

International Civil Aviation Organization

ICAO

**Twenty Sixth Meeting of the Communications/
Navigation and Surveillance Sub-group (CNS SG/26) of
APANPIRG**

Video Tele-Conference, 05 – 09 September 2022

Agenda Item 3: Aeronautical Fixed Service (AFS)

3.1 Review Report of the Ninth Meeting of the Aeronautical Communications Services Implementation Coordination Group (ACSICG/9) including:

- Report of the Ninth and Tenth Meetings of Common aeRonautical VPN Operations Group (CRV OG/9 & 10);

**REVIEW REPORT OF THE NINTH MEETING OF THE AERONAUTICAL
COMMUNICATION SERVICES IMPLEMENTATION
COORDINATION GROUP (ACSICG/9)**

(Presented by the Secretariat)

SUMMARY

This paper presents the report of the Ninth Meeting of the Aeronautical Communication Services Implementation Coordination Group (ACSICG/9), held from *19 to 21 April 2022*, for review and action.

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* via Video Tele-Conferencing (VTC). The Meeting was attended by One hundred forty five (145) participants from Twenty one (21) States/Administrations, Four (4) International Organizations and Three (3) Aviation Industries including Afghanistan, Australia, Bhutan, China, Hong Kong China, Macao China, Fiji, India, Indonesia, Japan, Lao PDR, Mongolia, New Zealand, Pakistan, Philippines, Republic of Korea, Singapore, Sri Lanka, Thailand, USA, Vietnam, CANSO, IATA, IFALPA, IFATCA, Frequentis, IDS Airnav, PCCW Global and ICAO. The 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 Ninth Meeting of the Common aeRonautical Virtual Private Network Operations Group of APANPIRG (CRV OG/9) was held via video tele-conference from *25 to 27 January 2022*. The 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>

1.3 The Tenth Meeting of the Common aeRonautical Virtual Private Network Operations Group of APANPIRG (CRV OG/10) was held *on 18 April 2022* via video tele-conference. The CRV

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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>

1.4 This paper summarized the report of ACSICG/9 for review and action by CNS SG/26.

2. DISCUSSION***Internet Protocol Suite (IPS) ecoDemonstrator Validation and Development Update***

2.1 The USA presented Internet Protocol Suite (IPS) ecoDemonstrator validation and development (IP/06) in USA, which is intended to provide a migration from legacy Aircraft Communications Addressing and Reporting System (ACARS) and Aeronautical Telecommunications Network (ATN) to IP-based protocols which have no changes to the existing applications (e.g. CPDLC) while moving away from legacy protocols.

2.2 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, this strategy might need to further reviewed by ACSICG.

2.3 The Co-Chair reminded the meeting that the CNS SG/25 discussed the domain naming and IPv6 address management on the 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 communication.

Outcomes of Relevant Meetings Related to IWXXM

2.4 The IP/07 presented recent outcomes from APANPIRG, MET SG and MET/IE WG forums regarding the States' implementation of ICAO provisions to disseminate meteorological information in the ICAO meteorological information exchange model (IWXXM) Form.

Review the outcomes of CRV OG/9***Outcomes of Ad-hoc expert Strategy, Design, Transition and, Operations Groups***

2.5 The paper presented an update on the progress of the Ad Hoc expert groups for Strategy, Design, Transition and Operations. CRV OG/8 meeting created an Ad Hoc Group of experts to progress sections of the CRV Operations Manual. New Zealand presented 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 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 meeting was informed that the latest version of the CRV Operations Manual has been presented in the ad-hoc group on 10th March 2022 with the aim to publish by 31st March 2022.

CRV Implementation Plan

2.6 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

2.7 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.

Latest CRV Operational Performance Report

2.8 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

2.9 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

2.10 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

2.11 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.

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Upgrade/Downgrade CRV Circuits Subscribed by PCCWG

2.12 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. After discussions, the CRV OG/9 meeting 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.

2.13 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 so. 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.

2.14 The CRV OG/9 meeting agreed for one day CRV OG/10 meeting on 18 April 2022 before ACSICG/9 meeting.

Non-ANSPs joining CRV

2.15 PCCWG introduced PCCW Console Connect Aviation Platform that would provide an easy, managed, flexible and scalable mechanism for non-ANSP users to exchange SWIM data with ANSPs, who are on the CRV Network.

Current Status of CRV Implementation in India

2.16 India shared 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.

2.17 The CRV OG/9 meeting shared the concern of high lead time of 8 months given the situation that many states are waiting for India to join CRV, as India is BBIS. PCCWG informed that high lead time is due to shortage of chips for the NID routers, local fiber providers need to install fiber at customer site with approval from local government, and PCCWG is trying its best to take necessary action to reduce the lead time and will provide an official response if there is any contractual and commercial impacts for member states who sign the contract in 2022 but the installation date exceeds the standard lead time in 4 weeks.

Update on Fiji's CRV Network Upgrade

2.18 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.

SWIM User Network Requirements analysis

2.19 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.

2.20 The CRV OG/9 meeting agreed that the ICAO Secretariat would present a paper to SWIM TF on behalf of CRV OG to inform about the relevant discussion in CRV OG. 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.

SWIM Providers joining CRV

2.21 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-ANSPs 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.

Technical Proposal for Regional IP Network Interconnection

2.22 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

2.23 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 enhance 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.

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

2.24 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.

2.25 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.

2.26 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 CNS SG/26/XX (ACSICG/09/01 (CRV OG/09/01)): Revised Amendment of the Management Service Agreement for CRV project (RAS14801)	
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, i) all Pioneer States are encouraged to counter-sign the Revised amended Pro Document provided in Appendix B to this paper; ii) any Pioneer State not countersigning is entitled to get its share of the remaining fund balance back. and 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	Expected impact: ☐ Political / Global ☐ Inter-regional ☒ Economic ☐ Environmental ☒ Ops/Technical
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 Pioneer States is willing to use the rest of their initial contribution to continue to support CRV implementation.	Follow-up: ☒ Required from States
When: 23-Nov-22	Status: Draft to be adopted by PIRG
Who: ☒ Sub groups ☒ APAC States ☒ ICAO APAC RO ☐ ICAO HQ ☐ Other:	

2.27 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

2.28 New Zealand presented an estimate of work for a safety assessment or security assessment of the CRV network. 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.

CRV Diversity and Security Implementation

2.29 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 Aircservices 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

2.30 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

2.31 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 CRV OG/10

Proposal to Extend CRV Contract

2.32 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.

2.33 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

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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.

2.34 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**.

2.35 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 CNS SG/26/XX (ACSICG/09/02 (CRV OG/10/01)): Extension of CRV Contract for one year		
What: 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 recommended to extend current CRV contract for one year. 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. c) After the extension, the CRV contract expiry date will be 31 December 2028.		Expected impact: ☐ Political / Global ☐ Inter-regional ☒ Economic ☐ Environmental ☒ Ops/Technical
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.	Follow-up: ☒ Required from States	
When: 23-Nov-22	Status: Draft to be adopted by PIRG	
Who: ☒ Sub groups ☒ APAC States ☒ ICAO APAC RO ☐ ICAO HQ ☐ Other:		

2.36 Singapore queried for the rate for additional one year term after CRV contract extension. The meeting was informed that the current contract extension will be based on same terms and conditions and rates. After initial five years term, states may renew the CRV contract on yearly basis till expiry of the contract. However, States and PCCWG may negotiate bilaterally for better rate to renew the contract for more than one year. Nevertheless, the last date of contract cannot exceed CRV contract expiry date.

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

2.37 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.

2.38 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 proposal was being presented by PCCWG in SP/01.

2.39 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.

2.40 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.

2.42 To respond to an enquiry, 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 which was postponed to be discussed on 15 September 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.

CRV Operations Manual

2.43 New Zealand informed that the current DRAFT version of the Operations Manual is ready for publication as version 1.1. The updates in different sections were explained in detail in this paper. It was added that Member States can request access to the manual by requesting access to the portal by following the steps mentioned on [CRV Landing Page](#).

2.44 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: ☐ Political / Global ☐ Inter-regional ☐ Economic

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		☐ Environmental
		☒ Ops/Technical
Why: Ongoing improvements to the documentation supporting the APAC CRV network	Follow-up:	☐ Required from States
When: 21-Apr-22	Status:	Adopted by ACSICG
Who: ☐ Sub groups ☐ APAC States ☐ ICAO APAC RO ☐ ICAO HQ ☒ Other: CRV OG and ACSICG		

2.45 The State Letter **Ref:** T 8/9.1 – AP077/22 (CNS) with Subject of *Publication of CRV OG Operations Manual v1.1* has been issued on 24th May 2022 to urge States/Administrations to reference this manual for implementation of the CRV.

ICAO ATN/AMHS Guidance Document Tree

2.46 The WP/04 of ACSICG/9 presented the ICAO ATN/AMHS Guidance Document Tree and proposed to add CRV reference documents into the ATN Guidance Document tree. The ACSICG/9 meeting further reviewed the ATN/AMHS Documentation Tree and considered the recommendation of the CRV OG/9 for addition of CRV reference documents including the document locations on the ATN/AMHS Documentation tree, and necessary modifications on the tree structure. The ACSICG/9 meeting 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 and 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

2.47 Thailand presented the AMHS implementation status information in Asia/Pacific Region updated in ATS Messaging Management Centre (AMC) in Attachment A of the paper through WP/05. 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

2.48 The Secretariat presented the current status of the AFTN/ATSMHS routing directory and the latest Communication Chart for Asia and Pacific Regions in WP/12. The ACSICG/9 meeting was informed that the CNS SG/23 meeting agreed to fully follow the AFTN/ATSMHS routing directory during the transition period by end of 2020.

2.49 The 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.

2.50 The paper summarized the updates provided by States/Administrations since the publication of the AFTN/ATSMHS Routing Directory (28th Edition AFTN Routing Directory) and informed that the updates 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 C** to this paper.

Draft Conclusion CNS SG/26/XX (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 paper be further updated and distributed to States/Administrations as 29 th Edition.	Expected impact: ☐ Political / Global ☐ Inter-regional ☐ Economic ☐ Environmental ☒ 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: ☐ Required from States
When:	09 September 22	Status: Draft to be adopted by Subgroup
Who:	☒ CNS SG ☒ APAC States ☒ ICAO APAC RO ☐ ICAO HQ ☐ Other:	

Update status of AMHS implementation by States/Administrations

2.51 WP/13 presented by FAA on the traffic load measured at the Salt Lake City (SLC) Communications centre that supports AMHS connections to APAC States with 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, Australia and Japan need to be monitored and action taken as needed to increase the bandwidth in support of IWXXM and other XML based messages being introduced in the near future.

2.52 Thailand presented AMHS/ATN Implementation Status in Thailand by IP/03. The meeting was informed that Currently Thailand is transitioning from AFTN to AMHS and has completed commissions of AMHS connection with some BBIS and BIS. Thailand's AMHS system is able to support IWXXM, and AIDC services over AMHS have been implemented. The paper also shared the AFTN/AMHS traffic load report for Bangkok COM Centre.

2.53 The IP/04 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 shared the recent AMHS progresses, and updated the CRV implementation status that the installation and testing on CRV is expected to be completed in Q3-4/2022. India supplemented that their interregional connection between Mumbai and Muscat are dedicated circuits.

2.54 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.

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- 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

2.55 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 files are provided in **Appendix D** and **Appendix E** to this paper respectively.

AMHS Readiness Status for Supporting IWXXM Traffic in APAC Region

2.56 The Secretariat 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 in WP/14. 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 per the AMHS Routing Directory Tables from the ATS Messaging Management Centre (AMC) as of March 2022. States that have and have no AMHS service in operation were summarized in the paper.

2.57 States/Administrations were 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 F** to this paper.

Repository of AIDC Implementation Status in APAC

2.58 To follow up the **ACTION ITEM 7-1** of APA TF/7 and 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 a new table to maintain a common understanding between ATMAS TF and ACSICG on AIDC implementation. The ACSICG/9 meeting reviewed and accepted the format of AIDC repository in APAC region for ATMAS TF/3 consideration. Additionally, as suggested by ACSICG Co-Chairs, once the table is adopted by both meetings, the ICAO Secretariat will fill the table according to the latest updates from States/Administrations and share it with States/Administrations in due course for supplements and validation.

MPLS/IP Based Inter-Regional Connection

2.59 WP/07 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.

2.60 As the technical proposal for interconnection of CRV and REDDIG II is ready, the two potential business solutions for the proposed interconnection were proposed by the ICAO Secretariat for meeting consideration regarding approximately infrastructure cost and revised recurring charges. The ICAO Secretariat also informed that the ICAO APAC Office and ICAO EUR/NAT Office coordinated internally as well as with the service providers of regional network in respective regions. The outcomes of the discussions 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 shared.

2.61 The ACSICG/9 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

2.62 WP/08 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 paper further introduced the requirements for IATF Digital Identity concept uses Public Key Infrastructure (PKI) Digital Certificates, Network Information Security which includes the use of IPv6, Domain Name System (DNS), information security, network management and network contingencies, and SWIM interchanges with external entities.

