

International Civil Aviation Organization



**AUTOMATIC DEPENDENT SURVEILLANCE –
BROADCAST SEMINAR AND ELEVENTH MEETING
OF AUTOMATIC DEPENDENT SURVEILLANCE –
BROADCAST (ADS-B) STUDY AND
IMPLEMENTATION TASK FORCE (ADS-B SITF/11)**



Agenda Item 2: Review the outcome of the APANPIRG/22 on ADS-B SITF/10 and SEA/BOB ADS-B WG/7 Meetings

**REVIEW REPROT OF THE SEVENTH MEETING OF SOUTH-EAST ASIA
BAY OF BENGAL SUB-REGIONAL ADS-B IMPLEMENTATION WORKING GROUP
(SEA/BOB ADS-B WG/7)**

(Presented by India and the Secretariat)

SUMMARY

This paper presents the progress achieved by the seventh meeting of the South-East Asia and Bay of Bengal Sub-regional ADS-B Implementation Working Group.

Action by ADS-B SITF/11 is at Paragraph 3.

1. INTRODUCTION

1.1 APANPIRG/18 in 2007 agreed to establish a South-East Asia sub-regional ADS-B implementation working group (SEA ADS-B WG) and adopted Conclusion 18/38.

1.2 The following meetings of the WG have been held:

- SEA ADS-B WG/1 15 - 16 November 2007 in Singapore
- SEA ADS-B WG/2 27- 29 February 2008 in Bali, Indonesia
- SEA ADS-B WG/3 2 - 3 July 2008 in Putrajaya, Malaysia
- SEA ADS-B WG/4 9 -10 February 2009 in Melbourne, Australia
- SEA ADS-B WG/5 21-22 January 2010 in Jakarta, Indonesia
- SEA ADS-B WG/6 24-25 February 2011 in Singapore
- SEA/BOB ADS-B WG/7 28-30 November 2011 in Chennai, India

1.3 The Seventh Meeting of the South East Asia and Bay of Bengal Sub-regional ADS-B Implementation Working Group (SEA/BOB ADS-B WG/7), hosted by the Airports Authority of India (AAI) was attended by 44 participants from Australia, Bangladesh, Hong Kong China, India, Malaysia, the Philippines, Republic of Korea, Singapore, Thailand, USA and IATA.

1.4 The whole report is also available on the ICAO APAC website:
http://www.bangkok.icao.int/cns/meeting.do?method=MeetingDetail&meeting_id=92

1.5 Mr. Somasundaram, member of ANS, AAI nominated by the host State acted as the moderator for the meeting. The meeting was also facilitated by Mr. Greg Dunstone ADS-B SITF of APANPIRG. The meeting considered 13 WPs and 7 IPs under 7 agenda items adopted by the meeting.

1.6 The Working Group reports to APANPIRG through ADS-B Study and Implementation Task Force.

2. DISCUSSION

2.1 The meeting reviewed outcome of DGCA Conf/48 and APANPIRG/22 on ADS-B related activities. Hong Kong China noted the sample proposal attached to APANPIRG Conclusion 22/36 for amendment to the Regional Supplementary Procedure Doc7030 in which there is a reference to FAA Rulemaking AC No. 20-165 – Airworthiness Approval of ADS-B. States may need to consider the need to include AC No. 20-165 in their ADS-B mandates. This issue is required to be further discussed at the next ADS-B SITF meeting.

Review Outcome of DGCA Conf/48

2.2 The meeting was informed that the 48th Conference of Directors General of Civil Aviation (DGCA), Asia and Pacific Regions, held in Noumea, New Caledonia in October 2011 had noted progress of collaborative ADS-B activities over the South China Sea area and regional ADS-B implementation plan. Outcome of DGCA Conf/18 is provided in IP03 for reference.

2.3 The Conference noted that many States/Administrations in the APAC Region had taken proactive steps to plan, conduct trials and implement ADS-B technology. However, in a survey conducted by the ICAO for 16 States/Administrations on their plan to implement ADS-B, it was revealed that only 6 of them provided an implementation roadmap with specific timelines. ICAO Member States/Administrations with near term plan to implement ADS-B by 2013 were urged to publish their mandate no later than 2011 in accordance with APANPIRG Conclusion 21/39 to give sufficient prior notice to aircraft operators for early planning and implementation; as well as making reference to the operational framework agreed. States/Administrations were requested to review their strategy on surveillance coverage (for both Radar and ADS-B) and submit their ADS-B Implementation Plan to the ICAO APAC Regional Office before end of 2012.

2.4 The Conference reaffirmed the need for expediting implementation of ADS-B and developed action Item 48/4.

2.5 In order for States and Administrations to take timely follow-up action on the above action plan, the meeting considered it necessary for ICAO Regional Office to issue a State Letter to remind States/Administration to provide their implementation plan. Therefore, Secretariat was requested to make arrangement for such letter. In this connection, ICAO Regional Office issued a general APAC State Letter AP – RD0108/11 in end of November 2011 on the outcome of DGCA Conf/48 Pacific Regions, in which States/Administrations were requested to provide their responses to the ICAO APAC Office preferably by 30 April 2012 for their follow-up actions taken on the action items developed by the Conference. The Regional Office again issued another State letter as reminder T 8/10.17, T 8/10.21:AP050/12 (CNS) dated 4 April 2012 to request Administrations to share their ADS-B implementation plan by 30 April 2012. In the letter, the States and Administrations were also reminded of APANPIRG Conclusion 21/39 adopted in 2010 urging States/Administrations with near term plan to publish equipage mandate no later than 2011 to give sufficient prior notice to aircraft operators for early planning and implementation.

