



ICAO

INTERNATIONAL CIVIL AVIATION ORGANIZATION

Twenty seventh Meeting of the Africa-Indian Ocean Planning and Implementation Regional Group (APIRG/27) and Tenth Meeting of the Regional Aviation Safety Group for the Africa-Indian Region (RASG-AFI/10), Joint sessions

4 and 8 November 2024

Agenda Item 3: APIRG and RASG-AFI Coordination

3.4. AFI Airspace Monitoring

**AUTOMATIC DEPENDENT SURVEILLANCE-BROADCAST – OUT (ADS-B OUT)
HEIGHT MONITORING IMPLEMENTATION**

(Presented by IATA and AFRAA)

SUMMARY	
This paper presents a report on the gap in aircraft equipage and the new phenomena of spoofing/interference generated by the loss of GNSS signals that could impact the usage of ADS-B OUT. It also informs APIRG members of the challenges faced by the airspace users related to retrofitting aircraft operating in the Region as required by APIRG/22 Conclusion 22/40 and requests the Group to revisit its ADS-B out mandatory requirement. Action by Meeting The proposed action to the meeting is as per paragraph 3 of this paper.	
References:	REFERENCE(S) APIRG Reports.
<i>Strategic Objectives</i>	Aviation Safety, B - Air Navigation Capacity and Efficiency, C - Security and Facilitation, D -Economic Development.

1 INTRODUCTION

1.1 ADS-B Out for height monitoring is a vital component of modern air traffic management, enhancing both safety and efficiency in Reduced Vertical Separation Minimum RVSM airspace. Continuously broadcasting and analyzing altitude data ensures that aircraft maintain precise altitude-keeping performance.

1.2 ADS-B Out relies on accurate position data from GPS or other navigation systems. If the position source data is inaccurate or unavailable, the ADS-B Out system cannot function correctly.

1.3 The recent Technical Working Group (TWG) report has revealed numerous aircraft operating in the region without ADS-B OUT compliance.

1.4 APIRG/22 Conclusion 22/40 urged States and aircraft operators to ensure that all aircraft operating within the AFI RVSM airspace are equipped with ADS-B Transponder Extended Squitter 1090 by June 2023 and States and aircraft operators ensure that all aircraft operating within the AFI Region airspace are equipped with ADS-B Transponder Extended Squitter 1090 by January 2025.

2. DISCUSSION

2.1 *Aircraft Equipage/Cost Involvement:* The recent TWG report revealed numerous aircraft operating in the region without ADS-B OUT compliance. ADS-B is critical in dealing with very high-density flight areas such as the North Atlantic, Europe, and North America. While other regions have mandated ADS-B Out, Asia did not make ADS-B mandatory.

2.2 African long-range fleets operating to and from high-density flight areas are equipped with ADS-B Out. In the low-density African flight environment, the added value of ADS-B out is modest. Hence, in the TWG survey results, the following elements need to be considered:

- ❖ The cost of modifications can vary depending on the aircraft type, ranging from \$100,000 to \$150,000 per aircraft.
- ❖ The grounded time that should be considered for effective planning, particularly during Heavy Maintenance, involves minimal intervals of three years, depending on the Aircraft Type.

2.3 ADS-B OUT relies on the Global Navigation Satellite System GNSS signal for position reporting, introducing new risks related to new technology and airspace management, like loss of GNSS signal, which impacts numerous aircraft systems. Due to the emergence of this new phenomenon, it is necessary to coordinate with all relevant stakeholders to collect and share GNSS safety data, establish universal procedural GNSS incident guidance from aircraft manufacturers, and secure a commitment from states to maintain conventional navigation systems as backups in instances where GNSS are spoofed or jammed. Solutions to protect operations from GNSS spoofing foster additional expenditure to avoid impairing the safety of equipped aircraft. Therefore, operators should make a business case for individual airplanes of their fleets based on their networks.

2.4 During AAO SG/7, the following draft conclusion has been defined:

- a. conduct a survey on the rate of aircraft equipped with ADS-B 1090Mhz Extended Squitter (30 March 2025)
- b. reschedule the publication of the mandatory carriage of ADS-B for new aircraft operating in the State's RVSM Airspace (31 December 2026)
- c. non-ADS-B equipped aircraft operating in AFI RVSM Airspace are to comply with the mandatory carriage of ADS-B. (31 December 2028)

2.5 However, referring to the retrofit constraints and ongoing GNSS safety issues, the working paper request APIRG reconsiders its conclusions, making ADS-B Out mandatory. Operators should ensure ADS-B Out in the aircraft specification for newly ordered aircraft, however, retrofitting older aircraft types should be left to the operators' discretion. Operators should also use their equipped fleet to meet the height monitoring requirements with ARMA's cost-effective solution based on ADS-B Out.

3 ACTION BY THE MEETING

3.1 The meeting is invited to:

- a) Note the information contained in this working paper;
- b) Secure a commitment from ARMA to maintain conventional RVSM Height Monitoring as an alternate; and
- c) Reconsider the conclusions to make ADS-B OUT mandatory and leave the decision to aircraft operators.