International Civil Aviation Organization

Fourth Meeting of the Asia/Pacific Air Traffic Management Automation System Task Force (APAC ATMAS TF/4)

Bangkok, Thailand, 28 - 30 June 2023

Agenda Item 2: Review of outcomes of relevant meetings on Surveillance

OUTCOMES OF THE TENTH MEETING OF AERONAUTICAL COMMUNICATION SERVICES IMPLEMENTATION COORDINATION GROUP OF APANPIRG (ACSICG/10)

(Presented by Secretariat)

SUMMARY

This paper presents the outcomes of Tenth Meeting of the Aeronautical Communication Services (ACS) Implementation Coordination Group (ACSICG/10) for information and action.

1. INTRODUCTION

1.1 The Tenth Meeting of the Aeronautical Communication Services (ACS) Implementation Coordination Group (ACSICG/10) was held at ICAO APAC Regional Office, Bangkok, Thailand, from 24 to 26 May 2023. The meeting was held back-to-back with the First Meeting of CRV OG Ad-hoc Governance Group from 22 to 23 May 2023. The Meeting was attended by Sixty-two (62) participants from Nineteen (19) States/Administrations, Two (2) International Organizations, and One (1) industry partner. The meeting report, working papers, information papers and other resources can be accessed at

https://www.icao.int/APAC/Meetings/Pages/2023-CRV-OG-Ad-hoc-Governance-Group-and-the-ACSICG10.aspx

1.2 ACSICG/10 reviewed the report of the Eleventh meeting of Common aeRonautical VPN Operations Group (CRV OG/11) which was held from 1 to 3 February 2023 in ICAO Asia and Pacific Regional Office, Bangkok, Thailand. CRV OG/11 was attended by 65 participants from 19 Member States/Administration, 1 International Organizations, and 1 telecommunication. The CRV OG/11 meeting report, working papers, information papers, and other resources can be accessed at

https://www.icao.int/APAC/Meetings/Pages/2023-CRV-OG11-.aspx

1.3 This paper summarized relevant information and updates from the meeting.

2. DISCUSSION

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

Outcomes of MET/IE WG/21 (WP/17)

2.2. The paper presented relevant outcomes from the Twenty-first Meeting of the

Meteorological Information Exchange Working Group (MET/IE WG/21) to support global IWXXM exchange and invited the ACSICG meeting to consider proposals for the expedited implementation of AMHS (with File Transfer Body Part (FTBP) and Interpersonal Message Heading Extension (IHE)) intra- and inter-regionally, and a possible conjoint meeting session to be conducted by the MET/IE WG and ACSICG in 2024. Supporting discussion and a related proposal were presented through WP/10.

2.3. The ACSICG/10 meeting supported the proposal to conduct a conjoint meeting session of the MET/IE WG and ACSICG in 2024. Therefore, the meeting requested the Co-Chairs and Secretariat to consider convening a conjoint meeting session of the ACSICG in 2024 in conjunction with MET/IE WG.

2.4. The ACSICG/10 meeting was brought to the attention about IWXXM AMHS header requirement to be generated in IWXXM message. This is different than today's procedure which TAC is not required to include. This creates some issues for MET to generate proper IWXXM messages.

Review the report of the Eleventh meeting of Common aeRonautical VPN Operations Group (CRV OG/11) (WP/03)

Update to CRV Implementation Plan

2.5. The paper presented the proposed updates/editorial changes to the CRV Implementation Plan for review and adoption. The CRV OG/11 meeting agreed to publish the CRV OG Implementation Plan and adopted the **Decision CRV OG/11/02** - *Update to the CRV Implementation Plan*. The latest version of CRV OG Implementation Plan without restricted information has been published on ICAO APAC e-docs under CNS Section. The latest version of CRV OG Implementation Plan has been uploaded on the ICAO CRV Secure portal, and CRV portal hosted by Airways New Zealand. The relevant information has been shared with Member States/Administration through State Letter **Ref.:** 8/2.15 – AP034/23 (CNS) dated **22 February 2023** on the subject - *Publication of ICAO APAC CRV OG Operations Manual v1.2 and ICAO APAC CRV Implementation Plan v2.2*.

ATN Documentation Tree Update

2.6. The paper presented an update of **the Asia/Pacific regional ATN Documentation Tree**. The CRV OG/11 meeting deliberated the proposed APAC ATN Documentation Tree and various CRV documents suggested to be placed in the Tree. The CRV OG/11 Meeting agreed that the CRV OG Ad Hoc Expert Group will work on modifying relevant CRV documents and updating the CRV OG Operations Manual to ensure that any changes within CRV consider modifications required to the document tree. The ACSICG/10 Meeting further reviewed and updated the Tree, and endorsed the **Draft Conclusion ACSICG/10/01** – *Adoption of the Asia/Pacific Regional ATN Documentation Tree* for CNS SG/27 consideration.

Update the APAC CRV Implementation Table

2.7. The latest updates presented on the planning and implementation status of CRV were as follows:

- **Under Operation**

Australia, Bhutan, China, Fiji, Hong Kong China, India, Indonesia, Japan, Malaysia, New Zealand, Philippines, PNG, Republic of Korea, Singapore, Thailand, and USA.

- **Under Provisioning**

Nepal, Mongolia, Vietnam

- **Hot Prospects in 2023**
  Sri Lanka, Pakistan, and New Caledonia

2.8. The CRV OG/11 meeting reviewed and updated the APAC CRV Implementation Table, which is provided in Appendix C to the Report.

Various CRV users and their joining process

2.9. To follow up the Action Item 9-9 of the CRV OG/9 and Action Item 6-1 of SWIM TF/6, the paper presented the outcomes of relevant discussion of various CRV OG Expert Ad-hoc group Meetings along with the definition of CRV users prepared by CRV OG Expert Ad-hoc group in concurrence with MET SG experts and their joining process for Meeting approval.

2.10. The reviewed and finalized definition agreed upon by the Meeting was as follows:

CRV USER – State/Administration: An entity officially designated by the State to provide the air traffic or air navigation services the State is obligated to provide according to the ICAO provisions.
CRV USER – Industry: An entity not officially designated by the State but authorised by the State to provide aviation or related services commercially.

2.11. It was approved that State's ANSPs will assign IP addresses to any entities joined CRV, and all entities will sign their contract individually. Additionally, for the difference in the joining process, CRV Users- State/Administration will follow the same process as mentioned in CRV OG Operational Manual and CRV Landing Page, while industries will need sponsorship by States.

MPLS/IP Based Inter-Regional Connection

2.12. The paper provided the current status of discussion being done for potential interconnection of CRV and REDDIG II and CRV and New PENS and 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. It was noted that there is no concert technical proposal ready to work further for CRV and REDDIG II interconnection, while the interconnection proposal for CRV and New PENS is in progress.

AFTN/ATSMHS Routing Directory in APAC (WP/06)

2.13. The paper presented a brief history of the ICAO APAC AFTN Routing Directory which was based on the existing AFTN circuits in the Asia and Pacific regions. The ACSICG/10 meeting was reminded again that the region would follow the AFTN/ATSMHS routing directory during transition period, for inter-regional traffic, it is required to follow the existing entry/exit points and procedure. The ACSICG/10 meeting reviewed and updated the AFTN/ATSMHS CONNECTIONS_ASIA/PAC Routing Directory.

APAC AMHS Implementation Status from AMC (WP/18)

2.14. Thailand presented the AMHS implementation status information in Asia/Pacific Region updated in ATS Messaging Management Centre (AMC) (OPER 247) as of 3 May 2023 in Attachment A of the paper. AMC was implemented by EUROCONTROL to provide off-line network management services in support of the ground ATS Messaging network of Air Navigation Service Providers (ANSPs). It was informed that the AMC round 248 has been cancelled due to technical failure, and the next round for AMC data update will be AMC round 249 on 18 May. The ACSICG/10

meeting was invited to review and update information to AMC via AEROTHAI if necessary, including points of contact.

Proposal for Transition from AFTN to AMHS between Indonesia (Jakarta) and Australia (Brisbane) – Indonesia (WP/13)

2.15. The paper presented the proposal for transition from AFTN to AMHS between Indonesia (Jakarta) and Australia (Brisbane). The ACSICG/10 meeting noted in March 2023, there were discussions between Indonesia and Australia regarding to the transition process of the AMHS. It was acknowledged to propose the connection between AMHS to AMHS and the interoperability Test is planned for June 2023.

