



International Civil Aviation Organization

**MIDANPIRG Communication, Navigation and Surveillance Sub-Group
(CNS SG/15)**

(Doha, Qatar 11 – 14 May 2026)

Agenda Item 3: Surveillance issues

**IMPLEMENTATION OF AUTOMATIC DEPENDENT SURVEILLANCE - BROADCAST
(ADS-B)**

(Presented by Saudi Arabia)

SUMMARY

This paper provides information on the deployment of ADS-B ground stations network in KSA as second layer for ATS surveillance to support the provision of ATC service within the **Jeddah Flight Information Region (JED FIR)**. The paper outlines the main lessons learned and observations during the implementation and integration phases of ADS-B ground stations.

Action by the meeting is at paragraph 6 of this IP.

REFERENCES

- ICAO Annex 10 Vol VI.
- ICAO Doc 9924 Aeronautical Surveillance Manual.
- MIDANPIRG/22 and RASG-MID/12 Report.
- ICAO Doc 4444, PANS-ATM.
- ICAO Doc 9854, Global Air Traffic Management Operational Concept.
- ICAO Doc 9750, Global Air Navigation Plan.
- ICAO Doc 9871, Technical Provisions for Mode S and ADS-B Services.
- MIDANPIRG/19 & RASG-MID/9-WP/73 14/02/2022
- CNS SG/14 WP/22

1. INTRODUCTION

- 1.1 The Automatic Dependent Surveillance Broadcast (ADS-B) is a surveillance technology where an aircraft broadcasts data related to its position, altitude, speed, identification typically once per second. The Ground stations receive and track these broadcasts known as ADS-B Out, serving as an advanced, and efficient alternative for surveillance to traditional surveillance (e.g radars) systems.

- 1.2 The ADS-B implementation in the Kingdom of Saudi Arabia (KSA) aims to:
- 1) provide en-route redundancy of ATS surveillance coverage where Radars surveillance is already available,
 - 2) enhance the situational awareness of Air Traffic Controllers, and
 - 3) be used as gap-filer for the surveillance coverage within Jeddah FIR.
- 1.3 The Automatic Dependent Surveillance Broadcast transmissions on 1090MHz Extended Squitter data link will be used to support the provision of ATS surveillance services to equipped aircraft flying within KSA airspace.
- 1.4 The ADS-B implementation plan will the enhance surveillance capabilities in remote areas and complement existing surveillance radar, and it is full operation.

2. DISCUSSION

- 2.1 The ADS-B deployment in the Kingdom effectively complements existing radar network and infrastructure, particularly for En-route environment. This dual-surveillance design enhances safety and operational availability and reliability by adding a redundant layer, especially critical in remote areas within the Jeddah FIR.
- 2.2 The ADS-B implementation in Saudi Arabia represents a comprehensive, resilient, and one of the pillars of the Saudi National Air Navigation Plan (SNAP) for the modernization of ATS surveillance.
- 2.3 The deployment of ADS-B has been designed to cover the whole JED FIR, by installing **14 ADS-B** ground stations, and **8** ground stations co-located with WAM Systems to enhance the surveillance performance, availability, and reliability. **One** ADS-B station is supporting the provision of Alula remote aerodrome ATS (Digital Tower) to complement the video surveillance. The ADS-B data is complementing the visualization of traffic by adding labels on equipped aircraft with identification information, position, altitude, and speed.
- 2.4 In addition to the ADS-B project, the migration with Aeronautical Telecommunication Network (ATN) infrastructure was successfully completed, and the integration with ATM simulator system was successfully completed. Currently ADS-B systems are under testing, and validation phase. The data collected during the testing and validation phase will be analysed and evaluated compared to the ATS surveillance data available through the conventional surveillance network.
- 2.5 Prior to introducing the ADS-B service with JED FIR, an AIP SUP will be issued in advance to notify the airspace users about this major upgrade and enhancement of ATS surveillance capabilities, requirements, and operational procedures.
- 2.6 The ADS-B service adds a significant milestone in enhancing air traffic safety, situational awareness, and operational efficiency across the Jeddah FIR.

3. KEY BENEFIT OF IMPLEMENTATION ADS-B

The expected Key benefits of ADS-B can be summarized as follows:

- A- Enhance surveillance Coverage.
- B- Support Real-Time, Cooperative Surveillance.
- C- Increase airspace capacity

- D- Enhance the ATS surveillance resilience as the ADS-B data is used as a second layer of ATS surveillance and gap filler.

4. LESSONS LEARNED

The key lessons learned from the on-going integrating of ADS-B ground stations with the ATM system can be summarized as follows:

- A) **There is a need to establish continuous GNSS performance monitoring** within the intended ADS-B coverage area to ensure the availability, accuracy, and integrity of position data, and data quality check, and validation,
- B) **It is essential to configure ATM system quality thresholds** including NIC, NUC, SIL, and related indicators to ensure that only ADS-B target reports meeting defined performance criteria are accepted and displayed at ATC working positions, and exclude the ADS-B reports not meeting the criteria
- C) **It is necessary to conduct periodic validation of ADS-B targets data**, through regular comparison with an independent surveillance source such as radar or WAM, on a monthly basis to confirm systems accuracy, availability, and reliability.

5. CONCLUSION:

The implementation of ADS-B in Saudi Arabia constitutes a strategic milestone in the national modernization of ATS surveillance infrastructure and will strength the safety in the provision of ATC service, enable more efficient air traffic management, enhance airspace capacity, and long-term operational resilience aligned with the Saudi National Air Navigation Plan (SNAP).

6. ACTION BY THE MEETING

The meeting is invited to take note the information in this Paper and invite the MID States to share information on the deployment of ADS-B and lessons learned.