



Fifth Meeting of the Programmes and Projects Review Committee (PPRC/5)
 Mexico City, Mexico, 16 to 18 July 2019

Agenda Item 7: Analysis of the Emerging Threats to Air Navigation
7.2 Other emerging threats to air navigation

PBCS IMPLEMENTATION IN SAM REGION

(Presented by Chile)

EXECUTIVE SUMMARY	
<p>This working paper proposes to evaluate the incorporation of a new Program or creation of a new Project within an existing Program, whose purpose is the implementation of Communication and Surveillance Based on Performance in the SAM Region.</p>	
Action:	<p>It is suggested to recognize the need and prioritize the incorporation into CAR / SAM ANP of the complete implementation of the PBCS Concept.</p> <p>If it concurs, evaluate the incorporation of a new Program, and / or creation of a new Project within an existing Program to the tasks of GREPECAS, whose purpose is the implementation of Communication and Surveillance Based on Performance in the SAM Region.</p>
<i>Strategic Objectives:</i>	<ul style="list-style-type: none"> • Air Navigation Capacity and Efficiency • Economic Development of Air Transport • Environmental Protection
<i>References:</i>	<ul style="list-style-type: none"> • Annex 6 — Operation of Aircraft • Annex 11 — Air Traffic Services • Procedures for Air Navigation Services — Air Traffic Management (PANS-ATM, Doc 4444) • Global Operational Data Link (GOLD) Manual (Doc 10037) • Performance-based Communication and Surveillance (PBCS) Manual (Doc 9869) • Taller para la implementación de enlace de datos de servicios de tránsito aéreo (ATS) para las Regiones NAM/CAR/SAM (Philisburg, Saint Maarten, 18 al 21 de abril de 2016)

1. Introduction

1.1 PBCS concept has its origin in the year 1983 with the decision of the Council of ICAO to establish the Special Committee for Future Air Navigation Systems (FANS) with the purpose of study, identify and evaluate new technologies and propose recommendations for the development of civil aviation.

1.2 Such development of the PBCS concept is evidenced through multiple determinations taken over more than 20 years in various forums such as: air navigation (AN-Conf/10-11) Conference, mobile communications Panel Aeronautical (AMCP/4), Air Navigation Commission (ANC) tasks, Automatic dependent surveillance Panel (ADSP / OPLINKP 2014). The determinations resulting from the above-mentioned instances include, among others, the incorporation of Communications Performance specifications (CPR) and Surveillance Performance (RSP) specifications; policies, procedures and criteria for aircraft approval, operators and providers of navigation systems and post-implementation monitoring system.

1.3 Ultimately, the PBCS concept provides a framework for the management of performance of communications and surveillance in accordance with internationally accepted specifications; completing, together with the PBN, a virtuous triangle concept that allows raising levels of operational safety and maximize the operational benefits of the emerging technology that supports ATM operations.

1.4 Considering that the year 2008 Easter Island FIR was still assigned to the APAC Region, the State of Chile began its participation in the Informal Coordinating Group of the ATS of the Pacific South (ISPACG) with the purpose of contributing to the harmonious development of CNS in the FIR of the APAC Region for the optimum use of airspace. Consistent with the working group capacity improvement plan, starting from the year 2013, Oceanic Area Control Centre of Chile incorporated the use of Data Link technology to its communication and surveillance processes namely Controller Pilot Data Link Communications (CPDLC) and Automatic Dependent Surveillance - Contract (ADS-C). From 2016, ISPACG working plan began to be called *Pacific FIRs Seamless PBCS Planning Chart* whose objective is to collaborate with the development of the concept and operational implementation of PBCS inside Asia Pacific Region.

The development of the PBCS Concept is relevant to the State of Chile, and eventually for other States of the Region, since the considerable volume of oceanic and remote airspace assigned to Oceanic Area Control Center of Chile (fig.1), the amount of air traffic crossing into Oceania surpassed 1,000 aircraft in 2018 and aircraft using oceanic routes into Lima FIR surpassed 36,000 aircraft in the same period (Figure 2). Of these, all operations eligible for PBCS, could have benefited from the use of minimum horizontal separations based on this concept, with an important impact on the different Performance Improvement Areas defined in the GANP.

1.5 Since 2016, Doc. 4444, PANS-ATM (16th edition) includes standards for lateral and longitudinal separation based on performance incorporating communications and surveillance with requirements such as RCP and RSP.

1.6 Currently, the CAR / SAM ANP documents partially identify and as susceptible to be developed, some components of the PBCS concept such as RCP.

