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INFORMATION PAPER

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Automatic Dependent Surveillance – Broadcast OUT Implementation Meeting for the NAM/CAR Regions (ADS-B/OUT/M)

Ottawa, Canada, 21-23 August 2019

Agenda Item 4: **Update Status ADS-B Implementation for States**

EVALUATION OF SPACE BASED ADS-B IN BRAZIL

(Presented by Brazil)

EXECUTIVE SUMMARY	
This Information Paper presents a summary of the Brazilian initiative to sing a cooperation agreement with AIREON LLC for the technical and operational evaluation of the collected and transmitted surveillance ADS-B data through satellite.	
Strategic Objectives:	• Safety • Air Navigation Capacity and Efficiency • Economic Development of Air Transport
References:	• Automatic Dependent Surveillance – Broadcast (ADS-B) Implementation and Regulation Meeting for the NAM/CAR/SAM Regions (ADS-B/LEG), Mexico City, Mexico, 2630 November 2018.

1. Introduction

1.1 DECEA's strategic program for the evolution of Brazilian air traffic management, SIRIUS BRAZIL, aligned with the recommendations contained in Doc 9750 and aligned with the ASBU, considers the implementation of ADS-B in some of its projects to meet the operational demands, while contributing to the evolution of the future ATM concepts.

1.2 A project of great relevance is the implementation of ADS-B earth stations throughout the Brazilian territorial area, to provide surveillance coverage in the continental FIRs, which is already under development and its implementation is estimated until the end of 2020.

1.3 Likewise, aware of the constant technological evolution and the availability of new products on the market, DECEA signed with the AIREON LLC a Technical and Operational Cooperation Agreement for the evaluation of ADS-B surveillance data transmitted by satellite.

2. Discussion

2.1 The evolution of ADS-B technology and its adoption by global civil aviation led to the emergence of an alternative solution based on satellite media, better known as space-based ADS-B or satellite ADS-B. This solution uses the infrastructure of a constellation of low-orbit satellites of the IRIDIUM network for the reception of ADS-B data from aircraft, which will be processed in processing centers for later delivery to the ANSPs, service providers of air navigation.

2.2 Since ADS-B satellite technology is emerging; in-depth evaluation of its advantages and disadvantages is necessary, from a technical and operational point of view.

2.3 Therefore, the Brazilian administration chose to sign an agreement with AIREON LLC, whose objective is the collection of surveillance data for aircraft using the airspace under the responsibility of DECEA, obtained through ADS-B technology Satellite With this data, it will be possible for the DECEA specialists to carry out technical and operational studies and analyzes, which will subsidize the decision making by the senior management of the DECEA, regarding the suitability of its adoption for the improvement of surveillance and of airspace control.

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

1 Phase - 1 - Tracking of Specific Aircraft

AIREON will provide the tracking of aircraft during the planned test period in the areas of interest of the DECEA, in order to test the capabilities of the satellite ADS-B.

2 Phase - 2 – Real Time Tracking

It consists of collecting and sending data in real time through a virtual private network ("VPN") server connected to the Internet, of aircraft equipped with the ADS-B and flying in previous test areas - selected by the DECEA. These tests will aim to expand the analysis from Phase 1 for all FIRs under the jurisdiction of the DECEA and continue testing the ADS-B services via satellite.

2.5 The possible benefits of the application of ADS-B Satellite technology, which are subject to the evaluations planned in this Agreement, include, but are not limited to:

- Increase the scope of the surveillance service in oceanic areas and / or complement it in airspaces on the continent, where operational demand is identified and the use of terrestrial surveillance infrastructure is not possible or viable;

- Improvement of air traffic management in airspace managed by DECEA and how this space can be optimized to expand air traffic capacity through more direct routes and / or by applying reduced separation minima between aircraft;

- Improved air traffic flow management in Brazilian airspace

- Improved search and rescue operations ("SAR") in the airspace managed by DECEA

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

2.6 The Agreement was signed on May 15, 2019.

2.7 Phase 1 began with data collection of aircraft flights defined by DEDCEA along with some airlines and ended on August 15. Now the AIREON company is preparing the planned deliverables: videos and PCAP files of ten flights.

2.8 Meanwhile, Phase 2 is already under development, with the execution of the following activities:

- Provision of the virtual private network ("VPN") server and installation in test facilities;

- Training for DECEA staff on the use of the VPN server to access space-based ADS-B data;

- Sending data signals for the 5 Brazilian FIRs as a single FIR (block);

- The activation of the communication channel via VPN;

- Integration of the signal in the automated SAGITTARIO system of the existing laboratory in DECEA, with the joint participation of the AIREON and ATECH companies.

2.9 Likewise, we already have the reception and visualization of the data provided by AIREON, integrated into the SAGITTARIO system, as can be seen in the following figure:

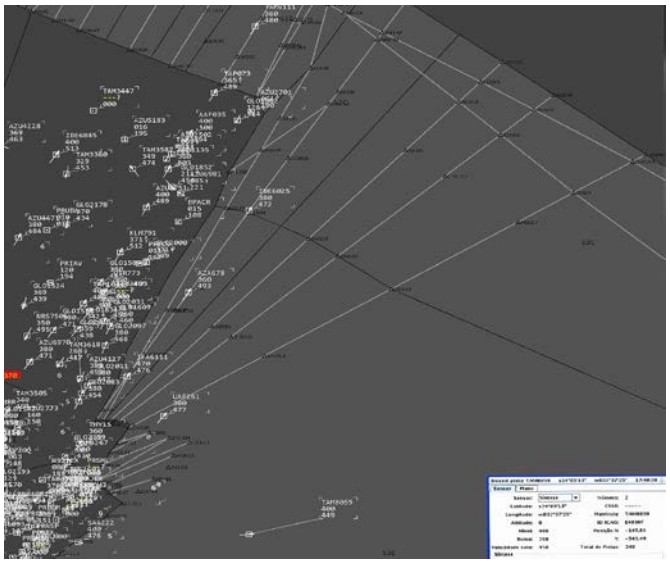

Fig. 1 – Display of space based ADS-B in SAGITARIO system

3. Conclusion

3.1 The Meeting is invited to take note of this document.

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