



International Civil Aviation Organization

**AUTOMATIC DEPENDENT SURVEILLANCE –
BROADCAST SEMINAR AND TWELFTH MEETING
OF AUTOMATIC DEPENDENT SURVEILLANCE –
BROADCAST (ADS-B) STUDY AND
IMPLEMENTATION TASK FORCE (ADS-B SITF/12)**



Kolkata, India, 15-18 April 2013

**Agenda Item 2: Review the outcome of the APANPIRG/23 On ADS-B SITF/11 and
SEA/BOB ADS-B WG/8 Meetings**

OUTCOME OF APANPIRG/23 ON ADS-B

(Presented by Secretariat)

SUMMARY

This paper reviews the outcome of APANPIRG/23 on ADS-B and works accomplished by the Eleventh Meeting of ADS-B Study and Implementation Task Force and the Sixteenth CNS/MET Sub-group meeting.

1. INTRODUCTION

1.1 APANPIRG/23 meeting held in September 2012 in Bangkok reviewed the outcome of the Eleventh Meeting of the Automatic Dependent Surveillance – Broadcast (ADS-B) Study and Implementation Task Force (ADS-B SITF/11) and an ADS-B Seminar held from 24 to 27 April 2012 in Jeju, Republic of Korea including the work accomplished by the Seventh meeting of the SEA and BOB ADS-B Working Group. The outcome of APANPIRG/23 on matters relating to ADS-B is provided at **Attachment** to this paper for review.

1.2 The reports of Eleventh Meeting of ADS-B SITF and Seventh Meeting of the working groups were also reviewed by CNS/MET SG/16 meeting held in Bangkok, Thailand in July 2012 and noted by ATM/AIS/SAR SG/22 meeting held in June 2012.

2. DISCUSSION

2.1 APANPIRG/23 meeting noted the updates of implementation status by States and developments and some issues observed during implementation of ADS-B in the Region. The actions taken by APANPIRG/23 meeting on ADS-B related matters are highlighted below:

- Conclusion 23/16 – recognizing the importance of data collection for safety monitoring purposes, States be urged to provide available ADS-B data for height-keeping monitoring to RMAs when requested.
(State Letter –SL T3/10.1.1 AP137/12 ATM dated Oct. 12)
- Decision 23/30 – adopted the revised TOR and updated Subject/Tasks List of ADS-B SITF;
(The proposed TOR and updated Subject/Task List contained in Appendices F and G was adopted)
- Conclusion 23/31 – adopted guidance materials on ADS-B:
 - a) Guidance Material on generation, processing and sharing of ASTERIX Category 21 ADS-B Messages provided in **Appendix H** to the Report on agenda item 3.4;
 - b) Guidance Material on advice to military authorities regarding sharing of ADS-B data provided in **Appendix I** to the Report on agenda item 3.4.
(SL T8/10.21:AP184/12 CNS dated Dec. 2012)
- Conclusion 23/32 – Amendment to ADS-B Implementation Guidance Document (AIGD) to include a sample template on harmonization framework of ADS-B implementation as provided in Appendix J to the Report on Agenda Item 3.4;
(SL T8/10.21:AP184/12 CNS dated Dec. 2012)
- Conclusion 23/33 – Database of Blacklist Airframe broadcasting misleading ADS-B Data – a) Australia was requested to establish and maintain a database of Blacklist for sharing with other Administrations and b) Administrations are encouraged to provide the identified occurrences to Australia for entry into the database;
(Follow-up letter from ICAO Regional Office sent to Australia T8/10.21: AP-CNS0159/12 dated Feb. 13 which was not supported by Australia)
- Conclusion 23/34 - Urged States to provide ADS-B data for sharing to support ATC operations and safety monitoring.
(Follow-up letter distributed in early April 2013)
- Conclusion 23/35 – Adopted a revised surveillance Strategy
(SL T8/2.11:AP169/12 CNS dated November 2012)
- Hong Kong China proposed a holistic approach in collecting and managing ADS-B information shared with States (for CNS and RASMAG SGs). APANPIRG adopted a Conclusion on sharing ADS-B data to support ATC operations and safety monitoring (Conclusion 23/34 refers)

2.2 APANPIRG/23 meeting appreciated the efforts and progress made by the ADS-B SITF and the SEA and BOB ADS-B WG and thanked Airports Authority of India and Republic of Korea for hosting the Seventh Meeting of the South East Asia and Bay of Bengal Sub-Regional ADS-B implementation Working Group and Eleventh Meeting of the ADS-B Study and Implementation Task Force.