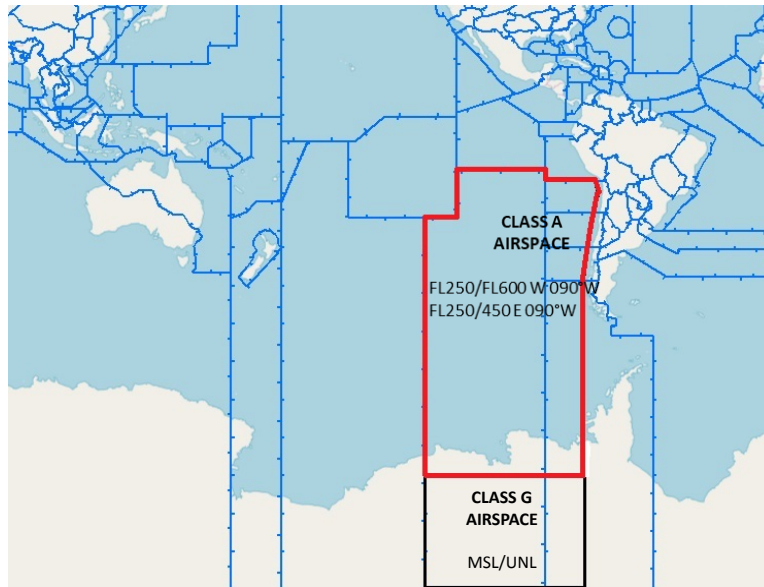


Fig. 1: Distribution of airspace assigned to Oceanic Area Control Center of Chile.

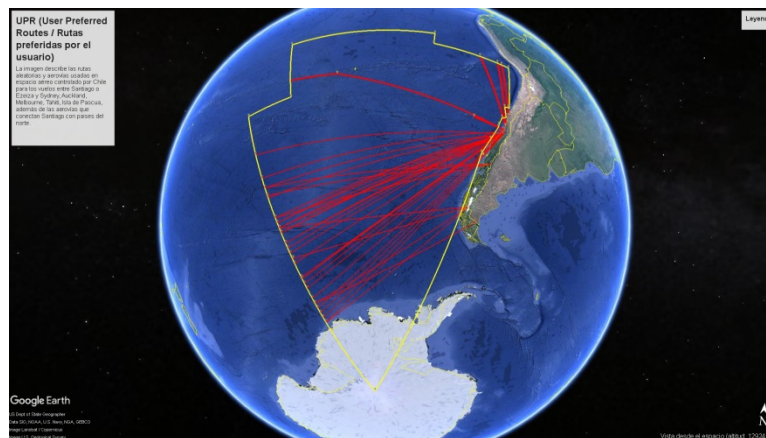


Fig. 2: Heat map with ATS and UPR routes used in the airspace assigned to Oceanic Area Control Centre of Chile.

2 Analysis

2.1 Tasks described in the Performance-Based Communication and Surveillance (PBCS) Manual (Doc. 9869) involve the participation of various stakeholders: Regulatory State, air navigation service providers, operators, communication and surveillance service providers (CSP / SSP) and aircraft manufacturers.

2.2 In order to carry out the implementation of the PBCS concept in our SAM Region, coordinated work between the interested parties mentioned above and any others that may be necessary is imperative.

2.3 Activities susceptible of compliance verification at a regional level for the harmonious development of the implementation include, without necessarily being the only ones:

- a. Stakeholder's identification at a regional level. Determination of formal agreement between the interested parties to participate in the implementation of the PBCS concept.

- b. Prescription and publication of the RCP / RSP specifications. Verify the need for inter-regional agreements for the use of common formats.
- c. Identification of means for the application and verification of compliance with RCP / RSP specifications. Requirements for: the provision of ATS, ATIS and CSP / SSP systems. Requirements related to the FPL forms. Requirements for monitoring, alerts and warnings.
- d. Identification of means to determine the aircraft operator's eligibility requirements for PBCS operations, including requirements for operations, maintenance, aircraft system and CSP / SSP service agreements.
- e. Evaluate the need to propose an amendment to the Regional Supplementary Procedures (Doc. 7030).
- f. Evaluate the need to establish a PBCS implementation team. If successful, prepare a plan that summarizes the tasks for the implementation of PBCS that includes interdependencies between tasks, milestones of fulfilment of tasks, points of contact and any required coordination.

2.4 Even though PBCS concept is coincident with PBN, important differences between both concepts can be identified. One of them, and one that is important for our SAM Region, is that PBCS concept requires post-implementation monitoring programs at a local and regional level, with a global exchange of information. Therefore, continuous data collection is required after implementation, monitoring, problem reporting and monitoring, analysis and corrective action when performance falls below specified levels, or problems are reported. It is also necessary to consider that regional monitoring and reporting system has a collaborative, secure and consensual-scope computing platform that includes all interested parties.

2.5 Implementation of the PBCS concept will mean an advance in the Seamless Air Space for the States of the Region that currently provide air navigation services in FIR with transoceanic and remote routes; thus, promoting the increase in operational safety, reduction of CO2 emissions into the atmosphere and the optimization in rational use of airspace.

The mentioned advantages are aligned with the strategic objectives of ICAO: operational safety, capacity and efficiency of air navigation, economic development of air transport and protection of the environment and evidenced in the Performance Improvement Area (PIA) 4, thread TBO (Trajectory Based Operation), Improved safety and efficiency through the early use of data link and SATVOICE of the Global Air Navigation Plan.

3. Action

3.1 It is suggested to recognize the need and prioritize the incorporation into CAR / SAM ANP of the complete implementation of the PBCS Concept.

3.2 If it concurs, evaluate the incorporation of a new Program, and/or creation of a new Project within an existing Program to the tasks of GREPECAS, whose purpose is the implementation of Communication and Surveillance Based on Performance in the SAM Region.