



ICAO

*International Civil Aviation Organization***The Sixth Meeting of System Wide Information Management Task Force (SWIM TF/6)**

Video Teleconference (VTC), 17 – 20 May 2022

Agenda Item 2: Outcomes of relevant meetings on SWIM related matters**OUTCOMES OF ACSICG/9 MEETING**

(Presented by the Secretariat)

SUMMARY

This paper presents the discussions and relevant outcomes on the Ninth Meeting of the Aeronautical Communication Services Implementation Coordination Group (ACSICG/9).

1. INTRODUCTION

1.1 The Ninth Meeting of the Aeronautical Communications Services (ACS) Implementation Coordination Group (ACSICG/9) was held *from 19 to 21 April 2022*. The Meeting was attended by 136 participants from **21** States/Administrations, **4** International Organizations and **3** Aviation Industries. ACSICG/9 meeting report, working papers, information papers, and other resources can be accessed by following link:

<https://www.icao.int/APAC/Meetings/Pages/2022-ACSICG9.aspx>

1.2 The Tenth Meeting of the Common aeRonautical Virtual Private Network Operations Group of APANPIRG (CRV OG/10) held on *18 April 2022* via video tele-conference. The meeting was attended by **89** participants from **21** Member States/Administration and **1** industry. CRV OG/10 meeting report, working papers, information papers, and other resources can be accessed by following link:

<https://www.icao.int/APAC/Meetings/Pages/2022-CRV-OG-10.aspx>

1.3 The Ninth Meeting of the Common aeRonautical Virtual Private Network Operations Group of APANPIRG (CRV OG/9) was held *from 25 to 27 January 2022* via video tele-conference. The meeting was attended by **119** participants from **21** Member States/Administration, **1** International Organizations, and **1** Industry. CRV OG/9 meeting report, working papers, information papers, and other resources can be accessed by following link:

<https://www.icao.int/APAC/Meetings/Pages/2022-CRV-OG-9.aspx>

1.4 This paper summarised relevant information and updates from the meetings.

2. DISCUSSION

2.1 The summary of discussion in the meeting is given in following paragraphs.

Internet Protocol Suite (IPS) ecoDemonstrator Validation and Development Update – USA (IP/06)

2.2 The paper presented Internet Protocol Suite (IPS) ecoDemonstrator Validation and Development in USA. The meeting was informed that the IPS is intended to provide a migration from legacy ATN and ACARS to IP-based protocols which have no changes to the existing applications (e.g. CPDLC) while moving away from legacy protocols. USA further introduced the benefits of moving to IPS, the IPS system architecture, evolution of the technology, standardization activities, and validation and testing.

2.3 The ICAO Secretariat referred to the Strategy for Implementation of the Air-Ground Data Link in the Asia/Pac Region, which was revised by ACSICG/7. The strategy mentioned that *States should consider implementing ATN OSI/IPS Gateway to support aircrafts equipped with either ATN/OSI or ATN/IPS in addition to existing ACARS*. The meeting was informed that after the 41st Assembly with the GANP 7th Edition endorsed, this strategy might need further review by ACSICG to align. The Co-Chair also reminded the meeting that the CNS SG/25 discussed the domain naming and IPv6 address management on top of authentication, which is a part of big picture to air-ground and ground-ground IPS implementation. In future when the ATN/IPS are available to ANSP to use ground-based gateway as a subscription of service, the domain naming safety and IPv6 address framework will be important. ANSP would then need to consider those factors to support the future of ATN/IPS for air-ground.

Outcomes of Relevant Meetings Related to IWXXM – Sec (IP/07)

2.4 The paper presented recent outcomes from APANPIRG and its contributory bodies' meetings regarding the States' implementation of ICAO provisions to disseminate meteorological information in the ICAO meteorological information exchange model (IWXXM) form. Recent discussions on IWXXM within the APANPIRG, MET SG and MET/IE WG forums focused on developing supporting resources, including an *Online Register of IWXXM Exchange Status, IWXXM Implementation in APAC Region – Frequently Asked Questions (FAQs)*, and reviewing the status of implementation by the States of IWXXM for the dissemination of OPMET messages which were shared in details in this paper.

Review the report of the Ninth meeting of Common aeRonautical VPN Operations Group (CRV OG/9) - Sec (WP/03)

2.5 The paper summarized the relevant outcomes of the Ninth Meeting of the Common aeRonautical Virtual Private Network Operations Group of APANPIRG (CRV OG/9) held from 25 to 27 January 2022 via video tele-conference. CRV OG/9 meeting report, working papers, information papers, and other resources can be accessed by following link:

<https://www.icao.int/APAC/Meetings/Pages/2022-CRV-OG-9.aspx>

Outcomes of Ad-hoc expert Strategy, Design, Transition and, Operations Groups

2.6 The paper presented an update on the progress of the Ad Hoc expert groups for Strategy, Design, Transition and Operations. CRV OG/8 meeting held via VTC during 17-19 May 2021 created an Ad Hoc Group of experts to progress sections of the CRV Operations Manual. The outcomes of three ad-hoc group meeting held on 13th September 2021, 12th November 2021, and 13th January 2022, all by VTC, were presented to the meeting. The latest version has been presented in the ad-hoc group on 10th March 2022 with the aim to publish by 31st March 2022.

CRV Implementation Plan

2.7 The ICAO Secretariat shared the information about latest version of published CRV Implementation plan on ICAO APAC e-documents portal and concern raised by some States for publication of some information. The meeting agreed that ICAO Implementation Plan will be continued to upload on ICAO APAC e-documents portal. Under Table 1 (National Points of Contact), Table 2 (Local Points of Contact), Appendix A and Appendix B (Network Assignment for APAC and MID region), a message would be added to refer to ICAO APAC CRV Secure portal or CRV Portal hosted by New Zealand to get required information along with the instructions needed as an action item of CRV OG/9, which has been completed.

VoIP Regional dial plan

2.8 USA provided an overview of the Voice over Internet Protocol (VoIP) dial plan implemented in the CRV network. The CRV OG/9 meeting was informed that USA has accepted responsibility for maintaining the CRV dial plan for all member states and any updates/changes should be submitted to be added to the dial plan by contacting USA or CRV OG Co-Chairs.

CRV Operations Manual

2.9 New Zealand presented the status of the current draft of the CRV Operations Manual. The meeting was informed that since publication of the CRV Operations Manual in December 2020, there have been many updates including those coming from the Ad Hoc Groups presented by WP/03. The updates are currently in DRAFT for publication pending updates from PCCW and the next Ad Hoc Groups meeting. The updates in different sections were explained.

Latest CRV operational performance report

2.10 PCCWG shared Latest CRV Updates and CRV Network Yearly Service Review for 2021. The CRV OG/9 was informed about 2021 Ticket Summary by Ticket Type and their overview. PCCWG informed that there are 45 circuits in 27 cities with different CRV packages, A, B+, C+, C and D. There are 2 service providers in the CRV network and 5 circuits (A, B+ and C+) are under implementation. It was further informed that 9 cities are joining CRV in 2022, which are Mumbai (India), Jakarta (Indonesia), Makassar (Indonesia), Kathmandu (Nepal), Moscow (Russia), Khabarovsk (Russia), New Caledonia, Sri Lanka, and French Polynesia.

Update the APAC CRV Implementation Table

2.11 The meeting was informed that the format of CRV Implementation table updated by CRV OG/8 is modified to accommodate other necessary information required by the ICAO Secretariat time-to-time for monitoring the progress and implementation status of CRV, and connected States by CRV for each Member State. The CRV OG/9 meeting updated the CRV Implementation Status Table, which is provided in **Appendix A** to this paper.

Extension of CRV Contract

2.12 The paper presented the request received by APAC Member States for extension of current contract of CRV with PCCWG for one year due to current pandemic situation. The meeting was informed that as per the current contract, all Authorities shall join the CRV program and sign the relevant Service Contract(s) with PCCWG with the billing start date on or before 31 December, 2022. For authorities, which join CRV after 31 December, 2022, any additional charges may be imposed. The CRV OG/9 meeting invited Member States who have not already contracted or initiated CRV contract process to share their intention to join CRV in next few year, if there is any plan.

Upgrade/Downgrade CRV Circuits Subscribed

2.13 The paper summarized the outcomes of discussion of ad-hoc group formed by action item 8-3 of ACSICG/8 that States should have option to upgrade/downgrade the circuits based on the need. The first meeting of Ad-hoc group formed by ACSICG/8 as per ACTION ITEM 8-3 discussed and agreed that PCCWG will draft relevant clauses to add in Terms and conditions document of CRV contract for consideration of CRV OG/9 and PCCWG will present sample calculation of penalty charges in case package degradation are opted by any contracting States within their terms of contract of CRV in CRV OG/9 for Member State's understanding. In response, PCCWG presented next described WP/09 to the CRV OG/9 for further discussion.

