



**INTERNATIONAL CIVIL AVIATION ORGANIZATION  
ASIA AND PACIFIC OFFICE**

**REPORT OF  
THE SEVENTH MEETING OF  
THE COMMON AERONAUTICAL VPN OPERATIONS GROUP (CRV OG/7)**

(Bangkok, Thailand, 20 – 22 January 2020)

The views expressed in this Report should be taken as those of CRV OG/7 Meeting and not of the Organization. This Report will be provided for review by ACSICG/7 and CNS SG/24 Meetings for further action.

## **HISTORY OF THE MEETING**

History of the Meeting .....	ii
Attendance .....	ii
Officers and Secretariat.....	ii
Organization, working arrangement, language and documentation.....	ii

## **REPORT ON AGENDA ITEMS**

Agenda Item 1:	Adoption of Agenda.....	1
Agenda Item 2:	Review and update the AMHS/ATN Implementation Status table and the APAC CRV Implementation Table .....	1
Agenda Item 3:	Discuss and endorse CRV operating manual - CRV monthly operational performance report; and - to include the process of connection with service providers .....	5
Agenda Item 4:	Review the progress on the next step for using the rest of CRV Pioneer States Contribution to the ICAO Manged Service Agreement (MSA) including scope of work (SOW) to be agreed .....	6
Agenda Item 5:	Inter-regional CRV implementation (Bahrain and Russian Federation).....	7
Agenda Item 6:	MPLS/IP based inter-regional connection .....	7
Agenda Item 7:	Share best practices on cybersecurity and develop agenda items for joint Session of ACSICG/CRV/SWIM TF on cyber safety/security and resilience .....	8
Agenda Item 8:	Updates Subject/Task List of CRV OG .....	9
Agenda Item 9:	Next meetings and any other business .....	9

## **LIST OF APPENDICES**

Appendix A:	Updated AMHS/ATN/AIDC Table
Appendix B:	APAC CRV Implementation Table
Appendix C:	CRV Operations Manual (Flimsy 1)
Appendix C:	Updated Subject/tasks List
Appendix D:	National focal contact points for CRV Implementation

## **LIST OF ATTACHMENTS**

Attachment 1:	List of participants
Attachment 2:	List of working and information papers

-----

## 1. History of the Meeting

1.1 The Seventh Meeting of the Common aeRonautical Virtual Private Network Operations Group of APANPIRG (CRV OG/7) was held at the Conference Building of ICAO Asia Pacific Office, Bangkok, Thailand from 20 to 22 January 2020.

1.2 The Co-Chair of CRV OG, Mr. Terence Palmer welcomed all participants, recalled the achievements made since CRV OG/6 and the main tasks that need to deal with by the CRV OG/7. Mr. Hoang Tran, Chairman of ACSICG explained the reason for adjusting dates of this meeting in following up the CNS SG/23 decision on security concerns to have a joint meeting in USA. In this connection, letter of invitation has been issued by the ICAO Regional Office and a working paper on the arrangement and proposed agenda for the AFS Safety and Protection will be discussed through a working paper from USA.

1.3 On behalf of ICAO Regional Director and the Secretariat, Mr. Li Peng, Regional Officer CNS, ICAO APAC Office welcomed to the participants to the ICAO Regional Office and thanked their administrations for continuous support to the regional CRV project at the beginning of the new year. He reminded the meeting the need to meet the target date of CRV implementation by the end of 2020 as set by DGCA Conference and emphasized the need to have the initial CRV Operations Manual to be developed by the meeting.

## 2. Attendance

2.1 The meeting was attended by 57 participants from 17 States/Administration, Australia, China, Hong Kong-China, Fiji, India, Indonesia, Japan (as an observer) Malaysia, Myanmar, Nepal, Philippines, Papua New Guinea, Republic of Korea, Russian Federation, Singapore, Thailand and USA. Representatives from ICCAIA (AIREON) and PCCW Global also participated in the meeting. The List of Participants is provided in **Attachment 1** to this Report.

## 3. Officers and Secretariat

3.1 Mr. Terence Palmer from Airservices, Australia and Mr. Kelepi Dainaki from Fiji Airports co-chaired the Meeting. Mr. Li Peng and Mr. Luo Yi, Regional Officers CNS, ICAO APAC Office acted as Secretaries.

## 4. Organization, working arrangement, language and documentation

4.1 The CRV OG/7 met as a single body during the meeting. The working language for the meeting was English inclusive of all documentation and this Report. The meeting considered 10 Working Papers, 12 Information Papers and the CRV Service Report of PCCW Global for 2019, one flimsy under its nine agenda items. List of Working and Information Papers is provided in **Attachment 2** to this Report.

-----

**Agenda Item 1: Adoption of Agenda**

1.1 The agenda items presented in WP/01 was adopted by the meeting. The meeting was conducted according to a work programme agreed by the meeting.

**Agenda Item 2: Review and update the AMHS/ATN Implementation Status table and the APAC CRV Implementation Table**

2.1 Under this Agenda item, the meeting reviewed consequential actions taken by ACSICG, CNS SG/23 and APANPIRG/30 meetings. Member States/Administrations updated their implementation progress since September 2019.

**Outcome of APANPIRG/30 on AFS related matters (IP/02)**

2.2 The meeting noted the outcome of APANPIRG/30 (November 2019) meeting on AFS related matters including those relevant to CRV planning and implementation. The report of APANPIRG/30 meeting is based on the deliberations of CNS SG/23 meeting held in September 2019. The meeting report and papers of CNS SG/23 are available on the following webpage: <https://www.icao.int/APAC/Meetings/Pages/2019-CNS-SG23.aspx>

2.3 The meeting noted that the CNS SG endorsed the recommendations of CRV OG and ACSICG on the revised CRV Implementation Plan (Ver. 2) and adopted the revised the TOR of CRV OG through Decision CNS SG/23/2. The meeting also confirmed that CRV will used for support of SWIM in the APAC Region.

**Updates on the AMHS/ATN/AIDC and APAC CRV Implementation Tables (WP/02)**

2.4 The meeting reviewed and updated the AMHS/ATN/AIDC and APAC CRV Implementation Tables based on the updates since September 2019. These tables had been maintained by the contributory bodies of the CNS SG including CRV OG.

2.5 The updated AMHS/ATN/AIDC table is provided in **Appendix A** and the updated APAC CRV Implementation Table is provided in **Appendix B** to this Report.

**Feasibility of utilizing existing Satellite Link between China and Nepal while implementing CRV (WP/04)**

2.6 Nepal informed the meeting that the existing AMHS connection between Mumbai (India) and Nepal (Kathmandu) is a native X.25 connection, end to end operating over a 64Kbps international leased line connection The existing AFTN connection between Beijing (China) and Kathmandu (Nepal) remains a serial connection via a recently upgraded (2015) VSAT link using China Sat-10 (C-band) with a bandwidth of 110 Kbps. The link provided data connectivity between Beijing and Kathmandu as well as voice connectivity between Lhasa and Kathmandu.

2.7 Nepal intends to join the CRV on a staged basis and wishes to use the existing infrastructure to connect CRV with support of AMHS data connectivity as the first priority. China was requested to investigate the possibility whether the C-Band TES Satellite network connectivity to adjacent States can be

incorporated for linking to CRV such as Vietnam, Mongolia, DPR. Korea, Mongolia, and Macau China. Whereas some of these links are to be upgraded, those that have been recently upgraded include Myanmar in 2017 (BW 110 Kbps), Nepal in 2015 (BW 110Kbps) and Vietnam in 2019 (BW 330Kbps). This would reduce both period of testing and costs.

2.8 The meeting encouraged States concerned and the PCCWG to look into the proposal and to study the feasibility.

#### **CRV Status for DSNA, France (IP/05)**

2.9 France provided information about the progress of DSNA in its decision process for joining CRV. Several scenarios of implementation were considered. The benefits should be considered in the long term and especially the opening towards future data exchanges such as ADS-B and AIDC etc. and some services such as SWIM. There is only one Telecommunication Provider in New-Caledonia and also in French Polynesia. In order to avoid Single Point of Failure, the best scenario is to set-up a VSAT connection to CRV core network with a back-up over Internet. The decision needs to be made soon, taking into account the requirement of ICAO to implement CRV no later than 2020.

#### **Progress of CRV Implementation in India (IP/06)**

2.10 India updated the meeting on CRV Implementation status. India (AAI) has shared High Level questionnaire with M/s PCCW Global Ltd. for assessment/comment to plan, design and implement CRV in India along with bandwidth and media redundancy requirement after successful completion of the POC. In response to the high level questionnaire, the draft service order along with agreement proposal for CRV implementation in India has been received from M/s PCCWG in 2019. The wording of Article 19.1 of Terms and Conditions (Taxes, Fees and Duties) of the agreement which is contradictory in nature with respect to taxes. Stalemate is on the issue related to "Withholding Tax" applicable on the payments that will be made by AAI in India to M/s PCCWG. It was noted that India had recently signed a treaty for avoidance of double taxation with Hong Kong-China which has come into effect in India with effective date from 01 April 2019. In terms of the said treaty, it is possible for PCCWG to seek credit in respect of taxes paid in India against its tax liability in Hong Kong.

2.11 The PCCWG is therefore requested to discuss this matter bilaterally with India and work out a way forward. This may not impact other States.

#### **Fiji Implementation of Voice & AMHS/AIDC over CRV Network (IP/07)**

2.12 Fiji updated the meeting on the successful implementation of voice and AMHS/AIDC services with Australia, New Zealand & USA over the CRV network. The CRV NID was installed in December 2019. Fiji had completed the migration of ATS Voice and AMHS/AIDC with States that have joined CRV as provided in the Table below:

<b>STATES</b>	<b>CRV IMPLEMENTATION</b>	<b>ATS VOICE SERVICES</b>	<b>AMHS/AIDC SERVICES</b>	<b>REMARKS</b>
Australia	January, 2019	April, 2019	June, 2019	Complete ATS Voice: April, 2019 Complete AMHS/AIDC: June, 2019

New Zealand	January, 2019	March,2019	Connected via Australia	Complete ATS Voice: April, 2019
USA	January, 2019	February, 2019	March, 2019	Complete ATS Voice: March, 2019 Complete AMHS/AIDC: April, 2019

2.13 The Operational performance of the Voice & AMHS/AIDC services over the CRV has been satisfactory since it was commissioned for operation in July, 2019. ATC has acknowledged the improvement in voice quality for communication using VoIP. To improve the reliability of the CRV, Fiji plans to upgrade the current CRV Package C+ to CRV Package B+ to enhance connection resiliency.

**Implementation Plan for CRV and Cyber Security Concern in Indonesia (IP/08)**

2.14 Indonesia informed the meeting that they would use 2 package A with 2 Mbps bandwidth that connect to 2 centers in in Jakarta Centre (JATSC) and Ujung Pandang Centre (MATSC) respectively to achieve high availability and alternate functions. Both connections will service for all applications including AFTN/AMHS, AIDC, Voice, ADS-B data sharing. The target date for implementation with counter parts except for with India and Sri Lanka are shown in the following table:

	AIDC	AFTN/AMHS	ADS-B	VOICE
Singapore	TBD	2020	2020	2020
Australia	2020	2020	2020	2020
Malaysia	2020	-	-	2020
Papua New Guinea	2020	-	2021	2020
Philippines	2020	-	-	2020
USA	2020	-	-	2020

**CRV Implementation Status in the Philippines (IP/09)**

2.15 The Philippines engaged a contract with PCCW Global for Package “A” on 22 March 2018 based on the ICAO Common Engineering Package which consisting of a dual 2Mbps MPLS connection to CRV network. The voice circuit over CRV between Manila and Hong Kong was first put into operations successfully on 14 August 2018. On 18 January 2019, AMHS over CRV testing was successfully conducted. The Inter-Operability Test (IOT) commenced on 28 February 2019 and completed on 4 March 2019. The Pre-Operational Test (POT) of Manila /Hong Kong AMHS over CRV started on 25 March 2019 and completed on 23 April 2019. The Technical Memorandum of Cooperation (TMC) between Philippines and Hong Kong China was officially signed on 30 April 2019. On 3 June 2019, the AMHS connection between Manila and Hong Kong was officially put into operation. Manila /Hong Kong AFTN line was then decommissioned on 31 June 2019.

2.16 The voice connection over CRV between Manila and Taipei was put into operation in March 2019. AMHS CRV Inter-Operability Test (IOT) successfully completed on 30 April 2019. On 6 September 2019, the Manila/Taipei AMHS over CRV was officially into operation. Manila/Oakland ATS voice over CRV implemented in 11 September 2019. Manila/Singapore ATS voice over CRV implemented 3 January 2020.

2.17 CRV Network Performance for 2019 in the Philippines is very satisfactory, though network outages experienced from 7 February 2019 to 14 December, 2019.

#### **Airservices Australia CRV Update (IP/10)**

2.18 Australia presented an update on the CRV implementation. Airservices elected to install 2 “Package C” CRV services. The first service was installed in the Brisbane Centre and the second service was installed in the Melbourne Centre. BGP (border gateway protocol) is deployed between Melbourne and Brisbane for failover of the CRV services in the case of a local link failure. Airservices elected to use a ping IP SLA measure to continuously test the availability of the PCCWG POP from the Customer Edge router. This enables Airservices to make routing decisions if there is a NID or a POP failure.

2.19 Due to the nature of the CRV IP addresses, Airservices was unable to use the assigned ICAO IPs in the Airservices network and was required to implement a number of double network address translations to ensure that there was no clash with internal IP addresses. Airservices did not elect to use the PCCW CRV voice services available in the NID instead use their own voice gateway. For the voice services, the challenges arose with using SIP aware firewalls in the path of the voice traffic flow. Certain SIP aware firewalls do support SIP calling with double network address translations. Due to this fact, Airservices was required to use Airservices public IP addresses into the CRV to allow the SIP calling to function correctly.

2.20 Since the migration of these services, Airservices has seen the greatly improved reliability of international network connections and improved voice quality of speech between controllers. Airservices has not experienced any loss of service due to a link failure, but rather with planned maintenance. Airservices will continue to seek to establish secure VPN tunnels over the internet between our AHMS partner states to ensure the continuity of AHMS during a CRV outage.

#### **ATN/AMHS/AIDC/CRV Implementation Status updates by Myanmar (IP/11)**

2.21 Myanmar informed the meeting that the target date of AIDC implementation with Thailand is 1Q2020 while AIDC testing with Kunming, Chennai, Kolkata and Vientiane will be conducted in 2020. Myanmar has taken a staged approach and would sign contract with PCCWG for exchanging traffic of AFTN/AMHS, AIDC and voice in 3Q2020.

#### **Discussions on the Pacific Solutions updates**

2.22 In following the discussions at CRV OG/6 meeting, the meeting was informed that the interconnection with PASNET being explored by New Zealand and PCCWG who were working on a way forward. Some solid solution proposal is expected to be presented to the AFSSP WG meeting scheduled for end of April 2020.

### Annual Performance Presentation from PCCW Global

2.23 PCCWG presented annual service performance report for 2019 for those States/Administration who had signed off the CRV service, i.e. Australia, Hong Kong-China, Fiji, Japan, New Zealand, Philippines and USA. The information on the inventory, fault ticket reported, fault case detail, Site Availability of the subscribed services. The service report format was discussed at CRV OG/6 meeting so as to give a clear view on the service performance. The CRV OG member States were happy with the report format and information provided in the report. Such reports are expected to presented to the CRV OG annually and provided on the CRV OG portal site or meeting site of CRV OG meetings.

2.24 The member States also confirmed monthly report are also regularly received from the service provider. The meeting encouraged States to make similar review with PCCW Global individually and with CRV OG regularly.

#### Agenda Item 3: Discuss and endorse CRV operating manual

- CRV monthly operational performance report; and
- to include the process of connection with service providers

#### Review the draft CRV Operations Manual (WP/03)

3.1 The meeting reviewed the comments collected by the Secretariat on the draft CRV Operations Manual resulted from CRV OG/6 meeting in May 2019. The meeting recalled that the manual is based on ITIL 2011 Processes and will govern the operations and performance of the CRV Network. The Secretariat emphasized the need to have first edition of the manual agreed for adoption by CNS SG/24 meeting in July 2020.

3.2 The ITIL Processes cover **Strategy, Design, Transition, Operation, Continual Service Improvement (CSI)**, The similar examples are also provided through hyperlinks for REDDIG, MEVA, PENS and FTI.

3.3 Agreed contents of monthly, quarterly and annual performance reports with key indicators resulted from CRV OG/6 meeting were further reviewed and agreed for consolidation into the CRV Operations Manual. The format for incidents report was agreed for inclusion into the operations manual.

3.4 The meeting further endorsed the information in the draft operations manual on connection process of a service provider to the CRV. Although further works are required on the operations manual, the meeting considered too late if the operations manual to be adopted in 2021. There is urgent need to have the first edition of the Operations Manual released in the year of completion of CRV implementation. Accordingly, the following draft Conclusion was formulated for consideration by ACSICG and CNS SG:

#### Draft Conclusion CRV OG/7/1 - CRV Operations Manual

What: That, the CRV Operations Manual provided in **Appendix C** to this Report be adopted as first Edition for use by CRV member States/Administrations.

Expected impact:

Political / Global

Inter-regional

Economic

Environmental

Ops/Technical

Why: Need an operations manual for CRV OG performance and CRV operations	Follow-up: <input checked="" type="checkbox"/> Required from States
When: 25-Jul-20	Status: Adopted by Subgroup
Who: <input type="checkbox"/> Sub groups <input type="checkbox"/> APAC States <input type="checkbox"/> ICAO APAC RO <input type="checkbox"/> ICAO HQ <input type="checkbox"/> Other: XXXX	

3.5 India proposed to develop a CRV user checklist for daily operation which could be appended to the next edition of the Operations Manual. Need was identified for the volunteers to contribute for the development and input from PCCWG is also expected.

**Agenda Item 4: Review the progress on the next step for using the rest of CRV Pioneer State contribution to the ICAO Managed Service Agreement (MSA) including scope of work (SOW) to be agreed**

**CRV Pioneer State contribution to the ICAO Managed Service Agreement (IP/12)**

4.1 Pioneer States contributed to the CRV MSA fund that was used to fund the ICAO Assistance for the procurement of Asia/Pacific Common Regional Virtual Private Network (CRV) Services (RAS14801). Currently there is an available balance of approximately USD 88,000.00 less the ICAO Technical Cooperation Bureau (TCB) service overhead. the CRV OG co-chair (Asia) and & pioneer CRV member States were tasked to investigate use the MSA funds to undertake the independent safety assessment of the CRV and seek approval from Pioneer States during CRV OG/4. Decision CRV OG/6/3 was made in May 2019 that the funds to be used for an independent assessment on the safety and security of the CRV and need was identified to develop a scope of work.

