



ICAO

International Civil Aviation Organization

Tenth Meeting of the Aeronautical Communication Services Implementation Coordination Group (ACSICG/10)

Bangkok, Thailand, 24 - 26 May 2023

Agenda Item 6: Review and update the AMHS/ATN/AIDC Implementation Status

6.1 AMHS implementation Status

6.2 Readiness of AMHS to support IWXXM

AMHS IMPLEMENTATION AND READINESS STATUS FOR SUPPORTING IWXXM TRAFFIC IN THE APAC REGION

(Presented by the Secretariat)

SUMMARY

This paper presents the AMHS readiness status for supporting IWXXM Traffic of the States/Administrations in APAC Region, and States/Administrations that have no AMHS in operations such that IWXXM message would not be distributed to these States/Administrations.

1. INTRODUCTION

1.1 AMHS has been deployed by the majority of ANSPs as AFTN replacement in APAC Region, and new rich data formats using XML was also introduced in the past years. ICAO APAC Regional Office has been discussing and promoting the implementation of necessary infrastructure to support IWXXM exchange in the Region through APANPIRG and its contributory bodies. This paper summarizes the AMHS readiness status for supporting IWXXM Traffic of the States/Administrations in APAC Region, including States/Administrations that have no AMHS in operations, to facilitate the relevant Meteorological authorities/organisations with the dissemination of IWXXM messages accordingly to avoid overloading the AFTN.

1.2 2.1

2. DISCUSSION

2.1 Since the adoptions of Amendments 78 to Annex 3, the APAC Region has been discussing in APANPIRG and its contributory bodies on promoting the implementation of AMHS and a proper infrastructure identified for the Region to facilitate the States/Administrations' implementation of the IWXXM-related provisions in Amendment 78 to Annex 3, which extend the use of IWXXM as an International Standard, applicable from 5 November 2020. The following summarized the relevant Conclusions adopted in APANPIRG and its contributory bodies.

2.2 APANPIRG/28 adopted **Conclusion APANPIRG/28/16 - Upgrade AMHS to support IWXXM traffic** urging States/Administrations to implement *Extended AMHS* or *Basic AMHS plus File Transfer Body Parts (FTBP) sub-set of Extended AMHS for Binary data exchange functional groups* as defined in Doc 9880 Part IIB section 3.4.1 **by November 2020**.

2.3 CNS SG/22 adopted **Conclusion CNS SG/22/4 (CRV OG/4/2) - ATN/BBIS States/Administration Use CRV for AFTN/AMHS Traffic** to urge BBIS States/Administration to commence the transition of AMHS to CRV network as early as possible to allow more BIS State/Administrations to establish connections over CRV.

2.4 The APAC State Letter *Ref.: T 8/3.5 & T 8/2.11 – AP160/20 (CNS) dated 6 August 2020 with Title: Reminder for implementation of ATS Message Handling System (AMHS) in APAC Region by 2020* was sent to States/Administration in August 2020 as a reminder to upgrade the AMHS with FTBP and deploy AMHS connect to achieve a synchronized AMHS distribution mechanism to support MET information exchange using IWXXM in the APAC Region.

2.5 CNS SG/24 requested the MET SG and CNS SG to enhance mutual coordination and sharing outcomes of related survey and seminar/workshop, and the contributory body of MET SG (Meteorological Information Exchange Working Group (MET/IE WG)) to work collaboratively with ACSICG for a way forward in APAC region. In addition, APANPIRG/32 adopted **Conclusion APANPIRG/32/11: Updating Online Register of IWXXM Exchange Status** to request States/Administrations provide timely updates to the Online Register of IWXXM Exchange Status on the latest status of AMHS capability for IWXXM exchange among ROCs and NOCs, and the availability of IWXXM MET reports.

2.6 As of CNS SG/26, there were **13** States/Administrations provided their status on AMHS readiness and experience for supporting IWXXM Traffic with details provided in **Appendix A**, out of the **23** States/Administrations in the APAC Region which put their AMHS into operations per the AMHS Routing Directory Tables from the ATS Messaging Management Centre (AMC) as of April **2023** provided in **Appendix B**.

2.7 States/Administrations that have no active AMHS in operations per the AMHS Routing Directory Tables are provided in **Appendix C**. To avoid possible overload of the AFTN traffic, relevant Meteorological authorities/organisations should not disseminate IWXXM messages to these States/Administrations. A COM Chart captured from the EUROCONTROL AMC as of 25 April 2023 is provided in **Appendix D** for easy reference.

2.8 Although there has been a significant increase in the AMHS readiness for supporting IWXXM Traffic, the reporting gap was still identified, States/Administrations are urged to inform ICAO APAC Regional Office on their readiness and implementation progress/plan of AMHS with FTBP as soon as possible.

2.9 States/Administrations are reminded of the Beijing Declaration on “commit to implementation **by 2022**: Common ground/ground telecommunication infrastructure to support ANS applications” with reporting indicators including the status of Aeronautical Message Handling System (AMHS) with File Transfer Body Parts (FTBP) function for IWXXM data.

2.10 In 2014, the ACSICG/1 meeting consolidated a table on the status of AMHS and AIDC in the APAC Region to make the regional picture of implementation status on the enabler AMHS and B0-FICE, the Table was named as **ATN/AMHS/AIDC Implementation Status in the APAC Region** and has been updated by ACSICG on yearly basis. The Table updated by ACSICG/8 is provided in **Appendix E** to this paper.

2.11 With the dissolution of APAC AIDC Task Force and the establishment of ATM Automation System Task Force, a comprehensive repository on AIDC implementation was developed (refer to WP/05 of this meeting), therefore, ACSICG/9 meeting introduced a Table **Implementation Status of ATN/AMHS in the APAC Region** by extracting part of information from **ATN/AMHS/AIDC Implementation Status in the APAC Region**, which is provided in **Appendix F** to this paper.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

- a) note the information in this paper;
- b) review and update the information contained in **Appendix A, B, C** and **F** respectively if necessary;
- c) consider consolidating the information in **Appendix A, B, C** and **F** into a new table to monitor the implementation of AMHS completely and effectively for the region, including the readiness of AMHS to support IWXXM; and
- d) discuss any relevant matter as appropriate.

AMHS Readiness Report for Supporting IWXXM Traffic

No.	States/Administration	Name of State (Administration)/name of BBIS/BIS location where AMHS is installed:	AFTN/AMHS transition date/schedule	Readiness Status of AMHS for supporting File Transfer Body Part (FTBP), the Interpersonal Message (IPM) Heading Extension (IHE) to support for exchanging IWXXM reports of a maximum size of 4MB and FTBP of maximum 2MB:	Capacity status of the operational AFS links to support the exchange of the required meteorological information in both IWXXM GML form and TAC form:
1	Australia	Airservices - Brisbane	<p>Completed.</p> <p>AMHS exchange in place with USA, Fiji, New Zealand, Singapore and South Africa.</p> <p>AFTN still in place with Indonesia and PNG, migration to AMHS based on pending readiness both partners</p> <p>Several Pacific island nations connecting via FCO CADAS ATS Terminal, currently over AFTN. Airservices plans to migrate to AMHS P3 CADAS but will need to provide user training.</p> <p>All domestic users and data originators still on AFTN, no desire by external partners to migrate to AMHS, awaiting SWIM instead</p>	Full compliance and support since Nov 2020	Airservices has contracted a 2.0Mbps bandwidth using CRV Package C+ for Voice & AMHS services. Bandwidth on the leased line with South Africa / Johannesburg is also 2Mbps.
2	China	Beijing	AMHS deployed in 2008 which was upgraded to support ATN/IPS in 2013 and upgraded to support exchanging IWXXM in 2020.	support	CRV bandwidth is 3M. Minimally 64kbps for each AMHS connection..
3	Hong Kong China	Hong Kong China	December 2009	Support	2MB for CRV and 64kbps for IPLCs
4	Fiji	Fiji Airport/Air Traffic Management Centre	Completed. In June 2019, Fiji completed the transition of ATN BBIS to IPS for the AMHS service from Nadi to Salt Lake, USA & Brisbane, Australia over the CRV network. The local end User still operates on AFTN terminal and is converted to AMHS over the AFTN/AMHS Gateway.	The Comsoft AMHS System supports File Transfer Body Part (FTBP). Our system has the capability of exchanging IWXXM reports of a maximum size of 4MB and FTBP of maximum.	Nadi has contracted a 1.0Mbps bandwidth using CRV Package C+ for Voice & AMHS services. The total bandwidth usage for voice and data is 768K from the total 1.0Mbps. The bandwidth for AMHS is 64Kbps each to Brisbane & Salt Lake Center. It is noted in the ACSICG/7 WP04 presented by USA that 64Kbps is the minimum recommended required bandwidth for AMHS to exchange FTBP for IWXXM.
5	India	AAI/Mumbai Airport	<p>AMHS is in operation since 2011.</p> <p>India is in the process of tendering for replacement of existing AMHS system . The Tender action stands delayed due to COVID pandemic.</p>	Presently India is not able to exchange the required 4 MB messages and 2 MB FTBP attachments.	Indian Meteorological Department is in the process of upgradation of HPC & DB to support IWXXM.

