International Civil Aviation Organization

Sixth Meeting of the Surveillance Implementation Coordination Group (SURICG/6)

Web-conference, 24 – 27 August 2021

Agenda Item 6: Review implementation and co-ordination activities and sub-regional implementation plans

STOCKTAKE ON DOCUMENTS TO UPDATE UNDER AGENDA ITEM 6

(Presented by the Secretariat)

SUMMARY

This paper presents the documents under this Agenda Item for States/Administrations to provide their latest plans and implementation status.

1. INTRODUCTION

1.1. Due to the consolidation of supporting bodies under SURICG, the discussion and review of implementation and co-ordination activities and sub-regional implementation plans with focus on ADS-B are consolidated under this Agenda Item. This paper presents four documents for States/Administrations to provide their latest plans and implementation status.

2. DISCUSSION

2.1. ADS-B Implementation Status in the APAC Region

2.1.1. Prior to the development of a dedicated ADS-B implementation status reporting, the updates were used to report in a CNS/ATM Implementation Planning Matrix under CNS/MET SG. At the first few meeting of ADS-B SITF, States provided updates to the Matrix alongside other CNS ATM implementation provisions. In ADS-B SITF/13 in year of 2014, a dedicated Asia/Pacific Regional ADS-B Implementation Status document was proposed and it became an action item under ADS-B SITF since then. Formerly the dissolved SEA/BOB ADS-B WG would provide updates from participating States/Administration to update the Implementation Status Table and to be consolidated in ADS-B SITF and later, in SURICG. After the dissolution of SEA/BOB ADS-B WG, the task to review of ADS-B Implementation Status Table goes under SURICG. The last update of the ADS-B Implementation Status in the APAC Region is provided at **Attachment 1** to this paper.

2.2. ADS-B Data Sharing Implementation Status in the Asia/Pacific Region

2.2.1. SEA/BOB ADS-B WG/14 in 2018 proposed to include the status of ADS-B data sharing projects as a separate table for consideration by higher level meetings, and they took the opportunity to fill up the table with latest information on data sharing updated by SEA and BOB Ad Hoc Working Groups. After the dissolution of SEA/BOB ADS-B WG, the task to review of ADS-B Data Sharing

Implementation Status Table goes under SURICG. The last update of the ADS-B Data Sharing Implementation Status in the APAC Region is provided at **Attachment 2** to this paper.

2.3. Reports on the Sub-regional ADS-B Implementation Plan/Projects presented by South East Asia (SEA) and Bay of Bengal (BOB) Ad Hoc Working Groups

2.3.1. APANPIRG/18 in 2007 reviewed a proposal from certain South East Asian States to establish a Working Group for a sub-regional cooperation programme in South-East Asia area to implement ADS-B and share the data across FIR boundaries. APANPIRG/18 agreed the proposal to establish a South-East Asia Sub-regional ADS-B Implementation Working Group and adopted as Conclusion APANPIRG/18/38. In APANPIRG/22 in 2011, recognizing the need to expedite ADS-B implementation and surveillance data sharing in the Bay of Bengal area, the meeting adopted Decision APANPIRG/22/34 the SEA ADS-B WG be renamed as "South East Asia and Bay of Bengal Sub-regional ADS-B Implementation Working Group" to cover also projects in Bay of Bengal. The WG would review the outcomes from SEA and BOB Ad-hoc Working Groups conducted in the WG meetings, and the outcome from them were reviewed in ADS-B SITF and later, in SURICG. The last reports from the two Ad-hoc Working Groups are provided at **Attachments 3 and 4** to this paper.

2.4. States/Administrations are encouraged to provide their latest ADS-B and ADS-B Data Sharing implementation status and update the Attachments provided in this paper, and participate in discussion in the two Ad-hoc groups accordingly.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

a) review and update the documents provided in the **Attachments 1 to 4** respectively; and

b) discuss any relevant matter as appropriate

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ADS-B IMPLEMENTATION STATUS IN THE APAC REGION

State/ Administration	ADS-B Ground Infrastructure and ATC System readiness or Implementation plan	Date of issue/ effectiveness date of equipage mandate	Mandated Airspace and/or ATS-routes	Intended separation criteria to be applied	Remarks
AFGHANISTAN	ADS-B & Multi Lateration system installed.				subject to safety assessment
AUSTRALIA	A total of 50 ADS-B ground stations and 28 WAM stations are operational (Total 78) ATC readiness since 2004 ADS-B data sharing with Indonesia operational since 2/2011. ADS-B data sharing planned with PNG ASMGCS using multilateration and ADS-B is operational in Brisbane, Sydney, Melbourne and Perth November 2016 – ADS-B converted to "radar like" Cat 48 for use in Melbourne Terminal Area and Perth Terminal Area in early 2017. CMATS replacing the current ATM system is expected to be fully operational in 2024 period.	2009/effective date of mandating in upper airspace 12/12/2013. An ADS-B mandate for all IFR aircraft applies from 2/2017. Some limited exemptions for foreign registered aircraft and some private operations.	All airspace for IFR aircraft from 2/2017	2.5NM, 3NM and 5 NM surveillance separations. 3/2016 - Manual of ATC updated to include 3 nautical mile separation using ADS-B in terminal control unit. 3/2017 – 2.5NM separation authorized using ADS-B when also used with radar. Vectoring allowed using ADS-B Precision Runway Monitoring for Sydney WAM	WAM is operating in Tasmania since 2010 with 5 NM separation service. WAM is also operating in Sydney for 3 NM separation service in TMA and for precision runway monitoring function. CASA has approved the use of reduced specification ADS-B avionics to support ADS-B IN and ATC situational awareness for VFR aircraft
BANGLADESH	Bangladesh has a plan to install four ADS-B ground stations to be installed at Dhaka, Cox's Bazar, Saidpur and Barisal Airports by 2019. ADS-B data will be integrated with new ATM system at Dhaka. Bangladesh has also a plan to install MLAT stations to provide surface movement control at HSIA, Dhaka as well as TMA coverage as a backup and complimentary RADAR coverage to the Dhaka MSSR.				Bangladesh is willing to share ADS-B data with neighbouring States to enhance the safety and surveillance capability in the sub-region.