Upgrade/Downgrade CRV Circuits Subscribed by PCCWG

2.14 In WP/09 of CRV OG/9, PCCWG highlighted the CRV contract T&Cs and listed some examples to illustrate the cost implications in related to upgrade / downgrade the existing CRV services within the contract period. PCCWG informed that termination will require cancellation charges(= monthly charge x remaining months), while downgrade or upgrade if the new “Package” contract is less than 5-year term, the new monthly charge will be confirmed once a formal request is submitted. The CRV OG/9 meeting further discussed the questions raised by States, did not agree to the proposal presented by PCCWG, and proposed to create an ad-hoc group named as **ICAO CRV Steering Group** to devise the terms and conditions for addition of new services, for upgrade/downgrade of packages along with addition of new sites by contracted states into their contract.

2.15 The CRV OG/9 meeting recommended that ICAO APAC Office would send a State Letter to APAC Member States, who have not joined/not initiated process to join CRV to share their intention to join CRV and when they intend to do. The abovementioned ICAO CRV Steering Group will discuss and finalise the requirements of current CRV contract extension based on feedback received from Member States who would join CRV in next few years.

2.16 The CRV OG/9 meeting agreed for one day CRV OG/10 meeting on 18 April 2022 before ACSICG/9 meeting. The outcomes of CRV OG/10 has been presented through WP/11 of ACSICG/9.

Non-aviation providers joining CRV

2.17 PCCWG introduced PCCW Console Connect Aviation Platform for non-ANSP users to exchange SWIM Data with CRV members. PCCWG informed that in order to provide an easy, managed, flexible and scalable mechanism for non ANSP users to exchange SWIM data with those CRV users, PCCW Global planned to extend its EMS node with its own developed software defined interconnection platform - Console Connect for Aviation and purposed built SWIM as Service Platform. Additionally, PCCWG informed that the SWIM services from ANSPs on CRV will be listed on PCCW SWIM Registry where users can select and subscribe and concluded that the Console Connect Platform provides an alternative path for non-ANSP users to exchange SWIM data with ANSPs who are on the CRV Network. Furthermore, Fiji added that if ANSPs will be SWIM providers, SWIM data can be shared on CRV among ANSPs.

Current Status of CRV Implementation in India

2.18 The CRV OG/9 meeting was informed about the latest progress of CRV implementation in India. India informed that India had planned to implement the CRV after the CRV trials were successful but the implementation got delayed due to issues related to taxation and some other clauses along with delay due to the COVID-19 Pandemic. Furthermore, India has been informed by PCCW that lead time requirements for setup of CRV network in India may take 8 months after signing of the agreement, and India requested PCCW to keep themselves in the readiness and reduce

the lead-time to get the network established at the earliest after signing of the agreement.

Update on Fiji's CRV Network Upgrade

2.19 The paper presented information about Fiji's CRV network upgrade from Package C+ to CRV Package B+ for voice and AMHS services. The CRV OG/9 meeting was informed that Fiji has signed and implemented CRV Package C+ with PCCWG in 2019 and requested PCCWG to downgrade the CRV SLA to Package D to reduce operational cost due to impact of COVID-19 pandemic in April 2020. Fiji further explained CRV Package C+ and the downgraded CRV Package D for the Fiji CRV Connection by diagrams, and shared the plan to upgrade its CRV network from CRV Package C+ to Package B+ to support voice and AMHS services to Australia, New Zealand & USA in the 2nd Quarter of 2022.

2.20 In response to a question, Fiji informed that Fiji neither paid any penalty for downgrading the package or upgrading it back nor signed any new service order for 5 years. Fiji added that downgrade of CRV package was discussed with PCCW global on a special condition to return to the original package in a certain timeframe due to the impact of COVID 19 on the revenue.

SWIM User Network Requirements analysis

2.21 USA presented an analysis of the network requirements for SWIM users. CRV has been considered as an underlying Internet Protocol (IP) network for SWIM services. The meeting was informed that from the network point of view, SWIM users can be categorized into three different groups: a) SWIM subscribers (can be ANSPs or any entities), b) Global Enterprise Messaging Service (GEMS) providers, and c) ANSP based SWIM providers (and subscribers). USA added that the use of CRV to support SWIM may result in additional bandwidth demands due to the nature of XML based messages. However, CRV can provide a reliable and better secured network compared with the Public Internet.

2.22 The CRV OG/9 meeting was recommended to consider this approach and coordinate with the SWIM Task Force for network connection planning. The meeting agreed that ICAO Secretariat would present a paper to SWIM TF on behalf of CRV OG to inform about the relevant discussion in CRV OG. **ACTION ITEM 9-7**. It was also agreed that CRV ad-hoc expert Strategy and Design group would join SWIM TF meetings to note important discussions related to CRV and to inform CRV OG about the relevant outcomes. **ACTION ITEM 9-8**

SWIM Providers joining CRV

2.23 New Zealand presented discussion on SWIM Meteorological providers joining CRV for the delivery of SWIM based Meteorological Data. New Zealand shared the concerns about *whether or not Meteorological Services need to go through the documented process to add a new service to the CRV as a Service Provider*. The meeting agreed that the process to join CRV by non-aviation service providers such as Meteorological Service providers required detailed deliberations. The meeting agreed that a specialised meeting would be organised to discuss and devise a method for non-aviation service provider's joining process to CRV, which resulted into an action item of CRV OG/9.

Technical Proposal for Regional IP Network Interconnection

2.24 PCCWG shared the meeting how States in CRV Network can communicate with States in REDDIG II Network. PCCWG proposed to establish two (2) Interconnection Points between CRV Network and REDDIG II Network for Primary and Backup respectively. Additional resources are required to build these connections were explained in the paper. PCCWG invited the CRV OG/9 meeting to confirm which States will require communication between CRV Network and REDDIG II Network and the meeting did not receive any immediate request and interest from Member States to join REDDIG II network. However, France informed that in future France is interested to interconnect

with REDDIG II as well as with New PENS.

MPLS/IP Based Inter-Regional Connection

2.25 The paper provided current status of discussion being done for potential interconnection of CRV and REDDIG II (presented by PCCWG through WP/07), and CRV and New PENS. APAC member states were requested to record their interest, willingness, or need for interconnection of the CRV with other regional networks such as REDDIG II / New PENS with the ICAO secretariat. In order to enhanced global connectivity among states of different regions, it was suggested to States that connect to the CRV should also connect to other regional networks such as REDDIG and New PENS.

Updates on CRV Pioneer State Contribution to the ICAO Managed Service Agreement (MSA)

2.26 The ICAO Secretariat informed meeting in CRV OG/2 about the fund balance of USD 104,596 and proposed a draft of revision of Annex 1b to the MSA, and adopted by APANPIRG/28 as Conclusion APANPIRG/28/19: Amendment of the Management Service Agreement for CRV project (RAS14801) which remains as one of outstanding Conclusions/Decisions up to APANPIRG/32 held in December 2021. The paper presented an update on the relevant development of using the balance of the MSA.

2.27 With the efforts of the ICAO Secretariat, ICAO TCB, CRV OG co-chairs and ACSICG Chair, the Revised Annex 1 to Management Service Agreement (MSA) was prepared that the fund will be utilised in the span of 5 years starting from 31 March 2022 to 31 March 2027. The CRV OG/9 meeting requested Member States to provide examples of activities under different categories provided in scope of supporting CRV Network as described in section 10.5 as an action item of CRV OG/9.

2.28 With aforementioned, the following draft conclusion for the next step for using the rest of CRV Pioneer State Contribution to the ICAO Managed Service Agreement (MSA) proposed by CRV OG/9 was endorsed by ACSICG/9 for CNS SG/26 consideration.

