



## Second Meeting of the Steering Group of the Improvement of Air traffic Services over the South Atlantic (SAT/SG2)

Dakar, Senegal, 9-12 December 2024

### Agenda Item 5: SAT Members initiative

#### Title: State Report Dakar FIR

*(Presented by ASECNA)*

#### SUMMARY

This paper presents the latest updates in Dakar Oceanic FIR in terms of traffic figures and developments

#### REFERENCES

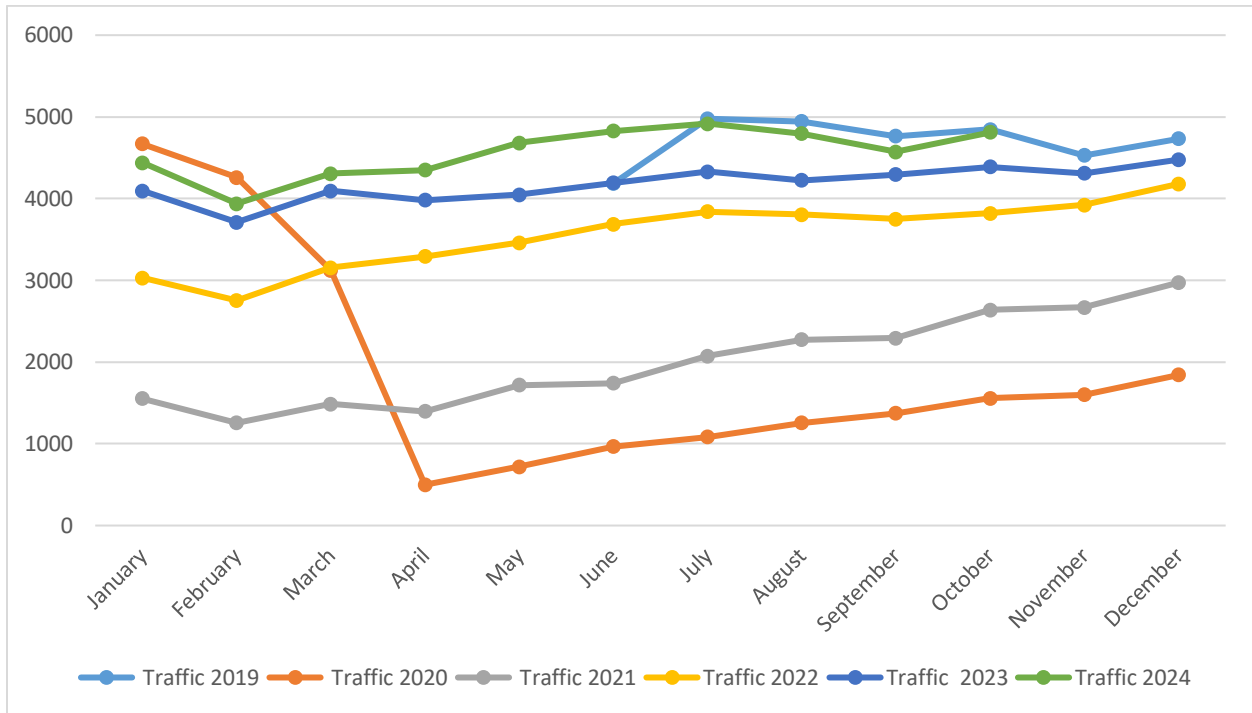
SAT Procedural Handbook  
SAT IMG/03 SoD

### 1. Introduction

- 1.1 This report aims at supporting SAT IMG planning and implementation. It also contributes in the provision of comprehensive understanding of the operational and infrastructural requirements within the region.
- 1.2 The report contains statistical data on traffic movements, performance, and projections for the Dakar FIR (GOOO FIR). It also includes status updates on planned ATM/CNS infrastructure changes, including percentages of aircraft equipped with modern capabilities.