State/ Administration	ADS-B Ground Infrastructure and ATC System readiness or Implementation plan	Date of issue/ effectiveness date of equipage mandate	Mandated Airspace and/or ATS-routes	Intended separation criteria to be applied	Remarks
BHUTAN	ADS-B ground infrastructure feasibility study will be completed in the middle of 2020.	Equipage mandate will be issued once after the completion of feasibility study.			
BRUNEI DARUSSALAM	5 ADS-B ground stations with WAM functionality installed in 2015 and full operation in October 2016. ADS-B/WAM data are fused with radar data in the TopSky ATC Automation system (Thales) to enhance full radar surveillance coverage for Brunei Darussalam. Memorandum of Understanding (MOU) on ADS-B data sharing with Singapore and Brunei Darussalam is expected to sign in April 2019.				
CAMBODIA	3 ADS-B ground stations installed at Phnom Penh, Siem Reap and Stung Treng City since 2011 and able to provide full surveillance coverage for Phnom Penh FIR. Cambodia is willing to share data with others.				
CHINA	5 UAT ADS-B stations are used for flight training of CAFUC. The upgrade to 1090ES ADS-B stations project has already started in 2017, and the project is planned to finish by 2022. 308 ADS-B stations nationwide have already finished installation and SAT by the end of 2018. 4 ADS-B stations operational in Sanya FIR since 2008. Chengdu-Jiuzhai and Chendu - Lhasa route with 9 ADS-B stations. 9 ADS-B stations deployed on the routes H15 and Z1 by the end of 2015. 19 ADS-B stations at the small airport.	The operation of national ADS-B Service is implementing in step -by-step way. The phase 1-plan has been carried out since October 2019, details as fllows: ➢ ADS-B control operation will be implemented in En-route area upper 8400m without Radar control ability; ➢ Radar/ADS-B combined control operation will be implemented in En-route area upper 8400m with Radar control ability.			

State/ Administration	ADS-B Ground Infrastructure and ATC System readiness or Implementation plan	Date of issue/ effectiveness date of equipage mandate	Mandated Airspace and/or ATS-routes	Intended separation criteria to be applied	Remarks
		The ADS-B mandate published in October, 2019, in a separated AIC named "Implementation of ADS-B Control Services"			
HONG KONG CHINA	A larger-scale A-SMGCS covering the whole Hong Kong International Airport put into operational use in April 2009. Data collection/ analysis on aircraft ADS-B equipage in Hong Kong airspace conducted on quarterly basis since 2004. ADS-B trial using a dedicated ADS-B system completed in 2007. ADS-B out operations over PBN routes L642 and M771 at or above FL 290 within HK FIR was effective in December 2013 and within HK FIR at or above FL 290 has been effective since December 2016. ADS-B ground station infrastructure completed in 2013. ADS-B signal provided by Mainland China to cover southern part of Hong Kong FIR commenced in 2010 and has been put into operational use after commissioning of the new ATMS since November 2016.	AIP supplement issued on 29 Aug 2014 with 8 Dec 2016 as effective date.	HKFIR at or above FL290	5NM surveillance separation	Fully implemented ADS-B in HKFIR by phased approach to ensure safe and smooth integration of ADS-B into the Air Traffic Management System to provide aircraft separation service since November 2018.
MACAO, CHINA	Mode S MSSR coverage available for monitoring purposes.				Airspace – ATZ only
DEMOCRATIC PEOPLE'S REPUBLIC OF KOREA	ADS-B has been used as back-up surveillance of SSR since 2008.				

State/ Administration	ADS-B Ground Infrastructure and ATC System readiness or Implementation plan	Date of issue/ effectiveness date of equipage mandate	Mandated Airspace and/or ATS-routes	Intended separation criteria to be applied	Remarks
FIJI ISLANDS	ADS- B /multilateration ground stations installed. Situations awareness service provided in 2013.	ADS-B mandate commencing from 31st December 2013	Mandate for domestic registered aircraft.		
FRANCE ***(French Polynesia)***	ATM system is ready for ADS-B sensors/Installation of 5 first GS expected at beginning of 2017. 2nd stage with implementation of 7 GS and associated VHF coverage.			5 NM for airspace under coverage.	
INDIA	ASMGCS (SMR + Multilat) is operational at Delhi, Mumbai, Chennai, Kolkata, Bangalore, Hyderabad, Jaipur, Amritsar, Lucknow, Ahmedabad and Guwahati Airports. ASMGCS(SMR+MLAT) proposed at Cochin and Bhubaneswar (VOCI&VEBS) Expected to be completed by December 2019. ADS-B Ground Stations were installed at 21 locations across continental airspace and including Oceanic airspace at Port Blair. Installation of 10 more ADS-B Ground stations was completed. ATM automation systems at 22 ATC Centres are capable of processing ADS-B data and provide the information on Display.	AIP supplement issued on 17th April 2014 with effective date of implementation from 29th May 2014.			ADS-B in India to provide redundancy for radar and filling the surveillance gaps. ADS-B data trial operations commenced in 2015 in both Non-radar and radar environment, in En-route & Terminal phases of flight for ATC purposes. AIP SUP 18 of 2014 issued ADS-B based APP approved at VOCL and VOCB
INDONESIA	All 30 ADS-B ground station have been met with DO260B in November 2019; The 18 new ADS-B ground stations, with DO260B capability, will be established to cover the traffic in terminal and area. The 7 ADS-B ground station has been installed in Papua. The rescheduling of completion for 11		Starting on 23rd April 2020, Indonesia has implemented mandatory ADS-B equipment for all transport aircraft	Using 5 NM separation standard.	ADS-B data sharing had been conducted by Indonesia with Australia and Singapore. LOA of collaboration in ADS-B data sharing has been

State/ Administration	ADS-B Ground Infrastructure and ATC System readiness or Implementation plan	Date of issue/ effectiveness date of equipage mandate	Mandated Airspace and/or ATS-routes	Intended separation criteria to be applied	Remarks
	ground stations in 4Q2021. The ADS-B ground stations has been integrated to 9 ATC systems and 3 others will follow after being upgraded.		category flying at all level (SFC up to FL600) in 2 ACCs, 9 TMAs and 10 Airports.		achieved with India. LOA of collaboration in ADS-B data sharing are under reviewing by Malaysia, Philippines and PNG.
JAPAN	Multilateration Systems for surface monitoring have been implemented at eight airports PRM (WAM) has been implemented at Narita Airport. En-route WAM system is manufacturing and will be put into operation in FY2018 Plan to evaluate accuracy of ADS-B information under RAD condition.				
LAO PDR.	2 ADS-B ground stations were installed in Vientiane and Luangprabang Int'l Airport in 2015 and the ADS-B data is fused with MSSR data target in the ATM Automation system. 3 additional ADS-B ground stations (DO-260B compliant) will be completed the installation at existing MSSR sites (Xiengkhouang, Savannakhet and Champasack) by 2016 to Q1 of 2017 to enhance the full ADS-B coverage of Lao FIR.				