Draft Conclusion ACSICG/09/01 (CRV OG/09/01): Revised Amendment of the Management Service Agreement for CRV project (RAS14801)	
<p>What: Recognizing that ICAO Technical Cooperation Bureau satisfactorily completed all the defined work items in the initial Management Service Agreement (MSA) and Project Document of RAS14801, that the required payments were settled, and that in end 2016, all the requirements of both parties have been fully completed and closed on record, That,</p> <p>i) all Pioneer States are encouraged to counter-sign the Revised amended Pro Document provided in Appendix B to the report;</p> <p>ii) any Pioneer State not countersigning is entitled to get its share of the remaining fund balance back. and</p> <p>iii) a Pioneer State for which a direct CRV connection is not considered feasible in 2017 by the selected vendor is entitled to get its initial contribution in full</p>	<p>Expected impact:</p> <p><input type="checkbox"/> Political / Global</p> <p><input type="checkbox"/> Inter-regional</p> <p><input checked="" type="checkbox"/> Economic</p> <p><input type="checkbox"/> Environmental</p> <p><input checked="" type="checkbox"/> Ops/Technical</p>
<p>Why: The initial scope of MSA was completed by ICAO TCB which allowed for a successful evaluation process and selection of a best and final offer; a majority of</p>	<p>Follow-up: <input checked="" type="checkbox"/> Required from States</p>

Pioneer States is willing to use the rest of their initial contribution to continue to support CRV implementation.	
When: 21-Apr-22	Status: Draft to be adopted by PIRG
Who: <input checked="" type="checkbox"/> Sub groups <input checked="" type="checkbox"/> APAC States <input checked="" type="checkbox"/> ICAO APAC RO <input type="checkbox"/> ICAO HQ <input type="checkbox"/> Other:	

2.29 This draft conclusion will be presented to APANPIRG/33 and may supersede outstanding Conclusion APANPIRG/28/19: *Amendment of the Management Service Agreement for CRV project (RAS14801)*.

Estimate of work for safety assessment/ security assessment

2.30 New Zealand presented an estimate of work for a safety assessment or security assessment of the CRV network. It was explained that the possible assessments are Physical Inventory, Overall Security Review, Visibility and Management Audit, Performance Analysis and Quantitative Data. The options and pricings of assessments were shared in details through this paper. New Zealand volunteered to lead the task to prepare the Terms of Reference (ToR) of Security and safety assessment of CRV as an action item of CRV OG/9.

CRV Diversity and Security Implementation

2.31 The CRV OG/9 meeting was informed about the methods used by the FAA in the CRV network to provide security and diversity for AMHS and voice services. Diversity implementation for AMHS traffic and voice traffic which both have primary and backup method were introduced respectively in detail. Additionally, FAA shared that in the event of failure on CRV access, the FAA and Airservices have implemented a backup Internet VPN. USA shared that some degree of privacy is accomplished using GRE (Generic Routing Encapsulation) tunnels over MPLS between corresponding CRV users and additional network level security is provided by the FAA’s firewall infrastructure.

Action Item 7-8 Charging structure for an ANSP service provider on Surveillance

2.32 The joint paper of Australia, Fiji, and PCCWG presented the procurement process for ANSP to operate surveillance services like Space ADS-B over the CRV network. The CRV OG/9 meeting was informed that PCCWG has confirmed that there is no special charging structure for adding the Space Based ADS-B services and stated that for ANSP that have implemented CRV, there is no additional cost to setup the new GRE tunnel between CRV Users under the CRV network, noting that Aireon LLC has already connected to the CRV. However, CRV Users have to consider whether the CRV bandwidth is enough to do so. The additional bandwidth cost is provided the CRV Pricing Schedule in the CRV Common Packages. Two scenarios were presented in detail in the paper.

Review ToR and Subject Task List

2.33 The CRV OG/9 meeting reviewed the ToR of CRV OG and reviewed and further updated the Subject Task list for CRV OG. The Meeting identified that there is no need for revision of ToR of CRV OG other than minor editorial correction while the meeting identified some new Items for the work programme of CRV OG.

Review the report of the Tenth meeting of Common aeRonautical VPN Operations Group (CRV OG/10) - Sec (WP/11)

2.34 The paper summarized the relevant outcomes of the Tenth Meeting of the Common aeRonautical Virtual Private Network Operations Group of APANPIRG (CRV OG/10) held on 18 April 2022 via video tele-conference. CRV OG/10 meeting report, working papers, information papers, and other resources can be accessed by following link:

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Proposal to Extend CRV Contract

2.35 The paper presented the relevant outcomes of the first meeting of the ICAO CRV Steering Group to discuss the necessity of extending the current CRV contract and corresponding recommendations.

2.36 As a follow up action of ACTION ITEM 9-4 of CRV OG/9, the ICAO APAC Office issued a State Letter to request States/Administrations to share the intention to join CRV and its Tentative Timelines. In response, total **13** (thirteen) member states shared their intention to join CRV along with tentative timelines, including 10 (ten) States/Administration intend to join CRV by Q4 2022, 2 (two) States intend to join CRV after Q4 2022, and 1 (one) State has no plan yet.

2.37 To follow up ACTION ITEM 9-5 of CRV OG/9, the first meeting of **ICAO CRV Steering Group** created by CRV OG/9 was held on **31 March 2022**. The meeting reviewed the responses received from Member States, discussed the requirement of additional efforts to support pacific Member States to join CRV, and advised to extend the contract duration for **one additional year**.

2.38 Based on the proposal of draft conclusion by CRV OG/10, the ACSICG/9 meeting endorsed the following draft conclusion for the consideration of CNS SG/26 and APANPIRG/33 meeting. The ICAO Secretariat will inform Member States about the extension of the current contract on same Terms and Conditions.

Draft Conclusion ACSICG/09/02 (CRV OG/10/01): Extension of CRV Contract for one year	
<p>What:</p> <p>a) Recognizing that as per current contract, all authorities shall join the CRV project and sign the relevant Service Contract(s) with PCCWG with the billing start date on or before 31 December 2022 to not impose additional charges by the service provider and based on the survey responses of 2022, many Member States are in process to join CRV which may not be completed by December 2022, it is recommend to extend current CRV contract for one year.</p> <p>b) If agreed to extend, as per amended CRV contract, all authorities shall join the CRV program and sign the relevant Service Contract(s) with PCCWG with the billing start date on or before 31 December 2023 to not impose additional charges by the service provider.</p> <p>c) After the extension, the CRV contract expiry date will be 31 December 2028.</p>	<p>Expected impact:</p> <p><input type="checkbox"/> Political / Global</p> <p><input type="checkbox"/> Inter-regional</p> <p><input checked="" type="checkbox"/> Economic</p> <p><input type="checkbox"/> Environmental</p> <p><input checked="" type="checkbox"/> Ops/Technical</p>
<p>Why: Several ICAO Member States have requested to extend CRV contract due to COVID-19 pandemic in CRV Implementation webinar held in 2021 and based on the response of the survey done in 2022, many Member States are in process to join CRV which may not be completed by December 2022.</p>	<p>Follow-up: <input checked="" type="checkbox"/> Required from States</p>
<p>When: 21-Apr-22</p>	<p>Status: Draft to be adopted by PIRG</p>
<p>Who: <input checked="" type="checkbox"/> Sub groups <input checked="" type="checkbox"/> APAC States <input checked="" type="checkbox"/> ICAO APAC RO <input type="checkbox"/> ICAO HQ <input type="checkbox"/> Other:</p>	

Upgrade/Downgrade/Addition of New Services or Sites in CRV Contract

2.39 The paper presented the relevant outcomes of the first Meeting of the ICAO CRV Steering Group for the discussion to upgrade/downgrade/addition of new services or sites into current CRV contract.

2.40 In the first meeting of ICAO CRV Steering Group held on **31 March 2022**, PCCWG shared the revised proposal for upgrade/downgrade/addition of new sites and services with reasonable pre-estimate of the anticipated losses suffered by PCCW Global. The revised proposal **withdraw cancellation charges and mandate of five years term** for each **upgrade** case and **addition of new sites/services**. Therefore, Member States may upgrade or add new sites or services in their contract without any additional charges or additional terms on the same rate. The revised proposal recommended to calculate **pre-estimate of the anticipated losses** suffered by PCCW Global by a proposed formula in case of **downgrade** and proposed to share the anticipated losses between PCCWG and States equally. Additionally, the mandate of five years terms for downgrade cases was withdrawn. Therefore, Member States may downgrade the current package in their contract with additional charges of 50% of **the anticipated losses** but without additional terms on the same rate. The proposal was accepted by all members of CRV Steering group for submission to CRV OG/10 deliberation and agreement.

2.41 The CRV OG/10 meeting deliberated and reviewed the proposal submitted by PCCWG for upgrade/downgrade/addition of new services or site into current CRV Contract, and endorsed the proposal to work further for revision of relevant documentation of CRV common package. PCCWG informed that the formalization of the proposal would be ready tentatively by **May 2022**. The ICAO Secretariat added that next ICAO CRV Steering group will review and discuss the phrasings of revised terms and conditions prepared by PCCWG in **July 2022**. The revised common package would be presented to CRV OG/11 for endorsement and approval. However, the presented proposal is applicable immediately after the endorsement by CRV OG/10 and ACSICG/9.