2.63 The ICAO Secretariat shared that the interim measures proposed in the paper is more tangible and implementable comparing high level concepts, which can be considered as a 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 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

2.64 The work programme for ACSICG was developed by ACSICG/3 meeting based on a project approach. The work programme was reviewed by ACSICG/8 meeting and discussed in ACSICG/9 for review and updates. The work programme of ACSICG reviewed and updated by the ACSICG/9 meeting is provided in **Appendix G** to this paper.

CRV Post Implementation Issues in Bhutan

2.65 The ACSICG/9 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 including the two ad-hoc meetings for its resolution by WP/09. Bhutan and New Zealand further updated that due to some technical setup issues, Bhutan revised the SEP (System Engineering Plan) document, and the managed router service revision has been completed on 25th February, 2022.

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Bhutan now awaits for the technical setup from New Zealand. The acceptance and bidirectional test will be performed between the two countries after the completion of technical setup from New Zealand.

2.66 The ACSICG/9 meeting noted that Thailand has already implemented CRV and it planned to test CRV circuits with Bhutan in June 2022. It was 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.

2.67 Bhutan further informed the ICAO Office through email on 6th July 2022 that considering the connectivity between Bhutan and Thailand is currently under inspection process for reliability/stability test and after consensus with New Zealand, Bhutan has decided to discontinue the temporary CRV connectivity with New Zealand.

Amendment 91 to Annex 10 Volume III on Selective Calling Codes

2.68 WP/15 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, which concerns the expansion of the pool of selective calling (SELCAL) codes, for review and action by the meeting. The ACSICG/9 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, which provided details on the SELCAL code pool expansion to all ANSPs was shared.

2.69 The ACSICG/9 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. The Secretariat further explained that the Guidance Material was incorporated with the State Letter. Information on the capability to support SELCAL codes of States is accessible via the contact published in their AIPs.

ICAO APAC Webinars: Implementation of CRV

2.70 The meeting reviewed the outcomes of the ICAO APAC Webinar on Implementation of CRV in APAC region which was successfully conducted on 20 July 2021 with 100% positive responses in IP/02. The information about the webinar on Implementation of CRV on 29th June 2022 with its detailed agenda and program was also shared.

AIDX Survey

2.71 IP/05 provided a brief on IATA's Aviation Information Data Exchange (AIDX) industry 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.

Date and Venue for the Next Meeting

2.72 The meeting discussed the need to meet Face-to-Face (F2F) and concluded that next meeting would be organised in F2F to further progress the tasks listed in the Terms of Reference, 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. The Secretariat will inform the member States of the exact dates and venue of the meeting.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

- a) note the information contained in this paper;
- b) adopt the draft conclusion defined in **Section 2.26, 2.35, 2.50;**
- c) note the updated CRV Implementation Status Table in **Appendix A;**
- d) review the Revised amended Pro Document - MSA in **Appendix B;**
- e) review AFTN-ATSMHS Connections Routing Directory in **Appendix C;**
- f) review the Implementation status of ATN AMHS in the APAC Region provided in **Appendix D;**
- g) note updated List of AMHS Focal Contact Point in **Appendix E;**
- h) review the AMHS Readiness Report for Supporting IWXXM Traffic in **Appendix F;**
- i) review the updated work programme for ACSICG9 in **Appendix G;** and
- j) discuss any relevant matter 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 USA PNG Singapore	Contract in May2018 and service readiness in 3Q 2018	AFTN, ADS-B, AMHS, Voice With: <u>Completed:</u> 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) Singapore Dec, 2020 (AMHS/AIDC); PNG June 2021 (AFTN) Oct 2021 (Voice) USA March 2019 (AFTN) March 2019 (Voice) <u>Pending:</u> South Africa TBC (AMHS/AIDC, Voice); Indonesia	Staged approach	Termination of current COM contract

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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
				TBC 2022 (AMHS/AIDC, Voice, ADS-B);		
3	Bangladesh					
4	Bhutan		Contract signed on Oct 2019. CRV installed successfully in Dec 2021. CRV P2P Test between Paro- Mumbai & Paro- Bangkok to be done once India and Thailand join CRV	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					

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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	

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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
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		

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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
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

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Appendix A to WP/05

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	

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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		In the process of settling the CRV contract terms and signing of the CRV contract between Malaysia and PCCWG Implementation status: CRV service started in Nov 2021. Service cut over will be in stages, starting with AHMS in Q1 2022.	AFTN, AMHS, ADS-B and ATS voice	staged approach	
20	Maldives					
21	Marshall 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
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					

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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	Nov-Dec 2022	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		



INTERNATIONAL CIVIL AVIATION ORGANIZATION

ANNEX 1 TO THE MANAGEMENT SERVICE AGREEMENT BETWEEN THE INTERNATIONAL CIVIL AVIATION ORGANIZATION AND THE CIVIL AVIATION AUTHORITIES AND/OR RELATED AIR NAVIGATION SERVICE PROVIDERS HAVING SIGNED THE AGREEMENT

Project Title: Common Regional Virtual Private Network (CRV) multinational service with a common service provider

Project No.: RAS/14/801 – Revision B

Duration: 5 years

Sector and Sub-Sector: Transport and Civil Aviation

Country Implementing Agency: Civil Aviation Authorities and/or related ANSPs

Executing Agency: International Civil Aviation Organization (ICAO)

Location: Asia Pacific

Estimated Start Date: 31 March 2022

Estimated Project Cost: US\$ 88,000

Brief Description: Under Revision B, ICAO will assist the Civil Aviation Authorities and/or related ANSPs in the continuation of the APAC CRV Project through the provision of expertise and support to the CRV Network (Stage 2). The ICAO assistance covers the specific work scope outlined in this project document.

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1. BACKGROUND

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Appendix B to WP/05

1.1 The Civil Aviation Authorities and/or related ANSPs as listed in Appendix A, hereinafter collectively referred to as the “Parties” and individually as the “Party”, have determined that the Common Regional Virtual Private Network (CRV) multinational service with a common service provider can more effectively:

- provide network services to the Parties;
- support a common Internet Protocol (IP) network;
- establish services based on Voice over IP (VoIP); and
- enhance network diversity and timely service implementation and delivery.

1.2 In 2014, all Parties jointly agreed to appoint ICAO Technical Cooperation Bureau or TCB to assist in the procurement management (i.e. Stage 1) of the CRV project and in the selection of the common Service Provider (RAS14801 Revision A). Upon selection of the common service provider after a Sealed Tender (ST) process through TCB, each Party were expected to subscribed to the Services by signing an individual Service Contract with the Service Provider for the procurement, installation, training, testing, commissioning and operation of the CRV network and the associated services.

1.3 After selection of the common service provider in 2016, a fund balance of USD 104,596 remained as on 31 March 2017. CNS SG/21 (17 to 21 July 2017) and APANPIRG/28 (11 to 14 September 2017) agreed to manage the remaining funds not used for the CRV selection process, to procure common services or expertise to support the implementation of the CRV Network (Stage 2).

1.4 As at 31 December 2021, the remaining fund for use are approximately USD 88,000 allowing for the return of funds to two pioneer Member States in terms of the Conclusion APANPIRG/28/19 “Amendment to the Management Service Agreement for CRV Project (RAS14801)”.

1.5 As a result of the discussions between the Parties, Revision B has been developed to utilise the carry-over funds from the completion of the activities of Stage 1 to procure common services or expertise to support the implementation of the CRV Network (Stage 2).

2. SCOPE OF SERVICES TO BE PROVIDED

2.1 Through this Revision, the following services will be provided by ICAO within the scope of supporting the CRV Network (Stage 2), as may be required:

- a) Provision of expertise through engagement of subject matter experts;
- b) Capacity building through training;
- c) Procurement of common services to support the implementation of the CRV Network;
- d) Other support, as needed.

3. IMPLEMENTATION STRATEGY

3.1 The Parties, through the CRV OG will be agreed on which activities to undertake based on needs priority assessment. Upon determination, the decision will be communicated to TCB through the APAC Regional Office for execution, as appropriate.

3.2 In case the proposed activities exceed the available funds, TCB will communicate this to the Parties through the Regional Office. At this point, the parties will need to decide to either reduce scope of activities, inject additional funds and/or a combination thereof.

4. BUDGET

4.1 The detailed budget is as attached at Appendix A.

4.2 Funds will be equally shared among the Civil Aviation Authorities and/or related ANSPs that have signed the MSA and continue to be party to this Revision, and provided by them in advance of commencement of the project.

4.3 The total estimated amount is of US\$ 88,000 as per Appendix A. This amount is the total estimated amount including administrative and technical support.

5. RISK ASSESSMENT

5.1 Delay in the signing of this project document.

Risk Level: Medium

Mitigation: ICAO will work through the APAC Regional Office to facilitate the signing of the Project Document Revision B.

6. PROJECT MONITORING, REVIEW AND REPORTING

6.1 Monitoring activities

6.1.1 The overall implementation of the project is monitored through regular reporting and project review meetings as appropriate.

6.1.2 ICAO will execute and monitor the project in close consultation with the focal point designated by each Party.

6.1.3 ICAO will maintain the financial accounting and budgetary control of the project, in accordance with its policies and practices.

6.1.4 ICAO may carry out missions on site to monitor the progress of the project, in accordance with the approved work plan or as required.

6.2 ICAO roles and responsibilities include:

- a) to execute and monitor the project under the direction of the Director, TCB. The Director, TCB will delegate the responsibility for the monitoring/oversight of project activities to the appropriate level within the designated/nominated representatives of the Parties;
- b) to provide financial management and budgetary control in accordance with its policies, rules, practices, processes and procedures;
- c) briefing of personnel;
- d) administering ICAO experts' contracts;
- e) to provide financial statements in accordance with ICAO policies, rules, practices, processes and procedures;
- f) organizing experts' travel to duty station;
- g) formalizing acceptance of the completed project deliverables;
- h) revising the project document (PRODOC) as requested;
- i) formalizing all activities required to close the project.

This Project Document is not intended and should not be construed as a recognition or endorsement by ICAO of any functions and/or responsibilities entrusted to or performed by regional entities.

7 PROJECT RULES AND REGULATIONS

7.1 International experts/personnel

7.1.2 ICAO will recruit and deploy international experts/personnel in accordance with ICAO policies, practices, ICAO/TCB Field Staff Services Rules and applicable process and procedures. In particular, as consultants engaged by ICAO, their entitlement payments will be issued by ICAO. The lead-time required for the recruitment of the experts may range between six (6) weeks to three (3) months, from the moment the funds are committed until the deployment of the experts. In the eventuality of a contract extension being required for one or more ICAO expert(s), the Implementing Agency will need to issue the necessary request at least three (3) months prior to the end of the ICAO expert(s)' contract, subject to availability of funds; the request will include a justification and corresponding additional duration, as appropriate.

7.2 Procurement

7.1.1 The procurement of equipment or services are carried out in accordance with ICAO's Procurement Code, Financial Regulations and Rules, and applicable process and procedures.

7.2 Finance

7.2.1 The reception and management of funds for this project are subject to ICAO's Financial Regulations and Rules, and applicable process and procedures. The use of any of the resources for this project will be processed upon reception of proper formal authorization.

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7.2.2 The unauthorized use of project resources is not allowed and could result in project delay and the discontinuation of the project's activities.

7.2.3 The provision of financial management and budgetary control of the project and submitting financial reports will be in accordance with ICAO rules, regulations, process and procedures.

7.2.4 ICAO will provide the financial statements concerning the services covered by this document, indicating the status of the funds, in US dollars. Any clarification or discrepancy with the financial statements must be officially communicated to ICAO within 30 days of receiving them, after which they are deemed accepted by the Parties.

7.2.5 If additional information is required after the deadlines set in the previous paragraph, costs related to such information will be charged to the project, with prior approval from the Parties.

7.3 General regulations

7.3.1 All project's activities are managed in accordance with the applicable ICAO policies, rules, regulations, processes and practices and applicable process and procedures.

7.3.2 Project activities, including reports and/or deliverables prepared by the ICAO experts may be reviewed by ICAO Headquarters and/or Regional Office, as appropriate.

7.3.3 This document was developed in English by the parties. Any document related to the implementation of this project that is required to be translated into another official language of ICAO, as may be required, shall be performed by ICAO and charged to the project, as appropriate. Any document related to the implementation of this project that is required to be translated into any other language not an official language of ICAO, shall be translated independently by that Party at its own cost. In case of disagreements on the text of any of the documents, the prevailing version will be the text in the original English language.

8 LEGAL FRAMEWORK

8.1 This project document shall constitute Revision B to Annex 1 (RAS14801) to the Management Service Agreement between the Parties.

8.2 The Project Document Revision B will come into force upon its signing by the Parties.

8.3 Any change, amendment or revision to this Project Document Revision (including scope, duration, budget, responsibilities, or other), will need to be formally approved in writing by the Parties.