State/ Administration	ADS-B Ground Infrastructure and ATC System readiness or Implementation plan	Date of issue/ effectiveness date of equipage mandate	Mandated Airspace and/or ATS-routes	Intended separation criteria to be applied	Remarks
MALAYSIA	Ground Infrastructure: Kuala Lumpur FIR: 1. Installation of two (2) ADS-B GS in Langkawi and Genting has been completed in October 2017. 2. Upgrading of Kuala Terengganu ADS-B for ADS-B Version 2 capability is to be completed at the end of Dec 2021. 3. Operation of all three ADS-B in new Kuala Lumpur ATC System is to be completed in Dec 2021. Kota Kinabalu FIR: Four (4) new ADS-B will be installed in Kuching, Bintulu, Kota Kinabalu and Sandakan, to be completed in Dec 2021. Implementation Plan: Phase 1: ADS-B services on specific ATS routes and Flight Levels within Kuala Lumpur FIR, target date Mar 2021. Phase 2: ADS-B as secondary means of surveillance within the Kuala Lumpur FIR for en-route airspace. Target date: Mar 2022. Phase 3: ADS-B used as the primary means of surveillance for en-route airspace. (TBA)	AIC Issued on September 2017. AIP Supp on 16 Jan 2020.	Phase 1: On ATS routes N571, P628, L510, P627, L645 and P574 at FL 290 to FL 410 within Kuala Lumpur FIR Phase 2: En-route airspace	ICAO approved surveillance separation.	
MALDIVES	4 ADS-B stations installed in Nov. 2012 (2 at Male' Ibrahim Nasir Intl Airport, 1 at Kulhudhuffushi Island in the North and 1 at Fuah Mulah Island in the South to cover 95% of the FIR at/above FL290. Maldives' ADS-B is integrated with the ATM system (in November 2013), and under observation prior to commencing trials. Maldives has planned to share ADS-B data with its adjacent FIRs. Updated by email				Seaplane in Maldives equipped with ADS-B for AOC purpose. These seaplanes have ADS-B IN functions as well.

State/ Administration	ADS-B Ground Infrastructure and ATC System readiness or Implementation plan	Date of issue/ effectiveness date of equipage mandate	Mandated Airspace and/or ATS-routes	Intended separation criteria to be applied	Remarks
MONGOLIA	Ten ADS-B ground stations for combination SSR and filled the surveillance gaps implemented in 2015 and integrated with ATM system and trial operation in early 2016.				
MYANMAR	**a) The ADS-B Implementation Update** - The five ADS-B ground stations have been installed in Myanmar. Among them, SITTWE and CoCo Island ground stations are installed in 2014, and are DO260 compliant. The other 3 stations, YANGON, MANDALAY and MYEIK airport ground stations are DO260B compliant and installations were finished in 2016. - All ADS-B data are fused with MSSR data in the TopSky ATC Automation system (Thales) in 2016 and using as MSSR backup in Yangon ACC. **b) The ADS-B data sharing update between neighbouring States** - Myanmar and India signed the MOU agreement for ADS-B data sharing on 6th May 2015. ADS-B data sharing test between Agartala (India) - Sittwe (Myanmar), and Port Blair (India) - CoCo Island (Myanmar) have been accomplished between technical teams since June 2018. At present, the shared ADS-B data from Myanmar side is now using as backup automation system at Kolkata for test purpose. But, Myanmar side is needed to discuss with ATM manufacturer for operational use of the India's Data at Yangon ACC. - Myanmar have planned to install new ADS-B Station in the 2nd quarter of 2019 at LASHIO Airport located in north-eastern	Doing ADS-B data analysis and statistic for ADS-B equipped Aircraft in Yangon FIR.			Supplement radar and fill the gaps to improve safety and efficiency ADS-C/CPDLC integrated in Yangon ACC since 2010.

State/ Administration	ADS-B Ground Infrastructure and ATC System readiness or Implementation plan	Date of issue/ effectiveness date of equipage mandate	Mandated Airspace and/or ATS-routes	Intended separation criteria to be applied	Remarks
	part of Myanmar closed to the China-Myanmar border near the LINSO transfer point on A599 ATS route. After the installation finished, the ADS-B data sharing process can be proceeded between Myanmar and China.				
NEPAL	Four ADS-B ground stations have been installed in 2019 at Kathmandu (Phulchowki), Bhairahawa, Nepalgunj and Dhangadi.				Safety assessment will be done soon.
NEW CALEDONIA	Three ADS-B ground stations commissioned in 2010 to cover international traffic at La tontouta airport serving Tontouta ACC & APP. It is used for Situation awareness and SAR.				
NEW ZEALAND	MLAT and ADS-B data is being used from the WAM system centred in the Queenstown area to provide surveillance coverage and surveillance separation (5 NM) over the southern half of the South Island of New Zealand. MLAT and ADS-B data from the Auckland MLAT system is used to support surface movement control at NZAA (Auckland). The New Zealand Navigation and Airspace and Air Navigation Plan "New Southern SKY" was issued in May 2014 34 ADS-B ground stations have been installed.	New Zealand introduced the following ADS-B OUT mandate as follows: ADS-B OUT equipment requirement for all aircraft operating in NZZC FIR controlled airspace above FL 245 from 31 December 2018 New Zealand has plans to introduce the following ADS-B OUT mandates: ADS-B OUT equipment requirement for all aircraft operating in any controlled airspace within the NZZC FIR from 31 December 2021. Since July 2018 all new aircraft registered in New	All controlled airspace within the NZZC FIR above FL245	5 NM surveillance separation in en-route controlled airspace, and 3NM surveillance separation in terminal controlled airspace – where surveilled.	

State/ Administration	ADS-B Ground Infrastructure and ATC System readiness or Implementation plan	Date of issue/ effectiveness date of equipage mandate	Mandated Airspace and/or ATS-routes	Intended separation criteria to be applied	Remarks
		Zealand, or any currently registered aircraft upgrading transponder(s) are required to install DO260B transponder(s) which meet the relevant NZCAA rule set. The Rule specifies the minimum Technical Standing Orders (TSO), or transponder GNSS receiver models for position input into ADS-B.			
PAKISTAN	Tender for procurement of 5 ADS-B stations issued to be installed at Pasni, Lakpass, Rojhan, Dalbandin and Laram-top. Contract expected to be finalized by end of 2016. These stations will be DO260B compliant and operational by end of 2017.				
PAPUA NEW GUINEA	Initially 7 ADS-B sites to be deployed across PNG to provide seamless coverage above FL285. Three (3) sites installed as of December 2017. Two (2) of these are operational.First site to be installed May/June 2017, with remainder to be completed in 2018. Additional 7 sites to be rolled-out in the 2018/19 timeframe. Site location will be dependent on infrastructure, security and an analysis of Phase 1 site performance. PNGASL (ANSP) will commence a transition to new ATM automation system in May 2018. The system will support fusion of ADS-B and RADAR data.	An ADS-B mandate is on CASA PNG roadmap, however legislation yet to be developed. The Australian mandates will largely drive equipage for overflights (e.g. East-Asia to Australia/South Pacific). Expectation is that PNGASL (the ANSP) will lead development of ADS-B mandate framework. Initial steps may include mandate above F245 – but will depend on performance of Phase	None	**Air Traffic Control** <u>Approach/ Arrivals</u> 2018 – 5NM 2019 – 3NM (approach) <u>Upper Airspace (>FL245)</u> 2017/18 – Situational awareness. 2018/19 – 5NM Note: Implementation dictated by training requirements and new ATM system	