### 2 Discussion

- 2.1 The tables and diagrams below provide an overview of traffic performance during the reporting period, illustrating the recovery of demand following the Covid-19 pandemic:



**Fig A: Traffic trend**

**Year-on-Year Growth Analysis:**

- ➔ 2019-2020: **-30.4%** decline due to the pandemic.
- ➔ 2020-2021: **+4.9%** gradual recovery.
- ➔ 2021-2022: **+77.4%** significant rebound, showing strong recovery.
- ➔ 2022-2023: **+17.4%** surge in demand, surpassing pre-pandemic levels.
- ➔ 2023-2024 (up to October): **+10.3%** growth compared to the same period in 2023.

Trends shows traffic in October 2024 almost equals to that of October 2019 stating full recovery from COVID-19 pandemic.

**Seasonal Trends:**

- ➔ June to August consistently sees the highest traffic volumes across all years, likely driven by summer vacation travel.
- ➔ April to June typically experiences lower traffic volumes, with dips in pandemic years (2020-2021) but showing recovery in post-pandemic years (2022 onwards)

**ATS routes and ATM operations**

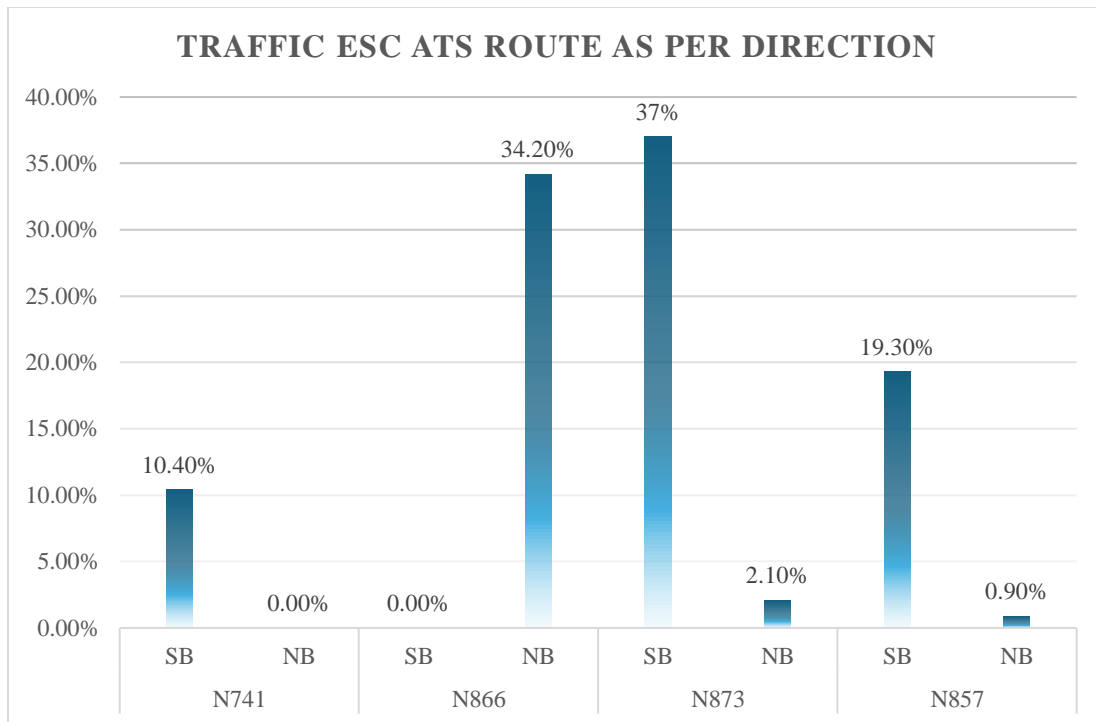
2.2 The Dakar Oceanic FIR (Flight Information Region) consists of a mix of airspace types:

- ➔ **Unidirectional RNAV routes:**
  - UN741 (southbound only) **and**
  - UN866 (northbound only).
- ➔ **Bidirectional routes** in the **EUR/SAM Corridor**, allowing traffic in both directions:
  - UN873 and
  - UN857.
- ➔ **Atlantic Ocean Random Routing Area (AORRA)**, which allows for flexible routing across the ocean