4.2 The meeting was informed that the development of a scope of work had not progressed at the time by CRV OG/6 meeting. 2020 APAC Aeronautical Fixed Service Safety and Protection Planning Working Group Meeting (AFSSP WG 2020) has been announced and will take place in 21 - 23 April 2020. The provisional agenda set for AFSSP WG 2020, closely aligns with the agreed use of the balance of the MSA funds. It would be beneficial for the resource undertaking the assessment to be present at AFSSP WG 2020. Therefore, the Co-Chair (Asia) will coordinate for a meeting early in February 2020, to finalize a scope of work to address the agreed use of the funds. Next step will then be worked out in coordination with ICAO TCB through ICAO APAC Office.

**Agenda Item 5: Inter-regional CRV implementation (Bahrain and Russian Federation)**

**CRV for AMHS Centres of the Russian Federation Interacting of COM Centres in the APAC Region (WP/07)**

5.1 Russian Federation provided updates on their plan and progress of joining CRV at number of centres (Moscow, Khavaroosk Irkusk) in Russia to interact with COM centres (Fukuoka, Beijing and Ulaanbaatar) in the APAC Region.

5.2 In following up the outcome of COM Coordination Meeting in May 2019, Russian Federation is considering options to join CRV at those designated entry/exit points in Russia with entry/exit points in the APAC Region. Russian Federation now is expecting the technical and commercial proposals from PCCWG which would be ready for sending out within 2 weeks after the meeting. It is also required to conduct some site surveys by the PCCWG. It was further informed that minimum three months would be required for Russian Federation to perform the tender process. ICAO APAC Office was also requested to issue a State Letter to Russia to confirm that the common regional service provider for the APAC Region had been selected through an ICAO Technical Cooperation process.

5.3 The all members of CRV OG attended CRV OG/7 meeting expressed their supports for Russian Federation to join CRV. China supported Russian Federation to join CRV as it would be more cost effective solution to replace the landline between Beijing and Khavaroosk which updated recently. Japan expressed no objection for Russian Federation to join CRV for use of the service to support circuits between Japan and Russia.

5.4 No further updates on potential CRV connection with MID Region were discussed at the meeting as no representatives from Bahrain presented at the CRV OG/7 meeting.

**Agenda Item 6: MPLS/IP based inter-regional connection**

**MPLS/IP Based Inter-Regional Connection (WP/10)**

6.1 The meeting agreed to a proposal to develop a high level concept on the interconnection of the CRV with other regional network such as REDDIG/MEVA/PENS. A number of States that connect to the CRV are also required to connect to other regional networks. There are potential benefits with implementing interconnections between regional networks such as harmonization and efficiency in the connection for services like SWIM and reducing costs for States that connect to other regional networks. Some States had already expressed their interest in a connection to other regional networks such as New Zealand to REDDIG and Singapore to PENS.

6.2 Noting these requirements, early discussions with these regional networks, the CRV OG and PCCWG will enhance the discussions with these regional networks at AFSSP WG 2020 how the CRV can potentially be interconnected with other regional networks.

6.3 The meeting considered necessary and important to discuss the inter regional network connectivity at the Data Communications Infrastructure Working Group of the Communications Panel to align the implementation of this concept with the directions of the this working group. Therefore, the Secretariat was requested to coordinate with the Secretary of Communication Panel for an information

paper providing guidance and guidelines from DCIWG of CP for presentation at AFSSP WG meeting in April 2020.

**Agenda Item 7: Share best practices on cybersecurity and develop agenda items for joint session of ACSICG/CRV/SWIMTF on cyber safety/security and resilience**

**CRV and AFS Safety and Protection planning (WP/06)**

7.1 In following up the outcome of CNS SG/23 meeting, FAA offered to host AFS Safety and Protection joint working group meeting scheduled for 21 to 23 April 2020 in Nevada, USA. The meeting reviewed the proposed provisional agenda item for the meeting and noted the necessary information for the participants to the meeting.

7.2 All member States of CRV OG presented at the meeting expressed their supports to organize such a meeting at the full implementation stage of CRV. The meeting considered necessary and timely to address safety and security concerns as more and more AFS and other new applications being transferred to and exchanged over CRV.

7.3 The meeting was further informed that the letter of invitation for this meeting was issued by ICAO APAC Regional Office on 16 January 2020 with reference T 8/2.10: AP018/20 (CNS). Member States were encouraged to nominate experts with knowledge and/or experience of communication network, aeronautical fixed service and information security to the meeting. ICAO Secretariat and FAA will further coordinate with experts from cybersecurity study group and NEXGEN project for their participation and contribution to the meeting. Other ICAO Mexico, Lima and Cairo regional offices and States in those regions should also be encouraged to participate in the meeting.

**Voice over IP Dial Plan (WP/05)**

7.4 USA shared with the meeting on a proposed dial plan to address the Voice over IP (Internet Protocol) dialing table used for communications between Japan and FAA. Air Traffic Service (ATS) voice communications over CRV will be used for air traffic transfer between Japan ATMC and the FAA. PCCW Global will perform IP digit manipulation. A comprehensive dial plan is required to provide to PCCW to ensure proper call routing.

7.5 The phone numbers for the various Air Traffic Controller positions in Japan and the FAA are required. Implementing VoIP into current CRV telecomm design requires Japan and the FAA submit information about dialing procedures performed by each entity and their voice switching equipment. These procedures will have dial sequences that will be translated between the two organizations using CRV network equipment. Translation of digits should be transparent to Air Traffic Controllers.

7.6 Adherence to ICAO dial plan format is necessary. ICAO has developed a format in which these translations should occur. An 8-digit numbering plan that looks like this:

- 1-3 digits will be for the Country Code/Area Identifier (AA) – E.164;
- 2 digits will be for the ANSP Centre code (CC) – ANSP provided; and
- 3 digits for the operator position (OO) – ANSP provided

7.7 The meeting considered necessary to maintain a table with VoIP dial plan for whole APAC Region. The table should be kept updated by PCCWG and forwarded to co-chair of CRV OG for posting on the CRV Portal.

**FAA International User Portal (IP/04)**

7.8 Through the paper, USA informed the meeting of a proposed plan to address the FAA's platform for providing IP services connectivity to external users using the International User Portal (IUP).

7.9 International Partner circuits connect to FTI through a set of routers positioned on the external side of the FAA's NESG (NAS Enterprise Security Gateway). The IUP provides IP (Internet Protocol) access for IP applications. IUP supports both IPv4 and IPv6 as well as operability between the two protocols. The IUP platform is implemented by L3Harris at three locations: ATL NEMC (Network Enterprise Management Center), SLC NEMC, and the FAA Tech Center (for testing).

7.10 Security in the IUP is configured in a 4-zone format: External Connection, Ops IP Connection, Internal DMZ, and External DMZ. IP tunnels, Firewalls, NATs (Network Address Translations), and ACLs (Access Control Lists) are used to strengthen security. Connection security is accomplished by having external IP sessions provided by a non-FAA server.

**Agenda Item 8: Update Subject/Task list of CRV OG**

8.1 The meeting reviewed and updated the list of subject/task (action items) presented by the Secretariat (**WP/09**). The list updated based on the discussions at the meeting is provided in **Appendix D** to this Report. The meeting further reviewed the national focal points of CRV Implementation currently kept in the CRV Implementation Manual. The meeting agreed to have it kept duplicated and posted on the ICAO webpage separately under APAC eDocument. The updated list of national focal points of CRV Implementation is provided in **Appendix E** to this Report.

**Agenda Item 9: Next meeting and any other business**

**Proposal to use CRV for Space based ADS-B (IP/03)**

9.1 PNG and ICCAIA jointly made a presentation on use of CRV for delivery of surveillance data from spaced based ADS-B. PNG Air Services Limited (PNGASL) has contracted for the supply of space based ADS-B data from Aireon LLC and is intending to contract for a CRV connection in early 2020 for a number of applications including space based ADS-B. One prime purpose for using CRV is to reduce the need for point to point circuits and would result in lower data communications costs for ANSPs. Aireon and PNG ASL believe that delivery of space based ADS-B via CRV will achieve these objectives. Indonesia expressed support to PNG's proposal to use CRV for distribution of space based ADS-B data.

9.2 The meeting was informed that the space based ADS-B is now fully operational. The service is being used by Canada and United Kingdom to separate aircraft in the Atlantic Ocean (using trial ASEPS procedures) and over continental Canadian airspace using 5 NM separation standards. In June 2019 Aireon was officially approved by the European Union Aviation Safety Agency (EASA) as an **Air Navigation Service Provider (ANSP)** Organization to provide Air Traffic Management (ATM)/Air

Navigation Service (ANS) surveillance services, to support the separation of aircraft. This authorizes Aireon as the first-ever certified provider of aircraft surveillance-as-a-service.

9.3 A number of participants asked for cost and benefit comparison between CRV and dedicated circuits used for delivery spaced based ADS-B data. Australia, Fiji and PCCWG were requested to develop a charging structure as soon as possible for an ANSP service provider to receive surveillance data so as to facilitate conducting CBA by ANSPs.

#### **SWIM Demonstration on CRV (WP/08)**

9.4 Hong Kong China, Thailand, Singapore and PCCWG jointly presented a proposal for SWIM Demonstration on CRV to be hosted by Hong Kong China in March 2020 to demonstrate the exchange of SWIM data over CRV, which is a potential hybrid SWIM infrastructure presented in HKCAD's previous paper at CRV OG/5 meeting. The demonstration would be conducted over a dedicated mini-CRV to be provided by PCCWG for the demonstration which would not impact normal operations for the routine traffic being exchanged over CRV. The SWIM Demonstration on CRV will showcase the operational benefits in using CRV to carry SWIM data and the corresponding services envisaged as necessary or complementary to support implementation of SWIM in APAC region through an operational scenario with real exchange of SWIM data.

9.5 The member States of CRV OG presented at the meeting fully supported the demonstration to be conducted by States concerned with PCCWG as it is a further step forward after SWIM Demonstrations in ASEAN were conducted in Bangkok and Singapore in November 2019. The result of the demonstration is expected to be presented to ACSICG/7 and SWIMTF/4 meetings in May 2020.

9.6 Although it will not be an open invitation to States, member States of CRV OG who have interest to participate in the demonstration are welcome. The host administration CAD. Hong Kong China may be approached for their participation.

#### **A State Letter to remind States to join CRV**

9.7 Secretariat was requested to coordinate with Australia and USA for a State Letter to remind those States/Administrations not yet joining CRV to expedite the service purchasing process for joining CRV in order to achieve harmonized implementation and early benefits as target date for regional implementation is 2020.

#### **Next meeting of CRV OG**

9.8 Accordingly TOR of CRV OG, the face to face meeting should be once a year i.e. annually meeting. The rest should be conducted through teleconference. The meeting agreed to have its next meeting in conjunction with ACSICG meeting in 2021. Some member States prefer not to have the meeting held on 12-14 May 2021.

-----

CRV OG/7  
Appendix A to the Report

**ATN/AMHS/AIDC Implementation Status in the APAC Region**

State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AMHS Vendors Selected	AIDC	ATM System selected to support AIDC and Associated ICD (Implementation Status of the Basic 5 message set supported)	Remarks
AFGHANISTAN					
AUSTRALIA	<p>ATN tests were conducted. BIS Router and Backbone BIS Router and AMHS implemented.</p> <p>AMHS has been migrated to CRV.</p> <p>Connection with Singapore using AMHS was implemented October 2016;</p> <p>Another AMHS connections pending CRV (target date by March 2020) including both connection with New Zealand and USA.</p> <p>AMHS connection with Indonesia pending on CRV implementation</p> <p>AMHS connection with South Africa has been established</p> <p>Plan to upgrade AMHS support IWXXM traffic from Nov. 2020.</p>	COMSOFT	<p>AFTN/AMHS based AIDC Implemented between Brisbane and Melbourne, Oakland, Nadi and Auckland;</p> <p>Implemented between Melbourne and Johannesburg;</p> <p>AIDC is also in use between Melbourne and Mauritius;</p> <p>Operational trial between Brisbane and Ujung Pandang since May 2013. Implementation in July 2017. LOA needs to be updated.</p>		

CRV OG/7  
Appendix A to the Report

State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AMHS Vendors Selected	AIDC	ATM System selected to support AIDC and Associated ICD (Implementation Status of the Basic 5 message set supported)	Remarks
<b>BANGLADESH</b>	In Q1/2013, Bangladesh installed ATN/AMHS and BIS Router at Dhaka (VGHS) with User Agents at Chittagong (VGEG) and Sylhet (VGSY).	COMSOFT	Tentative date of implementation of AIDC is Q4 of 2018 with Kolkata and Myanmar.		<p>The Bangladesh ATM Upgrade Project (BATMUP) under Public Private Partnership (PPP) in Dhaka is expected to be completed by 2018.</p> <p>As soon as the ATM up-gradation is completed hopefully Bangladesh will be able to implement AIDC with Kolkata and Myanmar by the end of 2018.</p>
<b>BHUTAN</b>	<p>ATN/AMHS circuits, using IP over VPN, with Thailand (Bangkok) and India (Mumbai) commissioned in June and July 2017 respectively.</p> <p>IOT and POT with Mumbai completed on 27<sup>th</sup> June 2017.</p> <p>IOT and POT with Thailand completed on 2<sup>nd</sup> May 2017.</p>	AEROTHAI'S AMHS System	Currently not applicable. If required in the future, will be decided after CRV implementation (scheduled for mid-2019).		

CRV OG/7  
Appendix A to the Report

State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AMHS Vendors Selected	AIDC	ATM System selected to support AIDC and Associated ICD (Implementation Status of the Basic 5 message set supported)	Remarks
	TMC signing with both countries at final stage.				
<b>BRUNEI DARUSSALAM</b>	ATN BIS Router planned for 2015 and AMHS planned for 2015				
<b>CAMBODIA</b>	BIS Router and AMHS installed. Cambodia (CATS) AMHS connected with Bangkok via VSAT IP link since 10 December 2013	AVITECH	AIDC function and capability made available.  Ready for testing with neighbors ATS Facilities starting from 2017 and target date of implementation with Bangkok in 4Q2019	THALES which supports AIDC ICD Version 1.	
<b>CHINA</b>	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.  The Beijing-Hong Kong AMHS link was put into operation in 2018;  With Thailand is completed POT, after sign the TMC circuit and was put into operation in Q12020  AMHS/ATN technical tests with Macau completed in 2009. Plan for ATN/AMHS implementation with Macao China in 2019.	IN-HOUSE (Aero-Info Technologies Co., Ltd)	AIDC between some of ACCs within China has been implemented. AIDC between several other ACCs are being implemented.  AIDC between Sanya and Hong Kong put in to operational use since 8 Feb 2007.  AIDC between Dalian and Incheon implemented in Nov. 2016;		

CRV OG/7  
Appendix A to the Report

State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AMHS Vendors Selected	AIDC	ATM System selected to support AIDC and Associated ICD (Implementation Status of the Basic 5 message set supported)	Remarks
	<p>ATN/AMHS circuit with ROK has been put into operation since June 2011.</p> <p>ATN/AMHS tests with India has been put into operation since 2016.</p> <p>ATN and AMHS IOT with Mongolia is completed in May 2018. Plan for commissioning after POT completion in 2020</p> <p>Connection tests with Nepal is TBD.</p> <p>AMHS testing with Japan in 2020.</p> <p>AMHS testing with Russia in 2020.</p>		<p>Guangzhou with Nanning/Zhanjiang/Zhuhai implemented;</p> <p>Nanning and Kunming/Guiyang/Zhanjiang implemented in 2011; Zhanjiang/Haikou;</p> <p>Chengdu and Chongqing/Guiyang implemented in 2011;</p> <p>Guiyang and Chongqing/Kunming implemented in 2011;</p> <p>For Beijing/Ulaanbaatar, planned date of testing in 2020.</p>		
<b>HONG KONG, CHINA</b>	<p><b>Manila / Philippines</b> CRV/AMHS circuit was put into operation in May 2019.</p> <p><b>Beijing / China</b> ATN/AMHS circuit was put into operation in 2018. Plan to migrate to CRV in 2020.</p> <p><b>Bangkok / Thailand</b> ATN/AMHS circuit was put into operation use in 2014. Plan to migrate to CRV in Q32020.</p>	COMSOFT	<p>AFTN-based AIDC with Sanya put into operational use in Feb 2007. AIDC technical trial with Taipei conducted in 2010 and completed in 2012 and put into operational use in Nov. 2012</p> <p>AIDC technical and interoperability tests with Guangzhou were conducted successfully in April and</p>	Raytheon ATM system Support AIDC ICD Version 3 commissioned in November 2016.	Already support exchange of IWXXM messages based on FTBP.

