

**54th CONFERENCE OF
DIRECTORS GENERAL OF CIVIL AVIATION
ASIA AND PACIFIC REGION**

*Ulaanbaatar, Mongolia
07 — 11 August 2017*

AGENDA ITEM 3 : AVIATION SAFETY AND
 AIR NAVIGATION

**ADS-B IMPLEMENTATION STATUS IN INDONESIA
AND DATA SHARING
BETWEEN INDONESIA, AUSTRALIA AND SINGAPORE**

(Presented by Indonesia)

INFORMATION PAPER

SUMMARY

This paper presents the information of the status of data sharing between Indonesia, Australian and Singapore and ADS-B Implementation progress in Indonesia.

ADS-B IMPLEMENTATION STATUS IN INDONESIA AND DATA SHARING BETWEEN INDONESIA, AUSTRALIA AND SINGAPORE

1. INTRODUCTION

1.1 Directorate General of Civil Aviation - Indonesia had installed 30 ADS-B Ground Stations with Dual System at Sorong, Biak, Timika, Merauke, Ambon, Saumlaki, Alor, Kupang, Galela, Manado, Kendari, Tarakan, Palu, Balikpapan, Banjarmasin Malino, Surabaya, Kintamani, Waingapu, Pangkalan Bun, Semarang, Banda Aceh, Medan, Pekanbaru, Matak, Natuna, Pontianak, Palembang, Jakarta, Cilacap, and 1 ADS-B Ground Station with single system for Test Bed purpose.

1.2 There are 10 ADS-B locations which have been met with DO260B standard, located at Natuna, Jakarta, Semarang, Cilacap, Waingapu, Alor, Kendari, Palu, Galela and Ambon. The rest of ADS-B will be upgraded and meet with DO260B in 2018.

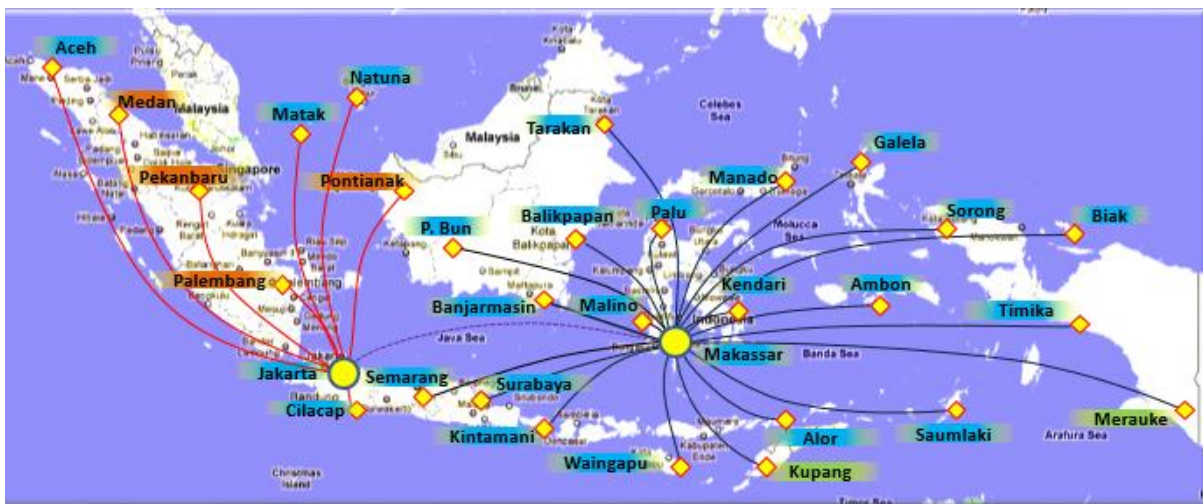


Figure 1. ADS-B Installations and Intergration in Indonesia

1.3 The 21 ADS-B Ground Stations in the Eastern part of Indonesia had been integrated with ATC system in Makassar Automated Air Traffic Control System (MAATS) in Makassar Center and 9 ADS-B Ground Stations in the Western part of Indonesia had been integrated with Jakarta Automated Air Traffic Control System (JAATS) in Jakarta Centre.

