



**TWENTYETH MEETING ON THE IMPROVEMENT OF AIR TRAFFIC SERVICES
OVER THE SOUTH ATLANTIC (SAT21)**

(Lisbon, Portugal, 8 to 10 June, 2016)

Agenda Item 2: Air traffic management (ATM)

RNP 4 IN THE EUR/SAM CORRIDOR

(Presented by ENAIRE)

SUMMARY

EUR/SAM corridor airspace concept

1. INTRODUCTION

The “EUR/SAM corridor airspace concept plan”, as any long term plan, has been developed through initial considerations and hypothesis that have to be constantly monitored and evaluated. To watch and follow the main critical parameters that may affect the project is the only way to estimate how time and “day to day” upcoming situations may impact on calculated benefits, so necessary amendments may be introduced into the plan to avoid deviations and reconsider milestones, or even targets.

It is to be reminded, as it may be seen in background section, that initial proposals regarding RNP4 in the corridor appeared in 2009, during SAT14 (Cape Verde), pushed by that time conditions and circumstances, which probably should be revised and updated seven (7) years later.

2. BACKGROUND

RNP4 implementation in the EUR/SAM Corridor has been discussed during last SAT meetings through several working papers, references and decisions:

- SAT14/TF1/Decision 11 (2009-Cape Verde): That EUR/SAM Corridor States and ANSPs agree on the need of RNP 4 (30/30NM) implementation strategy;
- SAT15/FIT5/Decision 3 (2010-Lisbon): That IATA and ACC units encourage Airlines to increase their level of participation in ADS-C/CPDLC operations in order to enhance safety and efficiency of operations within the SAT and specially within the EUR/SAM corridor;



- Based on previous discussion, it was decided by SAT States to develop a task in accordance with the following terms (Decision SAT 16/06 -Brazil):
 - *It is agreed by all EUR SAM States that consolidation of FANS1/A aircraft facilities, prior to RNP 4 fleet certifications, should be a prerequisite for the implementation of RNP 4 in the area.*
 - *SATMA will contact States and IATA to compile data and information required to achieve a cost/benefit study based on the following hypothesis:*
 - a) *Results in terms of time and average of FANS1/A equipped & RNP 4 certified aircraft on traffic growth expected;*
 - b) *Impact of “FL, Route or Airspace” restrictions for low average of FANS1/A equipped & RNP 4 certified aircraft;*
 - c) *Increase average of optimal levels per period /peak time set;*
 - d) *ATC/Pilots Work load impact;*

The cost/benefit analysis will be submitted to SAT Group for further actions”.

- SAT17/Conclusion 11, in order to achieve the implementation of RNP 4, SAT States concluded that:
 - SATMA and SAT States initiate the study for a mandatory target date for aircraft FANS equipage on the routes in the corridor in close coordination with NAT region;
 - IATA will assist with the data.
- SAT18/Conclusion 14, in order to achieve the implementation of RNP 4, SAT States concluded that:
 1. SATMA consolidates the study on the implementation of RNP4 in the EUR/SAM corridor and establishes an implementation working plan describing:
 - a. The responsibilities and tasks of all stakeholders (ANSPs, States, Operators);
 - b. Milestones and corresponding timelines;
 - c. Ways and means to conduct the required pre-implementation safety assessment.

2. SATMA will contact States, ANSPs and IATA to compile data and information required.

- SAT19/17 Conclusion: New Airspace Concept in the EUR/SAM Corridor. That:

An EUR/SAM corridor Airspace Concept Task Force is established with representatives of Brazil, Cape Verde, Senegal, Spain, IATA, WACAF ICAO Office and SAM ICAO Office, in order to:

- a) Analyze the Roadmap for EUR/SAM Corridor proposed by Spain, attached as Appendix M to this report;
- b) Develop an Airspace Concept to EUR/SAM Corridor, based on application of RNP 4, ADS-C and CPDLC;



