

International Civil Aviation Organization

ICAO

Eighth Meeting of Aeronautical Communication Service Implementation Co-ordination Group of APANPIRG (ACSICG/8)*Video Tele-Conference, 21 – 23 June 2021***Agenda Item 5** Review and update the AMHS/ATN Implementation Status

5.1 Update status of AMHS implementation

UPDATE THE AMHS/ATN IMPLEMENTATION STATUS TABLE

(Presented by the Secretariat)

SUMMARY

This paper presents the AMHS/ATN Implementation Status table for review and update by the meeting. It also presents CRV Implementation Status Table and AIDC Implementation table for information.

1. INTRODUCTION

1.1 The Seventh Meeting of the Aeronautical Communication Services Implementation Coordination Group (**ACSICG/7**) was held from *21 to 23 July 2020* via video tele-conference. The ACSICG/7 meeting reviewed the outcomes of the 7th meetings of CRV Operations Group (CRV OG/7) and took following actions.

1.2 The Twenty Fourth Meeting of the Communications, Navigation and Surveillance Sub-group (**CNS SG/24**) of Asia/Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG), was held from *30 November to 4 December 2020* via video tele-conference. The meeting noted the updated ATN/AMHS/AIDC and CRV implementation status in the APAC Region.

1.3 The Eighth Meeting of the Common aeRonautical Virtual Private Network Operations Group of APANPIRG (**CRV OG/8**) was held via video tele-conference from *17 to 19 May 2021*. The meeting reviewed and updated ATN/AMHS/AIDC table and the CRV implementation table in the APAC Region.

1.4 The Seventh Meeting of the Asia/Pacific ATS Inter-Facility Data-Link Communication Implementation Task Force (**APA TF/7**) of APANPIRG was held via video tele-conference from *07 to 09 June 2021*. The meeting further reviewed and updated ATN/AMHS/AIDC table and the CRV implementation table in the APAC Region.

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2. DISCUSSION

2.1 The ATN/AMHS/AIDC implementation table and the CRV implementation table further updated/reviewed by **CRV OG/8** and **APA TF/7** are provided in **Attachment A and Attachment B** respectively to this paper.

2.2 The APA TF/7 also proposed an **ACTION ITEM 7-2** to develop a MS Excel format sheet to monitor the AIDC implementation status in APAC region, based on the information recorded in the *ATN/AMHS/AIDC Implementation Status in the APAC Region* table in APA TF/7 meeting. All AIDC focal points in States are requested to update the relevant implementation status continuously to maintain the currency of the Excel Sheet.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

- a) note the information contained in this paper;
- b) review and update the ATN/AMHS implementation table provided in **Attachment A**;
- c) note the information contained in **Attachment A** for AIDC Implementation Status
- d) note the information contained in the **Attachment B**; and
- e) discuss any relevant matter as appropriate.

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.</p> <p>AMHS has been migrated to CRV.</p> <p>Connection with Singapore using AMHS was implemented October 2016;</p> <p>Another AMHS connections pending CRV (target date by March 2020) including both connection with New Zealand and USA.</p> <p>AMHS connection with Indonesia pending on CRV implementation</p> <p>AMHS connection with South Africa has been established</p> <p>Plan to upgrade AMHS support IWXXM traffic from Nov. 2020.</p>	COMSOFT	<p>AFTN/AMHS based AIDC Implemented between Brisbane and Melbourne, Oakland, Nadi and Auckland;</p> <p>Implemented between Melbourne and Johannesburg;</p> <p>AIDC is also in use between Melbourne and Mauritius;</p> <p>Operational trial between Brisbane and Ujung Pandang since May 2013. Implementation in July 2017. LOA needs to be updated.</p>		

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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
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 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				

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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
CAMBODIA	<p>BIS Router and AMHS installed. Cambodia (CATS) AMHS connected with Bangkok via VSAT IP link since 10 December 2013</p>	AVITECH	<p>AIDC function and capability made available.</p> <p>Ready for testing with neighbors ATS Facilities starting from 2017 and target date of implementation with Bangkok in 4Q2019</p>	THALES which supports AIDC ICD Version 1.	
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>	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. AIDC between Dalian and Incheon implemented in Nov. 2016;</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</p>	IN-HOUSE (Aero-Info Technologies Co., Ltd)

