	4.5	3.4	4.5	7.1	3.6	5.4	3.3	5.5	3.1	
			Honeywell	Mk2+		8.5	6.2	0.9	2.8		3.6	6.1	2.5	1.7	0.6	0.4	2.4
			Rockwell Collins	CMU900	6.2	14.2	5.9	9.4	6.9	8.3	4.5	7.0	7.1	6.3	4.5	5.2	6.1
	2100	Airbus	FANS-A+B	1.1	1.7	1.1	2.3	3.5	0.8	2.7	5.6	3.2	3.7	2.5	2.1	2.3	
			FANS-B+	1.6	2.1	2.0	1.4	2.3	2.6	1.9	3.0	2.2	3.3	2.5	2.1	1.8	
			FANS-C	0.5	3.3	8.3	16.6	18.6	38.6	2.7	5.6	4.0	6.3	4.0	4.0	3.3	
		Honeywell	777 AIMS2	14.6	16.1	21.3	15.3	16.2	18.4								
			787 CMF	3.8	5.5	9.2	6.9	6.0	6.7	6.7	6.4	5.6	8.3	6.9	7.5	5.5	
			Mk2+	3.0	4.3	5.7	4.5	4.4	3.2	4.6	4.5	2.6	3.5	3.0	3.7	2.7	
			Rockwell Collins	CMU900	14.1	6.8	5.7	5.7	6.3	7.0	7.1	5.7	6.9	5.8	4.6	4.2	3.4
	2200	Airbus	FANS-A+B	2.5	2.8	2.6	2.2	2.8	3.4	2.5	2.6	3.6	5.6	3.9	4.3	4.0	
			FANS-B+	1.9	2.9	3.2	2.6	4.5	5.1	4.0	5.8	2.2	3.3	3.6	3.3	3.4	
			FANS-C	2.1	3.8	4.0	2.7	3.0	4.4	3.4	3.7	2.5	4.6	3.8	3.5	3.6	
	4000	Rockwell Collins	CMU900	0.0	0.0	3.8	0.0	6.7	6.7	3.8	5.7	3.5	9.3	6.5	7.5	8.6	
CMU4000			3.1	3.4	7.5	10.2	12.6	4.6	6.0	8.8	7.7	11.2	5.1	4.6	2.0		
RIU-4000			13.9	18.9	10.3	8.9	13.0	13.0	20.6	15.4	21.0	16.2	13.1	9.8	4.7		
		RIU-4010	11.8	8.9	8.4	17.0	16.1	14.2	12.7	13.0	13.7	9.1	12.3	10.0	10.0		
Spectralux	Dlink+	Spectralux	Dlink+	22.8	20.5	20.5	23.0	24.5	34.4	26.3	20.2	22.9					
Thales	EVR750	Airbus	FANS-B+	5.3	7.2	4.6	3.2	4.6	6.6	5.7	9.2	7.6	9.6	7.7	6.8	4.0	
UASC	UL801	UASC	UL801	5.8	8.0	11.0	5.7	4.4	6.1				0.0	18.6	0.0	6.3	

Figure 2-6: Monthly PA rate for various avionics configurations for aircraft on the logon list.

Note: NM believe that a reasonable sample size on which to judge performance of avionics is at least 250 hours of CPDLC usage. In the table above, PA rate computed from less than 250 hours of CPDLC session is displayed in grey.

Overall Technical Round Trip Delay

Figure 2-7 below shows the 95th and 99th percentiles of the technical round trip delay <O-2><O-3>. It represents the delay between the time when a message is uplinked and the time when the ground system receives the corresponding application level acknowledgement (aggregated for all systems providing data to LISAT). As agreed during DPMG8, the TRTD is now computed taking into account downlinked ERROR messages (DM62). This has resulted in an increase of the 99th percentile value.

