



International Civil Aviation Organization

**SIXTH MEETING OF THE SOUTHEAST ASIA
SUB-REGIONAL ADS-B IMPLEMENTATION
WORKING GROUP (SEA ADS-B WG/6)**



Singapore, 24 - 25 February 2011.

Agenda Item 2: Review of the outcome of the ADS-B SITF/9, APANPIRG/21

OUTCOME OF ADS-B SITF/9 AND APANPIRG/21 ON ADS-B

(Presented by the Secretariat)

SUMMARY

This paper reviews the outcome of APANPIRG/21 on ADS-B and works accomplished by the Ninth Meeting of ADS-B Study and Implementation Task Force and the Fourteenth CNS/MET Sub-Group.

Action by SEA ADS-B WG/6 is at Paragraph 3.

1. INTRODUCTION

1.1 The APANPIRG/21 held from 6 to 10 September 2010 in Bangkok reviewed the outcome of the Regulator's Workshop on ADS-B Avionics Requirement and Ninth meeting of the ADS-B Study and Implementation Task Force (16 – 19 August 2010) including work accomplished by Fifth meeting of the SEA ADS-B Working Group. The outcome of APANPIRG/21 on matters relating to ADS-B is provided at Attachment to this paper for review by the meeting.

1.2 The reports of Ninth Meeting of ADS-B Task Force and Fifth meeting of the working group were also reviewed by CNS/MET SG/14 meeting held in Jakarta, Indonesia from 19 to 22 July 2010.

2. DISCUSSION

2.1 APANPIRG noted the trial and implementation status by States and development and some issues observed during implementation. The actions taken by APANPIRG/21 meeting on ADS-B are highlighted as follows:

- Decision 21/37 – adopted the updated Subject/Tasks List of ADS-B SITF;
- Conclusion 21/38 – adopted guidance material on processing and display of ADS-B Tracks on Air Traffic Controller Positions;
 - *Follow-up State letter Ref.: T 8/10.21:AP017/11 (CNS) was distributed on 2 February 2011.*

- Conclusion 21/39 – agreed to a Template for promulgation of ADS-B Avionics Equipage Requirements. States were encouraged to use the adopted template to promulgate mandating rule for ADS-B Avionics Equipage Requirements as soon as possible.
 - *Follow-up State letter Ref.: T 8/10.21:AP174/10 (CNS) was distributed on 24 November 2010.*
- Conclusion 21/40 – adopted Guidelines for Airworthiness and Operational Approval for ADS-B Avionics Equipage;
 - *Follow-up State letter Ref.: T 8/10.21:AP008/11 (CNS) was distributed on 24 January 2011.*
- Conclusion 21/41 – adopted revised regional surveillance strategy for Asia and Pacific Regions; and
 - *Follow-up State letter Ref.: T 8/2.11:AP007/11 (CNS) was distributed on 21 January 2011.*
- Conclusion 21/42 – agreed to a recommended rule on misleading ADS-B Transmissions. States are requested to consider publishing additional provisions for misleading ADS-B transmissions.
 - *Follow-up State letter Ref.: T 8/10.21:AP175/10 (CNS) was distributed on 24 November 2010.*

2.2 The meeting appreciated the efforts and progress made by the ADS-B SITF and the SEA ADS-B WG and expressed its appreciation and gratitude to the DGCA, Indonesia hosting the Fifth Meeting of the South East Asia Sub-Regional ADS-B implementation Working Group, the Regulator’s Workshop on ADS-B Avionics Requirement and Ninth meeting of the ADS-B Study and Implementation Task Force.