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	<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>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 Sanya and Hong Kong China put into operational use since February 2007.</p> <p>AIDC between Shanghai/Guangzhou and Tapei China put in to 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</p>	<p>and 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 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>	

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			<p>and Vientiane put into pre-operational trails since January 2021.</p> <p>AIDC technical test between Beijing ACC 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>with the Beijing - Japan AMHS link was put into operation in in 2020.</p> <p>AMHS testing 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>	COMSOFT	<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>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>

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	<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 CRV/AMHS circuit was put into operation in June 2020.</p>		AIDC with Manila put in operational use in May 2019.		
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]		

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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.

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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 was planned in July with Muscat, however it was cancelled due to technical problems at Muscat end. Muscat will intimate readiness after resolution. 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: Trials have been carried out between various ATS units listed below I Delhi: Ahmedabad, Varanasi, Nagpur I. Chennai: 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	

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			<p>II. Kolkata: Chennai, Nagpur, Varanasi, Guwahati III. Mumbai: Chennai, Ahmedabad, Nagpur</p> <p>Operational: Chennai-Mumbai; Delhi-Nagpur; Delhi-Ahmedabad, Ahmedabad – Nagpur, Kolkata-Chennai Functional: Delhi-Varanasi, LOA to be signed shortly.</p> <p>B: Implementation with Neighbouring 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 confirmation. TOC/AOC is implemented w.e.f. 1st Jan 2021. LOA signed on</p>	<p>Trichy: INDRA Aircon 2100</p> <p>All these systems follow APAC AIDC ICD Ver 3.0 of 2007</p>	

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			<p>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 are ready</p> <p>V. Mumbai & Male (Maldives) –</p>		

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			<p>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 exchange (e.g. ABI, EST) happens for most of the East bound flights</p>		

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			<p>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 because of the extra space in messages from Lahore.</p>		

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			<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 compatible ATM Automation system in place for AIDC</p>		

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			coordination with Mumbai ATSU		
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; - Target date for implementation 4Q2021.</p> <p>4) Ujung Pandang ACC – Oakland ARTCC: - Successfully tested and target date for implementation in 4Q2021.</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.

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			<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); 2) Jakarta – Chennai (2Q2022); 3) Jakarta – Melbourne (3Q2022); 4) Jakarta – Colombo (4Q2022); 5) Jakarta – Singapore (2Q2023);</p>		<p>Priority is in accordance with Hot Spot identified by RASMAG/23</p>

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			6) Jakarta - Kuala Lumpur (3Q2023); 7) Jakarta – Kota Kinabalu (4Q2023).		
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>Upgrading connection with Hong Kong and Singapore using VPN will be implemented in 2020 after implementation of CRV.</p> <p>Coordinating for all other circuits upgrading.</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> <p>Implemented between Fukuoka and Incheon since June 2009.</p>		Japan and USA conducting testing AIDC over AMHS and cutover date is 5 May 2017.

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	<p>Connection tests with Hong-Kong and Singapore using AMHS/FTBP over CRV since Dec 2019 and testing is going.</p> <p>AMHS/FTBP over CRV implementation with Beijing/China in 4Q2020, and with Incheon/Korea in 1Q2021.</p> <p>Connection AMHS over CRV as below:</p> <ul style="list-style-type: none"> - Singapore from Oct. 2020 - Hong Kong from Sep. 2020 - Beijing from Mar. 2021 		<p>AIDC implemented between Fukuoka ACC/Naha ACC and Taibei 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, Hanoi and Yangon ACCs. 	THALES which is able to support ICD Version 2.	

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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 ACC and Chennai OCC conducted since 31st July 2013.</p>	SELEX which is able to support ICD Version 3.	