3. ACTION BY THE MEETING

3.1 The meeting is invited to review the outcome of the APANPIRG/23 and take any necessary follow-up actions.

Extracted from Report of APANPIRG/23

Surveillance

Outcome of ADS-B SITF/11 Meeting

3.4.86 The Eleventh Meeting of Automatic Dependent Surveillance – Broadcast (ADS-B) Study and Implementation Task Force (ADS-B SITF/11) and an ADS-B Seminar, hosted by the Korean Office of Aviation, Ministry of Land, Transportation and Maritime Affairs (MLTM) and the Incheon International Airport Corporation (IIAC) were held from 24 to 27 April 2012 in Jeju, Republic of Korea.

Review of Terms of Reference and Subject/Tasks List

3.4.87 The meeting reviewed the revised TOR of ADS-B SITF as recommended by the Task Force and endorsed by the CNS/MET SG. Considering that ADS-B IN is part of ASBU modules to be considered for adoption by AN Conf/12, the meeting agreed that ADS-B IN implementation should be added included in the work programme of the Task Force. The meeting noted the updated Subject/Tasks List for ADS-B SITF and adopted following Decision:

Decision 23/30 - Revised Terms of Reference and Subject/Tasks List of ADS-B Study and Implementation Task Force

That, the revised Terms of Reference and updated Subject/Tasks List of ADS-B Study and Implementation Task Force provided in **Appendices F** and **Appendix G** to the Report on agenda item 3.4 be adopted.

Guidance Materials on ASTERIX Category 21 and ADS-B Data Sharing

3.4.88 The ADS-B SITF meeting reviewed the Draft Guidance Material on generation, processing and sharing of ASTERIX Category 21 Messages. The guidance material analyzed various aspects of generation, processing and sharing of ASTERIX Category 21 ADS-B messages. It introduced concept of grouping ASTERIX data fields (i.e. mandatory, desirable and optional ADS-B data fields) for the sharing of ADS-B data in ASTERIX Category 21 format to ensure system interoperability and harmonized ADS-B implementation in the Asia/Pacific Region.

3.4.89 The meeting also reviewed the draft “*Guidance material addressing military concerns regarding sharing of ADS-B data*” proposed by the Task Force. The meeting expressed appreciation for the development of a Guidance Material which would be very useful for the APSAPG for providing guidance on civil-military cooperation aspects. Accordingly, the meeting adopted following Conclusion.

**Conclusion 23/31 - Guidance Materials on ASTERIX Category 21 Messages
& Advice to Military Authorities regarding Sharing of
ADS-B Data**

That, the following ADS-B implementation guidance materials be adopted:

- a) generation, processing and sharing of ASTERIX Category 21 ADS-B Messages provided in **Appendix H** to the Report on agenda item 3.4; and
- b) advice to military authorities regarding sharing of ADS-B data provided in **Appendix I** to the Report on agenda item 3.4.

3.8.90 While concurring with the above Conclusion, USA informed the meeting that ASTERIX Category 33 is used in the United States.

Sample template on harmonization framework for ADS-B implementation

3.4.91 The meeting noted the proposed sample template on harmonization framework for inclusion into ADS-B implementation in the AIGD based on experience gained in the South China Sea ADS-B implementation project. Accordingly, the meeting adopted following Conclusion formulated by the Task Force:

**Conclusion 23/32 – Amendment to ADS-B Implementation Guidance
Document (AIGD)**

That, the AIGD be amended to include a sample template on harmonization framework for ADS-B implementation as provided in **Appendix J** to the Report on agenda item 3.4.

**Collaboration in ADS-B Implementation over the South China Sea and Bay
of Bengal (WP/23)**

3.4.92 CANSO highlighted several ADS-B initiatives over the South China Sea and the Bay of Bengal where it had been working closely with ICAO, IATA and several ANSPs to promote the implementation of ADS-B in the region. These initiatives were in support of APANPIRG Conclusions 22/34 and 22/35 and Action Item 4/48 of the 48th DGCA Conference.