8.4 Nothing contained in or relating to this Project Document Revision B shall be deemed a waiver, express or implied, of any of the privileges and immunities of ICAO and its personnel.

9 LIABILITY

CNS SG/26
Appendix B to WP/05

9.1 The Parties shall indemnify, defend, and hold and save harmless, ICAO and its officials, agents and employees, from and against all suits, proceedings, claims, demands, losses, and liability of any kind or nature brought against ICAO, including, but not limited to, all litigation costs and expenses, attorney's fees, settlement payments, and damages. For the avoidance of doubt, the Parties shall be obligated, at their sole expense, to defend ICAO and its officials, agents, and employees, regardless of whether the suits, proceedings, claims, and demands in question actually give rise to or otherwise result in any loss or liability.

9.2 ICAO shall advise the Parties about any such suits, proceedings, claims, demands, losses, or liability within a reasonable period of time after having received actual notice thereof. ICAO shall have control over any assertion or defense of the privileges and immunities of ICAO or any matter relating thereto, including the assertion or defense that ICAO is acting as mandatory for the Parties, for which only ICAO itself is authorized to assert and maintain. ICAO shall have the right to be represented in any such suit, proceeding, claim or demand by independent counsel of its own choosing and shall also be indemnified, held, and saved harmless by the Parties for such litigation costs and expenses and attorney's fees.

9.3 ICAO shall have the right to set-off any costs incurred pursuant to this Article from any remaining funds received under this Agreement.

9.4 The obligation under this clause shall survive the termination of this Agreement.

CNS SG/26
Appendix B to WP/05

APPENDIX A

**PROJECT BUDGET COVERING MSA CONTRIBUTION
(IN UNITED STATES DOLLARS)**

COUNTRY: REGIONAL PROJECT
PROJECT NO: RAS14801
PROJECT TITLE: COMMON REGIONAL VIRTUAL PRIVATE NETWORK (CRV) APAC
WORK ORDER: RAS14801-01
VERSION: 3

	TOTAL		2022		2023		2024		2025		2026	
	w/m	\$	w/m	\$	w/m	\$	w/m	\$	w/m	\$	w/m	\$
PROJECT PERSONNEL												
INTERNATIONAL PROFESSIONAL POSTS												
11.501 CONSULTANCIES AND CONTRACTORS (TSS FEE)		35 000		5 000		10 000		10 000		10 000		
SUB-TOTAL (INTERNATIONAL PROFESSIONAL POSTS)		35 000		5 000		10 000		10 000		10 000		
16.001 INTERNATIONAL TRAVEL		11 000		2 000		2 000		2 000		3 000		2 000
TOTAL (PROJECT PERSONNEL)		46 000		7 000		12 000		12 000		13 000		2 000
EQUIPMENT												
41.001 EXPENDABLE EQUIPMENT - INTERNATIONAL		30 000		10 000		20 000						
TOTAL (EQUIPMENT)		30 000		10 000		20 000						
MISCELLANEOUS												
51.001 REPORTING COSTS		2 200										2 200
52.001 MISCELLANEOUS EXPENSES		2 000		500		800		300		300		400
B807F PROFESSIONAL LIABILITY INSURANCE												
53.001 OVERHEAD CHARGES		7 500		2 100		2 700		1 200		1 300		200
TOTAL (MISCELLANEOUS)		12 000		2 600		3 500		1 500		1 600		2 800
PROJECT TOTAL		88 000		19 600		35 500		13 500		14 600		4 800



INTERNATIONAL CIVIL AVIATION ORGANIZATION

ASIA AND PACIFIC OFFICE

AFTN/ATSMHS ROUTING DIRECTORY

ASIA AND PACIFIC REGIONS

Appendix C of the ACSICG/9 Report

MAY 2022

PREPARED BY THE ICAO ASIA AND PACIFIC REGIONAL OFFICE

EXPLANATORY NOTES

The Routing Directory is based on the existing AFTN circuits in the Asia and Pacific Regions.

I. Explanation of columns:

- a) Column A contains destination AFTN routing indicators. These indicators employ the minimum number of characters to preclude ambiguity.
- b) Columns 1, 2, 3 etc. contain the location indicators of the originating/relaying AFTN COM centres/stations in the heading and the AFTN routing indicators in conjunction with the destination indicators.
- c) Primary Routing is indicated in the left-hand subdivision under each origin, in upper case letters.
- d) Alternate routing is indicated in the right-hand subdivision under each origin, in lower case letters.
- e) National and/or non-AFTN routing is indicated by the letter (N). Local arrangement for alternate routing is indicated by the letter n.

II. Explanation of Symbols:

- A stations - stations in the "A" Aeronautical Fixed Service
Routing Area (AFSRA) - Solomon Is., Nauru,
and Papua New Guinea.
- AG stations - stations in Solomon Is.
- AN stations - stations in Nauru
- AY stations - stations in Papua New Guinea

- B stations - stations in the "B" AFSRA - (Greenland, Iceland)
- C stations - stations in the "C" AFSRA - (Canada)
- D stations - stations in the "D" AFSRA - (West Africa)
- E stations - stations in the "E" AFSRA - (Europe)
- F stations - stations in the "F" AFSRA - (Central and South Africa)
- G stations - stations in the "G" AFSRA - (Coastal West Africa)

- H stations - stations in the "H" AFSRA - (Coastal East Africa)
- HE stations - stations in the Arab Republic of Egypt

- K stations - stations in the "K" AFSRA - (U.S.A.)
- L stations - stations in the "L" AFSRA - (Europe, Mediterranean)
- M stations - stations in the "M" AFSRA - (Caribbean, Central America)

2.

N stations - stations in the "N" AFSRA (South Pacific)
NC stations - stations in Cook Is.
NF stations - stations in Fiji
NFT stations - stations in Tonga
NG stations - stations in Kiribati
NGF stations - stations in Tuvalu
NI stations - stations in Niue Island
NL stations - stations in Futuna and Wallis Islands
NS stations - stations in Samoa
NST stations - stations in American Samoa
NT stations - stations in French Polynesia
NV stations - stations in Vanuatu
NW stations - stations in New Caledonia
NZ stations - stations in New Zealand

O stations - stations in the "O" AFSRA - (Middle East)
OA stations - stations in Afghanistan
OB stations - stations in Bahrain
OE stations - stations in Saudi Arabia
OI stations - stations in Iran, Islamic Rep. of
OJ stations - stations in Jordan
OK stations - stations in Kuwait
OL stations - stations in Lebanon
OM stations - stations in United Arab Emirates
OO stations - stations in Oman
OP stations - stations in Pakistan
OR stations - stations in Iraq
OS stations - stations in Syria
OT stations - stations in Qatar
OY stations - stations in Yemen

P stations - stations in the "P" AFSRA - (North Pacific)
PA stations - stations in Alaska
PB stations - stations in Baker Is.
PC stations - stations in Phoenix Is.
PG stations - stations in Mariana Is. Guam
PH stations - stations in Hawaii
PJ stations - stations in Johnston Is.
PK stations - stations in Marshall Is.
PL stations - stations in Line Is.
PM stations - stations in Midway Is.
PT stations - stations in Federated State of Micronesia
PW stations - stations in Wake Is.

R stations - stations in the "R" AFSRA - (West Pacific)
RC stations - stations in China
RJ stations - stations in Japan
RK stations - stations in Republic of Korea
RO stations - stations in Japan (Ryukyu Is.)
RP stations - stations in the Philippines

3.

S	stations - stations in the "S" AFSRA - (South America)
SA	stations - stations in Argentina
SC	stations - stations in Chile
T	stations - stations in the "T" AFSRA - (North East Caribbean)
U	stations - stations in the "U" AFSRA - (Russian Federation)
UT	stations - stations in Uzbekistan
V	stations - stations in the "V" AFSRA - (East and West Asia)
VA	stations - stations in India (West)
VC	stations - stations in Sri Lanka
VD	stations - stations in Cambodia
VE	stations - stations in India (East)
VG	stations - stations in Bangladesh
VH	stations - stations in Hong Kong
VI	stations - stations in India (North)
VL	stations - stations in Lao People's Democratic Republic
VM	stations - stations in Macau
VN	stations - stations in Nepal
VO	stations - stations in India (South)
VQ	stations - stations in Bhutan
VR	stations - stations in Maldives
VT	stations - stations in Thailand
VV	stations - stations in Viet Nam
VY	stations - stations in Myanmar
W	stations - stations in the "W" AFSRA (Brunei, Indonesia, Malaysia, Singapore, Southern South East Asia)
WA	stations - stations in Indonesia (Eastern part of Indonesia)
WB	stations - stations in Malaysia (East)
WBA	stations - stations in Brunei
WBS	stations - stations in Brunei
WI	stations - stations in Indonesia (Western part of Indonesia)
WM	stations - stations in Malaysia (West)
WP	stations - stations in Timor Leste
WR	stations - stations in Indonesia (Middle part of Indonesia)
WS	stations - stations in Singapore
Y	stations - stations in "Y" AFSRA (Australia)
Z	stations - stations in the "Z" AFSRA (China, Dem. People's Rep. of Korea, Mongolia)
Z	stations (except ZK and ZM) - stations in China
ZK	stations - stations in Democratic People's Republic of Korea
ZM	stations - stations in Mongolia

Note 1: The names of the continents, areas and countries appearing in parentheses indicate broadly the geographical location of the AFSRAs. The chart contained in Doc 7910, shows the delineation of these AFSRAs.

4.

AMENDMENTS

RECORD OF AMENDMENTS AND CORRIGENDA
RELATING TO AFTN ROUTING DIRECTORY, ASIA AND PACIFIC REGIONS,
TWENTY-SEVENTH EDITION

[illegible][illegible]

5.

A	1		2		3		4		5		6	
ORIGIN DESTINATION	AGGG		ANAU		AYPM		KSLC		NCRG		NFFN	
AG	(N)	n	YB		YB		YB	nf	NZ		YB	ks
AN	YB		(N)	n	YB		YB	nf	NZ		YB	ks
AY	YB		YB		(N)	n	YB	nf	NZ		YB	ks
B	YB		YB		YB		(N)	n	NZ		KS	yb
C	YB		YB		YB		(N)	n	NZ		KS	yb
D	YB		YB		YB		(N)	n	NZ		YB	ks
E	YB		YB		YB		(N)	n	NZ		YB	ks
F	YB		YB		YB		(N)	n	NZ		YB	ks
G	YB		YB		YB		(N)	n	NZ		YB	ks
H	YB		YB		YB		(N)	n	NZ		YB	ks
K	YB		YB		YB		(N)	n	NZ		KS	yb
L	YB		YB		YB		(N)	n	NZ		YB	ks
M	YB		YB		YB		(N)	n	NZ		KS	yb
NC	YB		YB		YB		NZ	yb	(N)	n	YB	ks
NF (EX. NFT)	YB		YB		YB		NF	yb	NZ		(N)	n
NFT	YB		YB		YB		NZ	yb	NZ		YB	ks
NG (EX. NGF)	YB		YB		YB		NF	yb	NZ		NGT	n
NGF	YB		YB		YB		NF	yb	NZ		NGF	n
NI	YB		YB		YB		NZ	yb	NZ		YB	ks
NL	YB		YB		YB		NF	yb	NZ		NW	n
NS (EX. NST)	YB		YB		YB		NZ	yb	NZ		YB	ks
NST	YB		YB		YB		NST	n	NZ		KS	yb
NT	YB		YB		YB		NZ	yb	NZ		YB	ks
NV	YB		YB		YB		YB	nf	NZ		YB	ks
NW	YB		YB		YB		NF	yb	NZ		NW	yb
NZ	YB		YB		YB		NZ	yb	NZ		YB	ks
OA	YB		YB		YB		(N)	n	NZ		YB	ks
OB	YB		YB		YB		(N)	n	NZ		YB	ks
OE	YB		YB		YB		(N)	n	NZ		YB	ks
OI	YB		YB		YB		(N)	n	NZ		YB	ks
OJ	YB		YB		YB		(N)	n	NZ		YB	ks
OK	YB		YB		YB		(N)	n	NZ		YB	ks
OL	YB		YB		YB		(N)	n	NZ		YB	ks
OM	YB		YB		YB		(N)	n	NZ		YB	ks
OO	YB		YB		YB		(N)	n	NZ		YB	ks
OP	YB		YB		YB		RJ	yb	NZ		YB	ks
OR	YB		YB		YB		(N)	n	NZ		YB	ks
OS	YB		YB		YB		(N)	n	NZ		YB	ks
OT	YB		YB		YB		(N)	n	NZ		YB	ks
OY	YB		YB		YB		(N)	n	NZ		YB	ks
P	YB		YB		YB		(N)	n	NZ		KS	yb
RC	YB		YB		YB		RJ	yb	NZ		YB	ks
RJ,RO	YB		YB		YB		RJ	yb	NZ		YB	ks
RK	YB		YB		YB		RJ	yb	NZ		YB	ks
RP	YB		YB		YB		RP	rj	NZ		YB	ks
S	YB		YB		YB		(N)	n	NZ		KS	yb
T	YB		YB		YB		(N)	n	NZ		KS	yb

[illegible]

7.

