



**Twenty-first Meeting of the CAR/SAM Regional Planning and Implementation Group
 (GREPECAS/21)**

Santo Domingo, Dominican Republic, 15 to 17 November 2023

Agenda Item 4: GREPECAS Work Programme

ADS-B IN CENTRAL AMERICA

(Presented by Belize, Costa Rica, El Salvador, Guatemala, Honduras, and Nicaragua)

EXECUTIVE SUMMARY	
<p>This Working Paper includes the actions carried out by Belize, the States of Central America, and COCESNA, with the purpose of improving air traffic services in different airspaces of the Central American FIR, through the implementation of aerial Automatic dependent surveillance–broadcast (ADS-B) and the establishment of a regulation to ensure the equipment of aircraft with the required features.</p>	
Action:	Suggested actions are presented in Section 3.
<i>Strategic Objectives:</i>	<ul style="list-style-type: none"> • Safety • Air Navigation Capacity and Efficiency
<i>References:</i>	<ul style="list-style-type: none"> • Doc 4444 PANS/ATM • Doc 9971 • Annex 11

1. Introduction

1.1 COCESNA, as part of its strategic and investment planning, modernized the aeronautical surveillance systems with Automatic dependent surveillance–broadcast (ADS-B) capacity and updated the ATS Control Centers both Route (ACC CENAMER), Approach (APP) and Control Towers (TWR), to integrate ADS-B messages considering the processing of ADS-B versions 0, 1 and 2, in addition to using and processing the latest versions of the Asterix CAT 021 surveillance data exchange format. It is expected that the new contracted versions for the Control Centers allow improvements to be introduced to process ADS-B figures of merit according to the criteria established in the ADS-B operational concepts.

1.2 Currently, ground-based ADS-B receivers provide an additional layer of surveillance that overlaps with the one provided by radars in the continental and oceanic areas where coverage exists. This information is used in the Control Centers for surveillance purposes and to monitor the capabilities of aircraft within the Central American FIR.

1.3 In the Pacific Ocean space of the FIR of Central America, where it is not possible to have ground-based radar and ADS-B coverage, COCESNA has contracted ADS-B satellite data, with the purpose of improving surveillance and operational security in said airspace, achieving a reduction in LHD in said airspace and reducing aircraft separation.

1.4 As part of the investment initiatives, a performance assurance system was implemented that allows monitoring of the general performance of the radar and ADS-B sensors in a periodic and automated manner, in addition to developing software that allows, based on the ADS-B data, monitor the ADS-B capabilities of the avionics and perform statistical analysis of the figures of merit reported by aircraft in ADS-B messages.

1.5 This system has made it possible to monitor, starting in 2019, how aircraft have been equipped with version 2 (DO-260B), mainly due to the mandate established by the USA as of 1 January 2020, a situation that has been beneficial in the Central American region. According to the statistics and reports of the Member States, important advances are observed in equipping aircraft with ADS-B in both commercial and general aviation.

1.6 Through the Multi-Regional Civil Aviation Assistance Programme (MCAAP), an Air Navigation Services (ANS) Surveillance Task Group (TF) Meeting was held at the ICAO NACC Regional Office, in Mexico City, Mexico, from 13 to 15 July 2022, which COCESNA participated as an integral and active member of the surveillance TF.

1.7 The surveillance TF developed an analysis of the implementation status of data from surveillance systems, including ADS-B. As part of this process, it was identified that the Central American subregion with all its Member States already has the operational implementation of ADS-B, both on the ground and satellite, making important recommendations that have been considered by COCESNA and its Member States, among them the following:

Recommendation No. 3 “States should take advantage of the surveillance capabilities currently existing on aircraft, mainly ADS-B, and adopt the mandatory use of ADS-B as regulations. That the States that have the necessary ADS-B infrastructure ready for their operations, implement the necessary regulations to ensure their operations in the short term.”

1.8 Through Conclusion GREPECAS/20/30 “Study on operational priorities for implementation of ADS-B and aspects of the use of ADS-B in ATC units”, it is indicated that the Secretariat, in coordination with the industry, execute a study on operational priorities for the implementation of ADS-B and on aspects of the use of ADS-B in ATC units, based on the technical guidance documentation available for the CAR/SAM Regions before GREPECAS/21, with the purpose of promoting coherent and harmonized ADS-B implementation in the CAR/SAM regions, within the framework of the ASUR module of the GANP, recognizing the priorities of airspace optimization and the provision of ATS services in the region.

1.9 For ADS-B operational use and to achieve all the current and future benefits and capabilities established in the Global Air Navigation Plan to provide ATS services in radar and non-radar spaces, it is necessary to develop a regional regulation for the operational implementation of ADS-B and promote that all aircraft are equipped and comply with the features required for the different airspaces.

1.10 Through a resolution of the Board of Directors of COCESNA, a Working Group made up of specialists from each State was formed to prepare the roadmap for the analysis and implementation of the ADS-B regulation in the region and additional resolutions have been adopted to strengthen the activities of the work team.

1.11 During the NAM/CAR/SAM Workshop on the development of regulations/standards for the implementation of ADS-B in July 2023, the results obtained by the working group, related to the implementation of ADS-B enablers and the roadmap for ADS-B regulation were presented.

2. Results of the Working Group for ADS-B Regulation

2.1 The Working Group, with the support of the ICAO NACC Regional Office and the Surveillance TF, developed a roadmap for the purpose of carrying out the analysis and implementation of the ADS-B regulation.

2.2 This roadmap considers an analysis of the avionics situation in terms of equipment, including aircraft registration, a cost analysis of ADS-B implementation and certification, identification and participation of the industry, review of ICAO regulations on the ADS-B and the regulatory framework of each of the Central American States, study of the cases of implementation of the regulation in other States, definition and review of the ADS-B operational concept, evaluation of operational safety aspects and definition of ADS-B performance requirements, in order to conclude the analysis and present a proposal for ADS-B regulation.

2.3 From the review of the qualifications for ADS-B operational use, the following results were obtained:

1. **ADS-B Regulation:** The regulations for each of the Member States were evaluated, identifying several AIC publications related to ADS-B equipment and the establishment of dates for its mandatory use, concluding the need to unify the regulation at the level of Central America, for this purpose airworthiness experts will be incorporated and, in addition to the recommended practices in Annex 10, those established in Annex 6 will be considered.
2. One of the aspects to strengthen is the registration of aircraft in terms of ICAO 24-bit addressing, equipment, and certification.
3. **Infrastructure:** The necessary ground and satellite ADS-B infrastructure is available to cover the entire airspace, identifying small gaps at a lower level in spaces where flight information is provided. All ADS-B control centers, towers, and systems have the capability to process ADS-B data.
4. **ADS-B Avionics:** there is significant progress in the equipment of general aviation aircraft, reaching 50% in some countries. It is concluded that, within the region, there are workshops to equip aircraft, this being an important aspect to consider time rather than cost, which is not significant.
5. **ADS-B Training:** There is experience in ADS-B personnel training carried out for ADS-B implementation and it is being considered that by 2024 all recurrences will include the operational use of ADS-B.

2.4 In the next meetings, the progress and results obtained will be reported.

3. Suggested actions

3.1 The Meeting is invited to:

- a) review the information provided in this working paper;
- b) to the industry and the States, contribute and collaborate with the ADS-B regulation initiative in Central America; and
- c) any other matter that you deem appropriate.

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