



International Civil Aviation Organization

**The Twenty-First Meeting of the APANPIRG ATM/AIS/SAR Sub-Group  
(ATM/AIS/SAR/SG/21)**

Bangkok, Thailand, 27 June – 01 July 2011

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**Agenda Item 6: Provision of ATM/AIS/SAR in the Asia/Pacific Region, including associated  
CNS matters**

**OUTCOME OF THE TENTH MEETING OF  
AUTOMATIC DEPENDENT SURVEILLANCE-BROADCAST  
(ADS-B) STUDY AND IMPLEMENTATION TASK FORCE**

(Presented by the Secretariat)

**SUMMARY**

This paper provides brief information on the work accomplished by the tenth meeting of ADS-B Study and Implementation Task Force Meeting.

This paper relates to –

**Strategic Objectives:**

- A: *Safety – Enhance global civil aviation safety*
- C: *Environmental Protection and Sustainable Development of Air Transport – Foster harmonized and economically viable development of international civil aviation that does not unduly harm the environment*

**Global Plan Initiatives:**

- GPI-1 Flexible use of airspace
- GPI-5 RNAV and RNP (Performance-based navigation)
- GPI-7 Dynamic and flexible ATS route management
- GPI-9 Situational awareness
- GPI-12 Functional integration of ground systems with airborne systems
- GPI-17 Data link applications

**1. INTRODUCTION**

1.1 The Tenth Meeting of Automatic Dependent Surveillance – Broadcast (ADS-B) Study and Implementation Task Force (ADS-B SITF/10) hosted by Civil Aviation Authority of Singapore (CAAS) was held from 26 to 29 April 2011 in Singapore. An information sharing session on ADS-B development and implementation was organized on 26 April in conjunction with the ADS-B SITF/10 meeting. The outcome of deliberations at the information sharing session was taken into consideration at the 10<sup>th</sup> meeting of the Task Force.

1.2 The Meeting was attended by 78 participants from Australia, China, Hong Kong China, Macao China, Fiji Islands, India, Indonesia, Malaysia, Nepal, New Caledonia, Papua New Guinea, the Philippines, Republic of Korea, Singapore, Sri Lanka, Thailand, USA, Viet Nam, CANSO, IATA, SITA and representatives from industrial groups.

1.3 In accordance with Terms of Reference of the ADS-B SITF adopted by APANPIRG/18, the Task Force should report to the APANPIRG, through the CNS/MET Sub-Group and provide a briefing to the ATM/AIS/SAR Sub-Group.

## **2. DISCUSSION**

2.1 The ADS-B SITF/10 meeting formulated 2 draft Decisions and 7 Draft Conclusions for consideration by APANPIRG/22. The meeting considered 10 Information Papers and 21 Working Papers. 12 presentations were made at the ADS-B information sharing session.

2.2 The Information Sharing Session covered a comprehensive list of topics on the ADS-B, as follows:

- Operational use of ADS-B from user's perspective
- Updates from airframe manufacturers – Airbus and Boeing
- ANSPs perspective and benefits of implementation
- Regional implementation status and activities
- Updates from States' programme
- Presentations and Demo from Industry

### **Main Outcome of the Task Force**

2.3 The meeting reviewed the TORs of the Task Force and updated the list of Subject and Tasks of the Task Force. The TORs was considered appropriate and the meeting did not propose any changes to the TORs. (**Draft Decision 10/1**)

### **Guidance Material on building a safety case for ADS-B separation service**

2.4 The meeting reviewed and endorsed a draft guidance material on building a Safety Case for delivery of an ADS-B separation services presented by CASA Australia. The draft material provides guidance on the steps and contents with a brief description of each topic for inclusion in an ADS-B Design and Implementation of Safety Case. The list of topics has been derived from the Safety Case for the ADS-B Upper Airspace Program (UAP) prepared in Australia by the ANSP. The meeting noted that the ICAO Circular 311 had been pulled out of circulation and replaced by Circular 326 which will be ready for publication by September 2011. The meeting reviewed the structure and contents of the draft Guidance Material and proposed for adoption through a draft Conclusion.