CRV Operations Manual

2.42 New Zealand presented the status of the current draft of the CRV Operations Manual. The meeting was informed that since publication of the CRV Operations Manual in December 2020, there have been many updates including those coming from the Ad Hoc Groups. The current DRAFT version of the Operations Manual is ready for publication as version 1.1. CRV OG Co-Chair Asia presented and explained the revised Operational Manual to the meeting. The CRV OG Operational Manual can be accessed [here](#).

2.43 Based on the proposal by CRV OG/10 in this paper, the ACSICG/9 meeting adopted the following **Decision**:

Decision ACSICG/09/03 (CRV OG/10/02) - Publication of the ICAO APAC CRV OG Operations Manual v1.1	
What: The current Draft of the APAC CRV Operations Manual is ready for publication following updates from the Ad Hoc groups.	Expected impact: <input type="checkbox"/> Political / Global <input type="checkbox"/> Inter-regional <input type="checkbox"/> Economic <input type="checkbox"/> Environmental <input checked="" type="checkbox"/> Ops/Technical
Why: Ongoing improvements to the documentation supporting the APAC CRV network	Follow-up: <input type="checkbox"/> Required from States

When: 21-Apr-22	Status: Adopted by ACSICG
Who: <input type="checkbox"/> Sub groups <input type="checkbox"/> APAC States <input type="checkbox"/> ICAO APAC RO <input type="checkbox"/> ICAO HQ <input checked="" type="checkbox"/> Other: CRV OG and ACSICG	

ICAO ATN/AMHS Guidance Document Tree – Sec (WP/04)

2.44 The paper presented the ICAO ATN/AMHS Guidance Document Tree and proposed to add CRV reference documents into the ATN Guidance Document tree to provide integrated ATN/AMHS structure for APAC States/Administrations. Mr. Hoang Tran, ACSICG Chair suggested that ASIA/PAC Regional ATN Documentation Tree should include CRV Reference documents. The CRV OG/9 meeting recommended that ACSICG/9 may create an ad-hoc group to update the ATN/AMHS Guidance Tree. The ACSICG/9 meeting reviewed the Tree and agreed to deliberate the recommendation of the CRV OG/9 to form an ad-hoc group for this purpose. The Ad-Hoc group will be comprised of China, Fiji, New Zealand (Tentative), Singapore, USA, and the ICAO Secretariat which will prepare revised ICAO APAC ATN/AMHS Guidance Document Tree and present it to the next ACSICG meeting for endorsement and approval.

APAC AMHS Implementation Status from AMC - Thailand (WP/05)

2.45 This paper presented the AMHS implementation status information in Asia/Pacific Region updated in ATS Messaging Management Centre (AMC) in Attachment A of the paper. AMC was implemented by EUROCONTROL to provide off-line network management services in support of the ground ATS Messaging network of Air Navigation Service Providers (ANSPs). The meeting was invited to review and update information to AMC via AEROTHAI if necessary, including points of contact in record.

AFTN/ATSMHS Routing Directory and the Communication Chart - Sec (WP/12)

2.46 The paper presented the current status of the AFTN/ATSMHS routing directory and the latest Communication Chart for Asia and Pacific Regions.

2.47 Based on CRV OG/5 consideration, the ACSICG/6 meeting and the CNS SG/23 meeting further reviewed the role of AFTN/ATSMHS Routing Directory during transition period, and as a result of discussions, the CNS SG/23 meeting **agreed to fully follow the AFTN/ATSMHS routing directory during the transition period by end of 2020**. The ACSICG/9 meeting highlighted the any to any connectivity for IP network, as well as the reality that not all APAC States have joined CRV, while automation systems still heavily depend on the character-based message exchanging applications, this hybrid environment might keep on existing and there was not yet a clear timeframe for a full transition to CRV. As such, the ACSICG/9 meeting **agreed to fully follow the AFTN/ATSMHS routing directory** for present time in APAC region. For inter-regional traffic, it is required to follow the existing entry/exit points and procedure.

2.48 Since the publication of 28th Edition AFTN/ATSMHS Routing Directory, Australia, Hong Kong, China, Philippines, and USA provided some updates on the directory. The meeting updated the AFTN/ATSMHS Routing Directory for Asia and Pacific Region which would be published as 29th edition of AFTN/ATSMHS Routing Directory after adoption. Subsequently, the meeting endorsed the following Draft Conclusion for consideration by CNS SG/26. The draft AFTN/ATSMHS Routing Directory is provided in **Appendix B** to this paper.

Draft Conclusion ACSICG/09/04 - Revised AFTN/ATSMHS Routing Directory		
What:	That, the AFTN/ATSMHS Routing Directory for the APAC Region provided in Appendix C to the Report be further	Expected impact: <input type="checkbox"/> Political / Global

updated and distributed to States/Administrations as 29 th Edition.		<input type="checkbox"/> Inter-regional <input type="checkbox"/> Economic <input type="checkbox"/> Environmental <input checked="" type="checkbox"/> Ops/Technical
Why: A number of new ATSMHS connections have been established and became operational. Consequential amendments to the AFTN/ATSMHS Routing Directory are required.	Follow-up:	<input type="checkbox"/> Required from States
When: 21-Apr-22	Status:	Draft to be adopted by Subgroup
Who: <input checked="" type="checkbox"/> CNS SG <input checked="" type="checkbox"/> APAC States <input checked="" type="checkbox"/> ICAO APAC RO <input type="checkbox"/> ICAO HQ <input type="checkbox"/> Other:		

FAA AMHS Traffic Load Salt Lake City Communication Centre - USA (WP/13)

2.49 The paper presented by FAA on the traffic load measured at the Salt Lake City (SLC) Communications centre that supports AMHS connections to Brisbane, Australia; Nadi, Fiji; Christchurch, New Zealand; Fukuoka, Japan; and Manila, Philippines. The FAA SLC AMHS has a bandwidth of 2Mbps provided by CRV. The current average monthly measurement of the bandwidth usage is 27 kbps for incoming traffic and 35 kbps for outgoing traffic. Based on the traffic, the AMHS bandwidth between FAA and Australia and Japan need to be monitored and action take as needed to increase the bandwidth in support of IWXXM and other XML based messages being introduced in the near future.

AMHS/ATN Implementation Status of Thailand (IP/03)

2.50 Thailand completed the AMHS system implementation in July 2011. Currently Thailand is transitioning from AFTN to AMHS and has completed commissions of AMHS connection with some BBIS States and BIS States. Thailand AMHS system is able to support IWXXM, and they have implemented AIDC services over AMHS. The paper also shared the AFTN/AMHS traffic load report for Bangkok COM Centre. Thailand supplemented that the bandwidth of the interregional connection between Bangkok and Rome to be 2Mbps, and Singapore provided the bandwidth of the interregional connection between Singapore and London currently to be 64Kbps. Singapore observed not many attachments sent via IWXXM during their testing, they would soon start exchanging messages and they would upgrade the bandwidth if required.

AMHS/ATN Implementation Status in India (IP/04)

2.51 The paper presented current implementation status of AMHS & CRV in India with BIS and BBIS states. The meeting was informed that the AMHS connectivity has been successfully implemented between Mumbai and three BBIS and with five BIS. India also shared the recent AMHS progresses. Furthermore, India updated the CRV implementation status that India has placed the purchase order with PCCW Global for CRV implementation at Mumbai, and is awaiting commencement of work from PCCW Global shortly and installation and testing on CRV is expected to be completed in Q3-4/2022.

2.52 The meeting discussed on a draft reporting template on the monitoring of AFTN/AMHS traffic load. Upon discussion, the meeting agreed to monitor under different scenarios as follows:

- The CRV OG may monitor Bandwidth Utilization Rate of APAC member states already implemented CRV by adding it into its meeting agenda items. The APAC

member states may request PCCWG to share information about Bandwidth Utilization Rate in monthly report and then present it to CRV OG meetings.

- For States’ non-CRV AMHS connections, after deliberation and considering the multi-facet of data sources, the ICAO Secretariat will consult with experts to propose a common template to report on the monitoring of connection loading.
- For States’ AFTN-only connections, there is no concern over increased traffic load from XML-based message and thus no such need to monitor the traffic in this regard.

