



SOUTH ATLANTIC SAFETY  
OVERSIGHT GROUP  
SAT SOG

# SAT Annual Safety Report



## Safety Policy

Safety is the SAT SOG core function. The Group is committed to developing an organisational culture that provides the conditions for executing safe practices and encourages effective operational safety reporting (voluntary and mandatory). SAT-SOG aims to foster effective communication between its *stakeholders* (ANSPs, airspace users, CSPs, States and relevant stakeholders) to promote the safety of operations. Further seeking to develop, implement, maintain, and constantly improve strategies and processes to ensure that all our aviation activities receive balanced organisational resources. SAT SOG will aim to achieve the highest level of safety performance and meet regional safety objectives under national and international standards, the Global Aviation Safety Plan (GASP), and the Global Air Navigation Plan (GANP).

### Objective

The objective of the SAT Member States is to maintain and, where possible, improve the agreed safety standards in all activities supporting the provision of Air Navigation Services in the SAT Region:

- All States involved are responsible for delivering the agreed level of safety performance in providing Air Navigation Services in the South Atlantic Region.
- All involved States are accountable for delivering the agreed safety performance in aircraft operations in the South Atlantic Region.
- All States involved must raise awareness of the importance of the good reporting culture with internal and external users and follow the processes established in processing messages for the monitoring bodies.
- Safety in the SAT Region is managed through the organisation and activities of the relevant implementation and oversight groups established by the SAT SG, in coordination with non-member States and observers, to achieve its Safety Objective.

### Guiding Principles

The SAT SOG will act to:

- **Clearly** define all accountabilities and responsibilities for the delivery of safety performance concerning the provision of air navigation services and participation in SAT SOG and its contributory bodies activities;
- **Maintain** continuous processes that monitor safety performance and establish and measure objectives, targets and performance indicators for operational safety to follow up the level of safety achieved;
- **Encourage** operational safety assurance activities as a way to continuously improve the services provided concerning safety performance, as well as to monitor the implementation processes for maintaining operational safety;
- **Support** safety management activities that will result in a Just Culture, foster safety best practices, encourage effective reporting and communication;
- **Distribute** safety information and SAT operating requirements to stakeholders;
- **Establish** and **implement** hazard identification and risk management processes in order to eliminate or mitigate safety risks associated with air navigation services supporting aircraft operations in the South Atlantic Region; and
- Incentivize all SAT member States to contribute experts to the SAT SOG or one or more of its various subgroups and support the overall safety management in the Region.

All of the SAT member States/ANSP contribute experts to the SAT SOG, or one or more of its project teams, RMAs and so, support the overall management of safety in the SAT Area and establishing, achieving and maintaining satisfactory levels of safety performance.

To accomplish it, a just culture is crucial to promote best management practices to improve safety awareness. The SAT Safety Policy was created to harmonise with ICAO objectives and civil aviation safety-related activities within its jurisdiction. Promoting the SAT Safety Policy also enables a system where all airspace users are invited to collaborate on understanding the safety concept in the SAT Region and how we, as members of its airspace, can improve it. .

## Executive Summary

This edition of the South Atlantic Area’s Annual Safety Report (ASR) is issued by SAT SOG and covers performance for the 2024 calendar within the EUR/SAM Corridor.

The referenced year, 2024, registered a significant increase in the global figures of the EUR/SAM Corridor regarding precedent year: an average of 13% compared to 2023 (See Figure 1 below). This upward trend was more relevant in the period between May and August, being a steady trend for the rest of year.