**Current Separation minima:**

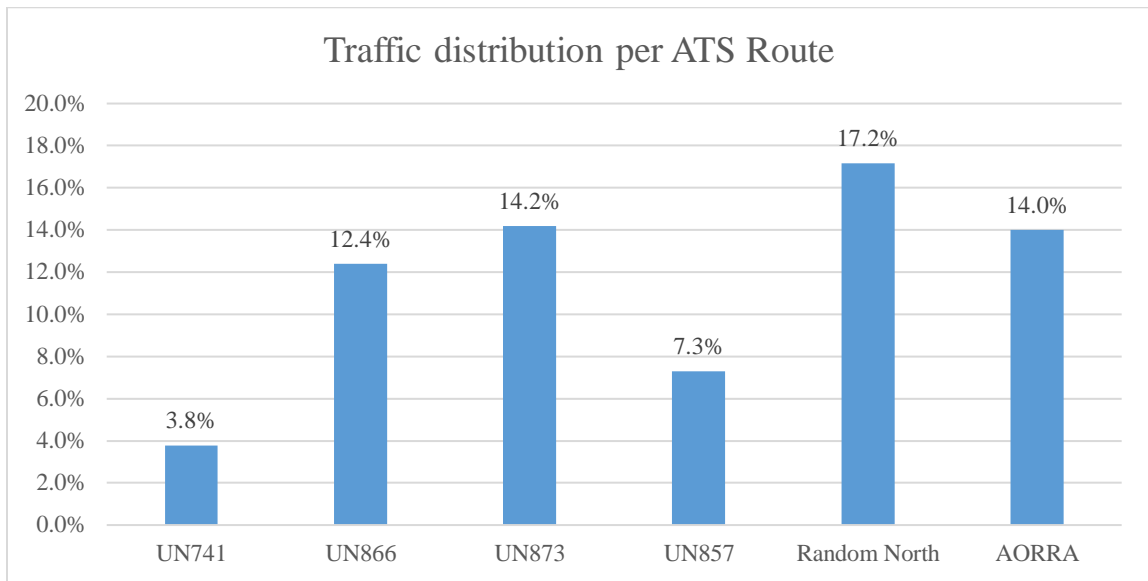
- ➔ Longitudinal separation: ten (10) minutes, using the Mach Number Technique
- ➔ Lateral separation: 50 NM (RNAV 10 required).

**Traffic distribution**



***Fig B:*** Traffic trend

Month	Number of Flights		UN741	N866		UN866	N873		UN873	N857		UN857		Random North		AORRA	RANDOM
	SB	NB		SB	NB		SB	NB		SB	NB			OCNN			
<b>January</b>	148	0	148	0	792	792	585	206	791	178	79	257	1234	1086	1332	1075	2161
<b>February</b>	182	1	183	1	488	489	474	115	589	302	18	320	1226	1043	1336	1016	2059
<b>March</b>	183	0	183	0	660	660	629	63	692	223	19	242	1406	1223	1278	1036	2259
<b>April</b>	212	1	213	0	584	584	797	4	801	263	6	269	1315	1102	1310	1041	2143
<b>May</b>	225	4	229	1	755	756	735	5	740	375	8	383	1462	1233	1383	1000	2233
<b>June</b>	196	1	197	0	743	743	690	2	692	465	4	469	1387	1190	1471	1002	2192
<b>July</b>	192	0	192	0	704	704	980	3	983	482	7	489	1409	1217	1393	904	2121
<b>August</b>	209	1	210	0	621	621	761	5	766	519	7	526	1397	1187	1537	1011	2198
<b>September</b>	236	0	236	0	741	0	800	1	801	466	8	474	1259	1023	1399	925	1948
<b>October</b>	242	1	243	1	578	579	768	4	772	487	13	500	1207	964	1881	1381	2345
<b>Total</b>	2025	9	2034	3	6666	6669	7219	408	7627	3760	169	3929	11267	9233	11464	7535	16768



Traffic per Route from Jan to Oct 2024						
UN741	UN866	UN873	UN857	Random North	AORRA	RANDOM
3,8%	12,4%	14,2%	7,3%	17,2%	14,0%	31,2%

**Fig C:** Traffic Distribution

**Southbound traffic** continues to grow strongly, particularly on **UN873** and **UN857**, as well as **UN741**.

**Northbound traffic** shows a significant decline, with **UN873** and **UN857** seeing the largest drops in 2024 and increase on UN866.