1.4 On 25 May 2017, Directorate of Air Navigation - DGCA Indonesia has published AIRAC AIP Supplement Nr. 18/17 for Automatic Dependent Surveillance Broadcast (ADS-B) Implementation in Indonesia and effective from 20 July 2017

1.5 Since February 2015, DGCA Indonesia has issued circular letter to Indonesian Airlines regarding the minimum standard for ADS-B equipment that has to comply with requirements in/equivalent with DO-260 or DO-260a or DO-260b, and also requesting the airlines to collect the transponder and GNSS receiver model and part number, in order to confirm to the acceptable configuration refer to CASA AC 20-45(1). The overall installed ADS-B ground stations compliant with DO260B standard located at Natuna, Jakarta, Semarang, Cilacap, Palu, Waingapu, Kendari, Alor, Galela and Ambon;

1.6 On 2018, Air Navigation Indonesia has already planned for 7 (seven) ADS-B ground stations (DO260B) located in Papua Region (East part of Indonesia), they are at Jayapura, Senggeh, Borome, Oksibil, Dekai, Wamena and Elelim.

2. DISCUSSION

2.1 AREA OF IMPLEMENTATION

- 2.1.1 The expansion of ADS-B has already implemented in Jakarta FIR and Ujung Pandang FIR from 20 July 2017 at 1900 UTC. It will be applied in Class A, B, C, D, E and G airspace, Class A Airspace from F290 up to F460.
- 2.1.2 Up to 31 December 2017, the carriage of ADS-B equipment for flight from ground/surface up to FL600 is optional;
- 2.1.3 Since 31 December 2017, unless otherwise authorized by DGCA, all aircraft operates within Class A airspace, between F290 to F600 should equipped with ADS-B equipment;
- 2.1.4 Starting from 1 January 2018 the implementation of ADS-B in all airspace :
 - a. from ground up to FL290 exclusive is optional
 - b. from FL290 up to FL600 is mandatory

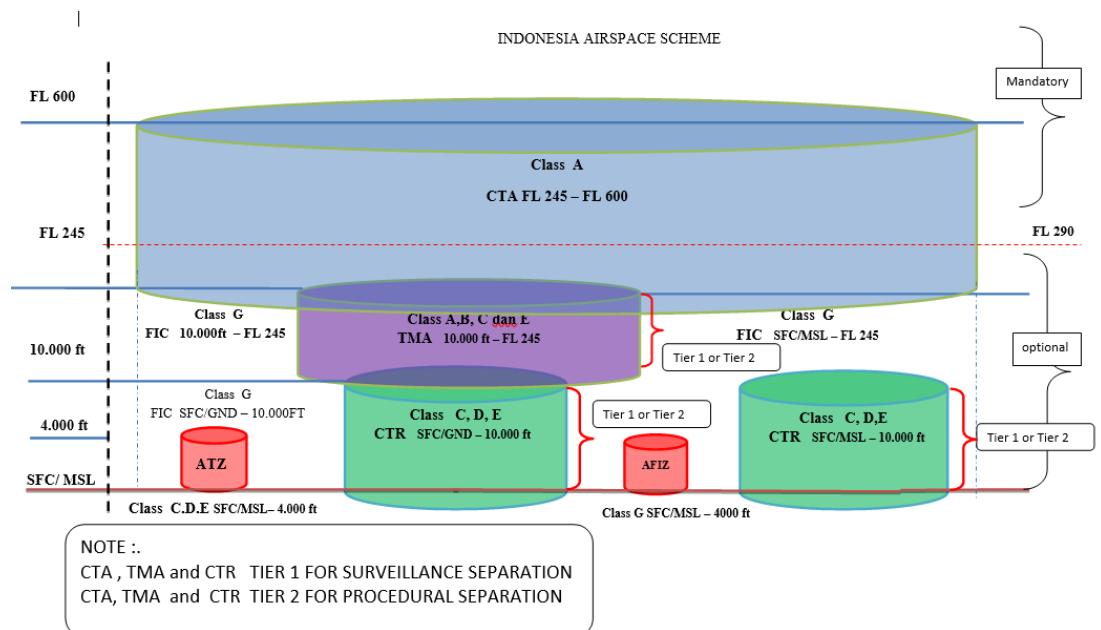
However with ADS-B only surveillance coverage, priority will be given to aircraft which are ADS-B equipped over non-equipped aircraft