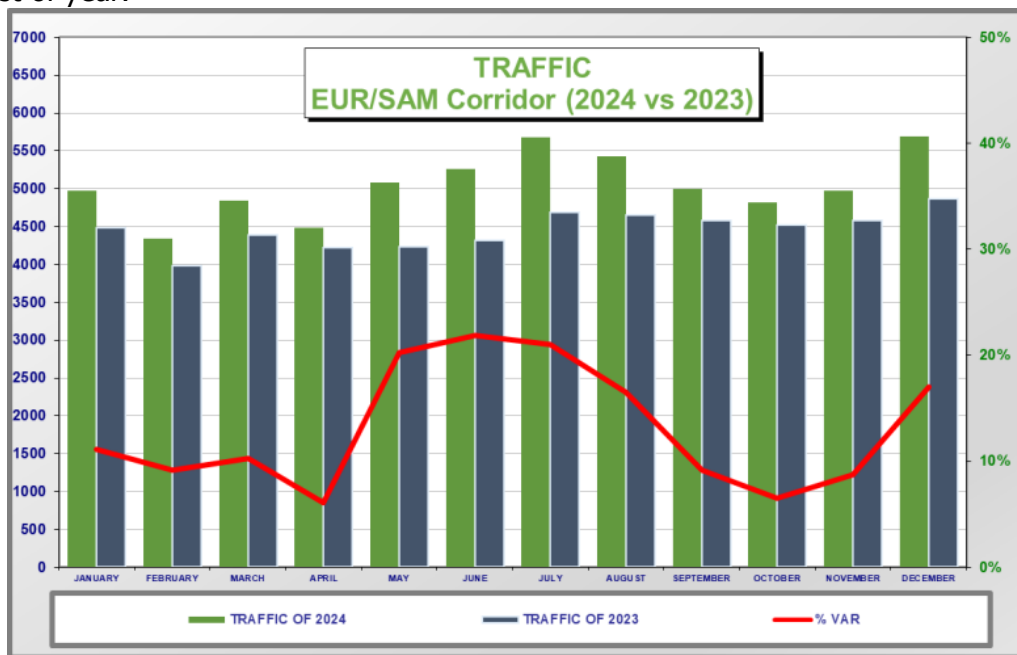


Figure 1 - Traffic picture in the EUR/SAM Corridor (2024)

In 2024, the number of events scrutinized increased by 30% in comparison to those scrutinized in 2023. The top four common causal factors remained consistent with those identified in 2022 and 2021. They were: “Flight Plan vs. Clearance”, “Weather”, “ATC coordination”, and “Did not adhere to ATC clearances”.

Safety Performance in the EUR/SAM Corridor continues to be monitored by the measures and targets associated with Safety Key Performance Indicators (SKPIs), with targets based on three years of rolling data.

Based on 2024 data, only 4 of the 11 SKPIs met their associated targets, while 7 indicators fell short. The Vertical Collision Risk Estimate (CRE) for the EUR/SAM Corridor increased to  $33.1 \times 10^{-9}$  fatal accidents per flight hour (fapfh) for all of the EUR/SAM Corridor, which is higher in comparison to the 2023 estimate ( $20.3 \times 10^{-9}$ ). A possible explanation of the increased Vertical CRE can be found in CRE section below.

The 2024 lateral collision risk was estimated to be  $8.1 \times 10^{-9}$  fapfh, which represents a 36% decrease from 2023 ( $12.7 \times 10^{-9}$ ). The decrease in risk is in part due to fewer long duration events and a change to the estimate methodology, which accounts for the use of the strategic lateral offset procedure (SLOP).

# The EUR/SAM Scenario

The airspace of the EUR/SAM Corridor, which links Europe and South America, is one of the busiest oceanic airspace in the world.

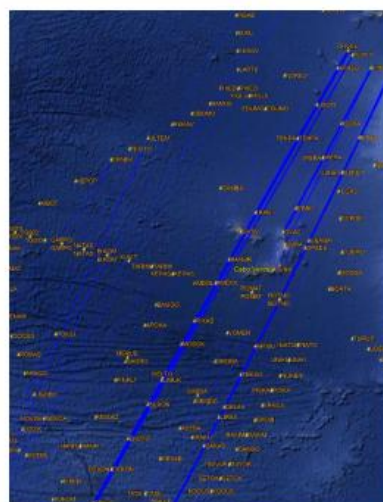
The EUR/SAM corridor traffic that is considered for the calculations in this report mainly flows in a broadly southbound, northbound and transversal orientation. EUR/SAM traffic flow is almost exclusively jet transport aircraft that operate in the en-route phase of flight between 29,000 and 41,000 feet.

Next figures and tables show the top flows in terms of flights travelling southbound, northbound and transversal in the EUR/SAM corridor in 2024.