ADS-B OUT Included in the ASBU

2.6 While discussion on Action Item No. 2 of DGCA Conf/48 regarding potential significant impact of the ICAO Aviation System Block Upgrades (ASBU) on national ATM modernisation and regional harmonisation the meeting noted that the regional position for the ASBU may be further discussed at the Asia Pacific Seamless ATM Planning Group of APANPIRG in the end of January 2012. The meeting considered it necessary for the planning group to note that there is no element of ADS-B Out in the existing ASBU Block “0”, therefore the meeting requested the Secretary to forward a recommendation of the ADS-B Working Group for consideration by the Seamless Planning Group.

2.7 In this connection, a paper was prepared and presented to the regional Seamless Planning Group. Coordination was also carried out with ICAO Headquarters by the Secretariat to address the subject. The concerned point has been considered and module B0-84 on ADS-B Out based ground surveillance service being developed by Technical Team on ASBU. Therefore no further action is required to be taken by the Seamless Planning Group.

Terms of Reference of SEA/BOB ADS-B WG

2.8 The SEA ADS-B WG/1 meeting developed Terms of Reference for the working group based on a proposal made by Australia and Singapore. The SEA ADS-B WG/3 meeting reviewed the Terms of Reference of the SEA ADS-B Working Group and agreed to revise the TOR to include Cambodia and CANSO as members of the working group. The revised TOR includes “Coordination for implementation of the plan. In addition to the ADS-B ground stations, the requirement for provision of VHF radio communication service had also been identified and included in the TOR.

2.9 In accordance with APANPIRG’s decision, the seventh WG meeting reviewed the TOR with editorial updates presented by the Secretariat. Considering that the new Major Traffic Flow AR-10 has been identified by the APANPIRG and there is a need to address surveillance enhancement in the area between Maldives and Sri Lanka/India including coordination between ACCs in several FIRs, the meeting agreed to include Maldives as member of the Working Group. In view of the foregoing, the meeting adopted the revised TOR as provided in the Appendix B to the report of the SEA/BOB WG/7 meeting.

Update on Australia’s ADS-B programme

2.10 The meeting reviewed updates on ADS-B related activities and programme from Australia and discussed about the issue of

White List & Black List

- Australia described how they plan to transition from the current “White list” approval process to a new “Black list” process, hopefully in 2012. Australia has a plan to remove the white list approval before end 2013 and rely on operators complying with regulations that became effective in 2007. These regulations require domestic and foreign operators to disable ADS-B transmissions that are not compliant. CASA and foreign regulators are expected to ensure that operators comply. A “black list” of non-compliant operators will be used to remove known incorrect data. This list will be advised to the regulator for corrective action. This approach is also supported by the APANPIRG agreement to publish a regional supplementary procedure in Doc 7030 requiring non complaint transmissions to be disabled.

2.11 This process will assume that all aircraft ADS-B transmissions comply with the regulations. Exceptions will be listed into a black list. The black list will be provided to CASA for regulatory resolution and arrangement is in place to prevent further data from aircraft in the black List reaching ATC system. It is expected that this will “normalise” ADS-B so that it is treated just like ATC transponders. Aircraft operators have responsibility to comply with the regulations and hence the liability will rest with them.

- IATA strongly supported the Black list approach and stated that all states need to proceed to normalise like this.
- Australia indicated that agreement had been reached with FAA, Navcanada, and Europe to exchange ADS-B problem data into a consolidated list of avionics issues.
- Hong Kong China asked if Australia would be willing to share black list airframes with other States. Airservices Australia indicated that it could not reply definitively at this time and suggested that States write to the Australian regulator to request for this information.
- Australia has developed a list of known ADS-B avionics problems that need to be addressed. This list may be considered by other States wishing to operationally use ADS-B. The list is provided in the **Appendix C** to the Report of seventh meeting of the WG.
- noted the commencement of ADS-B based ITP operations for revenue flights by the FAA in the Pacific using United Airlines aircraft – including using DO260 aircraft as “targets”.

Update from India (Need further update by India at ADS-B SITF/11)

2.12 India provided updates on the Indian ADS-B Implementation Plan based on the information provided to APANPIRG/22. India has an ambitious plan to enhance the surveillance through the use of ADS-B on major air routes and in terminal areas. India has planned to implement ADS-B at 14 locations, i.e. Jaipur, Lucknow, Calicut, Agartala Trivandrum, Ahmadabad, Guwahati, Port Blair, Nagpur, Mangalore, Coimbatore, Cochin, Varanasi and Amritsar for the purpose of supplementing the coverage of the existing Radars. ADS-B ground stations at these locations will be with redundant configuration and will be integrated with the ATC Automation system.

2.13 ADS-B ground system at Amritsar, Varanasi, Ahmedabad, Nagpur, Cochin, Mangalore, Trivandrum and Guwahati will provide supplementary surveillance coverage as standby to radar systems. ADS-B ground stations at other airports i.e. Jaipur, Lucknow, will facilitate in filling the surveillance gap due to non-availability of radars at these airports.

