ANNEX

June 2018

Scope

- **The necessary flight plan information to perform this study is obtained from PALESTRA (ENAIRe´s data base):**
  - this flight plan data contains initial flight plan information that is updated by radar and controllers with pilot position reports.
  - 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.
    - traffic using the random route.
  - this study does not reflect:
    - traffic not overflying Canaries FIR/UIR.
    - data from east-west flows crossing the EUR-SAM corridor.
    - southbound traffic to/ from Cape Verde.

enaire.es

June 2018

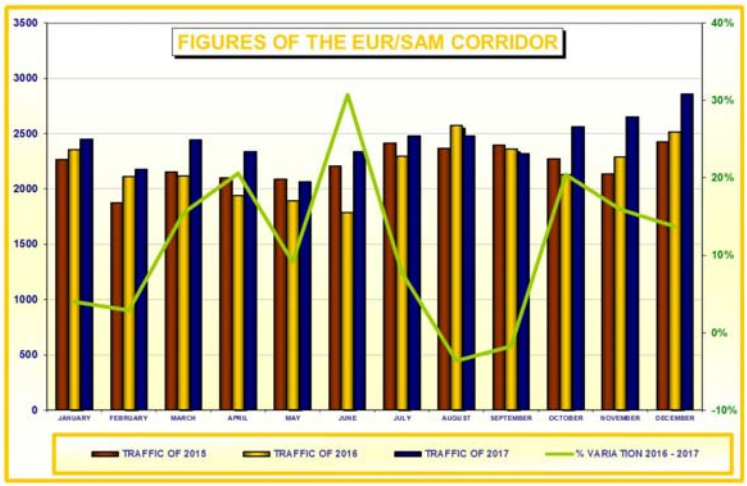
Global figures of the EUR/SAM corridor

MONTH	SOUTHBOUND		NORTHBOUND		TOTAL TRAFFIC IN THE CORRIDOR						% VARIATION	% VARIATION
	2016	2017	2016	2017	2015	DAILY	2016	DAILY	2017	DAILY	2015 - 2016	2016 - 2017
JANUARY	1188	1098	1167	1351	2264	73	2355	76	2449	79	4%	4%
FEBRUARY	918	1012	1195	1163	1874	67	2113	73	2175	78	13%	3%
MARCH	908	1073	1209	1373	2151	69	2117	68	2446	79	-2%	16%
APRIL	916	1088	1021	1247	2099	70	1937	65	2335	78	-8%	21%
MAY	790	1010	1101	1055	2086	67	1891	61	2065	67	-9%	9%
JUNE	852	1025	935	1312	2205	74	1787	62	2337	78	-19%	31%
JULY	1139	1112	1159	1364	2415	78	2298	74	2476	80	-5%	8%
AUGUST	1217	1202	1358	1279	2368	76	2575	83	2481	80	9%	-4%
SEPTEMBER	1104	1121	1254	1196	2393	80	2358	79	2317	77	-1%	-2%
OCTOBER	1013	1339	1114	1222	2269	73	2127	69	2561	83	-6%	20%
NOVEMBER	969	1190	1319	1463	2134	71	2288	76	2653	88	7%	16%
DECEMBER	1144	1337	1369	1522	2423	78	2513	81	2859	92	4%	14%
AVERAGE	1013	1134	1183	1296	2223	73	2197	72	2430	80	-1%	11%

enaire.es 2

June 2018

Global figures of the EUR/SAM corridor



enaire.es 3

June 2018

Number of movements

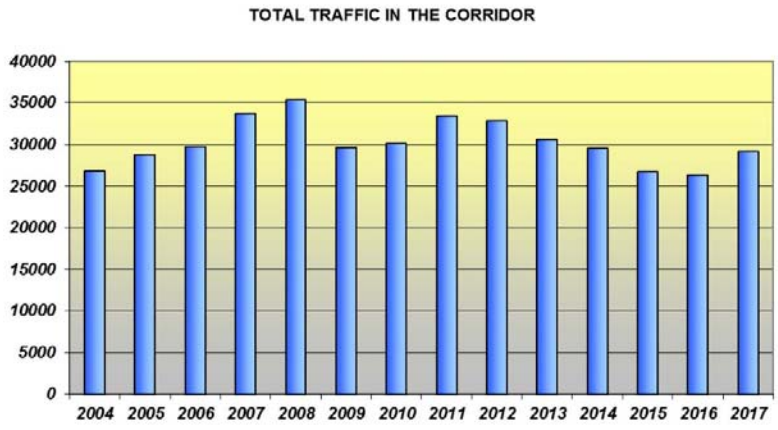
FIGURES OF	SOUTHBOUND	NORTHBOUND	TOTAL TRAFFIC IN THE CORRIDOR	MONTHLY	DAILY
2004	13108	13685	26793	2233	73
2005	14088	14674	28762	2397	79
2006	14651	15036	29687	2474	81
2007	16704	17004	33708	2809	92
2008	17024	18295	35319	2943	96
2009	14256	15366	29622	2468	81
2010	14083	16019	30102	2508	82
2011	15426	17988	33414	2784	92
2012	15245	17624	32869	2739	90
2013	14778	15867	30645	2554	84
2014	13469	16113	29582	2465	81
2015	11613	15068	26681	2223	73
2016	12158	14201	26359	2197	72
2017	13607	15547	29154	2430	80

enaire.es

4

June 2018

Number of movements

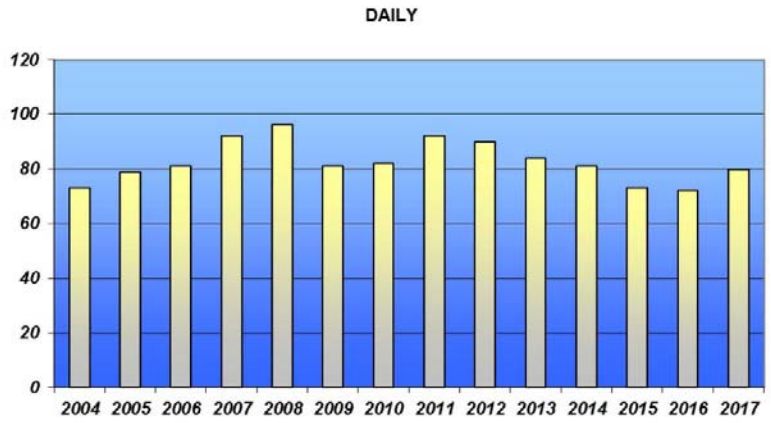


enaire.es

5

June 2018

Average daily traffic

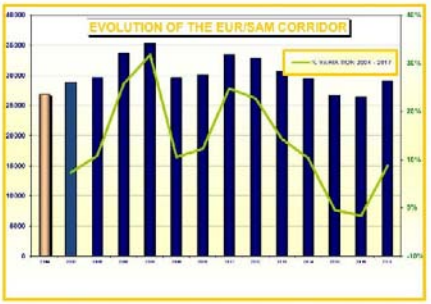


enaire.es

June 2018

EUR/SAM corridor evolution

FIGURES OF	SOUTHBOUND	NORTHBOUND	TOTAL TRAFFIC IN THE CORRIDOR	% INCREASE FROM 2004
2004	13108	13685	26793	-
2005	14088	14874	28782	7.3%
2006	14651	15036	29687	10.8%
2007	16704	17004	33708	25.8%
2008	17024	18295	35319	31.82%
2009	14256	15366	29622	10.56%
2010	14083	16019	30102	12.35%
2011	15426	17988	33414	24.71%
2012	15245	17624	32869	22.68%
2013	14778	15867	30645	14.38%
2014	13469	16113	29582	10.41%
2015	11613	15068	26681	-0.42%
2016	12158	14201	26359	-1.62%
2017	13607	15547	29154	8.81%