3.4.93 It was reported that, at a meeting hosted by CANSO in July 2012, India and Myanmar agreed in principle to share ADS-B data involving ADS-B stations at Port Blair and Agartala in India and Sittwe and Coco Island in Myanmar. In a separate meeting, the Philippines also agreed in-principle to the installation of an ADS-B station in Quezon Palawan and the sharing of ADS-B data with Singapore to extend ADS-B coverage in the eastern part of the South China Sea.

3.4.94 CANSO stated that the objective of both these initiatives was to plug radar surveillance gaps on some of the major traffic flows from SE to NE Asia and from Australasia to Europe. The States involved plan to issue a NOTAM/AIC for ADS-B mandate in 2013 to be effective in 2015. CANSO commended the States concerned for working together and noted that the success of such cross border collaboration with a strong focus on deliverables could be replicated in other high traffic density areas where there is a lack of surveillance. States were urged to move beyond plans to actual implementation and to start harmonising their plans with their neighbours.

Black List /White List filtering

3.4.95 The meeting noted that currently Australia uses a “white list” filtering system where only “approved” aircraft have their ADS-B data forwarded to ATC. Airservices Australia is working on a safety case, to abandon the use of the aircraft by aircraft “white list” filtering system and present all aircraft ADS-B transmissions other than known (blacklist) faulty transmissions. In view of the foregoing, the meeting considered it necessary to establish a database for the region to maintain a list of identified ADS-B airframe problems. Australia was requested to establish and maintain such database and States were requested to provide required information for entry in the Database for sharing. Accordingly, the meeting adopted following Conclusion:

Conclusion 23/33 – Database of Blacklist Airframe broadcasting misleading ADS-B Data

That,

- a) Australia be requested to establish and maintain a Database of Blacklist airframe broadcasting misleading ADS-B data for sharing with other Administrations in the Asia/Pacific Region; and
- b) States implementing ADS-B based surveillance service be encouraged to provide the identified occurrences of airframe broadcasting misleading data to Australia for entry into the ADS-B Blacklist Database.

3.4.96 IATA was very supportive of the approach being taken by Australia on discontinuing white list approval process.

3.4.97 USA informed the meeting that it does not intend to expand or continue the use of eligibility or blacklists for its implementation of ADS-B services. The U.S. is moving away from approved aircraft lists and will instead rely on the performance from the aircraft to the appropriate version/standard to use those aircraft for separation services with ADS-B and investigate those who are not operating properly. US believes that maintaining an eligibility list on a regional basis brings with it inherent problems. Maintaining a list for the entire region could become burdensome making it difficult to maintain its currency.

ADS-B derived data for RVSM height monitoring

3.4.98 The meeting noted the deliberations on the use of ADS-B derived data as a cost effective solution to enable long-term height monitoring capability. States were encouraged to consider utilizing ADS-B for this function as they implement ADS-B in the Region.

3.4.99 The meeting noted that the last Regional Airspace Safety Monitoring Advisory Group meeting (RASMAG/16, Bangkok, 20-24 February 2012) had endorsed this process and it was expected that the next RASMAG meeting (RASMAG/17, 28-31 August 2012) will be updated on RMA progress on the usage of ADS-B data for height monitoring. The meeting was also informed that RASMAG/17 is expected to discuss updated *Asia/Pacific Regional Impact Statement for RVSM monitoring* to incorporate reference to ADS-B as a preferred solution, given the cost advantages of using ADS-B for airlines.

3.4.100 In this connection, the meeting noted that MAAR Bangkok had agreed to receive and process ADS-B data for RVSM monitoring. However, calculating Altimetry System Error (ASE) using ADS-B data would largely depend on the availability of the ADS-B data from States and how to retrieve ADS-B data directly from the ADS-B messages by States. It was also required to forward all relevant data to States once the reports of calculation and analysis are completed.

3.4.101 The meeting endorsed the recommendation of the Task Force for RASMAG to develop a requirement and procedure for collection of ADS-B data for height monitoring.

States' activities on trials and implementation of ADS-B and multilateralism

3.4.102 The meeting noted that updates on ADS-B implementation activities and plans were provided by Australia, Cambodia, China, Hong Kong China, Fiji Island, India, Indonesia, Japan, Republic of Korea, Singapore, USA and Viet Nam were included in the Task Force meeting report.

