



Agenda item 5: Operational implementation of new ATM automated systems and integration of the existing systems

STATUS OF ADS-B IMPLEMENTATION IN THE SAM REGION

(Presented by the Secretariat)

SUMMARY	
This Working Paper presents the current state of ADS-B implementation in the SAM Region.	
References	
<ul style="list-style-type: none">• Workshop/Seminar for the ADS-B implementation ADS-B, Lima-Peru, 13 to 16 November, 2017;• Automatic Dependent Surveillance – Broadcast (ADS-B) Implementation and Regulation Meeting for NAM/CAR/SAM Regions (ADS-B/LEG), Mexico City-Mexico, 26 to 30 November 2018; and• Twenty Third Workshop/Meeting of the SAM Implementation Group (SAM/IG/23), Lima-Peru, 20 to 24 May, 2019.	
ICAO strategic objectives:	<i>A – Safety; and B – Air navigation capacity and efficiency</i>

1 Introduction

1.1 As a basis for the implementation of the ADS-B in the SAM Region, a CAR/SAM Unified Regional Surveillance Strategy, and a Technical and Operational Considerations Guide for the Implementation of the ADS-B in the SAM Region, have been prepared.

1.2 Additionally, a study on the Convenience and Feasibility of the Satellite ADS-B in a Regional Implementation has been presented during the Twenty Second Workshop/Meeting of the SAM Region Implementation Group (SAM/IG/ 22) of the SAM Region for the consideration of the States. In the links below, it is possible to access the study:

1) Spanish Version:

https://www.dropbox.com/s/bz0aqwp5b1xw4rw/SAM%20Estudio%20sobre%20ADS_B%20Sat%2010%20Enero%202019.pdf?dl=0

2) English Version:

https://www.dropbox.com/s/3g9smip32z0avnu/SAM%20ADS_B%20Sat%20Study%2010%20Jan%202019%20.pdf?dl=0

2 Analysis

Implementation initiatives of terrestrial ADS-B

Argentina

2.1 Argentina is in the stage of implementing a secondary radar (SSR) with built-in terrestrial ADS-B reception for Paraná airport, located 500 km NNO from the city of Buenos Aires. This system, which will be operational in the second half of 2020 and will be the first ADS-B sensor in the country, will be assigned to the road surveillance service of the Ezeiza, Córdoba and Resistencia FIRs. Its coverage area includes routes with high air traffic density, especially international flights, and critical points such as KORTA (transfer point between the Ezeiza and Resistencia FIRs) and Monte Caseros (border with the Montevideo FIR).

2.2 It is planned that the new technology of Mode S and ADS-B of the Paraná system, once operational, will then be deployed in each of the other 22 secondary radars available in the country manufactured by the Argentine company INVAP S.E., in a term of 3 years.

2.3 In addition, for the next 2 years, the incorporation of 3 primary radars with associated secondary A/C/S radar and ADS-B ground station, intended for the Buenos Aires, Cordoba and Mendoza TMAs, is planned.

2.4 On the other hand, it is in the process of execution a contract for the installation at the Ezeiza airport of a MLAT system, whose receivers also allow to receive and process secondary radar signals A/C/S modes, as well as ADS- B. This system is also part of an advanced surface movement guide control system (ASMGCS).

2.5 The ADS-B standard to be used is the RTCA DO 260 B.

2.6 Argentina has implemented ADS-B information exchange tests, using REDDIG to receive information from ADS-B stations from Paraguay.

Brazil

2.7 Brazil has implemented ADS-B, mainly to support aircraft operations in the Macaé TMA, a place of interest for oil operations, characterized by the movement of helicopters between the continent and the platforms or vessels anchored in this basin, in the oceanic zone, for transporting persons and cargo.

2.8 To serve the Campos basin in the airspace corresponding to the Macaé-TMA, 6 ADS-B stations were installed: four stations on maritime platforms and two on the continent. This infrastructure, integrated with the current radar network that supports air traffic control in that region, allows surveillance throughout the TMA airspace at 500 feet and more. Figure 1 presents coverage in the TMA-Macaé area.