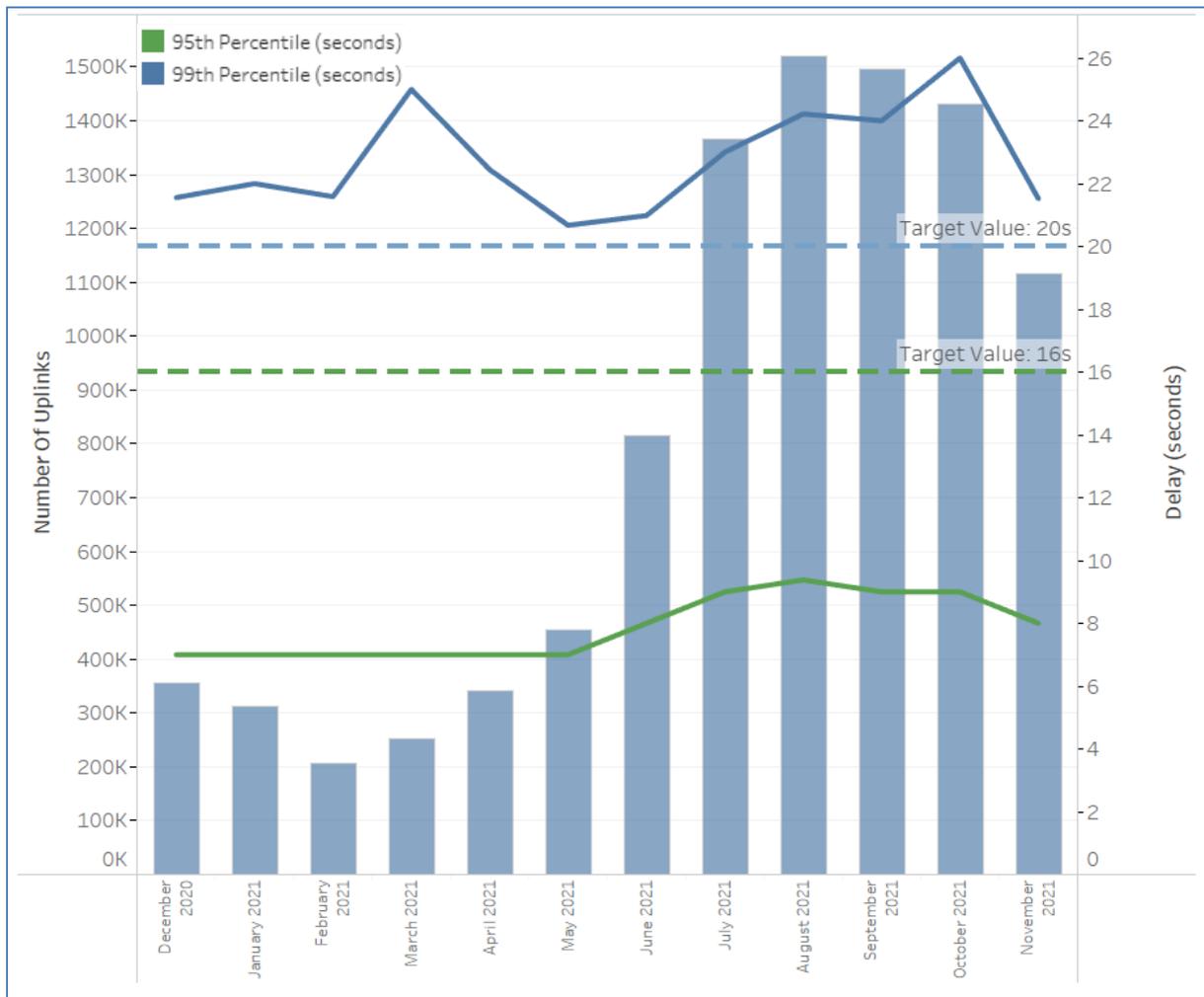


Figure 2-7: Technical Round Trip Delay

Technical Round Trip Delay per ACSP

The figure below shows the 95th and 99th percentiles of the technical round trip delay per ACSP for aircraft on the Logon List. The ACSP information is taken from the declarations made by the aircraft operators when adding their aircraft to the Logon List; 'BOTH' implies that the aircraft may use ARINC or SITA.