ADS-B data sharing and establishment of a database to support ATC operations and safety monitoring for the APAC Regions (WP/20)

3.4.103 Hong Kong, China presented a paper on sharing of ADS-B data and establishment of a database to support ATC operations and safety monitoring for the APAC Regions. Many States in the APAC Regions are initiating program to include ADS-B as one of the essential building elements for their Air Traffic Management Systems. The paper highlighted that apart from enhanced ATC surveillance, other information contained in the ADS-B reports could be used for effective safety monitoring purpose. The meeting noted Hong Kong, China's plan in making use of ADS-B data to support ATC operations and to develop a system for safety monitoring. States were encouraged to mutually share monitoring results when they are ready to establish their own blacklist for aircraft transmitting erroneous ADS-B data and perform safety monitoring using ADS-B data. The consolidated monitoring results would build a database for use by the APAC States in enhancing ATC surveillance operations over major traffic flow routes and busy airspace, as well as improving overall safety level of the entire APAC Regions. The meeting identified need for the ADS-B SITF to further study the requirement for the establishment of the database.

Australian ADS-B Mandate

3.4.104 Australia reiterated that ADS-B mandate for Australian upper airspace (at and above FL290) will become effective from 13 December 2013 and aircraft without required ADS-B equipment will not be allowed to fly into the specified airspace. The papers presented nine mandates including equipment mandates for GNSS Navigation under the IFR (SATNAV); for fitment of Mode S Transponders (with ADS-B OUT capability) and further mandates for ADS-B

OUT equipment. The reasons for requiring applicable aircraft to be fitted with the modern navigation and surveillance technology were also explained.

3.4.105 Based on the feedback resulting from aviation industry consultation on the amendment proposal undertaken in September 2011, Australia had decided on 8 December 2011 for forward fit of SA Aware in the GNSS avionics. In making this decision, Australia was aware that the safety impact of not having SA Aware had been offset to a large extent by a recently approved lowering of the level of the aircraft transmitted position integrity (Navigation Uncertainty Category) parameter acceptable in the ADS-B ground system for display of ADS-B targets to ATC.

Flight with unserviceable ADS-B equipment

3.4.106 Industry consultation on the proposed additions to the ADS-B rule to allow for flight with unserviceable ADS-B equipment was also undertaken in the same NPRM (No 1103AS) that proposed the change to the date for SA Aware.

3.4.107 The outcome is that the Australian ADS-B rule has been amended to provide for aircraft having unserviceable ADS-B equipment undertaking flight under following conditions to position the aircraft for equipment repairs, as follows:

- a) the equipment was listed in the aircraft operator's Minimum Equipment List as a Permissible Unserviceability (PUS) for the flight; or
- b) flight with unserviceable equipment had been approved by CASA and both of the following applies:
 - i) the flight took place within 3 days of the discovery of the unserviceability; and
 - ii) ATC cleared the flight before it commenced.

Equipment mandate for fitment of TCAS II Version 7.1 avionic (ICAO standard)

3.4.108 An aircraft that is turbine powered and is used in public transport services first placed on the Australian Civil Aircraft Register on/after 1 January 2014 that has a maximum certified take-off weight in excess of 5700 kg or has a certified passenger capacity of more than 19 passengers must be fitted with an approved TCAS II Version 7.1. This mandate is in accordance with the ICAO Annex 10 Volume IV standard for forward fitment in new turbine powered aeroplanes.

3.4.109 While thanking Australia for the proactive action taken by CASA, IATA expressed concerns at CNS/MET SG/16 meeting about the mandate for TSO-C145, TSO-C146 and TSO-C196 by 6 February 2014 and considered that it would be challenging.

ATM Automation Modernization

3.4.110 Hong Kong, China through its paper presented to CNS/MET SG/16 shared experiences in planning and implementation of the ATM modernization project to meet the traffic growth and to support ICAO's ASBU initiative. The project has adopted the design concept of

SEED, i.e. Sustainable, Environmental friendly and Educational to ensure the sustainability of aviation development in the region. The meeting noted the work done by Hong Kong, China and agreed to the need for early harmonization of potential system interoperability issues when deploying AIDC and ATN/AMHS.