No.	States/Administration	Name of State (Administration)/name of BBIS/BIS location where AMHS is installed:	AFTN/AMHS transition date/schedule	Readiness Status of AMHS for supporting File Transfer Body Part (FTBP), the Interpersonal Message (IPM) Heading Extension (IHE) to support for exchanging IWXXM reports of a maximum size of 4MB and FTBP of maximum 2MB:	Capacity status of the operational AFS links to support the exchange of the required meteorological information in both IWXXM GML form and TAC form:
6	Japan	Japan/Fukuoka	ATN BBIS router and AMHS installed at 2000. Connection tests with USA 2000 - 2004 and put into operational use in 2005 and over CRV in February 2019. Put into AMHS operation with Hong- Kong and Singapore in 2021. AMHS implementation with China in 2021 , Korea and Taipei in 2022.	Already support exchange of IWXXM messages based on FTBP in August 2015. It is possible to send , receive and transfer up to 2GB for the contents such as FTBP,IPM and IHE in AMHS,and the size of IWXXM supported system by Japan Meteorological Agency is 2MB	AFS links over CRV is a Package A, Bandwidth 2M.
7	Macao China	Macao China	Q4/2009	Q3/2021	To be determined
8	New Zealand	Airways – Christchurch	AMHS connections are in place with Australia, USA and the New Zealand	Support	Airways New Zealand has contracted a 1.0Mbps bandwidth using CRV Package C+ for Voice and AMHS services from Auckland and Christchurch.
9	Philippines	Philippines/ATMC Manila	Completed March 2018	Can support IHE and FTBP maximum 1MB (tested with Taipei on 13-May-20)	1MB Philippines has contracted 2Mbps bandwidth using CRV package “A” voice and data services.
10	Republic of Korea	Gimpo international airport	ATN/AMHS with China put into operational use in June, 2011. AMHS implementation with China and Japan over CRV will be in 4Q, 2022.	AMHS implementation for supporting FTBP and IHE will be in 4Q, 2022.	AFS links over CRV is a Package A, Bandwidth 2M.
11	Singapore	Singapore	March 2011	Yes	2MB for CRV and minimally 64kbps for IPLCs
12	Thailand	Thailand	BBIS/BIS Routers already implemented. AMHS has been implemented since July 2011. Connection with Bangladesh, Bhutan, Cambodia, China, India, Lao PDR, Myanmar, Singapore, Hong Kong China, and Malaysia implemented. Connection with SITA (SITA AMHS Gateway inter-connections) implemented. Bangkok - Vietnam Circuit	Completed, the IWXXM exchange has been implemented since November 2020.	The capacity of links readied to support in both form.

No.	States/Administration	Name of State (Administration)/name of BBIS/BIS location where AMHS is installed:	AFTN/AMHS transition date/schedule	Readiness Status of AMHS for supporting File Transfer Body Part (FTBP), the Interpersonal Message (IPM) Heading Extension (IHE) to support for exchanging IWXXM reports of a maximum size of 4MB and FTBP of maximum 2MB:	Capacity status of the operational AFS links to support the exchange of the required meteorological information in both IWXXM GML form and TAC form:
			IOT Test : Done POT Test: Planned for end of 3Q2021 Bangkok - Rome Circuit IOT Test: Planned for 3Q2021 POT Test: Planned for 4Q2021		
13	USA	Federal Aviation Administration	Q4, 2020	Yes. FAA AMHS has FTBP capability. National Weather Service (NWS) projected to implement IWXXM by Q3, 2021	Yes. 2MB bandwidth over CRV

ACSICG/10
Appendix B to WP/07

States with AMHS in Operation (Active AMHS Routing Directory found)		
State/Administrator	IWXXM Support	COM Centre with AMHS Routing
Australia	Yes	YBBB - BRISBANE (FIR/FIC/ACC/COM/MET/NOF) - Australia
Bangladesh	-	VGHS - HAZRAT SHAHJALAL INTERNATIONAL AIRPORT, DHAKA - Bangladesh
Bhutan	-	VQPR - PARO, INTL - Bhutan
Cambodia	-	VDPP - PHNOM PENH - Cambodia
China	Yes	ZBBB - BEIJING CITY - China
	-	RCTP - TAIPEI/TAIWAN TAOYUAN INTERNATIONAL - China
Fiji	Yes	NFFN - NADI/INTL - Republic of Fiji
Hong Kong China	Yes	VHHH - HONG KONG/INTERNATIONAL - Hong Kong Special Administrative Region of China
India	Yes	VABB - CHHATRAPATI SHIVAJI INTL AIRPORT, MUMBAI - India
	-	VECC - NETAJI SUBHASH CHANDRA BOSE INTERNATIONAL AIRPORT, KOLKATA - India
Indonesia	-	WIII - JAKARTA/SOEKARNO-HATTA INTL - Indonesia
Japan	Yes	RJJJ - FUKUOKA/JCAB AIR TRAFFIC MANAGEMENT CENTRE, AFTN/AMHS COM CENTER - Japan
Lao PDR	-	VLVT - VIENTIANE(WATTAY) - Lao People's Democratic Republic (the)
Macao China	Yes	VMMC - MACAO/INTL AIRPORT - Macao Special Administrative Region of China
Malaysia	-	WMKK - KL INTERNATIONAL/SEPANG - Malaysia
Myanmar	-	VYYY - YANGON INTERNATIONAL - Myanmar, the Republic of the Union of
Nepal	-	VNKT - KATHMANDU - Federal Democratic Republic of Nepal
New Zealand	-	NZCH - CHRISTCHURCH INTL - New Zealand
Pakistan	-	OPKC - KARACHI/JIAP INT'L - Pakistan
Philippines	Yes	RPLL - NINYO AQUINO INTERNATIONAL AIRPORT, MANILA - Philippines
ROK	Yes	RKSS - GIMPO - Republic of Korea
Singapore	Yes	WSSS - SINGAPORE/SINGAPORE CHANGI INTL - Singapore
Sri Lanka	-	VCCC - RATMALANA/COLOMBO - Sri Lanka
Thailand	Yes	VTBB - BANGKOK (ACC/FIC/COM CENTRE) - Thailand
United States	Yes	KSLC - SALT LAKE CITY INTL - United States of America
		KATL - HARTSFIELD - JACKSON ATLANTA INTL - United States of America
<i>Total: 23 States</i>	<i>Total: 12 States</i>	

Source: ATS Messaging Routing Directory Part II

ACSICG/10
Appendix C to WP/07

States without AMHS in Operation (AMHS Routing Not Found)
Afghanistan
Brunei Darussalam
Cook Islands
Democratic People's Republic of Korea
Kiribati
Maldives
Marshall Islands
Micronesia (Federated States of)
Mongolia
Nauru
Palau
Papua New Guinea
Samoa
Solomon Islands
Timor Leste
Tonga
Tuvalu
Vanuatu
Viet Nam
<i>Total: 19 States</i>

Source: ATS Messaging Routing Directory Part II

ATN/AMHS/AIDC Implementation Status in the APAC Region

State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AMHS Vendors Selected	AIDC	ATM System selected to support AIDC and Associated ICD (Implementation Status of the Basic 5 message set supported)	Remarks
AFGHANISTAN					
AUSTRALIA	<p>ATN tests were conducted. BIS Router and Backbone BIS Router and AMHS implemented. CRV operational since May 2019.</p> <p>AMHS over CRV with: Singapore, New Zealand, Fiji and USA</p> <p>AMHS over leased line with: South Africa</p> <p>Planning to migrate existing AFTN connections over leased line with Indonesia and PNG to AFTN over CRV (2021) prior to upgrading to AMHS over CRV (TBC)</p> <p>Extended AMHS with FTBP in support of IWXXM exchange in operation since Nov. 2020.</p>	Frequentis Comsoft	<p>AFTN/AMHS based AIDC Implemented between Brisbane and Melbourne.</p> <p>For neighbouring ANSP of <u>Brisbane</u>, AIDC implemented with Auckland, Nadi, Oakland, Port Moresby, Ujung Pandang</p> <p>For neighbouring ANSP of <u>Melbourne</u>, AIDC implemented with Johannesburg and Mauritius.</p>		CPL and CDN exchange limited
BANGLADESH	In Q1/2013, Bangladesh installed ATN/AMHS and BIS Router at Dhaka (VGHS) with User Agents at Chittagong (VGEG) and Sylhet (VGSY).	COMSOFT	Tentative date of implementation of AIDC is Q4 of 2023 with Kolkata and Yangon.		Implementation of AIDC is included in the “Modernization of CNS-ATM System of

ACSICG/10
Appendix E to the Report

State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AMHS Vendors Selected	AIDC	ATM System selected to support AIDC and Associated ICD (Implementation Status of the Basic 5 message set supported)	Remarks
					CAAB” project which is going on G2G agreement with French Government and likely to be implemented by the end of 2023.
BHUTAN	<p>ATN/AMHS circuits, using IP over VPN, with Thailand (Bangkok) and India (Mumbai) commissioned in June and July 2017 respectively.</p> <p>IOT and POT with Mumbai completed on 27th June 2017.</p> <p>IOT and POT with Thailand completed on 2nd May 2017.</p> <p>TMC signing with both countries signed.</p>	AEROTHAI’S AMHS System	Currently not applicable. If required in the future, will decide after CRV implementation.		
BRUNEI DARUSSALAM	ATN BIS Router planned for 2015 and AMHS planned for 2015				
CAMBODIA	BIS Router and AMHS installed. Cambodia (CATS) AMHS connected with Bangkok via VSAT IP link since 10 December 2013	AVITECH	AIDC function and capability made available.	THALES which supports AIDC ICD Version 1.	