enaire.es

June 2018

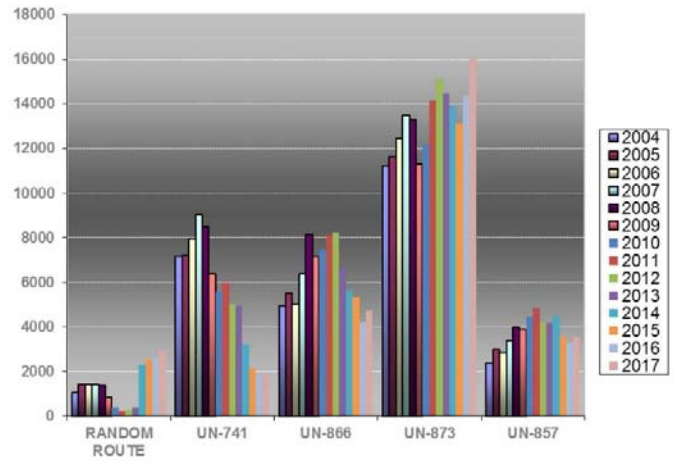
Traffic per ATS route

	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

enaire.es

June 2018

Traffic per ATS route



enaire.es

June 2018

Daily traffic

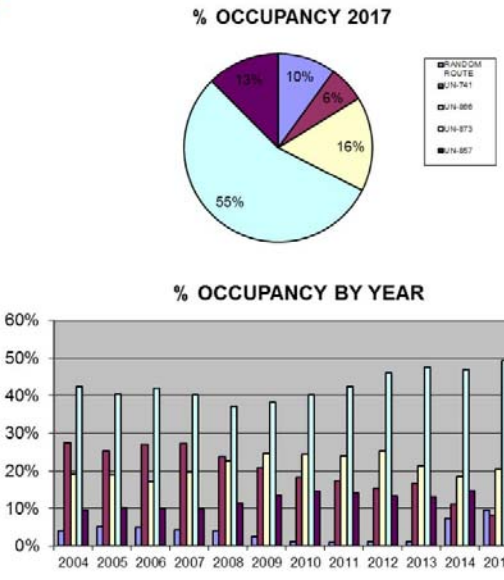
	TOTAL CORREDOR	RANDOM ROUTE		UN-741		UN-866		UN-873		UN-857	
		DAILY	%	DAILY	%	DAILY	%	DAILY	%	DAILY	%
2004	73	3	4%	20	27%	14	19%	31	42%	7	10%
2005	79	4	5%	20	25%	15	19%	32	41%	8	10%
2006	81	4	5%	22	27%	14	17%	34	42%	8	10%
2007	92	4	4%	25	27%	18	20%	37	40%	9	10%
2008	97	4	4%	23	24%	22	23%	36	37%	11	11%
2009	81	2	2%	17	21%	20	25%	31	38%	11	14%
2010	82	1	1%	15	18%	20	24%	33	40%	12	15%
2011	92	1	1%	16	17%	22	24%	39	42%	13	14%
2012	91	1	1%	14	15%	23	25%	42	46%	12	13%
2013	84	1	1%	14	17%	18	21%	40	48%	11	13%
2014	81	6	7%	9	11%	15	19%	38	47%	12	15%
2015	73	7	10%	6	8%	15	21%	36	49%	10	14%
2016	72	7	10%	5	7%	12	17%	39	54%	9	13%
2017	80	8	10%	5	6%	13	16%	44	55%	10	13%

enaire.es

10

June 2018

Daily traffic



enaire.es

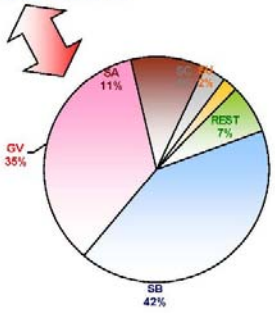
11

June 2018

Main flows

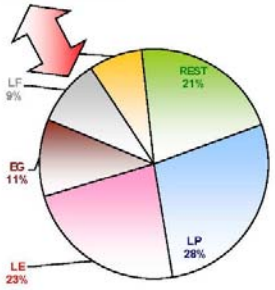
COUNTRY *	2016	2017	VAR %
SB	11290	12159	8%
GV	9185	10254	12%
SA	2716	3133	15%
SC	748	942	26%
SU	567	624	6%
REST	1829	2043	12%

* ORIGIN / DESTINATION



COUNTRY *	2016	2017	VAR %
LP	6773	8143	20%
LE	5905	6703	12%
EG	2691	3181	18%
LF	2895	2748	-5%
ED	2066	2209	7%
REST	5849	6172	6%

* ORIGIN / DESTINATION



enaire.es

12

June 2018

Main airports

MAIN AIRPORT: LEPT

% CORRIDOR: ######

ATS ROUTE	SOUTHBOUND	NORTHBOUND	TOTAL	%PER ROUTE
RANDOM	14	87	101	1%
UN-741	312		312	4%
UN-866	1	1477	1478	19%
UN-873	2938	2223	5161	68%
UN-857	300	236	536	7%
TOTAL	3565	4023	7588	

MAIN AIRPORT: LEMD

% CORRIDOR: ######

ATS ROUTE	SOUTHBOUND	NORTHBOUND	TOTAL	%PER ROUTE
RANDOM	509	455	964	16%
UN-741	599		599	10%
UN-866		1194	1194	20%
UN-873	1174	1326	2500	42%
UN-857	475	279	754	13%
TOTAL	2757	3254	6011	

MAIN AIRPORT: LEBB

% CORRIDOR: ######

ATS ROUTE	SOUTHBOUND	NORTHBOUND	TOTAL	%PER ROUTE
RANDOM	120	161	281	5%
UN-741	383		383	6%
UN-866		1474	1474	26%
UN-873	1479	1544	3023	52%
UN-857	458	166	624	11%
TOTAL	2420	3345	5765	

enaire.es

13

June 2018

Main airports

MAIN AIRPORT: GVAC

% CORRIDOR: #####

ATS ROUTE	SOUTHBOUND	NORTHBOUND	TOTAL	% PER ROUTE
RANDOM	18	29	47	1%
UN-741	138	3	141	3%
UN-866	3	309	312	6%
UN-873	1800	2414	4214	78%
UN-857	159	527	686	13%
TOTAL	2118	3282	5400	

MAIN AIRPORT: SAEZ

% CORRIDOR: #####

ATS ROUTE	SOUTHBOUND	NORTHBOUND	TOTAL	% PER ROUTE
RANDOM	346	312	658	21%
UN-741	304		304	10%
UN-866		465	465	15%
UN-873	648	839	1288	42%
UN-857	204	161	365	12%
TOTAL	1502	1776	3079	