State/ Administration	ADS-B Ground Infrastructure and ATC System readiness or Implementation plan	Date of issue/ effectiveness date of equipage mandate	Mandated Airspace and/or ATS-routes	Intended separation criteria to be applied	Remarks
	5 mile separation to be provided using ADS-B and fused ADS-B/Radar from May 2018. From 2018 onwards, PNGASL will be looking to share ADS-B data with Indonesia and Australia.	1 ADS-B deployment. Country-wide mandate not envisaged before 2021/22.		transition priorities. **Flight Service** <u>Directed Traffic (FIS)</u> 2019 – Situational awareness	
PHILIPPINES	One ADS-B GS installed at the Manila ATM Center for situational awareness. One ADS-B Ground Station installed at Bataraza, Palawan for data sharing with Singapore. Additional ground stations are planned to be installed in Laoag Airport, Tagaytay, Jomalig Island, Puerto Princesa Airport, Mt. Majic Mactan, and General Santos "Tambler" Airport.				
REPUBLIC OF KOREA	Currently, MLAT/ADS-B are being used for surface monitoring and situation awareness at some airports. For enroute surveillance , additional installation of 10 ADS-B Ground stations is now in progress. It will be completed by December 2019. 95% of Korean national carriers are equipped with ADS-B Out transponder as of 2018.	After trial operation in the first half of 2020, time for equipage mandate will be decided.	After trial operation in the first half of 2020, the scope of application will be decided .	After trial operation in the first half of 2020, separation criteria will be decided.	
SINGAPORE	The airport MLAT system was installed in 2007 and "far-range" ADS-B sensor was installed in 2009. ATC system has been processing ADS-B data since 2013.	AIC was issued on 28 December 2010/effective from 12 Dec.2013. ADS-B OUT equipment requirement for all aircraft operating on selected ATS routes within the WSSS FIR from 27 January	At and above FL290, affecting the following ATS routes L642, L644, M753, M771, N891 & N892	40nm implemented on ATS routes L644 and N891. 20nm implemented on ATS routes L642, M771, M753 and N892.	Safety case was completed end of November. 2013.

State/ Administration	ADS-B Ground Infrastructure and ATC System readiness or Implementation plan	Date of issue/ effectiveness date of equipage mandate	Mandated Airspace and/or ATS-routes	Intended separation criteria to be applied	Remarks
		2022. ADS-B OUT equipment requirement for all aircraft operating within the WSSS FIR from 26 January 2023. AIP updated in May 2018 to reflect the ADS-B equipment certified as meeting: a. EASA - (AMC 20-24), or b. EASA CS-ACNS (Subpart D - Surveillance - SUR), or c. FAA - Advisory Circular No: 20-165A (or later versions), or d. The equipment configuration standards in Appendix XI of Civil Aviation Order 20.18 of CASA.	At and above FL290, affecting the following ATS routes L517, L625, L649, M758, M767, M768, M772 & N884.		
SRI LANKA	Total of 5 ADS-B Ground Receiving Stations and 01 Central Processing Station have been installed in March 2017. ADS-B Data is fused with Multi-sensor Data, including MSSR and ADS-C in the ATM system at Colombo ACC Ratmalana was launched for operational used on 15 Nov. 2017. New ATM system planned for operational at APP Centre in 2018 will also be capable of fusing Multi-sensor Data, including MSSR and ADS-B	Revised Date of Equipage mandate would be 31st Dec 2020. Ref: AIC A02/16 (Initially AIC A02/14 was issued in November 2014)	All ATS Routes within Colombo TMA	Initially 5 NM within Approach Radar Coverage, 8 Nm within Area Radar Coverage & Procedural Separation minima outside Radar Coverage.	On completion of a safety assessment, use of ADS-B alone for ATC separation purposes.

State/ Administration	ADS-B Ground Infrastructure and ATC System readiness or Implementation plan	Date of issue/ effectiveness date of equipage mandate	Mandated Airspace and/or ATS-routes	Intended separation criteria to be applied	Remarks
THAILAND	Six ADS-B ground stations (DO-260B compliant) have been installed since 2015 for the research and development purpose. Installation of more ADS-B ground stations to provide coverage in terminal and airport areas is being assessed. The MLAT system have been implemented at VTBS and VTBD. At VTSP and VTCC, MLAT systems are being installed with expectation to be operational in 2020. Multiple surveillance sensor data such as Mode-S SSR, ADS-B, MLAT and WAM are integrated into the new ATM systems and expected to be operational in early 2020. The ATS surveillance data sharing with the adjacent FIRs was approved in principle in October 2018.	Aircraft equipage mandate is expected to be issued in 2021 with the expected target effective date in 2026.			
TONGA	Trial planned for 2017				
UNITED STATES	The US identified required ADS-B Service Volumes in 2007. Using data from over 600 terrestrial radio sites, the US domestic ADS-B system became operational in 2014. As of 1 January 2020, ADS-B aircraft equipage is mandated in most controlled airspace within the US. Over 160,000 US registered aircraft are now equipped. ADS-B is available to U.S. air traffic control facilities for ATC separation; all En Route Centers and major Terminal facilities are using ADS-B for ATC separation.	The U.S. ADS-B Out rule (14 CFR 91.225 and 14 CFR 91.227) was issued in May 2010 and specifies that the ADS-B Out mandate is effective on 1 January 2020.	Class A, B, and C airspace, plus Class E airspace above 10,000 ft MSL. See 14 CFR 91.225 for details.	The U.S. is using both terminal and en route (5nm) separation criteria, depending on the specific airspace and available surveillance information. Terminal separation includes the following separation criteria: - 3nm - 2.5nm	The U.S. has implemented integrated WAM/ADS-B in the following terminal areas: Charlotte LAX Implementation of integrated WAM/ADS-B is being considered for additional U.S. terminal areas.

State/ Administration	ADS-B Ground Infrastructure and ATC System readiness or Implementation plan	Date of issue/ effectiveness date of equipage mandate	Mandated Airspace and/or ATS-routes	Intended separation criteria to be applied	Remarks
				- independent parallel approach operations down to 3600 ft centreline separation - dependent parallel approach operations down to 2500 ft centreline separation (currently 1.0 nm diagonal distance).	
VIET NAM	Two phases ADS-B implementation plan adopted. Phase 1 implemented in March 2013. Phase 2 commenced in 2015 for whole lower and upper Hanoi FIR and 2018 for Ho Chi Minh FIR	AIC issued on 20 June 2013/ADS-B mandating effective from 12 December 2013 in Ho Chi Minh FIR.	M771, L642, L625, N892, M765, M768, N500 and L628 At/above FL290.		Operators required to have operational approval from State of aircraft registry.