ACASICG/10
Appendix E to the Report

State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AMHS Vendors Selected	AIDC	ATM System selected to support AIDC and Associated ICD (Implementation Status of the Basic 5 message set supported)	Remarks
			Ready for testing with neighbors ATS Facilities starting from 2017 and target date of implementation with Bangkok in 4Q2019		
CHINA	<p>ATN Router and AMHS including NCC deployed in 2008 which is being upgraded to support ATN/IPS with target date of completion in December 2013.</p> <p>The Beijing-Hong Kong AMHS link was put into operation in 2018;</p> <p>With Thailand was put into operation in Q12020</p> <p>AMHS/ATN technical tests with Macau completed in 2009. Plan for ATN/AMHS implementation with Macao China is TBD. ATN/AMHS circuit with ROK has been put into operation since June 2011.</p> <p>ATN/AMHS tests with India has been put into operation since 2016.</p> <p>ATN and AMHS IOT with Mongolia is completed in May 2018. Plan for</p>	IN-HOUSE (Aero-Info Technologies Co., Ltd)	<p>AIDC between some of ACCs within China has been implemented.</p> <p>AIDC between several other ACCs are being implemented.</p> <p>AIDC between Sanya and Hong Kong China put into operational use since 8 Feb 2007.</p> <p>AIDC between Dalian and Incheon implemented in Nov. 2016;</p> <p>AIDC between Sanya and Hong Kong China put into operational use since February 2007.</p>	<p>ATN Router and AMHS including NCC deployed in 2008 which is being upgraded to support ATN/IPS with target date of completion in December 2013.</p> <p>The Beijing-Hong Kong AMHS link was put into operation in 2018;</p> <p>With Thailand is completed POT, after sign the TMC circuit and was put into operation in Q12020</p> <p>AMHS/ATN technical tests with Macau</p>	IN-HOUSE (Aero-Info Technologies Co., Ltd)

ACSICG/10
Appendix E to the Report

State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AMHS Vendors Selected	AIDC	ATM System selected to support AIDC and Associated ICD (Implementation Status of the Basic 5 message set supported)	Remarks
	<p>commissioning after POT completion in 2021</p> <p>Connection tests with Nepal is TBD.</p> <p>AMHS testing with Japan was completed in March 2021. It will put into operation after TMC is signed.</p> <p>AMHS testing with Russia in 2021.</p>		<p>AIDC between Shanghai/Guangzhou and Tapei China put into operational use since 2013.</p> <p>AIDC between Dalian and Incheon put into operational use since October 2016.</p> <p>AIDC between Guangzhou and Hong Kong China put into operational use since May 2018.</p> <p>OLDI between Shenyang and Khabarovsk put into operational use since Oct.2019.</p> <p>AIDC between Kunming and Vientiane put into pre-operational trails since January 2021.</p> <p>AIDC technical test between Beijing ACC</p>	<p>completed in 2009. Plan for ATN/AMHS implementation with Macao China in 2019.</p> <p>ATN/AMHS circuit with ROK has been put into operation since June 2011.</p> <p>ATN/AMHS tests with India has been put into operation since 2016.</p> <p>ATN and AMHS IOT with Mongolia is completed in May 2018. Plan for commissioning after POT completion in 2021</p> <p>Connection tests with Nepal is TBD.</p> <p>with the Beijing - Japan AMHS link was put into operation in 2020.</p>	

ACSICG/10
Appendix E to the Report

State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AMHS Vendors Selected	AIDC	ATM System selected to support AIDC and Associated ICD (Implementation Status of the Basic 5 message set supported)	Remarks
			<p>and Ulaanbaatar ACC conducted since 2018.</p> <p>Kunming/Yangon under test and progress since May 2017</p> <p>AIDC technical test between Sanya ACC and Hanoi ACC conducted since 2019.</p>	<p>AMHS testing with Russia in 2021</p>	
<p>HONG KONG, CHINA</p>	<p>Manila / Philippines CRV/AMHS circuit was put into operation in May 2019.</p> <p>Beijing / China CRV/AMHS circuit was put into operation in April 2021</p> <p>Macao / China ATN/AMHS circuit was put into operation in December 2009. Wait for Macao to join CRV.</p> <p>Bangkok / Thailand ATN/AMHS circuit was put into operation use in 2014. Wait for Thailand to join CRV.</p> <p>Fukuoka / Japan</p>	<p>COMSOFT</p>	<p>AFTN-based AIDC with Sanya put into operational use in Feb 2007.</p> <p>AIDC with Taibei put into operational use in Nov 2012.</p> <p>AIDC with Guangzhou put into operational use in May 2018.</p> <p>AIDC with Manila put in operational use in May 2019.</p>	<p>Raytheon ATM system Support AIDC ICD Version 3 commissioned in November 2016.</p>	<p>Already support exchange of IWXXM messages based on FTBP.</p> <p>Support of IHE is planned since November 2020.</p>

ACSICG/10
Appendix E to the Report

State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AMHS Vendors Selected	AIDC	ATM System selected to support AIDC and Associated ICD (Implementation Status of the Basic 5 message set supported)	Remarks
	<p>CRV/AMHS circuit was put into operation in September 2020.</p> <p>HoChiMinh / Vietnam Currently on AFTN. Simple AMHS IOT was conducted in Dec 2019. Wait for Vietnam to join CRV.</p> <p>Taibei CRV/AMHS circuit was put into operation in June 2020.</p>				
MACAO, CHINA	<p>ATN/AMHS interoperability test with Beijing commenced in March 2009.</p> <p>ATN/AMHS circuit with Hong Kong put into operational use in end Dec 2009.</p> <p>Upgrade of ATN/AMHS to support IPS and IWXXM planned with tentative target date of Q3 2021.</p>	COMSOFT	[Not applicable for using AIDC, looking into the possible application between TWR and ACC/APP]		

ACSICG/10
Appendix E to the Report

State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AMHS Vendors Selected	AIDC	ATM System selected to support AIDC and Associated ICD (Implementation Status of the Basic 5 message set supported)	Remarks
COOK ISLANDS					
DEMOCRATIC PEOPLE'S REPUBLIC OF KOREA	The ATN BIS Router and AMHS planned for in 2011.		With neighboring ACCs to be implemented		
FIJI ISLANDS	<p>ATN BBIS IPS router and AMHS implemented over CRV for connection to USA in April, 2019 with Australia planned for June, 2019.</p> <p>.</p> <p>For connections with sub-regional centers: For New Caledonia using AMHS since 2017; For connection with Kiribati using UA/AMHS implemented in 2015.</p>	COMSOFT	AFTN based AIDC implemented between Nadi/ Brisbane, Auckland and Oakland.	<p>- Support and implemented AIDC messaging: ABI, EST, CPL, CDN, ACP, TOC, AOC with all three centers</p> <p>- AIDC ICD version 2.0 implemented with Auckland and Oakland.</p> <p>- AIDC ICD Version 1.0 implemented with Brisbane</p>	B2B connection between Nadi AMHS and Brisbane AMHS planned for Q3, 2021 as backup for CRV.

ACSICG/10
Appendix E to the Report

State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AMHS Vendors Selected	AIDC	ATM System selected to support AIDC and Associated ICD (Implementation Status of the Basic 5 message set supported)	Remarks
FRANCE <i>(French Polynesia Tahiti)</i>	Planned for implementation of AMHS in 2022 (T1). Using IP with New Zealand since 2017.		Implementation of AIDC (based on Version 3) with adjacent centers (Oakland and Auckland) since 2009.	THALES EUROCAT for AIDC	Alternate routing for backup between Tahiti and Christchurch via Tahiti/New Caledonia IP link
INDIA	Dual stack ATN/IP router and AMHS implemented at Mumbai in 2011. Operational AMHS connections with Bangkok, Dhaka, Singapore, Kathmandu, Karachi implemented. With Beijing implemented in 2016; With Colombo implemented in May2017; With Bhutan implemented in July 2017; (IOT/POT) between Mumbai – Muscat is scheduled with mutual agreement between India & Oman between 0600-0900 UTC from 21.06.2021 onwards. IOT with Nairobi in September 2020 failed due to compatibility issues noticed at Nairobi, which has Thales system, Messages from Mumbai did not go out of the transmit queue. System software level compatibility problems need to be resolved by Nairobi taking the OEMs on board.	COMSOFT	Initially-15-May-2017, AIDC implemented between Chennai and Kuala Lumpur with ABI and EST messages. India is currently using APAC AIDC ICD version 3. A. Implementation within India: Testing & trials: I. At Delhi with: Ahmedabad, Varanasi, Nagpur II. At Chennai with: Mumbai, Kolkata, Trivandrum, Mangalore, Trichy, Hyderabad, Bengaluru	Mumbai: Raytheon Auto track-III Chennai- Raytheon Auto track-III + Delhi: INDRA Aircon Kolkata: INDRA Aircon Bengaluru: SELEX Hyderabad: SELEX Ahmedabad: INDRA Aircon 2100 Nagpur: INDRA Aircon 2100 Varanasi: INDRA Aircon 2100 Guwahati: INDRA Aircon 2100 Trivandrum: INDRA Aircon 2100 Mangalore: INDRA Aircon 2100	INDIA