2.3 APANPIRG/21 noted that the next meeting of ADS-B Study and Implementation Task Force is scheduled for April 2010 to be hosted by CAA, Singapore. (25-29 April 2011 in Singapore)

2.4 The adopted guidance materials and the guidelines and the revised regional Surveillance Strategy adopted by APANPIRG/21 have been posted in the ICAO APAC website: <http://www.bangkok.icao.int/edocs>

3. ACTION BY THE MEETING

3.1 The meeting is invited to review the outcome of the APANPIRG/21 and take any necessary follow-up actions.

**EXTRACT FROM REPORT OF APANPIRG/21
(6 – 10 SEPTEMBER 2010) ON ADS-B**

Surveillance

3.4.27 Under this agenda item, the meeting reviewed outcome of the Regulator's Workshop on ADS-B Avionics Requirement and the Ninth meeting of the ADS-B Study and Implementation Task Force held from 16 to 19 August 2010 in Jakarta, Indonesia. The meeting also reviewed the outcome of the Fifth Meeting of the South East Asia Sub-Regional ADS-B implementation Working Group held from 21 to 22 January 2010 in Jakarta, Indonesia.

Regulator's Workshop on ADS-B Avionics Equipage Requirements

3.4.28 The Regulator's Workshop on ADS-B Avionics Equipage Requirements, in conjunction with the ADS-B SITF/9 meeting was organized in accordance with APANPIRG Conclusion 20/51. Twenty four presentations covering following topics on the ADS-B equipage requirements were presented and discussed by the Workshop:

- ADS-B Concept Introduction
- Operational use of ADS-B in the Asia and Pacific Region
- Standards and equipment
- Review existing equipage mandates
- Existing and Future Equipment Certification
- Need to harmonize and compliance timing
- Avionics products
- View of air space users and ANSPs
- Harmonization and guidance material

3.4.29 The outcome of deliberations at the Workshop was considered by the Task Force meeting. Based on the feedback survey conducted during the events, it was concluded that the ADS-B Workshop was very well received by the participants.

Need for Flight Inspection/Validation of ADS-B Ground Stations

3.4.30 In respect of APANPIRG decision 20/47, the meeting noted that one of the topics being studied by Aeronautical Surveillance Panel was the development of guidance on flight testing of ADS-B and Multilateration systems. While recognizing that the flight inspection for ADS-B ground stations may be required to validate the theoretical coverage against predictions, the meeting was of the view that it could be achieved by alternate means also. It was agreed that further monitoring of outcome of ASP study in this regard is required. The Task Force agreed that a formalized flight validation/testing program of ADS-B ground station should not be considered as a mandatory requirement. While the meeting noted that States may at their own discretion conduct such a program, this was beyond the minimum requirements. In view of the foregoing, it was concluded that there is no need for the Task Force to develop such guidance material.

Update of ICAO Panels on ADS-B Related issues

3.4.31 The meeting noted ADS-B related developments made by the ICAO panels and their work programme including Aeronautical Surveillance Panel (ASP), Aeronautical Communication Panel (ACP), Separation and Airspace Safety Panel (SASP), Operational Data Link Panel (OPLINKP) and the newly established Airborne Surveillance Task Force (ASTAF).

Review the Terms of Reference and Subject/Tasks List

3.4.32 The meeting reviewed the TOR adopted by APANPIRG/18 and updated the list of Subject and Tasks of the Task Force. The TOR was considered appropriate and the meeting did not propose any changes to the TOR. In respect of the Tasks List, the meeting adopted following Decision:

Decision 21/37 - Subject/Tasks List of ADS-B Study and Implementation Task Force

That, the Subject/Tasks List for ADS-B Study and Implementation Task Force provided in **Appendix N** to the Report on Agenda Item 3.4 be adopted.

Processing and Display of ADS-B Tracks

3.4.33 The meeting adopted the Guidance Material on Processing and Display of ADS-B tracks at Air Traffic Controller's Positions provided by Australia. The meeting adopted following Conclusion formulated by the ADS-B Study and Implementation Task Force on the subject:

Conclusion 21/38 – Guidance Material on Processing and Display of ADS-B Tracks on Air Traffic Controller Positions

That, the Processing and Display of ADS-B Tracks on Air Traffic Controller positions provided in **Appendix O** to the Report on Agenda Item 3.4 be adopted.