Updated AMHS Focal Contact Point and Implementation Status of ATN/AMHS in the APAC Region

2.53 The meeting was invited to provide updates to the AMHS Focal Contact Point and Implementation Status of ATN/AMHS in the APAC Region. The updated Implementation Status of ATN/AMHS in the APAC Region is provided in **Appendix C** to this paper.

AMHS Readiness Status for Supporting IWXXM Traffic in APAC Region - Sec (WP/14)

2.54 This paper summarised the outcomes from previous meetings for States/Administrations in APAC Region on supporting IWXXM traffic via AMHS implementation, reviewed AMHS readiness status for supporting IWXXM Traffic of the States/Administrations in APAC Region, and listed out the States/Administrations that have no AMHS in operations such that IWXXM message would not be distributed to these States/Administrations. As of CNS SG/25, there were 12 States/Administrations provided their status on AMHS readiness and experience for supporting IWXXM Traffic, out of the 23 States/Administrations in the APAC Region which put their AMHS into operations as of March 2022.

2.55 States/Administrations are reminded of the targets set in 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. The meeting updated the AMHS Readiness Table for Supporting IWXXM Traffic that is provided in **Appendix D** to this paper.

Repository of AIDC Implementation Status in APAC – Sec (WP/06)

2.56 To follow up the **ACTION ITEM 7-1** of APA TF/7, the Secretariat has worked on the table formatting and separated AIDC and ATM System Implementation columns from the ATN/AMHS/AIDC implementation table into a standalone table. Considering the necessity of a comprehensive monitoring tool for AIDC implementation status in APAC region to support data statistics and analysis, the ICAO Secretariat designed and a new table to maintain a common understanding between ATMAS TF and ACSICG on AIDC implementation, and eventually build up the regional repository of AIDC Implementation Status. The meeting reviewed and accepted the format of AIDC repository in APAC region for ATMAS TF/3 consideration.

MPLS/IP Based Inter-Regional Connection- Sec (WP/07)

2.57 The paper provided current status of discussion being done for potential interconnection of CRV and REDDIG II and CRV and New PENS. The paper presented the final technical proposal for interconnection of CRV and REDDIG II and proposed various business model to way forward. It also requested APAC member states to record their interest, willingness, or need for interconnection of the CRV with other regional networks such as REDDIG II / New PENS with the ICAO secretariat.

2.58 The meeting was informed that there were communications requirements between APAC ANSPs and SAM ANSPs in order to set up the AMHS P1 connection between AMHS COM Centres of Christchurch (New Zealand) and Santiago (Chile). Based on outcomes of several discussions between APAC and SAM, the Interconnection Link for CRV and REDDIG II will be connected between PCCWG provided Router and Lumen provided Router, which will be **shared responsibility between PCCWG and Lumen.**

2.59 As the technical proposal for interconnection of CRV and REDDIG II is ready, it was required to think about the **way forward for the business case for the proposed interconnection.** PCCWG and Lumen should prepare an **estimate for the infrastructure cost** for the interconnection. It is also required to provide **potential revised package/monthly recurring cost** for New Zealand and Chile by respective service provider assuming both will subscribe to the services and assuming that PCCWG and Lumen will revise charges in case both states wish to avail interregional connection services. With aforementioned, the two potential business solutions regarding **approximately infrastructure cost and revised recurring charges** are proposed by the ICAO Secretariat for meeting consideration.

2.60 ICAO Secretariat informed that ICAO APAC Office and ICAO EUR/NAT Office has coordinated internally as well as with the service providers of regional network in respective region. The outcomes of the meeting between PCCWG, the CRV service provider, and British telecom, the New PENS service provider and the internal meeting of British Telecom, EUROCONTROL and ANSPs were also shared.

2.61 The meeting agreed to form an Ad-hoc group comprised of APAC Member States having interregional connections, CRV OG Chairs, CRV and REDDIG II service providers, interested states of SAM region, and the ICAO Secretariat under CRV OG. The ICAO Secretariat will coordinate with relevant APAC member states to nominate focal points for Ad-Hoc group. The ICAO Secretariat will coordinate with ICAO SAM Office to get nomination from interested SAM member states for this task.

Aeronautical Fixed Service (AFS) Cybersecurity Considerations for Information over CRV - USA (WP/08)

2.62 The paper presented some interim security considerations for CRV, including Digital Identity and Network Information Security, prior to International Aviation Trust Framework (IATF) to be implemented in future. The IATF Digital Identity concept uses Public Key Infrastructure (PKI) Digital Certificates to identify the correspondents of an information exchange and potentially secure or encrypt the exchanged data. Network Information Security requirements includes the use of IPv6, Domain Name System (DNS), information security, network management and network contingencies were introduced in detail. Additionally, the meeting was informed that SWIM interchanges with external entities will typically contain XML formatted data (e.g. IWXXM, FIXM, AIXM). These exchanges can eventually be protected with Signing as a Service (SaaS) and Verifying as a Service (VaaS) using Digital Identities. In the interim, information exchanges should be protected according to the network infrastructure used, and XML information received should be schema-validated, and users should scan published information prior to uploading.

2.63 The ICAO Secretariat appreciated USA for the continuous effort to address cybersecurity issues, recalled that there were many useful presentations in the APAC Regional Cybersecurity Webinar in 2021. The interim measures proposed in the paper is more tangible and implementable comparing high level concepts, which can be considered as useful reference for the CRV OG Operations Manual. While CRV OG and SWIM TF have their corresponding action items, the Co-Chairs noticed that the coming XML-based messages may compromise automation systems and it would be necessary to formulate managing plans to address the possible threat in cybersecurity. The

ICAO Secretariat suggested to add regular Agenda Item for ACSICG meetings and invite States and Organizations concerned to continue the discussion on improving in the cybersecurity ideas presented in this paper. With CANSO and IATA expressed their interest to contribute to this Agenda Item, the Secretariat will coordinate with interested parties to discuss various tasks under this Agenda Item.

Review Work Programme for ACSICG- Sec (WP/10)

2.64 The work programme for ACSICG was developed by ACSICG/3 meeting based on a project approach. The work programme reviewed by ACSICG/8 meeting and discussed in ACSICG/9 for review and updates. The work programme of ACSICG reviewed and updated by the meeting.

CRV Post Implementation Issues in Bhutan – Sec, Bhutan & New Zealand (WP/09)

2.65 The meeting was informed about the issues faced by Bhutan related to CRV post implementation due to the non-readiness of peer States and the action taken by CRV OG and ACSICG for its resolution. The ad-hoc group formed by Australia, Bhutan, India, New Zealand, Singapore and Thailand, agreed that New Zealand acts as a bridge between CRV and existing AMHS circuits for Bhutan, and further discussed the AFTN Routing Directory changes. Bhutan and New Zealand updated the progress of System Engineering Plan (SEP) and technical setups to the meeting. The acceptance and bidirectional test will be performed between the two countries after the completion of technical setup from New Zealand.

2.66 Since Thailand has already implemented CRV and planned to test CRV circuits with Bhutan in **June 2022**, the meeting discussed and agreed that Bhutan and New Zealand would continue to work on above mentioned on-going proposal. The Ad-Hoc group will meet in last week of **June 2022** to note the status of testing of CRV circuits between Bhutan and Thailand and progress on implementation of the temporary routing through New Zealand. Based on the status, the Ad-Hoc group will decide to continue the task to implement GRE tunnel between Bhutan and New Zealand or to close the action item.

Amendment 91 to Annex 10 Volume III on Selective Calling Codes – Sec (WP/15)

2.67 The paper presented the main points of State Letter Ref.: AN 7/64.2.2-20/127 and the action required by the letter regarding the Adoption of Amendment 91 to Annex 10, Volume III for review and action by the meeting. The meeting was informed that Aviation Spectrum Resources, Inc. (ASRI), which is the Official ICAO Registrar of the Selective Calling (SELCAL) system would like to remind all Air Navigation Service Providers (ANSPs) that the deadline (November 2022) is approaching for all ANSPs to be ICAO compliant with the SELCAL32 amendment to support an additional sixteen (16) new audio tones, in addition to the existing 16 audio tones. Furthermore, the SELCAL32 Brochure was introduced which provided details on the SELCAL code pool expansion to all ANSPs in the region. More information on SELCAL32 can be found at www.asri.aero/SELCAL.

2.68 The meeting was invited to notify ICAO HQ on any differences and compliance **before 3 October 2022**, and copy notifications to the ICAO Regional Office accredited to your Government.