A	1		2		3		4		5		6	
ORIGIN DESTINATION	NFTF		NGFU		NGTT		NIUE		NSFA		NSTU	
AG	NZ		NF		NF		NZ		NZ		KS	
AN	NZ		NF		NF		NZ		NZ		KS	
AY	NZ		NF		NF		NZ		NZ		KS	
B	NZ		NF		NF		NZ		NZ		KS	
C	NZ		NF		NF		NZ		NZ		KS	
D	NZ		NF		NF		NZ		NZ		KS	
E	NZ		NF		NF		NZ		NZ		KS	
F	NZ		NF		NF		NZ		NZ		KS	
G	NZ		NF		NF		NZ		NZ		KS	
H	NZ		NF		NF		NZ		NZ		KS	
K	NZ		NF		NF		NZ		NZ		KS	
L	NZ		NF		NF		NZ		NZ		KS	
M	NZ		NF		NF		NZ		NZ		KS	
NC	NZ		NF		NF		NZ		NZ		KS	
NF (EX. NFT)	NZ		NF		NF		NZ		NZ		KS	
NFT	(N)	n	NF		NF		NZ		NZ		KS	
NG (EX. NGF)	NZ		NF		(N)	n	NZ		NZ		KS	
NGF	NZ		(N)	n	NF		NZ		NZ		KS	
NI	NZ		NF		NF		(N)	n	NZ		KS	
NL	NZ		NF		NF		NZ		NZ		KS	
NS (EX. NST)	NZ		NF		NF		NZ		(N)	n	KS	
NST	NZ		NF		NF		NZ		NZ		(N)	n
NT	NZ		NF		NF		NZ		NZ		KS	
NV	NZ		NF		NF		NZ		NZ		KS	
NW	NZ		NF		NF		NZ		NZ		KS	
NZ	NZ		NF		NF		NZ		NZ		KS	
OA	NZ		NF		NF		NZ		NZ		KS	
OB	NZ		NF		NF		NZ		NZ		KS	
OE	NZ		NF		NF		NZ		NZ		KS	
OI	NZ		NF		NF		NZ		NZ		KS	
OJ	NZ		NF		NF		NZ		NZ		KS	
OK	NZ		NF		NF		NZ		NZ		KS	
OL	NZ		NF		NF		NZ		NZ		KS	
OM	NZ		NF		NF		NZ		NZ		KS	
OO	NZ		NF		NF		NZ		NZ		KS	
OP	NZ		NF		NF		NZ		NZ		KS	
OR	NZ		NF		NF		NZ		NZ		KS	
OS	NZ		NF		NF		NZ		NZ		KS	
OT	NZ		NF		NF		NZ		NZ		KS	
OY	NZ		NF		NF		NZ		NZ		KS	
P	NZ		NF		NF		NZ		NZ		KS	
RC	NZ		NF		NF		NZ		NZ		KS	
RJ,RO	NZ		NF		NF		NZ		NZ		KS	
RK	NZ		NF		NF		NZ		NZ		KS	
RP	NZ		NF		NF		NZ		NZ		KS	
S	NZ		NF		NF		NZ		NZ		KS	
T	NZ		NF		NF		NZ		NZ		KS	

8.

[illegible]

A	1		2		3		4		5		6	
ORIGIN DESTINATION	NTAA		NVVV		NWWW		NZCH		OPKC		PKMJ	
AG	NZ		YB		NF		YB	ks	VA	zb	KS	
AN	NZ		YB		NF		YB	ks	VA	zb	KS	
AY	NZ		YB		NF		YB	ks	VA	zb	KS	
B	NZ		YB		NF		KS	yb	OK	oi	KS	
C	NZ		YB		NF		KS	yb	OK	oi	KS	
D	NZ		YB		NF		YB	ks	OK	oi	KS	
E	NZ		YB		NF		YB	ks	OK	oi	KS	
F	NZ		YB		NF		YB	ks	OK	oi	KS	
G	NZ		YB		NF		YB	ks	OK	oi	KS	
H	NZ		YB		NF		YB	ks	OK	oi	KS	
K	NZ		YB		NF		KS	yb	OK	oi	KS	
L	NZ		YB		NF		YB	ks	OK	oi	KS	
M	NZ		YB		NF		KS	yb	OK	zb	KS	
NC	NZ		YB		NF		NC	n	VA	zb	KS	
NF (EX. NFT)	NZ		YB		NF		YB	ks	VA	zb	KS	
NFT	NZ		YB		NF		NFT	n	VA	zb	KS	
NG (EX. NGF)	NZ		YB		NF		YB	ks	VA	zb	KS	
NGF	NZ		YB		NF		YB	ks	VA	zb	KS	
NI	NZ		YB		NF		NI	n	VA	zb	KS	
NL	NZ		YB		NL		YB	ks	VA	zb	KS	
NS (EX. NST)	NZ		YB		NF		NS	n	VA	zb	KS	
NST	NZ		YB		NF		KS	yb	VA	zb	KS	
NT	(N)	n	YB		NF	nt	NT	n	VA	zb	KS	
NV	NZ		(N)	n	NF		YB	ks	VA	zb	KS	
NW	NZ	nw	YB		(N)	n	YB	ks	VA	zb	KS	
NZ	NZ		YB		NF		(N)	n	VA	zb	KS	
OA	NZ		YB		NF		YB	ks	OA	oi	KS	
OB	NZ		YB		NF		YB	ks	OK	oi	KS	
OE	NZ		YB		NF		YB	ks	OK	oi	KS	
OI	NZ		YB		NF		YB	ks	OI	ok	KS	
OJ	NZ		YB		NF		YB	ks	OK	oi	KS	
OK	NZ		YB		NF		YB	ks	OK	oi	KS	
OL	NZ		YB		NF		YB	ks	OK	oi	KS	
OM	NZ		YB		NF		YB	ks	OK	oi	KS	
OO	NZ		YB		NF		YB	ks	OK	oi	KS	
OP	NZ		YB		NF		YB	ks	(N)	n	KS	
OR	NZ		YB		NF		YB	ks	OI	ok	KS	
OS	NZ		YB		NF		YB	ks	OI	ok	KS	
OT	NZ		YB		NF		YB	ks	OK	oi	KS	
OY	NZ		YB		NF		YB	ks	OK	oi	KS	
P	NZ		YB		NF		KS	yb	VA	zb	(N)	n
RC	NZ		YB		NF		YB	ks	VA	zb	KS	
RJ,RO	NZ		YB		NF		YB	ks	VA	zb	KS	
RK	NZ		YB		NF		YB	ks	VA	zb	KS	
RP	NZ		YB		NF		YB	ks	VA	zb	KS	
S	NZ		YB		NF		KS	yb	OK	oi	KS	
T	NZ		YB		NF		KS	yb	OK	oi	KS	

[illegible]

A	1		2		3		4		5		6	
ORIGIN DESTINATION	PTKK		PTPN		PTRO		PTSA		PTYA		RCTP	
AG	KS		KS		KS		KS		KS		RP	vh
AN	KS		KS		KS		KS		KS		RP	vh
AY	KS		KS		KS		KS		KS		RP	vh
B	KS		KS		KS		KS		KS		VH	rp
C	KS		KS		KS		KS		KS		VH	rp
D	KS		KS		KS		KS		KS		RP	vh
E	KS		KS		KS		KS		KS		VH	rp
F	KS		KS		KS		KS		KS		RP	vh
G	KS		KS		KS		KS		KS		RP	vh
H	KS		KS		KS		KS		KS		RP	vh
K	KS		KS		KS		KS		KS		VH	rp
L	KS		KS		KS		KS		KS		VH	rp
M	KS		KS		KS		KS		KS		VH	rp
NC	KS		KS		KS		KS		KS		RP	vh
NF (EX. NFT)	KS		KS		KS		KS		KS		RP	vh
NFT	KS		KS		KS		KS		KS		RP	vh
NG (EX. NGF)	KS		KS		KS		KS		KS		RP	vh
NGF	KS		KS		KS		KS		KS		RP	vh
NI	KS		KS		KS		KS		KS		RP	vh
NL	KS		KS		KS		KS		KS		RP	vh
NS (EX. NST)	KS		KS		KS		KS		KS		RP	vh
NST	KS		KS		KS		KS		KS		RP	vh
NT	KS		KS		KS		KS		KS		RP	vh
NV	KS		KS		KS		KS		KS		RP	vh
NW	KS		KS		KS		KS		KS		RP	vh
NZ	KS		KS		KS		KS		KS		RP	vh
OA	KS		KS		KS		KS		KS		RP	vh
OB	KS		KS		KS		KS		KS		RP	vh
OE	KS		KS		KS		KS		KS		RP	vh
OI	KS		KS		KS		KS		KS		RP	vh
OJ	KS		KS		KS		KS		KS		RP	vh
OK	KS		KS		KS		KS		KS		RP	vh
OL	KS		KS		KS		KS		KS		RP	vh
OM	KS		KS		KS		KS		KS		RP	vh
OO	KS		KS		KS		KS		KS		RP	vh
OP	KS		KS		KS		KS		KS		RP	vh
OR	KS		KS		KS		KS		KS		RP	vh
OS	KS		KS		KS		KS		KS		RP	vh
OT	KS		KS		KS		KS		KS		RP	vh
OY	KS		KS		KS		KS		KS		RP	vh
P	(N)		(N)		(N)		(N)		(N)		VH	rp
RC	KS		KS		KS		KS		KS		(N)	n
RJ,RO	KS		KS		KS		KS		KS		RJ	vh
RK	KS		KS		KS		KS		KS		RJ	vh
RP	KS		KS		KS		KS		KS		RP	vh
S	KS		KS		KS		KS		KS		VH	rp
T	KS		KS		KS		KS		KS		VH	rp

[illegible]

A	1		2		3		4		5		6	
ORIGIN DESTINATION	RJJJ		RKSS		RPLL		UH HH		UUUU		VABB	
AG	WS	vh	RJ		WS	vh	UU	zb	RJ	n	VT	vc
AN	WS	vh	RJ		WS	vh	UU	zb	RJ	n	VT	vc
AY	WS	vh	RJ		WS	vh	UU	zb	RJ	n	VT	vc
B	KS	ws	RJ		VH	ws	UU	zb	BI	n	VT	vc
C	KS	ws	RJ		KS	vh	UU	zb	EG	n	VT	vc
D	WS	vh	RJ		WS	vh	UU	zb	LF	n	HK	vt
E	WS	vh	RJ		VH	ws	UU	zb	(N)	n	VT	vc
F	WS	vh	RJ		WS	vh	UU	zb	LF	n	HK	vt
G	WS	vh	RJ		WS	vh	UU	zb	LE	n	HK	vt
H	WS	vh	RJ		WS	vh	UU	zb	LG	n	HK	vt
K	KS	ws	RJ	zb	KS	vh	UU	zb	RJ	n	VT	vc
L	WS	vh	RJ		VH	ws	UU	zb	(N)	n	VT	vc
M	KS	ws	RJ		KS	vh	UU	zb	EG	n	VT	vc
NC	KS	ws	RJ		WS	vh	UU	zb	RJ	n	VT	vc
NF (EX. NFT)	KS	ws	RJ		WS	vh	UU	zb	RJ	n	VT	vc
NFT	KS	ws	RJ		WS	vh	UU	zb	RJ	n	VT	vc
NG (EX. NGF)	KS	ws	RJ		WS	vh	UU	zb	RJ	n	VT	vc
NGF	KS	ws	RJ		WS	vh	UU	zb	RJ	n	VT	vc
NI	KS	ws	RJ		WS	vh	UU	zb	RJ	n	VT	vc
NL	KS	ws	RJ		WS	vh	UU	zb	RJ	n	VT	vc
NS (EX. NST)	KS	ws	RJ		WS	vh	UU	zb	RJ	n	VT	vc
NST	KS	ws	RJ		WS	vh	UU	zb	RJ	n	VT	vc
NT	KS	ws	RJ		WS	vh	UU	zb	RJ	n	VT	vc
NV	KS	ws	RJ		WS	vh	UU	zb	RJ	n	VT	vc
NW	KS	ws	RJ		WS	vh	UU	zb	RJ	n	VT	vc
NZ	KS	ws	RJ		WS	vh	UU	zb	RJ	n	VT	vc
OA	WS	vh	RJ		WS	vh	UU	n	LC	n	OP	vn
OB	WS	vh	RJ		WS	vh	UU	n	LC	n	OO	op
OE	WS	vh	RJ		WS	vh	UU	n	LC	n	OO	op
OI	WS	vh	RJ		WS	vh	UU	n	LC	n	OP	oo
OJ	WS	vh	RJ		WS	vh	UU	n	LC	n	OO	op
OK	WS	vh	RJ		WS	vh	UU	n	LC	n	OO	op
OL	WS	vh	RJ		WS	vh	UU	n	LC	n	OO	op
OM	WS	vh	RJ		WS	vh	UU	n	LC	n	OO	op
OO	WS	vh	RJ		WS	vh	UU	n	LC	n	OO	op
OP	WS	vh	RJ		WS	vh	UU	n	LC	n	OP	oo
OR	WS	vh	RJ		WS	vh	UU	n	LC	n	OO	op
OS	WS	vh	RJ		WS	vh	UU	n	LC	n	OO	op
OT	WS	vh	RJ		WS	vh	UU	n	LC	n	OO	op
OY	WS	vh	RJ		WS	vh	UU	n	LC	n	OO	op
P	KS	ws	RJ		KS	vh	UU	zb	EG	n	VT	vc
RC	RC	vh	RJ		RC	vh	UU	zb	RJ	n	VT	vc
RJ,RO	(N)	n	RJ	zb	VH	rc	UU	zb	RJ	n	VT	vc
RK	RK	zb	(N)	n	VH	rc	UU	zb	RJ	n	VT	vc
RP	WS	vh	RJ		(N)	n	UU	zb	RJ	n	VT	vc
S	KS	ws	RJ		KS	vh	UU	zb	LE	n	VT	vc
T	KS	ws	RJ		KS	vh	UU	zb	EG	n	VT	vc