2.14 New ATC Automation Systems installed at Nagpur, Ahmadabad, Mangalore, Trivandrum, Guwahati and Varanasi have the capability of processing ADS-B input and presenting on the Air-situation display. New Automation Systems at other locations are under installation.

2.15 ADS-B ground station at Port Blair will provide the surveillance coverage over Bay of Bengal up to the FIR boundary of Chennai / Kuala Lumpur and Kolkata / Yangon. The data to be derived from Port Blair ADS-B station would be fed into ATC Automation Systems at Chennai and Kolkata respectively.

2.16 India has also successfully integrated Radars and ADS-B in Chennai FIR thus enabling seamless upper airspace with lower limit as FL 260. India is also planning to integrate Surveillance sensors at Delhi and Mumbai ATC Centers.

2.17 In next phase by the end of 2014, it is proposed to install more ADS-B Ground stations depending upon the traffic density at the airports as well as to provide redundancy to the existing Radar systems. India is also planning to install ADS-B Ground system at airport where terrain limitations are restricting Radar installation in the North-East & Northern part of India.

2.18 In response to a query, the meeting was informed that the ADS-B ground stations to be purchased in the first phase will be installed by April 2012 (Updates on this is required).

Implementation of ADS-B at Port Blair

2.19 In addition to informing the meeting about its plan to provide complete surveillance over the continental airspace, India provided information on the implementation of ADS-B at Port Blair which will cater to increasing en-route airspace capacity and will better meet the demand for optimum flight levels in the Bay of Bengal area. Analysis of upper air space around Port Blair for a distance of approximately 200 NM indicates that there are close to 200 aircraft over flying around Port Blair in addition to arrivals and departures at Port Blair.

2.20 Implementing ADS-B at Port Blair will enable provision of efficient air traffic services on ATS routes P628, L510, N877, N 571, P761, P762 and L759 and aid the controllers in better conflict detection and separation management over crossing points. The existing separation of 15 minutes over crossing points can be reduced to ATS surveillance separation minima allowing aircraft on crossing tracks to maintain optimum levels. The provision of ADS-B in Port Blair will permit efficient resolution of En route traffic particularly in the critical areas East of Port Blair.

2.21 The meeting noted that India is willing to share ADS-B data with neighboring states to enhance the surveillance capability in the Bay of Bengal area. India is considering to issue mandate of ADS-B in the entire Indian airspace and planning to operationalise ADS-B stations by December 2013 as per Asia/Pacific regional plan. (update on confirmation at ADS-B SITF/11 from India is expected)

2.22 Neighboring States were requested to take necessary action for the sharing of ADS-B data with India and operators were urged to equip their aircraft suitably in a time-bound manner to facilitate implementation of ADS-B in the Region.

2.23 IATA congratulated India for the excellent paper presented and for the plan of ADS-B implementation at Port Blair which will bring benefits for the airspace users. The meeting encouraged India for their initiative in offering data sharing with the relevant FIRs.

Updates from Hong Kong, China

2.24 Hong Kong China informed the meeting that AIC on mandating ADS-B was issued on 24 May 2011 for operation in the defined airspace (FL290 inclusive and above) along two ATS routes L642 and M771 within Hong Kong FIR from 12 December 2013. Mandating ADS-B Out equipage for the whole Hong Kong FIR for flight level at or above FL290 is anticipated on 31 December 2014.

ADS-B Equipage and NUC value analysis by Singapore

2.25 The meeting noted the result of analyses of the NUC values observed by the Singapore ADS-B station and the level of equipage within the Singapore FIR. Data for analyses was collected from 11 July 0630 UTC to 12 July 0645 UTC. The ADS-B station saw a total of 524 targets (i.e. 524 different 24-bit codes). These targets include 502 airborne targets, 20 ground vehicles at Changi Airport and 2 test transponders. Out of the 502 airborne targets, 429 entered Singapore FIR within the said timeframe.

2.26 In terms of movements (i.e. call-signs), the ADS-B station saw a total of 1,282 movements of which 996 entered the Singapore FIR.

2.27 The analysis was split into 2 parts. The first part is the analysis of the data within the coverage of the ADS-B station. The second part is the analysis of the data within Singapore FIR and the coverage of the ADS-B station.

2.28 Within the ADS-B station coverage, it was also observed that out of the 502 airborne targets, 20 targets were equipped with DO260A avionics. Within the Singapore FIR, it was observed that out of the 429 airborne targets, 19 targets were equipped with DO260A avionics. According to the flight plans, the aircraft types of these 19 DO260A targets were one A320, one B757, two B767s and 15 A380s.

2.29 A further analysis was made on the NUC values and equipage in terms of aircraft movement within the ADS-B coverage. It was found that 72% of the aircraft were equipped with ADS-B and 70% are able to provide ADS-B messages with good NUC.

Review of sub-regional implementation plans

- Near-term implementation plan in Bay of Bengal
- Update on Near-term implementation plans in South China Sea
- Identification of potential projects in Eastern part of South China Sea area
- Harmonization of ADS-B regulations, rules and procedures

ADS-B Implementation Developments in SEA and BOB areas

2.30 CANSO provided two working papers which were presented by the Secretariat. The papers summarised developments in ADS-B implementation over the South China Sea and the Bay of Bengal. It recalled that at the DGCA Conf/46, the KANSAI statement was issued expressing determination to realize a Seamless Sky for the Asia and Pacific Region and calling for the planning of the future ATM system by active collaboration and participation of the whole of the Region.