AMHS/ATN Implementation Status of Thailand (IP/02)

2.16. The paper presented information about AMHS/ATN implementation status of Thailand as well as the summary of link configuration after the successful implementation of CRV network in May 2022. AEROTHAI has migrated most AMHS links from conventional IPLC (private leased line) onto CRV, and started investigating other services to be used on CRV such as voice, SWIM-enabled applications, etc. The AFTN/AMHS monthly traffic load report of Bangkok COM Centre from 2019 to 2023, AIDC implementation status over AMHS, and the current status of data connections over CRV have also been listed in detail. Furthermore, Thailand shared the work plan to consider solutions for Business Continuity Plan (BCP) for CRV connections, use ATS Direct Speech Circuit over CRV with Malaysia, and experiment on using CRV to relay ATFM messages with relevant stakeholders.

AIDC Implementation Status (IP/04)

2.17. Malaysia presented the AIDC implementation status in Malaysia between Kuala Lumpur Area Control Centre (ACC), Kota Kinabalu ACC, and Kuching Sub-ACC, with adjacent ACCs, including India, Thailand, and Singapore. Following the successful implementation of AIDC as described in the matrix, Malaysia shared the plan to expand this initiative with other adjacent States on the AIDC implementation and exchange additional AIDC messages between the already established ACCs, which includes Vietnam, Indonesia, Philippines, and Singapore. Malaysia supplemented that with the successful implementation of TOC and AOC between Kuala Lumpur and Chennai, Malaysia is open to discuss the implementation of TOC and AOC with other States.

AMHS Implementation and Readiness Status for Supporting IWXXM Traffic in the APAC Region (WP/07)

2.18. The paper summarized the AMHS readiness status for supporting IWXXM Traffic of the States/Administrations in APAC Region, including States/Administrations that have no AMHS in operations, to facilitate the relevant Meteorological authorities/organisations with the dissemination of IWXXM messages accordingly. As of CNS SG/26, there were **13** States/Administrations provided their status on AMHS readiness and experience for supporting IWXXM Traffic with details, while out of the **23** States/Administrations in the APAC Region put their AMHS into operations per the AMHS Routing Directory Tables from the ATS Messaging Management Centre (AMC) as of April **2023**.

2.19. The ACSICG/10 meeting was invited to consider consolidating the information in Appendix A - AMHS Readiness Table for Supporting IWXXM Traffic, Appendix B - State with AMHS in Operations in APAC, Appendix C - State with no AMHS in Operations in APAC, and Appendix F - Implementation status of ATN AMHS in the APAC Region by ACSICG9 of the paper into a new table to monitor the implementation of AMHS completely and effectively for the region, including the readiness of AMHS to support IWXXM.

2.20. The meeting updated the AMHS Readiness Table for Supporting IWXXM Traffic and the Implementation status of ATN AMHS in the APAC Region, which are provided in **Appendix A** and **Appendix B** to this paper respectively.

2.21. Mr. Hoang Tran, the co-chair of ACSICG, made a statement on the necessity to implement AMHS for States. He recalled that the first implementation of AMHS in APAC was in 2005, the introduction of CRV was in 2013 while the first implementation was in 2019. It may take 5 to 10 years for States to implement the infrastructure after the formal adoption by the region. Due to the technical limitation, AFTN is only supported by X.25, AMHS is the only available solution over IP before SWIM can take over. Therefore, AMHS is needed by States to support IWXXM traffic as of today.

Repository of AIDC Implementation Status in APAC (WP/05)

2.22. The paper presented the latest repository of AIDC Implementation Status in APAC region, the preliminary analysis of the current status, and invites States/Administrations to review and continue to update the AIDC implementation status if necessary, which will be shared through WP/06 of ATMAS TF/4.

AIDC and AMHS Implementation Status in Republic of Korea (IP/05)

2.23. Republic of Korea presented its AIDC and AMHS implementation status. Republic of Korea introduced the detailed AIDC implementation status with China and Japan, and highlighted that ROK has been carrying out AIDC establishment project since June 2022 to interlink Incheon ACC with Shanghai ACC, with the project scheduled to be completed in June 2023, while the function test of the AIDC will be conducted in May. Furthermore, the establishment of AMHS between ROK and China, and between ROK and Japan have been completed and been officially operated since January 2023 through CRV, and the project for the exchange of next-generation weather information (IWXXM) between countries is being prepared.

Telecommunication Infrastructure Plan for APAC (WP/09)

2.24. USA presented the telecommunication infrastructure including Common aeRonautical VPN (CRV) and other telecommunication media used in the region, which was also presented to CRV OG Ad-Hoc Governance meeting. For better management and coordination, a draft version of Telecommunication Infrastructure table, which compiles all tables developed by CRV OG and includes a section for AMHS coordination with AMC, was proposed for review and recommendation.

2.25. It was recommended that the agreed table should be posted on the CRV OG website for members to update, and supersede the Table CNS II-2 — Required ATN Infrastructure Routing Plan in the ANP VOL II part III, and CRV OG will be the task owner to maintain the table in future. The table is now posted on CRV Portal hosted by Airways New Zealand for members to update, States are invited to visit this CRV Portal at https://airwayscorporation.sharepoint.com/:x:/r/teams/APAC-CRV/_layouts/15/Doc.aspx?sourcedoc=%7B1E37219E-2B6C-4B46-BDFB-B214231EAE97%7D&file=AsiaPac%20ATN%20Infrastructure%20Routing%20Plan%203-2023.xlsx&action=default&mobileredirect=true&DefaultItemOpen=1. To establish an account, members should email to APAC-CRV@AirwaysCorporation.onmicrosoft.com for approval.

2.26. The **Draft Conclusion ACSICG/10/04** - *Telecommunication Infrastructure Table* was adopted by ACSICG/10 for CNS SG/27 consideration, which is provided in **Appendix C** to this paper. The ACSICG/10 meeting agreed to stop the updating of Table CNS II-1 and II-2 in APAC e-ANP Volume II in APAC region.

ACSICG Support for Progressing Inter-Regional IWXXM Exchange (WP/10)

2.27. Australia described the status of inter-regional IWXXM exchange as observed by the Meteorological Information Exchange Working Group (MET/IE WG) and requested the support from ACSICG to further progress the global exchange of IWXXM. The ACSICG/10 meeting supported the global dissemination of meteorological information in IWXXM form, and formulated the **Draft Conclusion ACSICG/10/05** - *Global Dissemination of IWXXM.*

AFTN/AMHS Connection between APAC Region and Other Regions (WP/16)

2.28. The paper summarized the status of AFTN/AMHS connection between APAC region and other regions (Europe, Mideast, Africa, North America, and South America) with reference to the information contained in ASIA/PAC ROUTING DIRECTORY and the COM Charts by EUROCONTROL AMC. It was also noted there is no direct connection between South America and Asia/Pacific, the aeronautical messages are routed via USA. A extract of AFTN/ATSMHS Inter-Regional Connections from ASIA/PAC ROUTING DIRECTORY, and the COM Chart by EUROCONTROL AMC for AFI, EUR, MID, NAM and SAM as of 25 April 2023 were also shared for easy reference.

2.29. The ACSICG/10 meeting was informed the Mumbai-Muscat AMHS connection has been implemented, and ICAO APAC Office is requested to coordinate with MID Office to push forward the AMHS implementation between Beijing and Kuwait.

2.30. The ACSICG/10 meeting reminded that global SWIM implementation should be the real push for the inter-connection of regional IP networks in future. But for now, AMHS connections between regions are the feasible solution to support global dissemination of meteorological information in IWXXM form, which implies additional cost for concerned States if they need to enhance the inter-regional AMHS connections to support XML format messages.

Review Terms of Reference of ACSICG (WP/08)

2.31. The paper recalled the establishment of the Aeronautical Communication Services Implementation Coordination Group, and reviewed the Terms of Reference. The meeting was reminded that ACSICG, as the parent body of CRV OG on the reporting path to APANPIRG through CNS SG, was established with a target to complete implementation of Asia and Pacific (APAC) Aeronautical Telecommunication Network (ATN) and voice/data service to support the evolving ICAO operational requirements for the dynamic exchange and management of aeronautical information, with the rapid change of communications technology to support G-G and A-G solution/application, it is deemed necessary to revisit the ToR of ACSICG to align the tasks and deliverables with the emerging requirements.

2.32. Through a joint effort by Thailand and the Secretariat, a draft of ToR was proposed for ACSICG consideration. The ToR agreed by the ACSICG/10 meeting is provided in **Appendix D** to this paper, and the **Draft Decision ACSICG/10/06 -** *Revised ToR of Aeronautical Communication Services Implementation Coordination Group (ACSICG)* was proposed by ACSICG/10 for CNS SG/27 consideration.

Election of Co-Chair

2.33. Nominated by the USA and seconded by the Thailand and Philippines, Mr. Kelepi Dainaki, General Manager Assets & Infrastructure, Fiji Airport Limited, Co-Chair (Pacific) of CRV OG, was elected as Co-Chair of ACSICG.