[illegible]

A	1		2		3		4		5		6	
ORIGIN DESTINATION	VCCC		VDPP		VECC		VGZR		VHHH		VIDD	
AG	WS	va	VT		VA	vg	VT	va	VT	rp	VA	n
AN	WS	va	VT		VA	vg	VT	va	VT	rp	VA	n
AY	WS	va	VT		VA	vg	VT	va	VT	rp	VA	n
B	WS	va	VT		VA	vg	VT	va	RJ	vt	VA	n
C	WS	va	VT		VA	vg	VT	va	RJ	rp	VA	n
D	WS	va	VT		VA	n	VT	va	VT	vvt	VA	n
E	WS	va	VT		VA	n	VT	va	VT	rj	VA	n
F	WS	va	VT		VA	vo	VT	va	VT	rp	VA	ve
G	WS	va	VT		VA	n	VT	va	VT	vvt	VA	n
H	WS	va	VT		VA	n	VT	va	VT	vvt	VA	n
K	WS	va	VT		VA	vg	VT	va	RJ	rp	VA	n
L	WS	va	VT		VA	n	VT	va	VT	rj	VA	n
M	WS	va	VT		VA	vg	VT	va	RJ	rp	VA	n
NC	WS	va	VT		VA	vg	VT	va	VT	rp	VA	n
NF (EX. NFT)	WS	va	VT		VA	vg	VT	va	VT	rp	VA	n
NFT	WS	va	VT		VA	vg	VT	va	VT	rp	VA	n
NG (EX. NGF)	WS	va	VT		VA	vg	VT	va	VT	rp	VA	n
NGF	WS	va	VT		VA	vg	VT	va	VT	rp	VA	n
NI	WS	va	VT		VA	vg	VT	va	VT	rp	VA	n
NL	WS	va	VT		VA	vg	VT	va	VT	rp	VA	n
NS (EX. NST)	WS	va	VT		VA	vg	VT	va	VT	rp	VA	n
NST	WS	va	VT		VA	vg	VT	va	VT	rp	VA	n
NT	WS	va	VT		VA	vg	VT	va	VT	rp	VA	n
NV	WS	va	VT		VA	vg	VT	va	VT	rp	VA	n
NW	WS	va	VT		VA	vg	VT	va	VT	rp	VA	n
NZ	WS	va	VT		VA	vg	VT	va	VT	rp	VA	n
OA	VA	ws	VT		VA	n	VT	va	ZB	vt	VA	n
OB	WS	va	VT		VA	n	VT	va	VT	rp	VA	n
OE	WS	va	VT		VA	n	VT	va	VT	rp	VA	n
OI	WS	va	VT		VA	n	VT	va	VT	rp	VA	n
OJ	WS	va	VT		VA	n	VT	va	VT	rp	VA	n
OK	WS	va	VT		VA	n	VT	va	VT	rp	VA	n
OL	WS	va	VT		VA	n	VT	va	VT	rp	VA	n
OM	WS	va	VT		VA	n	VT	va	VT	rp	VA	n
OO	WS	va	VT		VA	n	VT	va	VT	rp	VA	n
OP	VA	ws	VT		VA	n	VT	va	ZB	vt	VA	n
OR	WS	va	VT		VA	n	VT	va	VT	rp	VA	n
OS	WS	va	VT		VA	n	VT	va	VT	rp	VA	n
OT	WS	va	VT		VA	n	VT	va	VT	rp	VA	n
OY	WS	va	VT		VA	n	VT	va	VT	rp	VA	n
P	WS	va	VT		VA	vg	VT	va	RJ	rp	VA	n
RC	WS	va	VT		VA	vg	VT	va	RC	rp	VA	n
RJ,RO	WS	va	VT		VA	vg	VT	va	RJ	rc	VA	n
RK	WS	va	VT		VA	vg	VT	va	RJ	zb	VA	n
RP	WS	va	VT		VA	vg	VT	va	RP	rc	VA	n
S	WS	va	VT		VA	vg	VT	va	RJ	rp	VA	n
T	WS	va	VT		VA	vg	VT	va	RJ	rp	VA	n

[illegible]

A	1		2		3		4		5		6	
ORIGIN DESTINATION	VLVT		VMMC		VNKT		VOMM		VQPR		VRMM	
AG	VT	vv	VH	zg	VA	zb	WM	va	VA		VC	
AN	VT	vv	VH	zg	VA	zb	WM	va	VA		VC	
AY	VT	vv	VH	zg	VA	zb	WM	va	VA		VC	
B	VT	vv	VH	zg	ZB	va	WM	va	VA		VC	
C	VT	vv	VH	zg	ZB	va	WM	va	VA		VC	
D	VT	vv	VH	zg	ZB	va	VA	wm	VA		VC	
E	VT	vv	VH	zg	VA	zb	VA	wm	VA		VC	
F	VT	vv	VH	zg	ZB	va	VA	wm	VA		VC	
G	VT	vv	VH	zg	ZB	va	VA	wm	VA		VC	
H	VT	vv	VH	zg	ZB	va	VA	wm	VA		VC	
K	VT	vv	VH	zg	ZB	va	WM	va	VA		VC	
L	VT	vv	VH	zg	VA	zb	VA	wm	VA		VC	
M	VT	vv	VH	zg	ZB	va	WM	va	VA		VC	
NC	VT	vv	VH	zg	VA	zb	WM	va	VA		VC	
NF (EX. NFT)	VT	vv	VH	zg	VA	zb	WM	va	VA		VC	
NFT	VT	vv	VH	zg	VA	zb	WM	va	VA		VC	
NG (EX. NGF)	VT	vv	VH	zg	VA	zb	WM	va	VA		VC	
NGF	VT	vv	VH	zg	VA	zb	WM	va	VA		VC	
NI	VT	vv	VH	zg	VA	zb	WM	va	VA		VC	
NL	VT	vv	VH	zg	VA	zb	WM	va	VA		VC	
NS (EX. NST)	VT	vv	VH	zg	VA	zb	WM	va	VA		VC	
NST	VT	vv	VH	zg	VA	zb	WM	va	VA		VC	
NT	VT	vv	VH	zg	VA	zb	WM	va	VA		VC	
NV	VT	vv	VH	zg	VA	zb	WM	va	VA		VC	
NW	VT	vv	VH	zg	VA	zb	WM	va	VA		VC	
NZ	VT	vv	VH	zg	VA	zb	WM	va	VA		VC	
OA	VT	vv	VH	zg	VA	zb	VA	n	VA		VC	
OB	VT	vv	VH	zg	VA	zb	VA	wm	VA		VC	
OE	VT	vv	VH	zg	VA	zb	VA	wm	VA		VC	
OI	VT	vv	VH	zg	VA	zb	VA	wm	VA		VC	
OJ	VT	vv	VH	zg	VA	zb	VA	wm	VA		VC	
OK	VT	vv	VH	zg	VA	zb	VA	wm	VA		VC	
OL	VT	vv	VH	zg	VA	zb	VA	wm	VA		VC	
OM	VT	vv	VH	zg	VA	zb	VA	wm	VA		VC	
OO	VT	vv	VH	zg	VA	zb	VA	wm	VA		VC	
OP	VT	vv	VH	zg	ZB	va	VA	wm	VA		VC	
OR	VT	vv	VH	zg	VA	zb	VA	wm	VA		VC	
OS	VT	vv	VH	zg	VA	zb	VA	wm	VA		VC	
OT	VT	vv	VH	zg	VA	zb	VA	wm	VA		VC	
OY	VT	vv	VH	zg	VA	zb	VA	wm	VA		VC	
P	VT	vv	VH	zg	ZB	va	WM	va	VA		VC	
RC	VT	vv	VH	zg	ZB	va	WM	va	VA		VC	
RJ,RO	VT	vv	VH	zg	ZB	va	WM	va	VA		VC	
RK	VT	vv	VH	zg	ZB	va	WM	va	VA		VC	
RP	VT	vv	VH	zg	ZB	va	WM	va	VA		VC	
S	VT	vv	VH	zg	ZB	va	WM	va	VA		VC	
T	VT	vv	VH	zg	ZB	va	WM	va	VA		VC	

[illegible]

A	1		2		3		4		5		6	
ORIGIN DESTINATION	VTBB		VVTs		VVVV		VYYY		WBKK		WBSB	
AG	WS	wm	VT	vh	VVT		VT		WM		WS	wm
AN	WS	wm	VT	vh	VVT		VT		WM		WS	wm
AY	WS	wm	VT	vh	VVT		VT		WM		WS	wm
B	VH	ws	VH	vt	VVT		VT		WM		WS	wm
C	VH	ws	VH	vt	VVT		VT		WM		WS	wm
D	WS	va	VT	vh	VVT		VT		WM		WS	wm
E	LI	ws	VH	vt	VVT		VT		WM		WS	wm
F	WS	va	VT	vh	VVT		VT		WM		WS	wm
G	WS	va	VT	vh	VVT		VT		WM		WS	wm
H	WS	va	VT	vh	VVT		VT		WM		WS	wm
K	VH	ws	VH	vt	VVT		VT		WM		WS	wm
L	LI	ws	VH	vt	VVT		VT		WM		WS	wm
M	VH	ws	VH	vt	VVT		VT		WM		WS	wm
NC	WS	wm	VT	vh	VVT		VT		WM		WS	wm
NF (EX. NFT)	WS	wm	VT	vh	VVT		VT		WM		WS	wm
NFT	WS	wm	VT	vh	VVT		VT		WM		WS	wm
NG (EX. NGF)	WS	wm	VT	vh	VVT		VT		WM		WS	wm
NGF	WS	wm	VT	vh	VVT		VT		WM		WS	wm
NI	WS	wm	VT	vh	VVT		VT		WM		WS	wm
NL	WS	wm	VT	vh	VVT		VT		WM		WS	wm
NS (EX. NST)	WS	wm	VT	vh	VVT		VT		WM		WS	wm
NST	WS	wm	VT	vh	VVT		VT		WM		WS	wm
NT	WS	wm	VT	vh	VVT		VT		WM		WS	wm
NV	WS	wm	VT	vh	VVT		VT		WM		WS	wm
NW	WS	wm	VT	vh	VVT		VT		WM		WS	wm
NZ	WS	wm	VT	vh	VVT		VT		WM		WS	wm
OA	VA	ws	VT	vh	VVT		VT		WM		WS	wm
OB	WS	va	VT	vh	VVT		VT		WM		WS	wm
OE	WS	wm	VT	vh	VVT		VT		WM		WS	wm
OI	WS	wm	VT	vh	VVT		VT		WM		WS	wm
OJ	WS	wm	VT	vh	VVT		VT		WM		WS	wm
OK	WS	wm	VT	vh	VVT		VT		WM		WS	wm
OL	WS	wm	VT	vh	VVT		VT		WM		WS	wm
OM	WS	wm	VT	vh	VVT		VT		WM		WS	wm
OO	WS	wm	VT	vh	VVT		VT		WM		WS	wm
OP	VA	ws	VT	vh	VVT		VT		WM		WS	wm
OR	WS	wm	VT	vh	VVT		VT		WM		WS	wm
OS	WS	wm	VT	vh	VVT		VT		WM		WS	wm
OT	WS	wm	VT	vh	VVT		VT		WM		WS	wm
OY	WS	wm	VT	vh	VVT		VT		WM		WS	wm
P	VH	ws	VH	vt	VVT		VT		WM		WS	wm
RC	VH	ws	VH	vt	VVT		VT		WM		WS	wm
RJ,RO	VH	ws	VH	vt	VVT		VT		WM		WS	wm
RK	VH	ws	VH	vt	VVT		VT		WM		WS	wm
RP	VH	ws	RP	vh	VVT		VT		WM		WS	wm
S	VH	ws	VH	vt	VVT		VT		WM		WS	wm
T	VH	ws	VH	vt	VVT		VT		WM		WS	wm