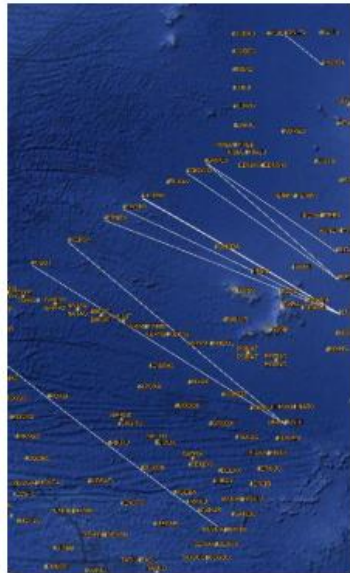
| Main Flows in Term of Flights - Southbound 2024 |         |       |       |
|---|---------|-------|-------|
| TRAFFIC FLOWS                                   | FLIGHTS | %     | % A   |
| LIMAL VUNOK                                     | 7424    | 28.4% | 28.4% |
| LIMAL GVAC                                      | 2450    | 9.4%  | 37.8% |
| NELSO JOBER                                     | 1810    | 6.9%  | 44.7% |
| ULTEM JOBER                                     | 1737    | 6.6%  | 51.3% |
| LIMAL GVBA                                      | 1703    | 6.5%  | 57.8% |
| ULTEM DAKAP                                     | 1263    | 4.8%  | 62.7% |
| LIMAL GVNP                                      | 925     | 3.5%  | 66.2% |
| ERNEK GOGSO                                     | 541     | 2.1%  | 68.3% |
| LIMAL GVSV                                      | 526     | 2.0%  | 70.3% |
| BIPET VUNOK                                     | 419     | 1.6%  | 71.9% |
| BIPET GVAC                                      | 362     | 1.4%  | 73.3% |
| ROSTA JOBER                                     | 320     | 1.2%  | 74.5% |
| NELSO ESLEL                                     | 316     | 1.2%  | 75.7% |
| BUVUK UTRAM                                     | 294     | 1.1%  | 76.8% |
| BAMUX JOBER                                     | 283     | 1.1%  | 77.9% |

Main flows in the EUR/SAM Corridor (2024) – Southbound



| Main Flows in Term of Flights - Northbound 2024 |         |       |       |
|---|---------|-------|-------|
| TRAFFIC FLOWS                                   | FLIGHTS | %     | % A   |
| MAGNO ORVEK                                     | 4968    | 18.8% | 18.8% |
| UTRAM BIPET                                     | 3896    | 14.7% | 33.6% |
| GVAC LIMAL                                      | 3496    | 13.2% | 46.8% |
| MAGNO PUCLO                                     | 2582    | 9.8%  | 56.6% |
| DAKAP ULTEM                                     | 1282    | 4.9%  | 61.4% |
| GVNP LIMAL                                      | 875     | 3.3%  | 64.7% |
| GVBA LIMAL                                      | 832     | 3.1%  | 67.9% |
| VUNOK BIPET                                     | 545     | 2.1%  | 69.9% |
| VUKIR BIPET                                     | 454     | 1.7%  | 71.7% |
| DAKAP NEXUX                                     | 399     | 1.5%  | 73.2% |
| GVAC BIPET                                      | 376     | 1.4%  | 74.6% |
| VUNOK LIMAL                                     | 361     | 1.4%  | 76.0% |
| GVSV ORVEK                                      | 347     | 1.3%  | 77.3% |
| GOGSO ERNEK                                     | 314     | 1.2%  | 78.5% |
| DAKAP OSLEV                                     | 309     | 1.2%  | 79.6% |