CRV OG/7  
Appendix A to the Report

State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AMHS Vendors Selected	AIDC	ATM System selected to support AIDC and Associated ICD (Implementation Status of the Basic 5 message set supported)	Remarks
	<p><b>Fukuoka / Japan</b> Currently on AFTN. Plan to cut over to CRV/AMHS in Q1 2020.</p> <p><b>HoChiMinh / Vietnam</b> Currently on AFTN. Plan to test ATN/AMHS in 2020.</p> <p><b>Taibei</b> Currently on AFTN. Plan to test CRV/AMHS in 2020</p>		<p>June 2017 respectively and put into operational use in May 2018.</p> <p>AIDC technical and interoperability tests with Manila were conducted successfully in May 2018 with no observations on exchanging core set messages (EST, ACP, TOC, AOC, LAM, LRM). AIDC operational trial with Manila was commenced in March 2019.</p>		
<b>MACAO, CHINA</b>	<p>ATN/AMHS interoperability test with Beijing commenced in March 2009.</p> <p>ATN/AMHS circuit with Hong Kong put into operational use in end Dec. 2009. ATN/AMHS implementation with mainland China planned for 2019.</p>	COMSOFT	(Not applicable for using AIDC, looking into the possible application (some way) between TWR and ACC/APP).		
<b>COOK ISLANDS</b>					
<b>DEMOCRATIC PEOPLE'S REPUBLIC OF KOREA</b>	The ATN BIS Router and AMHS planned for in 2011.		With neighboring ACCs to be implemented		

CRV OG/7  
Appendix A to the Report

State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AMHS Vendors Selected	AIDC	ATM System selected to support AIDC and Associated ICD (Implementation Status of the Basic 5 message set supported)	Remarks
<b>FIJI ISLANDS</b>	<p>ATN BBIS IPS router and AMHS implemented over CRV for connection to USA in April, 2019 with Australia planned for June, 2019.</p> <p>For connections with sub-regional centers: For New Caledonia using AMHS since 2017; For connection with Kiribati using UA/AMHS implemented in 2015.</p>	COMSOFT	AFTN based AIDC implemented between Nadi/ Brisbane, Auckland and Oakland.	<p>- Support and implemented AIDC messaging: ABI, EST, CPL, CDN, ACP, TOC, AOC with all three centers</p> <p>- AIDC ICD version 2.0 implemented with Auckland and Oakland.</p> <p>- AIDC ICD Version 1.0 implemented with Brisbane</p>	
<b>FRANCE</b> <i>(French Polynesia Tahiti)</i>	<p>Planned for implementation of AMHS in 2020.</p> <p>Using IP with New Zealand since 2017.</p>		Implementation of AIDC (based on Version 3) with adjacent centers (Oakland and Auckland) since 2009.	THALES EUROCAT for AIDC	Alternate routing for backup between Tahiti and Christchurch via Tahiti/New Caledonia IP link
<b>INDIA</b>	<p>Dual stack ATN/IP router and AMHS implemented at Mumbai in 2011.</p> <p>Operational AMHS connections with Bangkok, Dhaka, Singapore, Kathmandu, Karachi implemented.</p> <p>With Beijing implemented in 2016;</p> <p>With Colombo implemented in May2017;</p> <p>With Bhutan implemented in July 2017;</p> <p>Planned for Nairobi in Q1 2020 and Muscat for 2020.</p>	COMSOFT	<p>-15-May-2017, AIDC implemented between Chennai and Kuala Lumpur with ABI and EST messages. CDN is done with voice confirmation. TOC/AOC to be implemented;</p> <p>- Chennai-Colombo under test trial;</p> <p>- Chennai-Male under test trial;</p> <p>- Chennai-Yangon under test trial;</p>	<p>1) Raytheon at Mumbai and Chennai.</p> <p>2) Selex at Hyderabad and Bengaluru.</p> <p>3) INDRA at 40 locations</p>	<p>1) Major Indian airports and ATC centers have integrated ATS Automation Systems having AIDC capability. Successful AIDC trials have been carried out amongst major ATSUs within India.</p> <p>2) AIDC implemented between Chennai and Mumbai.</p> <p>3) AMHS implemented and working between</p>

CRV OG/7  
Appendix A to the Report

State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AMHS Vendors Selected	AIDC	ATM System selected to support AIDC and Associated ICD (Implementation Status of the Basic 5 message set supported)	Remarks
			<ul style="list-style-type: none"> <li>- Mumbai-Male test trials completed; LOA signed.</li> <li>- Trivandrum-Male under test trial. LOA signed.</li> <li>- Mumbai-Muscat under test trial;</li> <li>-Ahmedabad-Karachi under test trial. LOA signed.</li> </ul>		<ul style="list-style-type: none"> <li>A. BBIS: Mumbai-Singapore, Bangkok</li> <li>B: BIS: Mumbai, Kathmandu, Dhaka, Karachi, Colombo &amp; Paro</li> </ul>
INDONESIA	<p>ATN BIS Router and AMHS with Singapore implemented Since February 2018;</p> <p>AMHS Trial (IOT) with Brisbane pending for CRV implementation.</p>	<p>IDS</p> <p>ELSA</p>	<p>Implementation Jakarta (new ATM system in 4Q2020) The target date of AIDC implementation will commence testing in 4Q2020 including following pairs:</p> <p>Jakarta-Singapore; Jakarta-Chennai; Jakarta-Ujung Pandang; Jakarta-Melbourne; Jakarta – Kuala Lumpur</p> <p>Ujung Pandang –Brisbane: implemented in July 2017. Ujung Pandang – Manila - Successful testing conducted; Target date of implementation 4Q2019</p> <p>Ujung Pandang - Kota Kinabalu - Implementation date TBC</p>	Thales in Makassar able to support ICD Version 3 since December 2015	For CRV, contract in 1Q2020 and implementation in 2Q2020

CRV OG/7  
Appendix A to the Report

State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AMHS Vendors Selected	AIDC	ATM System selected to support AIDC and Associated ICD (Implementation Status of the Basic 5 message set supported)	Remarks
			<p>-Ujung Pandang – Oakland, test conducted, and target date for implementation in 3Q2019.</p> <p>- Ujung Pandang – PNG trial 3Q2020</p>		
<p><b>JAPAN</b></p>	<p>ATN BBIS router and AMHS installed at 2000. Connection tests with USA 2000 - 2004 and put into operational use in 2005.</p> <p>ATN BBIS router (to apply to Dual Stack) and AMHS (to upgrade in 2015. The connection test with each country which is not currently connecting is started after update.</p> <p>Upgrading connection with Hong Kong and Singapore using VPN will be implemented in 2020 after implementation of CRV.</p> <p>Coordinating for all other circuits upgrading.</p>	<p>NEC</p>	<p>AIDC implemented between Fukuoka ATMC and Oakland ARTCC in 1998.</p> <p>AIDC implemented between Fukuoka ATMC and Anchorage ARTCC in 2005.</p> <p>AIDC implemented between Tokyo ACC/Fukuoka ACC and Incheon ACC in 2010.</p> <p>Implemented between Fukuoka and Incheon since June 2009.</p> <p>AIDC implemented between Fukuoka ACC/Naha ACC and Taipei ACC implemented.</p> <p>AIDC between Fukuoka ACC and Shanghai ACC under negotiation.</p>		<p>Japan and USA conducting testing AIDC over AMHS and cutover date is 5 May 2017.</p>

CRV OG/7  
Appendix A to the Report

State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AMHS Vendors Selected	AIDC	ATM System selected to support AIDC and Associated ICD (Implementation Status of the Basic 5 message set supported)	Remarks
<b>KIRIBATI</b>	Connection with Nadi using UA/AMHS implemented in 2015.				
<b>LAO PDR</b>	ATN BIS Router and AMHS completed, planned for operation with Bangkok since 4Q 2016.	THALES	<p>AIDC testing with Bangkok in 2017 and target for implementation in 4Q2019.</p> <p>Testing with Hanoi on-going since 2017; with Cambodia operational test again in June 2018, and implementation 2Q 2019. Testing with Kunming and Yangon ongoing.</p>	THALES which is able to support ICD Version 2.	
<b>MALAYSIA</b>	<p>ATN BIS Router completed 2007. AMHS implementation planned for Q42017;</p> <p>Malaysia – Singapore for AMHS implementation in March 2020.</p> <p>Malaysia – Thailand for AMHS implementation in 2019.</p>	FREQUENTIS	<p>AIDC testing with Bangkok ACC conducted since 2016. Operational trial will commence in August 2019.</p> <p>AIDC Between Kuala Lumpur/ Chennai implemented in phases from May 2017 implementation for ABI, EST and MAC along with response messages LAM, LRM and ACP. Review on the CDN message implementation conducted in Aug. 2017. SOP signed 26 April, 2017.</p> <p>AIDC testing with Singapore on going since</p>	SELEX which is able to support ICD Version 3.	

CRV OG/7  
Appendix A to the Report

State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AMHS Vendors Selected	AIDC	ATM System selected to support AIDC and Associated ICD (Implementation Status of the Basic 5 message set supported)	Remarks
			<p>2016. Target date for operational trial from 3Q2018, and Implementation 2Q2019.</p> <p>Planned testing with Ho Chi Minh ACC – 3Q2019;</p> <p>AIDC between KK ACC and Manila ACC in 4Q2020 and technical testing 2Q 2019.</p> <p>KK ACC with Ujung Pandang TBC;</p> <p>AIDC between Kuching ACC and Singapore planned for 2Q2020;</p> <p>AIDC technical test between Kota <u>Kinabalu</u> ACC and Singapore planned for 3Q2019;</p> <p>AIDC between Kuala Lumpur and Jakarta testing planned for 4Q2020.</p>		
<b>MALDIVES</b>	<p>In the process of replacing the existing operational AFTN system by AMHS. It is expected to complete the installation before the end of 2019.</p> <p>With the new AMHS, it is planned to establish a new IP connection between an additional</p>		<p>Connection established with all the adjacent ATSUs. Interoperability tests successfully completed in 2017.</p>	SELEX which is able to support ICD Version 3.	

CRV OG/7  
Appendix A to the Report

State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AMHS Vendors Selected	AIDC	ATM System selected to support AIDC and Associated ICD (Implementation Status of the Basic 5 message set supported)	Remarks
	<p>neighboring ATSU as the current link is an X.25 connection between Colombo.</p> <p>Also will look for the possibility of implementing the CRV network to use with AMHS and AIDC during the same phase.</p>		<p>LOA signed for operational trials between Mumbai, Chennai, and Trivandrum. Operational trials were also successful with these ATSUs, while several issues were resolved from both ends.</p> <p>Ready to sign LOA with Melbourne and is expected during the 2nd quarter of 2019.</p> <p>Trials with Colombo had few issues, which Colombo is working to resolve it on their end with the automation system supplier. Connections between all 5 ATSUs are turned ON in the ATS automation system to conduct pre-notified operational trials.</p>		
<b>MARSHALL ISLANDS</b>					
<b>MICRONESIA (EDERATED STATES OF)</b>					

CRV OG/7  
Appendix A to the Report

State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AMHS Vendors Selected	AIDC	ATM System selected to support AIDC and Associated ICD (Implementation Status of the Basic 5 message set supported)	Remarks
Chuuk					
Kosrae					
Pohnpei					
Yap					
<b>MONGOLIA</b>	<p>AMHS/AFTN gateway implemented 2012.</p> <p>ATNBIS router implemented in 2014.</p> <p>ATN and AMHS IOT with China was completed in May 2018. Plan for commissioning after POT completion in 2019.</p>	COMSOFT	<p>ATM automation system supports both AIDC and OLDI.</p> <p>Coordinating with Russia on OLDI connection in target date 2016.</p> <p>Coordinating with China on AIDC connection between Beijing/Ulaanbaatar technical trials in progress. Planned date of testing in 2019.</p>	INDRA Aircon 2100 supporting AIDC ICD Version 2.	
<b>MYANMAR</b>	<p>AMHS including AFTN/AMHS gateway implemented in Nov. 2011;</p> <p>Connection with Thailand implemented in 4Q2016;</p> <p>Planned for AMHS connection with Beijing. Target date TBC.</p>	THALES	<p>AIDC connection pre-operation test with Thailand conducted in 4Q2017 and Target date of implementation 1Q2020; AIDC testing with Kunming Chennai, Kolkata and Vientiane conducted in 2020.</p>	THALES Automation system (Topsky ATC supports APAC AIDC ICD Ver. 2.	
<b>NAURU</b>					

CRV OG/7  
Appendix A to the Report

State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AMHS Vendors Selected	AIDC	ATM System selected to support AIDC and Associated ICD (Implementation Status of the Basic 5 message set supported)	Remarks
<b>NEPAL</b>	AFTN/AMHS Gateway implemented in 2012. AMHS implemented with India since June 2014. AFTN connection with China. Plan to test AMHS connection soon.	COMSOFT	Nepal uses custom built ATM system from NEC.  Some issues regarding ICD need to be resolved in order to proceed ahead with AIDC testing with India and China.		
<b>NEW CALEDONIA</b>	New router and AMHS commissioned December 2016	COMSOFT			
<b>NEW ZEALAND</b>	AMHS connection with the USA over CRV was implemented in April 2019. AMHS connection to Australia over CRV is scheduled for June 2019.	COMSOFT	AIDC implemented between New Zealand, Australia, Fiji, Tahiti, Chile and USA.	Supported the Basic 5 message set. ATM systems are LEIDOS and ADACEL	
<b>PAKISTAN</b>	ATN/AMHS connections with Mumbai since 2015.  Planning for AMHS connection with Beijing and Kuwait after upgrading existing facilities between the Countries. Target dates for implementation TBC.	COMSOFT	Implemented between Karachi and Lahore ACCs  Further testing to be conducted between Delhi/Karachi & Delhi/Lahore after system upgradation at Indian end; Mumbai/Karachi & AHM/Karachi on trial operation. For testing with Muscat planned for 4Q2019. Coordination for testing with Tehran is in progress.	ATM system from Intra AIRCON 2100	Existing Radar system being upgraded.

CRV OG/7  
Appendix A to the Report

State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AMHS Vendors Selected	AIDC	ATM System selected to support AIDC and Associated ICD (Implementation Status of the Basic 5 message set supported)	Remarks
<b>PAPUA NEW GUINEA</b>	<p>Currently AFTN over IP.</p> <p>AMHS implementation is planned for after successful implementation of CRV this year.</p> <p>AMHS implementation planned for 2020.</p>	<p>COMSOFT is the supplier of PNG AFTN/AMHS system</p>	<p>AIDC using AFTN operational with Australia, testing/trial with Oakland (USA) started late last year and in progress.</p> <p>AIDC implementation with Indonesia to happen after CRV implementation this year.</p>	<p>New ATM System from Thales (TopSky-ATC) implemented and operational now supports AIDC V3.</p>	
<b>PHILIPPINES</b>	<p>New ATN/AMHS was installed at the New CNS/ATM Center in Manila. Site Acceptance was successfully done on October 2015. The new AMHS commissioned and operational in March 2018. The international connection still using AFTN except Hong Kong. The AMHS Implemented over CRV with Hong Kong 1Q2019 and with Singapore is planned over CRV by end of 2Q2020.</p> <p>AMHS implementation with Oakland USA via CRV is planned for 3Q2020.</p>	<p>COMSOFT</p>	<p>On-going test with Singapore, Ujung Pandang and Taipei ACCs; Planned technical trial over new ATM system with other ACCs from 4Q2017 to 3Q2019; Coordination is underway for using AIDC function of the new ATM system with adjacent ACCs.</p> <p>Planned implementation: 2Q2019 – Singapore ACC; 4Q2019 – Ujung Pandang ACC; 3Q2019 – Taipei ACC; 2Q2019- Hong Kong ACC;</p>	<p>THALES which is able to support ICD Version 2.</p>	

CRV OG/7  
Appendix A to the Report

State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AMHS Vendors Selected	AIDC	ATM System selected to support AIDC and Associated ICD (Implementation Status of the Basic 5 message set supported)	Remarks
<b>REPUBLIC OF KOREA</b>	<p>ATN/AMHS circuit with China put into operational use in June 2011.</p> <p>AMHS implementation with China over CRV in 2Q2020.</p> <p>AMHS implementation with Japan over CRV in 4Q2020.</p>	SAMSUNG	<p>AIDC implemented between ACC and Fukuoka ATMC in 2010</p> <p>AIDC between Incheon and Dalian implemented in Nov. 2016.</p>	Rockheed Martin System	
<b>SINGAPORE</b>	<p>AMHS implemented.</p> <p>ATN/AMHS circuit with India put into operational use in March 2011.</p> <p>ATN/AMHS circuit with UK put into operational use in March 2012.</p> <p>ATN/AMHS circuit with Thailand put into operational use in December 2014.</p> <p>ATN/AMHS circuit with Australia put into operational use in October 2016.</p> <p>ATN/AMHS circuit with Indonesia put into operational use in February 2018.</p> <p>Inter-Operability Test (IOT) with Japan, Malaysia, and Vietnam started 2019, targeted in 2019. IOT with Philippines, Sri Lanka, Bahrain and Brunei targeted in 2020.</p>	FREQUENTIS COMSOFT	<p>Operational with Ho Chi Minh implemented July 2014</p> <p>Kuala Lumpur operational trial started since September 2018 and is implemented Nov. 2019.</p> <p>Manila operational trial started in February 2019. Implementation Nov. 2019</p> <p>Technical trials with Jakarta ACC will be initiated once the Jakarta ACC ATMS renewal is completed.</p>	THALES supports ICD Version 3 since December 2018	

CRV OG/7  
Appendix A to the Report

State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AMHS Vendors Selected	AIDC	ATM System selected to support AIDC and Associated ICD (Implementation Status of the Basic 5 message set supported)	Remarks
<b>SRI LANKA</b>	ATN BIS Router Planned for 2013. IP based AMHS implemented by Oct. 2017. <ul style="list-style-type: none"> <li>- Mumbai tested May 2017 operational planned for Q4 2017;</li> <li>- Singapore testing in Q4 2017 operational for 2018;</li> <li>- Male testing and operational date TBD.</li> </ul>	IDS	Trials with Male planned for in 3Q2019.  Trial with Chennai on-going. Plan for implementation in 2018 and with Melbourne plan for 1Q2018.	INTELCAN which is able to support ICD Version 3.	
<b>THAILAND</b>	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 implemented.  Implementation with Malaysia planned for 2019.  Interoperability Test: with Viet Nam planned for end of 3Q2019 and Italy planned for end of 4Q2019  Connection with SITA (SITA AMHS Gateway inter-connections) implemented.	AEROTHAI's AMHS System	AIDC Connection test with Lao PDR, Cambodia, Myanmar and Malaysia underway since 2016;  Operation trial with these States from late 2017 to early 2019. Target date of implementation is around 2Q2020.	THALES which is being implemented with planned completion in 4Q2019.  AIDC feature supports APAC AIDC ICD V.3.	
<b>TONGA</b>	AMHS planned for 2008.  The provider is linked to the New Zealand AFTN				CPDLC and ADS-C is not considered for lower airspace

CRV OG/7  
Appendix A to the Report

State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AMHS Vendors Selected	AIDC	ATM System selected to support AIDC and Associated ICD (Implementation Status of the Basic 5 message set supported)	Remarks
<b>UNITED STATES</b>	<ul style="list-style-type: none"> <li>- Australia (1/2019)</li> <li>- Fiji (1/2019)</li> <li>- New Zealand (1/2019)</li> <li>- Japan (2/2019)</li> <li>- Philippines (3<sup>rd</sup> 2020)</li> </ul>	IN-HOUSE	<ul style="list-style-type: none"> <li>- Fiji, Japan, New Zealand,</li> <li>- Tahiti (via New Zealand),</li> <li>- Papua New Guinea (via Australia)</li> <li>- Philippines (3<sup>rd</sup> 2020)</li> <li>- Indonesia via Australia (2019)</li> <li>- Russian Federation (pending joining CRV)</li> </ul>	IN-HOUSE which is able to support APAC and NAT ICDs currently Version 2.	
<b>VANUATU</b>					
<b>VIET NAM</b>	<p>AMHS (basic) implemented. Trial phase from 4Q/2015 to 3Q/2018. IOT with Thailand in progress from 4Q/2017 Plan to use AMHS in 4Q/2018;</p> <p>Planned for IOT with Hong Kong, Singapore and Thailand in 2019</p> <p>For IOT with Laos PDR and Cambodia in 2019.</p>	IN-HOUSE	<p>Operational between Ho Chi Minh and Singapore since July 2014. Trial for additional messages sets since 2018.</p> <p>Implementation between Ho Chi Minh with Philippines planned for 4Q2020;</p> <p>Technical testing with Cambodia already done; Trials between Hanoi and Vientiane, Lao. PDR on going.</p> <p>with Malaysia TBC</p> <p>Testing with Cambodia on – going; For operation trial TBC.</p>	<p>Support ICD Version 1.0 with THALES at Ho Chi Minh ATM system.</p> <p>Support ICD Version 3.0 with Selex at Hanoi ATM System.</p>	