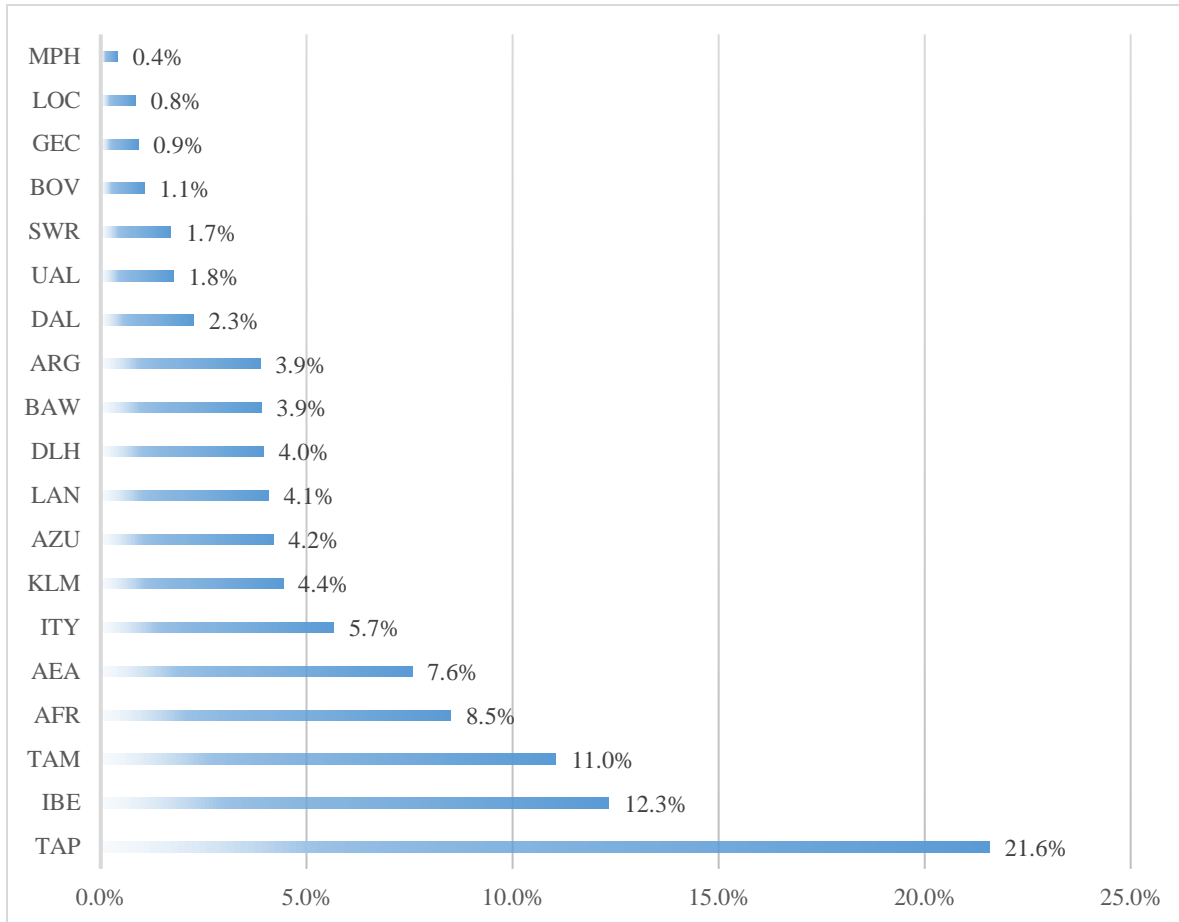
The data shows that random routings are the most frequent routes in the oceanic airspace of Dakar, accounting for a total of 31.2%.