ACSICG/10
Appendix E to the Report

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			<p>III. At Kolkata with: Chennai, Nagpur, Varanasi, Guwahati</p> <p>IV. At Mumbai with: Chennai, Ahmedabad, Nagpur</p> <p>Operational:</p> <p>Chennai- Mumbai; Delhi-Nagpur; Delhi- Ahmedabad,</p> <p>Functional:</p> <p>Delhi-Varanasi, LOA to be signed shortly.</p> <p>B: Implementation with Neighboring States: The status on AIDC implementation with following ATSUs of neighboring FIRs is as under:</p> <p>I. Chennai & Kuala Lumpur (Malaysia) – ABI, EST successful. CDN is done with voice</p>	<p>Trichy: INDRA Aircon 2100</p> <p>All these systems follow APAC AIDC ICD Ver 3.0 of 2007</p>	

ACSICG/10
Appendix E to the Report

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			<p>confirmation. TOC/AOC is implemented w.e.f. 1st Jan 2021. LOA signed on 26th May 2021 effective from 1st June 2021.</p> <p>II. Chennai & Male (Maldives) –Trails have been successful. LOA in process. Safety Assessment conducted on 9th April 2021 for implementation</p> <p>III. Chennai & Colombo (Sri Lanka) - Colombo in process to address the syntax errors in ABI. Thereafter, trails will be conducted. LOA in progress.</p> <p>IV. Chennai & Yangon (Myanmar) – Trials commenced in January 2018. Issues of incorrect reference number in Counter CDN from Yangon persists. Yangon has intimated that, they will inform Chennai for conducting the Test, as soon as they</p>		

ACSICG/10
Appendix E to the Report

State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AMHS Vendors Selected	AIDC	ATM System selected to support AIDC and Associated ICD (Implementation Status of the Basic 5 message set supported)	Remarks
			<p>are ready</p> <p>V. Mumbai & Male (Maldives) – Safety Assessment conducted on 9th April 2021 for implementation. Final LOA to be signed shortly.</p> <p>VI. Mumbai & Mogadishu - Successful trials conducted in March 2021. Minor adaptation system issues with Mogadishu automation system identified. Resolution awaited from Mogadishu.</p> <p>VII. Mumbai & Muscat - Successful trials conducted in March 2021. System issues with Muscat’s automation system identified. Resolution awaited from Muscat ATCAS vendor</p> <p>VIII. Ahmedabad & Karachi (Pakistan) – Automatic message</p>		

ACSICG/10
Appendix E to the Report

State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AMHS Vendors Selected	AIDC	ATM System selected to support AIDC and Associated ICD (Implementation Status of the Basic 5 message set supported)	Remarks
			<p>exchange (e.g. ABI, EST) happens for most of the East bound flights between Karachi & Ahmedabad. Karachi Automation system not generating auto ACP message in response of EST messages. Pakistan is currently doing technical trials between Lahore and Delhi ACCs in first phase. Pakistan will take up test trials between Karachi and Mumbai & Karachi and Ahmedabad in second and third phase respectively.</p> <p>IX. Delhi & Lahore (Pakistan)- Under test trails. During the first test trials during the March'2021 it was identified that Lahore Automation system not generating automatic ACP messages. Also Delhi system is rejecting the AIDC messages</p>		

ACSICG/10
Appendix E to the Report

State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AMHS Vendors Selected	AIDC	ATM System selected to support AIDC and Associated ICD (Implementation Status of the Basic 5 message set supported)	Remarks
			<p>because of the extra space in messages from Lahore.</p> <p>X. Kolkata & Yangon (Myanmar) – Initial trials were conducted in Q4 of 2018 in which some ABI and message reference errors were encountered. Vendor at both ends modified the software and issues were mitigated. In the next trials in Q1 of 2020 most message exchanges were successful. LOA to be negotiated and signed.</p> <p>C. Under Planning I. To conduct operational trials between Kolkata-Dhaka, Mumbai-Karachi (Pakistan), Chennai-Jakarta and Varanasi-Kathmandu subject to readiness from the concerned states.</p> <p>D. Seychelles and Sana ATSU do not have a</p>		

ACSICG/10
Appendix E to the Report

State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AMHS Vendors Selected	AIDC	ATM System selected to support AIDC and Associated ICD (Implementation Status of the Basic 5 message set supported)	Remarks
			<p>compatible ATM Automation system in place for AIDC coordination with Mumbai ATSU</p> <p>E. Delhi – Karachi: AIDC between Delhi & Karachi will not be required due to re-structuring of FIRs</p>		
INDONESIA	<p>ATN BIS Router and AMHS with Singapore implemented since February 2018;</p> <p>AMHS Trial (IOT) with Brisbane pending for CRV implementation.</p>	IDS	<p>AIDC implementation in Ujung Pandang ACC conducted as follows:</p> <p>1) Ujung Pandang ACC – Brisbane ACC: Implemented since July 2017.</p> <p>2) Ujung Pandang ACC – Manila ACC: Implemented since 4Q 2020;</p> <p>3) Ujung Pandang ACC – Kota Kinabalu ACC: - Successfully tested and target date for operational trial in 4Q2020;</p>	Thales TopSky in Makassar able to support ICD version 3 since December 2015.	For CRV, target of contract in 3Q2021 and implementation in 4Q2021.

ACSICG/10
Appendix E to the Report

State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AMHS Vendors Selected	AIDC	ATM System selected to support AIDC and Associated ICD (Implementation Status of the Basic 5 message set supported)	Remarks
			<p>- Target date for implementation 4Q2021.</p> <p>4) Ujung Pandang ACC – Oakland ARTCC: - Successfully tested and target date for implementation in 4Q2021.</p> <p>5) Ujung Pandang ACC – Port Moresby ACC: - Successfully tested on 7 July 2020; - Target date for operational trial in 3Q2020. - Target date for implementation 2Q2021.</p> <p>6) Ujung Pandang ACC – Jakarta ACC; - Target date for operational trial in 3Q2021. - Target date for implementation 4Q2021;</p> <p>AIDC implementation in Jakarta ACC will be carried out with the following priorities: 1) Jakarta – Ujung Pandang (4Q2021);</p>		

ACSICG/10
Appendix E to the Report

State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AMHS Vendors Selected	AIDC	ATM System selected to support AIDC and Associated ICD (Implementation Status of the Basic 5 message set supported)	Remarks
			2) Jakarta – Chennai (2Q2022); 3) Jakarta – Melbourne (3Q2022); 4) Jakarta – Colombo (4Q2022); 5) Jakarta – Singapore (2Q2023); 6) Jakarta - Kuala Lumpur (3Q2023); 7) Jakarta – Kota Kinabalu (4Q2023).		Priority is in accordance with Hot Spot identified by RASMAG/23
JAPAN	<p>ATN BBIS router and AMHS installed at USA in 2000. Connection tests with USA in 2000 - 2004 and put into operational use in 2005.</p> <p>ATN BBIS router (to apply to Dual Stack) and AMHS (to upgrade in 2015. The connection test with each country which is not currently connecting is started after update.</p> <p>Hong-Kong AMHS/FTBP over CRV was put into operation in September 2020.</p>	NEC	<p>AIDC implemented between Fukuoka ATMC and Oakland ARTCC in 1998.</p> <p>AIDC implemented between Fukuoka ATMC and Anchorage ARTCC in 2005.</p> <p>AIDC implemented between Tokyo ACC/Fukuoka ACC and Incheon ACC in 2010.</p>		Japan and USA conducting testing AIDC over AMHS and cutover date is 5 May 2017.

ACSICG/10
Appendix E to the Report

State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AMHS Vendors Selected	AIDC	ATM System selected to support AIDC and Associated ICD (Implementation Status of the Basic 5 message set supported)	Remarks
	<p>Singapore AMHS/FTBP over CRV was put into operation in December 2020.</p> <p>Beijing/China AMHS/FTBP over CRV test was all completed in March 2021. It will put into operation after TMC is signed</p> <p>Taipei Plan for AMHS/FTBP over CRV IOT in July 2021 POT in 1Q 2022</p> <p>Incheon/Korea Plan for AMHS/FTBP over CRV IOT in 4Q 2021</p>		<p>Implemented between Fukuoka and Incheon since June 2009.</p> <p>AIDC implemented between Fukuoka ACC/Naha ACC and Taipei ACC implemented.</p> <p>AIDC between Fukuoka ACC and Shanghai ACC under negotiation.</p>		
KIRIBATI	Connection with Nadi using UA/AMHS implemented in 2015.				
LAO PDR	<ul style="list-style-type: none"> - ATN BIS Router and AMHS Implemented with Bangkok and Phnom Penh. - AFTN used with Hanoi and Kunming. - For Yangon we have no direct link the connection is used via Bangkok. 	THALES	<ul style="list-style-type: none"> - Vientiane ACC AIDC used for coordination between Bangkok and Phnom Penh ACCs since 2020. - Operation trials are on going with Kunming. 	THALES which is able to support ICD Version 2.	