CRV OG/7  
Appendix A to the Report

---

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

-----

CRV OG/7  
Appendix B to the Report

**CRV IMPLEMENTATION TABLE**

State/ Administration	Intended date for CRV cut-over	Applications targeted	Migration scheme	Prerequisites/ dependencies
<b>Australia</b>	Contract in May2018 and service readiness in 3Q 2018	AFTN, ADS-B, AMHS, Voice With: <b>Australia</b> February,2019(AMHS/AIDC), March,2019(Voice) <b>Fiji</b> March,2019 (AMHS June 2019/AIDC, Voice completed April) <b>New Zealand</b> , February, 2019 (AMHS June 2019, AFTN May 2019/AIDC), March, 2019 (Voice April 2019 completed) <b>Indonesia</b> 4Q2019 (TBC) (AMHS/AIDC, Voice, ADS-B); <b>PNG</b> 4Q2019(TBC), (AMHS/AIDC, Voice) <b>Singapore</b> 2Q2019 TBC (AMHS/AIDC, Voice); <b>South Africa</b> TBC  3Q2019 TBC (AMHS/AIDC, Voice); <b>Japan</b> would be end of 2019.	staged approach	Termination of current COM contract
<b>Bhutan</b>	Contract in 3Q2019, service readiness in 4Q2019	Data(AMHS, AFTN) and voice		Administrative approval from the management for the direct contract and approval from BCAA
<b>Cambodia</b>	As early as convenient, dependent on neighboring countries			Internal decision making

CRV OG/7  
Appendix B to the Report

State/ Administration	Intended date for CRV cut-over	Applications targeted	Migration scheme	Prerequisites/ dependencies
<b>China</b>	Contract in 1Q2020, service readiness in 2Q2020	Data(AMHS) With: Hong Kong 2Q2020; Japan 2Q2020; Thailand 2Q2020; India 2Q2020. Republic of Korea a.s.a.p ATFM traffic test May 2020 over CRV	staged approach	
<b>Democratic People's Republic of Korea</b>	Contract in 3Q2018 and service readiness in 4Q2018	AFTN and VoIP		
<b>Hong Kong, China</b>	Contract signed on 6 April 2018.  Connection was installed successfully in June 2018.  CRV-Voice with Manila was put into operation on 14 August 2018.	DATA (AMHS) With: Beijing 2Q2020; Manila operational May 2019 Japan 1Q2020; Thailand 3Q2020;	staged approach	Need to coordinate with relevant CAAs/ANSPs in joining CRV in a harmonized manner, etc.
<b>Macao, China</b>	To be confirmed			CBA migration from X25 to IP
<b>Fiji</b>	Contract in May 2018 and service readiness in 3Q 2018	Data (AMHS) and VoIP With: Australia ATS voice April 2019 completed, AMHS planned June 2019, NZ ATS voice c. 2019 and USA ATS voice March 2019 completed. AMHS April 2019.	Staged approach	CBA, safety case

CRV OG/7  
Appendix B to the Report

State/ Administration	Intended date for CRV cut-over	Applications targeted	Migration scheme	Prerequisites/ dependencies
<b>France (New Caledonia and French Polynesia)</b>	2019 is target for DNSA to sign contract subject to internal security assessment (done).	ATS Voice, AMHS with Fiji & AIDC, AMHS with USA, AIDC/AMHS with NZ and ATS voice.		CBA, cost must be affordable <i>Wallis and Futuna: no dedicated connection to CRV</i>
<b>India</b>	Contract in 1Q2020 and service readiness in 2Q2020. Available	. Data first then voice.	staged approach	safety case
<b>Indonesia</b>	Contract in 1Q2020 and Service readiness in 2Q2020	AFTN, AMHS, ADS-B and voice		CBA completed
<b>Japan</b>	Contract signed in Nov.2017 and service readiness in 1Q 2018 for Fukuoka	Data first: With: Hong Kong 1Q2020 USA completed 1Q 2019 Singapore 3Q2019; China 2Q2020	staged approach	
<b>Malaysia</b>	Contract to be signed 2Q 2020 and service readiness in 4Q2020	AFTN, AMHS, ADS-B and ATS voice	staged approach	New ATC centre operational in 2020. Contract issue with the new ATC main contractor. COM Project is part of the main contract.
<b>Myanmar</b>	Contract in 3Q 2020	AFTN/AMHS, AIDC, ADS-B and voice	staged approach	CBA and if one of counterparts join in

CRV OG/7  
Appendix B to the Report

State/ Administration	Intended date for CRV cut-over	Applications targeted	Migration scheme	Prerequisites/ dependencies
<b>Nepal</b>	Nepal intends to join CRV on staged approach with AMHS data connectivity as first priority and intends to sign the contract with PCCW within 2020.			
<b>New Zealand</b>	Contract in May 2018 and service readiness in 3Q 2018	Australia AMHS June 2019, French Polynesia AMHS and Voice Chile AMHS (SAM regional network REDDIG)		CBA attractive if all counterparts join in
<b>Philippines</b>	Contract signed in March 2018 and service readiness in 2Q2018	Data (AMHS and AIDC) and voice with HK AIDC 2Q 2019, AMHS May 2019 with Taipei AIDC 3Q2019 , AMHS IOT 2Q 2019, Voice completed 1Q 2019. with USA AMHS & AIDC 4Q 2019. For Voice: with HK Aug. 2018, with USA June 2019	staged approach	Success transition to the New ATM centre in 4Q2018
<b>Republic of Korea</b>	Contract in 3Q2019 and service readiness in 4Q 2019	Data (AMHS), AIDC and VoIP With CHN AMHS 4Q2019 With JPN xx	staged approach	
<b>Singapore</b>	Contract in May Q2019 and service readiness in 3Q2019	1/AFTN/AMHS 2/Voice/AIDC/ADS-B AMHS With: Australia 2Q2020; Japan 2Q2020 Thailand 2020; India 2020. 3/Voice with Manila: to complete in Jan. 2020	staged approach	CBA attractive if all counterparts join in

CRV OG/7  
Appendix B to the Report

State/ Administration	Intended date for CRV cut-over	Applications targeted	Migration scheme	Prerequisites/ dependencies
<b>Sri Lanka</b>	As soon as CRV is available	AMHS connectivity with Mumbai, Singapore and Male.  Direct Speech facilities with Chennai, Trivendrum, Mumbai, Male, Jakarta, Melbourne, Singapore	Phased approach with the implementation of CRV	CBA
<b>Thailand</b>	Contract in 1Q 2020 and service readiness in 4Q2020	Data first Then voice, subject to safety case: China 4Q2019 Hong Kong 4Q2019; Singapore 4Q2019; India 2019.	Staged approach	

CRV OG/7  
Appendix B to the Report

State/ Administration	Intended date for CRV cut-over	Applications targeted	Migration scheme	Prerequisites/ dependencies
<b>United States</b>	Contract in May 2018 and service readiness in 3Q 2018	1) with Australia AFTN to AMHS over IP: Feb 2019 Voice: March, 2019 2) With Fiji AMHS/AIDC Feb 2019 Voice March, 2019 3) With New Zealand AMHS/AIDC, Voice March 2019 4) With Japan AMHS/AIDC Feb 2019 VOICE: June 2020 5) With Philippines AMHS/AIDC 3Q2019 VOICESeptember, 2019 6) With Indonesia Voice 2020 7) With Russian Federation Pending joining CRV 8) With PNG Voice: Feb/2019 via Australia with direct CRV planned for 2020 9) other FIRs as opportune (French Polynesia, Samoa, etc.) 7) ATFM, AMHS with Attachment 8) BBIS with Fiji, Australia and Japan 3Q2018 (for only AMHS)	Staged approach	
<b>Viet Nam</b>	To be confirmed later (After discussed with PCCW Global)			

-----



**Common aeRonautical Virtual Private Network (CRV) Operations  
Group (OG) of Asia/Pacific Air Navigation Planning and  
Implementation Regional Group (APANPIRG) (APANPIRG CRV OG)**

**OPERATIONS MANUAL**

Draft First Edition – July 2020



## Contents

Contents.....	3
1 PART I: FOREWORD.....	75
1.1 Introduction.....	86
2 PART II: TERMS OF REFERENCE, COMPOSITION AND POSITION IN ICAO OF THE CRV OG 117	
2.1 Terms of Reference (TOR).....	128
2.2 Position within ICAO.....	138
3 PART III: WORKING ARRANGEMENTS.....	159
3.1 APANPIRG Procedural Handbook.....	1740
3.2 Administration of the CRV OG.....	1740
4 PART IV: SERVICE STRATEGY.....	1914
4.1 Strategy Management.....	2042
4.2 Service Portfolio Management.....	2042
4.3 Financial Management.....	2042
4.4 Business Relationship Management.....	2042
4.4.1 Legal Documentation.....	2143
4.4.2 Design and Implementation document flow.....	2244
4.4.3 Common Package.....	2345
4.4.4 Pre-Sales Stage.....	2345
4.4.5 Implementation Stage.....	2345
Operation Stage.....	2446
4.4.6.....	2446
4.5 Demand Management.....	2446
5 PART V: SERVICE DESIGN.....	2547
5.1 Service Catalogue Management.....	2648
5.1.1 Requirements.....	2648
5.1.2 Process to add new Services to the CRV.....	2648
5.2 Availability Management.....	2949
5.2.1 Monthly Performance Management Reports.....	2949
5.2.2 Monthly Operations Reports.....	2949
Monthly meetings with PCCW.....	3049
5.2.3.....	3049
5.2.4 Quarterly Operations Reports.....	3049
5.2.5 Annual OG meetings.....	3120
5.2.6 Root cause analysis reports.....	3120
5.2.7 Notifications of Maintenance.....	3120
5.2.8 Diversity Audits.....	3120
5.2.9 Testing failover.....	3120
5.3 Capacity Management.....	3224

5.4	IT Service Continuity Management .....	3224
5.4.1	CRV Contingency Operations .....	3224
5.5	Service Level Management.....	3224
5.6	Design Co-ordination .....	3324
5.7	Information Security Management .....	3322
5.8	Supplier Management .....	3322
6	PART VI: SERVICE TRANSITION .....	3523
6.1	Transition Planning and Support.....	3624
6.2	Change Management.....	3624
6.3	Service Asset and Configuration Management.....	3624
6.4	Release and Deployment Management.....	3624
6.5	Service Validation and Testing Management .....	3624
6.6	Change Evaluation .....	3725
6.7	Knowledge Management .....	3725
7	PART VII: SERVICE OPERATION.....	3926
7.1	Service Boundary.....	4027
7.2	Event Management .....	4027
7.3	Incident Management.....	4128
7.4	Request Fulfilment .....	4128
7.5	Problem Management.....	4128
7.6	Access Management.....	4228
8	PART VIII: CONTINUAL SERVICE IMPROVEMENT .....	4429
8.1	Service Review.....	4530
8.2	Process Evaluation .....	4530
8.3	Definition of CSI Initiatives .....	4530
8.4	Monitoring CSI Initiatives .....	4530
9	PART IX: CONTINUAL SERVICE IMPROVEMENT .....	4631
9.1	Definitions.....	4832
10	PART X: APPENDICES .....	4933
	Appendix A: CRV Terms of Reference as accepted by APANPIRG .....	5034
	Appendix B: General Structure of ITIL .....	5236
	Appendix C: Process for connecting a Service Provider / Service Consumer to the CRV .....	5337
	Contents.....	3
1	PART I: FOREWORD .....	5
1.1	Introduction.....	6
2	PART II: TERMS OF REFERENCE, COMPOSITION AND POSITION IN ICAO OF THE CRV OG	
	7	
2.1	Background.....	8
2.2	Terms of Reference .....	8
2.3	Reporting.....	8

2.4	Participation	8
2.5	Conduct of the work	8
2.6	Rapporteur	8
2.7	Position within ICAO	9
3	PART II: WORKING ARRANGEMENTS	10
3.1	APANPIRG Procedural Handbook	11
3.2	Administration of the CRV OG	11
4	PART III: SERVICE STRATEGY	13
4.1	Strategy Management	14
4.2	Service Portfolio Management	14
4.3	Financial Management	14
4.4	Business Relationship Management	14
4.4.1	Legal Documentation	15
4.4.2	Design and Implementation document flow	16
4.4.3	Common Package	17
4.4.4	Pre-Sales Stage	17
4.4.5	Implementation Stage	17
4.4.6	Operation Stage	18
4.5	Demand Management	18
5	PART IV: SERVICE DESIGN	19
5.1	Service Catalog Management	20
5.1.1	Requirements	20
5.1.2	Criteria to add a new service	20
5.2	Availability Management	23
5.2.1	Monthly Performance Management Reports	23
5.2.2	Monthly Operations Reports	23
5.2.3	Monthly meetings with PCCW	23
5.2.4	Quarterly Operations Reports	24
5.2.5	Annual OG meetings	24
5.2.6	Root cause analysis reports	24
5.2.7	Notifications of Maintenance	24
5.2.8	Diversity Audits	24
5.2.9	Testing failover	24
5.3	Capacity Management	25
5.4	IT Service Continuity Management	25
5.5	Service Level Management	25
5.6	Design Co-ordination	26
5.7	Information Security Management	26
5.8	Supplier Management	26
6	PART V: SERVICE TRANSITION	27

6.1	Transition Planning and Support.....	28
6.2	Change Management.....	28
6.3	Service Asset and Configuration Management.....	28
6.4	Release and Deployment Management.....	28
6.5	Service Validation and Testing Management.....	28
6.6	Change Evaluation.....	29
6.7	Knowledge Management.....	29
7	PART VI: SERVICE OPERATION.....	30
7.1	Event Management.....	31
7.2	Incident Management.....	31
7.3	Request Fulfilment.....	31
7.4	Problem Management.....	31
7.5	Access Management.....	32
	PART VII: CONTINUAL SERVICE IMPROVEMENT.....	33
7.6	Service Review.....	34
7.7	Process Evaluation.....	34
7.8	Definition of CSI Initiatives.....	34
7.9	Monitoring CSI Initiatives.....	34
8	PART VIII.....	35
8.1	Definitions.....	36

DRAFT

**DRAFT**

~~PART I~~ **PART I: FOREWORD**

## 1.1 Introduction

---

- a. The Common ~~Raerona~~ ~~l~~ ~~egional~~ Virtual Private Network Operations Group (CRV OG) Operations Manual is ~~an informal publication developed by~~ ~~prepared by~~ the CRV ~~Task Force~~ OG and endorsed by ACSICG and CNS Sub-group of the Asia/Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG), intended to provide, for easy reference of interested parties, a consolidation of material, particularly of a procedural nature, about the work of the CRV OG and its contributory bodies. It contains the Terms of Reference of the CRV OG established by ~~the Asia/Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG) (~~ through Decision 27/3433). It also contains the working arrangements and internal instructions ~~agreed~~ ~~developed~~ by the Group for the practical application of its Terms of Reference.
- b. The document describes ~~the~~ ; Terms of Reference; Composition; Position within ICAO; Working Arrangements; Rules of Procedure and Practices governing the Conduct of Business.
- c. This manual basically follows the ITIL Processes which typically covers Strategy, Design, Transition, Operation, Continual Service Improvement (CSI), and presented issues require discussion under operation including Event Management, Problem Management, Incident Management, Change Management, Change Evaluation, Knowledge Management and Availability Management. The general structure of the ITIL Processes is provided in ~~Appendix B: General Structure of ITIL~~ ~~Appendix B: General Structure of ITIL~~ ~~Appendix X~~ to this manual.
- d. The framework of Part and Sections headings in addition to the page numbering has been devised to provide flexibility and the facilitation of the revision of additional or new material. Each Part includes an Introduction giving its purpose and status. A Table of Contents is also provided which serves also as a subject index and as a check list for the current pages.
- e. All pages bear the date of issuance. Replacement pages will be issued as necessary and any portion of a page that has been revised will be identified by a vertical line in the margin. Additional arterial will be incorporated in the existing Sections or will be the subject of new Sections, as required.
- f. Changes to text will be identified by a vertical line in the margin in the following manner;
  - i. N for new or revised text;
  - ii. E for editorial modification that do not alter the substance or meaning of the text;
  - iii. D for deleted text
  - iv. For practical reasons, this shall not be applied to title pages or to the routine insertion and deletion of Conclusions and Decisions. The absence of change bars, when data or page numbers have changed, will signify reissue of the section concerned or rearrangement of text (e.g., following an insertion or deletion with no other changes).
- g. The Operations Manual will be distributed to Members and Observers of APANPIRG, the ICAO Secretariat, and to other States and international organizations participating in meetings, contributing to, or having interest in the work of the CRV OG and/or its Contributory Bodies.

|

DRAFT

DRAFT

~~PART II~~ PART II: TERMS OF REFERENCE,  
COMPOSITION AND POSITION IN ICAO OF  
THE CRV OG

## 2.1 Background

---

The establishment of APANPIRG CRV OG was proposed during the deliberations of the CRV Task Force (TF) as a dedicated group to provide oversight of the CRV operations and the performance of the CRV Service Provider. The APANPIRG CRV OG is formally established by APANPIRG Decision 27/34.

### 2.2.1 Terms of Reference (TOR)

---

The TOR for The Common Regional Aeronautical Virtual Private Network (VPN) Operations Group (OG) is approved by the ICAO Asia/Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG). The CRV OG will provide oversight of the function and performance of the CRV and the performance of the Service Provider.

The activities to be performed by the CRV OG are published in the TOR and will be updated in Appendix A: CRV Terms of Reference as accepted by APANPIRG will provide oversight of the function and performance of the CRV and the performance of the Service Provider. The following are the activities to be performed:

- a. Oversee the implementation of the CRV post Contract Award;
- b. Manage issues arising from the transition with CRV TF, if any;
- c. Co-ordinate and standardize the establishment or upgrade of CRV services as required;
- d. Co-ordinate activities with other ICAO CRV OGs, if any, to make sure that decision making and communication with CRV Service Provider is consistent and timely;
- e. Oversee the performance of the CRV Service Provider, including customer service;
- f. Oversee the performance of the CRV network;
- g. Oversee the escalation and solving by the CRV Service Provider of issues associated with the provision of the CRV, including safety and security related issues;
- h. Assist with the resolution of issues associated with the provision of the CRV among the CRV Users as required, including safety and security related issues;
- i. Assist with the migration of Aeronautical Fixed Services (AFS) onto the CRV, in line with the GANP and seamless ATM plan;
- j. Maintain CRV OG documentation associated with the function, performance and management of the CRV, including the CRV OG Operations Manual, a list of CRV users and a record of variations to the common tender package;
- k. Accept deliverables from the CRV Service Provider on behalf of the CRV Users as required;
- l. Promote the use of CRV; and
- m. Perform any other activity as required by CRV operations.