2.31 ADS-B is a building block of this future ATM system and the work of the ICAO ADS-B Study and Implementation Task Force is crucial to the realization of this vision. The paper also highlighted a call to action by the DGCA Conf/48 to expedite ADS-B implementation in the region and requested the meeting to develop concrete plans for ADS-B implementation over the Bay of Bengal and to enhance ADS-B coverage over eastern part of the South China Sea. States were urged to work closely together to harmonise their ADS-B implementation plans to optimise overall benefits.

Potential Operational Benefits arising from Initial Phase of ADS-B over BOB

2.32 In order to stimulate discussions on how best States in the Bay of Bengal area can collaborate to optimise the benefits of ADS-B implementation and set the stage for the development of concrete bilateral and regional action plans, CANSO proposed following three scenarios for cross border sharing of ADS-B data and VHF communications and presented a typical programme milestones for the initial phase of ADS-B implementation identifying the parties involved and the key milestones and target dates.

- a) Airway segment N887 and N571 involving the sharing of ADS-B data from Aceh and Port Blair by Indonesia and India respectively.
- b) Crossing points of Airway P762 on Airways L510, L759, M770, N877 and P628 involving the sharing of ADS-B data from Port Blair and Coco Island by India and Myanmar respectively.

- c) if an ADS-B station can be installed at Kolkata (or if there is existing radar coverage), and coupled with the planned ADS-B stations at Yangon, Coco Island and Sittwe, it could potentially achieve end to end ADS-B coverage for several airways over the northern part of the Bay of Bengal. Through the sharing of ADS-B data and VHF communications, it would be possible to significantly increase airspace capacity and minimize flight delays on airways L607, M770, N895 and P646.

2.33 The meeting appreciated the papers from CANSO which provided the baseline for further discussion by the meeting. In order to develop and/or progress concrete sub-regional ADS-B Implementation plan, the meeting divided into two Ad Hoc Groups to progress the Sub-regional implementation plan.

Review of Outcome of Ad Hoc Groups on South East Asia (SEA) and Bay of Bengal (BOB) projects

2.34 The meeting reviewed the reports on the Sub-regional ADS-B implementation plan/projects presented by SEA and BOB Ad Hoc working groups. The discussions were based on the outcome of previous meetings of the ADS-B SITF/10 and SEA ADS-B WG/6 and information made available to the meeting. The outcome of discussions by Ad Hoc groups is provided in *Appendix D* to the report of the SEA/BOB ADS-B SITF/7 also reproduced as **Appendix A** to this paper meeting which could serve as a basis for further development of the sub-regional implementation plans.

Bay of Bengal

In addition, India outlined the conclusions from the BOB Ad Hoc group as follows:

2.35 ADS-B sharing benefits are likely to exist between India and Maldives, Sri Lanka, Pakistan and Myanmar. There are only minor benefits in using Indonesian data in India and no identified benefits in sharing between Thailand and India. India-Bangladesh sharing will be examined once Bangladesh has developed an ADS-B plan.

2.36 It was agreed that India would initiate ADS-B sharing discussions with Maldives, Sri Lanka, and Myanmar. ICAO was requested to initiate ADS-B data sharing discussions between India and Pakistan.

Surveillance based efficiencies

2.37 IATA presented a paper supporting the regional deployment of ADS-B to increase surveillance coverage and associated DCPC communication capability where required. IATA also supported the CANSO recommendations in delivering efficiencies enabled by ADS-B deployment.

2.38 It was stated that while recognizing the regional deployment of ADS-B is critical to enable widespread efficiencies, it is important to be aware that ADS-B supplements and supports current Radar surveillance coverage. The ATS Routes M771 & L642 are examples where surveillance based efficiencies will be available prior to full planned deployment of ADS-B. Once Indonesia has implemented ADS-B stations at Natuna & Matak, the above two routes will be fully within surveillance and communications coverage which allows implementation of efficiencies.

2.39 Singapore highlighted that the coverage of Indonesian ADS-B stations could cover up to the edge of Singapore FIR. Vietnam's ADS-B station at Con Son Island is also essential to enhance the ADS-B coverage at the edge of the Singapore FIR.

2.40 IATA urged States to consider implementation of efficiencies including reduction of separation where full surveillance & communication is available for ATS routes either supplemented by ADS-B or covered by Radar.

2.41 Moderator pointed out that ADS-B equipage rate is one of the factors, which impacts provision of ADS-B based surveillance service. IATA is requested to encourage member airlines to have ADS-B avionics equipped in a timely manner in order to receive more efficiencies derived from ADS-B based surveillance service. IATA clarified that timely mandate by regulators would allow reasonable period of time for airlines to equip their fleet as required.

2.42 Singapore stated that realising efficiency in terms of separation reduction may be achieved through taking a phased approach.