Template for promulgation of ADS-B Avionics Equipage Requirements

3.4.34 Following four source documents were identified by the Task Force that may be considered in the development of templates for a regulatory mandate.

- **CASA Australia Civil Aviation Order.** The ADS-B mandate that has actually been issued in final regulatory application is the relevant Civil Aviation Order of the Civil Aviation Safety Authority Australia. The Australian rule has been based on operations in an NRA environment but may also be satisfactory for a RAD environment. The updated Australian CAO is provided at following webpage:
http://www.casa.gov.au/wcmswr/_assets/main/download/orders/cao20/2018.pdf
- **EASA AMC 20-24. EASA AMC 20-24 'Certification Considerations for the Enhanced ATS in Non-Radar Areas using ADS-B Surveillance (ADS-B-NRA) Application via 1090 MHZ Extended Squitter'** was issued on 02/05/2008 as an Acceptable Means of Compliance for the airworthiness and operational approval of aircraft installations.
- **Eurocontrol ENPRM/10-003A.** In April 2010, Eurocontrol issued its **ENPRM/10-003 Surveillance Performance and Interoperability (SPI) Requirements** under its Single European Sky Mandate on Surveillance. The ENPRM proposes a 2015 mandate for application in a RAD environment. The material is available at following webpage:
http://www.eurocontrol.int/enprm/public/standard_page/enprm1003.html
- **FAA Final Rule for ADS-B Out equipage mandate**

3.4.35 The meeting noted that the promulgation of airspace requirements for ADS-B implementation by States needs to occur as early in the process as possible. This includes potential upgrades/retrofits and IATA had indicated that a general minimum time frame of 4-5 years should be considered.

3.4.36 The meeting noted the recommendation developed by the Task Force for consideration by those States intending to implement ADS-B based surveillance service. i.e. when promulgating requirements for mandating ADS-B airspace, States should include the following information in the documentation:

- a) Specify the airspace or routes that will require ADS-B equipage;
- b) Define the ADS-B performance standard(s) required recognising both EASA AMC 20-24 and CASA CAO 20.18 Appendix XI;
- c) The dates for initial implementation and if any upgrades required. These dates and timeline should identify when the ground capability becomes available and when full compliance with the requirements becomes effective.
- d) Provide appropriate justification for the mandate including safety analyses and business case.

3.4.37 In view of the foregoing, the meeting considered a template for use by APAC States to issue a regulatory mandate for aircraft ADS-B equipment carriage in defined airspace and adopted following Conclusion:

Conclusion 21/39 – Template for promulgation of ADS-B Avionics Equipage Requirements

That, based on APANPIRG Conclusion 20/54, States intending to implement ADS-B based surveillance service for a defined airspace and having not published regulations be urged to promulgate mandating rule for ADS-B Avionics Equipage Requirements as soon as possible using the following template:

On and after dd/mm/yyyy, if an aircraft operates on airways (insert routes).....at or above FLXXX.....(or in defined airspace boundaries at or above FLXXX):

- a) *the aircraft must carry serviceable ADS-B transmitting equipment that has been certificated as meeting EASA AMC 20-24, or meets the equipment configuration standards in Appendix XI of Civil Aviation Order 20.18 of the Civil Aviation Safety Authority of Australia; and*
- b) *the aircraft operator must have the relevant operational approval from the State of Registry.*

Airworthiness and Operational Approval for ADS-B Avionics Equipage

3.4.38 The meeting agreed that while operational approval was necessary, it should follow the established procedures for other operational approvals such as RVSM and PBN. This will ensure that an undue burden is not placed on either regulators or operators and will maintain a simple consistency through the regulatory approval process.

3.4.39 There is a regime in place for both PBN and RVSM where States must manage the approvals. RVSM approvals are also registered with a Regional Monitoring Agency (RMA) while a global database of PBN approvals is being established jointly by ICAO and IATA. There was a recommendation that a similar regional monitoring agency process be established for ADS-B OUT and eventually ADS-IN approval.