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ADS-B Data Sharing Implementation Status in the Asia/Pacific Region

Related States/Administrations	ATS Route Served	Initiation Year	Agreement Date	Target Data Sharing Year	Implementation Status	Remarks/Challenges
Australia - Indonesia	Phase 1a L511, R592, G578, B349, M735, G326, A587, M768, A461, R340, B472, B473, G459	2010	2010	2010	Completed	SEA Report: Project 1
	Phase 1b M774, A458, J199, M766, G326, A587	2014	2014	TBD	Ongoing	Browse Basin oil rig (Australia) awaiting acceptance testing
	Phase 2 L895, A585	2017	2019	TBD	Completed	SEA Report: Project 2
Australia - Papua New Guinea	TBN				Ongoing	SEA Report: Project 6
Brunei - Singapore	M758, M768, M767	2015	2019	2019	Ongoing	SEA Report: Project 2
China – Hong Kong, China	Project 1 M771, L642	2010	2013	2013	Completed	
	Project 2 M771, L642, A1	2017		2018	Completed	Supplementary data sharing of Route A1
China - Lao PDR	A581, B465	2019		TBD	Ongoing	
China - Myanmar	A599	2019		2021	Ongoing	
India - Indonesia	B466, P574, N563	2018		2019	Ongoing	Data Sharing LoA on progress
India - Malaysia	N571, P628, L510, P627, L645, P574	2017		2021	Ongoing	
India - Myanmar	A201, A599, B465, G463, L507, P646, P762, G472, L524, M770, L759	2015	6/5/2015	2018	Completed	Myanmar side: Discussion with ATM manufacturer for operational use at ACC is needed. Indian side completed.
Indonesia - Papua New Guinea	R204, A215, B462, B456	2018	2019	2022	Ongoing	SEA Report: Project 6
Indonesia - Malaysia	B466, N571, P628, L510, P627, L645 and P574	2017		2021	Ongoing	
Indonesia - Philppines	A461, R590, B472	2018	2019	2022	Ongoing	SEA Report: Project 5
Indonesia - Singapore	G580, L504, M761 , M646, N875	2017		TBN	Ongoing	SEA Report: Project 2

ADS-B Data Sharing Implementation Status in the Asia/Pacific Region

Related States/Administrations	ATS Route Served	Initiation Year	Agreement Date	Target Data Sharing Year	Implementation Status	Remarks/Challenges
Malaysia - Singapore	**Project 1** M758, M768, L649,	2017		2021	Ongoing	SEA Report: Project 2
	Project 2 M904, M765, N875, N891	2018		2021	Ongoing	SEA Report: Project 2
Malaysia - Thailand	N571, P628, L510, P627, L645, P574	2018		2021	Ongoing	
Myanmar - India	Project 1: Effect on Myanmar A201, A599, B465 Effect India: G463, L507, P646, N895	2018	2015	2020/2021	Ongoing	Data communication between Myanmar and India is unstable. Different Multiaircraft Address from India ADS-B Data
	Project 2: L301, M770	2019	2016	2020/2021	On trial	
Philippines - Singapore	N884, M522, M754, M767, M772, L649	2018		2018	Completed	SEA Report: Project 2
Singapore - Vietnam	**Project 1** N892, N891, M771, M753, M758, L642, L644	2007		2013	Completed	SEA Report: Project 2
	Project 2 N892, N891, M771, M753, M758, M904, L642, L644	2014	2016	2018	Completed	SEA Report: Project 2

REPORT FROM SOUTHEAST ASIA SUB GROUP

Singapore, 3-5 November 2019

States Present

China
Hong Kong China
Indonesia
Malaysia
Singapore
Thailand
Vietnam

Previously Identified Projects

The South East Asia Group provide an update on the near term implementation of the following projects that were identified in previous meetings.

Project 1 – ADS-B Data Sharing Between Australia and Indonesia

Phase 1a
Indonesia and Australia sharing ADS-B data from the following sites:

- Saumlaki (Indonesia) (Installed)
- Merauke (Indonesia) (Installed)
- Waingapu (Indonesia) (Installed)
- Kintamani - Bali (Indonesia) (Installed)
- Thursday Island (Australia) (Installed)
- Gove (Australia) (Installed)
- Broome (Australia) (Installed)
- Doongan (Australia) (Installed)

Data Sharing Agreement signed in Nov 2010;
Communications links between Australia and Indonesia were upgraded from VSAT to terrestrial links in Mar 2016. The service quality was improved.

Benefits
Data used for air situational awareness and safety nets.
Enhanced Safety at FIR boundary.
Operational service commenced by Australia in 2010.
Indonesia has been using the data for Tier 2 services since Sep 2014

Phase 1b
Indonesia and Australia sharing ADS-B data from the following additional sites:

- Timika (Indonesia) (Installed) - Commenced data sharing
- Kupang (Indonesia) (Installed) - Commenced data sharing
- Christmas Island (Australia) (Not yet installed)
- Browse Basin oil rig (Australia) (installed in 2018)

Data Sharing Agreement signed on 18 Jun 2014:

Indonesia announced the use of ADS-B for situational awareness on 24 July 2014. Indonesia announced on 30 Apr 2015 that ADS-B will be used for separation from FL290 to FL460 (tier-1) with effect from 25 June 2015. The carriage of ADS-B equipment for flights between FL290 and FL460 remain optional until Dec 2017. From 1 Jan 2018, Indonesia implemented ADS-B mandate from FL290 to FL600 in Jakarta and Ujung Pandang FIRs.

Phase 2
Data sharing between Australia and Indonesia already completed.

- Cilacap (Indonesia)

Project 2 – ADS-B Data Sharing In Southeast Asia

Phase 1
Under the near term implementation plan, the parties have commenced ADS-B data sharing from the following sites:

- Singapore (Singapore provide data to Indonesia)
- Natuna (Indonesia provide data to Singapore)
- Matak (Indonesia provide data to Singapore)
- Con Son (Viet Nam provide data to Singapore)
- Sanya FIR (China provide fused data from four ADS-B stations to Hong Kong China)

VHF radio communication services (DCPC) were provided from the following stations to Singapore and Hong Kong China. This is to enable implementation of radar-like separations in the non-radar areas within the Singapore FIR as well as routes L642 and M771.

- Natuna VHF (Install for Singapore by Indonesia) (Installed)
- Matak VHF (Install for Singapore by Indonesia) (Installed)
- Con Son VHF (Install for Singapore by Viet Nam) (Installed)
- Sanya VHF (Install for Hong Kong China by China) (Installed)

ADS-B Data sharing and DCPC services agreement between Singapore and Indonesia signed in Dec 2010.