## 2.3 Reporting

---

The CRV OG will report to Asia/Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG) through ACSICG and CNS SG.

## 2.4—Participation

---

~~The CRV OG will include all APAC Member States/Administrations, and any other organization as needed.~~

## 2.5—Conduct of the work

---

~~It is anticipated that the CRV OG will conduct its work primarily by Web Conferences, teleconferences and other electronic means of communications. Face to Face meetings of CRV OG may be required on an annual basis. The ICAO APAC Regional Office will provide secretariat support for the CRV OG.~~

## 2.6—Rapporteur

---

~~There will be two Co-Chairpersons of the CRV OG, one primarily responsible for Asia coordination and the other for Pacific coordination.~~

## 2.72.2 Position within ICAO

---

- a) CRV OG shall be the guiding and co-ordinating organ for all activities conducted within ICAO concerning the Common Regional VPN for the Asia and Pacific Regions. However, it shall not assume authority vested in other ICAO bodies, except where such bodies have specifically delegated their authority to the Group. The activities of the Group shall be subject to review by the APANPIRG.
- b) The work of groups established and meetings held within the framework of ICAO, concerned with the Asia and Pacific CRV shall be coordinated with the CRV OG to ensure full harmonization with all regional activities regarding the development and operation of the Asia/Pacific system.

b) —

DRAFT

3 PART III: WORKING ARRANGEMENTS

DRAFT

- 
- 
- 
- 
- 
- 
- 
- 
- 

~~PART II: WORKING ARRANGEMENTS~~

---

DRAFT

---

### 2.83.1 APANPIRG Procedural Handbook

---

The CRV shall be guided by the APANPIRG Procedural Handbook to ensure that work arrangements are consistent with its parent body

### 2.93.2 Administration of the CRV OG

---

- c) The CRV shall be administered as follows:
- i. by two (2) Chairpersons, one elected from the Representatives designated by member States of the Group from ASIA Region and one from the PACIFIC region; and
  - ii. by ICAO Regional Director, Asia and Pacific Office designated as Secretary CRV OG by the Secretary General of ICAO. In the execution of duties the Secretary will be supported by the Asia and Pacific Regional Office.
- d) The Chairpersons, in close co-ordination with the Secretary, shall arrange for the most efficient working of the Group. The Group shall always work with a minimum of formality and paperwork.
- e) Between meetings of the CRV OG, some subjects may be dealt with by correspondence among appointed Representatives of Member States through the Secretary of the CRV OG. However, if States are to be consulted this should be done through the ICAO Regional Director, Asia and Pacific Office.

DRAFT

## ~~34 PART I~~ ~~PART IV~~: SERVICE STRATEGY

### **Service Strategy**

- Strategy Management
- Service Portfolio Management
- Financial Management
- Business Relationship Management
- Demand Management

DRAFT

### 3.14.1 Strategy Management

---

Process Objective: To assess the service provider's offerings, capabilities, competitors as well as current and potential market spaces in order to develop a strategy to serve customers. Once the strategy has been defined, Strategy Management for CRV IT Services is also responsible for ensuring the implementation of the strategy.

- a) Reduce telecommunication costs in most cases (to be confirmed by local CBA)
- b) Enable integration in the aeronautical infrastructure and enhanced services (GANP, regional objectives)
- c) Enhance information security
- d) Provide a standardized interface for AFS (instead of multiple protocols, some of which are obsolescent)
- e) Rationalize coordination for network management and enhancement
- f) Respond to Air Traffic requirements in a timely and standardized manner
- g) Coordination with Other Regional Private Networks
- h) Promote the use of CRV

### 3.24.2 Service Portfolio Management

---

Process Objective: To manage the service portfolio. Service Portfolio Management ensures that the CRV service provider has the right mix of services to meet required business outcomes at an appropriate level of investment.

- Criteria for services to be added to CRV.
- POC of new services.

### 3.34.3 Financial Management

---

Process Objective: To monitor the management of the service provider's budgeting, accounting and charging requirements.

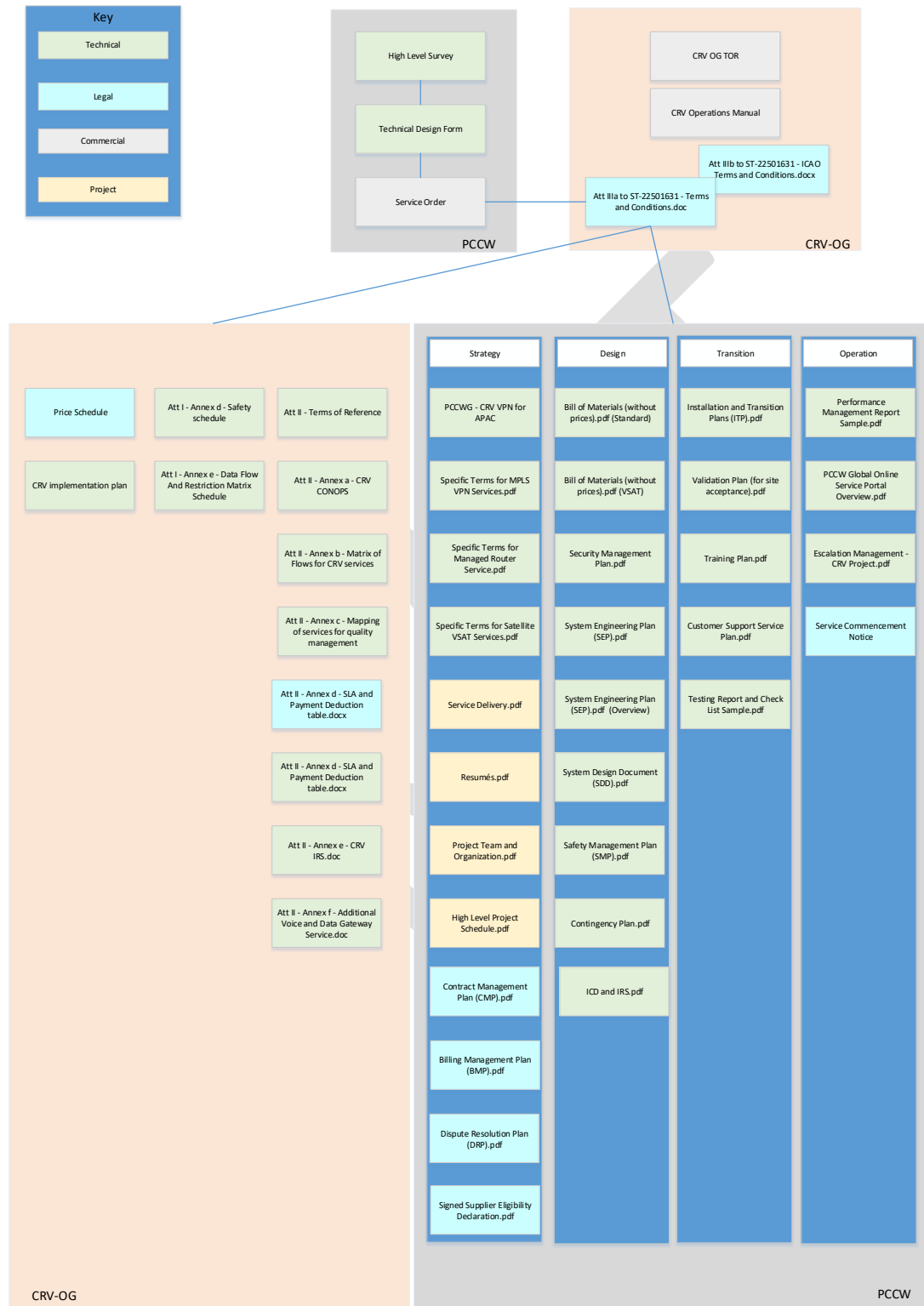
### 3.44.4 Business Relationship Management

---

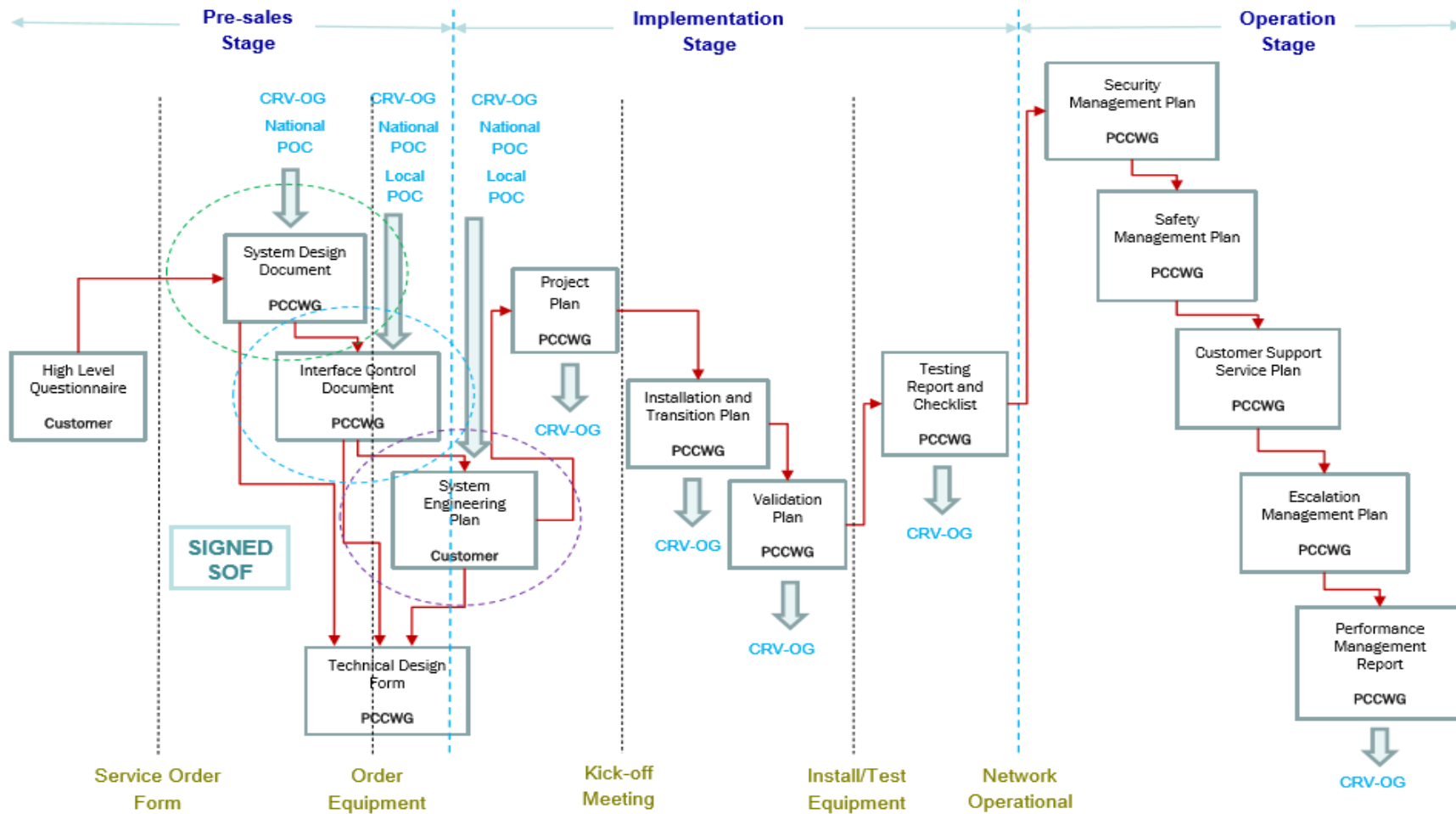
Process Objective: To maintain a positive relationship with customers. Business Relationship Management identifies the needs of existing and potential customers and ensures that appropriate services are developed to meet those needs.

### 3.4.14.4.1 Legal Documentation

The list below shows the precedence of the legal documents that pertains to CRV.



**3.4.24.4.2 Design and Implementation document flow**



### **3.4.34.4.3 Common Package**

This is located on the CRV Users Portal here: [Common Package](#).

### **3.4.44.4.4 Pre-Sales Stage**

#### a. High Level Questionnaire

This provides the high level information to PCCW to be able to provide the Service Order Form(SOF) for signing.

Example of the [High Level Questionnaire](#) and [Service Order Form](#).

#### b. System Design Document

This is the over-arching Design Document for the CRV Network.

Example of [System Design Document](#)

#### c. Interface Control Document

Example of [Interface Control Document](#)

#### d. Technical Design Form

Example [Technical Design Form](#)

#### e. System Engineering Plan

This is a living document covering the technical aspects of the CRV implementation. Any changes can be updated by the User or PCCW.

Example of a [System Engineering Plan](#)

## **4.4.5 Implementation Stage**

### **3.4.5 Sy**

#### a. System Engineering Plan

This is a living document covering the technical aspects of the CRV implementation. Any changes can be updated by the User or PCCW.

Example of a [System Engineering Plan](#)

#### b. Project Plan

Provided to each state post signing of the Contract and is only relevant to that state. It is updated regularly by the PCCW Project manager

Example of a [Project Plan](#)

c. Installation and Transition Plan

Example of an [Installation and Transition Plan](#)

d. Validation Plan

This is PCCW's testing plan post implementation of the Managed Service

Example of a [Validation Plan](#)

e. Testing and Report Checklist

This is the result of PCCW's Testing plan post implementation of the Managed Service and is accompanied by the Service Commencement Notice (SCN)

[Testing and Report Checklist](#)

## Operation Stage

### 3.4.64.4.6

a. Security Management Plan

b. Safety Management Plan

Example of a [Safety Management Plan](#)

c. Customer Support Service Plan

This details the contact details for any Problems or Incidents that the State may encounter.

Example of a [Customer Support Service Plan](#)

d. Escalation Management Plan

This details the contact details if the need arises to escalate any Tickets. It also details the escalation criteria

Example of an [Escalation Management Plan](#)

e. Performance Management Report

### 3.54.5 Demand Management

---

Process Objective: To understand, anticipate and influence customer demand for services. Demand Management works with Capacity Management to ensure that the service provider has sufficient capacity to meet the required demand.

45 ~~PART IV~~ ~~PART V~~: SERVICE DESIGN

**Service Design**

- Service Catalogue Management
- Availability Management
- Capacity Management
- IT Service Continuity Management
- Service level Management
- Design Co-ordination
- Information Security Management
- Supplier Management

#### 4.15.1 Service ~~Catalog~~Catalogue Management

Process Objective: To ensure that a Service Catalogue is produced and maintained, containing accurate information on all operational services and those being prepared to be run operationally. Service Catalogue Management provides vital information for all other Service Management processes: Service details, current status and the services' interdependencies.

##### 4.1.15.1.1 Requirements

- a. Latency
- b. Availability
- c. Jitter
- d. QoS/DSCP markings
- e. Security

#### 5.1.2 ~~Criteria to add a new service~~Process to add new Services to the CRV

~~4.1.2~~ In order to support the value of the CRV, a process to have been established to add new Service Provider / Service Consumer to the CRV, This process is as approved by ~~ut~~ the CRV OG and is located ~~Appendix C: Process for connecting a Service Provider / Service Consumer to the CRV~~Appendix C: Process for connecting a Service Provider / Service Consumer to the CRV

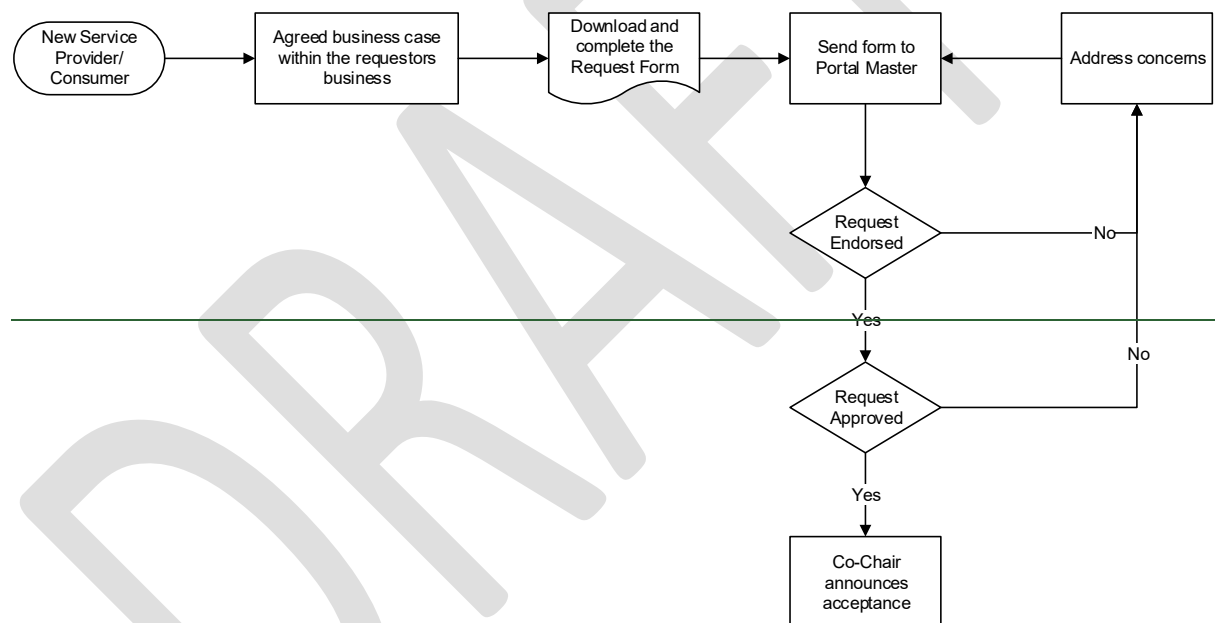
##### 4.1.2.1 Considerations

~~Connecting a Service Provider / Service Consumer (SPSC) to the CRV can be initiated by any party that identifies a need for an SPSC to connect to it. The following should be considered by the SPSC and the CRV Member state.~~

- ~~i. Service Provider (SP) is defined as a company that provides aeronautical service using the CRV as the means of communication.~~
- ~~ii. Service Consumer (SC) is defined as a company or organisation that consumes aeronautical information using the CRV as the means of communication.~~
- ~~iii. The SPSC should be referred to PCCW to enable an initial discussion with them to assess the feasibility of connecting to the CRV. During this discussion the SPSC should clarify:
 