AIDX Survey – IATA (IP/05)

2.69 The paper provided a brief on IATA's Aviation Information Data Exchange (AIDX) industry survey. The AIDX is the global XML messaging standard for exchanging flight data between airlines, airports, and any third party consuming operational data. The ACSICG/9 meeting was informed that IATA is undertaking the survey (<https://www.surveymonkey.com/r/AIDX>) to better understand where the AIDX standard is used around the world, by which industry players, and for which business scope. IATA shared their appreciation and encouraged States to participate and complete the survey no later than **30 April 2022**.

Date and Venue for the Next Meeting

2.70 The meeting discussed the need to meet Face-to-Face (F2F) and concluded that next meeting would be organised in F2F with a tentative date in the end of **May 2023**. However, member states having travel restrictions may request to join the meeting in virtual mode. ICAO Secretariat will inform about possibilities of virtual mode option based on the venue and available facilities to such states.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

- a) note the information in this paper; and
- b) discuss any matters as appropriate.

CRV IMPLEMENTATION TABLE

SN	State/ Administrati on (with* is BBIS; marked in blue- not yet join CRV/ no updates provided)	States /Administrati ons connected	Intended date for CRV cut- over	Applications targeted	Migration scheme	Prerequisites/ dependencies
1	Afghanistan					
2	Australia*	Fiji New Zealand Indonesia PNG Singapore Japan	Contract in May2018 and service readiness in 3Q 2018	AFTN, ADS-B, AMHS, Voice With: Australia February,2019(AMHS/AIDC), March,2019(Voice) Fiji March,2019 (AMHS June 2019/AIDC, Voice completed April) New Zealand , February, 2019 (AMHS June 2019, AFTN May 2019/AIDC), March, 2019 (Voice April 2019 completed) Indonesia 4Q2019 (TBC) (AMHS/AIDC, Voice, ADS-B); PNG 4Q2019(TBC), (AMHS/AIDC, Voice) Singapore 2Q2019 TBC (AMHS/AIDC, Voice); South Africa TBC3Q2019 TBC (AMHS/AIDC, Voice); Japan would be end of 2019. PNG AFTN June 2021,	Staged approach	Termination of current COM contract

SWIM TF/6
Appendix A to WP/03

SN	State/ Administrati on (with* is BBIS; marked in blue- not yet join CRV/ no updates provided)	States /Administrati ons connected	Intended date for CRV cut- over	Applications targeted	Migration scheme	Prerequisites/ dependencies
				Voice Oct 2021		
3	Bangladesh					
4	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.	Staged Approach	Dependent on India and Thailand for utilization of CRV network.
5	Brunei Darussalam					

SWIM TF/6
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SN	State/ Administrati on (with* is BBIS; marked in blue- not yet join CRV/ no updates provided)	States /Administrati ons connected	Intended date for CRV cut- over	Applications targeted	Migration scheme	Prerequisites/ dependencies
6	Cambodia		As early as convenient, dependent on neighbouring countries			Internal decision making
7	China*	Hong Kong China Japan Republic of Korea	Contract signed on 21 June 2020.	Applications targeted: Data(AMHS) With: Hong Kong 3Q2020; Japan 4Q2020; Thailand TBD; India 2022. Republic of Korea 4Q2022 Mongolia 4Q2022 ATFM test with Japan and ROK at Sep 2020 over CRV ADP exchange with Mongolia 4Q2022	staged approach	

SWIM TF/6
Appendix A to WP/03

SN	State/ Administrati on (with* is BBIS; marked in blue- not yet join CRV/ no updates provided)	States /Administrati ons connected	Intended date for CRV cut- over	Applications targeted	Migration scheme	Prerequisites/ dependencies
8	Hong Kong, China*	Philippines China Japan Thailand Vietnam	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 Fukuoka CRV-AMHS put into operation in September 2020 With Beijing CRV - AMHS POT in March and operation in April 2021 Bangkok and Hochiminh Subject to their readiness	staged approach	Need to coordinate with relevant CAAs/ANSPs in joining CRV in a harmonized manner, etc.
9	Macau China		December 2022	To be confirmed	Staged approach	Migration from X.25 to IPS
10	Cook Islands					
11	Democratic People's Republic of Korea		Contract in 3Q2018 and service readiness in 4Q2018	AFTN and VoIP		

SWIM TF/6
Appendix A to WP/03

SN	State/ Administrati on (with* is BBIS; marked in blue- not yet join CRV/ no updates provided)	States /Administrati ons connected	Intended date for CRV cut- over	Applications targeted	Migration scheme	Prerequisites/ dependencies
12	Fiji*	Australia New Zealand USA	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
13	France: -New Caledonia -French Polynesia	Fiji New-Zealand &USA	Q2/2022 Q1/2023	ATS Voice, AMHS AIDC, AMHS with USA, AFTN/AMHS with NZ.	Staged approach	Depends on : - solving legal issues raised in 2021 with PCCWG - an agreement with peer States on adding a layer of encryption (PSK) over CRV if we are able to sign the contract in 2022

SWIM TF/6
Appendix A to WP/03

SN	State/ Administrati on (with* is BBIS; marked in blue- not yet join CRV/ no updates provided)	States /Administrati ons connected	Intended date for CRV cut- over	Applications targeted	Migration scheme	Prerequisites/ dependencies
14	India*		Contract for CRV implementation with M/s PCCW in India will be signed by Feb 2022.	AFTN/AMHS,ADS-B,AIDC,ATS Voice	Staged approach	Internal Administrative/financial approvals & safety case
15	Indonesia		Contract in 3Q2021 and service readiness in 4Q2021.	AFTN, AMHS, ADS-B and voice		CBA completed Delayed by 2022 due to COVID-19 (CRV OG/9 updates)
16	Japan*	Hong Kong China USA Singapore China RoK	Contract signed in Nov.2017 and service readiness in1Q 2018 for Fukuoka	Data first with: Hong Kong completed 3Q2020 USA completed 1Q2019 Singapore completed 4Q2020 China completed 1Q2021 Voice Plan with: USA 2Q 2021 Daegu and Incheon (R.O.K) started in1Q2021 Philippines, Taipei FIR, add R.O.K will start from 1Q 2022	In progress	

SWIM TF/6
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SN	State/ Administrati on (with* is BBIS; marked in blue- not yet join CRV/ no updates provided)	States /Administrati ons connected	Intended date for CRV cut- over	Applications targeted	Migration scheme	Prerequisites/ dependencies
17	Kiribati					
18	Lao PDR					
19	Malaysia		<p>In the process of settling the CRV contract terms and signing of the CRV contract between Malaysia and PCCWG</p> <p>Implementation status: CRV service started in Nov 2021. Service cut over will be in stages, starting with AHMS in Q1 2022.</p>	AFTN, AMHS, ADS-B and ATS voice	staged approach	
20	Maldives					
21	Marshall Islands					

SWIM TF/6
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SN	State/ Administrati on (with* is BBIS; marked in blue- not yet join CRV/ no updates provided)	States /Administrati ons connected	Intended date for CRV cut- over	Applications targeted	Migration scheme	Prerequisites/ dependencies
22	Micronesia (Federated States of)					
23	Mongolia	CAAM and PCCWG made ICMP package test in 2021.	Contract in 1Q2022 and service readiness in 4Q2022	AFTN, ADS-B, AMHS, Voice With: China Dec, 2022(AMHS), (ADP) TBD Voice, ADS-B, AFTN Russia TBD (AFTN, ADS-B, AMHS, Voice)	staged approach	Negotiations with neighbouring countries and stakeholders on CRVs and its use are critical to implementation.
24	Myanmar		Contract will be signed after discussed with PCCW Global. Implementation was targeted in 3Q/2023 depends on PCCW's proposal quotation, and getting the Budget approval from Authority concerned.	AFTN/AMHS, AIDC, ADS-B and Voice	staged approach	One of counterparts join in
25	Nauru					

SWIM TF/6
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SN	State/ Administrati on (with* is BBIS; marked in blue- not yet join CRV// no updates provided)	States /Administrati ons connected	Intended date for CRV cut- over	Applications targeted	Migration scheme	Prerequisites/ dependencies
26	Nepal		SO signed with PCCW	AFTN/AMHS	Staged Approach	BBIS-state India joining the CRV network, as most traffic is routed through it
27	New Zealand	Australia USA Fiji French Polynesia Chile	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.
28	Pakistan					
29	Palau					