As airlines increasingly opt for random routing flexibility, particularly for northbound journeys. This **trend on random routes raises the question of whether we should consider the elimination of fixed routes or adopt daily routes similar to the North Atlantic Organized Track System (NAT-OTS).**

**Operators in GOOO FIR and Fleet Capability Assessment**

- 2.3 Traffic statistics are vital for studying, monitoring, and evaluating air navigation operations. They provide essential data for the efficient development of air navigation services. According to the SAT terms of reference, the SAT IMG must assess the CNS fleet's capabilities to inform deployment and monitoring plans.

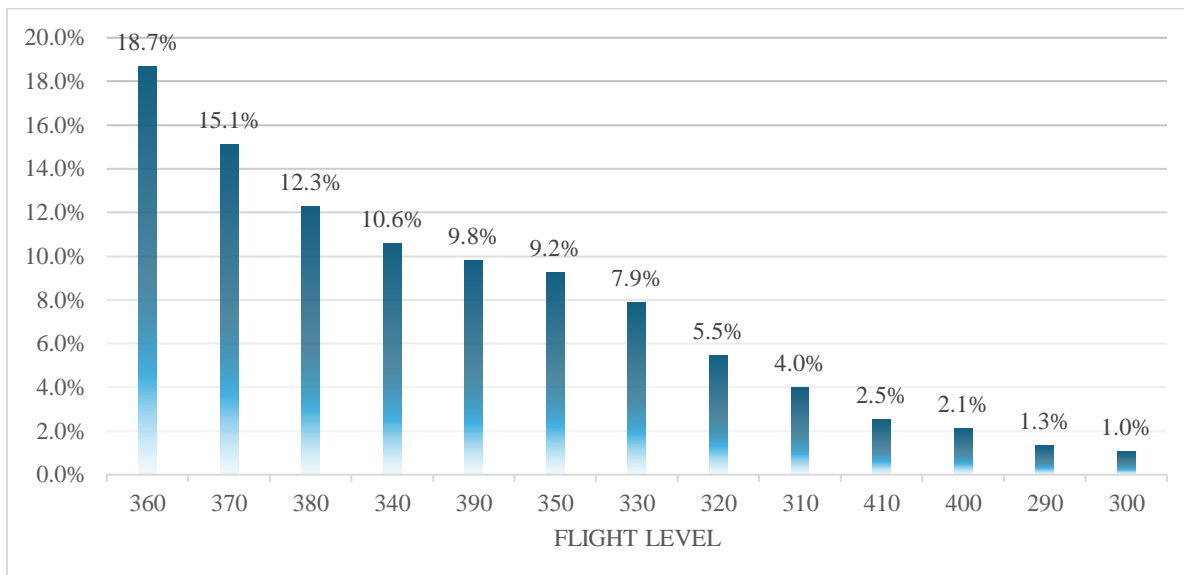
**2.4 Main Commercial Operators in GOOO FIR :**



**Fig D:** Main Commercial Operators in GOOO

As commercial operator, Air Portugal (TAP) remains the largest airspace users in GOOO oceanic FIR followed by Iberia (IBE).