3.4.40 The meeting reviewed the approval process that the State of Registry is responsible for the operational approval of their aircraft in accordance with Annex 6 Chapter 4. With respect to ADS-B equipage and operation authorizations, the meeting discussed several aspects that need to be considered by the Regulators for assessing an aircraft and the operator for ADS-B operation. The meeting therefore adopted following Conclusion:

Conclusion 21/40 – Guidelines for Airworthiness and Operational Approval for ADS-B Avionics Equipage

That, States be advised to use the guidelines provided in **Appendix P** to the Report on Agenda Item 3.4 for Airworthiness and Operational Approval for ADS-B Out Avionics Equipage.

Updates on ADS-B Upper Airspace Project

3.4.41 Australia informed the meeting that the ADS-B Upper Airspace Project (UAP) was operationally commissioned on 19 December 2009 and air traffic controllers are now authorized to provide 5 NM separation services using ADS-B based surveillance service for air traffic at and above FL290. The coverage is currently available across the whole continent from 29 ADS-B ground station sites and one Wide Area Multilateration system comprising 14 sites. The meeting was informed that operational feedback since commissioning has been extremely positive and more than 73 per cent of all scheduled international flights in Australia are flying ADS-B approved aircraft.

3.4.42 The last ADS-B ground station of UAP Phase 1 at Broken Hill was commissioned in February 2010. Additional 18 stations are planned to be installed as part of UAP Phase 2 to provide ADS-B coverage within existing SSR coverage to provide a backup and improved tracking performance which will extend ADS-B coverage to all en-route sectors.

ADS-B development in China

3.4.43 China provided updates on its ADS-B development and deployment plan. ADS-B technology is considered as an important surveillance technology over western airspace and a significant supplementary measure for the radar surveillance in eastern part of China. ADS-B application in oceanic areas and airport surface will also be promoted and 1090ES has been chosen as the primary data link. In April 2010, CAAC issued the Chinese Technical Standards Orders of “Extended Squitter Automatic Dependent Surveillance-Broadcast (ADS-B) and Traffic Information Service-Broadcast (TIS-B) Equipment Operating on the Radio Frequency of 1090 MHz” for manufactures applying for Chinese Technical Standard Order Authorization for 1090ES ADS-B and TIS-B equipment. In May 2010, CAAC issued the Advisory Circular of “Airworthiness and Operational Approval of Automatic Dependent

Surveillance-Broadcast Application in Non-Radar Areas via 1090 MHz Extended Squitter” for the manufactures, modification units and operators who want to get airworthiness approval for ADS-B airborne equipment.

3.4.44 In March 2009, CAAC set up an ADS-B station to serve ATS Routes L642 and M771 in the South China Sea area. In addition to the Chengdu - Jiu Zhai ATS route, CAAC is now working on a project of communication and surveillance with 5 ADS-B ground stations covering Chengdu-Lhasa ATS route to be completed by the end of 2010. CAAC also has a plan to install ADS-B stations along Lhasa-Ali route and B215 route from Yinchuan to Urumqi. Further, CAAC has scheduled to build ADS-B stations nationwide according to “the twelfth five-year plan”. In the same period, the relevant automatic air traffic management systems will be upgraded to be able to receive, process and display ADS-B data.

Hong Kong China reconfirmed its plan to:

- mandate ADS-B carriage, by end 2013 for aircraft flying on ATS routes L642/M771;
- mandate ADS-B carriage, by end 2014, for aircraft flying within Hong Kong FIR;
and
- mandate ADS-B carriage, after 2015 to be confirmed, for low flying aircraft including general aviation aircraft and helicopters.

ADS-B Implementation Process in Fiji

3.4.45 In June 2008, the Civil Aviation Authority of the Fiji Islands issued its Airworthiness notice detailing ADS B Equipment standards and as of the 01st May 2010, Fiji has mandated ADS B equipment for all Fiji registered aircraft operating in controlled airspace, with the exception of domestic aircraft due to be withdrawn by Jan 2011, international aircraft due to be withdrawn by Jan 2014 and any other aircraft exempted by the Authority.