[illegible]

A	1		2		3		4		5		6	
ORIGIN DESTINATION	WIII		WMKK		WPDL		WSSS		YBBB		ZBBB	
AG	YB	ws	WS	vt	Y		YB	wi	AG	n	RJ	zg
AN	YB	ws	WS	vt	Y		YB	wi	AN	n	RJ	zg
AY	YB	ws	WS	vt	Y		YB	wi	AY	n	RJ	zg
B	YB	ws	WS	vt	Y		RJ	yb	KS	nf	RJ	zg
C	YB	ws	WS	vt	Y		RJ	yb	KS	nf	RJ	zg
D	YB	ws	WS	vt	Y		YB	vt	FA	ws	RJ	op
E	WS	yb	WS	vt	Y		EG	vt	WS	wi	RJ	zg
F	YB	ws	WS	vt	Y		YB	vt	FA	ws	RJ	op
G	YB	ws	WS	vt	Y		YB	vt	FA	ws	RJ	op
H	YB	ws	WS	vt	Y		YB	vt	FA	ws	RJ	op
K	YB	ws	WS	vt	Y		RJ	yb	KS	nf	RJ	zg
L	WS	yb	WS	vt	Y		EG	vt	WS	wi	RJ	zg
M	YB	ws	WS	vt	Y		RJ	yb	KS	nf	RJ	zg
NC	YB	ws	WS	vt	Y		YB	wi	NZ	ks	RJ	zg
NF (EX. NFT)	YB	ws	WS	vt	Y		YB	wi	NF	nz	RJ	zg
NFT	YB	ws	WS	vt	Y		YB	wi	NZ	ks	RJ	zg
NG (EX. NGF)	YB	ws	WS	vt	Y		YB	wi	NF	nz	RJ	zg
NGF	YB	ws	WS	vt	Y		YB	wi	NF	nz	RJ	zg
NI	YB	ws	WS	vt	Y		YB	wi	NZ	ks	RJ	zg
NL	YB	ws	WS	vt	Y		YB	wi	NF	nz	RJ	zg
NS (EX. NST)	YB	ws	WS	vt	Y		YB	wi	NZ	ks	RJ	zg
NST	YB	ws	WS	vt	Y		YB	wi	KS	nf	RJ	zg
NT	YB	ws	WS	vt	Y		YB	wi	NZ	ks	RJ	zg
NV	YB	ws	WS	vt	Y		YB	wi	NV	n	RJ	zg
NW	YB	ws	WS	vt	Y		YB	wi	NF	nz	RJ	zg
NZ	YB	ws	WS	vt	Y		YB	wi	NZ	ks	RJ	zg
OA	WS	yb	VO	vt	Y		VC	vt	WS	wi	OP	vn
OB	WS	yb	WS	vt	Y		OB	vt	WS	wi	OP	zg
OE	WS	yb	WS	vt	Y		OB	vt	WS	wi	OP	zg
OI	WS	yb	WS	vt	Y		OB	vt	WS	wi	OP	zg
OJ	WS	yb	WS	vt	Y		OB	vt	WS	wi	OP	zg
OK	WS	yb	WS	vt	Y		OB	vt	WS	wi	OP	zg
OL	WS	yb	WS	vt	Y		OB	vt	WS	wi	OP	zg
OM	WS	yb	WS	vt	Y		OB	vt	WS	wi	OP	zg
OO	WS	yb	WS	vt	Y		OB	vt	WS	wi	OP	zg
OP	WS	yb	VT	ws	Y		VT	oo	WS	wi	OP	zg
OR	WS	yb	WS	vt	Y		OB	vt	WS	wi	OP	zg
OS	WS	yb	WS	vt	Y		OB	vt	WS	wi	OP	zg
OT	WS	yb	WS	vt	Y		OB	vt	WS	wi	OP	zg
OY	WS	yb	WS	vt	Y		OB	vt	WS	wi	OP	zg
P	YB	ws	WS	vt	Y		RJ	yb	KS	nf	RJ	zg
RC	WS	yb	WS	vt	Y		RJ	vt	WS	wi	RJ	zg
RJ,RO	WS	yb	WS	vt	Y		RJ	vt	WS	wi	RJ	zg
RK	WS	yb	WS	vt	Y		RJ	vt	WS	wi	RK	rj
RP	WS	yb	WS	vt	Y		RP	vt	WS	wi	VH	zg
S	YB	ws	WS	vt	Y		RJ	yb	KS	nf	RJ	zg
T	WS	yb	WS	vt	Y		RJ	yb	KS	nf	RJ	zg

[illegible]

A	1		2		3		4		5		6	
ORIGIN DESTINATION	ZGGG		ZJHK		ZKKK		ZMUB					
AG	VH	zb	VH	zg	ZB	n	ZB					
AN	VH	zb	VH	zg	ZB	n	ZB					
AY	VH	zb	VH	zg	ZB	n	ZB					
B	ZB	vh	ZG	vh	ZB	n	ZB					
C	ZB	vh	ZG	vh	ZB	n	ZB					
D	ZB	vh	ZG	vh	ZB	n	ZB					
E	VH	zb	VH	zg	ZB	n	ZB					
F	ZB	vh	VH	zg	ZB	n	ZB					
G	ZB	vh	ZG	vh	ZB	n	ZB					
H	ZB	vh	ZG	vh	ZB	n	ZB					
K	ZB	vh	ZG	vh	RK	zb	ZB					
L	VH	zb	VH	zg	ZB	n	ZB					
M	ZB	vh	ZG	vh	ZB	n	ZB					
NC	VH	zb	VH	zg	ZB	n	ZB					
NF (EX. NFT)	VH	zb	VH	zg	ZB	n	ZB					
NFT	VH	zb	VH	zg	ZB	n	ZB					
NG (EX. NGF)	VH	zb	VH	zg	ZB	n	ZB					
NGF	VH	zb	VH	zg	ZB	n	ZB					
NI	VH	zb	VH	zg	ZB	n	ZB					
NL	VH	zb	VH	zg	ZB	n	ZB					
NS (EX. NST)	VH	zb	VH	zg	ZB	n	ZB					
NST	VH	zb	VH	zg	ZB	n	ZB					
NT	VH	zb	VH	zg	ZB	n	ZB					
NV	VH	zb	VH	zg	ZB	n	ZB					
NW	VH	zb	VH	zg	ZB	n	ZB					
NZ	VH	zb	VH	zg	ZB	n	ZB					
OA	ZB	vh	ZG	vh	ZB	n	ZB					
OB	ZB	vh	ZG	vh	ZB	n	ZB					
OE	ZB	vh	ZG	vh	ZB	n	ZB					
OI	ZB	vh	ZG	vh	ZB	n	ZB					
OJ	ZB	vh	ZG	vh	ZB	n	ZB					
OK	ZB	vh	ZG	vh	ZB	n	ZB					
OL	ZB	vh	ZG	vh	ZB	n	ZB					
OM	ZB	vh	ZG	vh	ZB	n	ZB					
OO	ZB	vh	ZG	vh	ZB	n	ZB					
OP	ZB	vh	ZG	vh	ZB	n	ZB					
OR	ZB	vh	ZG	vh	ZB	n	ZB					
OS	ZB	vh	ZG	vh	ZB	n	ZB					
OT	ZB	vh	ZG	vh	ZB	n	ZB					
OY	ZB	vh	ZG	vh	ZB	n	ZB					
P	ZB	vh	ZG	vh	ZB	n	ZB					
RC	ZB	vh	VH	zg	ZB	n	ZB					
RJ,RO	ZB	vh	ZG	vh	RK	zb	ZB					
RK	ZB	vh	ZG	vh	RK	zb	ZB					
RP	VH	zb	VH	zg	ZB	n	ZB					
S	ZB	vh	ZG	vh	ZB	n	ZB					
T	ZB	n	ZG	vh	ZB	n	ZB					

[illegible]

25.

A	1		2		3		4		5		6	
ORIGIN DESTINATION	ZGGG		ZJHK		ZKKK		ZMUB					

AFTN/ATSMHS CONNECTIONS - ASIA/PAC ROUTING DIRECTORY

Terminal 1 (^ - BBIS)	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	N
	Fukuoka	AMHS	Y
	Guangzhou	AFTN	N
	Hong Kong	AMHS	Y
	Karachi	AFTN	N
	Khavarosk	AFTN	N
	Kathmandu	AFTN	N
	Mumbai	AMHS	N
	Pyongyang	AFTN	N
	Seoul	AMHS	N
	Ulaan Baatar	AFTN	N
	Yangon	AFTN	N
Brisbane^	Christchurch	AMHS	Y
	Timor Leste	AFTN/UA	N
	Jakarta	AFTN	N
	Johannesburg	AMHS	N
	Honiara	AFTN/UA	N
	Nadi	AMHS	Y
	Nauru	AFTN/UA	N
	Port Moresby	AFTN	Y
	Port Vila	AFTN/UA	N
	Singapore	AMHS	Y
	USA	AMHS	Y
Brunei	Kuala Lumpur	AFTN	N
	Singapore	AFTN	N
Chennai	Mumbai	AFTN	N
	Kolkata	AFTN	N
	Kuala Lumpur	AFTN	N

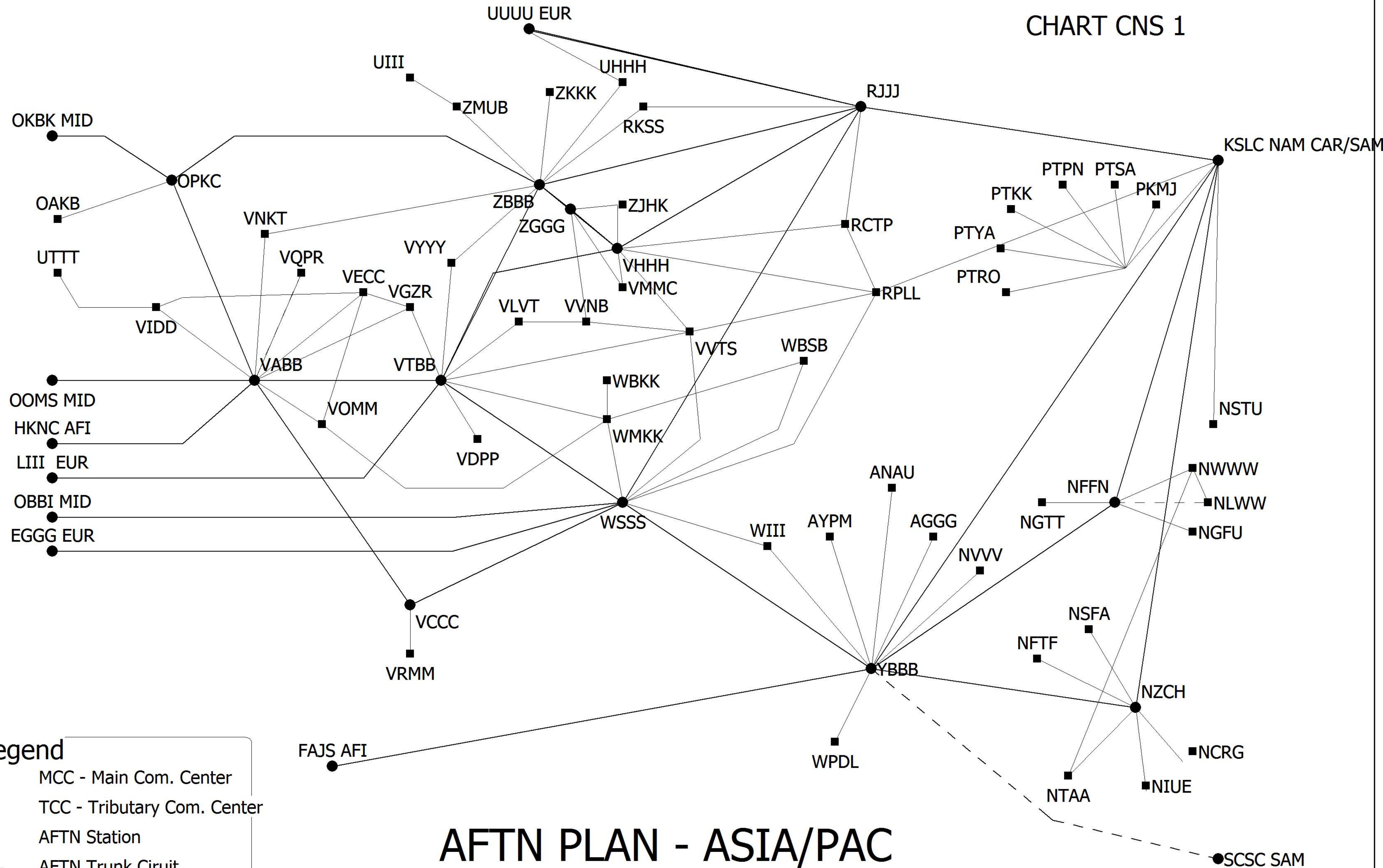
Terminal 1 (^ - BBIS)	Terminal II	ATSMHS or AFTN	Over CRV (Y/N)
Christchurch	Apia/Faleolo	AMHS/UA	N
	Niue	AMHS/UA	N
	Rarotonga	AMHS/UA	N
	Brisbane	AMHS	Y
	Papeete/Tahiti	AFTN	N
	Tonga/Fua'Amotu	AMHS/UA	N
	USA	AMHS	Y
Chuuk	USA	AMHS/UA	N
Colombo	Mumbai	AMHS	N
	Male	AFTN	N
	Singapore	AFTN	N
Delhi	Mumbai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