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			<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> <p>The operational implementation for TOC/AOC commenced on 1st January 2021.</p>		

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			<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> <p><u>Kuala Lumpur ACC and Ho Chi Minh ACC</u> AIDC technical test between Kuala Lumpur ACC and Ho Chi Minh</p>		

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			<p>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). Upcoming AIDC Technical Test between Kota Kinabalu ACC and Manila ACC to be conducted in Q32021</p>		

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			<p><u>Kota Kinabalu ACC and Ujung Pandang ACC</u> 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). Technical Test 3 was conducted on 11th March 2020 (EST / ACP / LAM / LRM).</p> <p>Upcoming AIDC Technical Test between Kota Kinabalu ACC and Ujung Pandang ACC to be conducted in Q32021</p> <p><u>Kota Kinabalu ACC and Jakarta ACC</u></p>		

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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>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 January 2020 (EST / ACP / LAM / LRM). AIDC Operational Trial started since 16th November 2020 and to</p>		

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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>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> <p>The AIDC Technical Test (Third and Fourth) was conducted both on 20-21 November 2019</p>		

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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 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> <p><u>Kuching ACC and Jakarta ACC</u> AIDC between Kuching ACC and Jakarta ACC TBD.</p>		

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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
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 Colombo is working to resolve it on their end with the automation system supplier.</p>	SELEX which is able to support ICD Version 3.	

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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
			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	<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. Plan for commissioning after POT completion in 2019.</p>	COMSOFT	<p>ATM automation system supports both AIDC and OLDI.</p> <p>Coordinating with Russia on OLDI connection in target date 2016.</p>	INDRA Aircon 2100 supporting AIDC ICD Version 2.	

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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
			Coordinating with China on AIDC connection between Beijing/Ulaanbaatar technical trials in progress. Planned date of testing in 2019.		
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					

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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 & Karachi/Ahmedabad are planned in Phase-2.</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.

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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
			After modification of Lahore/Karachi FIRs boundaries, trials between Karachi/Delhi ACC are not required.		
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	<p>AIDC using AFTN operational with Australia, testing/trial with Oakland (USA) started late last year and in progress.</p> <p>AIDC implementation with Indonesia to happen after CRV implementation this year.</p>	New ATM System from Thales (TopSky-ATC) implemented and operational now supports AIDC V3.	
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;</p>	Frequentis - Comsoft	<p>AIDC implementation status/update over AMHS with the following FIR's;</p> <p>HONG KONG – Implemented, May 2019</p>	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 implementation

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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"> • HONG KONG - May 2019 • TAIPEI - Sept. 2019 • SINGAPORE - Dec. 2020 • OAKLAND - April 2021 		<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 – Next progress AIDC test to be scheduled, target 2Q2021</p> <p>KOTA KINABALU – Next progress AIDC test to be scheduled, target 3Q2021</p> <p>OAKLAND – 1st test to be scheduled, target 2Q2021</p>		<p>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>

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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
REPUBLIC OF KOREA	<p>Plan to upgrade AMHS support IWXXM from 2023 over CRV Frequentice</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 and Japan in 4Q 2022 3) Cutover to AMHS/CRV with Chi na and Japan in Q1 2023 after POT 4) Implementation of AMHS/CRV with Japan Q1 2023 	FREQUENTIS	<p>AIDC implemented between ACC and Fukuoka ATMC in 2010</p> <p>AIDC between Incheon and Dalian implemented in Nov. 2016.</p>	Rockheed Martin System	
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. 	FREQUENTIS COMSOFT	<ol style="list-style-type: none"> 1) Operational with Ho Chi Minh implemented Jul 2014. 2) Kuala Lumpur operational trial started since Sep 2018 and is implemented Nov 2019. 3) Implemented with Kuching ATCC in Feb 2021. 4) Operational trial ongoing with Kota Kinabalu ATCC 	THALES supports ICD Version 3 since December 2018	

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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>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>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; - Male testing and operational date TBD. 	IDS	<p>Trials with Male planned for in 3Q2019.</p> <p>Trial with Chennai on-going. Plan for implementation in 2018 and with Melbourne plan for 1Q2018.</p>	INTELCAN which is able to support ICD Version 3.	
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,</p>	AEROTHAI's AMHS System	<p>The implementation with</p> <ul style="list-style-type: none"> · Malaysia has done since 14th March 2020 	THALES which supports AIDC feature, APAC AIDC ICD V.3.	

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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>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"> · Lao PDR has done since 14th July 2020 · Cambodia has done since 1st October 2020 <p>The AIDC implementation with Myanmar is during operational trial.</p>		
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) 	IN-HOUSE which is able to support APAC and NAT ICDs currently Version 2.	