### ***Draft Conclusion 10/2 – Development of Guidance Material on Building a Safety Case for Delivery of an ADS-B Separation Service***

*That, the draft Guidance Material on Building a safety case for delivery of an ADS-B separation service provided in Appendix B to the Report be adopted.*

### **Sample agreement for data sharing**

2.5 Indonesia and Singapore shared with the meeting their experiences on the adoption of the sample agreement. The meeting reviewed the description of the changes to the original sample agreement and formulated a draft Conclusion for adoption of revised sample agreement on data sharing.

#### ***Draft Conclusion 10/3 – Adoption of Revised Sample Agreement for data Sharing***

*That, the revised Sample Agreement for Data Sharing contained in Appendix C to the Report be adopted.*

### **Amendments to AIGD**

2.6 The meeting noted that the Amendment No. 1 to the PANS-ATM (Doc 4444) will become applicable on 15 November 2012. The meeting discussed a proposal for a consequential amendment to the ADS-B Implementation Guidance Document (AIGD). The AIGD has a section which specifies a temporary procedure to be used prior applicable date of the amendment to the Flight Plan as described in the Amendment No. 1 to the PANS-ATM. The meeting also agreed to add a guidance material into AIGD which contains 5 recommendations for reliability and availability for ADS-B ground system. In this connection, the meeting formulated DC 10/4 for consideration by APANPIRG.

#### ***Draft Conclusion 10/4 – Amendment to AIGD***

*That, Amendment to the ADS-B Implementation Guidance Document (AIGD) as shown in the Appendix D on consequential amendment to the Flight Plan and Appendix E on the reliability and availability for ADS-B ground system to this Report be adopted for inclusion in the AIGD.*

### **Radio Frequencies for Provision of VHF Voice Communications**

2.7 The meeting recalled that APANPIRG/19 urged States to support provision of VHF radio voice communication associated with ADS-B data sharing between adjacent States. In order to enable radar like separation, ADS-B based surveillance service must be complemented by the Direct Controller Pilot Communication (DCPC) such as VHF radio voice communication. Without supporting communication infrastructure, the ADS-B based surveillance will provide minimal operational benefits to the air space users. Viet Nam made a proposal that APANPIRG should further support the decision for States to provide VHF voice communications facilities for other States by developing a Conclusion. This would help in the domestic approval process for VHF radio frequency assignment. Australia and IATA supported Viet Nam's suggestion. The meeting reviewed and endorsed the following draft Conclusion.

#### ***Draft Conclusion 10/5 – Coordinate for VHF for sharing Voice Communication Capability***

*That,*

- a) States be urged to support provision of VHF radio voice air/ground communication infrastructure to adjacent States; and*
- b) The States sharing ADS-B data and supporting provision of VHF Voice air-ground communication infrastructure to adjacent States should co-ordinate with ICAO regional Office and their national Telecommunication Authority (Radio Frequency regulator) for assignment of VHF radio frequencies to be used by the adjacent States.*

### **Requirement for SA Aware**

2.8 The meeting discussed a proposal from IATA that the Australian ADS-B rule should be amended to extend the date of compliance by 2 years. Noting reasons stated and the date of 12 December 2013 becoming a generally accepted date among APAC Region States for the commencement of ADS-B mandates, the meeting considered that it would be a reasonable compromise to extend the date for SA aware forward fit compliance to the mandate date, rather than the 28 June 2012 date. It would provide for a reasonable compromise between the requirements of ATC service providers and airlines. In view of the foregoing, the meeting formulated following draft Conclusion for adoption by APANPIRG as recommendation for consideration by Australia.

#### ***Draft Conclusion 10/6 - Forward fit requirement for SA aware GNSS Equipment***

*That, based on information from IATA, the existing forward fit requirement in the Australian CAO 20.18 for SA Aware to be incorporated in GNSS receivers providing position source data for ADS-B be extended from 28 June 2012 to 12 December 2013.*

### **Support for DO260B**

2.9 The meeting noted that the difference between DO260/DO260A and DO260B may perhaps allow additional useful functionality to be deployed in the ATC automation system. Singapore and Hong Kong China were requested to prepare a paper for the next meeting, comparing the changes brought by DO260B and identifying any potential impacts on ATC systems.