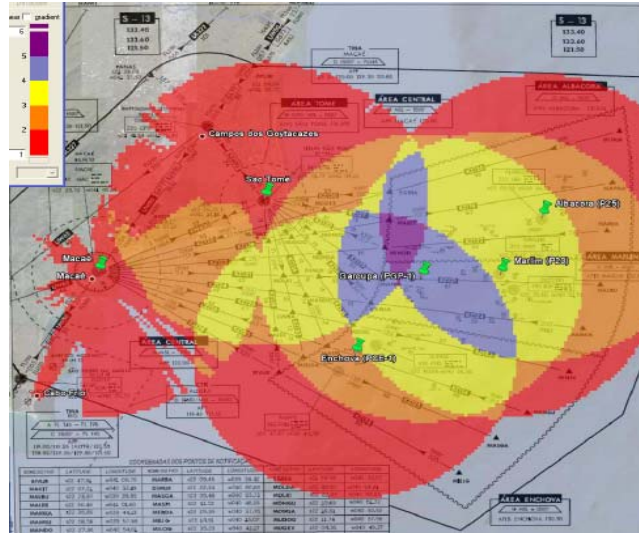


Figure 1 – Macaé TMA in Brazil

2.9 At continental level, there are plans to install 68 ground ADS-B stations in order to provide surveillance data of better quality and accuracy. The project is structured in 4 implementation phases:

- Phase 1 – Airways in the EURO/SAM corridor (UN741, UN856, UN873, UN857);
- Phase 2 – Airways in the SAM/NAM corridor (UA317, UA312, UL795, UL201, UL304, UZ13, UB680);
- Phase 3 – Airways UL306, UL540, UM799, UW33, UZ7; and
- Phase 4 – UL309, UL793, UL655, UB554, UM402, UM415.

Colombia

2.10 Colombia developed an extensive ADS-B implementation project starting in March 2016, to provide service starting on 1 January 2020 to all aircraft registered in Colombia and those operating in Colombian airspace. However, there are no plans to restrict aircraft not equipped with ADS-B, since the MSSR Mode S secondary surveillance radar network will remain operational.

2.11 During the SAM/IG/23, Colombia has presented a working paper (SAM/IG/23-WP/19), informing that 18 ADS-B was already installed and seven more are scheduled for this year, totalizing 25. Figure 2 depicts the ADS-B implementation in Colombia. Stations already installed are shown in yellow and those planned for installation are shown in red.

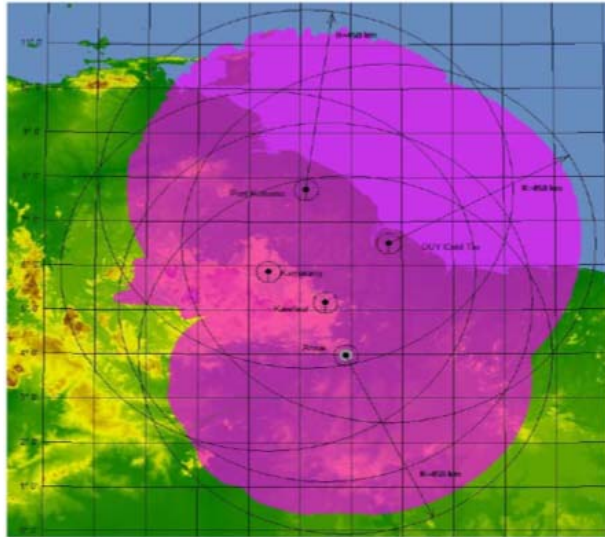


Figure 3 – ADS-B Coverage in Guyana for FL 300

Panama

2.16 Panama has implemented ADS-B stations in Cerro Jefe, Volcan Baru, Cerro Cana Agua, and El Porvenir.

Paraguay

2.17 Paraguay has implemented 6 ADS-B stations at the M. R. Alonso unified control center, Guaraní airport, Concepción airport, San Juan Baptista, Mariscal Estigarribia airport, and Bahía Negra airport.

Peru

2.18 Peru installed two ADS-B stations (INDRA GSS-20) for conducting tests in Pisco and Lima. Due to coverage issues with the ADS-B that existed in Lima, the decision was made to transfer to Lima the equipment that was installed in Pisco, which operates continuously to provide coverage redundancy and backup to the MSSR radar of Lima, eliminating the cone of silence for aircraft equipped with ADS-B.

