



Agenda Item 3: Communication Navigation and Surveillance

Space based ADS-B

(Presented by GCAA)

SUMMARY

This working paper seeks to discuss how SAT states can work to ensure the provision of Air Navigational Services over the SAT region in a safe and efficient manner. It highlights the resolution passed at the WRC 15 meeting held in Geneva, from November 2-26, 2015 which approved the primary allocation of 1090 MHz frequency for spaced based ADS-B receivers. The paper also discusses the possible benefits SAT states could derive from this new allocation.

References

ITU WRC -15 Finals Acts, Previous SAT reports

Related ICAO Strategic Objectives: A: *Safety*; B: *Air Navigation Capacity and Efficiency*

Related ASBU, Performance Improvement Area:

B0-FRTO: Improved Operations through Enhanced En-Route Trajectories

B1-FRTO: Improved Operations through Optimized ATS Routing

B0-NOPS: Improved Flow Performance through Planning based on a Network

-Wide view

B1-NOPS: Enhanced Flow Performance through Network Operational Planning

B0-ASUR: Initial Capability for Ground Surveillance

B0-SNET: Increased Effectiveness of Ground-based Safety Nets

B1-TBO: Improved Traffic Synchronization and Initial Trajectory-Based Operation

Action by the meeting: see paragraph 3

1.0 Introduction

The south Atlantic (SAT) Region, has over the years been discussing the best ways to manage the SAT to ensure safety and efficient use of airspace.

Generally, Radar and VHF coverage over remote oceanic regions is challenging due to range limitation of Radars and VHF's radios. Most Air Navigation Service providers (ANSPs) use HF radios for communicating over such ranges due to its long range capabilities. The use of HF radios however comes with its attendant problems of noise.

In the last couple of years, the SAT group has identified ADS-C /CPDLC as the candidate technology to cover its remote oceanic regions. Air Navigation Service Providers (ANSPs) have also been encouraged to ensure its deployment.

2.0 Discussions:

ADS-B has also been identified as one of the future solutions of providing surveillance coverage. ADS-B also features in the ICAO's ASBU modules as a good candidate technology for the present and the future.

Automatic Dependent Surveillance –Broadcast (ADS-B) is a surveillance technology, which allows an aircraft to determine its position via satellite navigation. The aircraft broadcasts positional information periodically which enables it to be tracked at any time. This information can also be received by Air Traffic Service units as well as other aircrafts to provide situational awareness and allow self-separations.

Most users of ADS-B today, use it for Air-to-Air and air-to ground operations at a frequency of 1090MHz. This ground based technology allows ADS-B to be available to ANSPs only where terrestrial infrastructure exists. This implies that ADS-B information is not available for Air Traffic Management in remote oceanic areas.

In the last couple of years some manufactures have been developing technologies which would solve this limitation of ground based ADS-B. Some industry players are in the process of deploying space based ADS-B technology.

With the space/satellite based ADS-B, information from aircrafts are available for reception by satellite-based ADS-B receivers onboard a global satellite constellation. This information is in turn transmitted to the ANSP's terrestrial infrastructure.

In November 2015, the ITU, the United Nations' specialized agency for information and communication technologies, resolved, during its 2015 World Radio Communication Conference (WRC-15) a primary allocation of 1090 MHz for spaced based ADS-B receivers and protect it for Aircraft to Satellite communication. ADS-B receivers will be mounted on low earth orbiting satellites to receive ADS-B information before being broadcasted to the Air traffic services units.

This Resolution implies that in the future evolution; there should be no coverage limitation in terms of surveillance data acquisition. ANSPs will be able to have access to ADS-B information from aircrafts even in remote and oceanic regions.

Satellite based ADS-B when fully matured, would enhance safety benefits in remote airspaces due to the availability of accurate aircraft position data to ATMs. It would support more direct routings and provide optimum altitudes, implying less fuel burn. Air space capacity, in dense areas can be improved because minimum separation standards can be used.

3.0 Action by the meeting:

The meeting is invited to:

- Take note of the information provided in this paper
- Discuss the possible benefit that ANSPs can derive from this new space –based ADS-B technology.
- Discuss the maturity, applicability and sustainability of this technology at present and in the future.