MAIN AIRPORT: GVDA

% CORRIDOR: #####

ATS ROUTE	SOUTHBOUND	NORTHBOUND	TOTAL	% PER ROUTE
RANDOM				
UN-741	18		18	1%
UN-866		26	26	1%
UN-873	1312	579	1891	82%
UN-857	346	21	367	16%
TOTAL	1676	626	2302	

enaire.es 14

June 2018

Main airports

MAIN AIRPORT: SBGL

% CORRIDOR: 7.90%

ATS ROUTE	SOUTHBOUND	NORTHBOUND	TOTAL	% PER ROUTE
RANDOM	42	41	83	4%
UN-741	77		77	4%
UN-866		669	669	31%
UN-873	292	354	646	30%
UN-857	462	228	690	32%
TOTAL	873	1292	2165	

MAIN AIRPORT: LPPC

% CORRIDOR: 7.43%

ATS ROUTE	SOUTHBOUND	NORTHBOUND	TOTAL	% PER ROUTE
RANDOM	54	128	182	9%
UN-741	243		243	11%
UN-866		432	432	20%
UN-873	408	631	1039	49%
UN-857	146	83	229	11%
TOTAL	851	1274	2125	

MAIN AIRPORT: GVAC

% CORRIDOR: 7.29%

ATS ROUTE	SOUTHBOUND	NORTHBOUND	TOTAL	% PER ROUTE
RANDOM				
UN-741	66	1	67	4%
UN-866		33	33	2%
UN-873	723	780	1503	79%
UN-857	223	67	290	15%
TOTAL	1012	881	1893	

MAIN AIRPORT: LICC

% CORRIDOR: 6.49%

ATS ROUTE	SOUTHBOUND	NORTHBOUND	TOTAL	% PER ROUTE
RANDOM	107	80	187	11%
UN-741	151		151	9%
UN-866		276	276	17%
UN-873	344	386	730	45%
UN-857	196	87	283	17%
TOTAL	798	829	1627	

enaire.es 19

June 2018

Main city-pair

CITY PAIR	TOTAL	% TOTAL
SBGR <-> LEMD	1772	6.1%
SAEZ <-> LEMD	1622	5.6%
GVNP <-> LPPT	1403	4.8%
SBGR <-> LPPT	951	3.3%
GVAC <-> LPPT	883	3.0%
SBGR <-> LFPG	842	2.9%
SBGL <-> LPPT	674	2.3%
SBKP <-> LPPT	630	2.2%
SBGR <-> EDDF	603	2.1%
SBRF <-> LPPT	603	2.1%
SUMU <-> LEMD	602	2.1%
SLVR <-> LEMD	534	1.8%
GVSV <-> LPPT	499	1.7%
GVAC <-> EHAM	487	1.7%
SBSV <-> LPPT	443	1.5%
SCEL <-> LEMD	429	1.5%
SBGR <-> EGLL	376	1.3%
GVAC <-> EGKK	365	1.3%
SBCF <-> LPPT	341	1.2%
GVAC <-> EGCC	341	1.2%
REST	14754	50.6%

enaire.es

16

June 2018

Evolution of AO's

AIRCRAFT OPERATOR	2016	2017	VARIATION
TAP	5463	6422	17.6%
IBE	2682	2667	-0.6%
AEA	1684	2010	19.4%
TOM	1338	1689	26.2%
AFR	1917	1528	-20.3%
TAM	813	1350	66.1%
DLH	924	922	-0.2%
BAW	851	848	-0.4%
TUI	671	700	4.3%
KLM	560	657	17.3%
REST	9456	10361	9.6%

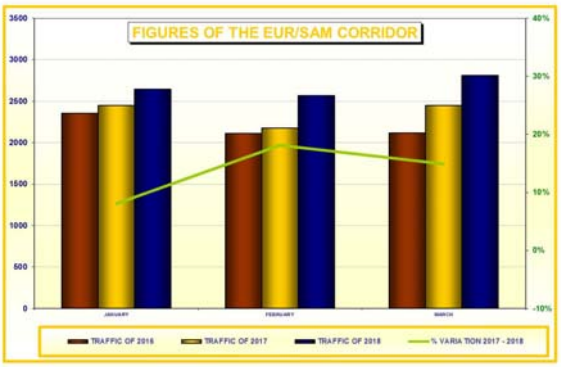
enaire.es

17

June 2018

2018 traffic evolution

MONTH	SOUTHBOUND		NORTHBOUND		TOTAL TRAFFIC IN THE CORRIDOR						% VARIATION	% VARIATION
	2017	2018	2017	2018	2016	DAILY	2017	DAILY	2018	DAILY	2016 - 2017	2017 - 2018
JANUARY	1098	1292	1351	1354	2355	76	2449	79	2646	88	4%	8%
FEBRUARY	1012	1157	1163	1412	2113	73	2175	78	2569	92	3%	18%
MARCH	1073	1372	1373	1438	2117	68	2446	79	2810	91	16%	15%
AVERAGE	1134	1274	1296	1401	2197	72	2430	80	2675	90	11%	14%



enaire.es

18

June 2018

Thank You

enaire.es

-END-

FLIGHT LEVEL OCCUPANCY

1. INTRODUCTION

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 previous SAT meetings as a relevant data to take preventive actions, in line with the evolution of these figures. Nevertheless, several issues were detected during last SATs 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.

The objective of this working paper is to cover both, the mentioned detected issues and SATMA monitoring performed in the EUR-SAM Corridor.

Once presented in SAT/23 meeting, this statistical data of the EUR-SAM Corridor will be available on SATMA web page: www.satmasat.com.

2. BACKGROUND

In accordance with the SAT19/01 conclusion, SATMA was assigned to gather the necessary traffic data for airspace planning, safety assessments and statistics in the EUR/SAM Corridor. In order to achieve this objective, Brazil, Cape Verde, Spain and Senegal should collect Air Traffic Movement data from their ATM Systems in a period of six months in accordance with the pre-established format agreed with each member.

Up to date, all SAT members have provided annually this information to perform the safety analysis. Afterward, a preliminary analysis of the global figures per ACCs is conducted to determine the representative month. This month is selected in accordance to the most relevant figures of traffic and its data consistency per FIR. August 2017 was selected to obtain the traffic for the safety assessment in 2017 and key source to perform the present assessment.

3. HYPOTHESIS, ASSUMPTIONS AND CONSIDERATIONS

Even though global figures and conclusions should be obtained directly from the data provided by each ANPS with an easy and simple process, the data provided are not coherent among ANSP. For instance, there are flight plans that are not registered by all involved ANPS's, the operational information shows 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, and in order to increase the consistency of this operational data, several hypothesis and assumptions have been considered:

- The original information supplied by each ANSP was treated as partial to obtain its operational indicators. However, this data was considered globally to complete the lacking of some flights in FIR reported by the rest of adjacent ones.

- A total of 30.000 position reports have been provided. Additional information has been extrapolated from this original data until 71.000 positions reports. Likewise, coordinates reports have been associated with the closer waypoint possible.