Date and Venue for the Next Meeting

2.34. The ACSICG/10 meeting discussed to meet Face-to-Face (F2F) with a tentative date on May 2024 to further progress the tasks listed in the Terms of Reference. However, considering the proposal to conduct the joint meeting with MET/IE WG, the ICAO Secretariat will coordinate internally and inform participants in due course for the exact dates and venue.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

a) note the information contained in this paper; and

b) discuss any relevant matter as appropriate

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AMHS Readiness Report for Supporting IWXXM Traffic					
No.	**States/Administration**	**Name of State (Administration)/name of BBIS/BIS location where AMHS is installed:**	**AFTN/AMHS transition date/schedule**	**Readiness Status of AMHS for supporting File Transfer Body Part (FTBP), the Interpersonal Message (IPM) Heading Extension (IHE) to support for exchanging IWXXM reports of a maximum size of 4MB and FTBP of maximum 2MB:**	**Capacity status of the operational AFS links to support the exchange of the required meteorological information in both IWXXM GML form and TAC form:**
1	Australia	Airservices - Brisbane	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	December 2009	Support	2MB for CRV and 64kbps for IPLCs
4	Fiji	Fiji Airport/Air Traffic Management Centre	Completed. In June 2019, Fiji completed the transition of ATN BBIS to IPS for the AMHS service from Nadi to Salt Lake, USA & Brisbane, Australia over the CRV network. The local end User still operates on AFTN terminal and is converted to AMHS over the AFTN/AMHS Gateway.	The Comsoft AMHS System supports File Transfer Body Part (FTBP). Our system has the capability of exchanging IWXXM reports of a maximum size of 4MB and FTBP of maximum.	Nadi has contracted a 1.0Mbps bandwidth using CRV Package C+ for Voice & AMHS services. The total bandwidth usage for voice and data is 768K from the total 1.0Mbps. The bandwidth for AMHS is 64Kbps each to Brisbane & Salt Lake Center. It is noted in the ACSICG/7 WP04 presented by USA that 64Kbps is the minimum recommended required bandwidth for AMHS to exchange FTBP for IWXXM.
5	India	AAI/Mumbai Airport	AMHS is in operation since 2011.		

AMHS Readiness Report for Supporting IWXXM Traffic					
No.	**States/Administration**	**Name of State (Administration)/name of BBIS/BIS location where AMHS is installed:**	**AFTN/AMHS transition date/schedule**	**Readiness Status of AMHS for supporting File Transfer Body Part (FTBP), the Interpersonal Message (IPM) Heading Extension (IHE) to support for exchanging IWXXM reports of a maximum size of 4MB and FTBP of maximum 2MB:**	**Capacity status of the operational AFS links to support the exchange of the required meteorological information in both IWXXM GML form and TAC form:**
			Note: 1. PO was awarded to Frequentis Comsoft on Jan-2023 for the replacement of existing AMHS System at Mumbai. 2. New AMHS System will be having DC at Mumbai & DR at Delhi. Subsequently second CRV connection will be implemented with at Delhi for DR AMHS Operation. 3. SDR (System Design Review) meeting with Frequentis Comsoft is planned in May 2023 4. Tentative timeline for commissioning of new AMHS System is Dec 2024.	Presently India is not able to exchange the required 4 MB messages and 2 MB FTBP attachments.	Indian Meteorological Department is in the process of upgradation of HPC & DB to support IWXXM.
6	Japan	Japan/Fukuoka	ATN BBIS router and AMHS installed at 2000. Connection tests with USA 2000 - 2004 and put into operational use in 2005 and over CRV in February 2019. Put into AMHS operation with Hong- Kong and Singapore in 2021. AMHS implementation with China in 2021 , Korea and Taipei in 2022.	Already support exchange of IWXXM messages based on FTBP in August 2015. It is possible to send , receive and transfer up to 2GB for the contents such as FTBP,IPM and IHE in AMHS,and the size of IWXXM suported system by Japan Meteorological Agency is 2MB	AFS links over CRV is a Package A, Bandwidth 2M.
7	Macao China	Macao China	Q4/2009	Support exchange of IWXXM messages based on FTBP.	To be determined
8	Maldives	Maldives / Velana International Airport (VRMM)	Contract awarded to replace existing AFTN system to an AMHS in 1Q2023. Installation and commissioning of AMHS to be completed by 3Q2023	AMHS supports FTBP	Discussion with PCCW for 128k bandwidth CRV package D
9	New Zealand	Airways – Christchurch	AMHS connections are in place with Australia, USA and the New	Support	Airways New Zealand has contracted a 1.0Mbps bandwidth using CRV Package C+ for Voice and AMHS services from Auckland and Christchurch.

AMHS Readiness Report for Supporting IWXXM Traffic					
No.	**States/Administration**	**Name of State (Administration)/name of BBIS/BIS location where AMHS is installed:**	**AFTN/AMHS transition date/schedule**	**Readiness Status of AMHS for supporting File Transfer Body Part (FTBP), the Interpersonal Message (IPM) Heading Extension (IHE) to support for exchanging IWXXM reports of a maximum size of 4MB and FTBP of maximum 2MB:**	**Capacity status of the operational AFS links to support the exchange of the required meteorological information in both IWXXM GML form and TAC form:**
10	Philippines	Philippines/ATMC Manila	Completed March 2018	Can support IHE and FTBP maximum 1MB (tested with Taipei on 13-May-20)	1MB Philippines has contracted 2Mbps bandwidth using CRV package “A” voice and data services.
11	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.
12	Singapore	Singapore	March 2011	Yes	2MB for CRV and minimally 64kbps for IPLCs
13	Thailand	Thailand	BBIS/BIS Routers already implemented. AMHS has been implemented since July 2011. Connection with Bangladesh, Bhutan, Cambodia, China, India, Lao PDR, Myanmar, Singapore, Hong Kong China, and Malaysia implemented. Connection with SITA (SITA AMHS Gateway inter-connections) implemented. **Bangkok - Vietnam Circuit** IOT Test : Done POT Test: Planned for end of 3Q2021 **Bangkok - Rome Circuit** IOT Test: Planned for 3Q2021 POT Test: Planned for 4Q2021	Completed, the IWXXM exchange has been implemented since November 2020.	The capacity of links readied to support in both form.
14	USA	Federal Aviation Administration	Q4, 2020	Yes. FAA AMHS has FTBP capability. National Weather Service (NWS) projected to implement IWXXM by Q3, 2021	Yes. 2MB bandwidth over CRV

Implementation Status of ATN/AMHS in the APAC Region

Extracted from ATN/AMHS/AIDC Implementation Table

State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AMHS Vendors Selected	Remarks
AFGHANISTAN			
AUSTRALIA	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	
BANGLADESH	In Q1/2013, Bangladesh installed ATN/AMHS and BIS Router at Dhaka (VGHS) with User Agents at Chittagong (VGEG) and Sylhet (VGSY).	COMSOFT	

State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AMHS Vendors Selected	Remarks
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	
BRUNEI DARUSSALAM	ATN BIS Router planned for 2015 and AMHS planned for 2015		
CAMBODIA	BIS Router and AMHS installed. Cambodia (CATS) AMHS connected with Bangkok via VSAT IP link since 10 December 2013	AVITECH	

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. Japan AMHS testing with Japan was completed in March 2021.It will put into operation after TMC is signed.	IN-HOUSE (Aero-Info Technologies Co., Ltd)	IN-HOUSE (Aero-Info Technologies Co., Ltd)

State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AMHS Vendors Selected	Remarks
	China have completed TMC signed and circuit put into operation in 2021 Russia AMHS IOT with Russia in 2021.		
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.~~ CRV/AMHS circuit was put into operation in August 2022. **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. **Taibei / China** CRV/AMHS circuit was put into operation in June 2020.	COMSOFT	

State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AMHS Vendors Selected	Remarks
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 3.0 planned with tentative target date of Q4 2023.~~Upgrade of ATN/AMHS to support IPS and IWXXM planned with tentative target date of Q2 2023.~~	COMSOFT	
COOK ISLANDS			
DEMOCRATIC PEOPLE'S REPUBLIC OF KOREA	The ATN BIS Router and AMHS planned for in 2011.		
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.