3.4.46 The ATM System has been replaced with the AURORA System. At the Nadi International Airport, there are 5 ADS-B Ground Stations, 1 of which includes an interrogator. These will be setup in appropriate configuration to enable MLAT operation at Nadi International Airport. The ADS-B and MLAT ground station installations are expected to be completed before end of 2010 with Site Acceptance Testing completed by mid of first quarter 2011. The Fiji ADS-B and MLAT system is expected to be used initially as a surveillance tool from second quarter of 2011.

Indonesia

3.4.47 Indonesia provided updates on ADS-B implementation. 27 ADS-B Ground stations with dual system had been installed at Makassar, Sorong, Natuna, Kupang, Merauke, Banda Aceh, Matak, Cilacap, Soekarno Hatta Airport-Jakarta, Tarakan, Pangkalan Bun, Palu, Kintamani - Bali, Waingapu, Alor, Galela, Ambon, Saumlaki, Medan, Pakanbaru, Palembang, Pontianak, Timika, Biak, Kendari, Manado, and Surabaya amongst which 18 Stations in the Eastern part of Indonesia are connected to Makassar Air Traffic Service (MAATS) ATM system and 9 ADS-B Ground Station in the Western part of Indonesia are linked to the Remote Control Monitor System (RCMS) in JAATS-Jakarta. The Test-Bed system at DGCA Headquarters is able to monitor and control the ADS-B Data from these 27 ADS-B Ground Stations.

3.4.48 MAATS-Makassar has been upgraded from Eurocat-X version 2.4 to version 3.15 integrating ADS-B capabilities and was commissioned in December 2009. DGCA will establish Implementation Team for ADS-B implementation. Required regulations such as Operational Concept, Safety Assessment, ADS-B Procedure will be developed and introduced into CASR. For Near Term, DGCA has a plan to use ADS-B for Situational Awareness in MAATS Center. Cross FIR boundary operational data sharing has been identified as the initial application of ADS-B Services. Based on experience gained in using ADS-B for situational awareness, Indonesia will provide separation services using ADS-B.

Malaysia

3.4.49 Updates from Malaysia were as follows:

- DCA Malaysia had a discussion with DGCA Indonesia at Special Coordination Meeting which was held in June 2009 regarding ADS-B data sharing from Banda Aceh for ATC surveillance in Bay of Bengal. The discussion is still on-going;
- Malaysia had started upgrading the ATM System which will be able to integrate all the surveillance data inclusive of ADS-B. The project is scheduled to be completed in April 2011;
- Malaysian airspace is covered by radar except for a small portion in the Bay of Bengal which at the moment is covered by ADS-C. Nevertheless DCA Malaysia has submitted in 10th Malaysia Plan to install ADS-B station and also upgrade and refurbish the present radars;
- DCA Malaysia expects the timeline for ADS-B mandatory equipage in Kuala Lumpur and Kota Kinabalu FIRs to be before 2020.

3.4.50 Malaysia was encouraged to advance its plan for providing ADS-B based surveillance service for its air space in BoB area.

New Caledonia

3.4.51 France provided an update on the ADS-B implementation status in New Caledonia. Implementation of three ADS-B ground stations was completed in the first half of 2010 to provide situation awareness service for international traffic at La Tontouta airport, the domestic traffic at Magenta airport and Air Traffic Service within Nadi FIR. The ADS-B controller display positions are also available since 30 July 2010. Most of the commercial flights are now displayed on the screen for air traffic controllers whose work has become easier as now they have a better representation of the air traffic situation with more accurate information. However, some air traffic (military, general aviation etc) is not displayed and air traffic controllers still use procedure control to separate aircraft.

3.4.52 Aircraft operators flying to/from airports in New Caledonia and through sector of New Caledonia airspace are invited to equip their fleet. New Caledonia is also proposing cooperation for ADS-B data sharing with neighboring air navigation service providers such as instantaneous recordings for SAR purposes.