- Whereas flight plan information had only an initial and final point, the flight plan has been extrapolated to the closer route. For instance, if the initial 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, in this assessment, all data has been processed similarly.

Finally, it is necessary to explain some terms in order to understand the figures presented in this working paper:

- It is considered “EUR/SAM traffic” the traffic which has flown at least a leg of the following AWYs in SBAO/GOOO/GVSC FIRs: UN741, UN866, UN873 and UN857.

- It is considered “EUR/SAM Area” the area where the information has been reported to SATMA. Next figure depicts what it is considered the EUR/SAM Area.

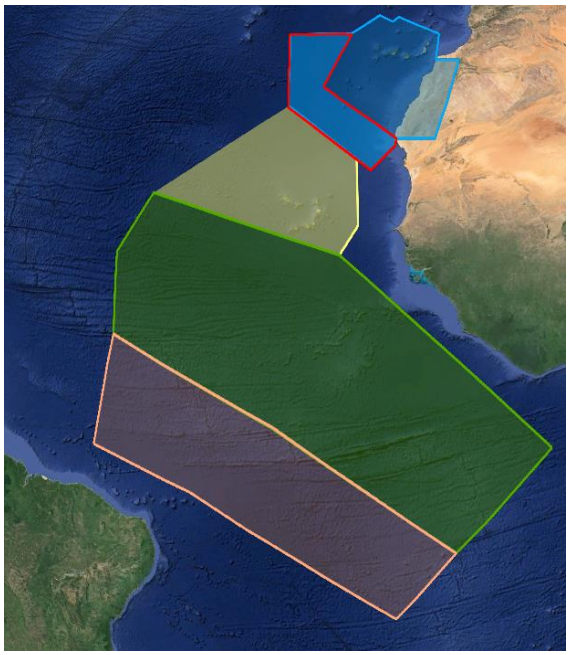


Figure 1. EUR/SAM Area

- The information related to dates, months, and times is obtained from the first waypoint where the flight is referred. The criteria and information used to perform this study, both global and per FIR, are the same.

4. DISCUSSION

4.1 AIR TRAFFIC STATISTICS IN THE EUR/SAM AREA – CANARIAS FIR

Next table shows the number of flights belonging to EUR/SAM or random/transversal traffic (Canarias FIR). The total number of flights registered in the EUR/SAM area of Canarias FIR has been **2.422** flights. Most of them are considered traffics belonging to EUR/SAM Corridor (92.5 % of total).

	Canarias FIR	
	AUGUST 2017	%
EUR/SAM	2242	92.6%
TRANSVERSAL	26	1.1%
RANDOM	154	6.4%
TOTAL	2422	

Table 1. Global Figures of Flights – EUR/SAM Area – Canarias FIR

The following table shows, for the most significant airlines in terms of registered figures, the number of flights and percentage referred to the total number of registered flights in the EUR/SAM Area – Canarias FIR during the studied period.

TRAFFIC PER AIRLINE IN CANARIAS FIR			
AIRLINE	FLIGHTS	% TOTAL	% EURSAM
TAP	586	24.2%	23.9%
IBE	211	8.7%	7.9%
AEA	168	6.9%	5.9%
TOM	126	5.2%	5.2%
TAM	122	5.0%	5.0%
AFR	104	4.3%	3.8%
DLH	82	3.4%	3.3%
TCV	72	3.0%	3.0%
AZU	61	2.5%	2.5%
KLM	58	2.4%	2.3%
TUI	54	2.2%	2.2%
RAM	54	2.2%	2.2%

Table 2. Global Figures per airline – Canarias FIR

On the other hand, considering the foreseen evolution of EUR/SAM Corridor, several additional analyses have been accomplished for each FIR:

- **Flight level distribution- Canarias FIR**
  Flight level FL350 was the most required one. Likewise, the 20% of traffic in Canarias FIR was cleared to FL340 or below.

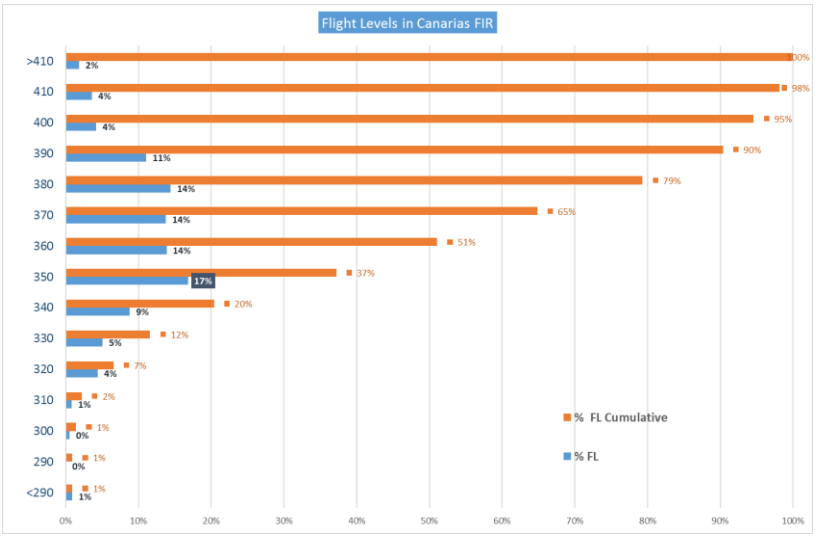


Figure 2. Distribution the Flight Levels in EUR/SAM Corridor – Canarias FIR

Note that to prepare this assessment only FL in the border of FIR was considered.

- **Traffic load- Canarias FIR**
  Next chart shows a summary of traffic load registered in Canarias FIR where bars represent the number of aircraft that entered in the FIR per hour. The orange curve represents the maximum number of aircrafts that entered in the FIR per hour. The peak periods of traffic are 00-02 and 13-14 UTC. Likewise the peak hour was 01 with 16 flights.

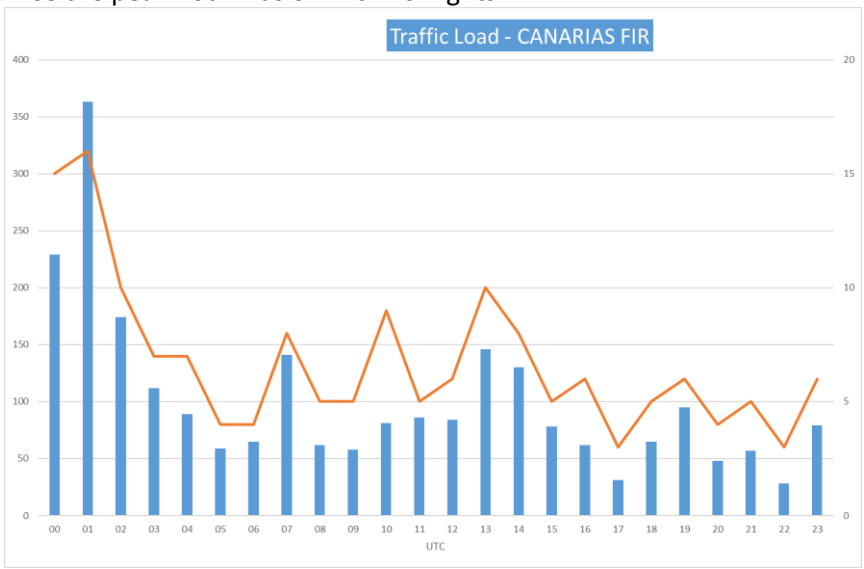


Figure 3. Traffic load in EUR/SAM Corridor – Canarias FIR

- **Traffic distribution per ATS Route– Canarias FIR:**

The following figures and tables try to sum up the operational data provided to SATMA. In Canarias FIR the main flow is via IPERA (UN873), afterwards this traffic planned other ATS routes depending on their origin/destination. UN741 and UN866 have also relevant figures but less than the first one due to their unidirectional characteristic. Note that UN857 figures have already overcome UN741 and UN866, even though it is a bidirectional route. Finally, it is remarkable that Canarias FIR registered several "random routes" which are based on published DCT.