- 2.1.5 The type of ADS-B implementation where as follows :
 - 2.1.2.1 ADS-B implementation for ATS surveillance separation (Tier 1) is applied in Class A airspace between FL 245 to FL600;
 - 2.1.2.2 ADS-B implementation for ATS surveillance separation (Tier 1) is applied in particular of Class B, C, D and E airspace, between SFC to FL245;
 - 2.1.2.3 ADS-B implementation for Position reporting for traffic advisory service/flight information service (Tier 3) is applied in Class G airspace and Aerodrome Traffic Zone (ATZ), between SFC to FL245;
- 2.1.6 Air Traffic Service Airspace which implement ADS-B as ATS surveillance separation are as follows :
 - 2.1.3.1 Bali TMA East, TMA West and CTR;
 - 2.1.3.2 Jakarta CTA North, CTA East, TMA East, TMA West, Arrival North and Arrival East;
 - 2.1.3.3 Pontianak TMA and CTR;
 - 2.1.3.4 Pekanbaru TMA and CTR;
 - 2.1.3.5 Surabaya West TMA, East TMA and CTR;
 - 2.1.3.6 Ujung Pandang TMA and CTR;
 - 2.1.3.7 Yogyakarta Military Control Airspace (MCA).
- 2.1.7 Air Traffic Service Airspace which implement ADS-B as Position Reporting for traffic advisory service / flight information service as follows :
 - 2.1.4.1 Bali FSS
 - 2.1.4.2 Jakarta FSS
 - 2.1.4.3 Pontianak FSS
 - 2.1.4.4 Ujung Pandang FSS
- 2.1.8 Aerodrome Traffic Zone (ATZ) which implement ADS-B as Position reporting for traffic advisory / flight information services as follows :
 - 2.1.5.1 Ngurah Rai ATZ
 - 2.1.5.2 Soekarno-Hatta ATZ
 - 2.1.5.3 Supadio ATZ

- 2.1.5.4 Sultan SyarifKasim II ATZ
- 2.1.5.6 Juanda ATZ
- 2.1.5.7 Hasanuddin ATZ
- 2.1.5.8 Adisutjipto ATZ

2.2 SEPARATION PROCEDURE

- 2.2.1 ADS-B Tier 1 has implemented for Surveillance Separation Service
 - a. Minimum surveillance separation standard is 5 NM
 - b. Separation applied :
 - 1) ADS-B target with ADS-B target; using Surveillance Separation;
 - 2) ADS-B target with Radar target; using Surveillance Separation;
 - 3).ADS-B target with ADS-B + Radar target; using Surveillance Separation;
 - 4). ADS-B target with non-surveillance aircraft; using Procedural Separation.
- 2.2.2 ADS-B Tier 2 implementation for Traffic Situational Awareness;
 - a. Procedural Separation (non-surveillance separation) is applied;
 - b. ADS-B air situation display will be used for air traffic flow planning purposes.
- 2.2.3 ADS-B Tier 3 implementation for Traffic Advisory Service (Flight Information Services);
 - a. Procedural separation (non-surveillance separation) is applied;
 - b. ADS-B air situation display will be used for providing air traffic information between aircraft.
- 2.2.4 If the controller does not able to confirm an aircraft is ADS-B coupled, before leaving radar coverage into ADS-B only coverage, procedural separation shall be established before the aircraft leaves radar coverage.
- 2.2.5 ADS-B tracks shall not be displayed or used for separation if the ADS-B quality measures (e.g. accuracy, integrity, figure of merit) are below thresholds defined by DGCA.



2.3 CONTINGENCY

- 2.3.1. ATC shall terminate the Surveillance separation and immediately provide the Procedural Separation for aircraft if the radar and ADS-B contact is lost from an ATC air situation display.
- 2.3.2. The pilot-in-command, upon awareness of an onboard ADS-B equipment failure, must inform ATC as soon as possible. ATC would then provide the necessary clearance to ensure separation with other flights operating in the delineated airspace.

2.4 EMERGENCY PROCEDURES

Whenever a general ADS-B emergency alert is observed on the situation display and there is no other indication of the particular nature of the emergency, the controller shall take the following action :

- 2.4.1. Attempt to establish communication with the aircraft to verify the nature of the emergency; or
- 2.4.2. If no response is received from the aircraft, the controller shall attempt to ascertain if the aircraft is able to receive transmissions from the air traffic control unit by requesting it to execute a specified maneuver which can be observed on the situation display.

Note 1 - Some aircraft equipped with first generation ADS-B avionics have the capability to transmit a general emergency alert only, regardless of the code selected by the pilot.

Note 2 - Some aircraft equipped with first generation ADS-B avionics do not have the capability of squawking IDENT while the emergency and/or urgency mode is selected.

2.5 FLIGHT PLANNING

- 2.5.1. Aircraft operators complying with the requirements stipulated in paragraphs 2 are to indicate the appropriate ADS-B designator in Item 10 of the ICAO flight plan :
 - 2.5.1.1 E - Transponder - Mode S, including aircraft identification, pressure-altitude and extended squitter (ADS-B) capability OR
 - 2.5.1.2. L- Transponder - Mode S, including aircraft identification, pressure-altitude, extended squitter (ADS-B) and enhanced surveillance capability.