  - ~~– Interfaces~~
  - ~~– Data transfer rates~~
  - ~~– DSCP marking etc.~~~~
- ~~iv. It is recommended that Service Providers use public IP addressing for the delivery their services.~~
- ~~v. It is recommended that Service Consumers are provided with a 10.x.x.x IP addressing from the CRV Member State where the PCCW NID is installed.~~

- ~~vi. SPSCs will NOT be a member of the CRV Operations Group (OG). The OG may establish a CRV user group that could facilitate discussion on the use of the CRV by SPSCs.~~
- ~~vii. SPSCs will need to adhere to the CRV System Design Document (SDD). Substantive changes to the SDD MUST be endorsed by the CRV OG.~~
- ~~viii. CRV member states should consider ICAO Doc 9855 AN/459 Guidelines on the Use of the Public Internet for Aeronautical Applications as guidance when they are the Primary sponsor.~~
- ~~ix. The CRV OG IS NOT responsible for the accreditation/certification/validation of a Service Provider, but must ensure that the all reasonable steps have been taken to ensure that the Service Provider has sufficient systems and process in place to provide their service over the CRV.~~
- ~~x. Service Consumers and CRV members SHOULD ensure that when obtaining a Service from a Service Provider that the service meets their operational service requirements.~~

~~5.1.2.2 Process~~



~~a. The information required in the connection request, should be presented in English and in a clear and logical format. The following process will be used for an SPSC to obtain approval connect to the CRV:~~

- ~~i. Provide a business justification including Benefits Realization for joining the CRV;~~
- ~~ii. For a Service Provider: provide a documentation using Section 2.3 ACCREDITATION OF AN IASP in ICAO Doc 9855 AN/459 as a guide including a cyber security plan;~~
- ~~iii. For a Service Consumer; at a minimum, provide a CRV connection plan and cyber security plan on how they will shield the CRV from their organisation;~~
- ~~iv. Obtain a Primary CRV member state to sponsor their connection to the CRV;~~
- ~~v. Obtain business justification from Primary Sponsor to support their request;~~

- ~~vi. Obtain a Secondary CRV member state to sponsor their connection to the CRV based on the information above;~~
  - ~~vii. The information provided above, will be provided to the CRV OG via the APAC CRV portal.~~
  - ~~viii. CRV OG members will be notified and have 25 business days to review and address any concerns that they may have with the request.~~
  - ~~ix. After the 25 days, if the majority of reviews by CRV OG members are endorsed, the CRV OG chairs will review the request.~~
  - ~~x. For the request to be approved, both CRV OG Co-Chairs need to approve the request.~~
  - ~~xi. A Document/Certificate will be provided to the primary sponsor that can used to verify that the SPSC is approved to connect the CRV.~~
- ~~b. The application process of Service Provider / Service Consumer is supported by the Airways New Zealand provided APAC CRV SharePoint portal. There will be Microsoft Word forms to facilitate the information and these forms will be migrated to an automated SharePoint Workflow as soon as practical.~~
- ~~e. Service Provider / Service Consumer will be required to undertake the following:~~
- ~~— Provide a business justification including Benefits Realisation for joining the CRV~~
  - ~~— Provide a High Level System Design on how their Service could potentially connect to the CRV.~~
- ~~Service Providers to use Public IP Addressing~~
  - ~~Service Consumers to use the ICAO allocated IP addresses~~
  - ~~Interfaces~~
  - ~~Data transfer rates~~
  - ~~DSCP marking~~

## 4.25.2 Availability Management

Process Objective: To define, analyse, plan, measure and improve all aspects of the availability of [IT CRV](#) services. Availability Management is responsible for ensuring that [all IT](#) infrastructure, processes, tools, roles etc. are appropriate for the agreed availability targets.

### 4.2.15.2.1 Monthly Performance Management Reports

~~Provided by PCCW Available from the PCCW Portal~~ -to each State that has joined CRV. ~~information available: covering:~~

- Traffic Report
- Router Report
- **QoS report**
- **Latency**
- **Packet Loss**
- **Jitter**
- Interface

~~(More SLA data is available from the PCCW Portal)~~

~~At the time of the monthly invoice, PCCWG has we have the Service Report with ticket and availability information and the portal provides the rest.~~

### 5.2.2 Monthly Operations Reports

#### 4.2.2

Provided by PCCW to each State that has joined CRV covering:

- Active Service Inventory
- Site Availability ~~(More SLA data is available from the PCCW Portal)~~
- Ticket Statistic
  - Problem Statistic**
  - Incident Statistic** [\(defined\)](#)
  - Incident without Service Impact Statistic** [\(defined\)](#)
- Requests
- Maintenance
- Ticket Details
- AOB

~~At the time of the monthly invoice, PCCWG has the Service Report (Operations Report) with ticket and availability information and the portal provides the rest~~

~~(The ticket statistic category (Problem, Incident, Requests, Maintenance) was briefly discussed in O/G6. After reviewing yearly ticket summary and detail, we will need to clarify with CRV OG on the definition of "Problem" and "Incident". (PCCWG comments)~~

From here: <https://wiki.en.it-processmaps.com/index.php/ITIL-Glossary#ITIL%20Glossary%20A-Z>

**Incident**—An Incident is defined as an unplanned interruption or reduction in quality of an IT service (a Service Interruption).

Eg. A link has been flapping in the network causing reroutes.

**Problem**—A cause of one or more Incidents. The cause is not usually known at the time a Problem Record is created.

Eg. Link flaps have been caused by unplanned work by a third party)

### 4.2.3 Monthly meetings with PCCW

#### 5.2.3

Conducted via Telephone conference that is hosted by PCCW, with each State that has joined CRV to discuss:

States Performance Management Report

States Operations Report

(PCCWG provided monthly service report to CRV state members, we will need to clarify with CRV OG on the meaning of "States Performance Management Report" and "States Operations Report".

Hmm, I know I wrote that, maybe I captured a discussion but did not change to the final conclusion as we only get one report that is called the Service Report (Operations Report) yet the Common Package has a Sample Performance Management Report but as this is just snips from the portal I think we decided that as each Service report came out, the State receiving the report would use the portal to review Router, Interface, QoS and Traffic, and raise any issues from that information)

### 4.2.45.2.4 Quarterly Operations Reports

Provided by PCCW to the OG [by email](#) covering:

Implementation progress

Site Availability ([More SLA data is available from the PCCW Portal](#))

Ticket Statistic

Problem Statistic

Incident Statistic

Requests

Maintenance

Ticket Details

AOB

**4.2.55.2.5 Annual OG meetings**

Implementation progress

Site Availability

[Average Monthly Bandwidth Utilisation](#)[Peak Bandwidth peak-Utilisation](#)[\(More SLA data is available from the PCCW Portal\)](#)

Ticket Statistic

Problem Statistic

Incident Statistic

Requests

Maintenance

Ticket Details

[Network Utilisation \(Bandwidth peak usage\)](#)

AOB

*PCCWG: We shall clarify with CRV OG on the meaning of "Network Utilisation".*

**4.2.65.2.6 Root cause analysis reports**

Upon request, PCCW to provide detail post every Incident to the affected State and the APAC CRV OG. Include these in each of the Monthly, Quarterly and Annual Report.

**4.2.75.2.7 Notifications of Maintenance**

Ensuring that all affected parties of maintenance releases are updated as appropriate.

**4.2.85.2.8 Diversity Audits**

[A rolling audit of States/Sites physical and logical connectivity based on the information provided in the Service Commencement Notice to validate diversity of the Package selected.](#)

[Regular diversity audits should be undertaken to ensure that least amount of CRV services are impacted by a CRV POP or core failure.](#)

[\(who, how, timing\)](#)

*(This will need more clarification from us and agreement with PCCW. It was based on the conversation in Fiji where it was raised that the Australia, New Zealand, Fiji and other Pacific sites would be terminated within two POPs in Sydney across several nodes. To ensure a single node failure did not impact multiple sites PCCW will need to provide the current POP/Node configuration for CRV and regularly audit this to ensure an agreed state is maintained.)*

**4.2.95.2.9 Testing failover**

State LOA/MOU/Technical Letter for carrying out failover testing to ensure service continuity.

### 4.35.3 Capacity Management

---

Process Objective: To ensure that the capacity of IT-CRV services and the IT-infrastructure is able to deliver the agreed service level targets in a cost effective and timely manner. Capacity Management considers all resources required to deliver the IT-CRV service, and plans for short, medium and long term business requirements.

Co-ordinate and standardize the establishment or upgrade of CRV services as required

Oversee the performance of the CRV network;

### 4.45.4 IT Service Continuity Management

---

Process Objective: To manage risks that could seriously impact IT-CRV services. ITSCM ensures that the IT-CRV service provider can always provide minimum agreed Service Levels, by reducing the risk from disaster events to an acceptable level and planning for the recovery of IT-CRV services. ITSCM should be designed to support Business Continuity Management.

#### a)5.4.1 CRV Contingency Operations

*The following was recorded at ~~from~~ CRV TF/6 ~~report there is this report~~:*

*The meeting discussed again the contingency plan in relation to the safety case. To mitigate the risk of a total or major failure (such as IT disaster that would affect the whole CRV), two layers of process would have to be articulated:*

*↳ the procedures and measures planned and implemented by PCCW; and*

*↳ consistentlyconsistently, the procedures and measures planned and implemented by the CRV Users, as part of their contingency plan required by ICAO SARPS.*

*Furthermore, the meeting agreed that procedures to mitigate the total failure of CRV should be discussed by CRV OG as part of the contingency planning.*

### 4.55.5 Service Level Management

---

Process Objective: To negotiate Service Level Agreements with the customers and to design services in accordance with the agreed service level targets. Service Level Management is also responsible for ensuring that all Operational Level Agreements and Underpinning Contracts are appropriate, and to monitor and report on service levels.

#### 4.65.6 Design Co-ordination

---

Process Objective: To coordinate all service design activities, processes and resources. Design coordination ensures the consistent and effective design of new or changed ~~IT-CRV~~ services, service management information systems, architectures, technology, processes, information and metrics.

Change Requests

Engineering Package

Legal Documents

#### 4.75.7 Information Security Management

---

Process Objective: To ensure the confidentiality, integrity and availability of an organization's information, data and ~~IT-CRV~~ services. Information Security Management usually forms part of an organizational approach to security management which has a wider scope than the ~~IT-CRV~~ Service Provider.

There are distinct responsibilities for security in the CRV, This can be broken in a CRV Provider and a CRV user. At a high level the area of responsibilities can be defined as:

CRV Provider: The CRV provider is required to ensure the integrity and security of the core if the CRV network. This is detailed in the PCCWG System Engineering Plan.

This include items such As a minimum the connectivity states is via GRE Tunnels.

CRV User: The CRV user should implement of security controls to ensure the integrity of Aeronautical Fixed Services (AFS), to protect the CRV Users from the CRV and to prevent compromise to the CRV from their networks

Security of CRV and sytem /\*\* TB edited is the responsibility of States and Service Provider for the implementation of security controls to ensure the integrity of services.

As a minimum the connectivity states is via GRE Tunnels.

Other methods of ensuring the security of the connectivity are:

- a. Utilising as small an IP Address range as possible.
- b. Only advertising relevant IP addresses.
- c. Only accepting verified IP Routes when required.
- d. Utilising firewalls.
- e. Utilising NAT.
- f. Utilising Intrusion Protection Software (IPS)

It is recommended that external security advice is sought.

#### 4.85.8 Supplier Management

---

Process Objective: To ensure that all contracts with suppliers support the needs of the business, and that all suppliers meet their contractual commitments.

- a) Oversee the performance of the CRV Service Provider, including customer service;
- b) Oversee the escalation and solving by the CRV Service Provider of issues associated with the provision of the CRV, including safety and security related issues

b) —

DRAFT

6 ~~PART V~~ PART VI: SERVICE TRANSITION

**Service Transition**

- Transition Planning and Support
- Change Management
- Service Asset & Configuration Management
- Release and Deployment Management
- Service Validation and Testing Management
- Change Evaluation
- Knowledge Management

#### 4.96.1 Transition Planning and Support

---

Process Objective: To plan and coordinate the resources to deploy a major Release within the predicted cost, time and quality estimates.

- a) Covered by the Implementation Plan, [\(CRV Portal - Documentation\)](#)

#### 4.106.2 Change Management

---

Process Objective: To control the lifecycle of all Changes. The primary objective of Change Management is to enable beneficial Changes to be made, with minimum disruption to [CRV/TF](#) services.

All changes are to be conveyed to PCCW via their Change Request Form. And covered by the Change Management Process as found in the Common Package. [\(CRV Portal - Documentation\)](#)

#### 4.116.3 Service Asset and Configuration Management

---

Process Objective: To maintain information about Configuration Items required to deliver an [IT-CRV](#) service, including their relationships.

- a) Maintain CRV OG documentation associated with the function, performance and management of the CRV, including the CRV OG Operations Manual, a list of CRV users and a record of variations to the common tender package;

This information is collated in the following ways:

- CRV Operations Manual – APAC Portal
- A list of CRV users – Registrations page on the APAC portal
- Record of Variations is found in the APAC CRV Portal in the Common Package Folder

#### 4.126.4 Release and Deployment Management

---

Process Objective: To plan, schedule and control the movement of releases to test and live environments. The primary goal of Release Management is to ensure that the integrity of the live environment is protected and that the correct components are released.

- a) Oversee the implementation of the CRV post Contract Award;
- b) Manage issues arising from the transition with CRV TF, if any

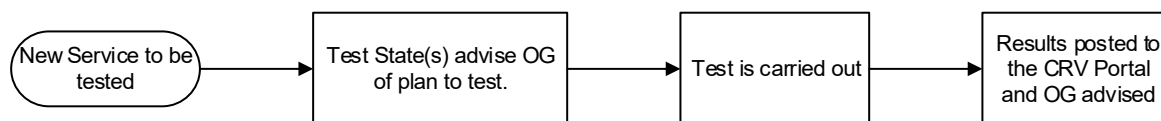
#### 4.136.5 Service Validation and Testing Management

---

Process Objective: To ensure that deployed Releases and the resulting services meet customer expectations, and to verify that [CRV/TF](#) operations is able to support the new service.

- a) Accept deliverables from the CRV Service Provider on behalf of the CRV Users as required;

- b) Refer to the CRV Implementation Plan
- c) New Services



New services being tested by any state,  
 Notifies OG intention to test as soon as practical.  
 Advises CRV OG and PCCW 48hrs prior to testing

Testing is to be carried out with a DSCP marking of DF so as to avoid impacting other services.

The results of the tests are to be posted on the CRV portal and the OG advised of the posting.

#### 4.146.6 Change Evaluation

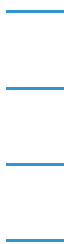
Process Objective: To assess major Changes, like the introduction of a new service or a substantial change to an existing service, before those Changes are allowed to proceed to the next phase in their lifecycle.

#### 4.156.7 Knowledge Management

Process Objective: To gather, analyse, store and share knowledge and information within an organization. The primary purpose of Knowledge Management is to improve efficiency by reducing the need to rediscover knowledge.

- a) All information relating to the ongoing operation of the network shall be retained in the [APAC CRV Portal](#)  
 There will be a link to the portal from the ICAO APAC page.
- b) To add items to the portal.
- c) To Workflow a document.

DRAFT



~~57 PART VI~~ PART VII: SERVICE OPERATION

**Service Operation**

- Event Management
- Incident Management
- Request Fulfilment
- Problem Management
- Access Management

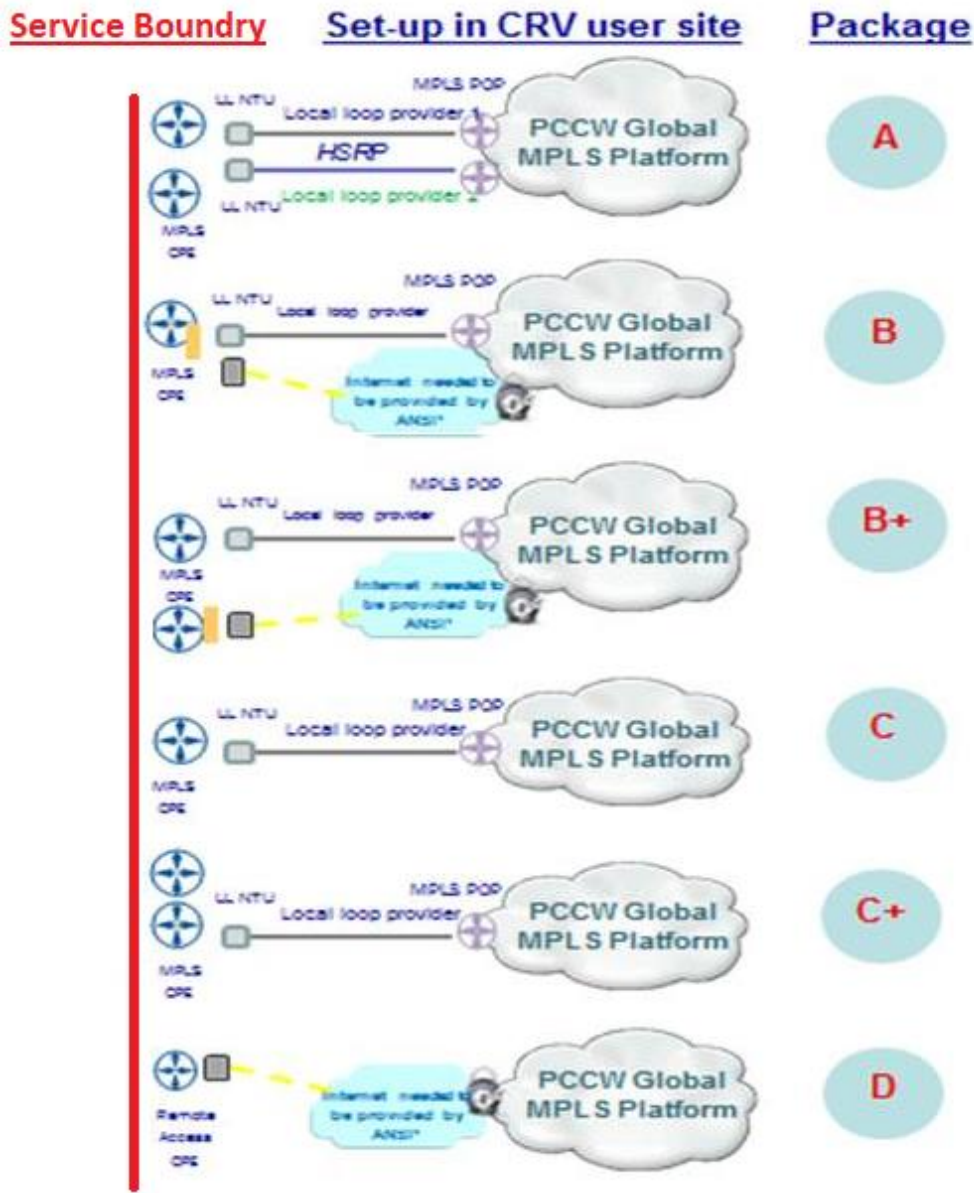
DRAFT

5.1

7.1 Service Boundary

It is important to define the CRV Service boundaries to ensure clear demarcation of responsibility for service operation.