- c) Analyze the feasibility of proposing a DOC 7030 Amendment to mandate the use of RNP 4, ADS-C and/or CPDLC.
 - d) Work through Electronic Correspondence and Teleconferences.
 - e) Present the results to the SAT 20 meeting.
- Decision 20/11: EUR/SAM CORRIDOR AIRSPACE CONCEPT Action Plan. That,
 - a) The EUR/SAM corridor airspace concept presented by Portugal is endorsed in principle;
 - b) Portugal is urged to review the airspace concept plan and roadmap including the proposed phases and milestones and provide more details on the required airborne and ground technical specifications;
 - c) Portugal is urged to organize a teleconference to endorse improvements to the plan;
 - Conclusion 20/06: EUR-SAM Corridor Aircraft Equipage Survey. That,
 - a) States of operators that have not done so yet are urged to develop and publish the RNP 4 (PBN) Regulatory Approval process.
 - b) IATA is urged to encourage airlines that have not done so to initiate RNP 4 approval process for their eligible fleets.
 - c) Portugal coordinates consultation with all stakeholders in the conduct of Safety Assessment, Regulatory Approvals, Training and Cost Benefit analysis as part of the implementation of the roadmap.

3. FLEET FANS CAPABILITIES IN EUR/SAM CORRIDOR

Through data collected by SATMA and reported by ENAIRE, the general behaviour relative to FANS performance services since 2010 may be estimated. This data concerns only aircraft flying in the UIR Canaries from/to the EUR/SAM Corridor.

| Traffic Data | 2015 | | | 2014 | | | 2013 | | | 2012 | 2011 |
|---|-------|-------|-------|-------|-------|-------|--------|--------|--------|--------|--------|
| | Max | Min | Mean | Max | Min | Mean | Max | Min | Mean | Mean | Mean |
| Number of connected flights | 1242 | 879 | 1070 | 1439 | 1115 | 1284 | 1518 | 1271 | 1400 | 1651 | 1601 |
| Percentage referred to total number of flights in the EUR/SAM | 56,92 | 46,79 | 52,85 | 61,38 | 51,99 | 56,10 | 57,66% | 52,80% | 55,13% | 59,97% | 61,37% |



| Corridor | | | | | | | | | | | |
|---|-------|-------|-------|------|-------|-------|--------|--------|--------|--------|--------|
| Percentage of connected flights that indicate "data link and ADS capacity" in the Flight Plan | 99,12 | 90,40 | 93,93 | 100 | 93,44 | 95,92 | 97,80% | 93,42% | 95,36% | 95,44% | 97,99% |
| Number of flights with CPDLC connection (Monthly average) | 1171 | 819 | 1003 | 1363 | 1051 | 1219 | 1460 | 1204 | 1335 | 1526 | 1525 |

Table 1: Traffic data summary

The main conclusions obtained from this study are the following:

- Previous data considers only traffic over flying the UIR Canaries from/to EUR/SAM Corridor. Percentage of connected FANS/total flights in the EUR/SAM Corridor has decreased almost a 10% from 61,37% to 52,85% in 5 years.
- Almost every equipped flight connected (**95%**) indicates FANS capability in the FP.
- The majority of logged-on flights exchanged CPDLC information (**95%**).
- No figures AVAILABLE about FANS equipped but no logged.

Therefore the traffic flows flying SANTA MARIA OCEANIC directly Cape Verde/Dakar or UR976/UA602 have been not considered. Thus, it may be a close estimation but no a global figure concerning fleet capabilities in the EUR/SAM Corridor.

The decreasing trend of this table, as commented, should be one of the keys to determine the course and future of RNP4 implementation plan.



At this point is also important to remind the PROPOSAL FOR AMENDMENT OF THE REGIONAL SUPPLEMENTARY PROCEDURES, AFI (Doc 7030/9)

“All concerned aircraft operating flights as general air traffic in accordance with instrument flight rules in the airspace defined below shall use controller-pilot data link communications (CPDLC) application, if the aircraft is properly equipped and hold an authorization, where applicable, either from the State of Registry or the State of the Operator.”

“All concerned aircraft operating flights as general air traffic in accordance with instrument flight rules in the airspace defined below shall use Automatic Dependent Surveillance – Contract (ADS-C) application, if the aircraft is properly equipped and hold an authorization, where applicable, either from the State of Registry or the State of the Operator.”