ADS-B Data sharing and DCPC services agreement between Singapore and Vietnam signed in Nov 2011.

DCPC services agreement between China and Hong Kong China signed in 2005.
ADS-B Data sharing agreement between China and Hong Kong China signed in 2013.

Operational Status
Singapore agreed on separation minima with Viet Nam and have commenced on ADS-B operations since Dec 2013. Singapore commenced with 40nm separation and subsequently reduced to 30nm separation between Singapore and Ho Chi Minh FIR. Further reduction to 20nm longitudinal separation was implemented on 10 Nov 2016.

All 4 administrations (China, Hong Kong China, Singapore and Viet Nam) agreed that operational approval is not required.

Initial Benefits

The above sharing/collaboration arrangements will benefit L642, M771, N891, M753, N892 and L644. Enhanced safety and reduced separation have been achieved. Mandate was effective in Singapore FIR from Dec 2013. China published the mandate in Oct 2019. Mandate for domestic fleet was effective on 10 Oct 2019. Mandate for international fleet will effective on 31 Dec 2020. Hong Kong China's ADS-B mandate was effective from Dec 2016 for aircraft at FL290 and above.

Phase 2
The Philippines has installed ADS-B station at Manila ATM Centre. It will install six other ADS-B stations within Manila FIRs (Puerto Princesa-Palawan, Laoag, Jomalig, Mt Majic, General Santos Airport and Iba Zambales). These ADS-B stations are targeted to complete by 2020.

Singapore and the Philippines signed an MOU in Oct 2015 to make available ADS-B data and VHF facilities at Bataraza, Palawan for Singapore. The project was completed in Aug 2017.

The Philippines indicated that there is a surveillance gap at Northwestern part of Manila FIR and is studying acquisition of space-based ADS-B data to cover the surveillance gap.

China's four ADS-B ground stations deployed in Sanya FIR may be able to cover parts of the surveillance gap. China is prepared to share its ADS-B data, via its ADS-B data processor, with neighbouring states.

Brunei signed an MOU with Singapore in April 2019 where Brunei will share ADS-B data with Singapore and provide the VHF facilities for Singapore ATC use. Data sharing is expected to commence in 2020.

Singapore and Viet Nam signed an agreement in Jul 2016 to make available ADS-B data and VHF facilities at Ca Mau for Singapore. The facilities were commissioned in Nov 2018.

Phase 3
Vietnam has ADS-B coverage at the Southern part of L625, N892, N884, M767 and M772 and Vietnam is willing to share the ADS-B data with the Philippines and Singapore. The discussion between Singapore and Vietnam is in progress.

The Philippines is studying the use of space-based ADS-B to cover its surveillance gaps.

In addition to sharing ADS-B data from its ADS-B station at Terrengganu, Malaysia is also willing to share the ADS-B data from its ADS-B stations at Kuchin, Bintulu, Kota Kinabalu, which are scheduled to be installed by 2021. The data from these three stations are also useful to Indonesia and will be shared under Project 3. Singapore will share data from its Singapore ADS-B station with Malaysia. It is noted that data sharing from Terrengganu can only be done after June 2020.

Malaysia and Singapore will initiate discussions after June 2020 on data sharing from the following sites:

- Terrengganu (Malaysia) (Installed)
- Bintulu (Malaysia) – To be installed by 2021
- Kota Kinabalu (Malaysia) – To be installed by 2021
- Kuching (Malaysia) – To be installed by 2021
- Singapore (Singapore) - Installed

Initial benefits
Enhanced Safety at FIR boundary and coverage redundancy

Project 3 – ADS-B data sharing between Indonesia and Malaysia

Indonesia and Malaysia are willing to share the ADS-B data from the following sites:

- Pontianak (Indonesia) – Installed
- Tarakan (Indonesia) - Installed
- Bintulu (Malaysia) – To be installed by 2021
- Kota Kinabalu (Malaysia) – To be installed by 2021
- Kuching (Malaysia) – To be installed by 2021

Malaysia and Indonesia are reviewing the collaboration agreement.

Initial benefits
Enhanced Safety at FIR boundary and coverage redundancy

Project 4 – ADS-B data sharing between Cambodia, Thailand and Viet Nam

Cambodia is willing to share the ADS-B data from the following sites:

- Phnom Penh International Airport (installed)
- Siem Reap International Airport (installed)
- Stung Treng City (installed)

Vietnam is planning to install stations in the HCM FIR from 2016 to 2020. Vietnam is willing to share data with Cambodia and Thailand.

Initial benefits
For redundancy

Project 5 – ADS-B data sharing between Indonesia and the Philippines

Indonesia and the Philippines initiated discussion in 2019 on data sharing:
Melonguane (Indonesia) (will be installed in 2020)
General Santos (The Philippines) (yet to install)

Initial benefits
Situational awareness

Project 6 – ADS-B data sharing between Australia, Indonesia and Papua New Guinea

Data Sharing between Australia and Papua New Guinea

- Thursday Island (Australia) (installed)
- Gove (Australia) (installed)
- Kintore (Australia) Not yet installed – Target to be installed by 2019
- Burns Peak – Port Moresby (PNG) (installed)
- Mt Robinson (PNG) (to be installed by 2018) or Mt Nauwein (to be installed by 2018)

Note that the above information was based on previous updates as both Australia and Papua New Guinea were not present at the meeting.

Data Sharing between Indonesia and Papua New Guinea

- Mt Nauwein (PNG) (to be installed by 2018)– Phase 1
- Merauke (Indonesia) (installed) – Phase 1
- Jayapura (Indonesia) (installed)– Phase 2

New ATM system installed in PNG.
The parties will probably sign direct bi-lateral agreements in 2020.

General remark for all the above projects: As agreed at previous APAC ADS-B Task Force and WG meetings, sharing of ADS-B data should include sharing of VHF radio facilities/services, where possible

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REPORT FROM BAY OF BENGAL AD HOC WORKING GROUP
SEA/BOB ADS-B WG/14
(Singapore, 3-5 December, 2019)

States Presented:

Bangladesh
Bhutan
China
Indonesia
Malaysia
Maldives
Myanmar
Thailand
India
Sri Lanka

The participants met to update the status of implementation of ADS-B and possible Data sharing between the neighbouring States.

Implementation Updates

1. Bangladesh

We are trying to modernize our systems through the implementation of ATM project. At first it was in PPP & now it is on G2G with France. This was under the process of government approval. Government approval is granted, and 5 ADS-B receivers will have been installed at detailed below,

Cox's Bazar, Barisal, Saidpur, Dhaka and Sylhet, there is another one for Extended Economic Zone at new area in the Bay of Bengal which is 200NM at south of the country.