TRAFFIC	RANDOM	UN741	UN866	UN873	UN857	TRANSVERSAL
NORTHBOUND	89	0	335	627	161	26
SOUTHBOUND	65	178	0	750	191	
TOTAL	154	178	335	1377	352	26

Table 3. Distribution per ATS Route – Canarias FIR

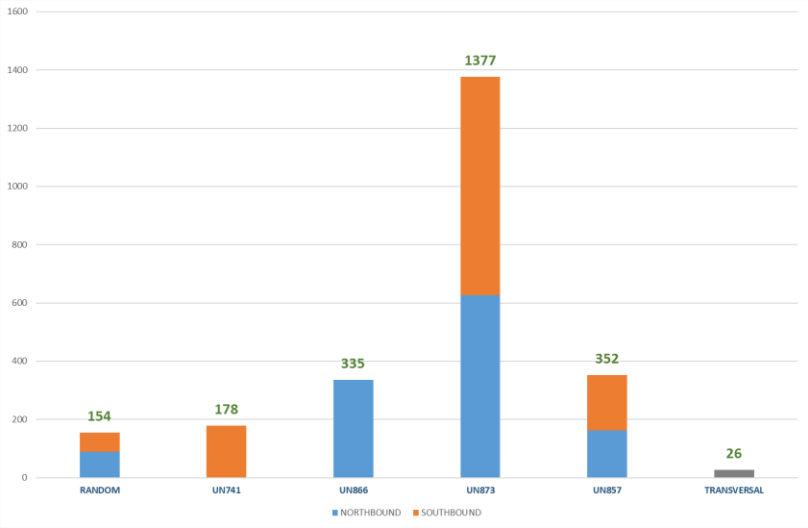


Figure 4. Distribution per ATS Route – Canarias FIR

- **Main Flows - Canarias FIR**

TRAFFIC FLOWS	FLIGHTS	%
SAMAR IPERA	626	25.8%
IPERA SAMAR	316	13.0%
IPERA VASTO	247	10.2%
TENPA KONBA	190	7.8%
NELSO EDUMO	160	6.6%
TERTO IPERA	103	4.3%
TERTO GUNET	90	3.7%
GUNET SOLNA	64	2.6%
TENPA BIMBO	62	2.6%
TENPA VASTO	53	2.2%
SAMAR GUNET	50	2.1%
SOLNA GUNET	49	2.0%

Table 4. TRAFFIC FLOWS – Canarias FIR

4.2 AIR TRAFFIC STATISTICS IN THE EUR/SAM AREA – SAL OCEANIC FIR

Next table shows the number of flights belonging to EUR/SAM or random/transversal traffic (Sal Oceanic FIR). The total number of flights registered in the EUR/SAM area of Sal Oceanic FIR has been **4.021** flights. The number of flights belonging to EUR/SAM corridor is similar to Canarias FIR. However, the random traffic registered a significant figure to be taking into account by the SAT group.

	SAL OCEANIC FIR	
	AUGUST 2017	%
EUR/SAM	2350	58.4%
TRANSVERSAL	461	11.5%
RANDOM	1210	30.1%
TOTAL	4021	

Table 5. Global Figures of Flights – EUR/SAM Area – Sal Oceanic FIR

The following table shows, for the most significant airlines in terms of registered figures, the number of flights and percentage referred to the total number of registered flights in the EUR/SAM Area – Sal Oceanic FIR during the studied period.

TRAFFIC PER AIRLINE IN SAL OCEANIC FIR			
AIRLINE	FLIGHTS	% TOTAL	% EURSAM
TAP	817	20.3%	14.3%
IBE	298	7.4%	4.8%
TAM	294	7.3%	3.0%
AFR	266	6.6%	2.3%
AEA	192	4.8%	3.5%
BAW	157	3.9%	0.8%
DLH	140	3.5%	2.0%
KLM	139	3.5%	1.3%
TCV	136	3.4%	2.0%
SAA	124	3.1%	0.0%
TOM	124	3.1%	3.1%
DAL	115	2.9%	0.0%

Table 6. Global Figures per airline – Sal Oceanic FIR

On the other hand, considering the foreseen evolution of EUR/SAM Corridor, several additional analyses have been accomplished for each FIR:

- **Flight level distribution – Sal Oceanic FIR**
  Flight level FL350 and FL370 were the most required one. Likewise, the 27% of traffic in SAL Oceanic FIR was cleared to FL340 or below.

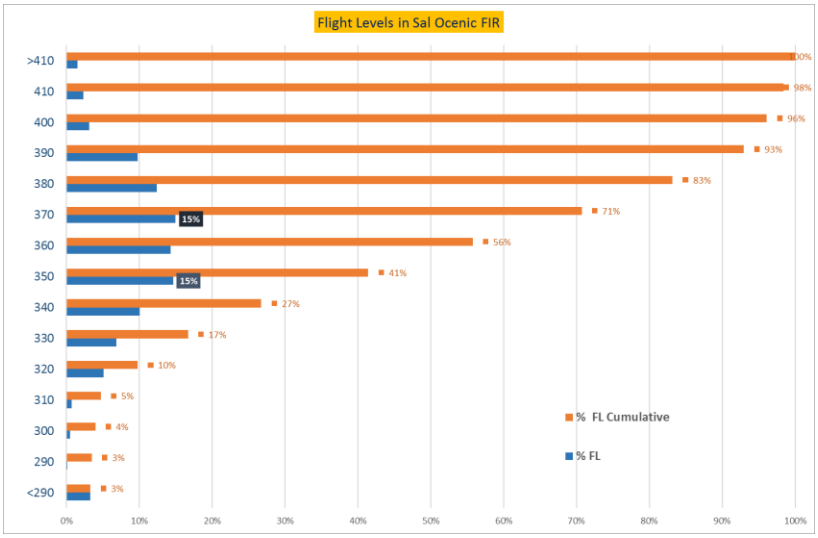


Figure 5. Distribution the Flight Levels in EUR/SAM Corridor – Sal Oceanic FIR

Note that to prepare this assessment only FL in the border of FIR was considered.

- **Traffic load – Sal Oceanic FIR**
  Next chart shows a summary of traffic load registered in Sal Oceanic FIR where bars represent the number of aircraft that entered in the FIR per hour. The orange curve represents the maximum number of aircrafts that entered in the FIR per hour. The peak periods of traffic are 23-03 and 13-14 UTC. Likewise the peak hour was 01 with 20 flights.