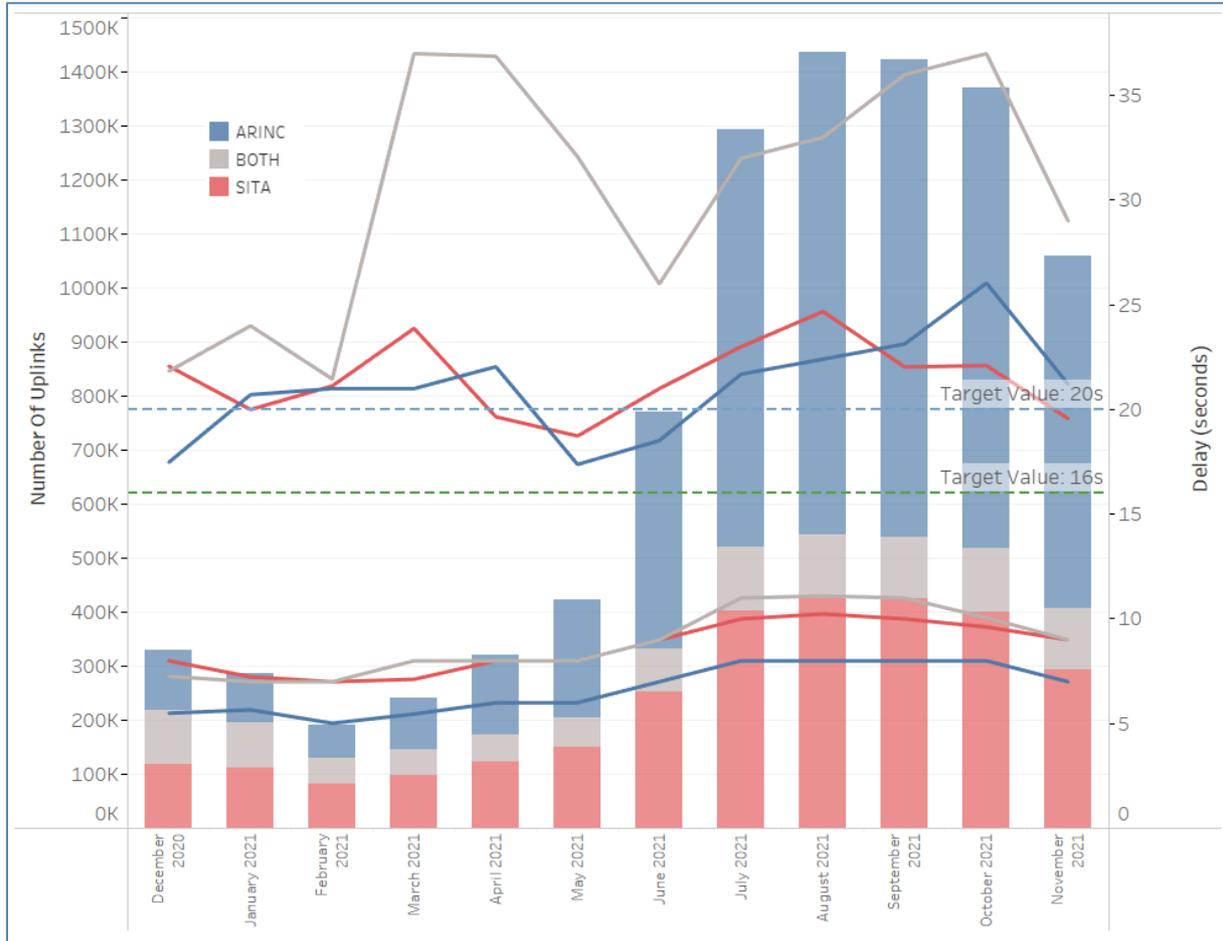


Figure 2-8: TRTD per ACSP

Monthly 95th percentile of TRTD per Centre

Atsu Code	December 2020	January 2021	February 2021	March 2021	April 2021	May 2021	June 2021	July 2021	August 2021	September 2021	October 2021	November 2021
EDUU	5.6	6.1	5.8	5.4	5.0	5.2	6.2	7.3	8.1	7.8	8.1	6.8
EDYY	6.0	5.4	5.2	5.0	6.4	5.5	6.2	7.1	7.4	7.3	7.3	6.8
EGPX	4.7	6.3	5.6	4.9	4.8	4.8	5.5	6.2	5.9	6.4	6.5	6.2
EGTT	4.9	4.7	4.7	5.0	5.4	4.8	5.0	6.3	6.7	6.7	6.9	6.9
EKDK	7.0	6.0	6.0	6.0	5.0	6.0	6.0		6.0		8.0	7.0
EPWW	5.2	5.6	5.4	5.0	4.5	4.3	5.0	5.4	5.5	5.7	5.6	5.6
ESMM						6.0	5.0	5.0	6.0	6.0	6.0	6.0
EVR	6.1	9.5	9.0	9.0	8.0	9.0	10.0	9.0	9.0	10.0	9.0	8.0
GCCC	37.7	7.3	13.5	6.6	14.1	23.4	37.6	39.9	15.6	37.8	35.4	20.1
LDZO		7.0	6.0	7.0	8.0	9.0	11.0	13.0	13.0	12.0	12.0	10.0
LECB	7.4	7.1	7.8	8.5	7.3	7.6	8.1	9.2	8.7	9.0	9.6	7.6
LECM	4.6	5.7	4.7	4.8	5.0	4.8	5.3	6.1	6.2	6.5	6.5	6.8
LFBB	5.0	5.0	4.0	4.0	5.0	5.0	6.0	7.0	7.0	7.0	7.0	6.0
LFEE	7.0	6.0	6.0	6.0	7.0	6.0	7.0	9.0	9.0	8.0	8.0	8.0
LFFF	6.0	6.0	6.0	7.0	7.0	7.0	8.0	9.0	9.0	9.0	9.0	9.0
LFMM	6.0	6.0	6.0	6.0	6.0	6.0	8.0	10.0	10.0	10.0	9.0	8.0
LFRR	6.0	6.0	5.0	5.0	6.0	5.0	6.0	7.0	7.0	8.0	8.0	7.0
LJLA	8.8	7.8	6.6	7.7	8.7	8.7	11.1	13.8	14.3	13.7	12.3	10.9
LKAA	8.0	7.0	6.0	7.0	6.0	6.0	7.0	8.0	8.0	8.0	8.0	7.0
LOVV								11.0	10.0	11.0	11.0	11.0
LRBB	5.1	4.9	4.5	4.7	4.9	4.9	6.1	6.5	4.6	4.6	4.6	4.6
LSAG	6.0	5.0	5.0	6.0	6.0	6.0	7.0	9.0	10.0	10.0	8.0	7.0
LSAZ	7.0	7.0	7.0	7.0	7.0	7.0	8.0	11.0	12.0	11.0	10.0	9.0

Figure 2-9: Monthly 95th percentile of TRTD per Centre

Monthly 99th percentile of TRTD per Centre

Atsu Code	December 2020	January 2021	February 2021	March 2021	April 2021	May 2021	June 2021	July 2021	August 2021	September 2021	October 2021	November 2021
EDUU	24.8	37.2	29.0	37.0	36.9	35.3	24.1	37.0	40.8	38.5	38.1	27.1
EDYY	21.0	21.1	21.2	37.1	61.0	32.1	26.2	24.0	28.5	37.3	37.1	24.6
EGPX	9.2	14.1	37.1	37.5	13.0	60.7	21.9	15.8	14.9	17.3	19.2	15.4
EGTT	17.8	13.6	19.1	22.2	40.2	20.8	14.6	19.4	18.7	20.9	21.3	20.8
EKDK	15.4	13.0	17.0	13.0	13.0	12.0	14.0		13.0		18.9	14.0
EPWW	20.2	17.4	21.9	22.5	14.9	14.5	12.7	14.7	13.7	17.0	19.2	20.1
ESMM						14.1	13.0	13.0	13.0	15.0	15.0	15.0
EVR	15.4	36.5	37.0	51.9	39.4	39.0	39.0	39.0	38.0	42.7	41.9	20.0
GCCC	85.7	38.0	19.2	19.9	68.5	116.2	70.2	109.0	85.7	121.6	85.8	105.9
LDZO		16.0	17.0	16.0	18.0	25.3	33.0	35.0	36.0	34.0	38.0	31.0
LECB	36.9	20.9	37.9	61.1	21.7	21.8	21.9	23.2	22.0	22.5	24.3	22.1
LECM	21.9	36.9	24.7	37.6	21.9	20.9	21.1	21.5	20.5	21.2	21.4	37.2
LFBB	10.0	10.0	8.0	9.0	8.0	10.0	11.0	14.0	13.0	14.0	13.0	12.0
LFEE	15.0	11.0	14.0	13.0	18.0	12.0	14.0	18.0	16.0	16.0	16.0	14.0
LFFF	13.0	10.0	12.2	10.0	12.0	10.8	15.2	19.0	18.0	16.0	16.0	16.0
LFMM	13.0	13.0	13.0	13.0	14.0	13.0	15.0	20.0	21.0	19.0	19.0	18.0
LFRR	13.6	12.0	9.0	11.0	13.0	11.0	12.0	14.0	14.0	14.0	14.0	15.0
LJLA	36.9	38.9	18.5	17.2	27.9	37.2	45.3	56.6	63.3	54.2	40.0	40.5
LKAA	16.0	17.1	14.8	34.4	21.9	15.0	15.0		23.0	23.0	35.0	25.0
LOVV								40.0	36.4	38.0	38.0	39.0
LRBB	9.3	38.1	36.8	19.4	34.7	14.8	23.1	21.3	12.6	9.3	13.1	10.4
LSAG	15.0	19.0	13.0	13.0	12.0	13.0	16.0	25.0	28.5	28.0	19.1	16.0
LSAZ	37.0	20.0	31.0	31.7	15.0	14.0	19.0	35.0	40.0	31.0	32.4	27.0

Figure 2-10: Monthly 99th percentile of TRTD per Centre

Overall Technical Continuity

The graph below shows the “Technical Continuity” (<0-25>). This is the probability that a LACK is received for an uplink message before the technical response timer expires i.e. within 40 seconds.