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

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

Terminal 1 (^ - BBIS)	Terminal II	ATSMHS or AFTN	Over CRV (Y/N)
	Majuro	AMHS UA	N
	Manila	AMHS	Y
	Nadi	AMHS	Y
	Pago Pago	AMHS UA	N
	Pohnpei	AMHS UA	N
	Yap	AMHS UA	N
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
Taipei	Hong Kong	AMHS	Y
	Manila	AMHS	Y
	Fukuoka	AMHS	Y
Tarawa	Nadi	AMHS/UA	N
Timor Leste	Brisbane	AMHS	N
Tonga/Fua'Amotu	Christchurch	AMHS/UA	N
Ulaan Baatar	Beijing	AFTN	N
	Irkutsk	AFTN	N
Vientiane	Bangkok	AMHS	N
	Hanoi	AFTN	N
Wallis Is.	Nadi	(planning)	-
Yangon	Bangkok	AMHS	N
	Beijing	AFTN	N
Yap	USA	AMHS/UA	N

CHART CNS 1



7 April 2022

Legend

- MCC - Main Com. Center
- TCC - Tributary Com. Center
- AFTN Station
- AFTN Trunk Circuit
- AFTN Circuit
- Non_implemented Circuit

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

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

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

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7.	CHINA	ATN Router and AMHS including NCC deployed in 2008 which is being upgraded to support ATN/IPS with target date of completion in December 2013. Hong Kong China The Beijing-Hong Kong AMHS link was put into operation in 2018; CRV/AMHS circuit was put into operation in April 2021 Thailand With Thailand was put into operation in Q12020 Plan implement IOT and POT in 2022 Macau China AMHS/ATN technical tests with Macau completed in 2009. Plan for ATN/AMHS implementation with Macao China is TBD. Korea ATN/AMHS circuit with ROK has been put into operation since June 2011. Completed CRV/AMHS IOT in 2021 Plan implement POT in Q2 2022 India ATN/AMHS tests with India has been put into operation since 2016. Mongolia ATN and AMHS IOT with Mongolia is completed in May 2018. Plan for commissioning after POT completion in 2021 Nepal Connection tests with Nepal is TBD.	IN-HOUSE (Aero-Info Technologies Co., Ltd)	IN-HOUSE (Aero-Info Technologies Co., Ltd)
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SN	State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AMHS Vendors Selected	Remarks
		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 Russia AMHS IOT with Russia in 2021.		

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

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

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SN	State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AMHS Vendors Selected	Remarks
12.	FIJI ISLANDS	ATN BBIS IPS router and AMHS implemented over CRV for connection to USA in April, 2019 with Australia planned for June, 2019. . For connections with sub-regional centers: For New Caledonia using AMHS since 2017; For connection with Kiribati using UA/AMHS implemented in 2015. 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.	COMSOFT	B2B connection between Nadi AMHS and Brisbane AMHS planned for Q3, 2022 as backup for CRV.
13.	FRANCE (<i>French Polynesia Tahiti</i>)	Planned for implementation of AMHS in 2022 (T2). Using IP with New Zealand since 2017.	COMSOFT	

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SN	State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AMHS Vendors Selected	Remarks
14.	INDIA	Dual stack ATN/IP router and AMHS implemented at Mumbai in 2011. Operational AMHS connections with Bangkok, Dhaka, Singapore, Kathmandu, Karachi implemented. With Beijing implemented in 2016; With Colombo implemented in May2017; With Bhutan implemented in July 2017; (IOT/POT) between Mumbai – Muscat is scheduled with mutual agreement between India & Oman between 0600-0900 UTC from 21.06.2021. 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. 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.	COMSOFT	INDIA

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SN	State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AMHS Vendors Selected	Remarks
15.	INDONESIA	ATN BIS Router and AMHS with Singapore implemented since February 2018; AMHS Trial (IOT) with Brisbane pending for CRV implementation.	IDS	For CRV, target of contract in 2Q2022 and implementation in 4Q2022.

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SN	State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AMHS Vendors Selected	Remarks
16.	JAPAN	ATN BBIS router and AMHS installed at USA in 2000. Connection tests with USA in 2000 - 2004 and put into operational use in 2005. 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. Hong-Kong AMHS/FTBP over CRV was put into operation in September 2020. Singapore AMHS/FTBP over CRV was put into operation in December 2020. Beijing/China AMHS/FTBP over CRV was put into operation in March 2021. Taipei/China AMHS/FTBP over CRV was put into operation in March 2022. Incheon/Korea Plan for AMHS/FTBP over CRV IOT in 4Q 2022	NEC	Japan and USA conducting testing AIDC over AMHS and cutover date is 5 May 2017.
17.	KIRIBATI	Connection with Nadi using UA/AMHS implemented in 2015.		

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SN	State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AMHS Vendors Selected	Remarks
18.	LAO PDR	- 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	
19.	MALAYSIA	ATN BIS Router completed 2007. AMHS for Malaysia – Singapore implemented in March 2020. AMHS for Malaysia – Thailand implemented in Dec 2019.	FREQUENTIS	
20.	MALDIVES	In the process of replacing the existing operational AFTN system by AMHS. It is expected to complete the installation before the end of 2019. 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. Also will look for the possibility of implementing the CRV network to use with AMHS and AIDC during the same phase.		
21.	MARSHALL ISLANDS			

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SN	State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AMHS Vendors Selected	Remarks
22.	MICRONESIA (EDERATED STATES OF)			
	Chuuk			
	Kosrae			
	Pohnpei			
	Yap			
23.	MONGOLIA	AMHS/AFTN gateway implemented 2012. ATNBIS router implemented in 2014. ATN and AMHS IOT with China was completed in May 2018. ATN and AMHS POT with China was completed in May 2019. Upgraded the AMHS system and purchased UA terminals in 2020, but it is not yet fully operational due to the Covid-19 pandemic situation. The AMHS system is planned to be fully operational in the fourth quarter of 2022.	COMSOFT	

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SN	State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AMHS Vendors Selected	Remarks
24.	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	AMHS including AFTN/AMHS gateway implemented in Nov 2011. Connection with Thailand implemented in 4Q2016. Planned for AMHS connection with Beijing. Target date TBC.
25.	NAURU			
26.	NEPAL	AFTN/AMHS Gateway implemented in 2012. AMHS implemented with India since June 2014. AFTN connection with China. Plan to test AMHS connection soon.	COMSOFT	
27.	NEW CALEDONIA	New router and AMHS commissioned December 2016	COMSOFT	

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SN	State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AMHS Vendors Selected	Remarks
28.	NEW ZEALAND	An AMHS connection with the USA over CRV was implemented in April 2019. The AFTN connection to Australia was moved to CRV in June 2019. The AFTN connection to Australia over CRV was replaced with an AMHS connection over CRV in September 2020 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).	Frequentis Comsoft	
29.	PAKISTAN	ATN/AMHS connections with Mumbai and Kuwait since 2015 and 2018 respectively. AMHS connection with Beijing, Kabul, Tehran and Muscat will be provided after up gradation of existing AMHS at Karachi which is already in progress.	Existing COMSOFT After up gradation ISD	
30.	PAPUA NEW GUINEA	Currently AFTN over IP. AMHS implementation is planned for after successful implementation of CRV this year. AMHS implementation planned for 2020.	COMSOFT is the supplier of PNG AFTN/AMHS system	

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SN	State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AMHS Vendors Selected	Remarks
31.	PHILIPPINES	ATN/AMHS Boundary Intermediate System was installed at the new Manila CNS/ATM Center; • Site Acceptance, Oct. 2015 • Commissioned & operational, March 2018 AMHS implementation over CRV with the following adjacent FIR's; • HONG KONG - May 2019 • TAIPEI - Sept. 2019 • SINGAPORE - Dec. 2020 • OAKLAND - April 2021	Frequentis - Comsoft	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; -HONG KONG -TAIPEI -SINGAPORE -OAKLAND
32.	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	

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SN	State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AMHS Vendors Selected	Remarks
33.	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	
34.	SRI LANKA	ATN BIS Router Planned for 2013. IP based AMHS implemented by Oct. 2017. - Mumbai tested May 2017 operational planned for Q4 2017; - Singapore testing in Q4 2017 operational for 2018; - Male testing and operational date TBD.	IDS	

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SN	State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AMHS Vendors Selected	Remarks
35.	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	
36.	TONGA	AMHS planned for 2008. The provider is linked to the New Zealand AFTN		CPDLC and ADS-C is not considered for lower airspace
37.	UNITED STATES	- Australia - Fiji - New Zealand - Japan - Philippines - Indonesia (2023)	IN-HOUSE	
38.	VANUATU			

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

AMHS FOCAL CONTACT POINT
(Key: **MAIN** – Main Contact; **ALT** – Alternative Contact)

Note: Info in yellow extracted from https://applications.icao.int/atn_chart/atn_chart.asp

CAT	STATE/ NAME OF CONTACT	TITLE/ORGANIZATION	TEL/ FAX / E-MAIL
	AFGHANISTAN		
MAIN			Tel: Fax: E-mail:
ALT			Tel: Fax: E-mail:
	AUSTRALIA		
MAIN	Mr. Pierre Kemmers	AIS Business Manager Airservices Australia	Tel: +61 2 6268 4426 Fax:- Email: pierre.kemmers@airservicesaustralia.com
ALT			Tel: Fax: E-mail:
	BANGLADESH		
MAIN	Mr. Saleh Ahmed Khan	Director (Communication)	Tel: 8911011 Fax: E-mail: dcom@bracnet.net
ALT			Tel: Fax: E-mail:
	BHUTAN		

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CAT	STATE/ NAME OF CONTACT	TITLE/ORGANIZATION	TEL/ FAX / E-MAIL
MAIN	Ms. Devi M Adhikari	Sr. Communication Officer	Tel:975-08-272511 Fax: - E-mail:dmadhikari@doat.gov.bt
ALT	Mr. Sonam Dorji	Communication Officer	Tel: 975-08-272511 Fax: - E-mail:sonamdorji@doat.gov.bt
	BRUNEI DARUSSALAM		
MAIN	Mr. Hedus Abdullah	Aeronautical Telecommunications Engineer	Tel: 673 233-0518 Fax: 673 233-3666 E-mail: hedus_abdullah@civil-aviation.gov.bn
ALT			Tel: Fax: E-mail:
	CAMBODIA		
MAIN			Tel: Fax: E-mail:
ALT			Tel: Fax: E-mail:
	CHINA		
MAIN	Mr Wang Tian Yu	Engineer, CNS Division of ATMB , CAAC	Tel: 86-10-87786968 Fax: 86-10-87786910 E-mail: wangtianyu@atmb.net.cn
ALT			Tel: Fax: E-mail:
	HONG KONG, CHINA		

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CAT	STATE/ NAME OF CONTACT	TITLE/ORGANIZATION	TEL/ FAX / E-MAIL
MAIN	Ms. Silvia Mak	Senior Aeronautical Communications Supervisor	Tel: 852 2910-6201 Fax: 852 2910-1160 E-mail: wymak@cad.gov.hk
ALT			Tel: Fax: E-mail:
	MACAO, CHINA		
MAIN	Mr. Lo Veng Tong, Freeman	Safety Officer Telecommunications and Radio	Tel: 85328511213 Fax: 85328338089 E-mail: freemanlo@aacm.gov.mo
ALT			Tel: Fax: E-mail:
	FIJI		
MAIN	Mr. Kelepi Dainaki	Team Leader CNS/ATM Support	Tel: 679 673-1623 Fax: 679 673-1123 E-mail: KelepiD@fijiairports.com.fj
ALT	Mr. Shivam Naicker	Senior ATO – ATM System	Tel: 679 673-1630 Fax: 679 673-1123 E-mail: ShivamN@fijiairports.com.fj
	FRENCH POLYNESIA		
MAIN	Mr. Dider YVETOT	ATM Team leader	Tel: (+689) 40.86.10.32 Fax: E-mail: didier.yvetot@aviation-civile.gouv.fr
ALT	Eric BERNARD	Installation leader	Tel: (+689) 40.86.10.34 Fax: E-mail: eric.bernard@aviation-civile.gouv.fr
	INDIA		

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CAT	STATE/ NAME OF CONTACT	TITLE/ORGANIZATION	TEL/ FAX / E-MAIL
MAIN	Mr. Ajay Kumar Kapur	General Manager (CNS-COM)/Airports Authority of India, Rajiv Gandhi Bhawan, New Delhi-110003	Tel:+91 (11) 2461 0537 Fax:+91 (11) 2463 2930 E-mail: akkapur@aai.aero
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	INDONESIA		
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AMHS Readiness Report for Supporting IWXXM Traffic