R&D activities on ADS-B, GBAS system technologies in the Republic of Korea (ROK)

3.4.53 The meeting noted the R&D activities related to ADS-B and Ground Based Augmentation System (GBAS) technologies undertaken in the Republic of Korea.

3.4.54 Based on the CNS/ATM R&D road map for 2005~2020 in the Republic of Korea(ROK), the Korean government will undertake 19 research programs on next generation aviation safety facilities step by step. Among them GBAS and ADS-B technologies are being developed during 2010~2014 in the ROK which are in accordance with the ICAO standards, particularly focusing on the certification and operation technologies. These systems will be implemented in Korean territory after the successful development of GBAS and ADS-B test-bed system. Schedule of ADS-B R & D are as follows:

- a) Phase 1 (2010-2011): Development of ADS-B system, Implementation of Test and Evaluation environments;
- b) Phase 2 (2012-2013): Performance Improvement of air and ground surveillance; and;
- c) Phase 3 (after 2014): Acquiring key technologies, deployment in the domestic area and regulation for installation of ADS-B airborne system;

Singapore

3.4.55 Singapore informed the meeting that the Civil Aviation Authority of Singapore (CAAS) installed an ADS-B station and an ADS-B data processor in Singapore on 7 December 2009. The facility will:

- a) complement the existing surveillance coverage by the Long Range Radar;
- b) allow Singapore to perform operational trial using ADS-B data; and
- c) complement the coverage of Indonesia and Vietnam through data sharing.

3.4.56 The ground station supplied by Comsoft GmbH supports ASTERIX Cat 21 versions 0.23, 0.26 and 1.3 with coverage of about 290 NM based on targets of opportunity. The ADS-B data processor can also process versions 0.23, 0.26 and 1.3 of ASTERIX Cat 21. The processing system is able to fuse ADS-B data from various sources and customized filtered dataset for each user.

3.4.57 It was also informed that the ADS-B data is currently used mainly for technical evaluation and familiarization. CAAS is considering to purchase a stand-alone controller position to conduct operational trials, before the commissioning of the new ATM automation system in early 2012. Singapore is ready to share ADS-B data with other States.

ADS-B in USA

3.4.58 .An essential component of the FAA's Next Generation Air Transportation System (NextGen), is the ADS-B Program. This program will increase safety, capacity and efficiency of air travel and will provide critical flight information simultaneously to pilots and air traffic controllers. In response to a query, it was clarified that USA issued the final rule in end of May for DO260B mandate from 2020. It was further explained that the mandate does not include ADS-B IN nor does it include TIS-B and FIS-B. Further information regarding ADS-B project is available on the following FAA's webpage: www.adsb.gov

3.4.59 The current status of ADS-B deployment for FAA into National Airspace System of USA was noted. It introduced the system coverage by 794 radio sites. The meeting noted the implementation status and high level programme schedule in the presentation. About 800 ground stations will be commissioned by end of 2013. It was concluded that ADS-B technology is proven. It was informed that ITT Team has successfully designed, developed, and integrated an exceptional ADS-B ground infrastructure solution.

3.4.60 FAA, also provided information on the implementation status of essential services to the properly equipped aircraft with Traffic Information Service – Broadcast (TIS-B) and Flight Information Service – Broadcast (FIS-B). US ADS-B rule requires aircraft to be equipped by 2020 to transmit “ADS-B Out” to fly in certain airspace, equipage to receive “ADS-B In” to receive free traffic and weather service is voluntary as of now. The interoperability requirement between different ANSPs was stressed. It was also suggested that States should consider ADS-B in 3 mile terminal operation and airport surface instead of 5 mile separation for use in non-radar airspace, to save expenditure towards retrofits at a later date. It was advised that the States should consider total benefits that can be accrued from ADS-B before publishing any regulations or requirements. FAA claimed that its Final Rule and standards, notably DO 260B provides the maximum benefits possible for all these applications.