State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AMHS Vendors Selected	Remarks
FRANCE *(French Polynesia Tahiti)*	Planned for implementation of AMHS in 2022 (T2). Using IP with New Zealand since 2017.	COMSOFT	

INDIA	Dual stack ATN/IP router and AMHS implemented at Mumbai in 2011. Operational AMHS connections with Bangkok, Dhaka, Singapore, Kathmandu, Karachi, Beijing, Bhutan, Colombo & Muscat implemented. ~~With Beijing implemented in 2016;~~ ~~With Colombo implemented in May2017; With Bhutan implemented in July 2017;~~ Mumbai-Nairobi- AFTN Connectivity Implemented. CRV Circuits has been delivered in India/AMHS Mumbai in Dec 2022. Following AMHS Circuits has been migrated to CRV In Q1 of 2023: Mumbai-Bangkok Mumbai-Kathmandu Mumbai-Bhutan Mumbai-Singapore In Q2 of 2023: Mumbai-Beijing Note: CRV Connection with Karachi, Dhaka & Sri Lanka will be implemented once these states are ready with their CRV Connection from PCCWG. AMHS & AFTN Connection with Muscat & Nairobi respectively may be continuing with the existing IPLC circuit. ~~(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~~	COMSOFT	1. PO was awarded to Frequentis Comsoft in Q1 of 2023 for the replacement of existing AMHS System at Mumbai. 2. New AMHS System will be having DC at Mumbai & DR at Delhi. Subsequently, second CRV Connection may be implemented at Delhi for DR AMHS Connection. 3. SDR (System Design Review) meeting with Frequentis Comsoft is planned in May 2023 4. Tentative timeline for commissioning of new AMHS System is Dec 2024. ~~INDIA~~

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

State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AMHS Vendors Selected	Remarks
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.
KIRIBATI	Connection with Nadi using UA/AMHS implemented in 2015.		
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	

State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AMHS Vendors Selected	Remarks
MALAYSIA	ATN BIS Router completed 2007. AMHS for Malaysia – Singapore implemented in March 2020. AMHS for Malaysia – Thailand implemented in Dec 2019.	FREQUENTIS	
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.~~ IP link with Colombo to be established by 3Q2023 to replace the X.25 link used by AFTN. AMHS installation and commissioning to be completed 3Q2023.	IDS AirNav	
MARSHALL ISLANDS			
MICRONESIA (EDERATED STATES OF)			
Chuuk			
Kosrae			

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

State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AMHS Vendors Selected	Remarks
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	
NEW CALEDONIA	New router and AMHS commissioned December 2016	COMSOFT	
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	
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	

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

State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AMHS Vendors Selected	Remarks
REPUBLIC OF KOREA	Plan to upgrade AMHS supporting IWXXM from 2022 over CRV 1) AMHS/CRV IOT with China and Japan in 4Q of 2021 2) AMHS/CRV POT with China on July 2022, and with Japan in 4Q 2022 3) Cutover to CRV with China and Japan in 4Q 2022 4) Implementation of AMHS/CRV with China and Japan in 4Q 2022	FREQUENTIS	
SINGAPORE	AMHS implemented with: 1) AMHS circuit with India put into operational use in Mar 2011. 2) AMHS circuit with UK put into operational use in Mar 2012. 3) AMHS circuit with Thailand put into operational use in Dec 2014. 4) AMHS circuit with Australia put into operational use in Oct 2016. 5) AMHS circuit with Indonesia put into operational use in Feb 2018. 6) AMHS circuit with Malaysia put into operational in Mar 2020. 7) AMHS circuit with Japan put into operational in Dec 2020. 8) AMHS circuit with Philippines put into operational in Dec 2020. ~~8)~~9) AMHS circuit with Sri Lanka put into operational in May 2022. 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	
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	

State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AMHS Vendors Selected	Remarks
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 Italy (Rome) implemented. Bangkok - Vietnam Circuit IOT Test: Done POT Test: Done Commissioning: Planned for end of 4Q20233~~Q2022~~ Connection with SITA (SITA AMHS Gateway inter-connections) implemented.	AEROTHAI's AMHS System	
TONGA	AMHS planned for 2008. The provider is linked to the New Zealand AFTN		CPDLC and ADS-C is not considered for lower airspace
UNITED STATES	- Australia - Fiji - New Zealand - Japan - Philippines - Indonesia (2023)	IN-HOUSE	
VANUATU			

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

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TABLE CNS II-2 - REQUIRED ATN INFRASTRUCTURE ROUTING PLAN

EXPLANATION OF THE TABLE

Column	
1	Name of the Administration and Location of the ATN Router
2	Connected Router: List of the Administration and location of the ATN routers to be connected with the router shown in column 1)
3	Bandwidth: Link Speed expressed in bits per second (bps)
4	Network Protocol: If Internet Protocol Suite is used, indicate version of IP (IPv4 or IPv6)
5	Type of services being transported on the linkie AFTN/AMHS/Voice/Met/Radar
6	Contract Types (CRV/MPLS/VPN/Dedicated Circuit)

Status from AMC

Local		Remote						
Administration/ State	**City/Location**	**Administration/ State**	**City/Location**	**Bandwidth (bps)**	**Network Protocol (IP/X.25/Non Protocol)**	**Type of Service (AFTN/AMHS/Voice/Met/Radar)**	**Contract Types (CRV/MPLS/VPN/Dedicated Circuit)**	**REMARKS**
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
Afghanistan	Kabul **(OAKB)**	Pakistan						
American Samoa	Pago Pago	United States	Salt Lake City	64K	IP	AFTN/MET	VPN	
Australia	Brisbane	Fiji	Nadi					
		Indonesia						
		Japan						
		Papua New Guinea		64K	IP	AMHS	VPN	
		New Zealand	Christchurch	64K	IP	AMHS	CRV	**Primary**
		New Zealand	Auckland	64K	IP	Voice	CRV	**Primary**
		Singapore						
		South Africa						
		United States	Oakland	64K	IP	Voice	CRV	
		United States	Salt Lake City	64K	IP	AMHS	CRV	**Primary**
		United States	Atlanta	64K	IP	AMHS	CRV	**Backup**
	Melbourne	Fiji						
		Indonesia						
		Japan						
		Papua New Guinea		64K	IP	AMHS	VPN	
		New Zealand						
		Singapore						
		South Africa						
		United States (Salt Lake City)		64K	IP	AMHS	CRV	
Bangladesh	Dhaka	India						
		Thailand						
Bhutan Paro	**Bhutan** Paro	India						
Brunei Darussalam Brunei	**Brunei Darussalam** Brunei	Malaysia						
		Singapore						
Cambodia Phnom Penh	**Cambodia** Phnom Penh	Thailand						
China Beijing	**China** Beijing	DPR Korea						
		Hong Kong, China						
		India						
		Japan						
		Kuwait						
		Macau, China						

Status from AMC

Local		Remote						
Administration/ State	**City/Location**	**Administration/ State**	**City/Location**	**Bandwidth (bps)**	**Network Protocol (IP/X.25/Non Protocol)**	**Type of Service (AFTN/AMHS/Voice/Met/Radar)**	**Contract Types (CRV/MPLS/VPN/Dedicated Circuit)**	**REMARKS**
1	2	3	4	5	6	7	8	9
		Mongolia						
		Myanmar						
		Nepal						
		Pakistan						
		Republic of Korea						
		Russian Federation						
		Thailand						
		Vietnam						
Taibei	Taibei	Hong Kong, China						
		Japan						
Hong Kong, China	**Hong Kong, China**	China	Beijing	2M	IP	AMHS	CRV	Share 2M bandwidth
			Guangzhou	2.4K	Async Serial	AFTN	Dedicated Circuit	
			Haikou	2.4K	Async Serial	AFTN	Dedicated Circuit	
		Japan	Fukuoka	2M	IP	AMHS	CRV	Share 2M bandwidth
		Philippines	Manila	2M	IP	AMHS	CRV	Share 2M bandwidth
				112K	IP	Voice	CRV	Guarantee 112K bandwidth on 2M CRV
		Taibei	Taibei	2M	IP	AMHS	CRV	Share 2M bandwidth
				448K	IP	Voice	CRV	Guarantee 448K bandwidth on 2M CRV
		Thailand	Bangkok	2M	IP	AMHS	CRV	Share 2M bandwidth
		Macau, China	Macau	64K	CLNP/X.25	AMHS	Dedicated Circuit	
		Viet Nam	Ho Chi Minh	2.4K	Async Serial	AFTN	Dedicated Circuit	
Macau, China	**Macau, China**	China						
		Hong Kong, China						
Cook Island Rarotonga	**Cook Island** Rarotonga	New Zealand						
DPR Korea Pyongyang	**DPR Korea** Pyongyang	China						