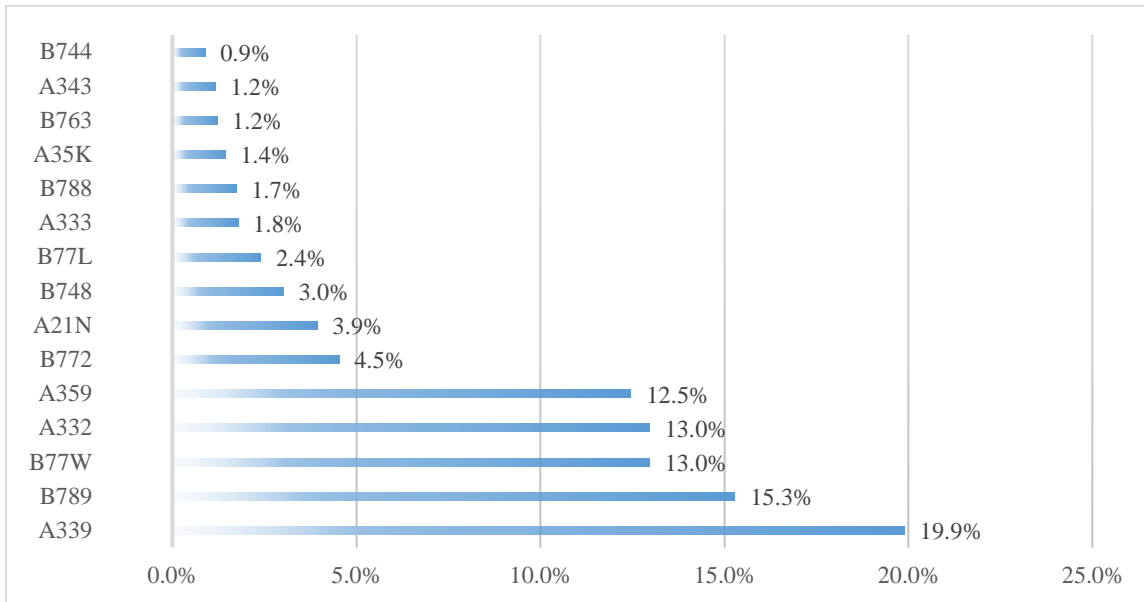
**2.5 Level range demand in GOOO Airspace:**



**Fig E:** Flight level usage range in GOOO

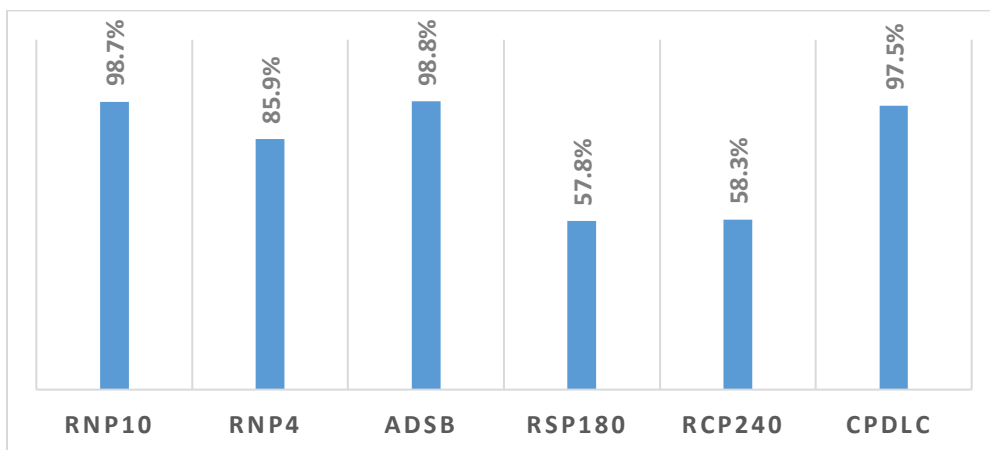
Flight level demand in GOOO airspace ranges at more than 56% from 340 to 380. The reason could be the main aircraft types operating in GOOO are, at more than 73%, composed of modern aircraft fly at high altitude (Ref **Fig E** below) and the halfway location of the airspace between Europe and South America.

**2.6 Main Aircraft Types Using GOOO Airspace:**



**Fig F:** Main aircraft types in GOOO

**2.7** An analysis from January to October 2024 shows trends in fleet capability in Dakar Oceanic FIR. The assessment used data collected from Flight Plans (FPL) through the ATM system.