2. Bhutan

Bhutan cannot join previous SEA/BOB ADS-B meeting as we do have plan to implement ADS-B, but now we are targeting to complete ADS-B feasibility study by mid of 2019 and now it is extended up to mid of 2020.We found out that feasibility study (Coverage and ground station location) is necessary as Bhutan is surrounded by mountain terrain.

As per the result of feasibility study we are going to implement installation of ground station.

Bhutan do not have any national policy or regulation about data sharing, so we will be sharing data with any neighbouring countries/states as per the regional norms and conditions.

3. China
China has been continuously promoting to push forward the application of ADS-B technology. China provided update on the installation and related activities regarding ADS-B surveillance system as follows:

- 5 UAT ADS-B stations are used for flight training of CAFUC. The upgrade to 1090ES ADS-B stations project has already started in 2017, and the project is planned to finish by 2022;
- 4 ADS-B station in operational in Sanya FIR since 2008;

- Chengdu-Jiuzhai and Chendu - Lhasa route with 9 ADS-B stations;
- 9 ADS-B stations deployed on the routes H15 and Z1 by the end of 2015;
- 19 ADS-B station at the small airport; and
- 308 ADS-B stations nationwide have already finished installation and SAT by the end of 2018. And there are 2 level-1 data processing centres working in main-standby mode for redundancy, 8 level-2 data processing centres to concentrate data from data stations within its area of responsibility, as well as 36 data stations to collect received data from GSs. All the installation and SAT of GSs, level-2 data processing centres and level-1 data processing centres have already complete. The trial operation has started from October 10, 2019 and the ADS-B mandate had also been published on October 1, 2019, which is effective from October 10.2019.

4. Indonesia

Indonesia earlier informed that ADS-B ground station at Aceh is already operational and expressed willingness to share data with India (It was earlier decided to have Port Blair-Aceh data sharing, but for better coverage and usability it was suggested in the meeting to have data sharing of upcoming Campbell Bay ADS-B - Aceh when India is ready).

Indonesia now will share the data with Campbell Bay ADS-B – Aceh only.
Campbell Bay ADS-B is installed.

Letter of Agreement between Indonesia and India regarding ADS-B data sharing is on progress
Letter of agreement is agreed by Indonesia and India, yet to be signed.

5. Malaysia

Malaysia has completed the installation of the two new ADS-B ground station in Langkawi and Genting and will be integrated into the ATM system in 2018. Both stations are compliance with DO-260B with output data handling function as plot and tracks (ASTERIX CAT21 rev. 0.23, rev. 0.26 and rev. 2.1.)

Malaysia venturing to share data with Indonesia, India and Thailand. Data sharing from India (Port Blair or Campbell Bay ADS-B), or from Indonesia (Aceh ADS-B) or from Thailand will close the surveillance gap within the KL FIR.

Malaysia available ADS-B data through ADS-B central processing system is integrated to existing ATC Systems via temporary node and only capable for legacy data exchange format. With that limitation and unavailability of other essential hardware, the existing ATC is not capable for data sharing. The new ATC system is in progress and only expected to be completed by 2H2019, thus Data Sharing target has to be shifted to 2H2021. However, Malaysia is reviewing the sample agreement proposed by India in 2018, and will revert as soon as possible.

ATC system is in progress and only expected to be completed by 2Half of 2020. Data sharing will be clarified after that activity.

6. Maldives

Not present
Maldives started using ADS-B to enhance ATS surveillance capability in Male FIR on 7th February 2016.

With 4 ground stations (2 autonomous stations at Male; 2 unduplicated ground stations: 1 at an island in the North and the other in the South), the ADS-B provides coverage up to 90% of Male FIR above FL290.

ADS-B serves as the backup for Male radar and is in use for vectoring and 5NM separation commensurate with Radars

As part of the effort towards full implementation of ADS-B, from March 2017 aircraft imported for commercial air transport in the Maldives are required to be equipped with ADS-B Out, as published in AIP ENR 1.6-3.

The full implementation, which would require carriage of ADS-B Out, is targeted for the year 2020

Maldives is making efforts to complete the airworthiness approval for all locally registered aircraft, already equipped with ADS-B.

Out of the 73 aircraft registered for commercial air transport in the Maldives, 62 aircraft have given approval for ADS-B by Maldives Civil Aviation Authority (MCAA).

This include 55 seaplanes (Twin Otter aircraft with floats) conducting commercial air transport between Velana International and resort islands. These aircraft, although operate on VFR, are fitted with ADS-B out functionality combined with GPS to give highly accurate positional information.

7. Myanmar

The 5 ADS-B ground stations have been installed in Myanmar. Among them, Sittwe and Co Co Island ground stations are installed in 2014 and they are DO260 compliant, and Yangon, Mandalay and Myeik airports ground stations are DO260B compliant and installation was finished in 2016.

All ADS-B data are fused with MSSR data target in the Top Sky ATC Automation system (Thales) in 2016, and using as MSSR backup and surveillance monitoring in Yangon ACC.

In addition, Myanmar have planned to install new ADS-B Station in the First quarter of 2020 at Lashio Airport located in north-eastern part of Myanmar closed to the China-Myanmar border near the LINSO transfer point on A599 ATS route. After the installation finished, the ADS-B data sharing process can be proceeded between Myanmar and China *after March, 2020*.

For the communication links between Yangon and Beijing, it can use the existing 2M E1 IPLC link which is now using for AFTN messaging and (AIDC Testing) Voice, and also can be used the existing Yangon-Beijing VSAT link as backup.

Myanmar also willing to participate the special coordination meetings to promote relevant works in terms of the surveillance data sharing among the countries to enhance the safety and surveillance capability in the sub-region.

Lashio installation will be completed by First quarter of 2020.
Redundant Communication link via Land line / CRV / V-SAT is proposed under discussion.

8. Thailand

Thailand provided update on the installation and related activities regarding ADS-B and other related surveillance system as follows:

ADS-B Ground Infrastructure and ATC System Readiness or Implementation Plan

- MLAT has been in operation at VTBS since 2006 and has been installed at VTBD with the expectation to be operational in 2020. At VTCC and VTSP, M-LAT is being installed with expectation to be operational in 2020.

- Six ADS-B ground stations (DO-260B compliant) have been installed covering airspace at and above 20,000 feet primarily for research and development purpose and are being undergone the certification process by Civil Aviation Authority of Thailand (CAAT) with a target date by the end of 2020.

- Additional ADS-B ground stations are planned to be installed aiming at providing coverage from ground to 11,000 feet for TMA and Airport operations.

- Multiple surveillance sensor data including SSR, ADS-B and WAM are integrated into the new ATM systems and expected to be operational in early 2020.

- Legal assessment regarding ADS-B data sharing with other states has been underway.