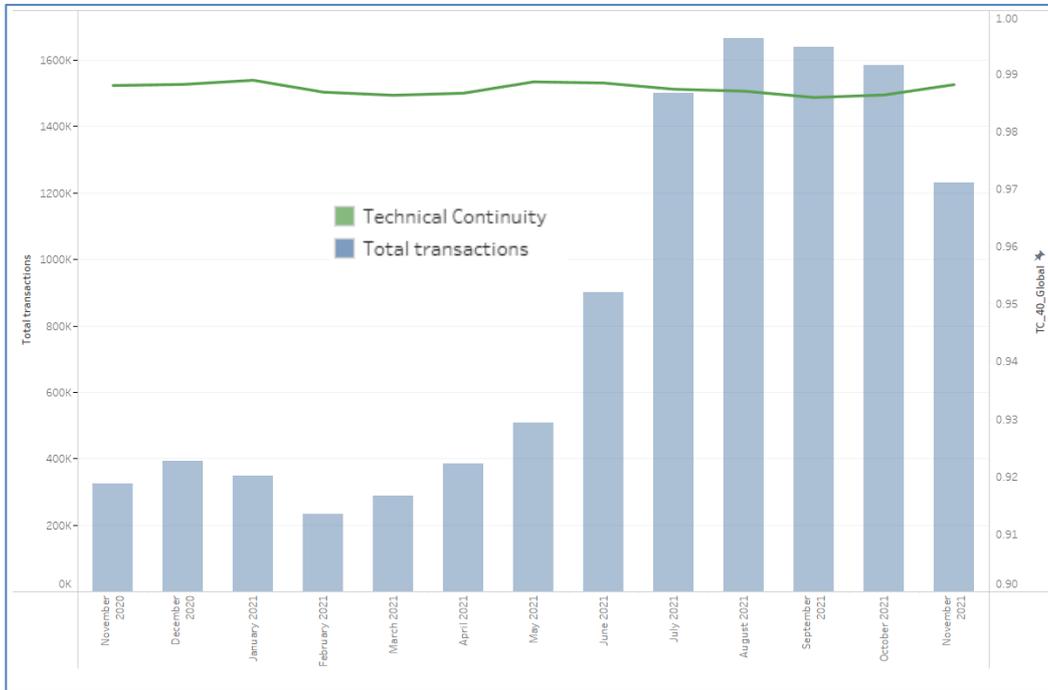


Figure 2-12: Technical Continuity

Technical Continuity per Centre

	November 2020	December 2020	January 2021	February 2021	March 2021	April 2021	May 2021	June 2021	July 2021	August 2021	September 2021	October 2021	November 2021
ATSU													
EDUU	0.9887	0.9892	0.9897	0.9892	0.9891	0.9900	0.9889	0.9893	0.9872	0.9871	0.9878	0.9883	0.9911
EDYY	0.9873	0.9855	0.9874	0.9842	0.9804	0.9806	0.9884	0.9881	0.9885	0.9862	0.9871	0.9876	0.9893
EGPX	0.9886	0.9909	0.9876	0.9850	0.9863	0.9887	0.9820	0.9852	0.9890	0.9908	0.9908	0.9893	0.9890
EGTT	0.9885	0.9887	0.9876	0.9880	0.9865	0.9825	0.9882	0.9915	0.9900	0.9910	0.9904	0.9906	0.9905
EKDK		0.9830	0.9880	0.9847	0.9878	0.9906	0.9906	0.9911		0.9907		0.9895	0.9893
EPWW	0.9900	0.9918	0.9934	0.9904	0.9880	0.9916	0.9895	0.9925	0.9927	0.9934	0.9929	0.9894	0.9901
ESMM							0.9913	0.9924	0.9942	0.9938	0.9915	0.9908	0.9923
ESOS												0.9906	0.9901
EVRR	0.9809	0.9843	0.9877	0.9866	0.9860	0.9793	0.9805	0.9748	0.9809	0.9796	0.9791	0.9789	0.9837
GCCC	0.9261	0.9186	0.9354	0.9189	0.9052	0.9159	0.9327	0.9547	0.9145	0.8914	0.8906	0.9061	0.8969
LDZO			0.9881	0.9802	0.9861	0.9874	0.9840	0.9845	0.9775	0.9753	0.9766	0.9699	0.9776
LECB	0.9869	0.9856	0.9850	0.9793	0.9675	0.9807	0.9820	0.9838	0.9845	0.9868	0.9859	0.9853	0.9881
LECM	0.9835	0.9834	0.9818	0.9763	0.9764	0.9767	0.9803	0.9815	0.9823	0.9844	0.9849	0.9837	0.9818
LFBB	0.9940	0.9966	0.9960	0.9947	0.9938	0.9957	0.9953	0.9934	0.9935	0.9941	0.9918	0.9929	0.9930
LFEE	0.9834	0.9851	0.9908	0.9876	0.9874	0.9859	0.9908	0.9880	0.9879	0.9877	0.9815	0.9887	0.9892
LFFF	0.9927	0.9930	0.9952	0.9953	0.9913	0.9939	0.9933	0.9911	0.9928	0.9944	0.9828	0.9880	0.9917
LFMM	0.9898	0.9899	0.9925	0.9899	0.9892	0.9915	0.9902	0.9876	0.9849	0.9841	0.9781	0.9857	0.9839
LFRR	0.9922	0.9886	0.9898	0.9926	0.9920	0.9900	0.9903	0.9904	0.9916	0.9919	0.9866	0.9899	0.9868
LJLA	0.9855	0.9834	0.9805	0.9779	0.9741	0.9713	0.9787	0.9794	0.9717	0.9704	0.9756	0.9769	0.9811
LKAA	0.9918	0.9916	0.9916	0.9933	0.9894	0.9902	0.9920	0.9930	0.9910	0.9920	0.9916	0.9910	0.9925
LOVV									0.9768	0.9775	0.9796	0.9790	0.9812
LRBB	0.9782	0.9827	0.9846	0.9838	0.9819	0.9826	0.9827	0.9811	0.9812	0.9803	0.9891	0.9881	0.9870
LSAG	0.9888	0.9860	0.9861	0.9827	0.9912	0.9891	0.9925	0.9902	0.9870	0.9854	0.9857	0.9908	0.9896
LSAZ	0.9884	0.9903	0.9913	0.9847	0.9883	0.9883	0.9922	0.9902	0.9859	0.9857	0.9878	0.9888	0.9911