ACSICG/10
Appendix E to the Report

State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AMHS Vendors Selected	AIDC	ATM System selected to support AIDC and Associated ICD (Implementation Status of the Basic 5 message set supported)	Remarks
			Hanoi and Yangon ACCs.		
MALAYSIA	<p>ATN BIS Router completed 2007.</p> <p>AMHS for Malaysia – Singapore implemented in March 2020.</p> <p>AMHS for Malaysia – Thailand implemented in Dec 2019.</p>	FREQUENTIS	<p><u>Kuala Lumpur ACC and Bangkok ACC</u> AIDC technical test between Kuala Lumpur ACC and Bangkok ACC conducted since November 2016 (ABI/EST/ACP/LAM/LRM/CDN/REJ/TOC/AOC).</p> <p>The operational trial commenced in August 2019 (EST/ACP/LAM/LRM).</p> <p>The operational implementation commenced on 14th March 2020 (EST/ACP/LAM/LRM).</p> <p><u>Kuala Lumpur ACC and Chennai OCC</u> AIDC technical test between Kuala Lumpur</p>	SELEX which is able to support ICD Version 3.	

ACSICG/10
Appendix E to the Report

State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AMHS Vendors Selected	AIDC	ATM System selected to support AIDC and Associated ICD (Implementation Status of the Basic 5 message set supported)	Remarks
			<p>ACC and Chennai OCC conducted since 31st July 2013.</p> <p>The operational trial implemented in phases from September 2016 (ABI/EST/MAC/LAM/LRM/ACP). Review on the CDN message implementation conducted in August 2017. SOP signed 26 April, 2017.</p> <p>The MOU signed on March 2020.</p> <p>The operational implementation commenced on 1st April 2020 (ABI/EST/ACP/LAM/LRM/CDN/REJ/MAC).</p> <p>The operational trial for TOC/AOC started on 1st July until 1st August 2020.</p>		

ACSICG/10
Appendix E to the Report

State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AMHS Vendors Selected	AIDC	ATM System selected to support AIDC and Associated ICD (Implementation Status of the Basic 5 message set supported)	Remarks
			<p>The operational implementation for TOC/AOC commenced on 1st January 2021.</p> <p>The updated LOA signed on 26th May 2021.</p> <p><u>Kuala Lumpur ACC and Singapore ACC</u> AIDC technical test between Kuala Lumpur ACC and Singapore ACC conducted since April 2015 (ABI/EST/ACP/LAM/LRM/CDN/REJ).</p> <p>The operational trial started on September 2018 (EST/ACP/LAM/LRM).</p> <p>The operational implementation commenced on 1st November 2019 (EST/ACP/LAM/LRM).</p>		

ACSICG/10
Appendix E to the Report

State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AMHS Vendors Selected	AIDC	ATM System selected to support AIDC and Associated ICD (Implementation Status of the Basic 5 message set supported)	Remarks
			<p><u>Kuala Lumpur ACC and Ho Chi Minh ACC</u> AIDC technical test between Kuala Lumpur ACC and Ho Chi Minh ACC To Be Discussed (TBD).</p> <p><u>Kuala Lumpur ACC and Jakarta ACC</u> AIDC technical test between Kuala Lumpur ACC and Jakarta ACC TBD.</p> <p><u>Kota Kinabalu ACC and Manila ACC</u> AIDC Technical Test 1 between Kota Kinabalu ACC and Manila ACC started on 21 – 22nd May 2019 (ABI / EST / ACP / LAM / LRM / TOC / AOC / MAC).</p> <p>Technical Test 2 was conducted on 21 – 22nd October 2019 (ABI / EST / ACP / LAM / LRM / TOC / AOC / MAC).</p>		

ACSICG/10
Appendix E to the Report

State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AMHS Vendors Selected	AIDC	ATM System selected to support AIDC and Associated ICD (Implementation Status of the Basic 5 message set supported)	Remarks
			<p>Upcoming AIDC Technical Test between Kota Kinabalu ACC and Manila ACC to be conducted in Q32021</p> <p><u>Kota Kinabalu ACC and Ujung Pandang ACC</u></p> <p>AIDC Technical Test 1 between Kota Kinabalu ACC and Ujung Pandang ACC started on 7 – 8th August 2019 (ABI / EST / ACP / CDN / LAM / LRM / REJ / MAC).</p> <p>Technical Test 2 was conducted on 23 – 24th October 2019 (ABI / EST / ACP / LAM / LRM / TOC / AOC / MAC).</p> <p>Technical Test 3 was conducted on 11th March 2020 (EST / ACP / LAM / LRM).</p> <p>Upcoming AIDC Technical Test between Kota Kinabalu ACC and</p>		

ACSICG/10
Appendix E to the Report

State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AMHS Vendors Selected	AIDC	ATM System selected to support AIDC and Associated ICD (Implementation Status of the Basic 5 message set supported)	Remarks
			<p>Ujung Pandang ACC to be conducted in Q32021</p> <p><u>Kota Kinabalu ACC and Jakarta ACC</u> AIDC Technical Test between Kota Kinabalu ACC with Jakarta ACC is to be discussed.</p> <p><u>Kota Kinabalu ACC and Singapore ACC</u> AIDC Technical Test between Kota Kinabalu ACC and Singapore ACC started on 22nd September 2015 (ABI / EST / ACP / CDN / LAM / LRM / REJ / MAC).</p> <p>AIDC Technical Test 1 was conducted on 18 – 19th November 2019 (ABI / EST / ACP / CDN / LAM / LRM / REJ / MAC).</p> <p>Technical Test 2 was conducted on 16th</p>		

ACSICG/10
Appendix E to the Report

State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AMHS Vendors Selected	AIDC	ATM System selected to support AIDC and Associated ICD (Implementation Status of the Basic 5 message set supported)	Remarks
			<p>January 2020 (EST / ACP / LAM / LRM). AIDC Operational Trial started since 16th November 2020 and to be extended until 30th June 2021. Agreement on Operational Implementation has been materialized on 3rd June 2021. Operational Implementation is agreed to be conducted on 1st July 2021 (EST / ACP / LAM / LRM)</p> <p><u>Kuching ACC and Singapore ACC</u> AIDC Technical Test (First and Second) between Kuching ACC and Singapore ACC was conducted both on 11 November 2015 and 24-25 November 2015 (ABI, EST, LAM, CDN, ACP, REJ, and LRM). However, it was discontinued until November 2019.</p>		

ACSICG/10
Appendix E to the Report

State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AMHS Vendors Selected	AIDC	ATM System selected to support AIDC and Associated ICD (Implementation Status of the Basic 5 message set supported)	Remarks
			<p>The AIDC Technical Test (Third and Fourth) was conducted both on 20-21 November 2019 and 14 January 2020 (ABI, EST, LAM, CDN, ACP, REJ, and LRM)</p> <p>AIDC Operational Trial was started on 20 July until 18 October 2020. Then it was continuing until 31 January 2021.</p> <p>Agreement on Operational Implementation has been materialized on 12 January 2021 via videoconference.</p> <p>The operational implementation was on 1 February 2021. The AIDC messages included for exchange are EST, LAM, LRM and ACP.</p>		

ACSICG/10
Appendix E to the Report

State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AMHS Vendors Selected	AIDC	ATM System selected to support AIDC and Associated ICD (Implementation Status of the Basic 5 message set supported)	Remarks
			<p><u>Kuching ACC and Jakarta ACC</u> AIDC between Kuching ACC and Jakarta ACC TBD.</p>		
MALDIVES	<p>In the process of replacing the existing operational AFTN system by AMHS. It is expected to complete the installation before the end of 2019.</p> <p>With the new AMHS, it is planned to establish a new IP connection between an additional neighboring ATSU as the current link is an X.25 connection between Colombo.</p> <p>Also will look for the possibility of implementing the CRV network to use with AMHS and AIDC during the same phase.</p>		<p>Connection established with all the adjacent ATSUs. Interoperability tests successfully completed in 2017.</p> <p>LOA signed for operational trials between Mumbai, Chennai, and Trivandrum. Operational trials were also successful with these ATSUs, while several issues were resolved from both ends.</p> <p>Ready to sign LOA with Melbourne and is expected during the 2nd quarter of 2019.</p> <p>Trials with Colombo had few issues, which</p>	SELEX which is able to support ICD Version 3.	

ACSICG/10
Appendix E to the Report

State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AMHS Vendors Selected	AIDC	ATM System selected to support AIDC and Associated ICD (Implementation Status of the Basic 5 message set supported)	Remarks
			Colombo is working to resolve it on their end with the automation system supplier. Connections between all 5 ATSU's are turned ON in the ATS automation system to conduct pre-notified operational trials.		
MARSHALL ISLANDS					
MICRONESIA (EDERATED STATES OF)					
Chuuk					
Kosrae					
Pohnpei					
Yap					
MONGOLIA	AMHS/AFTN gateway implemented 2012. ATNBIS router implemented in 2014.	COMSOFT	ATM automation system supports both AIDC and OLDI.	INDRA Aircon 2100 supporting AIDC ICD Version 2.	