Date of Issue/Effectiveness Date of Equipage Mandate

- Aircraft equipage mandate is expected to be issued in 2021 with the expected target effective date in 2026.

Data sharing

- ATS surveillance data sharing with adjacent FIRs was approved in principle in October 2018.

- User requirements, particularly ATS routes to be served, and communication link test plan are discussed in 2018-2019.

9. India (no update provided in 2018)

India informed that 21 ADS-B ground receivers have already been installed and the information has been promulgated through AIP SUPP 18/2014 to use ADS-B in the provision of ATS surveillance service. The data sharing agreement between India and Myanmar has been signed on 06th May 2015. India is willing to share ADS-B data with Indonesia, Malaysia and Sri Lanka. India has invited open tenders for procurement of ten more ADS-B Ground Stations for installation at Kadappa, Raipur, Pantnagar, Indore, Jabalpur, Bikaner, Goa, Aurangabad, Dhanbad and Campbell Bay (in Bay of Bengal near FIR boundaries of Chennai, Jakarta and Kuala Lumpur) is completed in third quarter of 2019. The The objective is to provide ADS-B coverage in areas where there is no or limited Secondary Surveillance Radar (SSR) coverage. The data from the above ADS-B ground stations is integrated with existing ATM systems at different Area Control Centres. India expects the ground stations to be DO-260B compliant and operational by the end of 2018. The ADS-B receivers are capable of DO-260B, but not all the ATM Automation Systems are capable of DO-260.

10. Sri Lanka (no update provided in 2018)

Not Present

Sri Lanka has installed 5, ADS-B stations and data received by the stations have been integrated and available for sharing. The ADS-B coverage is approximately 350NM from Piduruthalagala, the highest mountain situated in central Sri Lanka. Sri Lanka is willing to share this data with India and Maldives.

India is requested to provide a soft copy of draft agreement for sharing of ADS-B data with Sri Lanka so as to enable Sri Lanka to look into the terms and conditions of draft agreement.

ADS-B Data Sharing

Project 1 - ADS-B Data Sharing between China, Laos and Myanmar

Phase 1 *China and Laos sharing ADS-B data from following:*
Kunming ADS-B data processing Centre (china), which can customize the output of ADS-B data in version, specific area and height range depend on Laos's requirement.

Route to be affected B465.

China and Myanmar sharing ADS-B data from the following sites:
Lashio (Myanmar) Not yet installed – Target to be installed by March 2020.Route to be affected A599

China and Myanmar sharing ADS-B data from the following:
Kunming ADS-B Data Processing Centre (China), which can customize the output of ADS-B data in version、specific area and height range depend on Myanmar's requirement.

Operational Status
N/A

Expected benefits
- Enhanced air navigation safety at FIRs boundary.
- Promoting air traffic control work efficiency.

Project 2 - ADS-B Data Sharing between India and Indonesia

Phase 1
Aceh – Indonesia
Camp Bell Bay – India

Route to be affected B466, P574 and N563

Operational Status
Camp Bell to Chennai link BSNL is under testing. Indonesia waiting till CRV scheduled 1st quarter 2020. India is getting ready for CRV by the end of first quarter 2020 with PCCW.

Benefits
Enhanced safety by reduction in occurrences of LHDs and LLDs in BOB region.

Project 3 - ADS-B Data Sharing between India and Malaysia

Phase 1
Port Blair/Campbell-Langkawi (2H2021)
Route to be affected N571, P628, L510, P627, L645 and P574

Operational Status
New ATM system installation in June 2020.

Expected benefits
Enhanced safety by reduction in occurrences of LHDs and LLDs in BOB region.

Project 4 - ADS-B Data Sharing between India and Myanmar

Phase 1
The ADS-B data sharing between Kolkata and Yangon FIR was an initiative taken by India and Myanmar to enhance safety and reduce LHDs along Kolkata-Yangon FIR boundary.

In 6 May 2015, Myanmar and India have signed the MOU agreement for ADS-B data sharing between the two countries.

As per the data sharing agreement, ADS-B data sharing test between Agartala(India) and Sittwe (Myanmar) and Port Blair(India) and Coco Island(Myanmar) has been accomplished between technical teams since June 2018. Kolkata has integrated the ADS-B feed from Sittwe and Co Co Island in its Automation system. Presently the data is given in the back up automation system at Kolkata for test purpose and ADS B equipped aircrafts are tracked from as far as 250 nm west of Bangkok.

But for Myanmar side, India's data is just received to Yangon ACC technical management room and need to discuss with ATM Manufacturer (Thales) of Surveillance Display System to integrate India's ADS-B data to existing Surveillance Display System for operational use in Yangon ACC. Because the multicast address and port from India's ADS-B data are different with existing setup.

The communication link used for ADSB data transfer between Yangon and Kolkata is the existing E1 IPLC link which is used for DSC phone between the two ATS units.

Route to be affected A201, A599, B465, G463, L507, P646, P762, G472, L524, M770 and L759

Operational Status
Operationalized for situational awareness.

Expected benefits
Enhanced safety by reduction in occurrences of LHDs and LLDs in BOB region.

Project 5 - ADS-B Data Sharing between Indonesia and Malaysia

Phase 1
Langkawi - Aceh (~~2H2019~~ 2H2021)
Route to be affected B466, N571, P628, L510, P627, L645 and P574

Operational Status
New ATM Automation system installation by June 2020 then data sharing.

Expected benefits
Enhanced safety at FIR boundary

Project 6 - ADS-B Data Sharing between Malaysia and Thailand

Phase 1
Langkawi - Phuket

General discussion about possibility to share ADS-B data for route N571, P628, L510, P627, L645 and P574

Operational Status
N/A

Expected benefits
- Enhanced visibility of surveillance targets in Bay of Bengal.
- Enhanced situational awareness at FIR boundary.

Project 7 - ADS-B Data Sharing between India and Sri Lanka (no update provided in 2018, 2019)

Phase 1
Trivandrum – Colombo (2H2018)
Trichy-Colombo (2H2018)
Route to be affected TBN

Operational Status
N/A

Expected benefits
Enhanced safety at FIR boundary

Important Notes

1. Terminology used in the region should be standardised and consistent, and recognise what crew need to know.

2. States need to develop procedures for the use of DAPs in relation to operating procedures, for example the use of selected altitude information being displayed on the controllers' screens and related pilot practices: pilots and controllers need to be aware of each other's operating practices.

3. There is a need to consider the capture, storage, and potential uses of ADS-B data. For example, in some states those data might be used to draw premature conclusions about the causes of an accident or incident and result in inappropriate or unwarranted enforcement action. In addition, there were concerns about who can access ADS-B data and for what purposes. Examples of inaccurate data being used by members of the public to make complaints about aircraft flight paths and noise impost are a concern.

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