Updates on the Collaborative Project in the South China Sea

2.43 Singapore presented a paper provided by Indonesia, Singapore and Vietnam on the their collaborative project updates

2.44 The meeting was informed that Singapore has been receiving the ADS-B data from Matak and Natuna ADS-B stations since 18 Nov 2011. Indonesia is also receiving ADS-B data from Singapore ADS-B station. Apart from the ADS-B ground stations, the other essential element towards reaping the full benefit of flight efficiency and enhancing safety will be the installation of VHF ground stations and setting up the appropriate links. The installation and setting up of VHF station and links from Natuna and Matak is currently on-going and it is targeted to complete by 1st half of 2012.

2.45 On 24 Nov 2011, Singapore and Viet Nam signed the ADS-B Collaboration Agreement in Singapore. The installation and setting up of ADS-B and VHF stations and the necessary links is targeted to be completed by the 2nd half of 2012.

Difference between DO-260, DO-260A and DO-260B

2.46 During the tenth meeting of the ADS-B Study and Implementation Task Force, it was noted that different avionics standards of DO-260, DO-260A and DO-260B might convey additional information to support new functionalities of the ATM automation system. In support of the regional development, Hong Kong, China and Singapore were requested to jointly conduct a comparison of the information contained in DO-260, DO-260A and DO-260B, and propose potential uses of the additional information available in DO-260A/B.

2.47 The meeting deliberated the information provided in the paper and considered it very useful in the identification of potential uses of the additional information available under DO-260A/B. Australia highlighted that currently there were only a few aircraft equipped with DO-260B in the APAC Regions. However, it was expected that the number of such aircraft would increase in a few years' time due to mandate of DO-260B in Europe and U.S. While some additional data available under DO-260A/B, was considered very useful from the ATC perspective (e.g. Resolution Advisory), States were urged to carefully review their needs in using the additional information to improve safety and efficiency of ATC.

2.48 Hong Kong, China stated that the movement from primitive to comprehensive utilization of ADS-B data would be an evolutionary process. To support the continuous development of this initiative, Hong Kong, China and Singapore will continue to collaborate to study the potential uses of the additional information available under DO-260A/B and report at the upcoming ADS-B SITF/11 meeting.

System Interoperability and Data Harmonization

2.49 Hong Kong, China highlighted potential system interoperability issues caused by variations of implementation among ADS-B ground stations in sending out optional data items via ASTERIX Category 21. Based on experience of ADS-B trials conducted by Hong Kong, China, it was found that different suppliers of ADS-B ground stations could have different interpretations and implementation on whether a particular optional data item shall be output by their ADS-B ground stations. Besides, different suppliers of ATM automation systems also have different requirements on data items from ADS-B ground stations to perform their intended functions. As a result, it could happen that the ADS-B data items not implemented by one State/Administration will be required by another State/Administration. To ensure system interoperability and harmonizing ADS-B implementation in the APAC Regions, Hong Kong, China recommended agreeing on a list of data items for the exchange of ADS-B data among States/Administrations.

2.50 Besides, Hong Kong, China also highlighted the discrepancies on classification of ADS-B mandatory/minimum and optional data types between ASTERIX Category 21 and EUROCAE ED-129 as highlighted in *Appendix 2 to the WP10*. Hong Kong, China thus recommended developing guidelines to address the different classification schemes under ASTERIX Category 21 and EUROCAE ED-129 so as to eliminate the discrepancies.

2.51 The meeting thoroughly deliberated the issues as highlighted in the working paper and considered necessary to develop a regional minimum requirement for ADS-B ground stations including guidelines on the data items that are mandatory for the exchange of ADS-B data among APAC States/Administration from the perspective of ATM automation system.

2.52 It was noted that so far no specific requirements is made available to the States for minimum data required to be delivered to ATM Automation system from ADS-B ground station for data received from DO260, DO260A and DO260B compliant avionics. It is also not clear whether an ATM Automation system is able to process some data derived from DO260B avionics. It was agreed to be taken up for further discussion at next ADS-B SITF meeting. A working paper therefore is required to be prepared based on the experience gained in Australian and result of research conducted by Hong Kong China. Australia and Hong Kong China agreed to jointly prepare the working paper for discussion at the upcoming ADS-B SITF/11 meeting.

2.53 Singapore pointed out that data sharing between States should be defined in the bilateral agreement. It was further stated that all data received from shared ADS-B stations should be delivered to the other party without filtering unless it is necessary.

Action Items List for SEA/BOB ADS-B WG

2.54 The meeting discussed and further updated action items as part of its work programme for the Working Group which is provided in the Appendix E to the WG/7's Report and also reproduced in **Appendix B** to this paper.

Note of appreciation

2.55 The meeting expressed its appreciation and gratitude to the to the Director General of Civil Aviation, India and Airports Authority of India for hosting the Working Group meeting.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

- a) note activities and efforts being made by SEA/BOB ADS-B WG;
- b) further develop the harmonized equipage requirements and timelines based on work done by the SEA/BOB ADS-B WG/7 – **Appendix A** refers;
- c) note the relevant action items formulated by the WG as contained in the **Appendix B**; and
- d) encourage States concerned to expedite implementation of the project in the Bay of Bengal area.

THE OUTCOME OF DISCUSSIONS BY AD HOC GROUPS

South China Sea Group

The proposals were formulated by the following States:

- a) Hong Kong, China
- b) The Philippines
- c) Singapore.