ACSICG/10
Appendix E to the Report

State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AMHS Vendors Selected	AIDC	ATM System selected to support AIDC and Associated ICD (Implementation Status of the Basic 5 message set supported)	Remarks
	ATN and AMHS IOT with China was completed in May 2018. Plan for commissioning after POT completion in 2019.		<p>Coordinating with Russia on OLDI connection in target date 2016.</p> <p>Coordinating with China on AIDC connection between Beijing/Ulaanbaatar technical trials in progress. Planned date of testing in 2019.</p>		
MYANMAR	AMHS including AFTN/AMHS gateway implemented in Nov 2011. Connection with Thailand implemented in 4Q2016. Planned for AMHS connection with Beijing. Target date TBC.	THALES	AIDC connection pre-operation test with Thailand conducted in 4Q2017 and Target date of implementation 4Q2020; AIDC testing with Chennai, Kolkata and Vientiane conducted in 2020. Myanmar improved ATS Surveillance Coverage at coordination point with China and will start AIDC test again with Kunming ACC in 2020.	THALES Automation system (Topsky ATC) supports APAC AIDC ICD Ver. 2.	AMHS including AFTN/AMHS gateway implemented in Nov 2011. Connection with Thailand implemented in 4Q2016. Planned for AMHS connection with Beijing. Target date TBC.
NAURU					

ACSICG/10
Appendix E to the Report

State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AMHS Vendors Selected	AIDC	ATM System selected to support AIDC and Associated ICD (Implementation Status of the Basic 5 message set supported)	Remarks
NEPAL	<p>AFTN/AMHS Gateway implemented in 2012.</p> <p>AMHS implemented with India since June 2014.</p> <p>AFTN connection with China. Plan to test AMHS connection soon.</p>	COMSOFT	<p>Nepal uses custom built ATM system from NEC.</p> <p>Some issues regarding ICD need to be resolved in order to proceed ahead with AIDC testing with India and China.</p>		
NEW CALEDONIA	New router and AMHS commissioned December 2016	COMSOFT			
NEW ZEALAND	AMHS connection with the USA over CRV was implemented in April 2019. AMHS connection to Australia over CRV is scheduled for June 2019.	COMSOFT	AIDC implemented between New Zealand, Australia, Fiji, Tahiti, Chile and USA.	Supported the Basic 5 message set. ATM systems are LEIDOS and ADACEL	
PAKISTAN	<p>ATN/AMHS connections with Mumbai and Kuwait since 2015 and 2018 respectively.</p> <p>AMHS connection with Beijing, Kabul, Tehran and Muscat will be provided after up gradation of existing AMHS at Karachi which is already in progress.</p>	<p>Existing COMSOFT</p> <p>After up gradation ISD</p>	<p>Implemented between Karachi and Lahore ACCs.</p> <p>Lahore/Delhi ACC AIDC trials are being carried out which started in March 2021 (Phase-1), Karachi/Mumbai &</p>	ATM system from Indra AIRCON 2100 version-2 in Lahore and Karachi ACC, Si-ATM version-3 in Islamabad ACC	Existing ATM system are likely to be upgraded in Lahore and Karachi ACC.

ACSICG/10
Appendix E to the Report

State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AMHS Vendors Selected	AIDC	ATM System selected to support AIDC and Associated ICD (Implementation Status of the Basic 5 message set supported)	Remarks
			Karachi/Ahmedabad are planned in Phase-2. After modification of Lahore/Karachi FIRs boundaries, trials between Karachi/Delhi ACC are not required.		
PAPUA NEW GUINEA	Currently AFTN over IP. AMHS implementation is planned for after successful implementation of CRV this year. AMHS implementation planned for 2020.	COMSOFT is the supplier of PNG AFTN/AMHS system	AIDC using AFTN operational with Australia, testing/trial with Oakland (USA) started late last year and in progress. AIDC implementation with Indonesia to happen after CRV implementation this year.	New ATM System from Thales (TopSky-ATC) implemented and operational now supports AIDC V3.	
PHILIPPINES	ATN/AMHS Boundary Intermediate System was installed at the new Manila CNS/ATM Center; <ul style="list-style-type: none"> • Site Acceptance, Oct. 2015 • Commissioned & operational, March 2018 	Frequentis - Comsoft	AIDC implementation status/update over AMHS with the following FIR's;	THALES which is able to support ICD Version 2.	The New ATN/AMHS of Manila CNS/ATM center has been in domestic operations since March 2018. And with the

ACSICG/10
Appendix E to the Report

State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AMHS Vendors Selected	AIDC	ATM System selected to support AIDC and Associated ICD (Implementation Status of the Basic 5 message set supported)	Remarks
	<p>AMHS implementation over CRV with;</p> <ul style="list-style-type: none"> • HONG KONG - May 2019 • TAIPEI - Sept. 2019 • SINGAPORE - Dec. 2020 • OAKLAND - April 2021 		<p>HONG KONG – Implemented, May 2019</p> <p>SINGAPORE – Implemented, December 2020</p> <p>TAIPEI – Implemented, December 2019</p> <p>UJUNG PANDANG – Implemented, December 2020 via BBIS</p> <p>HO CHI MINH - Awaiting OPS trial. Technical Test conducted on June 15-16, 2021.</p> <p>KOTA KINABALU – Next progress AIDC test to be scheduled, target 3Q2021</p>		<p>implementation of CRV, AMHS connection has been implemented with the following adjacent FIR's;</p> <p>-HONG KONG</p> <p>-TAIPEI</p> <p>-SINGAPORE</p> <p>-OAKLAND</p>

ACSICG/10
Appendix E to the Report

State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AMHS Vendors Selected	AIDC	ATM System selected to support AIDC and Associated ICD (Implementation Status of the Basic 5 message set supported)	Remarks
			OAKLAND – 1 st test to be scheduled, target 3Q2021		
REPUBLIC OF KOREA	Plan to upgrade AMHS support IWXXM from 2023 over CRV Frequentice 1) AMHS/CRV IOT with China and Japan in 4Q of 2021 2) AMHS/CRV POT with China and Japan in 4Q 2022 3) Cutover to AMHS/CRV with China and Japan in Q1 2023 after POT 4) Implementation of AMHS/CRV with Japan Q1 2023	FREQUENTIS	AIDC implemented between ACC and Fukuoka ATMC in 2010 AIDC between Incheon and Dalian implemented in Nov. 2016.	Rockheed Martin System	
SINGAPORE	AMHS implemented with: 1) AMHS circuit with India put into operational use in Mar 2011. 2) AMHS circuit with UK put into operational use in Mar 2012. 3) AMHS circuit with Thailand put into operational use in Dec 2014. 4) AMHS circuit with Australia put into operational use in Oct 2016. 5) AMHS circuit with Indonesia put into operational use in Feb 2018.	FREQUENTIS COMSOFT	1) Operational with Ho Chi Minh implemented Jul 2014. 2) Kuala Lumpur operational trial started since Sep 2018 and is implemented Nov 2019.	THALES supports ICD Version 3 since December 2018	

ACSICG/10
Appendix E to the Report

State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AMHS Vendors Selected	AIDC	ATM System selected to support AIDC and Associated ICD (Implementation Status of the Basic 5 message set supported)	Remarks
	<p>6) AMHS circuit with Malaysia put into operational in Mar 2020.</p> <p>7) AMHS circuit with Japan put into operational in Dec 2020.</p> <p>8) AMHS circuit with Philippines put into operational in Dec 2020.</p> <p>Inter-Operability Test (IOT) with Vietnam started in 2019.</p> <p>IOT with Sri Lanka, Bahrain and Brunei to be confirmed.</p>		<p>3) Implemented with Kuching ATCC in Feb 2021.</p> <p>4) Operational trial ongoing with Kota Kinabalu ATCC since Nov 2020 and implementation date on 1st July 2021.</p> <p>5) Manila operational trial started in Feb 2019. Implementation Nov 2019.</p> <p>6) Technical trials with Jakarta ACC will be initiated once the Jakarta ACC ATMS renewal is completed.</p>		
SRI LANKA	<p>ATN BIS Router Planned for 2013. IP based AMHS implemented by Oct. 2017.</p> <ul style="list-style-type: none"> - Mumbai tested May 2017 operational planned for Q4 2017; - Singapore testing in Q4 2017 operational for 2018; 	IDS	<p>Trials with Male planned for in 3Q2019.</p> <p>Trial with Chennai on-going. Plan for implementation in 2018</p>	INTELCAN which is able to support ICD Version 3.	

ACSICG/10
Appendix E to the Report

State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AMHS Vendors Selected	AIDC	ATM System selected to support AIDC and Associated ICD (Implementation Status of the Basic 5 message set supported)	Remarks
	<ul style="list-style-type: none"> - Male testing and operational date TBD. 		and with Melbourne plan for 1Q2018.		
THAILAND	<p>BBIS/BIS Routers already implemented. AMHS has been implemented since July 2011.</p> <p>Connection with Bangladesh, Bhutan, Cambodia, China, India, Lao PDR, Myanmar, Singapore, Hong Kong China, and Malaysia implemented.</p> <p>Bangkok -Viet Nam Circuit</p> <ul style="list-style-type: none"> · IOT Test: Done · POT Test: Planned for end of 3Q2021 <p>Bangkok - Rome Circuit</p> <ul style="list-style-type: none"> · IOT Test: Planned for 3Q2021 <p>Connection with SITA (SITA AMHS Gateway inter-connections) implemented.</p> <ul style="list-style-type: none"> · POT Test: Planned for end of 4Q2021 	AEROTHAI's AMHS System	<p>The implementation with</p> <ul style="list-style-type: none"> · Malaysia has done since 14th March 2020 · Lao PDR has done since 14th July 2020 · Cambodia has done on 22nd February 2021 <p>In addition, it is planned to implement AIDC with Myanmar.</p>	THALES which supports AIDC feature, APAC AIDC ICD V.3.	