ADS-B Seminar for Civil Aviation Authority of the Philippines (CAAP)

3.4.61 CANSO informed the meeting that an ADS-B seminar for the CAAP was conducted by the CANSO in Manila on 11 August 2010. The Seminar discussed the benefits of the Philippines participating in the South China Sea project and recommended that apart from the ADS-B site at Puerto Princesa, the CAAP consider adding another ADS-B station, taking into account the need to provide coverage on the 2 trunk routes (N884 and M767). A possible site identified was Quezon Palawan. The seminar recommended that the CAAP consider location of additional ADS-B sites based on possible cost allocation to other user States.

3.4.62 The meeting discussed the need to optimize overall benefits of ADS-B implementation for flights in South China Sea airspace and supported the recommendation for the Philippines to install an ADS-B station on a site in the South like Quezon Palawan to cover the above two trunk routes. In this connection, the meeting also supported the recommendation that Brunei consider installing an ADS-B ground station in Brunei.

GPS Time Tagging Issue

3.4.63 The meeting noted the GPS Time Tagging issues as presented by Australia. GPS time currently differs from Coordinated Universal Time (UTC) by 15 seconds due to UTC “leap seconds”. Some GPS receivers erroneously output GPS time (as if it were UTC) until a new offset is received in a GPS navigation message. It can be 14 minutes before such a message is received. If these GPS receivers are used for ADS-B time tagging, before the offset arrives false position reports can be shown to ATC. A number of protections can limit the impact of this issue.

Regional Surveillance Strategy for APAC Region

3.4.64 The meeting reviewed regional surveillance strategy for Asia and Pacific Regions adopted by APANPIRG/19 in 2008. The meeting updated the strategy taking into account comments from fourteenth meeting of CNS/MET Sub-group of APANPIRG held in July 2010 which suggested inclusion of information regarding newly developed standard DO260B (Version 2 ES being developed by ICAO to be applicable in November 2013) and insert additional word “cooperation” at last bullet paragraph as follows: ***Ensure civil-military cooperation and interoperability.***

3.4.65 The noted revised regional surveillance strategy for Asia and Pacific Regions and adopted the following Conclusion:

Conclusion 21/41 – Revised Regional Surveillance Strategy for Asia and Pacific Regions

That, the revised Regional surveillance strategy for Asia and Pacific Regions provided in **Appendix Q** to the Report be adopted.

Updates on ADS-B Data Sharing in South China Sea area

3.4.66 It was informed that Indonesia, Singapore and Vietnam have been jointly working on the installation of ADS-B ground stations and VHF radios. Discussions were also held between the parties concerned on the ADS-B data and VHF radio facilities sharing.

3.4.67 ADS-B operations will be implemented in the area in 2 phases. In Phase I, ADS-B operations will apply to ATS routes L642 and M771 while other ATS routes could be covered in Phase II. ADS-B operations will be exclusive and applicable between FL310 and FL410. Aircraft intending to operate in ADS-B airspace will need to be ADS-B equipped and certified accordingly.

3.4.68 During CNS/ATM SG meeting, CANSO congratulated Indonesia, Viet Nam and Singapore for the project and for coming up with the project timeline and milestone so that all parties could work towards timely completion of the project. It was further stated that this was an excellent example of regional collaboration involving multiple ANSPs which would pave the way for the wider implementation of ADS-B in the ASIA/PAC Region.

3.4.69 IATA supported efforts made by the three States to enable ADS-B data and DCPC capability sharing. IATA totally endorsed the proposed steps and emphasized the very important role of the project with clear timelines. Importance of regulator's ADS-B equipment seminar to be held in August was emphasized. It was suggested that States should finalize their equipment requirement to allow the air space users to have 4-5 years time for equipping their aircraft. Member Airlines are expecting to receive early benefits as best equipage should be able to receive best service.