N o.	States/Admin istration	Name of State (Administrati on)/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	Completed. AMHS exchange in place with USA, Fiji, New Zealand, Singapore and South Africa. 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. All domestic users and data originators still on AFTN, no desire by external partners to migrate to AMHS, awaiting SWIM instead.	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

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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	AMHS is in operation since 2011. India is in the process of tendering for replacement of existing AMHS system . The Tender action stands delayed due to COVID pandemic.	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	ATN BBIS router and AMHS installed at 2000. Connection tests with USA 2000 - 2004 and put into operational use in 2005 and over CRV in February 2019. Put into AMHS operation with Hong- Kong and Singapore in 2021. AMHS implementation with China in 2021 , AMHS implementation with Taipei in 2022 , Korea in 2022.	Already support exchange of IWXXM messages based on FTBP in August 2015. It is possible to send , receive and transfer up to 2GB for the contents such as FTBP,IPM and IHE in AMHS, and the size of IWXXM supported system by Japan Meteorological Agency is 2MB	AFS links over CRV is a Package A, Bandwidth 2M.
7	Macao China	Macao China	Q4/2009	Q2/2023	To be determined
8	Philippines	Philippines/A TMC Manila	Completed March 2018	Can support IHE and FTBP maximum 1MB (tested with Taipei on 13-May-20)	1MB Philippines has contracted 2Mbps bandwidth using CRV package “A” voice and data services.
9	Republic of Korea	Gimpo international airport	ATN/AMHS with China put into operational use in June, 2011. AMHS implementation with China and Japan over CRV will be in 4Q, 2022.	AMHS implementation for supporting FTBP and IHE will be in 4Q, 2022.	AFS links over CRV is a Package A, Bandwidth 2M.
10	Singapore	Singapore	March 2011	Yes, since 2020.	2MB for CRV and minimally 64kbps for IPLCs

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11	Thailand	Thailand	BBIS/BIS Routers already implemented. AMHS has been implemented since July 2011. Connection with Bangladesh, Bhutan, Cambodia, China, India, Lao PDR, Myanmar, Singapore, Hong Kong China, Malaysia and Rome implemented. Connection with SITA (SITA AMHS Gateway inter-connections) implemented. Bangkok - Vietnam Circuit Commissioning: Planned for end of 3Q 2022	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

Reference	Title of Work	Task	Planned Start	Planned completion	Status	Action Parties	Comment
2-1	COM Strategies	Revise Strategy for implementation of Communications Systems to support ATM operations in APAC	2016	2020	Close	G/G Australia/New Zealand, USA and Japan, New Zealand, and USA	Closed in ACSICG/6
2-2	AMHS Implementation	Implement AMHS transition including migration of concerned connections to SITA Type X mid 15 and updating APAC AMHS Naming Plan	2015	2020	Close	Australia, Singapore and Thailand	Closed in ACSICG/7
2-3	AMHS Implementation Registration	Continue coordination with members and other regions to maintain the AMC	On-Going	On-Going	On-going	Thailand	
2-4	Support AIDC implementation	Support Implementation of AIDC including PAN Regional AIDC ICD	2015	2021	On-going		
2-5	SWIM implementation APAC framework (SIAF) Project	Develop Cost Benefit Analysis to support SWIM using existing underlying ATN and IP sub-network	2016	2017	Close		Dependencies: SWIM ConOPs and Technical Manual In ACSICG/4, it was modified to Action Item 4-1
		Develop SWIM implementation roadmap and B1-SWIM ANRF			Close		
		Develop SWIM CONOPS refinement for APAC (FIXM, WXXM, AIXM, NOTAM) - models/infrastructure			Close		
		Develop SWIM guidance and requirements (performance, functional, safety, security)			Close		
		Develop SWIM governance architecture			Close		
		Develop SWIM governance entity/procedures	2015	2017	Close		
		Develop SWIM access points/services architecture and definition (iterative)			Close		
		Support testing of SWIM based applications (FIXM, IWXXM)			Close		
		Coordinate SWIM implementation and transition from existing environment to SWIM			Close		
2-6	CRV Project (under the TOR of CRV Task Force)	MSA/DOA	2014	2015	Close		closed in CRV OG/5
		Cost Benefit Analysis	2014	2015	Close		closed in CRV OG/5
		Users requirements (including performance and safety requirements)	2014	2015	Close		closed in CRV OG/5
		RFI	2014	2016	Close		closed in CRV OG/5
		Sealed Tender		2016	Close		closed in CRV OG/5
		Develop/agree on CRV Design (including an IPv6 address plan)		2017	Close		
		Implementation plan		2018	Close		
		Set up CRV OG		2016	Close		
2-7	CRV-OG	Oversight CRV operations and migration of applications	2016	2021	On-going		

Reference	Title of Work	Task	Planned Start	Planned completion	Status	Action Parties	Comment
2-8	Support ATFM Implementation using FIXM over CRV	Support development of ATFM IP ICD including coordination on the use of CRV to support ATFM FIXM (IP ICD developed by ACSICG has been provided to ATFM Group which is considered completed)	2015	2017	Close		Task description modified in ACSICG/5. It is revised text Close in CRV OG/5
2-9		Coordinate the IP network service for ATFM	2016	2019	Close		Added into revised text of 2-8 in ACSICG/5
2-10	Support transition of ATC voice service	Coordinate the use of VoIP technology to support the existing service based on Multiplexer	2015	2019	Close		Closed in CRV OG/5
4-1	Monitoring the SWIM implementation and work of APAC SWIM Task Force	Develop Cost Benefit Analysis to support SWIM using existing underlying ATN and IP sub-network	2016	2020	Close		
		Coordinate SWIM implementation and transition from existing environment to SWIM and confirm role of CRV (SWIM over CRV - role has been confirmed in 2019)	2017	2020	Close		Closed in ACSICG/8
4-2	AMHS Support IWXXM requirement 2020	Implement AMHS FTBP to meet the requirement of IWXXM including the basic AMHS plus FTBP sub-set of extended AMHS as defined in Doc9880. (Requirements for implementation is 5 November 2020) and monitor the possible compression solution following the ICAO guidelines for IWXXM implementation	2017	2020	On-going	All States/Administrations	
5-1	AFTN/ATSMHS Routing Directory and coordination with AMC	Update to the Directory and prepare a draft new Edition of the Directory	2018		Close	All States/Administrations	Completed
6-1	AMHS direct routing requirement	Develop AMHS routing policy to gain the benefits of implementation of AMHS over CRV.	2019	NA	On-going		
CNS SG/23 Task 2019	Update AMS and Datalink Strategies	Review and update AMS and Datalink Strategies (task given by CNS SG/23 Meeting)	2019	2020	Close		
7-1	Monitoring the SWIM implementation and work of APAC SWIM Task Force	Demonstrate capability of CRV to support SWIM and evaluate the impacts on network bandwidth to incorporate AMHS service.	2016	2021	On-going	Hong Kong China, Singapore and Thailand, IATA as reporter to SWIM TF	On-going

Reference	Title of Work	Task	Planned Start	Planned completion	Status	Action Parties	Comment
7-2	CRV Operations Manual	A small ad hoc working group with CRV OG members from USA, Singapore and New Zealand to further improve the draft and get it ready for consideration by CNSG SG through a joint working paper. Thailand also agreed to provide some support to review the revised draft.	2020	2020	Close	CRV OG co-chair, New Zealand, USA, Singapore, Thailand	SL Ref.:T 8/9.1 – AP262/20 (CNS), 22 December 2020 , Subject: The availability of various regional guidance materials for implementation of Air Navigation Facilities and Services in the Asia and Pacific Regions, Conclusion CNS SG/24/4 - Publishing of CRV operational manual to provide the information and directions required for CRV OG performance and CRV operations
7-3		States with designated BBIS: Australia, China, Hong Kong, China, Fiji, India, Japan, Singapore, Thailand and USA should increase their respective connection bandwidth to greater than 64kbps if feasible and applicable. Any ANSPs that are not on the above list should upgrade their AMHS with FTBP functionality to support IWXXM traffic. ~~ICAO Regional Office will issue a reminder to States/Administrations that have no AMHS with FTBP capability to implement or upgrade their AMHS with FTBP function as soon as possible.~~ States/Administrations should also be requested to deploy AMHS connection with a minimum of 64Kbps bandwidth.	2020		On-going	ICAO Secretariat	State Letter: Ref.: T 8/3.5 & T 8/2.11– AP160/20 (CNS), 6 August 2020 , Subject: Reminder for implementation of ATS Message Handling System (AMHS) in APAC Region by 2020. Traffic load data will support further action (ACSICG/9)
8-1	Suggested Implications to Cybersecurity and Associated Requirements for CRV Operations	i) The Meeting requested the ICAO Secretariat to inform and follow-up about the different requirements defined in Section 3 in Flimsy01 of ACSICG/8 with different CNS Contributory bodies for their simultaneous and timely implementation. ii) CRV OG Chairs to note various requirements defined in Section 3 and initiate action to prepare strategies for contracting other services on CRV for future potential needs.	2021		Close	i) ICAO Secretariat ii) CRV OG Chairs	Replaced by new action items 9-6 by WP/08 of ACSICG/9

Reference	Title of Work	Task	Planned Start	Planned completion	Status	Action Parties	Comment
8-2	Interconnection of Regional Networks	ICAO Secretariat to take necessary action to discuss the interconnection of various regional networks at higher level.	2021		Close	ICAO Secretariat	Ad-hoc group created in ACSICG/9 under CRV OG. Referred back to CRV OG Keep Agenda Item in the meeting to note updates
8-3	Upgrade/Downgrade CRV Circuits Subscribed	ICAO Secretariat to take necessary action to discuss this issue with CRV OG as States should have option to upgrade/downgrade the circuits based on the need.	2021	ACSICG/10	Open	ICAO Secretariat, ACSICG chairs, CRV OG Chairs,	Meeting was held on 28 September 2021 . PCCWG will draft relevant clauses to add in Terms and conditions document of CRV contract for consideration of CRV OG/9. 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~~
8-4	AMHS Routing Update due to CRV Post Implementation Issues in Bhutan	All six member States (Bhutan, India, Thailand, Singapore, Australia, and New Zealand) to create an Ad-hoc group with support of the ICAO Secretariat to further discuss about implementation of Option 2.	2021	ACSICG/10	Open	Bhutan, India, Thailand, Singapore, Australia, and New Zealand, ICAO Secretariat	Meeting was held on 27 May, 19 August, 03 September 2021 . New Zealand will act as BBIS No AMC updates required As on 15 Sep 2021, Next meeting after Bhutan and New Zealand discussion.
9-1	Update ICAO APAC ATN/AMHS Guidance Document Tree	Ad-Hoc Group will update ICAO APAC ATN/AMHS Guidance Document Tree	2022	ACSICG/10	Open	ICAO Secretariat, China, Fiji, New Zealand (Tentative), Singapore, USA	
9-2	Traffic Loading of CRV connection	States implemented CRV should note the Bandwidth Utilization rate and may present this data in upcoming CRV OG meetings.	2022	CRV OG/11	Open	ICAO Secretariat, Member States	
9-3	A common template to report the monitoring of connection loading	ICAO Secretariat will consult with experts to propose a common template to report on the monitoring of connection loading	2022	ACSICG/10	Open	ICAO Secretariat	To support Action Item 7-3

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Reference	Title of Work	Task	Planned Start	Planned completion	Status	Action Parties	Comment
9-4	MPLS/IP Based Inter-Regional Connection	To discuss the potential options for business cases to move forward with the proposal in MPLS/IP Based Inter-Regional Connection between CRV and REDDIG II.	2022	ACSICG/10	Open	ICAO Secretariat under CRV OG, APAC Member States having interregional connections, CRV OG Chairs, CRV and REDDIG II service providers, and interested states of SAM region	Technical proposal is being modified. Action on hold till final technical interconnection proposal is ready.
9-5	Nomiantion of SAM Member States to ad-hoc group under action item 9-4	ICAO Secretariat will coordinate with ICAO SAM Office to get nomination from interested SAM Member states for joining the Ad-Hoc Group in Action Item 9-4	2022	Jul-22	Open	ICAO Secretariat	Technical proposal is being modified. Action on hold till final technical interconnection proposal is ready.
9-6	New Agenda Item to discuss Cybersecurity issues in Aeronautical Communications	Create a regular Agenda Item from ACSICG/10 and invite States and Organizations concerned to continue the discussion on improving in the cybersecurity ideas presented in various cybersecurity-related meetings and webinars.	2022	ACSICG/10	Open	ICAO Secretariat, CANSO, IATA	
9-7	Continuation of Action Item 8-4	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.	2022	ACSICG/10	Open	ICAO Secretariat, Ad-hoc expert group	The temporary interconnection is stopped as Thailand joined CRV. The item is proposed to be closed in ACSICG/10