ACSICG/10
Appendix E to the Report

State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AMHS Vendors Selected	AIDC	ATM System selected to support AIDC and Associated ICD (Implementation Status of the Basic 5 message set supported)	Remarks
TONGA	<p>AMHS planned for 2008.</p> <p>The provider is linked to the New Zealand AFTN</p>				CPDLC and ADS-C is not considered for lower airspace
UNITED STATES	<ul style="list-style-type: none"> - Australia - Fiji - New Zealand - Japan - Philippines - Papua New Guinea (2021) - Indonesia (2022) - Russia (Planned) 	IN-HOUSE	<ul style="list-style-type: none"> - Fiji, Japan, New Zealand - Tahiti (via New Zealand), - Papua New Guinea via Australia (Direct planned for 2021) - Philippines (2021) - Indonesia via Australia (Direct planned for 2022) - Russian Federation (pending joining CRV) 	IN-HOUSE which is able to support APAC and NAT ICDs currently Version 2.	
VANUATU					

ACSICG/10
Appendix E to the Report

State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AMHS Vendors Selected	AIDC	ATM System selected to support AIDC and Associated ICD (Implementation Status of the Basic 5 message set supported)	Remarks
VIET NAM	<p>AMHS (basic) implemented from 4Q/2018. Plan AMHS extended from Q4 2022</p> <p>IOT with Singapore from 10/2019 to 8/2020</p> <p>IOT with Hong Kong 12/2019</p> <p>IOT with Thailand 6/2020, POT 8/2020.</p>	IN-HOUSE	<p>Operational between Ho Chi Minh and Singapore since July 2014.</p> <p>Operational trial for additional messages sets on-going.</p> <p>Technical testing between Ho Chi Minh with Philippines on going</p> <p>Technical testing with Cambodia already done;</p> <p>Technical testing between Hanoi and Vientiane, Lao. PDR- already done</p> <p>with Malaysia TBC</p> <p>For operation trial TBC.</p> <p>Operation trial between Ho Chi Minh and Hanoi ongoing.</p>	<p>Support ICD Version 1.0 with THALES at Ho Chi Minh ATM system.</p> <p>Support ICD Version 3.0 with Selex at Hanoi ATM System.</p>	

ACSICG/10
Appendix E to the Report

State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AMHS Vendors Selected	AIDC	ATM System selected to support AIDC and Associated ICD (Implementation Status of the Basic 5 message set supported)	Remarks
Wallis and Futuna (FRANCE)	AMHS implementation planned for end of 2017			COMSOFT	

ACSICG/10
Appendix F to the Report

Implementation Status of ATN/AMHS in the APAC Region Extracted from ATN/AMHS/AIDC Implementation Table

State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AMHS Vendors Selected	Remarks
AFGHANISTAN			
AUSTRALIA	<p>AMHS over CRV with: Singapore, New Zealand, Fiji and USA</p> <p>AMHS over leased line with: South Africa</p> <p>AFTN over CRV with: PNG</p> <p>AFTN over leased line with: Indonesia</p> <p>Planning to migrate existing AFTN connections with Indonesia and PNG to AMHS over CRV (TBC, pending readiness both ends)</p> <p>Extended AMHS with FTBP in support of IWXXM exchange in operation since Nov. 2020.</p>	Frequentis Comsoft	
BANGLADESH	In Q1/2013, Bangladesh installed ATN/AMHS and BIS Router at Dhaka (VGHS) with User Agents at Chittagong (VGEG) and Sylhet (VGSY).	COMSOFT	

ACSICG/10
Appendix F to the Report

State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AMHS Vendors Selected	Remarks
BHUTAN	<p>ATN/AMHS circuits, using IP over VPN, with Thailand (Bangkok) and India (Mumbai) commissioned in June and July 2017 respectively.</p> <p>IOT and POT with Mumbai completed on 27th June 2017.</p> <p>IOT and POT with Thailand completed on 2nd May 2017.</p> <p>TMC signing with both countries signed.</p>	AEROTHAI'S AMHS System	
BRUNEI DARUSSALAM	ATN BIS Router planned for 2015 and AMHS planned for 2015		
CAMBODIA	<p>BIS Router and AMHS installed.</p> <p>Cambodia (CATS) AMHS connected with Bangkok via VSAT IP link since 10 December 2013</p>	AVITECH	

ACSICG/10
Appendix F to the Report

CHINA	<p>ATN Router and AMHS including NCC deployed in 2008 which is being upgraded to support ATN/IPS with target date of completion in December 2013. Hong Kong China The Beijing-Hong Kong AMHS link was put into operation in 2018; CRV/AMHS circuit was put into operation in April 2021</p> <p>Thailand With Thailand was put into operation in Q12020 Plan implement IOT and POT in 2022</p> <p>Macau China AMHS/ATN technical tests with Macau completed in 2009. Plan for ATN/AMHS implementation with Macao China is TBD.</p> <p>Korea ATN/AMHS circuit with ROK has been put into operation since June 2011. Completed CRV/AMHS IOT in 2021 Plan implement POT in Q2 2022</p> <p>India ATN/AMHS tests with India has been put into operation since 2016.</p> <p>Mongolia ATN and AMHS IOT with Mongolia is completed in May 2018. Plan for commissioning after POT completion in 2021</p> <p>Nepal Connection tests with Nepal is TBD.</p> <p>Japan AMHS testing with Japan was completed in March 2021.It will put into operation after TMC is signed.</p>	IN-HOUSE (Aero-Info Technologies Co., Ltd)	IN-HOUSE (Aero-Info Technologies Co., Ltd)
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ACSICG/10
Appendix F to the Report

State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AMHS Vendors Selected	Remarks
	<p>China have completed TMC signed and circuit put into operation in 2021</p> <p>Russia AMHS IOT with Russia in 2021.</p>		
HONG KONG, CHINA	<p>Manila / Philippines CRV/AMHS circuit was put into operation in May 2019.</p> <p>Beijing / China CRV/AMHS circuit was put into operation in April 2021</p> <p>Macao / China ATN/AMHS circuit was put into operation in December 2009. Wait for Macao to join CRV.</p> <p>Bangkok / Thailand ATN/AMHS circuit was put into operation use in 2014. Wait for Thailand to join CRV.</p> <p>Fukuoka / Japan CRV/AMHS circuit was put into operation in September 2020.</p> <p>HoChiMinh / Vietnam Currently on AFTN. Simple AMHS IOT was conducted in Dec 2019. Wait for Vietnam to join CRV.</p> <p>Taibei / China CRV/AMHS circuit was put into operation in June 2020.</p>	COMSOFT	

ACSICG/10
Appendix F to the Report

State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AMHS Vendors Selected	Remarks
MACAO, CHINA	<p>ATN/AMHS interoperability test with Beijing commenced in March 2009.</p> <p>ATN/AMHS circuit with Hong Kong put into operational use in end Dec 2009.</p> <p>Upgrade of ATN/AMHS to support IPS and IWXXM planned with tentative target date of Q2 2023.</p>	COMSOFT	
COOK ISLANDS			
DEMOCRATIC PEOPLE'S REPUBLIC OF KOREA	The ATN BIS Router and AMHS planned for in 2011.		

ACSICG/10
Appendix F to the Report

State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AMHS Vendors Selected	Remarks
FIJI ISLANDS	<p>ATN BBIS IPS router and AMHS implemented over CRV for connection to USA in April, 2019 with Australia planned for June, 2019.</p> <p>.</p> <p>For connections with sub-regional centers: For New Caledonia using AMHS since 2017; For connection with Kiribati using UA/AMHS implemented in 2015.</p> <p>Upgrade of AMHS to support the Extended ATS service with up to 4.0MB file size including FTBP. and IWXXM planned with tentative target date of Q2 2023.</p>	COMSOFT	B2B connection between Nadi AMHS and Brisbane AMHS planned for Q3, 2022 as backup for CRV.
FRANCE <i>(French Polynesia Tahiti)</i>	<p>Planned for implementation of AMHS in 2022 (T2).</p> <p>Using IP with New Zealand since 2017.</p>	COMSOFT	

ACSICG/10
Appendix F to the Report

State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AMHS Vendors Selected	Remarks
INDIA	<p>Dual stack ATN/IP router and AMHS implemented at Mumbai in 2011. Operational AMHS connections with Bangkok, Dhaka, Singapore, Kathmandu, Karachi implemented. With Beijing implemented in 2016; With Colombo implemented in May2017; With Bhutan implemented in July 2017;</p> <p>(IOT/POT) between Mumbai – Muscat is scheduled with mutual agreement between India & Oman between 0600-0900 UTC from 21.06.2021. Technical Memorandum of Cooperation (TMC) between Oman and India has been signed in Feb.-2022. As agreed mutually, Mumbai- Muscat AMHS circuit will be commissioned on 25/04/2022 at 0600UTC.</p> <p>Technical Memorandum of Cooperation (TMC) between Oman and India has been signed in Feb.-2022. As agreed mutually, Mumbai- Muscat AMHS circuit will be commissioned on 25/04/2022 at 0600UTC.</p>	COMSOFT	INDIA
INDONESIA	<p>ATN BIS Router and AMHS with Singapore implemented since February 2018;</p> <p>AMHS Trial (IOT) with Brisbane pending for CRV implementation.</p>	IDS	For CRV, target of contract in 2Q2022 and implementation in 4Q2022.