The Services Boundary definition is illustrated in the diagram below, PCCWG is responsible for the connection from PCCWG MPLS Platform to the Customer interface on the PCCWG Customer Premises Equipment (CPE)/Network Interface Device (NID.)



5.27.2 Event Management

Process Objective: To make sure CIs and services are constantly monitored, and to filter and categorize Events in order to decide on appropriate actions.

- a) Managed by PCCW

### 5.37.3 Incident Management

---

Process Objective: To manage the lifecycle of all Incidents. The primary objective of Incident Management is to return the CRV service to users as quickly as possible.

- a) ~~Managed by PCCW~~

~~Check with Common Package.~~

~~Root cause reporting post the incident upon request. Template for this?~~

- a) ~~\_\_\_\_\_~~

### 5.47.4 Request Fulfilment

---

Process Objective: To fulfil Service Requests, which in most cases are minor (standard) Changes (e.g. requests to change a password) or requests for information.

- a) Managed by PCCW

### 5.57.5 Problem Management

---

Process Objective: To manage the lifecycle of all Problems. The primary objectives of Problem Management are to prevent Incidents from happening, and to minimize the impact of incidents that cannot be prevented. Proactive Problem Management analyses Incident Records, and uses data collected by other IT Service Management processes to identify trends or significant Problems.

- a) PCCW Initiated – Follow the Customer Support Service Plan
- b) Authority CRV User Initiated
  - a. Troubleshoot local connectivity
  - b. Polling the NID. On the ANSP NID provided by PCCW, a local loop back will be configured using a specified IP address from the allocated range of IP addressing. This will be called the troubleshooting IP address.
  - c. Troubleshoot with peers
  - d. ~~\_\_\_\_\_~~ Fault with PCCW following the Customer Support Service Plan ~~\_\_\_\_\_~~

### 5-67.6 Access Management

---

Process Objective: To grant authorized users the right to use a service, while preventing access to non-authorized users. The Access Management processes essentially execute policies defined in Information Security Management. Access Management is sometimes also referred to as Rights Management or Identity Management.

Access management includes aspects such as the following:

a) Physical Access Control

i. The Cabinet for Core Routers are locked

ii. The network main PoP sites are under 7x24 CCTV monitoring and recording

a)

b) Remote Network Access Control

i. The remote access of Cores and CE routers are controlled by access list ACL that is only allow authorized terminal of management systems.

ii. The TACACS is deployed to allow the authorized persons of PCCWG to access Core Routers or CE routers as AAA clients.

c) Portal Access

Review member's access annually. These controls are detailed in the PCCWG System Design Document. (CRV Portal - Documentation).

DRAFT

## 8 ~~PART VII~~ PART VIII: CONTINUAL SERVICE IMPROVEMENT

### **Continual Service Improvement**

- Service Review
- Process Evaluation
- Definition of CSI Initiatives
- Monitoring CSI Initiatives

### 5.78.1 Service Review

---

Process Objective: To review business-CRV services and infrastructure services on a regular basis. The aim of this process is to improve service quality where necessary, and to identify more economical ways of providing a service where possible.

From time to time the CRV OG will coordinate groups of volunteers to undertake a CRV Service Review in conjunction with the CRV Provider for each section

. These Service reviews will be reported back to the annual CRV OG meeting. Small groups around these sections.

Report back up to the master document owner

Approval by Chairs

Approval by APANPIRG

Master owner of the document updates and publishes every two months?

Quarterly conference call to start with to update the document.

### 5.88.2 Process Evaluation

---

Process Objective: To evaluate processes on a regular basis. This includes identifying areas where the targeted process metrics are not reached, and holding regular bench markings, audits, maturity assessments and reviews.

### 5.98.3 Definition of CSI Initiatives

---

Process Objective: To define specific initiatives aimed at improving the CRV services and processes, based on the results of service reviews and process evaluations. The resulting initiatives are either internal initiatives pursued by the service provider on his own behalf, or initiatives which require the customer's cooperation.

### 5.108.4 Monitoring CSI Initiatives

---

Process Objective: To verify if improvement initiatives are proceeding according to plan, and to introduce corrective measures where necessary.

9 PART ~~IX~~: CONTINUAL SERVICE  
IMPROVEMENT DEFINATIONS

DRAFT



DEFINITIONS

6 PART VIII

DRAFT

### 6.19.1 Definitions

---

- A Service is defined as any Aeronautical Fixed Service (AFS) provided over the CRV supporting Meteorological Service for International Air Navigation or Air Traffic Control Services.
- Incident - According to the network design of the Service, incident that resulted in service degradation or outage. e.g. State member B subscribed two Package C ( C1 and C2) and there is a fiber cut along C1. To PCCWG's point of view, C1 and C2 are two separated circuits. Even though C2 is still providing connectivity to State member B, this will still be categorized as "incident ".
- Incident without service impact - According to the network design of the Service, incident causes no service degradation or outage. E.g. State member A subscribed Package A, and there is a fibre cut on primary link. Since there is fail-over mechanism as redundancy for package A's user, the fibre cut is an incident without service impact.
- Service Consumer (SC) is defined as a company or organisation that consumes aeronautical information using the CRV as the means of communication.
- Service Provider (SP) is defined as a company that provides aeronautical service using the CRV as the means of communication.
- A Service is defined as any service provided over the CRV supporting Meteorological Service for International Air Navigation or Air Traffic Control Services.  
Connecting a Service Provider / Service Consumer (SPSC)

10 PART X: APPENDICES

DRAFT

## Appendix A: CRV Terms of Reference as accepted by APANPIRG

---

Common Regional Virtual Private Network (VPN) Operations Group (OG) of  
Asia/Pacific Air Navigation Planning and  
Implementation Regional Group (APANPIRG) (APANPIRG CRV OG)

### TERMS OF REFERENCE

#### 1. Background

The establishment of APANPIRG CRV OG was proposed during the deliberations of the CRV Task Force (TF) as a dedicated group to provide oversight of the CRV operations and the performance of the CRV Service Provider. The APANPIRG CRV OG is formally established by APANPIRG Decision 27/33.

#### 2. Terms of Reference

The Common Aeronautical Virtual Private Network (VPN) Operations Group (OG) will provide oversight of the function and performance of the CRV and the performance of the Service Provider. The following are the activities to be performed:

- a) Oversee the implementation of the CRV post Contract Award;
- b) Manage issues arising from the transition with CRV TF, if any;
- c) Co-ordinate and standardize the establishment or upgrade of CRV services as required; d) Co-ordinate activities with other ICAO CRV OGs, if any, to make sure that decision making and communication with CRV Service Provider is consistent and timely;
- e) Oversee the performance of the CRV Service Provider, including customer service; f) Oversee the performance of the CRV network;
- g) Oversee the escalation and solving by the CRV Service Provider of issues associated with the provision of the CRV, including safety and security related issues;
- h) Assist with the resolution of issues associated with the provision of the CRV among the CRV Users as required, including safety and security related issues;
- i) Assist with the migration of Aeronautical Fixed Services (AFS) onto the CRV, in line with the GANP and seamless ATM plan;
- j) Maintain CRV OG documentation associated with the function, performance and management of the CRV, including the CRV OG Operations Manual, a list of CRV users and a record of variations to the common tender package;
- k) Accept deliverables from the CRV Service Provider on behalf of the CRV Users as required; l) Promote the use of CRV;
- m) Undertake continuous service improvements review to ensure CRV meets future needs; and n) Perform any other activity as required by CRV operations.

#### 3. Reporting

The CRV OG will report to Asia/Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG) through ACSICG and CNS SG.

#### 4. Participation

The CRV OG will include all APAC Member States/Administrations, and any other organization as needed. Member States and/or inter-regional entry/exit Administrations in other ICAO regions may also be invited or request to participate in the activities of CRV OG.

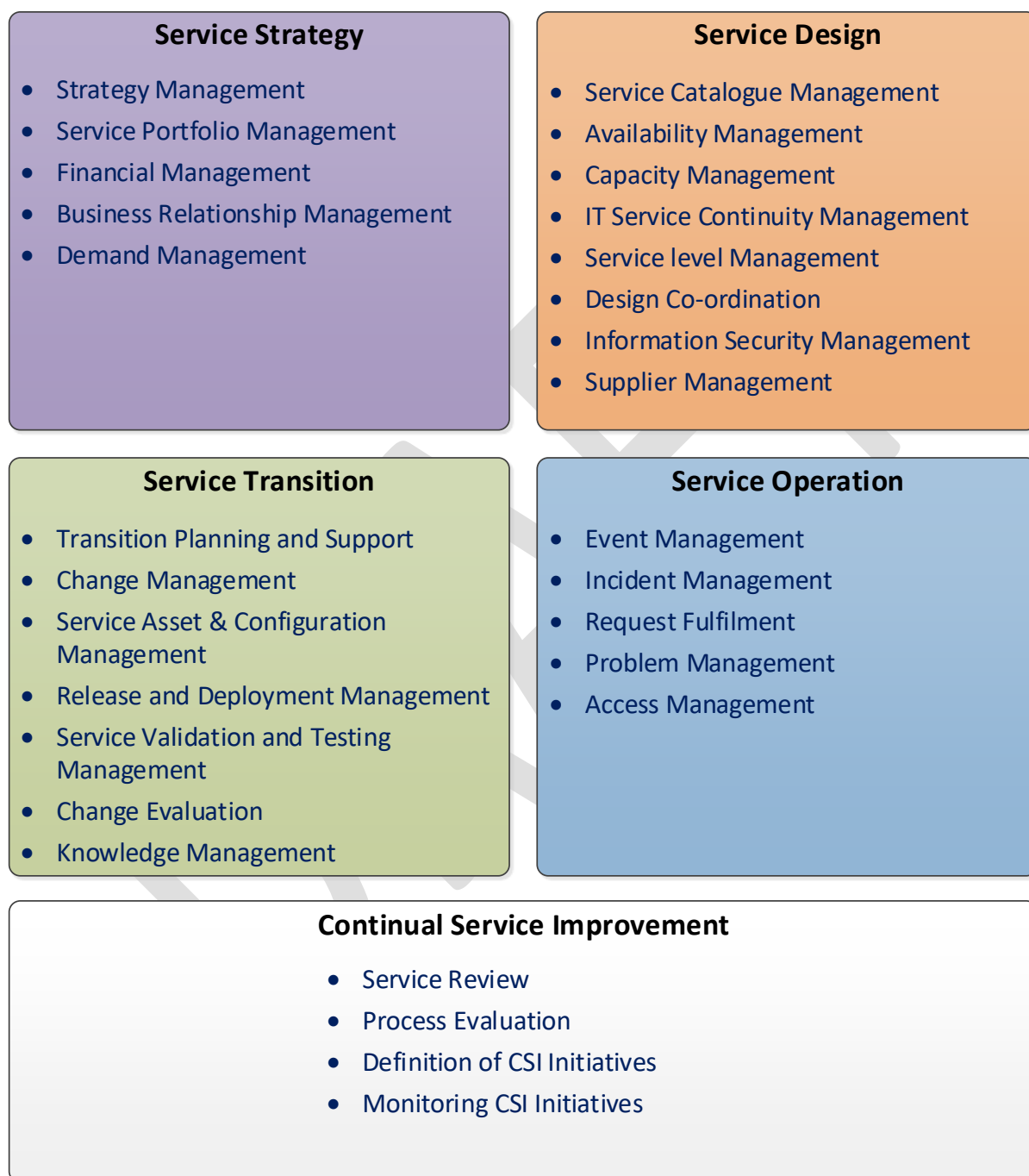
#### **5. Conduct of the work**

It is anticipated that the CRV OG will conduct its work primarily by Web Conferences, teleconferences and other electronic means of communications. Face to Face meetings of CRV OG may be required on an annual basis. The ICAO APAC Regional Office will provide secretariat support for the CRV OG.

#### **6. Rapporteur**

There will be two Co-Chairpersons of the CRV OG, one primarily responsible for Asia coordination and the other for Pacific coordination.

DRAFT

[Appendix B: General Structure of ITIL](#)~~[Appendix X: General Structure of ITIL](#)~~

## Appendix C: Process for connecting a Service Provider / Service Consumer to the CRV

### Introduction

Connecting a Service Provider / Service Consumer (SPSC) to the CRV can be initiated by any party that identifies a need for an SPSC to connect to it. The following should be considered by the SPSC and the CRV-Member state.

Service Provider (SP) is defined as a company that provides aeronautical service using the CRV as the means of communication.

Service Consumer (SC) is defined as a company or organisation that consumes aeronautical information using the CRV as the means of communication.

The SPSC should be referred to PCCW to enable an initial discussion with them to assess the feasibility of connecting to the CRV. During this discussion the SPSC should clarify:

--- Interfaces

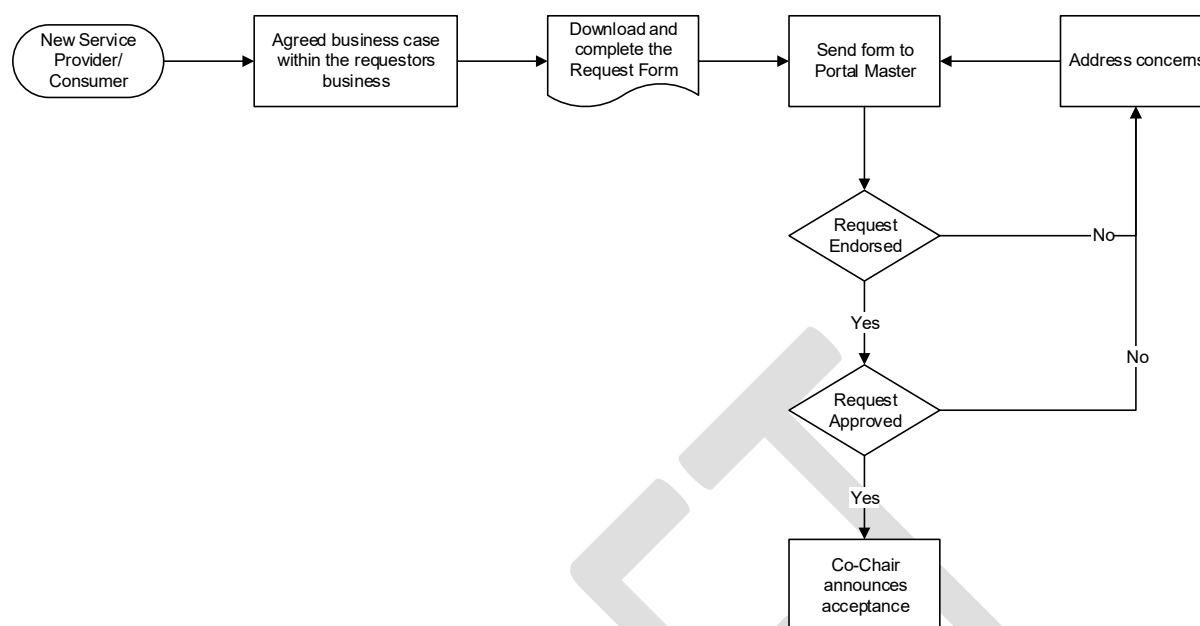
--- Data transfer rates

--- DSCP marking etc.

- 1) ---
- 2) It is recommended that Service Providers use public IP addressing for the delivery their services.
- 3) It is recommended that Service Consumers are provided with a 10.x.x.x IP addressing from the CRV Member State where the PCCW NID is installed.
- 4) SPSCs will NOT be a member of the CRV Operations Group (OG). The OG may establish a CRV user group that could facilitate discussion on the use of the CRV by SPSCs.
- 5) SPSCs will need to adhere to the CRV System Design Document (SDD). Substantive changes to the SDD MUST be endorsed by the CRV OG.
- 6) CRV member states should consider ICAO Doc 9855 AN/459 Guidelines on the Use of the Public Internet for Aeronautical Applications as guidance when they are the Primary sponsor.
- 7) The CRV OG IS NOT responsible for the accreditation/certification/validation of a Service Provider, but must ensure that the all reasonable steps have been taken to ensure that the Service Provider has sufficient systems and process in place to provide their service over the CRV.

- 8) Service Consumers and CRV members SHOULD ensure that when obtaining a Service from a Service Provider that the service meets their operational service requirements.

DRAFT

**5.1.2.2 — Process**

*Figure 1 : Process flow for adding a new Service Provider / Service Consumer*

a. The information required in the connection request, should be presented in English and in a clear and logical format. The following process will be used for an SPSC to obtain approval connect to the CRV:

- 1) Provide a business justification including Benefits Realization for joining the CRV;
- 2) For a Service Provider: provide a documentation using Section 2.3 ACCREDITATION OF AN IASP in ICAO Doc 9855 AN/459 as a guide including a cyber-security plan;
- 3) For a Service Consumer; at a minimum, provide a CRV connection plan and cyber-security plan on how they will shield the CRV from their organisation;
- 4) Obtain a Primary CRV member state to sponsor their connection to the CRV;
- 5) Obtain business justification from Primary Sponsor to support their request;
- 6) Obtain a Secondary CRV member state to sponsor their connection to the CRV based on the information above;
- 7) The information provided above, will be provided to the CRV OG via the APAC CRV portal.

- 8) CRV OG members will be notified and have 25 business days to review and address any concerns that they may have with the request.
- 9) After the 25 days, if the majority of reviews by CRV OG members are endorsed, the CRV OG chairs will review the request.
- 10) For the request to be approved, both CRV OG Co-Chairs need to approve the request.
- 11) A Document/Certificate will be provided to the primary sponsor that can used to verify that the SPSC is approved to connect the CRV.

The application process of Service Provider / Service Consumer is supported by the Airways New Zealand provided APAC CRV SharePoint portal. There will be Microsoft Word forms to facilitate the information and these forms will be migrated to an automated SharePoint Workflow as soon as practical.

Service Provider / Service Consumer will be required to undertake the following:

Provide a business justification including Benefits Realisation for joining the CRV

Provide a High Level System Design on how their Service could potentially connect to the CRV.