Though it will be a positive aim in terms of safety, it is not expected to impact in FANS traffic statistics

4. ENAIRE IN PHASE 1 AND PHASE2

The EUR/SAM corridor airspace concept presented in SAT20 was accepted as tentative plan to be followed (SAT21).

Phase 1 (50 NM Longitudinal Separation based RNP10)

As Phase 1 aim is to provide a tactical application, when possible, regarding 50NM longitudinal separation, and to establish DCT segments for low demanding periods, it should be developed on a bilateral basis. In fact, as “tactical mode” each State should estimate cost/benefits and apply its internal Safety regulations and coordinate LoAs with collaterals. So, no global EUR/SAM specific Safety Study should be performed, as the new scenario will be reflected in the annual SATMA Safety Assessment accordingly.

Phase 2 (50 NM Longitudinal Separation based RNP10 -Data Link Mandate)

Phase 2 implies a further step, as propose **preferential** FL for FANS1 equipped traffic, applying 50NM Longitudinal Separation above a determinate FL (to be defined). Phase 2 should only be started when Phase 1 conclusions are deeply analysed, so FL structure may be based in objective results.

Although the main concept of “best equipped best served” is no to be questioned, the idea of “preferential but no restricted” (Optimum flight level assignment to equipped and connected aircrafts, but no restricted to no FANS1 aircraft when available, maintaining 80NM) must be discussed, as other aspects should be considered.

Further aspects regarding last phases of EUR/SAM corridor airspace concept are discussed in ANNEX A.



5. ACTIONS BY THE MEETING

The SAT21 Meeting is invited to:

- a) Review Phase I :
 - a. Eliminate: “Preliminary CRM Safety Assessment” from Project Deliverables.
 - b. Eliminate: “States must provide the needed data to perform the safety assessment” from Remarks.
 - c. Modification: Post-Implementation Monitoring of 50NM Longitudinal Separation (to be accomplished within general EUR/SAM Safety Assessment) from Project Deliverables.

- b) Review Phase II :
 - a. Modification: Preliminary Airspace Structure. Delivery Date SAT22

- c) Join roadmap schedule of “EURSAM corridor new concept plan” to traffic trends and to a real use of FANS.



ANNEX A

RNP4 IN EUR/SAM CORRIDOR

Aircraft RNP4 certification, the first critical aim, remains as a problem due to fleets different capabilities. In that sense, it may be referenced to ASECNA report of the RNP4 survey on equipage of aircraft that flew across the Dakar FIR between March and April 2015. The outcome revealed that almost a 70% of aircraft operating were RNP 4 equipped, validating statistics from SATMA. A 30% of traffic off from RNP4 is not to depreciate.

But beyond RNP4 certifications troubleshooting, in order to maintain safe procedures from the very beginning, SAT States agreed to link RNP4 implementation to the existence of a high population of FANS1 equipped aircraft in the corridor, so the extended and general use of both ADS (surveillance) and CPDLC (D Link communications) was established as a prerequisite, prior and mandatory to any RNP4 applicability.

At this stage, before any debate, schedule or consideration, an eye must be kept on the TWO parameters that must command the entire project: The evolution of traffic in terms of increase or decrease, and the real use of FANS on the corridor. ENAIRE statistics (See IP-AA) show with no doubt that traffic over EUR/SAM standard airways is decreasing. On the other hand, outcome of SATMA CFRA last reports indicate a gradual and continuous diminution in the percentage of aircraft FANS equipped in the corridor.

So, with less traffic and less FANS equipped aircraft year by year, it might not be the best scenario to “build” more airways and to apply flight level restrictions to operators (optimum FL reserved for RNP4 equipped fleet). Will such an investment in upgrading procedures and systems, safety studies, training, etc. bring a real benefit for operators? Will make the corridor safer or more attractive for users?

Regarding safety, the EURSAM new concept project final target includes a RNP10/RNP4 scheme levels, applying 80/50NM longitudinal separation at lower levels, but 30 NM longitudinal separations at upper ones, even in the same airway. This introduces a new scenario in which safety might be a little more compromised than today, as ATC might be facing different “modus operandi” just depending of flight level.

As RVSM/RNP10 last safety assessments are far away from desired results, to reduce RNP10 to RNP4 separations rarely would seem to be a mitigating action.