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SN	State/ Administrati on (with* is BBIS; marked in blue- not yet join CRV/ no updates provided)	States /Administrati ons connected	Intended date for CRV cut- over	Applications targeted	Migration scheme	Prerequisites/ dependencies
30	Papua New Guinea	Australia USA-Oakland USA-Aireon		Australia: AFTN June 2021, Voice Oct 2021 USA-Oakland Voice November 2021 USA-Aireon Space based ADSB-July 2021	Staged approach	Completed
31	Philippines	Hong Kong China Singapore USA	Contract signed in March 2018 and service readiness in 2Q2018	Completed: with HONG KONG AIDC - 2Q2019; AMHS - 2Q2019; Voice - 3Q2018. with SINGAPORE AIDC – 4Q2019; AMHS – 4Q2020; Voice – 1Q2020. with USA AMHS – 2Q2021; Voice – 4Q2019. Planned: with JAPAN Voice – 1Q2022.	staged approach	Success transition to the New ATM center in 4Q2018

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SN	State/ Administrati on (with* is BBIS; marked in blue- not yet join CRV/ no updates provided)	States /Administrati ons connected	Intended date for CRV cut- over	Applications targeted	Migration scheme	Prerequisites/ dependencies
32	Republic of Korea	Japan China	Contract in 3Q 2019 and service readiness in 4Q 2022	Completed: with Japan Voice –March 2021 Planned; With Japan Voice additional lines-from 2022 to 2023 Data(AMHS) POT in 4Q and operation from 4Q 2022 With China Data(AMHS) POT in July and operation from 4Q 2022	staged approach	
33	Samoa					
34	Singapore*	Australia Japan Philippines	Contract signed in May 2019 and service readiness in Dec 2019	Data (AMHS over IP) with: Australia Dec 2020 (completed); Japan Nov 2020 (completed); Philippines Dec 2020 (completed); Malaysia 2022. Voice with: Philippines Mar 2020 (completed).	Staged approach	
35	Solomon Islands					

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SN	State/ Administrati on (with* is BBIS; marked in blue- not yet join CRV/ no updates provided)	States /Administrati ons connected	Intended date for CRV cut- over	Applications targeted	Migration scheme	Prerequisites/ dependencies
36	Sri Lanka	Planned: Australia India Indonesia Maldives Singapore	Q1 2023	Q1 2023 - AMHS with Singapore TBD - AMHS connectivity with Mumbai, and Male. TBD - Direct Speech facilities with Chennai, Trivandrum, Mumbai, Male, Jakarta, Melbourne, Singapore.	Phased Approach	Package D is planned based on CBA conducted. Comparison of performance of Package D and existing IPLC circuit.
37	Thailand*		1. Contract in 3Q2021 Status: Completed 2. Service readiness in 2Q2022	Data first Then voice, subject to safety case: China 2Q2022 Hong Kong 2Q2022; Singapore 2Q2022; India 2022.	Staged approach	
38	Timor Leste					
39	Tonga					
40	Tuvalu					

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SN	State/ Administrati on (with* is BBIS; marked in blue- not yet join CRV/ no updates provided)	States /Administrati ons connected	Intended date for CRV cut- over	Applications targeted	Migration scheme	Prerequisites/ dependencies
41	United States*	Australia Fiji Japan Philippines New Zealand Papua New Guinea Tahiti Russia	Contract in January 2018	1) AMHS with Australia Fiji Japan Philippines New Zealand Papua New Guinea (2021) Indonesia (2022) 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) 3) VoIP with Fiji Japan Philippines New Zealand Papua New Guinea (direct planned 2021) Indonesia (2022)	Staged approach	

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SN	State/ Administrati on (with* is BBIS; marked in blue- not yet join CRV/ no updates provided)	States /Administrati ons connected	Intended date for CRV cut- over	Applications targeted	Migration scheme	Prerequisites/ dependencies
42	Vanuatu					
43	Viet Nam	Hong Kong, China	4Q/2022	AFTN, AMHS connectivity with Hong Kong		

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AFTN/ATSMHS CONNECTIONS - ASIA/PAC ROUTING DIRECTORY

Terminal 1	Terminal II	ATSMHS or AFTN	Over CRV (Y/N)
Apia/Faleolo	Christchurch	AMHS/UA	N
Bangkok	Beijing	AMHS	N
	Mumbai	AMHS	N
	Dhaka	AMHS	N
	Ho-Chi-Minh	AFTN	N
	Hong Kong	AMHS	N
	Kuala Lumpur	AMHS	N
	Phnom Penh	AMHS	N
	Rome	AMHS	N
	Yangon	AMHS	N
	Singapore	AMHS	N
	Vientiane	AMHS	N
	Paro	AMHS	N
Beijing	Bangkok	AMHS	
	Fukuoka	AMHS	
	Guangzhou	AFTN	
	Hong Kong	AMHS	
	Karachi	AFTN	
	Khavarosk	AFTN	
	Kathmandu	AFTN	
	Mumbai	AMHS	
	Pyongyang	AFTN	
	Seoul	AMHS	
	Ulaan Baatar	AFTN	
	Yangon	AFTN	
Brisbane	Christchurch	AMHS	Y
	Timor Leste	AFTN/UA	
	Jakarta	AFTN	
	Johannesburg	AMHS	
	Honiara	AFTN/UA	
	Nadi	AMHS	Y
	Nauru	AFTN/UA	
	Port Moresby	AFTN	Y
	Port Vila	AFTN/UA	
	Singapore	AMHS	Y
	USA	AMHS	Y
Brunei	Kuala Lumpur		
	Singapore	AFTN	
Chennai	Mumbai	AFTN	
	Kolkata	AFTN	
	Kuala Lumpur	AFTN	
Christchurch	Apia/Faleolo	AMHS/UA	N

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Terminal 1	Terminal II	ATSMHS or AFTN	Over CRV (Y/N)
	Niue	AMHS/UA	N
	Rarotonga	AMHS/UA	N
	Brisbane	AMHS	Y
	Papeete/Tahiti	AFTN	Y*
	Tonga/Fua'Amotu	AMHS/UA	N
	USA	AMHS	Y
Chuuk	USA	AMHS/UA	
Colombo	Mumbai	AMHS	
	Male	AFTN	
	Singapore	AFTN	
Delhi	Mumbai	AFTN	
	Kolkata	AFTN	
Dhaka	Bangkok	AMHS	
Fukuoka	Beijing	AMHS	Y
	Hong Kong	AMHS	Y
	Moscow	AFTN	N
	Seoul	AFTN	N
	Singapore	AMHS	Y
	Taibei	AMHS	Y
	USA	AMHS	Y
Guangzhou	Beijing	AFTN	
	Hong Kong	AFTN	
	Macau	AFTN	
	Haikou	AFTN	
	Hanoi	AFTN	
Hanoi	Ho-Chi-Minh	AFTN	
	Vientiane	AFTN	
	Guangzhou	AFTN	
Haikou	Guangzhou	AFTN	
	Hong Kong	AFTN	
Ho-Chi-Minh	Bangkok	AFTN	
	Hanoi	AFTN	
	Hong Kong	AFTN	
	Singapore	AFTN	
	Manila	AFTN	
	Phnom Penh	AFTN	
Hong Kong	Bangkok	AMHS	N
	Beijing	AMHS	Y
	Guangzhou	AFTN	N
	Ho-Chi-Minh	AFTN	N

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Terminal 1	Terminal II	ATSMHS or AFTN	Over CRV (Y/N)
	Macau	AMHS	N
	Manila	AMHS	Y
	Haikou	AFTN	N
	Taipei	AMHS	Y
	Fukuoka	AMHS	Y
Honiara	Brisbane	AMHS/UA	
Jakarta	Brisbane	AFTN	
	Singapore	AMHS	
Karachi	Beijing	AFTN	
	Mumbai	AMHS	
	Kabul	AFTN	
	Kuwait	AMHS	
	Tehran*		
* Not listed in the ANP AFTN Planning Table			
Kathmandu	Beijing	AFTN	
	Mumbai	AMHS	
Kolkata	Mumbai	AFTN	
	Delhi	AFTN	
	Chennai	AFTN	
Koro	USA	AMHS/UA	
Kosrae	USA	AMHS/UA	
Kuala Lumpur	Bangkok	AFTN	
	Brunei		
	Singapore	AFTN	
	Chennai	AFTN	
Macau	Guangzhou	AFTN	
	Hong Kong	AMHS	
Majuro	USA	AMHS/UA	
Male	Colombo	AFTN	
Manila	Hong Kong	AMHS	Y
	Ho Chi Minh	AFTN	
	Singapore	AMHS	Y
	Taipei	AMHS	Y
	USA	AMHS	Y
Mongolia	Beijing	AFTN	