Collaboration projects identified:

Sharing of data from ADS-B station in Sanya FIR: from China to the Philippines

The Group recalled that during the 9th and 10th ADS-B SITF, China agreed to consider sharing of their ADS-B data from a station in Sanya FIR with the Philippines.

After evaluating the benefits of the above ADS-B data on the air route M772, between Hong Kong and the Philippines, the Group recommended that a meeting between China and the Philippines should be initiated to discuss the details on the data sharing before the 8th SEA/BOB ADS-B WG. Hong Kong, China will facilitate the coordination of the meeting between China and the Philippines.

It was also recalled that during 10th ADS-B SITF, the Philippines considered installing a station at Pasuquin in the Northern part of the Philippines to help cover N892 and L625.

Sharing of data from ADS-B station in the Palawan of the Philippines: from the Philippines to Singapore

The Group noted that the Philippines has plans to install ADS-B stations at Puerto Princessa and Manila. It was also noted that the previous ADS-B SITF and SEA ADS-B WG meetings had identified the benefits of installing an additional ADS-B station at Quezon Palawan or another suitable location at Southwestern part of the Palawan on air routes N884 and M767.

The Group recommended that a meeting be initiated between Singapore and the Philippines during 1st quarter of 2012.

Sharing of data from ADS-B station in Brunei: from Brunei to Singapore

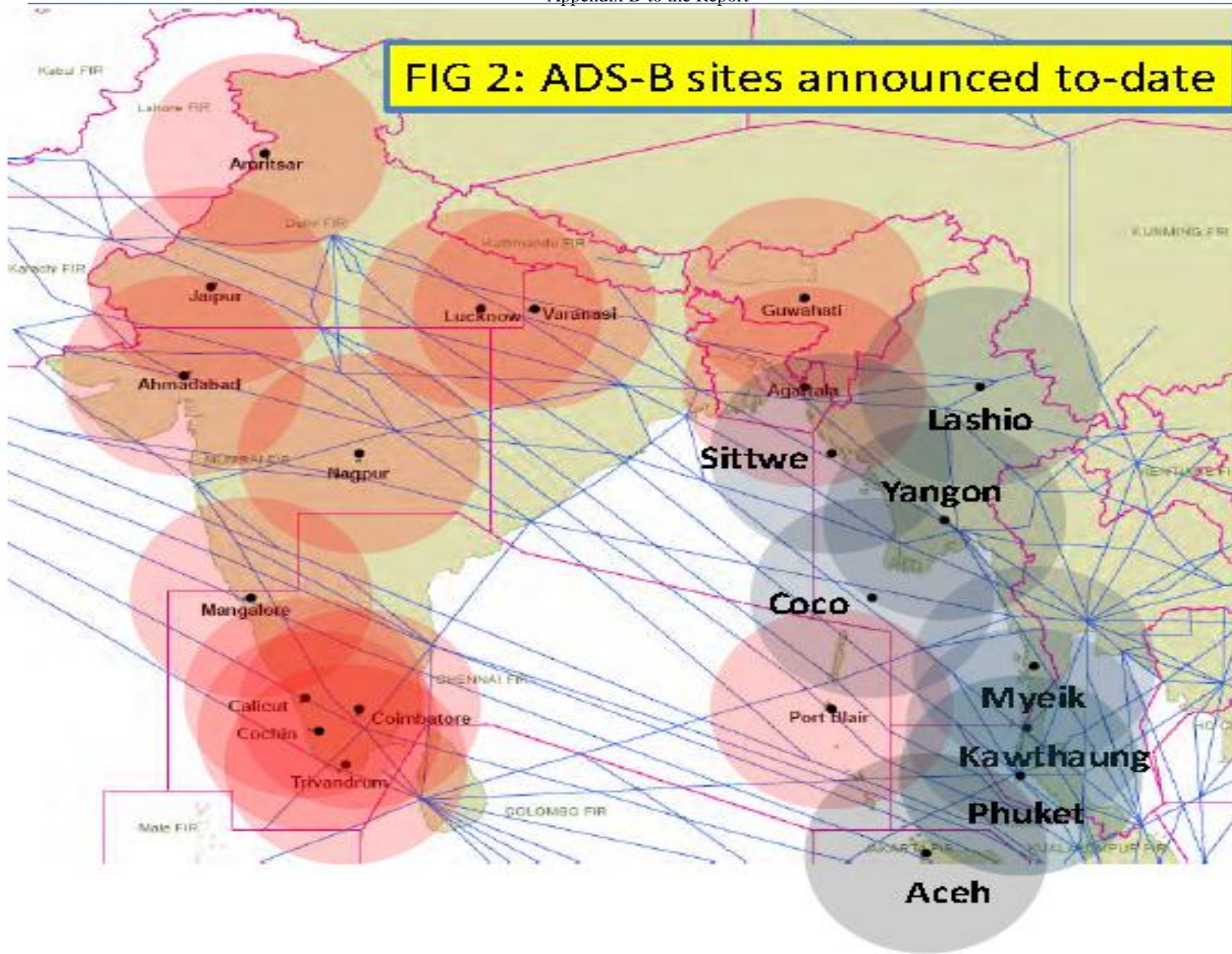
To optimise the benefits of ADS-B for N884 and M767, the previous ADS-B SITF and SEA ADS-B WG meetings recommended installation of an ADS-B station in Brunei to cover the surveillance gaps. Singapore reported that it had initiated a meeting with Brunei. Singapore would initiate another meeting with Brunei to discuss the details during 1st quarter of 2012.