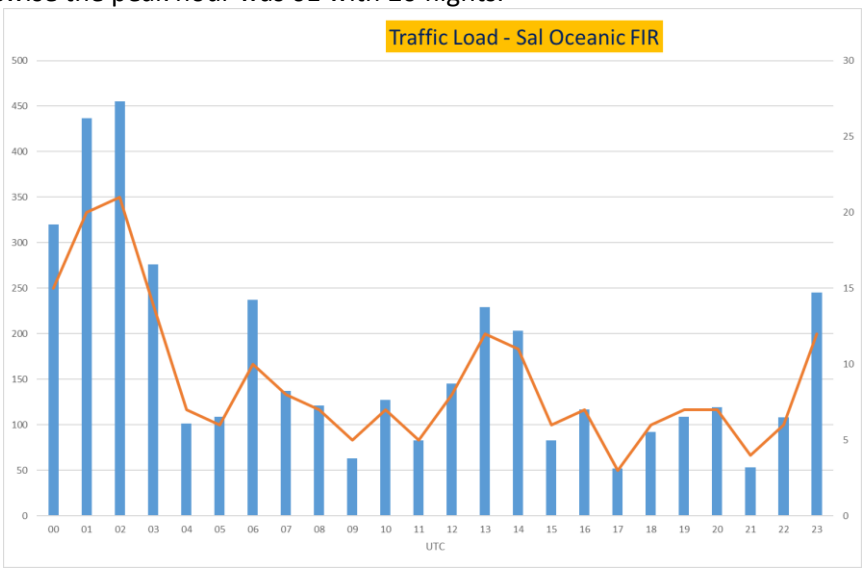


Figure 6. Traffic load in EUR/SAM Corridor – Sal Oceanic FIR

- **Traffic distribution per ATS Route– Sal Ocenacic FIR:**

The following figures and tables try to sum up the operational data provided to SATMA. In Sal Oceanic FIR the main flow is via IPERA (UN873). In addition, it is remarkable that Sal Oceanic FIR registered a relevant traffic by random route.

TRAFFIC	RANDOM	UN741	UN866	UN873	UN857	TRANSVERSAL
NORTHBOUND	632	7	346	648	168	461
SOUTHBOUND	579	223	4	753	200	
TOTAL	1211	230	350	1401	368	461

Table 7. Distribution per ATS Route – Sal Oceanic FIR

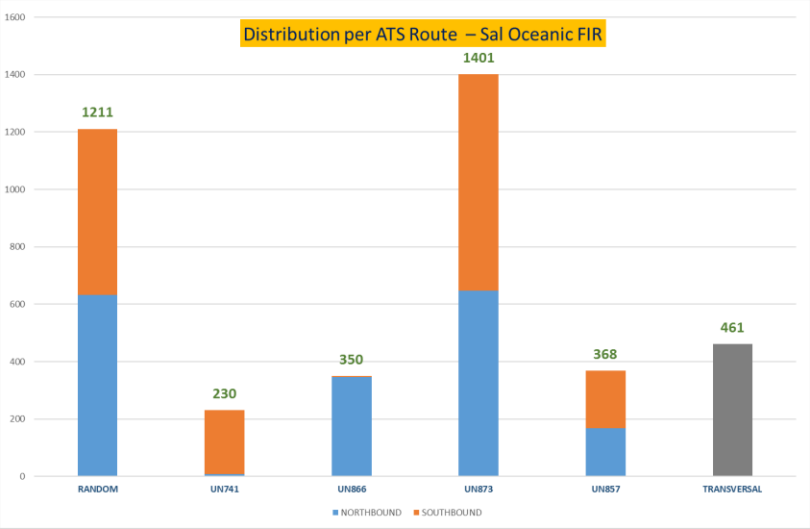


Figure 7. Distribution per ATS Route – Sal Oceanic FIR

- **Main Flows – Sal Oceanic FIR**

TRAFFIC FLOWS	FLIGHTS	%
IPERA POMAT	395	11.1%
AMDOL TENPA	309	8.7%
POMAT IPERA	297	8.3%
BIKOM ULTEM	286	8.0%
ULTEM XUVIT	220	6.2%
GARPO ERNEK	174	4.9%
CVS IPERA	168	4.7%
ULTEM BIKOM	143	4.0%
IPERA CVS	138	3.9%
EDUMO KENOX	134	3.8%
ERNEK GARPO	115	3.2%
GUNET BOTNO	100	2.8%

Table 8. TRAFFIC FLOWS – Sal Oceanic FIR

4.3 AIR TRAFFIC STATISTICS IN THE EUR/SAM AREA – DAKAR OCEANIC FIR

Next table shows the number of flights belonging to EUR/SAM or random/transversal traffic (Dakar Oceanic FIR). The total number of flights registered in the EUR/SAM area of Dakar Oceanic FIR has been **3.458** flights. The random traffic registered a significant figure, similar to Sal Oceanic FIR, to be taking into account by the SAT group.

	DAKAR OCEANIC FIR	
	AUGUST 2017	%
EUR/SAM	1965	56.8%
TRANSVERSAL	38	1.1%
RANDOM	1455	42.1%
TOTAL	3458	

Table 9. Global Figures of Flights – EUR/SAM Area – Dakar Oceanic FIR

The following table shows, for the most significant airlines in terms of registered figures, the number of flights and percentage referred to the total number of registered flights in the EUR/SAM Area – Dakar Oceanic FIR during the studied period.

TRAFFIC PER AIRLINE IN DAKAR OCEANIC FIR			
AIRLINE	FLIGHTS	% TOTAL	% EURSAM
TAP	653	18.9%	14.4%
TAM	374	10.8%	5.3%
IBE	337	9.7%	6.2%
AFR	291	8.4%	5.1%
AEA	211	6.1%	4.5%
AZA	203	5.9%	0.8%
DLH	173	5.0%	2.4%
BAW	161	4.7%	2.6%
KLM	146	4.2%	2.7%
ARG	121	3.5%	0.8%
LAN	76	2.2%	0.1%
AZU	65	1.9%	1.9%

Table 10. Global Figures per airline – Dakar Oceanic FIR

On the other hand, considering the foreseen evolution of EUR/SAM Corridor, several additional analyses have been accomplished for each FIR:

- **Flight level distribution – Dakar Oceanic FIR**
  Flight level FL370 was the most required one. Likewise, the 25% of traffic in Dakar Oceanic FIR was cleared to FL340 or below.

