



ICAO

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WESTERN AND CENTRAL AFRICA OFFICE

Twenty-Fourth Meeting on the Improvement of Air Traffic Services over the South Atlantic (SAT/24)

Luanda, Angola, 3-7 June 2019

Agenda Item 3.5: PBCS Implementation and Monitoring

3.5.4 PBCS IMPLEMENTATION IN SOUTH AFRICA

(Presented by the South Africa)

SUMMARY
This paper provides an outline of PBCS technology and an implementation plan overview
REFERENCE(S): G-PAT MANUAL GOLD MANUAL 10037 PBCS 9869 Annex 6 — Operation of Aircraft; Annex 11 — Air Traffic Services; Procedures for Air Navigation Services — Air Traffic Management (PANS-ATM, Doc 4444); Regional Supplementary Procedures (Doc 7030).
Related ICAO Strategic Objective(s): PBN

1. INTRODUCTION:

- 1.1 The 23rd meeting on the improvement of air traffic service over the south Atlantic (SAT) adopted Conclusion 06, implementation of reduced separation minima in the Region via PBCS and That,

- All SAT Region States will conduct an analysis to determine needs and enhancements necessary to implement PBCS in the SAT Region
- Identify appropriate airspace for implementation of reduced separation minima
- All SAT States shall agree to phased in approach of reduce separation in appropriate SAT Region airspace (PH1 – EURSAM Corridor) and;
- Identify required components to implement reduced separation minima in EUR/SAM corridor

2. DISCUSSION:

- 2.1 Performance-based communication (PB) and performance-based surveillance (PBS) constitute performance-based communication and surveillance (PBCS) and are similar, and complementary, to performance-based navigation (PBN). PBC and PBS involve the establishment of required communication performance (RCP) and required surveillance performance (RSP) specifications and imposing them on aeronautical communication and surveillance systems respectively. RCP and RSP specifications are composed of certain performance-related parameters. An RCP specification is identified by a designator (e.g. RCP 240) which shows the maximum transaction time in seconds. Similarly, the RSP designator (e.g. RSP 180) indicates maximum data delivery time in seconds. Moreover, there are other performance parameters attached to each RCP and RSP designator which include continuity, availability and integrity.
- 2.3 The PBCS concept is aligned with the concept of PBN. While the PBN concept applies RNP and RNAV specifications to the navigation element, the PBCS concept applies required communication performance (RCP) and required surveillance performance (RSP) specifications to communication and surveillance elements, respectively. Each RCP/RSP specification includes allocated criteria among the components of the communication and surveillance systems involved.

3 SOUTH AFRICA PBCS PROJECT STATUS

- 3.1 South Africa opted to migrate from RNAV 10 in our oceanic airspace to RNP4 by fully implementation of PBCS. This can only be achieved by following the PBCS Implementation Plan – Checklist (ICAO Doc 9869). Stemming from the above, there are tasks allocated to various aviation stakeholders, within South Africa, to ensure full PBCS implementation is synchronized for a future date of implementation. The Implementation plan (A task allocated to the ANSP) is still in a draft and has not been presented to all affected stakeholders for reasons outlined below.
- 3.2 A PBCS Implementation plan has been drafted, however, one of the important aspect of implementation is to at least test the current system in terms of functionality required for PBCS technical requirements.
- 3.3 To assess the current system, data needs to be extracted from the ATM system (ACARS messaging up/down) and then analysed by an analysis tool to assess if the RCP (Required communication performance) and RSP (Required surveillance performance) meets the

technical specification required for PBCS.

- 3.4 Currently ATNS has challenges accessing the required RCP and RSP information from the ATM system. This has been escalated to the ATM system supplier who has confirmed that they are currently addressing the challenge (*Timeframe unknown*).
- 3.4 Further to this, once the data is downloaded as per ICAO Doc 9869, an analysis tool will need to be acquired to analyse said data as per above requirement. Training will be required by staff to download required data from the ATM system and to use the analysis tool effectively.

4 PERFORMANCE MONITORING

- 4.1 The goal of monitoring data link communication performance is to:
 - Maintain safe and efficient operations;
 - Determine continued compliance and interoperability;
 - Investigate problems; and
 - Share lessons learned.
- 4.2 Once the required data is downloaded from the ATM system, it is important that it is populated in the correct format to be able to get imported into the analysis tool. It is foreseen that ARMA will indeed be the AFI RMA (Regional monitoring agency) which will monitor PBCS performance for the AFI region. ANSP's/regulators providing ARMA with extracted data must ensure that it arrives in the correct format for analysis by the analysis tool as ARMA does not have the resource to correct data formats prior to analysis
- 4.3 Obtaining a baseline of approximately 1 month of flights currently filing PBCS and flying in FAJO and then analysing performance of said flights and obtaining a result falling inside PBCS tolerance is required before the implementation plan will be set in motion to ensure that the ATM system is functioning properly

5 PBCS CHALLENGES

- 5.1 Contact with a local international airline has indicated that they were not filing their flight plans correctly as per flight plan 2012 (and revisions) to allow for ATC to ascertain if an aircraft is PBCS capable and certified. This has been corrected. Training will need to be provided to all ATC working FAJO airspace in terms of flight plan 2012 with specific focus on FANS 1/A and PBCS flight plan indicators.
- 5.2 Training will have to be given to all FAJO ATC's to ensure familiarity with reduced separation between aircraft and various contingency measures to implement should system failures occur, or recovery from failure needs to occur.
- 5.3 Obtaining the required PBCS extracted data in the correct format for analysis from various AFI member states will pose a challenge. It is foreseen that the PBCS data extraction which

is a current ATNS challenge will be a generic problem across the AFI member states.

- 5.4 Many states are currently considering ADS-B space based as a surveillance solution. They need to bear in mind that PBCS is an ADS-B enabler. Even with a RSP15 - corresponding to a position report updated interval of 15 s that may be achievable a multi-source ADS-B system with a space-based component – an RCP240 – implying a controller intervention time of 4 minutes – would at very best allow for 15 nautical mile (NM) lateral separation.
- 5.5 South Africa intends joining the PBCS charter once PBCS is fully implemented. Monitoring of PBCS performance is vital and needs to be stressed across the AFI region to ensure the RMA is provided with timeous data in the required format to avoid Exclusion from the PBCS charter. (*This PBCS Charter facilitates co-operation among all PBCS stakeholders to achieve the objectives of PBCS*)
- 5.6 Communication service providers across the AFI region need to be verified by ANSP's/Regulators to be part of the PBCS charter in meeting the required RSP/RCP technical requirements.

6 **PBCS IMPLEMENTATION PLAN – Checklist (Doc 9869)**

- 6.1 A checklist that should be used as a **guide** for planning the implementation of PBCS operations. The checklist below is organized as follows:
 - Group A tasks – State/region preparation;
 - Group B tasks – ANSP general project development and management;
 - Group C tasks – ANSP implementation activities – ATS service provision;
 - Group D tasks – Aircraft operator, aircraft type/system (airworthiness) eligibility;
 - Group E tasks – All stakeholders – post-implementation monitoring

8. Action by the meeting

The meeting is invited to:

- a. **Note the information in the paper; and**
- b. **Share experiences and assist SAT States as necessary to facilitate PBCS implementation in the SAT area.**

Note – The dates mentioned in the table below are subject to change as data extraction from the ATM system is currently a challenge.

