Agenda Item 4: SAT Air Traffic statistics

a) Status of Conclusion 24/06: Traffic Statistics
b) RMAs capacities regarding Statistic on navigation specifications of aircraft. EUR-SAM corridor and AORRA airspaces.

Traffic Picture in the EUR/SAM Corridor 2022

(Prepared by SATMA)

SUMMARY

This paper presents to SAT States detailed information about the traffic in the EUR-SAM Corridor (2022) according to the new air traffic data source set up in SAT-IMG01.

REFERENCES

- Report of the Twenty-Fourth Meeting on the Improvement of Air Traffic Services Over the South Atlantic (SAT/24, Luanda, Angola, 05-07 June 2019). SAT CONCLUSION 24/06: TRAFFIC STATISTICS.
- Report of the Special Atlantic Coordination Meeting (ACM-S, Madrid, Spain, 23-24 June 2022).
- Summary of discussions of SAT-IMG01 (Abidjan, Côte d'Ivoire, 21 to 24 November 2022): decision 01/01 and 01/02.

1. Introduction

1.1 SATMA has, among other duties, the compilation of statistical data regarding movements of all the ACCs in the EUR/SAM corridor (ACCs in the Canary Islands, Recife, Sal and Dakar) as well as the coordination in the drafting of the "Safety Assessment" document and further studies related with the Risk Analysis (RVSM and RNP10).

1.2 The importance of SATMA collection and treatment of statistical data of air traffic movements along the EUR-SAM Corridor during last years, has been strongly highlighted in earlier SAT meetings as a relevant data to take preventive actions, in line with the past evolution of these figures. Nevertheless, several issues were detected during last SATs meetings related to the statistical data presented:

- Provided figures do not represent whole EUR/SAM Corridor since data is based exclusively on traffic that fly over Canarias FIR;

- Regarding EUR/SAM Corridor Traffic Statistics Program, one of five programmes established by SAT 22 ATM WG, it was required to include information about Flight Level occupancy. This issue was needed also in the last AMC-S;

- There are inconsistent and lack of operational data among ANSP to perform studies like safety analysis or traffic statistics.

1.3 The aim of this working paper is to cover the mentioned detected issues, SATMA monitoring performed in the EUR-SAM Corridor as well as the SAT CONCLUSION 24/06.

1.4 On the other hand, considering the needed to identify required traffic statistics and analysis to enable the SAT SG to make more accurate and predictable planning decisions, ENAIRE/SPAIN in collaboration with SATMA suggested establishing a new and unique air traffic data source to conduct this kind of reports: statistics analysis and Safety Assessments. This new data source was agreed in SAT-IMG01 where decision 01/01 and 01/02 provided also new recommendations:

- There is a lack of foreseen traffic. Next report must include an expansion of time horizon for traffic figure monitoring (Task under revision).

- That, Spain amends the aircraft equipment monitoring tables for the EUR/SAM corridor so that they include the values for PBCS requirements: mainly RCP240 and RSP180.

Once presented in next SAT/IMG meeting, this statistical data of the EUR-SAM Corridor will be available on SATMA web page: www.satmasat.com.

2. Background

2.1 Regarding the compilation of statistical data, SATMA has presented statistical data of air traffic movements along the EUR-SAM Corridor during last years to take preventive actions, in line with the evolution of these figures. This data and its evolution are provided from 2004. Nevertheless, the statistical data do not represent whole EUR/SAM Corridor since data is based exclusively on traffic that fly over Canarias FIR: to perform this study is obtained from ENAIRE´s data base where flight plan data contains initial flight plan information that is updated by radar and controllers with pilot position reports.

2.2 The air traffic movements reflected in this study are all traffics using UN741, UN866, UN873 and UN857 whose flight plans contains information about EDUMO, TENPA, IPERA and GUNET waypoints and traffic using the random route. This study does not reflect traffic not overflying Canaries FIR/UIR as well as data from east-west flows crossing the EUR-SAM corridor and southbound traffic to/ from Cape Verde. Next picture shows an example :

MONTH	SOUTHBOUND		NORTHBOUND		TOTAL TRAFFIC IN THE CORRIDOR						% VARIATION	% VARIATION
	2021	2022	2021	2022	2020	DAILY	2021	DAILY	2022	DAILY	2020 - 2021	2021 - 2022
JANUARY	524	1040	623	1480	3719	120	1147	37	2520	81	-69%	120%
FEBRUARY	401	962	399	1196	3299	114	800	29	2158	77	-76%	170%
MARCH	452	1216	520	1354	2302	74	972	31	2570	83	-58%	164%
APRIL	428	1371	492	1416	274	9	920	31	2787	93	236%	203%
MAY	558	1369	668	1697	374	12	1226	40	3066	102	228%	150%
JUNE	520	1602	691	1722	429	14	1211	40	3324	107	182%	174%
JULY	775	1499	669	1787	532	17	1444	47	3286	106	171%	128%
AUGUST	809	1467	843	1777	596	19	1652	53	3244	108	177%	96%
SEPTEMBER	763	1192	875	1112	764	25	1638	55	2304	96	114%	41%
OCTOBER	1031		978		891	29	2009	65			125%	
NOVEMBER	1057		1153		873	29	2210	74			153%	
DECEMBER	1202		1370		1069	34	2572	83			141%	
AVERAGE	710	1302	773	1505	1260	41	1483	49	2807	95	110%	138%