Figure 2-13: Technical Continuity per Centre

3. VDL Mode 2 Performance

The following metrics⁴ are computed based on the available data from the VGS logs provided each month to the DPMF by ARINC and SITA. These logs contain the AVLC traffic recorded at each VGS during the 24hrs of the first Friday⁵ of each month.

Important note: As from April 2021, ARINC and SITA are providing logs for all their users and covering all the European Datalink airspace. ENAV is currently evaluating how to provide logs. Before April 2021 SITA was providing logs for all their users whereas ARINC is only providing data for their 28 largest ATN users as well as non-AOC users. Moreover, ARINC was providing logs for all their European VGSs whereas SITA is only providing logs of VGSs from which they can share the logs. Therefore the CSPs data was not represent the behaviour of their network as a whole. The trend information for each CSP was valuable and useful but the comparison between the two CSPs was problematic since different data sets were being compared.

AVLC Round Trip Time for the first Friday of the month.

The graph below shows the cumulative distributions per frequency (and per CSP) for the AVLC Round Trip Time (RTT) of acknowledged AVLC INFO frames conveying ATN packet to Logon-List aircraft and considering all the VGS logs. The 95th and the 99th percentile of ED-120 together with the 95th and the 99.9th percentile of ED-228A are also provided for comparison purposes and tabulated values are reported in the legend. Please note the logarithmic scale of the RTT.

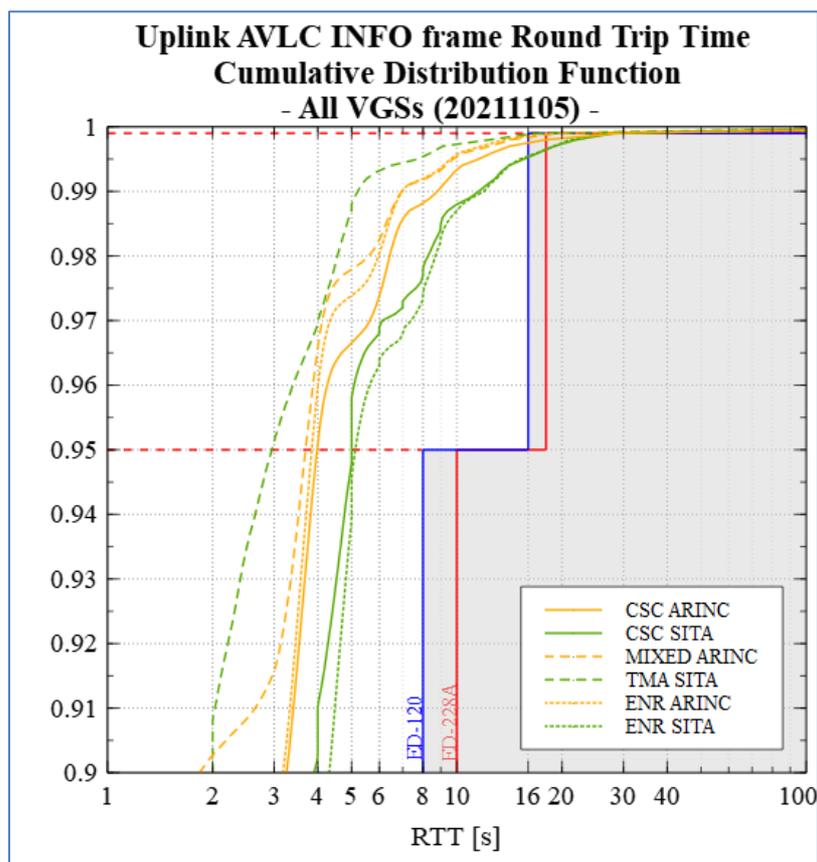


Figure 3-1: AVLC Round Trip Time

⁴ The Channel load, the AVLC RTT distribution and the number of retransmission distribution are defined in the DPMF report catalogue.

⁵ Friday is observed to have the highest flight traffic of the week.

Number of retransmissions for the first Friday of the month.

The graph below shows the cumulative distributions per frequency (and per CSP for the CSC) for the number of retransmissions needed before acknowledgement of uplink AVLC INFO frames conveying ATN packet to Logon-List aircraft considering all the VGS logs. N=0 represents successes on the first attempt, N=1 to N=5 represent successes on the first to the fifth retransmissions and N>5 represents N2T1 events.