2.9.1 The meeting recognized that aircraft equipped with ADS-B Out avionics compliant with DO260B are likely to enter Asia Pacific airspace in 2012-2015 timeframe. The meeting noted that at least one manufacturer (ACSS) has DO260B certified transponders available. There will be a need for States providing ADS-B based surveillance service to include the service to aircraft with DO260B compliant avionics. Therefore the meeting formulated a draft Conclusion as follows:

#### ***Draft Conclusion 10/7 – Support DO260B Compliant Avionics***

*That, States providing ADS-B based surveillance services be urged to upgrade their ADS-B ground stations in time (2012-2015) to receive DO260B standard transmissions in addition to those aircraft transmitting ADS-B data compliant with DO260 and DO260A.*

### **Review of the TOR and Name of the SEA ADS-B Implementation Working Group**

2.10 The meeting reviewed the outcome of the sixth meeting of the South East Asia ADS-B Implementation Working Group held from 24 to 25 February 2011 in Singapore. The meeting was attended by 54 Participants from Australia, China, Hong Kong China, Indonesia, Malaysia, Myanmar, the Philippines, Singapore, Thailand, and Viet Nam, IATA and one representative from industry.

2.10.1 The meeting noted that China and Hong Kong China agreed to join the working group as members. The meeting noted that the sixth meeting of the Working Group had adopted a revised Terms of Reference of the working group.

### **Bay of Bengal/South Asia Sub-regional Project**

2.10.2 The meeting reviewed and discussed an initial proposal for deployment of ADS-B ground stations in the Bay of Bengal. The meeting noted that India plays a key role in the sub-region. In particular, installation of ADS-B stations at Port Blair and Car Nicobar. The meeting noted that India is developing ADS-B implementation plan in India and taking up issues concerning the implementation of ADS-B at Port Blair. Regarding proposed ADS-B location at Car Nicobar, it was informed that more complicated coordination process with military authority would be required. Sri Lanka informed the meeting the potential location of ADS-B ground station would be at Pidurzitalagala in the central part of Sri Lanka. CANSO stated that the proposed locations in Myanmar were provided by DCA Myanmar during the recent Seminar.

2.10.3 With respect to work programme of the SEA ADS-B working group to cover the area of Bay of Bengal area, IATA noted that although the current name of this working group is for South East Asia, the TOR should be inclusive rather than exclusive. Expertise from this working group should be shared. Australia suggested changing the name of the working group to encourage non-SEA States to participate. Singapore suggested that States adjacent to FIRs of SEA states should be included as members. The meeting further discussed the proposal for changing the name of the working group. Considering the need to invite States in the Bay of Bengal area to participate in the working group meeting on a regular basis, the meeting agreed to propose changing the working group name into South East Asia and Bay of Bengal ADS-B Implementation Working Group (SEA/BOB ADS-B WG) and developed following draft Decision.

#### ***Draft Decision 10/8 – Name and Terms of Cooperation of ADS-B Implementation WG***

*That, Recognizing the need to expedite ADS-B implementation and surveillance data sharing in the Bay of Bengal area, the South-East Asia Sub-regional ADS-B Implementation Working Group be renamed as “South-East Asia and Bay of Bengal Sub-regional ADS-B Implementation Working Group”. A revised Terms of Cooperation and work programme be developed by the working group.*

### **Update on the ADS-B Collaboration Project in the South China Sea Area**

2.11 Indonesia, Singapore and Viet Nam updated the meeting on the implementation of ADS-B in the South China Sea area. The project involves collaboration between Indonesia and Singapore as well as collaboration between Singapore and Viet Nam.

2.11.1 Prior to implementation of exclusive ADS-B within Singapore FIR, two operational trial phases will be carried out. This phased approach will allow air traffic controllers, pilots and stakeholders to be familiar with the operations.