Table 1. Global figures reported by SATMA in earlier SAT meetings

	TOTAL	RANDOM ROUTE	UN-741	UN-866	UN-873	UN-857
2004	26793	1052	7179	4960	11219	2383
2005	28762	1413	7220	5534	11609	2986
2006	29687	1429	7935	5037	12442	2844
2007	33708	1424	9039	6389	13484	3372
2008	35319	1399	8486	8113	13314	4007
2009	29622	845	6383	7173	11320	3901
2010	30102	399	5605	7466	12170	4462
2011	33414	261	5999	8129	14172	4853
2012	32869	292	5009	8237	15129	4202
2013	30645	388	4968	6634	14477	4178
2014	29582	2310	3204	5650	13919	4499
2015	26681	2529	2121	5330	13134	3567
2016	26359	2643	1840	4201	14383	3292
2017	29154	2933	1843	4745	16053	3580
2018	35960	3956	2369	5055	19670	4910
2019	42476	4814	2347	6348	23350	5617
2020	15122	1797	932	1995	7877	2521
2021	17801	2364	1196	2264	9633	2344

Table 2. Global figures per ATS Route and historical data reported by SATMA

2.3 Moreover, this data does not include any information about flight level occupancy, performances, or aircraft equipment like RNP4, RCP, RSP, etc.

2.4 On the other hand, to conduct with "Safety Assessment" , up to now SATMA has urged to Brazil, Cape Verde, Spain and Senegal to collect air traffic movement data from their ATM Systems in a period of six months in accordance with the pre-established agreed format. SAT members provide annually LHDs information to perform the safety assessment. Moreover, a preliminary analysis of the global figures per ACCs is conducted to figure out which month will be representative of the yearly trend, based on the most relevant traffic figures and its data consistency per FIR. Next figure shows the summary of the reported information.

2022	Canarias UIR		SAL Oceanic UIR		Dakar Oceanic UIR		Atlántico-Recife FIR/UIR	
Month	Rutas principales	Cruce	Rutas principales	Cruce	Rutas principales	Cruce	Rutas principales	Cruce
JANUARY								
FEBRUARY								
MARCH								
APRIL								
MAY								
JUNE								
JULY								
AUGUST								
SEPTEMBER								
OCTOBER								
NOVEMBER								
DECEMBER								
LEYENDA:	Disponible		No disponible					

Table 3. Summary of reported data to SATMA (2022)

2.5 Even though global figures and conclusions could be obtained directly from the data provided by each ANSP with an easy and uncomplicated process, the data provided were not coherent among them. For instance, there were flight plans that are not registered by all involved ANSP, the operational information showed differences in terms of time, flight levels or coordination points, and even flight plans of the same day reported by the same ANSP with the same times but different trajectories. Therefore, to increase the consistency of this operational data, hypothesis and assumptions were considered:

- The information supplied should be treated globally, so that lacking or mistaken information provided by an ANSP were corrected according with the rest of existing information for that flight. Therefore, time, flight level and coordination points were revised. For example: a total of 130.000 position reports was provided to SATMA. More information was extrapolated from this original data. Likewise, coordinates reports were associated with the closer waypoint possible.

- Whereas flight plan information had only a first and last point, the flight plan was extrapolated to the closer route. For instance, if the first flight plan was TENPA SAMAR, the final flight plan would be TENPA USOTI APASO VIDRI GDV SAMAR.

- Although the provided data of traffic outside of the EUR-SAM corridor were not relevant for the safety and statistical assessments, all data was processed similarly.

3. Discussion

3.1 To sum up the information presented above, SATMA, to conduct the traffic and safety monitoring of the EUR/SAM corridor, every year has faced to main recurrent issues:

- Elaboration of statistical data based on do not represent whole EUR/SAM Corridor since data is based exclusively on traffic that fly over Canarias FIR.