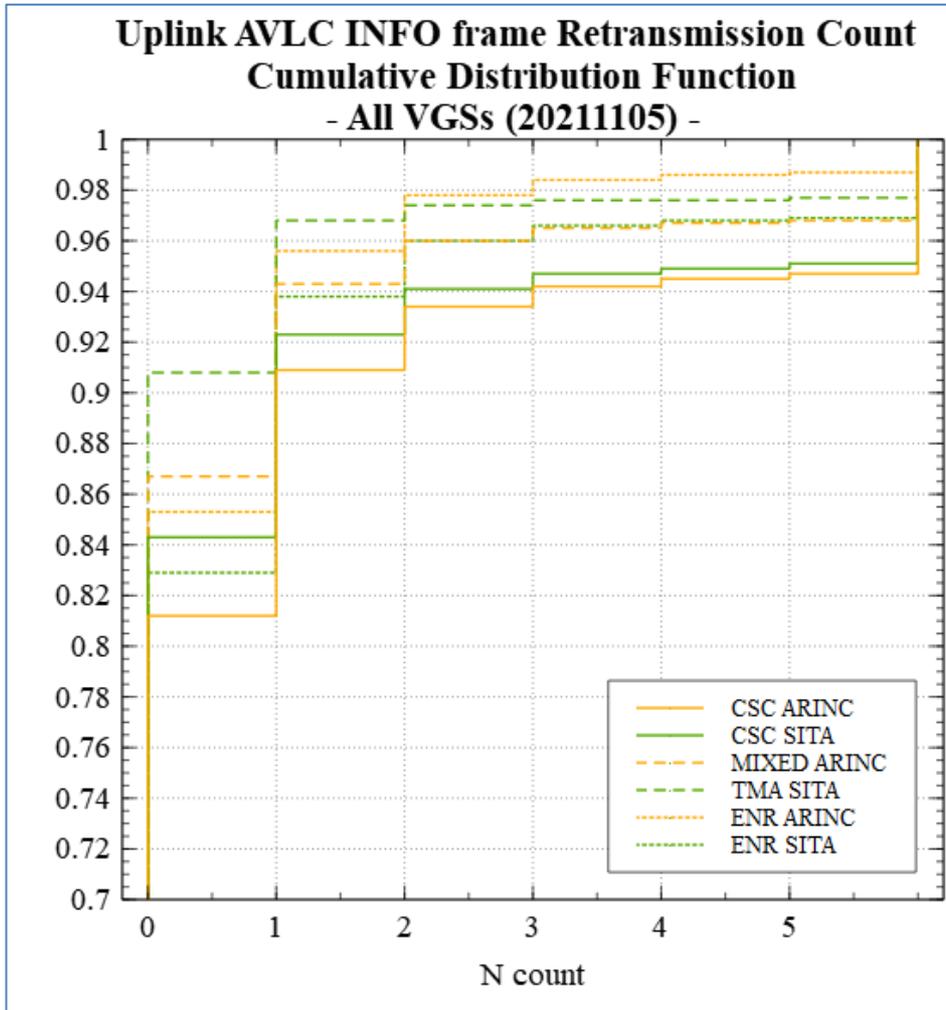


Figure 3-2: AVLC Uplink INFO frame retransmission count

AVLC Round Trip Time per frequency trend

The following set of graphs show the 95th and the 99th percentile of the AVLC RTT (in seconds) of acknowledged AVLC INFO frames conveying ATN packet to Logon-List aircraft for the first Friday of each month for each frequency with the CSC split over the two CSPs. The RTT axis has a logarithmic scale with the same range for the different frequencies. The graphs also shows the number of AVLC frames taken into account in the percentiles calculations (Frame count in linear scale) and the 95% confidence interval (gray area).

