

AERONAUTICAL INFORMATION CIRCULAR

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AUTOMATIC DEPENDENT SURVEILLANCE BROADCAST (ADS-B) IMPLEMENTATION IN NEPAL

1. INTRODUCTION

- 1.1. ICAO has endorsed the Aviation System Block Upgrades (ASBU) to provide a framework for global harmonization and interoperability of seamless ATM systems, and among those Block Upgrades, the Block 0-1: ASUR recommends States to implement ADS-B. ADS-B that provides an economical alternative to acquire surveillance capabilities especially for areas where traditional Radar surveillance is not available, viable or possible.
- 1.2. ADS-B has the potential use in almost all environments and operations and is likely to become a backbone of the future ATM system. ADS-B may be used to supplement existing Radar surveillance systems or as the primary means of surveillance.
- 1.3. Civil Aviation Authority of Nepal is planning to enhance surveillance coverage within Kathmandu FIR by introducing ADS-B surveillance.
- 1.4. This Aeronautical Information Circular (AIC) intends to expand the scope of ADS-B implementation as full-fledged ADS-B based surveillance service in Nepal.
- 1.5. ICAO Annex 6, Chapter 7, Section 7.3 mandates all aircraft to be equipped with onboard surveillance equipment to enable it to operate meeting the ATS requirements. As such, this AIC aims at notifying the policy on Automatic Dependent Surveillance – Broadcast (ADS-B) equipage and operation for civil aircraft within Kathmandu FIR within the designated airspace.
- 1.6. This AIC will necessitate the issuance of AIP Supplement or Amendment for the revision in the provisions of ENR 1.6 of AIP Nepal.

2. IMPLEMENTATION

- 2.1. The ADS-B implementation in Kathmandu FIR as a monitoring service under test purpose started since 28 November 2020.
- 2.2. The ADS-B based surveillance service will be applied within ADS-B covered Class C airspace in Kathmandu FIR, as mentioned below:
 - a) Kathmandu TMA (From FL 250 to upper limit of the TMA)

- b) Bhairahawa CTR
- c) ATS Airways (from FL 250 to upper limit of the Airways)

Note: The dimension (Lateral limit and Vertical limit) of each airspace is in accordance with AIP Nepal, ENR 2. ATS Airspace, ENR 3.1 & ENR 3.3. ATS routes and AD 2.17 of respective aerodromes.

3. INTENDED PLAN

3.1 Following plan has been intended for ADS-B implementation within the airspace as specified in paragraph 2.2 above:

- From 1st June 2021, ADS-B will be applied for situation awareness
- From 1st December 2021, ADS-B will be applied for ATS surveillance service (as a back-up for the available radar systems) within Radar covered airspace
- From 1st June 2022, ADS-B will be applied for full-fledged ATS surveillance service together with the current radar service

4. AIRCRAFT EQUIPAGE FOR ADS-B "OUT"

4.1 Any civil aircraft flying within Kathmandu FIR which is ADS-B equipped must meet the performance standards described in Paragraph 4.4 below.

4.2 Until 31st May 2022 at 2359 UTC, carriage of ADS-B equipment for flights within Kathmandu FIR within the airspace as mentioned in paragraph 2.2 is optional. However, within ADS-B only surveillance coverage like lower level of Bhairahawa CTR and west of SUKET along ATS route L626, priority will be given to aircraft which are ADS-B OUT equipped over the non-equipped aircraft.

4.3 Starting from 1st June 2022 at 0000 UTC, all civil aircraft flying within Kathmandu FIR within the airspace as mentioned in paragraph 2.2 must carry serviceable ADS-B OUT equipment with Mode S Transponder and GNSS source positioning that meet the performance standards described in paragraph 4.4 below.