Together with :

- B1 ADS-B with dedicated 1090 MHz ADS-B "out" capability OR
- B2 ADS-B with dedicated 1090 MHz "out" and "in" capability

- 2.5.2. 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 follows : either
 - 2.5.2.1 The three-letter ICAO designator of the aircraft operator followed by the flight number (e.g GIA234, QFA234, SIA234), when radiotelephony callsign consists of the associated ICAO telephony designator for the aircraft operator followed by the flight number (e.g. INDONESIA234, QANTAS234 SINGAPORE234); or

2.5.2.2. The aircraft registration (e.g. PKABC, VHABC, 9V234) when the radiotelephony callsign consists of the aircraft registration.

2.6 AIRCRAFT EQUIPAGE FOR ADS-B OUT

2.6.1 Any aircraft carries ADS-B transmitting within Jakarta FIR and Ujung Pandang FIR must comply with requirements in/equivalent with DO-260 or DO-260a or DO-260b,

2.7 ADS-B DATA SHARING UPDATE

ADS-B data sharing or ADS-B data collaboration is one of the main function of the ADS-B Implementation. The implementation of ADS-B mutual data sharing with neighboring countries will improve safety, capacity, efficiency for national and international flight services, because ATC officers in adjacent countries could see the position of aircraft that will enter their FIR, making it easier for ATC to control the area of their FIR boundary.

Australia, Singapore and Indonesia are one of the leading countries in the world for the implementation of ADS-B data sharing. So far Indonesia has been implementing the ICAO recommendations to conduct ADS-B data sharing with neighboring countries.

ADS-B Agreement	
DGCA Indonesia - Air Services Australia	DGCA Indonesia - CAA Singapore
1. 20 September 2010 first signing of LOA	1. 22 December 2010 first signing of LOA
2. 18 June 2014 Amendment Agreement No.1	2. 27 May 2013 Amendment Agreement No.1
	3. 16 April 2014 Amendment Agreement No.2

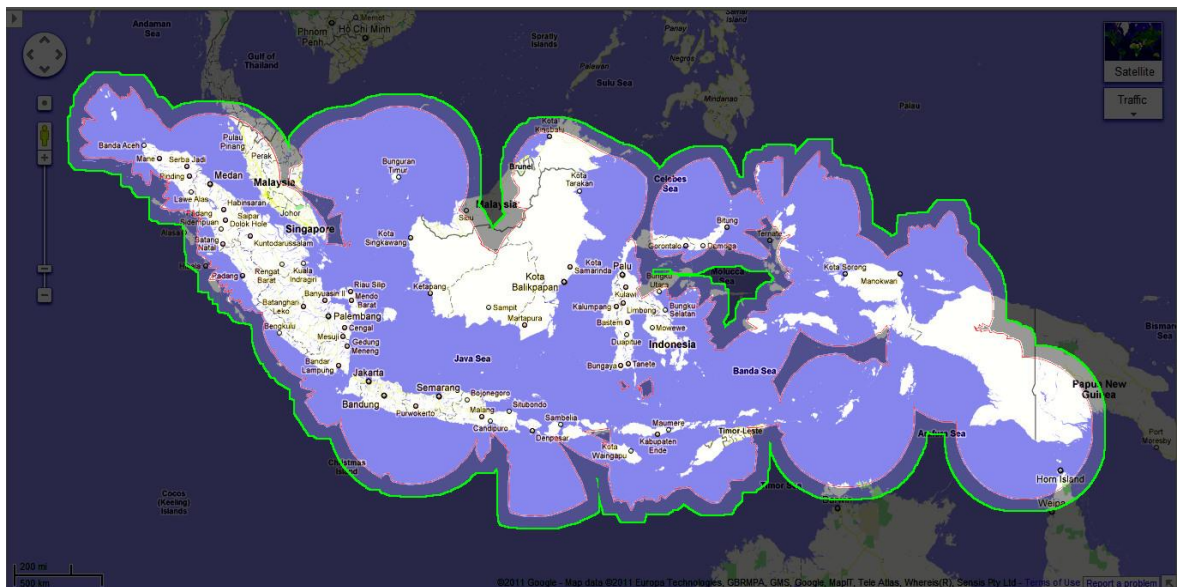


Figure 1. ADS-B Coverage on FL250 & FL380 in Indonesia

3. ACTION BY THE CONFERENCE

- 3.1 The meeting is invited to:
 - a) Note the information contained in this paper; and
 - b) Discuss any relevant matters as appropriate

— END —