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Terminal 1	Terminal II	ATSMHS or AFTN	Over CRV (Y/N)
Mumbai	Irkutsk	AFTN	
	Bangkok	AMHS	Y**TBI
	Dhaka	AMHS	Y**
	Kolkata	AFTN	
	Colombo	AMHS	Y**
	Delhi	AFTN	Y**
	Karachi	AMHS	Y**
	Kathmandu	AMHS	Y*
	Beijing	AMHS	Y*
	Chennai	AFTN	Y*
	Muscat/Seeb	AFTN (No connection)	
	Nairobi	AFTN	
	Paro	AMHS	Y*
	Singapore	AMHS	Y*
Nadi	Brisbane	AMHS	Y
	Funafuti	AMHS/UA	N
	Noumea	AMHS	Y*
	Tarawa	AMHS/UA	N
	USA	AMHS	Y
	Wallis Is.	AMHS/UA	N
Nauru	Brisbane	AMHS/UA	
Niue	Christchurch	Email	N
Noumea	Nadi	AMHS	Y
Pago Pago	USA	AMHS/UA	
Papeete/Tahiti	Christchurch	AFTN	Y*
Paro	Mumbai	AMHS	
	Bangkok	AMHS	
Phnom Penh	Bangkok	AMHS	
	Ho Chi Minh	AFTN	
Pohnpei	USA	AMHS/UA	
Port Moresby	Brisbane	AFTN	
Port Vila	Brisbane	AMHS/UA	
Pyongyang	Beijing	AFTN	
Rarotonga	Christchurch	AFTN	N
Salt Lake City	Brisbane	AMHS	Y
	Christchurch	AMHS	Y

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Terminal 1	Terminal II	ATSMHS or AFTN	Over CRV (Y/N)
	Chuuk	AMHS UA	
	Fukuoka	AMHS	Y
	Koro	AMHS UA	
	Kosrae	AMHS UA	
	Majuro	AMHS UA	
	Manila	AMHS	Y
	Nadi	AMHS	Y
	Pago Pago	AMHS UA	
	Pohnpei	AMHS UA	
	Yap	AMHS UA	
Seoul	Beijing	AMHS	N
	Fukuoka	AFTN	N
Singapore	Bangkok	AMHS	N
	Bahrain	AFTN	N
	Brisbane	AMHS	Y
	Brunei	AFTN	N
	Colombo	AFTN	N
	Ho-Chi-Minh	AFTN	N
	Jakarta	AMHS	N
	Kuala Lumpur	AMHS	N
	London	AMHS	N
	Manila	AMHS	Y
	Mumbai	AMHS	N
	Fukuoka	AMHS	Y
Taibei	Hong Kong	AFTN	
	Manila	AFTN	
	Fukuoka	AFTN	
Tarawa	Nadi	AMHS/UA	
Timor Leste	Brisbane	AMHS	
Tonga/Fua'Amotu	Christchurch	AMHS/UA	N
Ulaan Baatar	Beijing	AFTN	
Vientiane	Bangkok	AMHS	
	Hanoi	AFTN	
Wallist Is.	Nadi	(planning)	
Yangon	Bangkok	AMHS	
	Beijing	AFTN	
Yap	USA	AMHS/UA	

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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	
BHUTAN	ATN/AMHS circuits, using IP over VPN, with Thailand (Bangkok) and India (Mumbai) commissioned in June and July 2017 respectively.	AEROTHAI'S AMHS System	

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State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AMHS Vendors Selected	Remarks
	<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>		
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	
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>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</p>	IN-HOUSE (Aero-Info Technologies Co., Ltd)	IN-HOUSE (Aero-Info Technologies Co., Ltd)

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State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AMHS Vendors Selected	Remarks
	<p>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>Japa AMHS testing with Japan was completed in March 2021.It will put into operation after TMC is signed. 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</p>	COMSOFT	

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State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AMHS Vendors Selected	Remarks
	<p>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>		
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	

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State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AMHS Vendors Selected	Remarks
COOK ISLANDS			
DEMOCRATIC PEOPLE'S REPUBLIC OF KOREA	The ATN BIS Router and AMHS planned for in 2011.		
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	

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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.

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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 test was all completed in March 2021. It will put into operation after TMC is signed</p> <p>Taipei/China 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>	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.		

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State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AMHS Vendors Selected	Remarks
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	
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			

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State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AMHS Vendors Selected	Remarks
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. 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.</p> <p>Connection with Thailand implemented in 4Q2016.</p> <p>Planned for AMHS connection with Beijing. Target date TBC.</p>	THALES	<p>AMHS including AFTN/AMHS gateway implemented in Nov 2011.</p> <p>Connection with Thailand implemented in 4Q2016.</p> <p>Planned for AMHS connection with Beijing. Target date TBC.</p>
NAURU			

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State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AMHS Vendors Selected	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	
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.</p> <p>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	

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State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AMHS Vendors Selected	Remarks
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	
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>

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State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AMHS Vendors Selected	Remarks
REPUBLIC OF KOREA	Plan to upgrade AMHS supporting IWXXM from 2022 over CRV 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	
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. 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. Inter-Operability Test (IOT) with Vietnam and Sri Lanka started in 2019 and 2022 respectively. IOT with Bahrain and Brunei to be confirmed.	FREQUENTIS COMSOFT	

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State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AMHS Vendors Selected	Remarks
SRI LANKA	ATN BIS Router Planned for 2013. IP based AMHS implemented by Oct. 2017. <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	
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, Malaysia and Rome implemented. Bangkok - Vietnam Circuit Commissioning: Planned for end of 3Q2022 Connection with SITA (SITA AMHS Gateway inter-connections) implemented.	AEROTHAI's AMHS System	
TONGA	AMHS planned for 2008. The provider is linked to the New Zealand AFTN		CPDLC and ADS-C is not considered for lower airspace

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State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AMHS Vendors Selected	Remarks
UNITED STATES	<ul style="list-style-type: none"> - Australia - Fiji - New Zealand - Japan - Philippines - Indonesia (2023) 	IN-HOUSE	
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 IOT with Hong Kong 12/2019 IOT with Thailand 6/2020, POT 8/2020.</p>	IN-HOUSE	
Wallis and Futuna (FRANCE)	AMHS implementation planned for end of 2017		

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. 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 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	AMHS is in operation since December 2009 and upgraded to support the exchange of IWXXM since November 2020.	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). The AMHS system will be upgraded to support the exchange of IWXXM reports of a maximum size of 4MB and FTBP in Q2 of 2023.	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>	AMHS messages with FTBP having attachment size upto 1 MB has been exchanged bothways on Mumbai – Singapore AMHS circuit. However, AMHS messages with attachments above 1 MB size are not supported by Mumbai AMHS.	Indian Meteorological Department is in the process of upgradation of HPC & DB to support IWXXM.

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6	Japan	Japan/Fukuoka	<p>ATN BBIS router and AMHS installed at 2000.</p> <p>Connection tests with USA 2000 - 2004 and put into operational use in 2005 and over CRV in February 2019.</p> <p>Put into AMHS operation with Hong- Kong and Singapore in 2021. AMHS implementation with China in 2021 , Korea and Taipei in 2022.</p>	<p>Already support exchange of IWXXM messages based on FTBP in August 2015.</p> <p>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</p>	AFS links over CRV is a Package A, Bandwidth 2M.
7	Macao China	Macao China	Q4/2009	Q2/2023	To be determined
8	Philippines	Philippines/ATMC Manila	Completed March 2018	Can support IHE and FTBP maximum 1MB (tested with Taipei on 13-May-20)	<p>1MB</p> <p>Philippines has contracted 2Mbps bandwidth using CRV package "A" voice and data services.</p>
9	Republic of Korea	Gimpo international airport	<p>ATN/AMHS with China put into operational use in June, 2011.</p> <p>AMHS implementation with China and Japan over CRV will be in 4Q, 2022.</p>	AMHS implementation for supporting FTBP and IHE will be in 4Q, 2022.	AFS links over CRV is a Package A, Bandwidth 2M.
10	Singapore	Singapore	March 2011	Yes, since 2020.	2MB for CRV and minimally 64kbps for IPLCs
11	Thailand	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>Connection with SITA (SITA AMHS Gateway inter-connections) implemented.</p> <p>Bangkok - Vietnam Circuit</p> <p>Commissioning: Planned for end of 3Q 2022</p>	Completed, the IWXXM exchange has been implemented since November 2020.	The capacity of links readied to support in both form.
12	USA	Federal Aviation Administration	Q4, 2020	Yes. FAA AMHS has FTBP capability. National Weather Service (NWS) projected to implement IWXXM by Q3, 2022	Yes. 2MB bandwidth over CRV