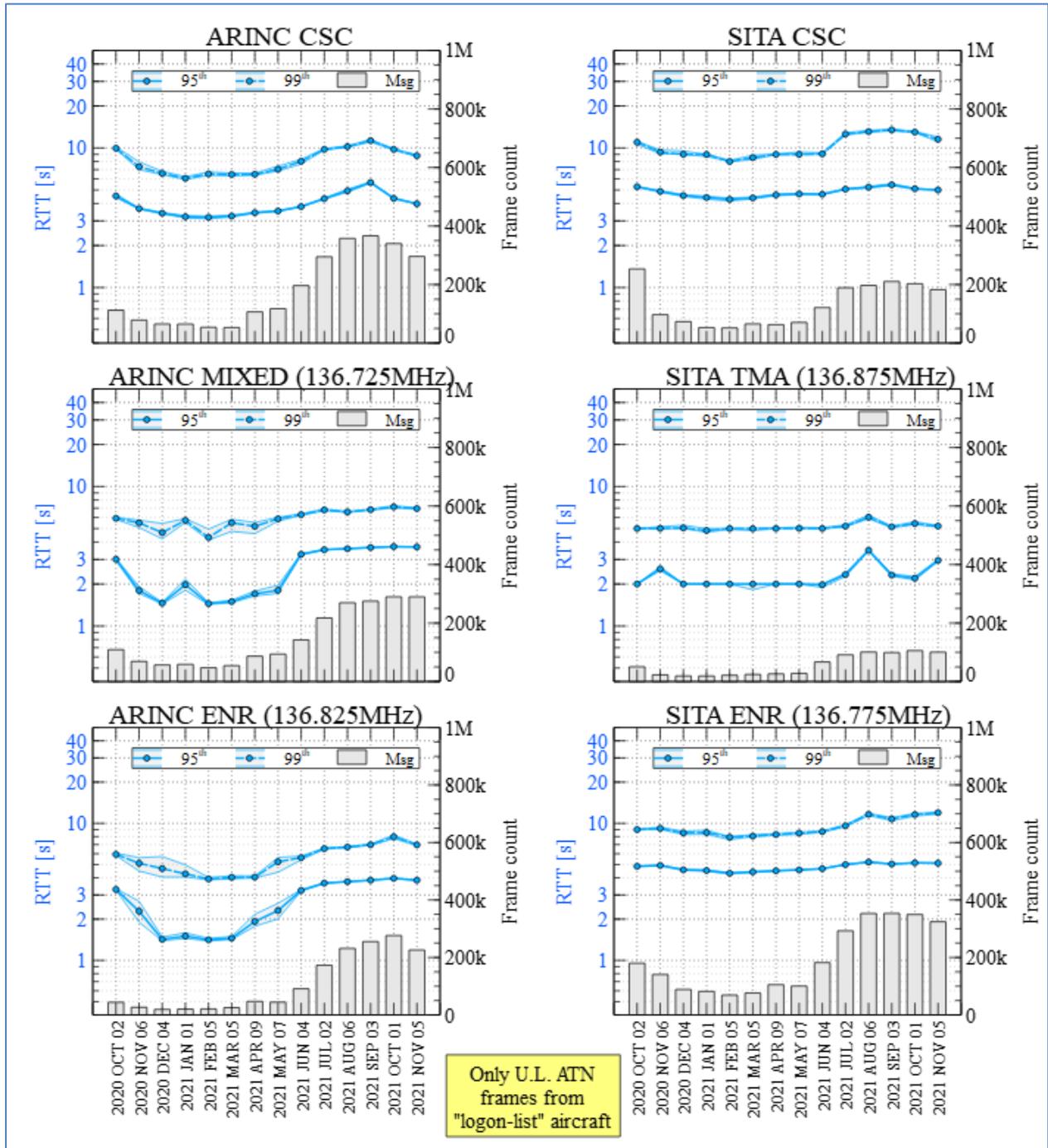


Figure 3-3: AVLC Uplink INFO Round Trip Time per Frequency

Uplink delivery success rate

The following set of graphs show the uplink delivery rate of AVLC INFO frames conveying ATN packet to Logon-List aircraft for the first Friday of each month for each frequency with the CSC split over the two CSPs. It is the probability that an AVLC uplink INFO frame is correctly delivered to the aircraft (ACK received). The graphs also shows the number of AVLC frames taken into account in the calculations (Msg count in linear scale = AVLC frame count sent on first attempt) and the 95% confidence interval (gray area).

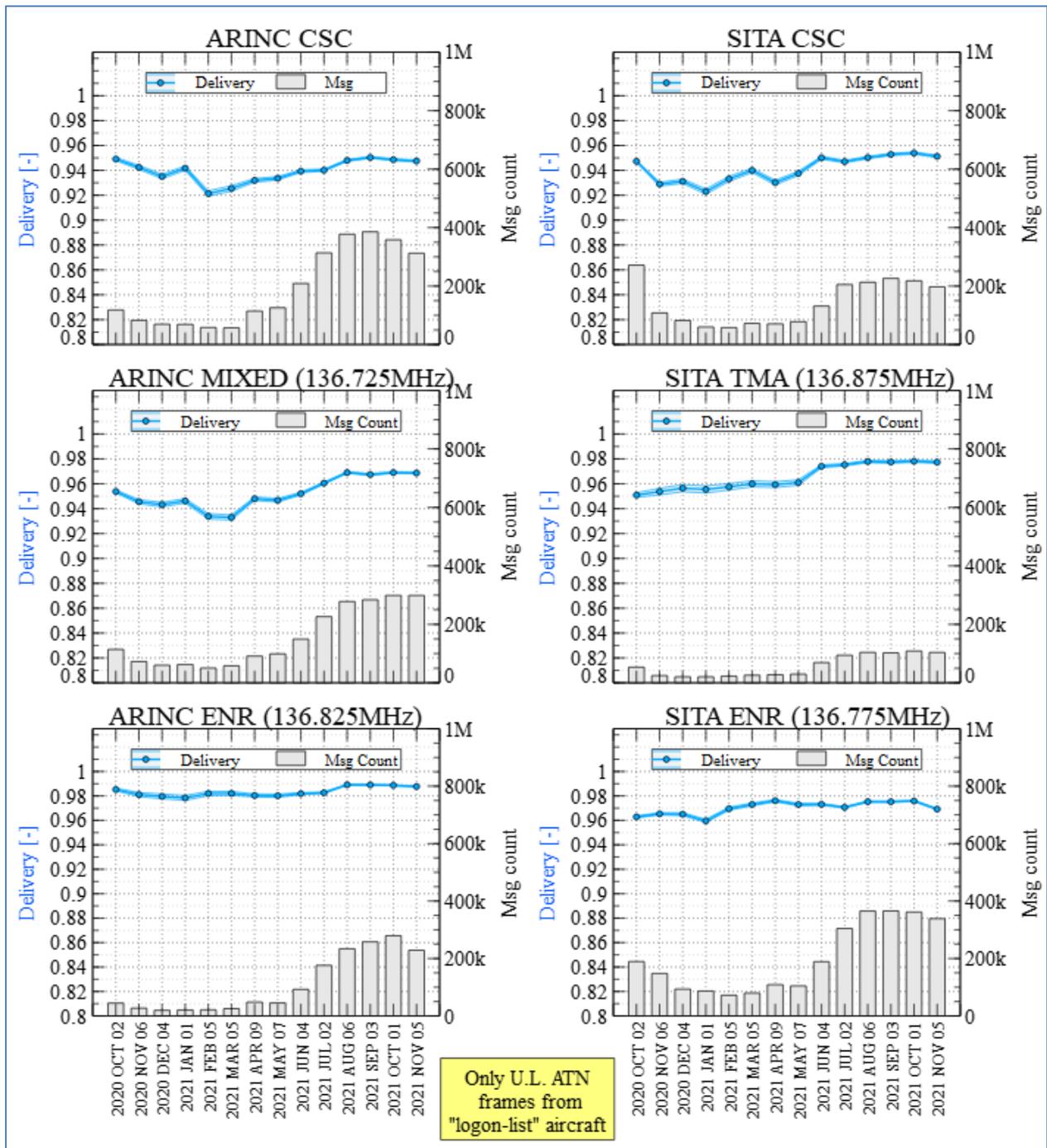


Figure 3-4: AVLC successful delivery rate per frequency

Channel load per frequency trend

The following set of graphs show the channel load per AVLC payload type (ATN, AOA and AVLC protocol related frames⁶) for the first Friday of each month for each frequency. An additional graph split the traffic on the CSC between ACSPs. The channel load is expressed in megabytes with the same range for the different frequencies.