ACSICG/10
Appendix F to the Report

State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AMHS Vendors Selected	Remarks
JAPAN	<p>ATN BBIS router and AMHS installed at USA in 2000. Connection tests with USA in 2000 - 2004 and put into operational use in 2005.</p> <p>ATN BBIS router (to apply to Dual Stack) and AMHS (to upgrade in 2015. The connection test with each country which is not currently connecting is started after update.</p> <p>Hong-Kong AMHS/FTBP over CRV was put into operation in September 2020.</p> <p>Singapore AMHS/FTBP over CRV was put into operation in December 2020.</p> <p>Beijing/China AMHS/FTBP over CRV was put into operation in March 2021.</p> <p>Taipei/China AMHS/FTBP over CRV was put into operation in March 2022.</p> <p>Incheon/Korea Plan for AMHS/FTBP over CRV IOT in 4Q 2022</p>	NEC	Japan and USA conducting testing AIDC over AMHS and cutover date is 5 May 2017.
KIRIBATI	Connection with Nadi using UA/AMHS implemented in 2015.		
LAO PDR	<ul style="list-style-type: none"> - ATN BIS Router and AMHS Implemented with Bangkok and Phnom Penh. - AFTN used with Hanoi and Kunming. - For Yangon we have no direct link the connection is used via Bangkok. 	THALES	

ACSICG/10
Appendix F to the Report

State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AMHS Vendors Selected	Remarks
MALAYSIA	<p>ATN BIS Router completed 2007.</p> <p>AMHS for Malaysia – Singapore implemented in March 2020.</p> <p>AMHS for Malaysia – Thailand implemented in Dec 2019.</p>	FREQUENTIS	
MALDIVES	<p>In the process of replacing the existing operational AFTN system by AMHS. It is expected to complete the installation before the end of 2019.</p> <p>With the new AMHS, it is planned to establish a new IP connection between an additional neighboring ATSU as the current link is an X.25 connection between Colombo.</p> <p>Also will look for the possibility of implementing the CRV network to use with AMHS and AIDC during the same phase.</p>		
MARSHALL ISLANDS			
MICRONESIA (EDERATED STATES OF)			
Chuuk			
Kosrae			
Pohnpei			
Yap			

ACSICG/10
Appendix F to the Report

State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AMHS Vendors Selected	Remarks
MONGOLIA	<p>AMHS/AFTN gateway implemented 2012.</p> <p>ATNBIS router implemented in 2014.</p> <p>ATN and AMHS IOT with China was completed in May 2018. ATN and AMHS POT with China was completed in May 2019.</p> <p>Upgraded the AMHS system and purchased UA terminals in 2020, but it is not yet fully operational due to the Covid-19 pandemic situation.</p> <p>The AMHS system is planned to be fully operational in the fourth quarter of 2022.</p>	COMSOFT	
MYANMAR	<p>AMHS including AFTN/AMHS gateway implemented in Nov 2011. Connection with Thailand implemented in 4Q2016. Planned for AMHS connection with Beijing. Target date TBC.</p>	THALES	<p>AMHS including AFTN/AMHS gateway implemented in Nov 2011. Connection with Thailand implemented in 4Q2016. Planned for AMHS connection with Beijing. Target date TBC.</p>
NAURU			
NEPAL	<p>AFTN/AMHS Gateway implemented in 2012.</p> <p>AMHS implemented with India since June 2014.</p> <p>AFTN connection with China. Plan to test AMHS connection soon.</p>	COMSOFT	

ACSICG/10
Appendix F to the Report

State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AMHS Vendors Selected	Remarks
NEW CALEDONIA	New router and AMHS commissioned December 2016	COMSOFT	
NEW ZEALAND	<p>An AMHS connection with the USA over CRV was implemented in April 2019.</p> <p>The AFTN connection to Australia was moved to CRV in June 2019. The AFTN connection to Australia over CRV was replaced with an AMHS connection over CRV in September 2020</p> <p>Work to provide an AMHS connection over CRV between Bhutan and New Zealand as a temporary solution for their usage of CRV (pending Thailand and India connecting to CRV) is ongoing (April-2022).</p>	Frequentis Comsoft	
PAKISTAN	<p>ATN/AMHS connections with Mumbai and Kuwait since 2015 and 2018 respectively.</p> <p>AMHS connection with Beijing, Kabul, Tehran and Muscat will be provided after up gradation of existing AMHS at Karachi which is already in progress.</p>	Existing COMSOFT After up gradation ISD	
PAPUA NEW GUINEA	<p>Currently AFTN over IP.</p> <p>AMHS implementation is planned for after successful implementation of CRV this year.</p> <p>AMHS implementation planned for 2020.</p>	COMSOFT is the supplier of PNG AFTN/AMHS system	

ACSICG/10
Appendix F to the Report

State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AMHS Vendors Selected	Remarks
PHILIPPINES	<p>ATN/AMHS Boundary Intermediate System was installed at the new Manila CNS/ATM Center;</p> <ul style="list-style-type: none"> • Site Acceptance, Oct. 2015 • Commissioned & operational, March 2018 <p>AMHS implementation over CRV with the following adjacent FIR's;</p> <ul style="list-style-type: none"> • HONG KONG - May 2019 • TAIPEI - Sept. 2019 • SINGAPORE - Dec. 2020 • OAKLAND - April 2021 	Frequentis - Comsoft	<p>The New ATN/AMHS of Manila CNS/ATM center has been in domestic operations since March 2018. And with the implementation of CRV, AMHS connection has been implemented with the following adjacent FIR's;</p> <p>-HONG KONG</p> <p>-TAIPEI</p> <p>-SINGAPORE</p> <p>-OAKLAND</p>
REPUBLIC OF KOREA	<p>Plan to upgrade AMHS supporting IWXXM from 2022 over CRV</p> <ol style="list-style-type: none"> 1) AMHS/CRV IOT with China and Japan in 4Q of 2021 2) AMHS/CRV POT with China on July 2022, and with Japan in 4Q 2022 3) Cutover to CRV with China and Japan in 4Q 2022 4) Implementation of AMHS/CRV with China and Japan in 4Q 2022 	FREQUENTIS	

ACSICG/10
Appendix F to the Report

State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AMHS Vendors Selected	Remarks
SINGAPORE	<p>AMHS implemented with:</p> <ol style="list-style-type: none"> 1) AMHS circuit with India put into operational use in Mar 2011. 2) AMHS circuit with UK put into operational use in Mar 2012. 3) AMHS circuit with Thailand put into operational use in Dec 2014. 4) AMHS circuit with Australia put into operational use in Oct 2016. 5) AMHS circuit with Indonesia put into operational use in Feb 2018. 6) AMHS circuit with Malaysia put into operational in Mar 2020. 7) AMHS circuit with Japan put into operational in Dec 2020. 8) AMHS circuit with Philippines put into operational in Dec 2020. <p>Inter-Operability Test (IOT) with Vietnam and Sri Lanka started in 2019 and 2022 respectively.</p> <p>IOT with Bahrain and Brunei to be confirmed.</p>	FREQUENTIS COMSOFT	
SRI LANKA	<p>ATN BIS Router Planned for 2013. IP based AMHS implemented by Oct. 2017.</p> <ul style="list-style-type: none"> - Mumbai tested May 2017 operational planned for Q4 2017; - Singapore testing in Q4 2017 operational for 2018; - Male testing and operational date TBD. 	IDS	

ACSICG/10
Appendix F to the Report

State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AMHS Vendors Selected	Remarks
THAILAND	<p>BBIS/BIS Routers already implemented. AMHS has been implemented since July 2011. Connection with Bangladesh, Bhutan, Cambodia, China, India, Lao PDR, Myanmar, Singapore, Hong Kong China, Malaysia and Rome implemented.</p> <p>Bangkok - Vietnam Circuit</p> <p>Commissioning: Planned for end of 3Q2022</p> <p>Connection with SITA (SITA AMHS Gateway inter-connections) implemented.</p>	AEROTHAI's AMHS System	
TONGA	<p>AMHS planned for 2008.</p> <p>The provider is linked to the New Zealand AFTN</p>		CPDLC and ADS-C is not considered for lower airspace
UNITED STATES	<ul style="list-style-type: none"> - Australia - Fiji - New Zealand - Japan - Philippines - Indonesia (2023) 	IN-HOUSE	
VANUATU			

ACSICG/10
Appendix F to the Report

State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AMHS Vendors Selected	Remarks
VIET NAM	AMHS (basic) implemented from 4Q/2018. Plan AMHS extended from Q4 2022 IOT with Singapore from 10/2019 to 8/2020 IOT with Hong Kong 12/2019 IOT with Thailand 6/2020, POT 8/2020.	IN-HOUSE	
Wallis and Futuna (FRANCE)	AMHS implementation planned for end of 2017		