Status from AMC

Local		Remote						
Administration/ State	**City/Location**	**Administration/ State**	**City/Location**	**Bandwidth (bps)**	**Network Protocol (IP/X.25/Non Protocol)**	**Type of Service (AFTN/AMHS/Voice/Met/Radar)**	**Contract Types (CRV/MPLS/VPN/Dedicated Circuit)**	**REMARKS**
1	2	3	4	5	6	7	8	9
Fiji Nadi	**Fiji** Nadi	Australia	Brisbane	64K	IP	Voice & AMHS	CRV	
		Kiribati	Bonriki	Internet	IP	Voice & AMHS	VPN	
		New Caledonia	Tontouta	Internet	IP	Voice & AMHS	VPN	
		Tuvalu	Funafuti	IDD-Tel	PSTN	Voice	PSTN	**Telephone IDD**
		United States	Oakland	64K	IP	Voice	CRV	
		United States	Salt Lake City	64K	IP	AMHS	CRV	**Primary**
		United States	Atlanta	64K	IP	AMHS	CRV	**Backup**
		Wallis Islands	Wallis	Internet	IP	Voice & AMHS	VPN	
French Polynesia Papeete (NTAA)	**French Polynesia** Papeete (NTAA)	New Zealand		64K	IP	AFTN/MET	VPN	
India Mumbai	**India** Mumbai	Bangladesh						
		Bhutan						
		China						
		Kenya						
		Nepal						
		Oman						
		Pakistan						
		Singapore						
		Sri Lanka						
		Thailand						
		Nairobi						
Indonesia Jakarta	**Indonesia** Makassar Jakarta Makassar	Australia		2M	IP	AFTN/MET	MPLS?	
		Singapore		128K	IP	AMHS/MET	CRV	
		United States	Oakland	64K	IP	Voice	CRV	
Japan Tokvo	**Japan** Tokvo/Fukuoka	Australia						
		China						
		Hong Kong, China						
		Europe						
		Republic of Korea						
		Russia Federation						
		Singapore						
		Taibei						
		United States	Oakland	64K	IP	Voice	CRV	

Status from AMC

Local		Remote						
Administration/ State	**City/Location**	**Administration/ State**	**City/Location**	**Bandwidth (bps)**	**Network Protocol (IP/X.25/Non Protocol)**	**Type of Service (AFTN/AMHS/Voice/Met/Radar)**	**Contract Types (CRV/MPLS/VPN/Dedicated Circuit)**	**REMARKS**
1	2	3	4	5	6	7	8	9
Kiribati Tarawa (NGTT)	**Kiribati** Tarawa (NGTT)	United States	Salt Lake City	64K	IP	AMHS	CRV	**Primary**
		United States	Atlanta	64K	IP	AMHS	CRV	**Backup**
		Fiji						
Lao PDR Vientiane	**Lao PDR** Vientiane	Thailand						
		Viet Nam						
Malaysia Kuala Lumpur	**Malaysia** Kuala Lumpur	Brunei						
		Singapore						
		Thailand						
Maldives Male (VRMM)	**Maldives** Male (VRMM)	Sri Lanka						
Marshall Islands Majuro (PKMJ)	**Marshall Islands** Majuro (PKMJ)	United States		64K	IP	AFTN/MET	VPN	
Micronesia Federated State of Chuuk (PTKK)	**Micronesia Federated State of** Chuuk (PTKK)	United States	Salt Lake City	64K	IP	AFTN/MET	VPN	
Kosrae (PTSA)	Kosrae (PTSA)		Salt Lake City	64K	IP	AFTN/MET	VPN	
Ponapei (PTPN)	Ponapei (PTPN)	United States	Salt Lake City	64K	IP	AFTN/MET	VPN	
Yap (PTYA)	Yap (PTYA)	United States	Salt Lake City	64K	IP	AFTN/MET	VPN	
Mongolia Ulanbaatar	**Mongolia** Ulanbaatar	United States	Salt Lake City	64K	IP	AFTN/MET	VPN	
		China						
Myanmar Yangon	**Myanmar** Yangon	China						
		Thailand						
Nepal Kathmandu	**Nepal** Kathmandu	China						
		India						
New Caledonia Noumea (NWWW)	**New Caledonia** Noumea (NWWW)	Fiji						
New Zealand Christchurch	**New Zealand** Christchurch	Australia						
		Cook Is.						
		French Polynesia						
		Samoa						
		Tonga						
		United States	Oakland	64K	IP	Voice	CRV	
		United States	Salt Lake City	64K	IP	AMHS	CRV	**Primary**
		United States	Atlanta	64K	IP	AMHS	CRV	**Backup**

Status from AMC

Local		Remote						
Administration/ State	**City/Location**	**Administration/ State**	**City/Location**	**Bandwidth (bps)**	**Network Protocol (IP/X.25/Non Protocol)**	**Type of Service (AFTN/AMHS/Voice/Met/Radar)**	**Contract Types (CRV/MPLS/VPN/Dedicated Circuit)**	**REMARKS**
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
New Zealand Auckland	**New Zealand** Auckland	Australia			IP	Voice	CRV	
		Cook Is.			IP	Voice	PASNET	
		Fiji			IP	Voice	CRV	
		Samoa			IP	Voice	PASNET	
		Tonga			IP	Voice	PASNET	
		United States	Oakland	64K	IP	Voice	CRV	
Pakistan Karachi	**Pakistan** Karachi	Afghanistan						
		China						
		India						
		Oman						
		Iran						
		Kuwait						
Papua New Guinea	**Papua New Guinea**	Australia		64K	IP	AMHS	CRV	
		United States (Oakland)		64K	IP	Voice	CRV	
Philippines	**Philippines**	Hong Kong, China		2 M	IP	AMHS	CRV	
		Singapore		2 M	IP	AMHS	CRV	
		United States	Oakland	64K	IP	Voice	CRV	
		United States	Salt Lake City	64K	IP	AMHS	CRV	**Primary**
		United States	Atlanta	64K	IP	AMHS	CRV	**Backup**
Republic of Korea Seoul	**Republic of Korea** Seoul	China						
		Japan		2 M	IP	AMHS	CRV	
Samoa Faleolo **(NSFA)**	**Samoa** Faleolo **(NSFA)**	New Zealand		1.1 Mb	IP	AFTN/MET	VPN	
Singapore Singapore	**Singapore** Singapore	Australia		2 M	IP	AMHS	CRV	
		Bahrain						
		Brunei						
		India						
		Indonesia						
		Japan						
		Malaysia						
		Philippines						
		Sri Lanka						
		Thailand						
		United Kingdom						
		Viet Nam						

Status from AMC

Local		Remote						
Administration/ State	**City/Location**	**Administration/ State**	**City/Location**	**Bandwidth (bps)**	**Network Protocol (IP/X.25/Non Protocol)**	**Type of Service (AFTN/AMHS/Voice/Met/Radar)**	**Contract Types (CRV/MPLS/VPN/Dedicated Circuit)**	**REMARKS**
1	2	3	4	5	6	7	8	9
Sri Lanka Colombo	**Sri Lanka** Colombo	India						
		Maldives						
		Singapore						
Thailand Bangkok	**Thailand** Bangkok	Bangladesh						
		Cambodia						
		China						
		Hong Kong, China						
		India						
		Italy						
		Lao PDR.						
		Malaysia						
		Myanmar						
		Singapore						
		Viet Nam						
Tonga Tongatapu (NFTF)	**Tonga** Tongatapu (NFTF)	New Zealand		85K	IP	AFTN/MET	VPN	
Tuvalu Faleolo	**Tuvalu** Faleolo	Fiji		64K	IP	AFTN/MET	VPN	
United States Salt Lake City	**United States** Salt Lake City with Atlanta as backup (CRV Package C/2MB at SLC and ATL)	Australia		64K	IP	AMHS	CRV	
		Australia		64K	IP	AMHS	VPN	**BACKUP**
		American Samoa	Pago Pago	64K	IP	AFTN/MET	VPN	
		Fiji		64K	IP	AMHS	CRV	
		Japan		64K	IP	AMHS	CRV	
		Marshall Islands		64K	IP	AFTN/MET	VPN	
		Micronesia, Federated State of		64K	IP	AFTN/MET	VPN	
		New Zealand		64K	IP	AMHS	CRV	
		Philippines		64K	IP	AMHS	CRV	
United States Oakland	United States Oakland (CRV Package A/2MB)	Fiji (Nadi)		64K	IP	Voice	CRV	
		Indonesia (Makassar)		64K	IP	Voice	CRV	
		Japan (Fukuoka)		64K	IP	Voice	CRV	

Status from AMC

Local		Remote						
Administration/ State	**City/Location**	**Administration/ State**	**City/Location**	**Bandwidth (bps)**	**Network Protocol (IP/X.25/Non Protocol)**	**Type of Service (AFTN/AMHS/Voice/Met/Radar)**	**Contract Types (CRV/MPLS/VPN/Dedicated Circuit)**	**REMARKS**
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
		New Zealand		64K	IP	Voice	CRV	
		Papua New Guinea		64K	IP	Voice	CRV	
		Philippines (Manila)		64K	IP	Voice	CRV	
Viet Nam Ho Chi Minh/Hanoi	**Viet Nam** Ho Chi Minh/Hanoi	Hong Kong, China						
		Lao PDR.						
		Singapore						
		Thailand						
Wallis Islands (NLWW)	**Wallis Islands** (NLWW)	Fiji		64K	IP	AFTN/MET	VPN	