Main flows in the EUR/SAM Corridor (2024) – Northbound



| Main Flows in Term of Flights - Transversal 2024 |         |       |       |
|--|---------|-------|-------|
| TRAFFIC FLOWS                                    | FLIGHTS | %     | % A.  |
| ULTEM LUMPO                                      | 1130    | 15.4% | 15.4% |
| LUMPO ULTEM                                      | 1086    | 14.8% | 30.2% |
| SEPOM OBOMO                                      | 368     | 5.0%  | 35.2% |
| BAMUX SEPOM                                      | 335     | 4.6%  | 39.8% |
| SEPOM BAMUX                                      | 329     | 4.5%  | 44.3% |
| OBOMO SEPOM                                      | 247     | 3.4%  | 47.7% |
| BAMUX ILGAS                                      | 179     | 2.4%  | 50.1% |
| ERNEK LUMPO                                      | 153     | 2.1%  | 52.2% |
| TEGTO LUMPO                                      | 150     | 2.0%  | 54.2% |
| LUMPO ERNEK                                      | 150     | 2.0%  | 56.3% |
| XIBOT UNIKI                                      | 148     | 2.0%  | 58.3% |
| IRELA BUVUK                                      | 137     | 1.9%  | 60.2% |
| OSLEV ROSTA                                      | 135     | 1.8%  | 62.0% |
| UNIKI VEPOP                                      | 116     | 1.6%  | 63.6% |
| XIBOT NUKEN                                      | 94      | 1.3%  | 64.9% |

Main flows in the EUR/SAM Corridor (2024) – Transversal

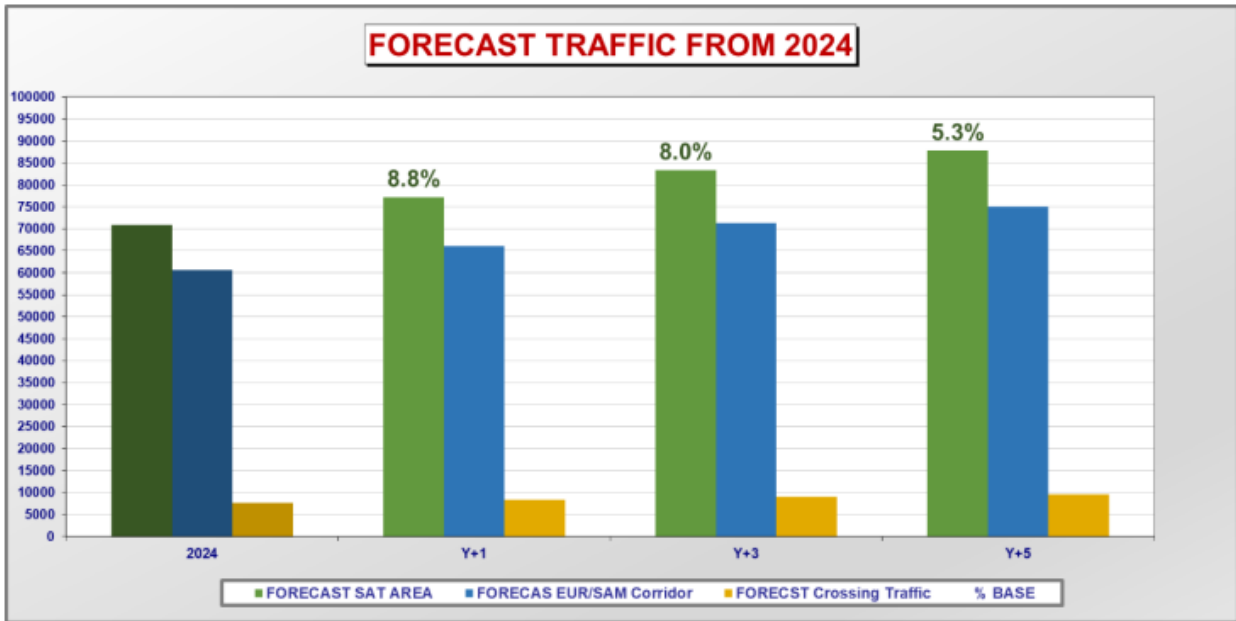
Regarding equipment and capabilities in the EUR/SAM Corridor (2024), next table shows the global figures registered in the referenced year as well as the evolution respect the previous one. There was not any relevant change/evolution about this analysis.

| EQUIPMENT                | 2024         | 2023  | VAR          |
|--------------------------|--------------|-------|--------------|
| RNP10                    | 97.8%        | 97.3% | 0.5%         |
| RNP4                     | 75.9%        | 73.4% | 2.5%         |
| CPDLC                    | 85.3%        | 86.3% | -1.0%        |
| RCP240                   | 60.8%        | 63.6% | -2.8%        |
| <b>RSP180/RCP240 ***</b> | <b>60.8%</b> | 63.6% | <b>-2.8%</b> |
| ADS-C FANS               | 77.8%        | 82.3% | -4.6%        |
| ADS-B                    | 92.2%        | 96.4% | -4.1%        |
| GNSS                     | 99.7%        | 99.5% | 0.1%         |

Global figures equipment and capabilities – EUR/SAM Corridor (2024vs 2023)

Note that RCP240 figure, if only it is considered crossing traffic in considered GOOO/SBAO airspace, raises until 75%.