**Fig G:** Fleet Capability

**Latest updates and developments in Dakar oceanic FIR**

**2.8** The table below presents the status of implementation of CNS/ATM concepts in the Dakar Oceanic airspace:





CNS/ATM Concepts	Latest updates
<p style="text-align: center;"><b>AIDC</b></p>	<p><b>Abidjan/Accra</b></p> <ul style="list-style-type: none"> <li>❖ Abidjan ACC successfully implemented AIDC with Accra ACC in July 2019.</li> </ul> <p><b>Abidjan/Dakar</b></p> <ul style="list-style-type: none"> <li>❖ Dakar ACC successfully implemented AIDC with Abidjan ACC in November 2021.</li> </ul> <p><b>Atlántico/Dakar</b></p> <ul style="list-style-type: none"> <li>❖ Dakar ACC and Atlántico ACC transition to AIDC coordination on <b>November 1st, 2023</b>. However, due to a technical issue, vocal coordination remains in effect until the problem is resolved.</li> </ul> <p><b>Sal/Dakar</b></p> <ul style="list-style-type: none"> <li>❖ The technical and operational tests were successful; Safety assessment is to be conducted to be finalized for full implementation.</li> </ul> <p><b>Cayenne/Dakar:</b></p> <ul style="list-style-type: none"> <li>❖ A mission from the Dakar center to Cayenne to define a common roadmap for the implementation of AIDC.</li> </ul> <p><b>Piarco/Dakar:</b></p> <ul style="list-style-type: none"> <li>❖ A mission from the Dakar to Piarco is scheduled in December 2024 to set the first steps for a possible implementation of AIDC.</li> </ul>
<p style="text-align: center;"><b>PBCS</b></p>	<p>Following the <i>SAT IMG Decision 01/03N</i>, a survey on PBCS implementation in the Dakar FIR was conducted in 2024 to assess readiness for PBCS implementation. The results are presented in Table C.</p> <p><b>RCP240</b> and <b>RSP180</b> monitoring tests carried out in the Dakar FIR from June to August 2024. See the table below.</p> <p>A local monitoring strategy is currently under development. In the meantime, a regional strategy is expected from the SAT Group.</p>
<p style="text-align: center;"><b>Space-based ADS-B</b></p>	<p>The space-based ADS-B is operationally implemented in Dakar Oceanic FIR since 19 May 2022 after the experimental phase launched in 2020.</p> <p>ADS-B monitoring is underway at the Dakar ATS Center for a future implementation of Advanced Surveillance-Enhanced Procedural Separation (ASEPS) using Space-based ADS-B and CPDLC.</p>
<p style="text-align: center;"><b>ATC procedures</b></p>	<p>The Mach Number Technique Compensation was successfully implemented in Dakar FIR on September 2<sup>nd</sup>, 2024. So far, no significant issues or deviations have been reported regarding its application.</p> <p>In accordance with <i>SAT IMG 3 Decision 03/06</i> UN866 bidirectionality implementation activities are being conducted to meet the target date of 23 January 2025.</p>

**Table A** summarizes CPDLC Actual Communications Performance for messages sent within *Dakar FIR*

<b>Dakar FIR CPDLC ACP per Month RCP 240</b>			
<b>Month 2024</b>	CPDLC transactions count	<b>95% RCP 240 benchmarking % &lt; 180 sec ACP&lt;=180sec</b>	<b>99,9% RCP 240 benchmarking %&lt; 210 sec ACP&lt;=210sec</b>
<b>Fleet Performance</b>			
June	3335	99,89	99,91
July	10275	99,78	99,82
August	6038	99,62	99,71
<b>TOTAL</b>	<b>19648</b>	<b>99,76%</b>	<b>99,81%</b>

**Table A: CPDLC MESSAGES LATENCY**

**Table B** summarizes ADS-C Downlink Latency measurements per month for messages sent within Dakar FIR

<b>Dakar FIR ADS-C Downlink Latency RSP 180</b>			
<b>Month 2024</b>	ADSC messages count	<b>95% RSP180 benchmarking % &lt;90 sec ASP&lt;=90sec</b>	<b>95% RSP180 benchmarking %&lt; 180 sec ASP&lt;=180sec</b>
<b>Fleet Performance</b>			
June	7411	98,39	99,52
July	19900	98,44	99,47
August	11655	98,55	99,55
<b>TOTAL</b>	<b>38966</b>	<b>98,46%</b>	<b>99,51%</b>

**Table B: DOWNLINK ADS MESSAGES LATENCY**

**3. Action Required**

3.1 The meeting is invited to:

- a) note the information provided.
- b) provide direction as deemed necessary; and
- c) discuss any relevant matters as appropriate.

-END