Sharing of data between Indonesia, Singapore and Viet Nam

As a continuous effort on the work done by an ad-hoc group during the 6th SEA ADS-B WG, the Group discussed on the need to further coordinate among the States involved. The Group noted that Singapore and Viet Nam has signed the ADS-B collaboration agreement and will be signing the Operational LOA in 1st half of 2012. As L642 and M771 extends from Singapore to Hong Kong, crossing the Ho Chi Minh FIR and Sanya FIR, the Group recommends that China, Hong Kong, China, Singapore and Vietnam to have a meeting during 1st half of 2012 to finalise the operational aspect of implementing ADS-B along L642 and M771.

Item	Description	Status	Target Completion
A	Installation of ADS-B ground stations and links		
	i) Natuna and Matak	Completed	
	ii) Singapore	Completed	
	iii) Con Son	On-Going	2H2012
B	Installation of VHF station and links		
	i) Natuna and Matak	On-Going	1H2012
	ii) Conson	On-Going	2H2012
C	Signing of ADS-B data and VHF radio facility sharing agreement		
	i) Between Indonesia and Singapore	Completed	
	ii) Between Vietnam and Singapore	Completed	
D	Signing of ATS Operational LOA between Ho Chi Minh and Singapore ACCs		1H2012
E	Issue AIC on aircraft equipage mandate	Completed	
F	Technical Monitoring of ADS-B		1H2012
G	Operational trial and Implementation	2H 2012	
H	Exclusive ADS-B operations for L642 and M771 above FL290	2H 2013	

FIG 2: ADS-B sites announced to-date



ADS-B DATA SHARING PLAN FOR BOB

- THAILAND-DO NOT REQUIRE ADS B DATA AT PRESENT
- MALASIA- AFTER COMMISSIONING OF NEW ATC AUTOMATION IN 2012 WILL INFORM THE NEED OF SHARING
- MALDIEVES/PAKISTAN/SRILANKA- INDIA NEEDS ADSB DATA. ADS B PLAN OF THESE CONTRIES REQUIRED.
- MAYANMAR- COCO ISLAND , SITWEE ADSB DATA REQUIRED
- BANGLADESH- AT PRESENT NO ADS B PLAN. SHARING CAN BE CONSIDER LATER ON.
- INDONESIA- MUTUAL SHARING CAN BE ACHIVED IF INDONASIA NEEDS PORT BLAIR

SEA/BOB ADS-B WG/7
Appendix E to the Report

LIST OF ACTION ITMES

No.	Subject	Forum Raised	Status / Target Date	Remarks / follow-up	Action Party
1.	<p>Conclusion 1/4 – Terms of cooperation for the Working Group</p> <p>That, a sample Agreement for ADS-B Data Sharing be developed based on the guidelines material provided by Eurocontrol contained in Appendix D to the Report.</p>	SEA ADS-B WG/1	Closed in SEA ADS-B WG/2	Completed	Singapore/ Australia
2.	<p>Decision 2/2 – SEA Sub-regional ADS-B implementation study project</p> <p>That, IATA conducts SEA Sub-regional ADS-B implementation study within the project scope as specified in the Appendix B to this Report and present the initial result of study to the next meeting of the SEA ADS-B Implementation WG</p>	SEA ADS-B WG/2	Closed in SEA ADS-B WG/3	Completed	IATA
3.	To present the outcome of first and second meeting to next ADS-B SITF.	SEA ADS-B WG/2	Closed during ADS-B SIFT/7	Completed	Singapore
4.	IATA and CANSO to conduct a cost benefit study on the South Seast Asia Project. To update progress on next working group.	SEA ADS-B WG/3	Closed in SEA ADS-B WG/4	Completed	IATA/CANSO
5.	<p>Action Item 45/3</p> <p>Recognizing the benefits that can be derived from implementation of ADS-B, the Conference invited the ICAO APANPIRG ADS-B Study and Implementation Task Force (ADS-B SITF) to develop guidance material for harmonized regulations of ADS-B systems on aircraft.</p>	SEA ADS-B WG/4 (originally from DGCA/45)	Closed in ADS-B SITF/8	Reflected in the PFF and Task List and completed by ADS/B-SITF/9	SEA ADS-B WG