2.19 Furthermore, Peru is planning to incorporate 8 ADS-B systems at national level in 2020.

2.20 The Peruvian State plans to begin the implementation of ADS-B in 2020, and it is also evaluating the elaboration of the regulation that allows the use of these systems in an operational way as a support and/or complement to the culmination of its implementation; In this regard, as there is a lack of referential regulations to regulate the proper use of ADS-B for the purpose of air traffic control, Peru requests ICAO its support to achieve such regulation, also considering that said norm will overcome the deficiency of the States of the SAM Region in the same situation.

Uruguay

2.21 Uruguay has plans to implement ADS-B and multilateration in the short term, in order to cover gaps in radar coverage.

Venezuela

2.22 Venezuela was in the process of acquiring ADS-B systems for Lagunazo, Santa Elena de Uairen, Cerro Los Colorados station, Cerro Catire station, Puerto Ordaz airport, Margarita airport, and La Chinita airport.

Satellite ADS-B implementation initiative*Bolivia*

2.23 Official operation of the radar system in Bolivia is scheduled to start in 2020. Once the actual coverage with the RADAR surveillance system is confirmed, plans will be made to use the ADS-B system for sectors lacking radar coverage, based on the information resulting from the Study on the convenience and feasibility of using satellite ADS-B.

Brazil

2.24 Brazil signed a technical and operational cooperation agreement with AIREON for the collection of data on the surveillance of aircraft using the airspace under the responsibility of DECEA, in order to make a decision on the adoption of the space-based ADS-B service.

2.25 The assessment of the technical and operational performance of satellite ADS-B surveillance based on the AIREON solution applied to DECEA airspace will consist of two phases:

- PHASE 1 – Tracking of specific aircraft: AIREON will provide aircraft tracking during the test period in the area of interest of DECEA, in order to test satellite ADS-B capabilities; and
- PHASE 2 – Real-time tracking: collection and real-time delivery of data through a virtual private network ("VPN") server connected to the internet, to track ADS-B-equipped aircraft, flying in test areas previously selected by DECEA. These tests will seek to extend the analyses conducted in Phase 1 to all the FIRs under the jurisdiction of DECEA and continue testing the satellite ADS-B services.

2.26 Possible benefits of the implementation of satellite ADS-B technology, which will be subject to the assessment proposed in this Agreement, include, but are not limited to:

- Increased coverage of the surveillance service in oceanic areas and/or supplementary coverage in continental airspace, wherever an operational demand is identified and where use of the ground surveillance infrastructure is not possible or feasible;
- Improved air traffic management in the airspace managed by DECEA, and airspace optimization to increase air traffic capacity through more direct routes and/or application of reduced aircraft separation minima;
- Improved air traffic flow management in Brazilian airspace;
- Improved search and rescue (SAR) operations in the airspace management by DECEA; and,

- Better understanding of the technical characteristics of the satellite ADS-B service offered by AIREON.

Colombia

2.27 Colombia considers that a technical and financial assessment is required in order to determine the advantages of using the satellite ADS-B service compared to ground ADS-B, especially to cover gaps in its airspace. In this regard, the SAM Region already has conducted a study on the convenience and feasibility of satellite ADS-B in a regional implementation, which could be taken into account.

Chile

2.28 Chile is interested on testing space-based ADS-B and is in advanced conversations with AIREON to implement an agreement.

Peru

2.29 Peru is arranging for a Memorandum of Understanding (MoU) to be signed with the space-based ADS-B provider, for the conduction of tests to identify the benefits of contracting the service.

Uruguay

2.30 Uruguay is, also, arranging for a Memorandum of Understanding (MoU) to be signed with the space-based ADS-B provider, for the conduction of tests to identify the benefits of contracting the service.

Other States

2.31 The SAM Region continues analyzing the advantages of adopting the space-based ADS-B service at the regional level compared with its individual adoption by each State. States are expected to express their position regarding this strategy in order to save costs in the Region.

FOCAL POINTS ADS-B

2.32 The Meeting is requested to update the Focal Points information, contained in the **Appendix A** to this working paper.

3 Suggested actions

3.1 The Meeting is invited to:

- a) Take note of the information presented in this Working Paper;
- b) discuss the feasibility and procedures for a potential implementation of the space-based ADS-B service; and
- c) agree on other actions deemed necessary.

APÉNDICE A / APPENDIX A

ADS-B
NATIONAL FOCAL POINTS / PUNTOS FOCALES NACIONALES

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