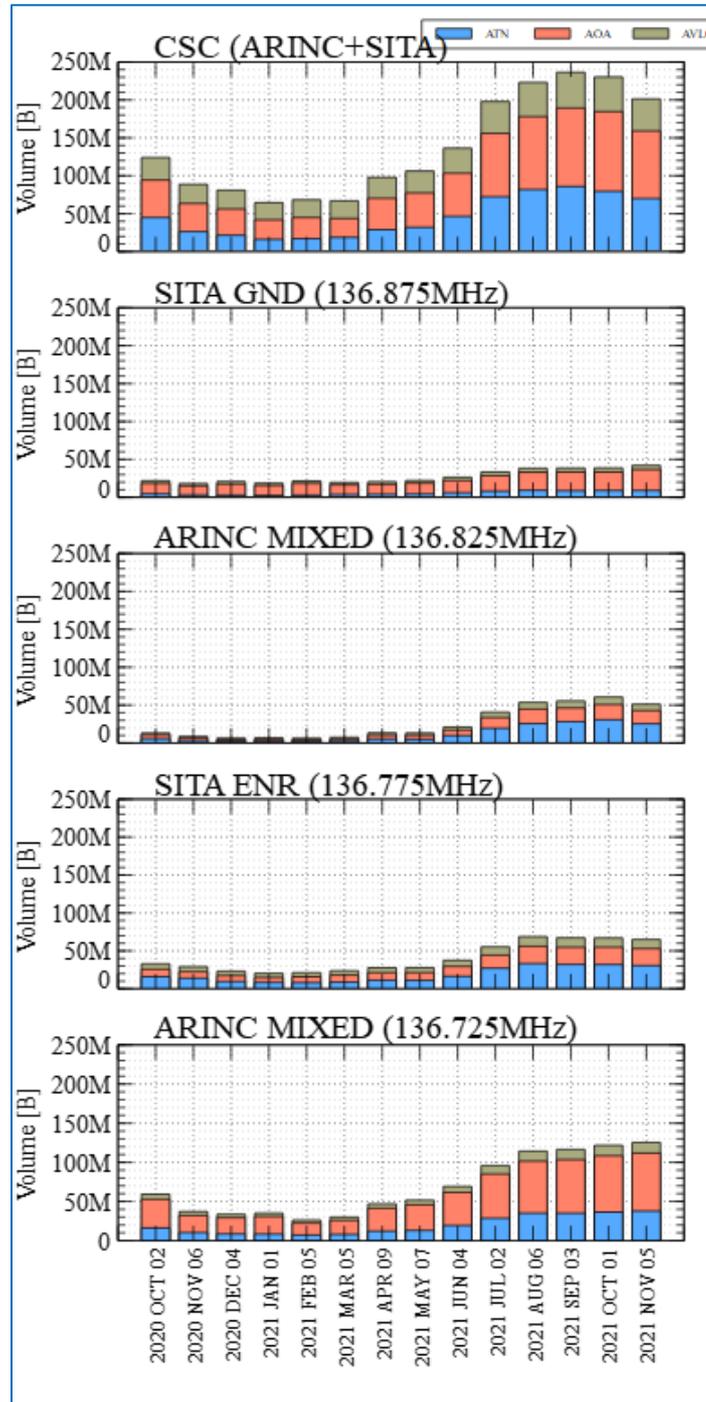


Figure 3-5: AVLC Channel load per frequency

⁶ i.e. RR, SREJ, XID, ...

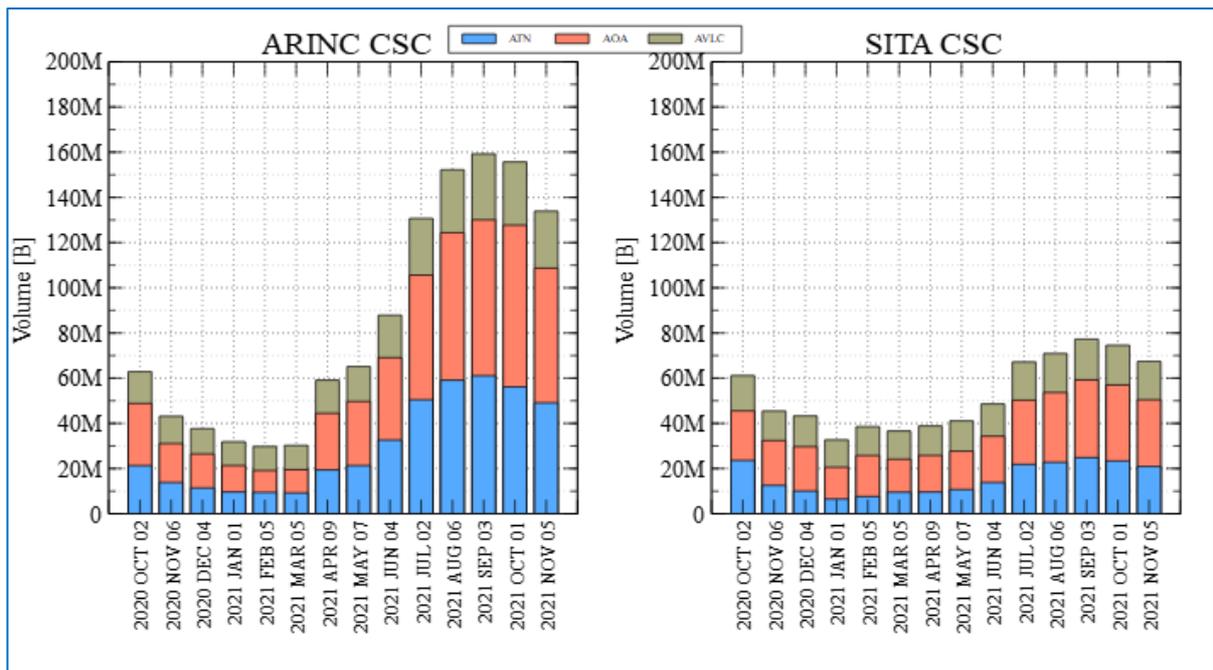


Figure 3-6: AVLC load on the CSC

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