15-Feb-23

Still have plan information in AMC

Administration and Location	Type of Router	Type of Interconnection	Connected Router	Bandwidth	Network Protocol	Via	Remark	Last update in AMC
China Beijing	BBIS	Inter-Regional	Kuwait	64000 bps	X.25		Router Implemented	
	BIS	Intra-Regional	Myanmar	64000 bps	IPS		Implementation on going/Plan Q4/15	
	BIS	Intra-Regional	Mongolia	9600 bps	X.25		Router Implemented	
	BBIS	Inter-Regional	Russian Federation	64000 bps	X.25		Router Implemented	
Hong Kong, China	BIS	Intra-Regional	Viet Nam	2 M	IPS	CRV	Plan to implement by 2023. Share 2M bandwidth	
India, Mumbai	BBIS	Intra-Regional	Nairobi	64000 bps	IPS			
Lao PDR Vientiane	BIS	Intra-Regional	Viet Nam	9600 bps	X.25			
Malaysia Kuala Lumpur	BIS	Intra-Regional	Brunei	2 M	IPS			
	BIS	Intra-Regional	Singapore	2 M	IPS	CRV	Scheduled for Q3/2022	29042022
Myanmar Yangon	BIS	Intra-Regional	China	64000 bps	IPS			
Singapore Singapore	BIS	Intra-Regional	Malaysia	2 M	IPv4	CRV	Scheduled for Q3/2022	29042022
Thailand Bangkok	BIS	Intra-Regional	Viet Nam	64000 bps	IPv4	VSAT	PLan to implement in Q3/2023	from Thailand
Viet Nam Ho Chi Minh/Hanoi	BIS	Intra-Regional	Hong Kong, China	64000 bps	X.25	DDN	TBD	
	BIS	Intra-Regional	Lao PDR.	9600 bps	X.25			
	BIS	Intra-Regional	Thailand	64000 bps	IPv4	VSAT	PLan to implement in Q3/2023	from Thailand

15-Jan-23

Red character is present status in AMC

No Plan information in AMC

Administration and Location	Type of Router	Type of Interconnection	Connected Router	Bandwidth	Network Protocol	Via	Remark	
1	2	3	4	5	6	7	8	
Afghanistan Kabul **(OAKB)**	BIS	Intra-Regional	Pakistan	64000bps	VPN		Intra-domain	
	BIS	Inter-Regional	Iran	50	AFTN			
Australia Brisbane	BBIS	Intra-Regional	Japan	64000 bps	IPS/IP-SNDCF	VPN	Not implemented	
	BBIS	Inter-Regional	South Africa	64000 bps	TBD		Not implemented	
Brunei Darussalam Brunei	BIS	Intra-Regional	Singapore	9600 bps	IPv4	DDN	ATN/AMHS trial commence on 2017	
China Beijing	BIS	Intra-Regional	Vietnam	9600 bps	X.25			
Cook Islands Rarotonga			New Zealand	796 kbps	IPS		Intra-domain	
DPR Korea Pyongyang	BIS	Intra-Regional	China	9600 bps	X.25			
Fiji Nadi	BIS	Intra-Regional	Kiribati	Internet	IPv4	VPN	Intra-domain (User Agent) - Implementation Q3 2015	
	BIS	Intra-Regional	New Caledonia	64000 bps	IPS (IPv4)	DDN	Intra-domain - Implementation 2016 Connect with Wallis	
	BIS	Intra-Regional	Tuvalu	Internet	IPv4	VPN	Intra-domain (User Agent) - Implementation Q3 2015	
	BIS	Intra-Regional	Wallis Islands	Internet	IPv4	VPN	Connect with New Caledonia - Implemente in 2016	
French Polynesia Papeete **(NTAA)**			New Zealand	64000 bps	IPS		Intra-domain	
Indonesia Jakarta	BIS	Intra-Regional	Australia	64000bps	IPS		Not Implemented	
Japan	BBIS	Intra-Regional	Australia	64000 bps	IPS/IP-SNDCF	VPN	Schedule after CRV	NO CONNECTION IN AMC
	BBIS	Inter-Regional	Europe	64000 bps	IP-SNDCF	DDN/	TBD	

No Plan information in AMC

Administration and Location	Type of Router	Type of Interconnection	Connected Router	Bandwidth	Network Protocol	Via	Remark
1	2	3	4	5	6	7	8
Tokyo	BBIS	Inter-Regional	Europe	64000 bps	IP-SNDCF	VPN	TBD
	BIS	Intra-Regional	Republic of Korea	64000 bps	IPS(IPv4)	VPN	Implement from 2016 onwards Scheduled after CRV
	BBIS	Inter-Regional	Russia Federation	64000 bps	IP-SNDCF	DDN/ VPN	TBD
Kiribati Tarawa (NGTT)	BIS	Intra-Regional	Fiji	Internet	IPv4	VPN	Intra-domain (User Agent) - Implementation Q3 2015
Maldives Male (VRMM)	BIS	Intra-Regional	Sri Lanka	64000 bps	X.25		
Marshall Islands Majuro (PKMJ)	BIS	Inter-Regional	United States	64000 bps	IP		VPN over Internet Intro-domain
Micronesia Federated State of Chuuk (PTKK)	BIS	Inter-Regional	United States	64000 bps	IP	VPN	VPN over Internet Intra-domain
Kosrae (PTSA)		Inter-Regional	United States	64000 bps	IP	VPN	VPN over Internet/Intra-domain
Ponapei (PTPN)		Inter-Regional	United States	64000 bps	IP	VPN	VPN over Internet/Intra-domain
Yap (PTYA)		Inter-Regional	United States	64000 bps	IP	VPN	VPN over Internet/Intra-domain
Nepal Kathmandu	BIS	Intra-Regional	China	9600bps	X.25		Router Implemented
New Caledonia Noumea (NWWW)			Fiji	64000 bps	IPS (IPv4)	DDN	Intra-domain - Implementation 2016 Connect with Wallis
New Zealand Christchurch			Cook Is.	2.4 K	IPS		Intra-domain
			French Polynesia	64000 bps	IPS		Intra-domain
			Samoa	2.4 K	IPS		Intra-domain
			Tonga	85000 bps	IPS		Intra-domain
Pakistan Karachi	BIS	Intra-Regional	Afghanistan	64000 bps	IPS		
	BIS	Intra-Regional	China	64000 bps	X.25		
	BIS	Inter-Regional	Oman	64000 bps	-		

No Plan information in AMC

Administration and Location	Type of Router	Type of Interconnection	Connected Router	Bandwidth	Network Protocol	Via	Remark
1	2	3	4	5	6	7	8
	BIS	Inter-Regional	Iran	64000 bps	-		
Republic of Korea Seoul	BIS	Intra-Regional	Japan	64000 bps	IPS(IPv4)	VPN	Implementation from 2016 onwards scheduled after CRV
Samoa Faleolo **(NSFA)**			New Zealand	1.1 Mb	IPS		Intra-domain
Singapore Singapore	BIS	Intra-Regional	Brunei	9600 bps	IPv4	DDN	ATN/AMHS trial commence on 2017
Sri Lanka Colombo	BIS	Intra-Regional	Maldives	64000 bps	X.25		TBD
Tonga Tongatapu **(NFTF)**	BIS	Intra-Regional	New Zealand	85000 bps	IPS		Intra-domain
Tuvalu Faleolo	BIS	Intra-Regional	Fiji	Internet	IPv4	VPN	Intra-domain (User Agent) - Implementation Q3 2015
United States Salt Lake City			American Samoa		IP		Intra-domain
		Intra-Regional	Marshall Islands	64000 bps	IP		Intra-domain/Internet
		Intra-Regional	Micronesia, Federated State of	64000 bps	IP		Intra-domain
Viet Nam Ho Chi Minh/Hanoi	BIS	Intra-Regional	Singapore	9600 bps	X.25	DDN	ATN/AMHS trial planned to completed by end 2015
Wallis Islands (NLWW)	BIS	Intra-Regional	Fiji	Internet	IPv4	VPN	Connect with New Caledonia - Implemente in 2016

15-Jan-23

TABLE CNS II-2 - REQUIRED ATN INFRASTRUCTURE ROUTING PLAN

EXPLANATION OF THE TABLE

Column

1 Name of the Administration and Location of the ATN Router

2 Type of Router (in end systems (ES) of the Administration shown in column 1)

3 Type of Interconnection:

Inter-Regional: Connection between different Regions/ domains
Intra-Regional: Connection within a Region/ domain.