Establishment of Safety Database in the ASIA/PAC Region

3.4.111 Hong Kong, China presented the paper and initiated a proposal on sharing of ADS-B data for performance monitoring and establishment of a regional database to support ATC operations and safety monitoring for the ASIA/PAC Region. The database proposed to be developed will contain information on black listed aircraft (based on harmonized determining criteria) and analyzed safety results, which would be of use to States in ADS-B implementation and safety monitoring for major traffic flow (MTF) routes and busy airspaces.

3.4.112 Hong Kong, China considered that there may be benefit for CNS/MET Sub-group to cooperate with RASMAG for early adoption of a holistic approach in collecting and managing ADS-B information shared with States. There is a very important prerequisite for ICAO member States to agree on sharing of ADS-B data for improved safety monitoring purposes. Therefore, the meeting adopted following Conclusion formulated by the CNS/MET SG

Conclusion 23/34 – Sharing of ADS-B data to support ATC operations and safety monitoring

That, States be urged to provide ADS-B data for sharing to support ATC operations and safety monitoring.

3.4.113 The meeting also recommended ICAO Regional Office to notify States by a consolidated State Letter including the Conclusion adopted under agenda 3.3, on provision of ADS-B data for height-keeping monitoring to RMA formulated by RASMAG

3.4.114 Hong Kong, China also recommended coordinating with RASMAG for establishing an arrangement for up keeping and managing a regional database containing operational data and safety analysis results.

Surveillance and Broadcast Services (SBS) Programme in USA

3.4.115 USA provided updates on the recent FAA's activities in the implementation of ADS-B. Surveillance and Broadcast Services (SBS) programme, including air traffic separation service; ADS-R which is a pilot advisory service that receives data from aircraft on one link and immediately rebroadcasts it on the other link; the up-linking of Traffic Information Services - Broadcast (TIS-B) and Flight Information Services – Broadcast (FIS-B) to the equipped aircraft. The following two radio links are supported:

- 978 MHz Universal Access Transceiver (UAT) link per FAA TSO-C154c; and
- 1090 MHz Extended Squitter (1090ES) link per TSO-C166b.

3.4.116 It was informed that as of 23 March 2012, 418 radio sites (of over 700 planned sites) were constructed and 371 radio sites have been declared operational by the FAA. The latest map of the operational radios can be found at: <http://www.faa.gov/nextgen/flashmap> . Various ADS-B based applications and services were introduced. By 2015, FAA plans to integrate ADS-B surveillance data in the Advanced Technologies and Oceanic Procedures (ATOP) automation platform to support ATC separation services in oceanic airspace for which the U.S. is responsible.

SIC assignments in India

3.4.117 India informed the meeting about the addressing scheme of Surveillance Exchange for India controlled Surveillance Infrastructure. The information provided by India on the assigned system identification code (SIC) will be reflected in the next consolidated amendment to the regional supplement document. States were encouraged to provide such information to the ICAO Regional Office for updates.

Low Altitude VFR Surveillance System

3.4.118 The Republic of Korea introduced their plans and activities concerning the Korean government's low altitude VFR aircraft surveillance system - en-route radar substitute system. The meeting was informed about the steady increase of VFR flights in the ROK including light and ultra-light aircraft for various purposes that fly low altitude. Approximately 236 aircrafts are expected to register and operate by September 2012. In order to achieve a secure operation of the VFR aircraft, Korea established mid-and long-term plans to remove blind zones for VHF Radio communications in the low altitude sections and to build up a proper surveillance system.

3.4.119 IATA expressed concerns about infrastructure and avionics cost involved for providing such service to GA type aircraft and the impact on the performance of air traffic controllers.

Review of Regional Surveillance Strategy

3.4.120 The meeting reviewed the regional Surveillance Strategy for Asia/Pacific Region which was last updated by the ADS-B SITF/9, CNS/MET SG/14 and adopted by APANPIRG/21 in 2010 through Conclusion 21/41. The meeting endorsed a recommendation from USA for removal of “ACAS acts as situational awareness tool and last resort for safety conflict resolution” from consideration part and a recommendation from China for adding “SMR” into the items for consideration part i.e. “multilateration is a technology that can supplement SSR, ADS-B and SMR”. Accordingly the meeting adopted following Conclusion:

Conclusion 23/35 – Surveillance Strategy for the Asia/Pacific Region

That, the revised surveillance strategy for the Asia/Pacific Region provided in the **Appendix K** to the Report on agenda item 3.4 be adopted.