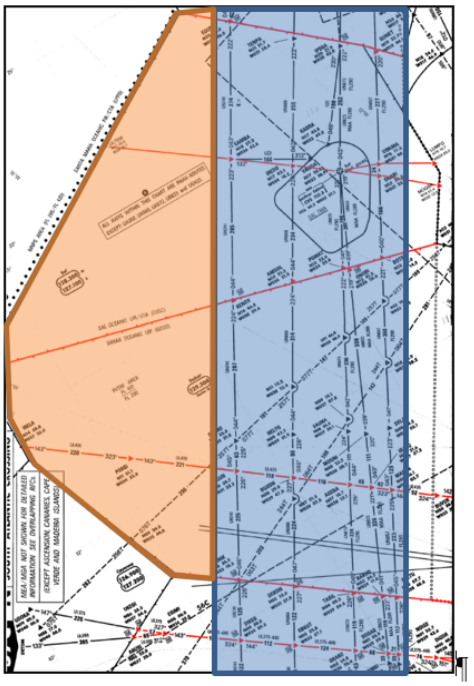
- The data provided by each ANSP , to perform the "Safety Assessment, to increase the consistency of this operational data, several hypothesis and assumptions were considered.

3.2 ENAIRE/Spain in collaboration with SATMA suggested to the SAT group (IMG01) establishing of new data source to cover the following area of interest identified for the SAT IMG: “Identify required traffic statistics and analysis to enable the SAT SG to make more accurate and predictable planning decisions”.

3.3 The new one is the Demand Data Repository (DDR) provided by EUROCONTROL, as the Network Manager (NM). The DDR provides Past traffic data. These focus on traffic demand, and most recently filed flight plan traffic trajectories and actual trajectories from which can be used for any past analysis. Regarding forecast, NM provides the following: Short-term forecasts are published four times a year. Medium-term forecasts look seven years ahead and build on the short-term forecasts. The medium-term forecasts combine flight statistics with economic growth and with models of other important drivers in the industry such as costs, airport capacity, passengers, load factors, aircraft size, etc. The medium-term forecast is published in February and refreshed in September. This task will be carried out for next IMG meeting.

3.4 Finally, before starting the analysis performed in 2022, it is needed to clarify the scope of the figures in the EUR/SAM corridor:

- The traffic that has overflown any part of UN741, UN866, UN873 and UN857 ATS ROUTE is considered Traffic in the EUR/SAM corridor (blue area).
- The traffic that has overflown any part of the ACCs in the EUR/SAM corridor (ACCs in the Canary Islands, Recife, Sal and Dakar) represented like blue and orange areas, see next image, is considered Traffic in the EUR/SAM Area.



Picture 1. Global flights– EUR/*SAM* Corridor (2022)

Considering the mentioned new source data, a dept analysis has been conducted in the EUR/SAM corridor/area. An extract of this study, focused on the global figures, are broken down as follows:

EUR/SAM Corridor (2022)					
MONTH	2022			2021	% VAR
	Random	Corridor	Area	TOTAL	
JANUARY	467	3141	3608	1728	109%
FEBRUARY	481	2613	3094	1339	131%
MARCH	494	3022	3516	1536	129%
APRIL	537	3170	3707	1456	155%
MAY	541	3160	3701	1856	99%
JUNE	520	3424	3944	1898	108%
JULY	540	3704	4244	2274	87%
AUGUST	589	3659	4248	2450	73%
SEPTEMBER	525	3543	4068	2345	73%
OCTOBER	459	3415	3874	2707	43%
NOVEMBER	484	3592	4076	2876	42%
DECEMBER	625	3814	4439	3397	31%
AVERAGE	522	3355	3877	2155	90%
TOTAL	6262	40257	46519	25862	80%

Table 4. Traffic picture in the EUR/SAM Corridor (2022)

EUR/SAM Corridor (2022)		
YEAR	COP	%
2022 (Area)	69177	53.5%
2022 (Corridor)	53155	54.0%

GCCC	GVSC	GVSC	GOOO	SBAO
EDUMO	AMDOL	OBOMO	ARAGO	JOBER
GOBEG	BAMUX	ONOBI	DEKON	MAGNO
GUNET	BIKOM	PIXED	ERETU	MOVGA
INSAD	BORTA	POMAT	GANAK	UTRAM
IPERA	BOTNO	RUKAV	GOGSO	VUNOK
IXIKU	ERNEK	SEPOM	MOVGA	
KUXOV	GARPO	TARIM	NANIK	
LAPTU	ILGAS	TEGTO	OPADO	
PIXED	KENOX	ULTEM	POKSI	
TENPA	LUMPO	VEPOP	RAKUD	
XIGLU	MOGSA	XIBOT	TASIL	
	NATAS	XIGLU		
		XUVIT		

Table 5. Global figures NOT Planned RFL – EUR/SAM Corridor (2022)

EUR/SAM Area (2022)