Bay of Bengal/South Asia Sub-regional Projects

3.4.70 Regarding planning and implementation of ADS-B in Bay of Bengal area, the meeting agreed to the proposal of the Task Force that a more pragmatic solution in the near term is to invite India and Myanmar to the next meeting of the SEA ADS-B Working Group, which had already been discussed and agreed by the working group. It was also suggested that both Pakistan and Nepal should also be invited.

Australia-Indonesia Data Sharing Project

3.4.71 Australia and Indonesia provided an update on their data sharing project between the Brisbane and Pandang FIRs. Airservices Australia has approved Phase 1A. Indonesia's DGCA has also approved Phase 1A and an ADS-B Filter has been installed in MAATS, Makassar. The ADS-B Filter has been tested and integrated into the ATC System in MAATS (Eurocat X). The tests were conducted between two States and the result of the test was successful. The need to re establish satellite channel previously used between Bali and Brisbane had been identified.

3.4.72 The project is expected to extend to Phase 1B and possibly Phase 2. The Phase 1A shall be operational before requesting approval to commence phase 1B which would comprise following additional sites: Broome, Doongan in Australia and Kintamani, Kupang in Indonesia. The Phase 2 would transform to full radar like separation when both parties have in place suitable infrastructure such as duplicated data communication links and DCPC capability. The meeting appreciated the progress made by the two States and supported the continued execution of the project.

Misleading ADS-B Transmissions

3.4.73 The meeting noted that a number of ADS-B avionics products transmit ADS-B data which could be considered misleading. Examples of these are:

- A product which transmits messages formats similar to, but not the same as DO260, DO260A or DO260B. When interpreted as DO260 messages, these can be misinterpreted as a good integrity messages with an incorrect position.
- A product which transmits DO260 NUC based solely on the accuracy value HFOM instead of the integrity value HPL. This can be interpreted as a DO260 message with good integrity when in fact integrity is poor.
- Other transponder and GPS products that fail to meet the published requirements of the Australian regulations

3.4.74 In environments where all airspace participants are required to have compliant equipment, the risk of using such misleading data is low. However, in an airspace which does not mandate ADS-B equipage, ADS-B transmissions may still be used, and the risk of use of such misleading data is higher in the following airspaces:

- where ATC separation services are delivered in voluntary equipage airspace;
- where ADS-B is used for ATC situational awareness only and ADS-B equipage is not mandatory; and
- where ADS-B IN may be used

3.4.75 The exception related to transmission of NIC or NUC_p=0 is made because NIC or NUC_p = 0 indicates that the data has no integrity and the Australian ATC system will discard such messages. Many aircraft with compliant ATC transponders, without GPS systems, transmit inertial positional data in ADS-B messages with NUC or NIC=0. It is also expected that ADS-B IN systems will discard NUC/ NIC=0 data.

3.4.76 In view of the foregoing, the meeting recommended all Asia/Pac States intending to implement ADS-B based surveillance service to consider publishing additional provisions in their mandating rule and adopted following Conclusion:

Conclusion 21/42 – Rule on Misleading ADS-B Transmissions

That, States where ADS-B may be used, even voluntarily, promulgate rule for ADS-B Avionics Equipage Requirements consider publishing additional provisions for misleading ADS-B transmission as follows:

After <insert earliest date that ADS-B may be used for any relevant operational purpose> if an aircraft carries ADS-B transmitting equipment which does not comply with

- a) EASA AMC 20-24, or*
- b) the equipment configuration standards in Appendix XI of Civil Aviation Order 20.18 of the Civil Aviation Safety Authority of Australia.*

the aircraft must not fly unless the equipment is:

- (a) deactivated; or*
- (b) set to transmit only a value of zero for the NUCp or NIC.*

Note:

- 1. It is considered equivalent to deactivation if NUCp or NIC is set to continually transmit only a value of zero.*
- 2. Regulators should take appropriate action to ensure that such regulations are complied with.*
- 3. ATC systems should discard ADS-B data when NUC or NIC=0*