4 Connected Router: List of the Administration and location of the ATN routers to be connected with the router shown in column 1)

5 Bandwidth: Link Speed expressed in bits per second (bps)

6 Network Protocol: If Internet Protocol Suite is used, indicate version of IP (IPv4 or IPv6)

7 Via: The media used to implement the interconnection of the routers. (in case of IP service bought from a service provider, indicate VPN)

DDN (public telecomm leased line)
VSAT
VPN

8 Remarks

Administration and Location	Type of Router	Type of Interconnection	Connected Router	Bandwidth	Network Protocol	Via	Remark
1	2	3	4	5	6	7	8
Afghanistan Kabul	BIS	Intra-Regional	Pakistan	64000bps	IPS		Intra-domain
	BIS	Inter-Regional	Iran	9600 bps	IPS		
American Samoa Pago Pago			United States				Intra-domain
Australia Brisbane	BBIS	Intra-Regional	Fiji	64000 bps	CLNP/IP-SNDCF (IPv4)	DDN	Implemented
	BIS	Intra-Regional	Indonesia	64000 bps	IPS		Not implemented
	BBIS	Intra-Regional	Japan	64000 bps	IPS/IP-SNDCF	VPN	Not implemented
	BIS	Intra-Regional	New Zealand	64000 bps	IPS	VPN	Not implemented
	BBIS	Intra-Regional	Singapore	64000 bps	CLNP/IP-SNDCF	DDN	ATN/AMHS trial planned to completed by end 2015
	BBIS	Inter-Regional	South Africa	64000 bps	TBD		Not implemented
	BBIS	Inter-Regional	United States	64000 bps	DDN lease line/IPS		
Bangladesh Dhaka	BIS	Intra-Regional	India	64000 bps	IPS		Implemented
	BIS	Intra-Regional	Thailand	32000 bps	IPv4	VSAT	Implemented
Bhutan Paro	BIS	Intra-Regional	India	64000 bps	IPS		TBD. Presently using AFTN via VPN through public internet
Brunei Darussalam Brunei	BIS	Intra-Regional	Malaysia	64000 bps	IPS		
	BIS	Intra-Regional	Singapore	9600 bps	IPv4	DDN	ATN/AMHS trial commence on 2017
Cambodia Phnom Penh	BIS	Intra-Regional	Thailand	64000 bps	IPv4	VSAT	Implemented
China Beijing	BIS	Intra-Regional	DPR Korea	9600 bps	X.25		Router Implemented
	BBIS	Intra-Regional	Hong Kong, China	64000 bps	X.25	DDN	Router Implemented
	BBIS	Intra-Regional	India	64000 bps	X.25/IPS	DDN	IOT/POT completed. - Migrate to IPS
	BBIS	Intra-Regional	Japan	64000 bps	IPS/SNDCF	VPN	Implement from 2016 onwards
	BBIS	Inter-Regional	Kuwait	64000 bps	X.25		Router Implemented
	BIS	Intra-Regional	Macau, China	64000 bps	X.25		Implemented
	BIS	Intra-Regional	Mongolia	9600 bps	X.25		Router Implemented

Administration and Location	Type of Router	Type of Interconnection	Connected Router	Bandwidth	Network Protocol	Via	Remark
1	2	3	4	5	6	7	8
	BIS	Intra-Regional	Myanmar	64000 bps	IPS		Implementation on going/Plan Q4/15
	BIS	Intra-Regional	Nepal	9600 bps	X.25		Router Implemented
	BIS	Intra-Regional	Pakistan	64000 bps	X.25		Router Implemented
	BIS	Intra-Regional	Republic of Korea	64000 bps	X.25		Implemented
	BBIS	Inter-Regional	Russian Federation	64000 bps	X.25		Router Implemented
	BBIS	Intra-Regional	Thailand	64000 bps	CLNP/X.25	DDN	
	BIS	Intra-Regional	Vietnam	9600 bps	X.25		
Taibei	BIS	Intra-Regional	Hong Kong, China	64000 bps	X.25	DDN	TBD
	BIS	Intra-Regional	Japan	64000 bps	IPS	VPN	Implement from 2016 onwards Scheduled after CRV
Hong Kong, China	BBIS	Intra-Regional	China	64000 bps	X.25	DDN	Router Implemented
	BIS	Intra-Regional	Macau, China	64000 bps	X.25	DDN	Implemented
	BBIS	Intra-Regional	Japan	64000 bps	X.25/SNDCF	VPN	Scheduled for Q4/2017
	BIS	Intra-Regional	Philippines	64000 bps	X.25/IPS	DDN	Scheduled for Q4/2016
	BBIS	Intra-Regional	Taibei	64000 bps	X.25	DDN	TBD
	BBIS	Intra-Regional	Thailand	64000 bps	CLNP/X.25	DDN	Implemented
	BIS	Intra-Regional	Viet Nam	64000 bps	X.25	DDN	TBD
Macau, China	BIS	Intra-Regional	China	64000 bps	X.25		Implemented
	BIS	Intra-Regional	Hong Kong, China	64000 bps	X.25	DDN	Implemented
Cook Islands Rarotonga			New Zealand	796 kbps	IPS		Intra-domain
DPR Korea Pyongyang	BIS	Intra-Regional	China	9600 bps	X.25		
Fiji Nadi	BBIS	Intra-Regional	Australia	64000 bps	CLNP/IP-SNDCF (IPv4)	DDN	Implemented
	BIS	Intra-Regional	Kiribati	Internet	IPv4	VPN	Intra-domain (User Agent) - Implementation Q3 2015
	BIS	Intra-Regional	New Caledonia	64000 bps	IPS (IPv4)	DDN	Intra-domain - Implementation 2016 Connect with Wallis
	BIS	Intra-Regional	Tuvalu	Internet	IPv4	VPN	Intra-domain (User Agent) - Implementation Q3 2015

Administration and Location	Type of Router	Type of Interconnection	Connected Router	Bandwidth	Network Protocol	Via	Remark
1	2	3	4	5	6	7	8
	BBIS	Inter-Regional	United States	9600 bps	CLNP/X.25-SNDCF	DDN	The protocol will upgrade to IPS/SNDCF in 2016
	BIS	Intra-Regional	Wallis Islands	Internet	IPv4	VPN	Connect with New Caledonia - Implemente in 2016
French Polynesia Papeete			New Zealand	64000 bps	IPS		Intra-domain
India Mumbai	BIS	Intra-Regional	Bangladesh	64000 bps	DDN leased line/IPS		Implemented
	BIS	Intra-Regional	Bhutan	64000 bps	IPS		TBD. Presently using AFTN via VPN through public internet
	BBIS	Intra-Regional	China	64000 bps	X. 25/IPS	DDN	IOT/POT completed. - Migrate to IPS
	BIS	Inter-Regional	Kenya	64000 bps	TBD	TBD	Presently using AFTN via VPN via public internet
	BIS	Intra-Regional	Nepal	64000 bps	IPS		Implemented
	BIS	Inter-Regional	Oman	64000 bps	IPS		IOT completed. POT planned. TMC to be signed
	BIS	Intra-Regional	Pakistan	64000 bps	IPS		IOT/POT completed. TMC to be signed
	BBIS	Intra-Regional	Singapore	64000 bps	X.25	DDN	Implementation Plan Q4/15
	BIS	Intra-Regional	Sri Lanka	64000 bps	IPS	DDN	IOT/POT Ccompleted.
	BBIS	Intra-Regional	Thailand	64000 bps	X. 25	DDN	Implemented
	BBIS	Intra-Regional	Nairobi	64000 bps	IPS		
Indonesia Jakarta	BIS	Intra-Regional	Australia	64000bps	IPS		Not Implemented
	BIS	Intra-Regional	Singapore	64000 bps	IPv4	VSAT	ATN/AMHS trial to be completed by end 2015. Implementation Plan Q1/16
Japan Tokyo	BBIS	Intra-Regional	Australia	64000 bps	IPS/IP-SNDCF	VPN	Schedule after CRV
	BBIS	Intra-Regional	China	64000 bps	IPS/IP-SNDCF	VPN	Implement from 2016 onwards Schedule after CRV
	BBIS	Intra-Regional	Hong Kong, China	64000 bps	X.25/SNDCF	VPN	Scheduled for Q4/2017
	BBIS	Inter-Regional	Europe	64000 bps	IP-SNDCF	DDN/ VPN	TBD