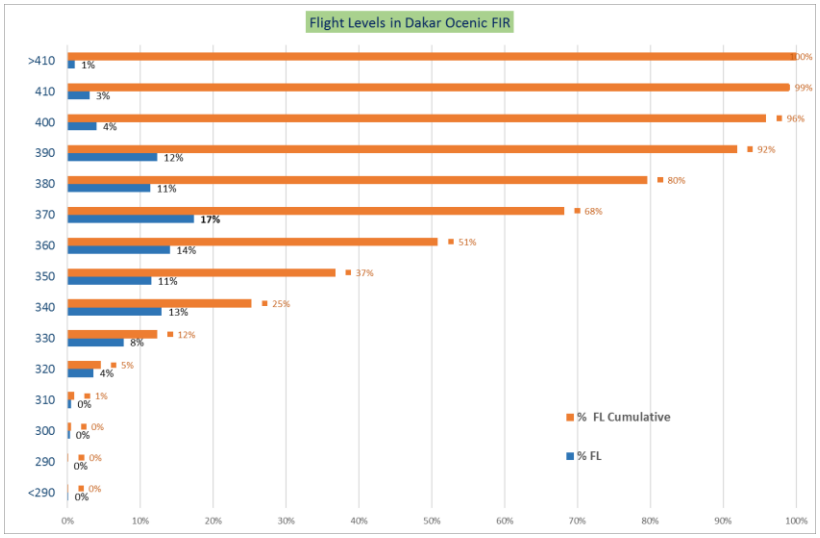


Figure 8. Distribution the Flight Levels in EUR/SAM Corridor – Dakar Oceanic FIR

Note that to prepare this assessment only FL in the border of FIR was considered.

- **Traffic load – Dakar Oceanic FIR**:
  Next chart shows a summary of traffic load registered in Dakar Oceanic FIR where bars represent the number of aircraft that entered in the FIR per hour. The orange curve represents the maximum number of aircrafts that entered in the FIR per hour. The peak periods of traffic are 01-03 and 22-23 UTC. Likewise the peak hour was 02 with 22 flights.

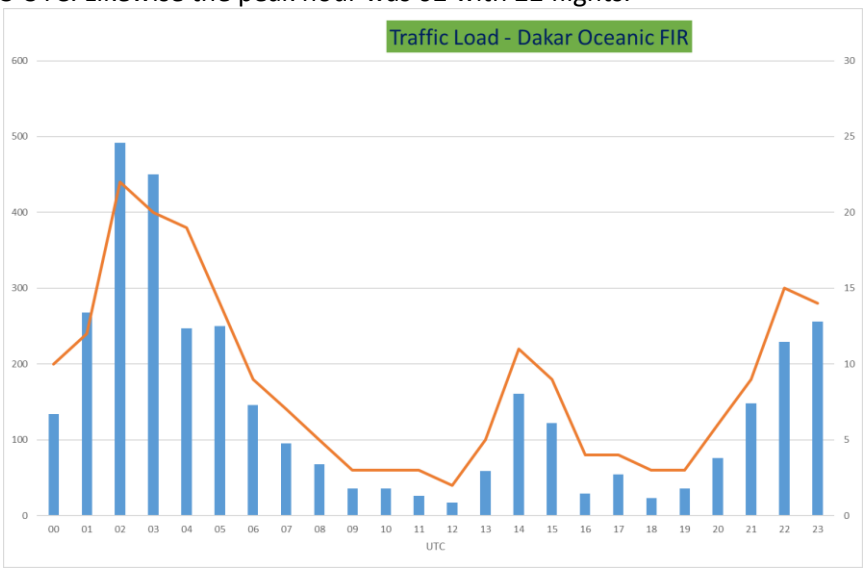


Figure 9. Traffic load in EUR/SAM Corridor – Dakar Oceanic FIR

- **Traffic distribution per ATS Route – Dakar Oceanic FIR:**
  The following figures and tables try to sum up the operational data provided to SATMA. In Dakar Oceanic FIR the main flow is random route.

TRAFFIC	RANDOM	UN741	UN866	UN873	UN857	TRANSVERSAL & EASTERN
NORTHBOUND	778		445	353	126	38
SOUTHBOUND	687	469		442	120	
TOTAL	1465	469	445	795	246	38

Table 11. Distribution per ATS Route – Dakar Oceanic FIR

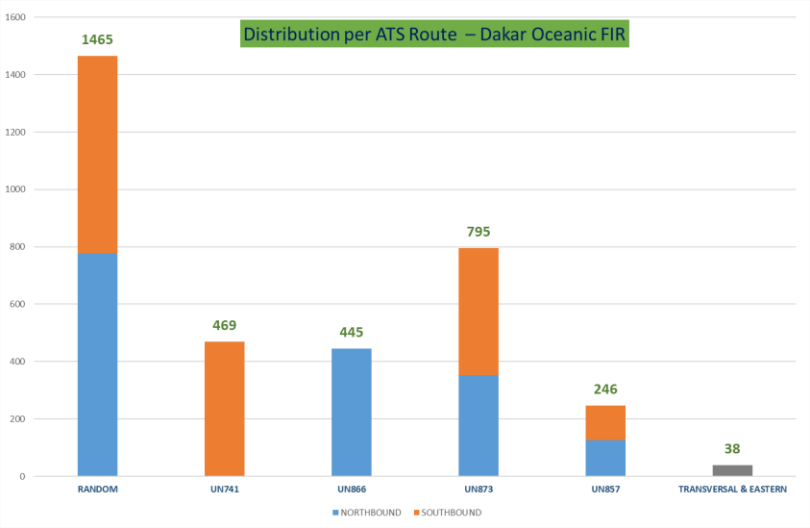


Figure 10. Distribution per ATS Route – Dakar Oceanic FIR

- **Main Flows – Dakar Oceanic FIR**

TRAFFIC FLOWS	FLIGHTS	%
POMAT TASIL	418	12.2%
DEKON AMDOL	410	12.0%
TASIL POMAT	352	10.3%
KODOS TAROT	334	9.8%
TAROT KODOS	327	9.6%
XUVIT NANIK	255	7.5%
MOVGA BIKOM	204	6.0%
KENOX NANIK	170	5.0%
ERETU BOTNO	121	3.5%
BOTNO ERETU	119	3.5%
GOGSO GARPO	119	3.5%
BIKOM MOVGA	110	3.2%

Table 12. TRAFFIC FLOWS – Dakar Oceanic FIR

4.4 AIR TRAFFIC STATISTICS IN THE EUR/SAM AREA – ATLANTICO FIR

Next table shows the number of flights belonging to EUR/SAM or random/transversal traffic (Atlantico FIR). The total number of flights registered in the EUR/SAM area of Atlantico FIR has been **3.387** flights. Eastern –Western flows are based on ATS Routes, that afterwards entry/exit in random areas Dakar Oceanic FIR.

	ATLANTICO FIR	
	AUGUST 2017	%
EUR/SAM	1856	54.8%
TRANSVERSAL	42	1.2%
EASTERN-WESTERN	1373	40.5%
RANDOM	116	3.4%
TOTAL	3387	

Table 13. Global Figures of Flights – EUR/SAM Area – Atlantico FIR

The following table shows, for the most significant airlines in terms of registered figures, the number of flights and percentage referred to the total number of registered flights in the EUR/SAM Area – Atlantico FIR during the studied period.