4.4 Within the Kathmandu FIR, ADS-B transmitting equipment shall be certificated whenever meeting:

- i. EASA AMC 20-24, Certification Considerations for the Enhanced ATS in Non-Radar Areas using ADS-B Surveillance (ADS-BNRA) Application via 1090 MHZ Extended Squitter, or
- ii. EASA ED Decision 2013/031/R adopting Certification Specifications for Airborne Communications Navigation and Surveillance (CS ACNS), or
- iii. FAA AC 20-165B, Airworthiness Approval of Automatic Dependent Surveillance – Broadcast (ADS-B) Out Systems, or
- iv. The equipment configuration standards in Appendix XI of Civil Aviation Order 20.18 of the Civil Aviation Safety Authority of Australia.

4.5 If an aircraft carries ADS-B OUT equipage which does not comply with the requirements of paragraph 4.4, the aircraft ADS-B equipment shall be:

- a) Deactivated; or

- b) Set to transmit only a value of ‘zero’ for the Navigation Uncertainty Category for Position (NUCp), Navigation Integrity Category (NIC), Navigation Accuracy Category for Position (NACp) and Source Integrity Limit (SIL).

Note:

- i. All civil aircraft meeting certification standards as specified in para 4.4 above must be RTCA DO-260, DO-260A or DO-260B compliant.
- ii. The requirement is met if the ADS-B OU Transmission equipment has a cockpit control that enables the pilot to turn the ADS-B transmissions on and off without disabling the ATC transponder.
- iii. Deactivation of the ADS-B transmissions must not affect the continued operation of the Mode S transponder responses to interrogations.
- iv. It is considered equivalent to deactivation if one or more of the position quality indicators NUCp, NIC, NACp or SIL is set to continually transmit only a value of ‘zero’.

5. FLIGHT PLANNING

5.1 Aircraft operators complying with the requirements stipulated in Paragraph 4.4 are to indicate the appropriate ADS-B designator in Item 10 of the ICAO flight plan:

- **E** – Transponder — Mode S, including aircraft identification, pressure-altitude and extended squitter (ADS-B) capability,

OR

- **L** – Transponder — Mode S, including aircraft identification, pressure-altitude extended squitter (ADS-B) and enhanced surveillance capability,

Together with:

- **B1**– ADS-B with dedicated 1 090 MHz ADS-B “out” capability,

OR

- **B2**– ADS-B with dedicated 1 090 MHz ADS-B “out” and “in” capability.

5.2 Aircraft Identification (ACID) not exceeding 7 characters must be accurately indicated in Item 7 of the ICAO flight plan and replicated exactly when set in the aircraft avionics (for transmission as Flight ID) as either of the following:

- i. The three-letter ICAO designator of the aircraft operator followed by the flight number (e.g. RNA231, HIM890), when radiotelephony call sign consists of the associated ICAO telephony designator for the aircraft operator followed by the flight number (e.g. ROYAL NEPAL231, HIMALAYA AIRLINES 890).
- ii. The aircraft registration (e.g. 9NALY, 9NAJK) when the radiotelephony call sign consists of the aircraft registration.

Note: ACID entered should not have any leading zeros unless it is part of the flight number as indicated in Item 7 of the ICAO flight plan. Hyphens, dashes or spaces are NOT to be used.

6. ATC-PILOT PHRASEOLOGY

Phraseology as mentioned in latest amendment to MATS Nepal and/or PANS ATM, Doc 4444 shall be applied for ATC-Pilot communication.

7. CONTINGENCY

7.1 ATC shall terminate the surveillance separation and immediately provide the procedural separation to the aircraft, if radar and ADS-B contact is lost in an ATC air situation display.

7.2 The pilot-in-command, upon awareness of an onboard ADS-B equipment failure, must inform ATC as soon as possible. ATC would then use other available systems and services to ensure separation with other aircraft operating in the designated airspace.

8. EFFECT

8.1 This AIC will be reviewed and re-issued as new AIC whenever changes are desirable and necessary.

8.2 This AIC or changes thereto shall remain in force until its information is incorporated into AIP Nepal.

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