2.11.2 In Phase I of the ADS-B operational trials, ADS-B based separation will be applied between suitably equipped aircraft on ATS routes L642 and M771. ADS-B based separation will be applied on an opportunity basis. It is foreseeable that longitudinal separation could be reduced in situations where two or more ADS-B equipped aircraft are flying in succession. The target commencement of Phase I Operation Trial is the second half of 2011.

2.11.3 In Phase II of the ADS-B operational trials, ADS-B based separation will be applied to the other routes within the parts of the Singapore FIR. In addition to ATS routes L642 and M771, ADS-B based separation would also be applied to suitably equipped aircraft on ATS routes N891, M753 and L644. In this phase of the operational trials, priority would be accorded to suitably equipped aircraft. This would mean that ADS-B equipped aircraft would be given priority for their preferred optimal flight level over non-ADS-B equipped requesting for the same flight level. This will ensure that the capacity could be maximized by pooling two or more ADS-B equipped aircraft at their

preferred optimal cruising flight level. The target commencement for Phase II Operational Trial is 2nd half of 2012.

2.11.4 The implementation of airspace that provides priority to aircraft operating ADS-B airspace is targeted for 12 December 2013 within Singapore FIR, and possibly other South China Sea FIRs. Aircraft intending to operate at or above FL 290 within this defined ADS-B airspace would need to be ADS-B equipped and certified accordingly. The aircraft operator must have the relevant operational approval from the State of Registry. Aircraft that did not have the relevant ADS-B operational approval from the State of Registry would be assigned a flight level below FL 290 should they wish to operate within the lateral limits of the defined airspace.

2.11.5 The meeting was also informed that Singapore is now working towards conducting the necessary safety assessment before commencing the operational trials within the Singapore FIR. In the future, the collaboration project may be expanded to include the major routes ATS routes N892, L625, N884 and M767.

2.11.6 Viet Nam informed the meeting that within Ho Chi Minh FIR, the section of the two ATS routes L642 & M771 was under double radar coverage. One new primary radar & SSR Mode S was going to be installed next to Tan Son Nhat – Ho Chi Minh, so Viet Nam uses radar for separation of aircraft on these ATS routes. Singapore can use ADS-B data from Con Son ADS-B ground station. There was a need to discuss and agree to a harmonized air traffic control procedure for the airspace in the South China Sea under enhanced surveillance coverage.

2.11.7 IATA applauded the efforts by the States that collaborated during this project to enhance the operating efficiency of busy ATS routes in the South China Sea. IATA urged other States to explore the areas in which ADS-B implementation would lead to significant benefits for airlines.

#### **Seamless Surveillance Coverage on L642 and M771**

2.11.8 Hong Kong noted that Indonesia, Singapore and Viet Nam are collaborating in the South China Sea Project to benefit traffic along routes L642 and M771. These routes pass through four FIRs, namely Singapore, Ho Chi Minh, Sanya and Hong Kong with distance over 1300NM.

2.11.9 As L642 and M771 will involve multiple ANSPs including Singapore, Vietnam, China and Hong Kong - China, there is an obvious need to harmonize both equipage requirements and timeline for ADS-B mandate among the concerned ANSPs. Hong Kong China recommended that the concerned CAA/ANSPs should review the adequacy of enhanced surveillance coverage to achieve seamless surveillance coverage and provide enhanced surveillance in supporting operations over the two parallel routes.

2.11.10 An ad hoc working group consisting of Singapore, Viet Nam, China and Hong Kong China at SEA ADS-B WG/6 Meeting worked out the harmonized requirements and timeline for implementation. The meeting further progressed the harmonized equipage requirements and timelines developed by the working group.

#### **Proposal for harmonization of air traffic control procedure**

2.11.11 Singapore provided an information paper on a proposal for harmonization of air traffic control procedures for ADS-B operations in the South China Sea area to be discussed at the SEACG meeting to be held in Bangkok from 3 to 6 May 2011. The paper proposes to discuss the harmonization of longitudinal spacing for pairs of ADS-B equipped flights during the operational trial and implementation on ATS routes L642 and M771 in order to reap the full benefits that come with the deployment of ADS-B based surveillance.