TRAFFIC PER AIRLINE IN DAKAR OCEANIC FIR			
AIRLINE	FLIGHTS	% TOTAL	% EURSAM
TAP	653	18.9%	14.4%
TAM	374	10.8%	5.3%
IBE	337	9.7%	6.2%
AFR	291	8.4%	5.1%
AEA	211	6.1%	4.5%
AZA	203	5.9%	0.8%
DLH	173	5.0%	2.4%
BAW	161	4.7%	2.6%
KLM	146	4.2%	2.7%
ARG	121	3.5%	0.8%
LAN	76	2.2%	0.1%
AZU	65	1.9%	1.9%

Table 14. Global Figures per airline – Atlantico FIR

On the other hand, considering the foreseen evolution of EUR/SAM Corridor, several additional analyses have been accomplished for each FIR:

- **Flight level distribution – Atlantico FIR**
  Flight level FL380 was the most required one. Likewise, the 29% of traffic in Atlantico FIR was cleared to FL340 or below.

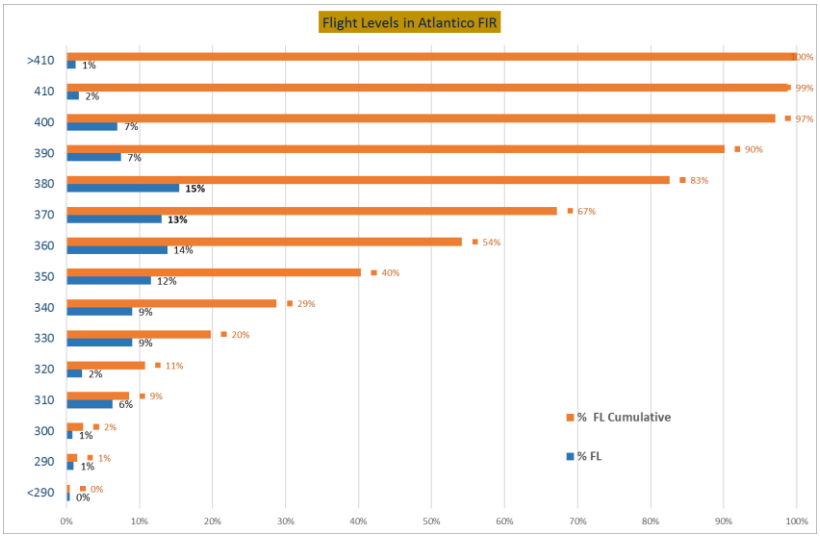


Figure 11. Distribution the Flight Levels in EUR/SAM Corridor – Atlantico FIR

Note that to prepare this assessment only FL in the border of FIR was considered.

- **Traffic load – Atlantico FIR**:
  Next chart shows a summary of traffic load registered in Atlantico FIR where bars represent the number of aircraft that entered in the FIR per hour. The orange curve represents the maximum number of aircrafts that entered in the FIR per hour. The peak period of traffic is 03-04. Likewise the peak hour was 04 with 29 flights.

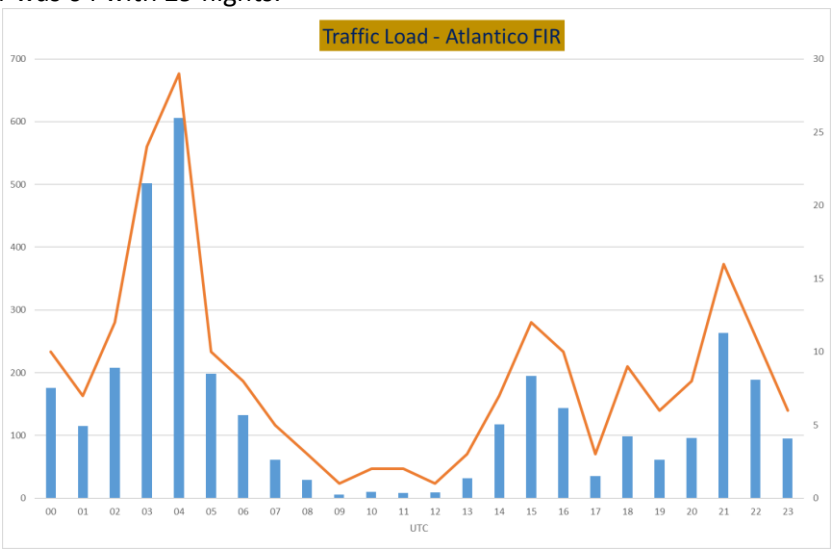


Figure 12. Traffic load in EUR/SAM Corridor – Atlantico FIR

- **Traffic distribution per ATS Route – Atlantico FIR:**

  The following figures and tables try to sum up the operational data provided to SATMA. In Atlantico FIR the main flow is via IPERA (UN873). Note that western –eastern flow cover a huge area with several ATS routes.

TRAFFIC	EASTERN-WESTERN	UN741	UN866	UN873	UN857	TRANSVERSAL	RANDOM
NORTHBOUND	694		362	371	117	42	67
SOUTHBOUND	679	456		451	99		49
TOTAL	1373	456	362	822	216	42	116

Table 15. Distribution per ATS Route – Atlantico FIR

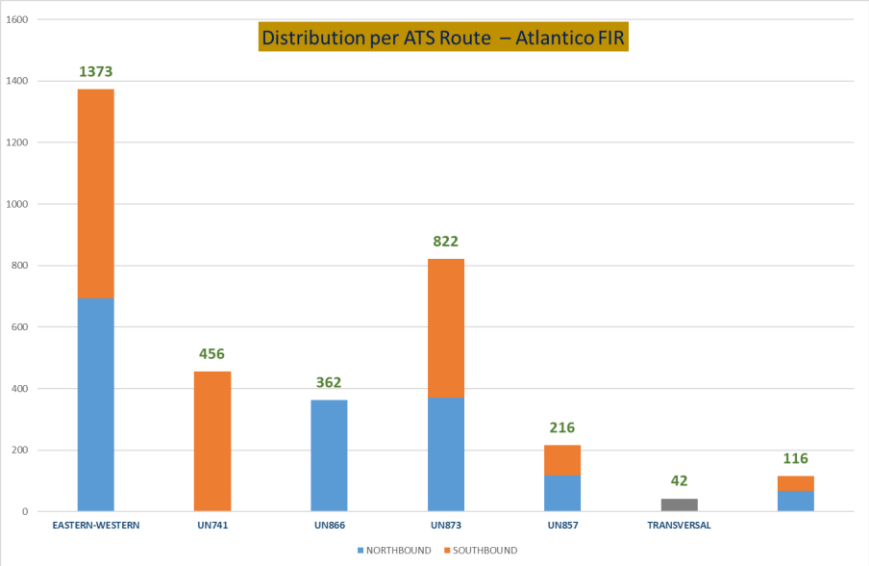


Figure 13. Distribution per ATS Route – Atlantico FIR

- **Main Flows – Atlantico FIR**

TRAFFIC FLOWS	FLIGHTS	%
NANIK JOBER	450	13.5%
TASIL VUNOK	445	13.4%
VUNOK TASIL	370	11.1%
MAGNO DEKON	361	10.8%
BUTAP CALVO	280	8.4%
DAKAP MOVGA	277	8.3%
CALVO BUTAP	219	6.6%
BUTAP VURBI	115	3.5%
ERETU UTRAM	95	2.9%
UTRAM ERETU	83	2.5%
MOVGA ESLEL	73	2.2%
MOVGA DAKAP	68	2.0%

Table 16. TRAFFIC FLOWS – Atlantico FIR