LIST OF ACTION ITMES

No.	Subject	Forum Raised	Status / Target Date	Remarks / follow-up	Action Party
6.	Prepare a paper on the plans for and status of ADS-B data sharing between Indonesia-Malaysia	SEA ADS-B WG/4	Updated in ADS-B SITF/8	On-going	Malaysia
7.	Prepare a paper on the experience of using the ADS-B data sharing template and make any recommendations for change of the data sharing template.	SEA ADS-B WG/4	Closed in ADS-B SITF/8	To be further updated and to be reviewed by ADS-B SITF/10	Singapore & Indonesia
8.	Identify the reasons for non compliance of some aircraft to AMC 20-24 when already approved for operations in Australia	SEA ADS-B WG/4	Closed in ADS-B SITF/8	Completed	Aric Oh (Singapore Airlines)
9.	Prepare a paper on the “state of play” of development of ADS-B avionics regulations explaining differences between regions, states	SEA ADS-B WG/4	Closed in ADS-B SITF/8	Completed	Australia
10.	Prepare a paper on the status of the proposed Indonesia-Australia project	SEA ADS-B WG/4	Closed in ADS-B SITF/8	Presented updates to SEA ADS-B WG/6	Australia & Indonesia
11.	Organise a side meeting for regulators to discuss the status of avionics standards and rulemaking at the ADS-B Task Force	SEA ADS-B WG/4	Completed in ADS-B SITF/9	Regulator’s workshop on avionics standards was conducted	ADS-B TF Chairman & ICAO Secretariat
12.	Prepare a proposal on avionics equipage acceptable to IATA members relevant to Asia Pacific objectives	SEA ADS-B WG/4	Closed in ADS-B SITF/8	Completed	IATA
13.	To invite Myanmar and India to next working group meeting	SEA ADS-B WG/5	SEA ADS-B WG/6	Invited for both SEA WG/6 & SEA/BOB WG/7	Secretariat

SEA/BOB ADS-B WG/7
Appendix E to the Report

LIST OF ACTION ITMES

No.	Subject	Forum Raised	Status / Target Date	Remarks / follow-up	Action Party
14.	Clarify relation between DO260B and 3NM separation in TMA	SEA ADS-B WG/6	Closed in ADS-B SITF/10 base on progress of SASP	Prepared a paper based outcome of SASP	Australia
15.	Renaming WG and relation between WG and TF	SEA ADS-B WG/6	Completed in ADS-B SITF/10	Review and consideration at ADS-B SITF/10	All members of WG and TF
16.	Review the forward fit requirement for SA Aware compliance by June 2012.	SEA ADS-B WG/6	Closed in ADS-B SITF/10	Deadline for compliance extended to 12 Dec.2013	IATA & Australia
17.	Identify new data sharing projects in the eastern part of South China Sea.	SEA ADS-B WG/6	Closed ADS-B SITF/10	Discussed in the breakout group	Singapore and Philippines
18.	Identify new data sharing projects in Bay of Bengal	SEA ADS-B WG/6	Closed in ADS-B SITF/10	Update the proposal	Australia
19.	To update ADS-B TF on the revised data sharing agreement	SEA ADS-B WG/6	Closed in ADS-B SITF/10	Template updated	Singapore
20.	Increase awareness by States for operational and airworthiness approval	SEA ADS-B WG/6	SEA ADS-B WG/7	Letter to States through regional offices Letters issued, Completed	Secretariat
21.	Increase awareness of Airlines' responsibility to get operational and airworthiness approval from State of registry.\ and the urgency required to meet various regional 2013 mandates.	SEA ADS-B WG/6	ADS-B SITF/11	Reminder to airlines and feedback to WG	IATA

LIST OF ACTION ITMES

No.	Subject	Forum Raised	Status / Target Date	Remarks / follow-up	Action Party
22.	To examine existing air-ground communication and surveillance capability in the boarder area between China and Myanmar and identify the need and possibility for sharing ADS-B data from potential ADS-B ground station at Lashio.	SEA ADS-B WG/6	On going ADS-B SITF/11	Report status and position (ADS-B GS to be installed at Lashio has been identified)	China & Myanmar
23.	To exam possibility of sharing ADS-B data from potential ADS-B ground station from CoCo and Pathein.	SEA ADS-B WG/6	On going ADS-B SITF/11	Report status and possibility	Myanmar & India
24.	ATS operational letter of agreements between neighboring FIRs among South China Sea States for radar-like surveillance service	SEA ADS-B WG/6	Ongoing – Reports at each meeting	Report progress	China, Hong Kong China, Viet Nam and Singapore
25.	Review of FPL Amendment to update AIGD and its effective date	SEA ADS-B WG/6	ADS-B SITF/11	Completed	Australia and Secretariat
26.	State letter in following up DGCA Conf/48 Action Item48/4	SEA ADS-B WG/7	ADS-B SITF/11	State letter – reminder issued	Secretariat
27.	Working Paper with draft Regional Guidance material on minimum requirement for output from ADS-B ground station data for data sharing and ATC use.	SEA ADS-B WG/7	ADS-B SITF/11	Paper and document prepared	Hong Kong China and Australia
28.	Further research on the potential uses of the additional information available under DO-260A/B	SEA ADS-B WG/6	ADS-B SITF/11	Paper prepared	Singapore and Hong Kong China
29.	India to coordinate with Myanmar, Maldives and Sri Lanka for ADS-B data sharing	SEA ADS-B WG/7	SEA ADS-B WG/8	Coordination	India
30.	ICAO Regional Office to facilitate coordination	SEA ADS-B	ADS-B SITF/11	Coordination	Secretariat

SEA/BOB ADS-B WG/7
Appendix E to the Report

LIST OF ACTION ITMES

No.	Subject	Forum Raised	Status / Target Date	Remarks / follow-up	Action Party
	between India and Pakistan for potential ADS-B data sharing	WG/7			
31.	In following-up APANPIRG Conclusions, a survey be conducted for ADS-B certificate/operational approval issued by Administrations	SEA ADS-B WG/7	SEA ADS-B WG/8	Survey	ICAO Regional Office