Administration and Location	Type of Router	Type of Interconnection	Connected Router	Bandwidth	Network Protocol	Via	Remark
1	2	3	4	5	6	7	8
	BIS	Intra-Regional	Republic of Korea	64000 bps	IPS(IPv4)	VPN	Implement from 2016 onwards Scheduled after CRV
	BBIS	Inter-Regional	Russia Federation	64000 bps	IP-SNDCF	DDN/ VPN	TBD
	BBIS	Intra-Regional	Singapore	64000 bps	IPS/SNDCF	DDN	Scheduled for Q1/2018
	BIS	Intra-Regional	Taibei	64000 bps	IPS	VPN	Implement from 2016 onwards Scheduled after CRV
	BBIS	Inter-Regional	United States	64000 bps	X.25-SNDCF	DDN/ VPN	Implemented
Kiribati Tarawa	BIS	Intra-Regional	Fiji	Internet	IPv4	VPN	Intra-domain (User Agent) - Implementation Q3 2015
Lao PDR Vientiane	BIS	Intra-Regional	Thailand	32000 bps	IPv4	VSAT	Implemented
	BIS	Intra-Regional	Viet Nam	9600 bps	X.25		
Malaysia Kuala Lumpur	BIS	Intra-Regional	Brunei	64000 bps	IPS		
	BIS	Intra-Regional	Singapore	64000 bps	IPv4	VSAT	Scheduled for Q1/2018
	BIS	Intra-Regional	Thailand	64000 bps	IPv4	VSAT	Implemented
Maldives Male	BIS	Intra-Regional	Sri Lanka	64000 bps	X.25		
Marshall Islands Majuro	BIS	Inter-Regional	United States	64000 bps	IP		VPN over Internet Intro-domain
Micronesia Federated State of Chuuk	BIS	Inter-Regional	United States	64000 bps	IP	VPN	VPN over Internet Intra-domain
Kosrae		Inter-Regional	United States	64000 bps	IP	VPN	VPN over Internet/Intra-domain
Ponapei		Inter-Regional	United States	64000 bps	IP	VPN	VPN over Internet/Intra-domain
Yap		Inter-Regional	United States	64000 bps	IP	VPN	VPN over Internet/Intra-domain
Mongolia Ulanbaatar	BIS	Intra-Regional	China	9600 bps	X.25		Router Implemented
Myanmar Yangon	BIS	Intra-Regional	China	64000 bps	IPS		

Administration and Location	Type of Router	Type of Interconnection	Connected Router	Bandwidth	Network Protocol	Via	Remark
1	2	3	4	5	6	7	8
	BIS	Intra-Regional	Thailand	32000 bps	IPv4	VSAT	Implemented
Nepal Kathmandu	BIS	Intra-Regional	China	9600bps	X.25		Router Implemented
	BIS	Intra-Regional	India	64000 bps	IPS		Implemented
New Caledonia Noumea			Fiji	64000 bps	IPS (IPv4)	DDN	Intra-domain - Implementation 2016 Connect with Wallis
New Zealand Christchurch	BIS	Intra-Regional	Australia	64000 bps	IPS	VPN	Not Implemented
			Cook Is.	796 kbps	IPS		Intra-domain
			French Polynesia	64000 bps	IPS		Intra-domain
			Samoa	1.1 Mb	IPS		Intra-domain
			Tonga	85000 bps	IPS		Intra-domain
	BIS	Inter-Regional	USA	64000 bps	IPS		
Pakistan Karachi	BIS	Intra-Regional	Afghanistan	64000 bps	IPS		
	BIS	Intra-Regional	China	64000 bps	X.25		
	BIS	Intra-Regional	India	64000 bps	IPS		IOT/POT completed. TMC to be signed
	BIS	Inter-Regional	Oman	64000 bps	-		
	BIS	Inter-Regional	Iran	64000 bps	-		
	BIS	Inter-Regional	Kuwait	64000 bps	-		
Philippines	BIS	Intra-Regional	Hong Kong, China	64000 bps	X.25/IPS	DDN	Scheduled for Q4/2016
	BIS	Intra-Regional	Singapore	64000 bps	IPv4	DDN	2016
		Intra-Regional	United States	64000 bps	IPS		to be implementated in 2016
Republic of Korea Seoul	BIS	Intra-Regional	China	64000 bps	X.25		Implemented
	BIS	Intra-Regional	Japan	64000 bps	IPS(IPv4)	VPN	Implementation from 2016 onwards scheduled after CRV
Samoa Faleolo			New Zealand	1.1 Mb	IPS		Intra-domain
Singapore Singapore	BBIS	Intra-Regional	Australia	64000 bps	CLNP/IP-SNDCF	DDN	ATN/AMHS trial planned to completed by end 2015
	BBIS	Inter-Regional	Bahrain	64000 bps	IPv4	DDN	

Administration and Location	Type of Router	Type of Interconnection	Connected Router	Bandwidth	Network Protocol	Via	Remark
1	2	3	4	5	6	7	8
	BIS	Intra-Regional	Brunei	9600 bps	IPv4	DDN	ATN/AMHS trial commence on 2017
	BBIS	Intra-Regional	India	64000 bps	X.25	DDN	Implemented
	BIS	Intra-Regional	Indonesia	64000bps	IPv4	VSAT	ATN/AMHS trial to be completed by end 2015. Implementation Plan Q1/16
	BBIS	Intra-Regional	Japan	64000 bps	IPS/SNDCF	DDN	ATN/AMHS trial commence on 2017 Scheduled for Q1/2018
	BIS	Intra-Regional	Malaysia	64000 bps	IPv4	VSAT	Scheduled for Q1/2018
	BIS	Intra-Regional	Philippines	64000 bps	IPv4	DDN	2016
	BIS	Intra-Regional	Sri Lanka	64000 bps	IPv4	DDN	Implementation Plan Q1/16
	BBIS	Intra-Regional	Thailand	64000 bps	CLNP/X.25	DDN	Implemented
	BBIS	Inter-Regional	United Kingdom	128000 bps	IPv4	VPN	Implemented
	BIS	Intra-Regional	Viet Nam	9600 bps	X.25	DDN	ATN/AMHS trial planned to completed by end 2015
Sri Lanka Colombo	BIS	Intra-Regional	India	64000 bps	IPS	DDN	Implementation Plan Q4/15
	BIS	Intra-Regional	Maldives	64000 bps	X.25		TBD
	BIS	Intra-Regional	Singapore	64000 bps	IPv4	DDN	Implementation Plan Q1/16
Thailand Bangkok	BIS	Intra-Regional	Bangladesh	32000 bps	IPv4	VSAT	Implemented
	BIS	Intra-Regional	Cambodia	64000 bps	IPv4	VSAT	Implemented
	BBIS	Intra-Regional	China	64000 bps	CLNP/X.25	DDN	
	BBIS	Intra-Regional	Hong Kong, China	64000 bps	CLNP/X.25	DDN	Implemented
	BBIS	Intra-Regional	India	64000 bps	X.25	DDN	Implemented
	BBIS	Inter-Regional	Italy	64000 bps	IPv4	DDN	
	BIS	Intra-Regional	Lao PDR.	32000 bps	IPv4	VSAT	Implemented
	BIS	Intra-Regional	Malaysia	64000 bps	IPv4	VSAT	Implemented
	BIS	Intra-Regional	Myanmar	32000 bps	IPv4	VSAT	Implemented
	BBIS	Intra-Regional	Singapore	64000 bps	CLNP/X.25	DDN	Implemented
	BIS	Intra-Regional	Viet Nam	64000 bps	IPv4	VSAT	
Tonga Tongatapu	BIS	Intra-Regional	New Zealand	85000 bps	IPS		Intra-domain

Administration and Location	Type of Router	Type of Interconnection	Connected Router	Bandwidth	Network Protocol	Via	Remark
1	2	3	4	5	6	7	8
Tuvalu Faleolo	BIS	Intra-Regional	Fiji	Internet	IPv4	VPN	Intra-domain (User Agent) - Implementation Q3 2015
United States Salt Lake City	BBIS	Inter-Regional	Australia	64000 bps	IPS		
			American Samoa				Intra-domain
	BBIS	Inter-Regional	Fiji	9600 bps	CLNP/X.25-SNDCF	DDN	The protocol will upgrade to IPS/SNDCF in 2016
	BBIS	Inter-Regional	Japan	64000 bps	X.25-SNDCF	DDN/ VPN	Implemented
		Intra-Regional	Marshall Islands	64000 bps	IP		Intra-domain/Internet
		Intra-Regional	Micronesia, Federated State of	64000 bps	IP		Intra-domain
	BIS	Inter-Regional	New Zealand	64000 bps	IPS		Implemented
		Intra-Regional	Philippines	64000 bps	IP		to be implementated in 2016
Viet Nam Ho Chi Minh/Hanoi	BIS	Intra-Regional	China	9600 bps	X.25		
	BIS	Intra-Regional	Hong Kong, China	64000 bps	X.25	DDN	TBD
	BIS	Intra-Regional	Lao PDR.	9600 bps	X.25		
	BIS	Intra-Regional	Singapore	9600 bps	X.25	DDN	ATN/AMHS trial planned to completed by end 2015
	BIS	Intra-Regional	Thailand	64000 bps	IPv4	VSAT	
Wallis Islands	BIS	Intra-Regional	Fiji	Internet	IPv4	VPN	Connect with New Caledonia - Implemente in 2016