2.11.11 Current air traffic management initiatives utilizing Performance Based Navigation (PBN) specifications allows reduction of longitudinal separation minima from the conventional 10 minutes or 80 NM to 50 NM based on RNP10 PBN specification and 30NM based on RNP4 PBN specification. As such, Singapore proposes that the appropriate reduction of longitudinal spacing to quantify the benefit of implementing of ADS-B based surveillance service.

2.11.12 The reduction of the longitudinal spacing would enable more ADS-B equipped flights to operate at their optimum flight level. This will also help reduce the ground delays at the respective airports, reduce operating costs and carbon emissions. Singapore is now working towards conducting the necessary safety assessment before commencing the operational trials within the Singapore FIR.

2.11.13 Hong Kong, China proposed that this should be discussed at the South East Asia ATS Coordination Group meeting and an appropriate timeline be agreed to take into account the safety case that needs to be carried out. The same WP from Singapore then was presented to the Eighteenth Meeting of South-East Asia ATM Coordination Group (SEACG/18, 4 to 6 May 2011, Bangkok).

2.11.14 Noting progress of ADS-B Implementation made by States in the South China Sea area, the meeting encouraged States concerned to expedite implementation of the project and developed the following Draft Conclusion:

***Draft Conclusion 10/9 – Expedite ADS-B implementation project in South China Sea area***

*That, States concerned with ADS-B implementation in the South China Sea area be urged to expedite required actions and coordination to achieve the implementation.*

**Australia-Indonesia Data Sharing Project**

2.12 Australia and Indonesia provided an update on their data sharing project between the Brisbane and Ujung Pandang FIRs. Under Phase 1A, Australia provides data from Gove and Thursday Island while Indonesia provides data from Merauke and Saumlaki. The plan was later revised to include sharing additional sites from each state at Broome, Doongan, Kintamani and Kupang. A satellite datalink was established to exchange the ADS-B data using multicast and using ASTERIX Category 21 Version 0.23. A Deed of Agreement to support ADS-B data sharing was signed on 20 September 2011. Full operation was achieved on 1 February 2011, with ADS-B data from foreign FIRs on screen in both Brisbane and Makassar ATC Centres.

**ADS-B Seminar in Myanmar and the Philippines**

2.13 CANSO informed the meeting that ADS-B seminar concluded recently for DCA Myanmar in Yangon on 22 February 2011 as well as a similar seminar conducted for the CAA of the Philippines in Manila in August last year. Both seminars were conducted by CANSO to provide the latest updates on ADS-B and to reach out to as many participants as possible from the ANSPs of the DCA/CAA as well as their regulators and airlines.

2.13.1 CANSO stressed the need for States to work together to harmonise their individual ADS-B implementation plans so that overall benefits can be optimized for the region as a whole. States concerned were urged to follow up on the proposed expansion of ADS-B coverage over the South China Sea and the Bay of Bengal.

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

2.14 The meeting noted implementation activities and plan updated by following States: New Caledonia, Australia, Singapore, China, Hong Kong China, Fiji, Indonesia, Republic of Korea, Papua New Guinea, Sri Lanka, Myanmar, the Philippines and Viet Nam.

**Time and Venue of Next Meeting**

2.15 The seventh meeting of SEA/BOB ADS-B Implementation Working Group is scheduled in November 2011. The next ADS-B SITF meeting is scheduled for April or May 2012. The meeting appreciated the kind offer made by the Republic of Korea to host the Eleventh ADS-B Study and Implementation Task Force meeting in Republic of Korea.

**3. ACTION BY THE MEETING**

3.1 The meeting is invited to:

- a) note the target implementation date of 12 December 2013 for airspace that provides priority for ADS-B equipped aircraft within certain South China Sea FIRs;
- b) discuss and agree to a regional airspace concept that mandates a priority for aircraft operating ADS-B equipment, so States may implement ADS-B airspace when required; and
- c) note the information provided in the paper.

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