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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"> - Philippines (2021) - Indonesia via Australia (Direct planned for 2022) - Russian Federation (pending joining CRV) 		
VANUATU					
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>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>	

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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
			with Malaysia TBC For operation trial TBC. Operation trial between Ho Chi Minh and Hanoi ongoing.		
Wallis and Futuna (FRANCE)	AMHS implementation planned for end of 2017			COMSOFT	

CRV IMPLEMENTATION TABLE

State/ Administration	Intended date for CRV cut-over	Applications targeted	Migration scheme	Prerequisites/ dependencies
Australia	Contract in May2018 and service readiness in 3Q 2018	<p>AFTN, ADS-B, AMHS, Voice With:</p> <p>Australia February,2019(AMHS/AIDC), March,2019(Voice)</p> <p>Fiji March,2019 (AMHS June 2019/AIDC, Voice completed April)</p> <p>New Zealand, February, 2019 (AMHS June 2019, AFTN May 2019/AIDC), March, 2019 (Voice April 2019 completed)</p> <p>Indonesia 4Q2019 (TBC) (AMHS/AIDC, Voice, ADS-B);</p> <p>PNG 4Q2019(TBC), (AMHS/AIDC, Voice)</p> <p>Singapore 2Q2019 TBC (AMHS/AIDC, Voice);</p> <p>South Africa TBC</p> <p>3Q2019 TBC (AMHS/AIDC, Voice);</p> <p>Japan would be end of 2019.</p>	staged approach	Termination of current COM contract
Bhutan	<p>Contract signed on Oct 2019.</p> <p>CRV installed successfully in Dec 2021.</p> <p>CRV P2P Test between Paro-Mumbai & Paro-Bangkok to be done once India and Thailand join CRV</p>	AMHS first and Voice & ADS-B will follow up after AMHS.		Dependent on India and Thailand for utilization of CRV network.

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State/ Administration	Intended date for CRV cut-over	Applications targeted	Migration scheme	Prerequisites/ dependencies
Cambodia	As early as convenient, dependent on neighboring countries			Internal decision making
China	Contract signed on 21 June 2020.	Applications targeted: Data(AMHS) With: Hong Kong 3Q2020; Japan 4Q2020; Thailand TBD; India TBD. Republic of Korea 4Q2020 ATFM test with Japan and ROK at Sep 2020 over CRV	staged approach	
Democratic People's Republic of Korea	Contract in 3Q2018 and service readiness in 4Q2018	AFTN and VoIP		
Hong Kong, China	Contract signed on 6 April 2018. Connection was installed successfully in June 2018.	With Manila CRV-Voice put into operation in August 2018 CRV-AMHS put into operation in May 2019 With Taipei CRV-AMHS put into operation in May 2020 With Fukuoka CRV-AMHS put into operation in September 2020 With Beijing CRV - AMHS POT in March and operation in April 2021	staged approach	Need to coordinate with relevant CAAs/ANSPs in joining CRV in a harmonized manner, etc.

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State/ Administration	Intended date for CRV cut-over	Applications targeted	Migration scheme	Prerequisites/ dependencies
		Bangkok and Hochiminh Subject to their readiness		
Macao, China	Service readiness in Q4 2021	To be confirmed	Staged approach	Migration from X.25 to IPS
Fiji	Contract in May 2018 and service readiness in 3Q 2018.	Data (AMHS) and VoIP With: Australia ATS voice April 2019 completed, AMHS completed in July 2019, NZ ATS voice completed April 2019 and USA ATS voice completed in March 2019 and AMHS completed in April 2019.	Staged approach	CBA, safety case
France (New Caledonia and French Polynesia)	2023 is target for DNSA to sign contract subject to internal security assessment (done).	ATS Voice, AMHS with Fiji & AIDC, AMHS with USA, AIDC/AMHS with NZ.		CBA, cost must be affordable <i>Wallis and Futuna: no dedicated connection to CRV</i>
India	Contract for CRV implementation with M/s PCCW in India will be signed in 3Q of 2021 and CRV Service will be ready in 4Q of 2021.	AFTN/AMHS, ADS-B, AIDC, ATS Voice	staged approach	Internal Administrative approvals & safety case