AIRLINE	FLIGHTS	% TOTAL	% AC.
TAP	9400	20.2%	20.2%
IBE	3556	7.6%	27.9%
TAM	3153	6.8%	34.6%
AFR	2927	6.3%	40.9%
AEA	2524	5.4%	46.3%
DAL	1908	4.1%	50.4%
KLM	1883	4.0%	54.5%
TOM	1801	3.9%	58.4%
UAL	1524	3.3%	61.6%
AZU	1387	3.0%	64.6%
BAW	1342	2.9%	67.5%
LAN	1303	2.8%	70.3%
DLH	1256	2.7%	73.0%
TUI	754	1.6%	74.6%
ETH	727	1.6%	76.2%
ARG	591	1.3%	77.5%

EUR/SAM Corridor (2022)

AIRLINE	FLIGHTS	% TOTAL	% AC.
TAP	8586	21.3%	21.3%
TAM	2945	7.3%	28.6%
IBE	2826	7.0%	35.7%
AEA	2011	5.0%	40.7%
AFR	1926	4.8%	45.4%
DAL	1908	4.7%	50.2%
TOM	1708	4.2%	54.4%
UAL	1524	3.8%	58.2%
AZU	1381	3.4%	61.6%
KLM	1099	2.7%	64.4%
DLH	985	2.4%	66.8%
BAW	827	2.1%	68.9%
TUI	754	1.9%	70.7%
LAN	745	1.9%	72.6%
ETH	718	1.8%	74.4%
TFL	512	1.3%	75.7%

Table 6. Global figures per airline – EUR/SAM Corridor (2022)

EUR/SAM Area (2022)

TYPE	CANT	%	% A.
A339	6916	14.9%	14.9%
B789	6081	13.1%	27.9%
A332	4198	9.0%	37.0%
B77W	4003	8.6%	45.6%
B788	3558	7.6%	53.2%
B38M	3046	6.5%	59.8%
B763	2749	5.9%	65.7%
A359	2282	4.9%	70.6%
A21N	1875	4.0%	74.6%
A20N	1250	2.7%	77.3%

EUR/SAM Corridor (2022)

TYPE	CANT	%	% A.
A339	6190	15.4%	15.4%
B789	4515	11.2%	26.6%
A332	3648	9.1%	35.7%
B77W	3254	8.1%	43.7%
B788	3126	7.8%	51.5%
B38M	2873	7.1%	58.6%
B763	2720	6.8%	65.4%
A21N	1803	4.5%	69.9%
A359	1497	3.7%	73.6%
A20N	1247	3.1%	76.7%

Table 7. Global figures per aircraft type – EUR/SAM Corridor (2022)

EUR/SAM Area (2022)			
TRAFFIC FLOWS	FLIGHTS	%	%A.
LIMAL IPERA POMAT TASIL VUNOK	5888	13.6%	13.6%
VUNOK TASIL POMAT IPERA LIMAL	4745	11.0%	24.6%
MAGNO DEKON AMDOL TENPA ORVEK	3483	8.1%	32.7%
CVS IPERA LIMAL	2393	5.5%	38.3%
LIMAL IPERA CVS	2071	4.8%	43.1%
BIPET GUNET BOTNO ERETU UTRAM	1697	3.9%	47.0%
ROSTA EDUMO KENOX NANIK JOBER	1396	3.2%	50.2%
LIMAL IPERA BVT	1190	2.8%	53.0%
MOVGA BIKOM ULTEM	981	2.3%	55.3%
MAGNO DEKON AMDOL TENPA PUCLO	899	2.1%	57.4%
ULTEM XUVIT NANIK JOBER	834	1.9%	59.3%
LIMAL IPERA SNT	785	1.8%	61.1%
ULTEM BIKOM MOVGA	758	1.8%	62.9%
SNT IPERA LIMAL	723	1.7%	64.5%
ULTEM LUMPO	689	1.6%	66.1%

Table 8. Global figures per trajectory/Route – EUR/SAM Corridor (2022)

EUR/SAM Area (2022)		
EQUIPMENT	2022	%
RNP10	46288	99.5%
RNP4	34639	74.5%
CPDLC	39900	85.8%
RSP180 *	22698	48.8%
RCP240	29813	64.1%
RSP180/RCP240	22320	48.0%
RSP180/RCP240 ***	22347	62.0%
ADS-C FANS	38867	83.6%
9- ADS-B	45808	98.5%

(*) RSP information is obtained from flight plan (B2B services from NM)

(**) Hypothesis based on: Traffic crossing LPPO FIR has RSP180/RCP240.

Table 9. Global figures equipment and capabilities – EUR/SAM Corridor (2022)

4. Action by the Meeting

4.1 The meeting is invited to:

a) note the information provided;

b) provide direction as deemed necessary related to the new data source;

c) open the debate to set up other alternatives, if needed.

— END —