An expansion of horizon for traffic figures monitoring has been carried out in the EUR/SAM corridor from 2024. The main results in terms of flights for next years is broken down in next figure.



Traffic in the EUR/SAM Corridor (2023 vs 2026)

The base scenario foresees an increase of 8.8% in (Y+1), 8.0% in (Y+3) and 5.3% in (Y+5).

The base scenario foresees a total increase for long-term (Y+5) of 23.7% which means 240 flights per day. A more optimistic scenario, high one, this increment is foreseeing until 35.4% with 263 flights per day.

Note that the referenced year, 2024, has registered an average of 194 flights/per day. Finally, the low scenario predicts 14.4% and 222 flights per day. Next table shows a comparative chart among scenarios.

| YEAR | Scenario | % Var | Flights/day |
|------|----------|-------|-------------|
| 2024 | -        |       | 194         |
| Y+5  | Low      | 14.4% | 222         |
|      | Medium   | 23.7% | 240         |
|      | High     | 35.4% | 263         |

Forecast (long term) vs Scenario

# **Safety Performance Monitoring and Measurement**

Collision Risk Estimates

**Safety benefit of the use of Strategical Lateral Offset Procedures (SLOP)**

**Safety Key Performance Indicators (SKPIs)  
SAT regional priorities**

## Appendix A

|                 |   |
|-----------------|---|
| <b>ADS-B</b>    | Automatic Dependent Surveillance - Broadcast          |
| <b>ADS-C</b>    | Automatic Dependent Surveillance – Contract           |
| <b>ADT</b>      | Autonomous Distress Tracking                          |
| <b>ANS</b>      | Air Navigation Service                                |
| <b>ATC</b>      | Air Traffic Control                                   |
| <b>ATS</b>      | Air Traffic Service                                   |
| <b>CPDLC</b>    | Controller-pilot data link communications (data link) |
| <b>CSO</b>      | Commercial Space Operations                           |
| <b>CSPs</b>     | Communication Service Providers                       |
| <b>EFFG</b>     | Economic, Financial and Forecast Group                |
| <b>fapfh</b>    | Fatal Accidents per Flight Hour                       |
| <b>GANP</b>     | Global Air Navigation Plan                            |
| <b>GASP</b>     | Global Aviation Safety Plan                           |
| <b>GNE</b>      | Gross Navigation Error                                |
| <b>GNSS</b>     | Global Navigation Satellite System                    |
| <b>HLA</b>      | High Level Airspace                                   |
| <b>ICAO</b>     | International Civil Aviation Organization             |
| <b>KPI</b>      | Key Performance Indicator                             |
| <b>LD LHD</b>   | Long Duration LHD                                     |
| <b>LHD</b>      | Large Height Deviation                                |
| <b>NAT</b>      | North Atlantic  |
| <b>NAT CMA</b>  | North Atlantic Central Monitoring Agency              |
| <b>NAT EFFG</b> | North Atlantic Economic, Financial and Forecast Group |
| <b>NAT MWG</b>  | North Atlantic Mathematicians Working Group           |
| <b>NAT SG</b>   | North Atlantic Scrutiny Group                         |
| <b>NAT SOG</b>  | North Atlantic Safety Oversight Group                 |
| <b>NAT SPG</b>  | North Atlantic Systems Planning Group                 |
| <b>OCA</b>      | Oceanic Control Area                                  |
| <b>RFI</b>      | Radio Frequency Interference                          |
| <b>SASP</b>     | Separation Airspace Safety Panel                      |
| <b>SKPI</b>     | Safety Key Performance Indicator                      |
| <b>SLOP</b>     | Strategic Lateral Offset Procedure                    |
| <b>SSPs</b>     | Satellite Service Providers                           |