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State/ Administration	Intended date for CRV cut-over	Applications targeted	Migration scheme	Prerequisites/ dependencies
Indonesia	Contract in 3Q2021 and service readiness in 4Q2021.	AFTN, AMHS, ADS-B and voice		CBA completed
Japan	Contract signed in Nov.2017 and service readiness in 1Q 2018 for Fukuoka	Data first with: Hong Kong completed 3Q2020 USA completed 1Q2019 Singapore completed 4Q2020 China completed 1Q2021 Voice Plan with: USA 2Q2021 Daegu and Incheon (R.O.K) started in 1Q2021	staged approach	
Malaysia	Contract to be signed 4Q 2020 and service readiness in 1Q 2021	AFTN, AMHS, ADS-B and ATS voice	staged approach	New ATC centre operational in 2021 Contract issue with the new ATC main contractor. COM Project is part of the main contract.
Myanmar	Contract will be signed 4Q2020.	AFTN/AMHS, AIDC, ADS-B and voice	staged approach	One of counterparts join in
Nepal	Nepal intends to join CRV on staged approach with AMHS data connectivity as first priority and intends to sign the contract with PCCW within 2020.			

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State/ Administration	Intended date for CRV cut-over	Applications targeted	Migration scheme	Prerequisites/ dependencies
New Zealand	Contract signed in July 2018 and service implemented December 2018	Australia Voice Completed March 2019 and AMHS June 2019 Completed USA Voice Completed March 2019 and AMHS March 2019 Completed Fiji Voice Completed April 2019 French Polynesia AMHS and Voice Chile AMHS (SAM regional network REDDIG)	Awaiting French Polynesia joining. Awaiting outcome of inter-regional network connectivity discussion. For Chile	CBA attractive if all counterparts join in.
Philippines	Contract signed in March 2018 and service readiness in 2Q2018	Completed: with HONG KONG AIDC - 2Q2019; AMHS - 2Q2019; Voice - 3Q2018. with TAIPEI AIDC 4Q2019; AMHS 3Q2019; Voice 1Q 2019. with SINGAPORE AIDC – 4Q2019; AMHS –4Q2020; Voice – 1Q2020. with USA AMHS – 2Q2021; Voice – 4Q2019;	staged approach	Success transition to the New ATM centre in 4Q2018

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State/ Administration	Intended date for CRV cut-over	Applications targeted	Migration scheme	Prerequisites/ dependencies
		with INDONESIA AIDC – 4Q2020.		
Republic of Korea	Contract in 3Q 2019 and service readiness in 4Q 2019	Completed: with Japan Voice –March 2021 Planned; With Japan Voice additional lines-from 2022 to 2023 AMHS-4Q 2022 With China Data(AMHS)-4Q 2022	staged approach	
Singapore	Contract signed in May 2019 and service readiness in Dec 2019	Data (AMHS over IP) with: Australia Dec 2020 (completed); Japan Nov 2020 (completed); and Philippines Dec 2020 (completed);and Malaysia Q3 2021. Voice with: Philippines Mar 2020 (completed).	Staged approach	Singapore
Sri Lanka	As soon as CRV is available	AMHS connectivity with Mumbai, Singapore and Male. Direct Speech facilities with Chennai, Trivendrum, Mumbai, Male, Jakarta, Melbourne, Singapore	Phased approach with the implementation of CRV	CBA

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State/ Administration	Intended date for CRV cut-over	Applications targeted	Migration scheme	Prerequisites/ dependencies
Thailand	Contract in 3Q2021 and service readiness in 1Q2022	Data first Then voice, subject to safety case: China 1Q2022 Hong Kong 1Q2022; Singapore 1Q2022; India 2022.	Staged approach	
United States	Contract in January 2018	<p>1) AMHS with Australia Fiji Japan Philippines New Zealand Papua New Guinea (2021) Indonesia (2022)</p> <p>2) AIDC with Fiji Japan New Zealand Papua New Guinea (Direct planned 2021) Tahiti (via New Zealand) Indonesia (Direct planned 2022) Russia (when join CRV)</p> <p>3) VoIP with Fiji Japan Philippines New Zealand Papua New Guinea (direct planned 2021) Indonesia (2022) Russia (when join CRV)</p>	Staged approach	

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State/ Administration	Intended date for CRV cut-over	Applications targeted	Migration scheme	Prerequisites/ dependencies
Viet Nam	To be confirmed later (After discussed with PCCW Global)			
