



ICAO

INTERNATIONAL CIVIL AVIATION ORGANIZATION

WESTERN AND CENTRAL AFRICA OFFICE

**Twenty-Third Meeting on the Improvement of Air Traffic Services over the South Atlantic
(SAT/23)**

Durban, South Africa, 6-8 June 2018

**Agenda Item 2: Air traffic management (ATM) (by the ATM Working Group)
Point 4: EUR/SAM Corridor Airspace Concept project**

**Implementation of 5 minutes Longitudinal Separation based on PBCS in the EUR/SAM
corridor**

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(Presented by ASECNA)

SUMMARY
The objective of this working paper is to recall the requirements from an ANSP perspective for the implementation of 05 minutes Time Based Longitudinal Separation and to share with the meeting the outcome of the study conducted to assess Dakar ACC's capability to meet these requirements. A proposal for EUR/SAM corridor airspace concept is also made.
REFERENCE(S): ICAO Doc 4444 PANS/ATM – PBCS Manual
Related ICAO Strategic Objective(s): Strengthen civil aviation safety worldwide

1. INTRODUCTION:

Following the decision by the SAT22 WG to replace the previous EUR/SAM Corridor Airspace Concept with a new one which will incorporate 05 minutes Time Based Longitudinal Separation enabled by the application of PBCS, ASECNA through Dakar ACC has been studying the requirements stated in November 2016 ICAO Doc 4444 edition which are the followings:

- RNP 4;
- RCP240;
- RSP180 and

- Maximum ADS-C periodic reporting interval of 14 minutes.

2. DISCUSSION:

2.1. Statistics of RNP4 aircraft equipped in Dakar Oceanic FIR

A PBN campaign was conducted from 15th to 28th January 2018 to determine the aircraft PBN capability. In a total of 1820 movements, a population of 437 aircraft sorted according to registration was recorded. It was noted that 82% of the sample were RNP4 operations approved.

2.2. Communication Specifications: RCP240

The communication system provided to enable the application of 05 minutes separation minima shall allow a controller, within 04 minutes, to intervene and resolve a potential conflict by contacting an aircraft using the normal means of communication. An alternative means shall be available to allow the controller to intervene and resolve the conflict within a total time of 10½ minutes, should the normal means of communication fail.

2.3. Surveillance Specifications: RSP180

When an ADS-C periodic or waypoint change event report is not received within 03 minutes of the time it should have been sent, the report is considered overdue and the controller shall take action to obtain the report as quickly as possible, normally by ADS-C or CPDLC. If a report is not received within 06 minutes of the time the original report should have been sent, and there is a possibility of loss of separation with other aircraft, the controller shall take action to resolve any potential conflict(s) as soon as possible. The communication means provided shall be such that the conflict is resolved within a further 7½ minutes.

2.4. Data link performance monitoring and analysis for FANS1/A

Statistics provided by SITA for Dakar ACC communication service performance give the following rate

Month Performance	Sept-17	Oct-17	Nov-17	Dec-17	Jan-18	Fev-18	Average
CPDLC (uplink message delivery time of 180s)	99.86%	99.90%	99.88%	99.93%	99.88%	99.90%	99.89%
CPDLC (downlink message delivery time of 180s)	99.45%	99.18%	99.21%	99.41%	99.40%	97.18%	98.97%

Statistics provided by SITA for Dakar ACC surveillance service performance give the following rate:

Month Performance	Sept-17	Oct-17	Nov-17	Dec-17	Jan-18	Fev-18	Average
ADS (uplink message delivery time of 180s)	99.84%	99.82%	99.63%	99.62%	99.71%	99.76%	99.73%

ADS (downlink message delivery time of 180s)	99.37%	99.29%	99.21%	99.38%	99.24%	97.66%	98.36%
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Despite these figures from the Communication Service Provider (SITA) we can also address some cases of ADS-C/CPDLC operational unavailability.

Dates	Periods of unavailability	Observations (causes)	Durations in minutes
01/09/2017	23h30mn – 01h15mn	ACARS line failure	105
06/09/2017	01h30mn – 02h30mn	ADS-C/CPDLC down	60
23/11/2017	15h07mn – 15h33mn	Disruption of link due to SITA maintenance	26
24/03/2018	15h20mn – 16h30mn	ADS-C/CPDLC down	70
30/03/2018	04h14mn – 12h	Broken submarine cable	524

As a mitigation action, in case of disruption of PBCS services, 10 minutes Longitudinal Separation with Mach number technique will be applied.

Taking into account all of the above-mentioned statements, we assume that Dakar ACC is able to handle the 05 minutes Time Based Longitudinal Separation with Mach number technique based on the ATM system performance.

2.5. Proposal for implementation

As a first step, we propose:

- application of 05 minutes Time Based Longitudinal Separation with Mach Number Technique on the following two (2) unidirectional ATS routes: UN741 and UN866.
- the creation of one RNP10 ATS route between these two (2) routes in order to offset an aircraft which loses its RNP4 capability.

As a second step, a post implementation evaluation will be conducted before extension to other two (2) ATS routes UN873 and UN857.

3. ACTION BY THE MEETING:

3.1. The meeting is invited to:

- note the information in this paper;
- discuss any relevant matters as appropriate; and
- take into consideration the proposals made with the aim of reaching a successful implementation of the 05 minutes longitudinal separation in the EUR/SAM corridor.

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