Service Providers to use Public IP Addressing

Service Consumers to use the ICAO allocated IP addresses

Interfaces

Data transfer rates

DSCP marking

CRV OG/7  
Appendix D to the Report

Reference	Who	What	Due date	Status	Completed on	Result	Comment
1	ICAO RO	after inclusion by ICAO TCB of the revised budget and procurement clauses, ICAO Regional Office to send an ICAO State letter to all Pioneer States in order to propose the draft of revised annex 1 for acceptance. CRV OG/6 made Decision OG/6/3 to develop SOW for the concrete proposal.	22-Jan-20		The revised annex 1 had been developed in CNS SG/21 report but no concrete proposal.		CRV OG/2 has agreed to first explore the possible solutions through a small working group - action postponed to 1 Dec 17. The TCB expects more concrete proposal for the 2nd phase. OG chair seeking comments from pioneers states for be reviewed at CRV OG/6 meeting
2	Vaughan Hickford, New Zealand:	to develop the flowchart to manage change requests to the common provisions and establish agreements between counterparts on CRV and integrate those flowcharts in the CRV Operating Manual	20-Apr-18	Open	5/10/2019		Flow chart had been developed by CRV OG/4 and it will be included in the CRV Operating Manual. Identify sections where to be inserted?
3	All member States	complete contract with PCCW Global by no later than 12/2020	1-Dec-20	Open	on-going		Report on the status at each CRV OG meeting & update the CRV Implementation status table
4	CRV OG co-chair (Asia) and & pioneer CRV member States	To investigate use the MSA funds to undertake the independent safety assessment and seek approval from Pioneer States	Apr.2020	Open	on-going		same as item serial no. 1-1
5	China, Nepal, PCCWG	Study on use of existing VSAT infrastructure linking with CRV	Jan-20	Open	on-going		feasibility on use the existing infrastructure
6	PCCW Global & New Zealand	Pacific solution on inter-connection with PASNET	May-20	Open	on-going		Feasibility for interconnection
7	Australia and New Zealand	Polishing draft First CRV Operations Manual	May-20	Open	on-going		get it ready for endorsement and adoption
8	PCCWG & Australia	maintain APAC dial plan and posted on CRV OG portal	May-20	Open	on-going		consolidated by PCCWG and posted on the portal
9	AFSSP WG	encouraging member states of CRV to participate	20-Apr-20	Open			Inform Administration to participate and contribute
10	Hong Kong China	SWIM demonstration over mini-CRV by HK, Singapore and Thailand	1-May	Open	on-going		present the outcome of the demo to ACSICG/7 and SWIMTF/4
11	Australia and PCCWG	High level concept for inter-regional MPLS/IP connection	21-Apr-20	Open	on-going		provide initial proposal at AFSSP WG
12	PCCWG & Australia, Fiji	Charging structure for an ANSP service provider on surveillance	20-Mar	Open	on-going		as soon as possible for cba comparison
13	ICAO RO, Australia and USA	State letter to States to remind joining CRV	Mar-20	Open			late comer may compromise the benefits

COMMON AERONAUTICAL VPN (CRV)

IMPLEMENTATION PLAN – V2.0

**NATIONAL CRV POINTS OF CONTACT**

**Asia Pacific Region:**

State/ Administration	ANSP/ CAA	National CRV Point of Contact (POC)	Job Title	E-mail	Telephone/FAX	Address
Afghanistan	Director of Technical Services Afghanistan Civil Aviation Authority (ACAA)	Eng. Mohammad Shaker Popal	Director of CNS	<a href="mailto:engpopal@yahoo.com">engpopal@yahoo.com</a>	Office Tele: +93 (0)20 2311962 Mobile : +93 (0)799 601095	Kabul international airport
Australia	Airservices Australia	Mr. Terence Palmer	Team Leader Networks	<a href="mailto:Terence.palmer@airservicesaustralia.com">Terence.palmer@airservicesaustralia.com</a>	Tel:+61 (2) 6268 4960	Airservice Australia 25 Constitution Avenue Canberra 2600, ACT Australia
Bangladesh	Dhaka Hazrat Shahjalal	Mr. S M A Gaffar Fakir	Communication Officer (ATM) Civil Aviation Authority of Bangladesh	<a href="mailto:cocatc@caab.gov.bd">cocatc@caab.gov.bd</a>	Tel +880 171 506 7502 Fax +880 (2) 890 1411	Headquarters, Kurmitola Dhaka 1229 Bangladesh

COMMON AERONAUTICAL VPN (CRV)

IMPLEMENTATION PLAN – V2.0

State/ Administration	ANSP/ CAA	National CRV Point of Contact (POC)	Job Title	E-mail	Telephone/FAX	Address
Bhutan	Civil Aviation Authority	Mr. Karma Wangchuk	Dy. Executive ANS Engineer	<a href="mailto:kwangchuk@bcaa.gov.bt">kwangchuk@bcaa.gov.bt</a>	Tel: +975 8 271347 (Ext.:107), Fax.: +975 8 271944	Paro Airport
Brunei Darussalam						
Cambodia		Mr. Neang To	Chief of CNS State Secretariat of Civil Aviation	<a href="mailto:neangto.ans@gmail.com">neangto.ans@gmail.com</a>	Tel +855 (23) 224 258 Fax +855 (23) 224 259	State Secretariat of Civil Aviation #44 Phnom Penh International Airport Russian Federation Blvd. Phnom Penh Cambodia

COMMON AERONAUTICAL VPN (CRV)

IMPLEMENTATION PLAN – V2.0

State/ Administration	ANSP/ CAA	National CRV Point of Contact (POC)	Job Title	E-mail	Telephone/FAX	Address
China	ATMB/CAAC	Mr. Huang Zheng	Engineer	<a href="mailto:huangzheng@catc.net.cn">huangzheng@catc.net.cn</a>	Tel:+86 58729977 Fax:+86 (10) 67331459	Air Traffic Management Bureau of CAAC No.301 Western, Dongwei Rd, SunHe, Chao Yang District, Beijing, China
Hong Kong, China	Civil Aviation Department Hong Kong, China	Mr. MH Hui	Chief Electronics Engineer	<a href="mailto:mhhui@cad.gov.hk">mhhui@cad.gov.hk</a>	Tel: +852 2910 6505 Fax: +852 2845 7160	Civil Aviation Department Headquarters 1 Tung Fai Road Hong Kong International Airport, Lantau Hong Kong, China
China, Macau	ADA- Administration of Airports	Mr. Samson Pun	Safety Officer	<a href="mailto:samsonpun@aacm.gov.mo">samsonpun@aacm.gov.mo</a>	Tel:+853 8796 4150 Fax:+853 2833 8089	Civil Aviation Authority of Macao, China Alameda Dr. Carlos D' Assumpcao 336-342, Centro Comercial Cheng Feng 18 andar Macao, China

COMMON AERONAUTICAL VPN (CRV)

IMPLEMENTATION PLAN – V2.0

State/ Administration	ANSP/ CAA	National CRV Point of Contact (POC)	Job Title	E-mail	Telephone/FAX	Address
Democratic People's Republic of Korea	General Administration of Civil Aviation	Mr. Ri Sung II	Vice Chief, Communication Section ATM Department	<a href="mailto:gaca@silibank.net.kp">gaca@silibank.net.kp</a>	Tel:+850 (2) 181111 Ext. 8108 Fax:+850 (2) 381 4410	General Administration of Civil Aviation Pyongyang International Airport Sunan District, Pyongyang Democratic People's Republic of Korea
Fiji	Airports Fiji Limited	Mr. Kelepi Dainaki	Manager Air Navigation Engineering Services	<a href="mailto:kelepid@afl.com.fj">kelepid@afl.com.fj</a>	Tel:+679 673 1623 Mobile:+679 990 6110 Fax:+679 673 1123	Airports Fiji Limited Private Mail Bag Nadi Airport Fiji Islands
France (territories of French Polynesia, New Caledonia and Wallis and Futuna)	DSNA (France)	Mr. Jean-Marc Valentin	ATM Expert	<a href="mailto:jean-marc.valentin@aviation-civile.gouv.fr">jean- marc.valentin@aviation- civile.gouv.fr</a>	Tel:+687 352443 Fax:+687 265 206	Direction Aviation Civile BP H1, 98800 New Caledonia
India	Airports Authority of India	Mr. Ajay Kapur	General Manager (COM)	<a href="mailto:akkapur@aai.aero">akkapur@aai.aero</a>	Tel:+91 (11) 2461 0537 Fax:+91 (11) 2463 2930	Airports Authority of India Rajiv Gandhi Bhawan Saddurjung Airport New Delhi 110003 India

COMMON AERONAUTICAL VPN (CRV)

IMPLEMENTATION PLAN – V2.0

State/ Administration	ANSP/ CAA	National CRV Point of Contact (POC)	Job Title	E-mail	Telephone/FAX	Address
Indonesia	AirNav Indonesia	Mr. David Farich	Network Infrastructure	<a href="mailto:david.farich@airnavindonesia.co.id">david.farich@airnavindonesia.co.id</a> <a href="mailto:farich@gmail.com">farich@gmail.com</a>	Tel: +62 (21) 5591 5000 Mobile: +62 811276665 Fax:+62 (21) 5591 5100	Airnav Indonesia Support Building Jl. Ir. Juanda, Tangerang Indonesia
Japan	JCAB	Mr. Kenichi Kato	Chief of Flight Information 1 <sup>st</sup> Section, Operations and Flight Inspection Division	<a href="mailto:katou-k24s@mlit.go.jp">katou-k24s@mlit.go.jp</a>	Tel:+81 (3) 5253-8751 Fax:+81 (3) 5253-1664	2-1-3 Kasumigaseki Chiyoda- ku Tokyo 100-8918 Japan
Kiribati						
Lao	Lao Air Traffic Management	Mr. Lamkeo Phouxay	Director of Air Traffic Technical Service Center Lao Air Traffic Management	<a href="mailto:lamkeoattsc@hotmail.com">lamkeoattsc@hotmail.com</a>	Tel: +856 (20) 585 777 94 Fax +856 (21) 512 216	Director of Air Traffic Technical Service Center P.O. Box 2985 Wattay International Airport Vientiane, Lao PDR
Malaysia	Civil Aviation Authority	Mr. Sahrol Nizal Bin Ab Rashid	Senior Assistant Director (CNS)	<a href="mailto:sahrol@caam.gov.my">sahrol@caam.gov.my</a>	Tel:+603 8871 4278 Fax:+603 8881 0530	Civil Aviation Authority of Malaysia No.27, Persiaran Perdana, Precinct 4, Level 4, Block Podium, 62618 Putrajaya Malaysia

COMMON AERONAUTICAL VPN (CRV)

IMPLEMENTATION PLAN – V2.0

State/ Administration	ANSP/ CAA	National CRV Point of Contact (POC)	Job Title	E-mail	Telephone/FAX	Address
Myanmar	Department Of Civil Aviation	Mr. Win Maw	Deputy General Manager	<a href="mailto:winmaw@dcamyanmar.aero">winmaw@dcamyanmar.aero</a>	Tel:+95 92 5018 3029 Fax:+95 (1) 533 016	Department of Civil Aviation ATC Operating Building Yangon International Airport Yangon 11021 Myanmar
New Zealand	Airways New Zealand	Mr. Vaughan Hickford  Mr. Dave Pearson	Team Leader Network Development  Network Support Team Leader	<a href="mailto:vaughan.hickford@airways.co.nz">vaughan.hickford@airways.co.nz</a>	Tel:+64 (3) 358 1521  Tel:+64 (3) 357 0346	Airways New Zealand 26 Sir William Pickering Drive Russley, Christchurch, Canterbury 8043 New Zealand
Nepal	Civil Aviation Authority of Nepal	Mr. Mukul Mishra	Head CNS Planning and Development Department	<a href="mailto:mishramukul@hotmail.com">mishramukul@hotmail.com</a>	Tel: 977-1-4256774  Fax: 977-1-4262516	Civil Aviation Authority of Nepal Head office, Babarmahal, Kathmandu Nepal
Pakistan		Mr. M. Fasih-uz- Zaman Khan	Senior Additional Director Com- Ops	<a href="mailto:Fasih-uz-Zaman.Khan@caapakistan.com.pk">Fasih-uz- Zaman.Khan@caapakistan.com.pk</a>		Pakistan Civil Aviation Authority Headquarters, Terminal-I Jinnah International Airport Karachi 75200 Pakistan

COMMON AERONAUTICAL VPN (CRV)

IMPLEMENTATION PLAN – V2.0

State/ Administration	ANSP/ CAA	National CRV Point of Contact (POC)	Job Title	E-mail	Telephone/FAX	Address
Philippines	Civil Aviation of the Philippines	Mr. Elmer E. Gomez	Division Chief	<a href="mailto:elm_gomez@yahoo.com">elm_gomez@yahoo.com</a>	Tel:+63 (2) 7944 2192 Fax:+63 (2) 8879 9244	Civil Aviation Authority of the Philippines Air Navigation Service ANS Technical Center Building Old Mia Road, Pasay City 1300 Metro Manila, Philippines
Papua New Guinea	PNGASL	Herman Rai	Chief Engineer	<a href="mailto:hrai@pngairservices.com.pg">hrai@pngairservices.com.pg</a>	Tel: +675 312 1500 Fax: +675 325 1941	PNG Air Services Limited Engineering Services BLD 8 mile, P.O.Box 273, BOROKO National Capital District Papua New Guinea
Republic of Korea	Ministry of Land, Infrastructure and Transport	Mr. Kyung Joon, Jang	Assistant Director	<a href="mailto:skyjjan@korea.kr">skyjjan@korea.kr</a>	Tel:+82 (44) 201 4362 Fax:+82 (44) 201 5637	Ministry of Land, Infrastructure and Transport 11, Doum-ro 6 Sejong Special self-governing City Republic of Korea
Singapore	Singapore Air Traffic Control Centre	Mr. Augustine Lau	Engineer (Communications / Nav aids Systems)	<a href="mailto:augustine_lau@caas.gov.sg">augustine_lau@caas.gov.sg</a>	Tel:+65 6422 7071 Fax:+65 6542 2447	Civil Aviation Authority of Singapore Singapore Changi Airport P.O. Box 1 Singapore 918141

COMMON AERONAUTICAL VPN (CRV)

IMPLEMENTATION PLAN – V2.0

State/ Administration	ANSP/ CAA	National CRV Point of Contact (POC)	Job Title	E-mail	Telephone/FAX	Address
Sri Lanka	Airport & Aviation Services (Sri Lanka) Ltd.	Mr. Wipula Wimanshanthi	Head of Electronics and Air Nav Engineering	<a href="mailto:head.eane@airport.lk">head.eane@airport.lk</a> <a href="mailto:wipula60@gmail.com">wipula60@gmail.com</a>	Mobile:+94 77 304 7653 Fax:94 (11) 263 3488	Airport & Aviation Services (Sri Lanka) Ltd. Colombo Airport Ratmalana 10370 Sri Lanka
Thailand	Aeronautical Radio of Thailand Ltd.	Mr. Chonlawit Banphawatthanrak	Chief, Policy and Strategy Management Bureau	<a href="mailto:chonlawit.ba@aerothai.co.th">chonlawit.ba@aerothai.co.th</a> <a href="mailto:chonlawit@gmail.com">chonlawit@gmail.com</a>	Tel: +66 (2) 285 9578 +66 63 265 3643 +66 86 575 7901 Fax:+66 (2) 285 9057	Aeronautical Radio of Thailand Ltd. 102 Soi Ngamduplee Tungmahamek, Sathon Bangkok 10120 Thailand
United States	Federal Aviation Administration (FAA)	Mr. Hoang Tran	International Telecommunicati on Lead	<a href="mailto:hoang.tran@faa.gov">hoang.tran@faa.gov</a>	Tel:+1 (202) 267 7142	Federal Aviation Administration ATO, Programme Management Organization 800 Independence Avenue, SW Washington, DC 20591 USA

COMMON AERONAUTICAL VPN (CRV)

IMPLEMENTATION PLAN – V2.0

**MID Region (CRV) Focal Points (updated in December 2017 at CRV OG/3 meeting):**

State	Name/Title	Contact Details (Tel./Fax/Mobile/Email)
<b>Bahrain</b>	Mohamed Ali Saleh <i>Chief Aeronautical Telecomm</i>	Fax: +973 17329966 Tel: +973 17321187 Email: <a href="mailto:masaleh@caa.gov.bh">masaleh@caa.gov.bh</a>
	Yaseen Hassan AlSayed <i>Head Aeronautical Telecomm Network</i>	Fax: +973 17329966 Tel: +973 17321183 Email: <a href="mailto:y.alsayed@caa.gov.bh">y.alsayed@caa.gov.bh</a>
<b>Egypt</b>	Mr. Mohamed Ramzy Mohamed Abdallah <i>Director of AFTN/AMHS Technical Department</i>	Tel: +202 22657981 +201007736780 Email: <a href="mailto:Mrma_eg@yahoo.com">Mrma_eg@yahoo.com</a>
	Eng. Haitham Mohamed Ahmed Eldosoki <i>Director of AIM Technical Department</i>	Tel: +202 22650781 +201007810781 Email: <a href="mailto:Haitham.mohamed@nansceg.net">Haitham.mohamed@nansceg.net</a>
<b>Iran</b>	Mr. AliAkbar SalehiValojerdi <i>Senior Expert of IRANAFTN/AMHS Training Department</i>	Fax: +98 21 66025101 Tel: +98 21 6102337 Mobile: +989 124 202775 Email: <a href="mailto:aasalehi@airport.ir">aasalehi@airport.ir</a>
	Mr. Alireza Mahdavisefat <i>Senior Expert of IRANAFTN/AMHS COM Centre</i>	Fax: +98 21 66025101 Tel: +98 21 6314 6432 Mobile: +989 333510320 Email: <a href="mailto:mahdavi@airport.ir">mahdavi@airport.ir</a>
<b>Iraq</b>		
<b>Jordan</b>	Ms. Mona Ribhi AlNaddaf	Tel: +9626 4881473 +96279 9876710 Email: <a href="mailto:m.al-nadaf@carc.gov.jo">m.al-nadaf@carc.gov.jo</a>

COMMON AERONAUTICAL VPN (CRV)

IMPLEMENTATION PLAN – V2.0

State	Name/Title	Contact Details (Tel./Fax/Mobile/Email)
<b>Kuwait</b>	Mr. Hassan Alattar <i>Communication Engineer</i>	Fax: +965-2 4721 279 Tel: +965-2 4732 530 Mobile: +965 99449454 Email: <a href="mailto:ha.alattar@dgca.gov.kw">ha.alattar@dgca.gov.kw</a>
<b>Lebanon</b>	Mr. Mohamad Abdallah Saad <i>Head of Telecommunication Equipment</i>	Fax: +961 1 629 031 Tel: +961 1 628 151 Mobile: +961 3 280 299 Email: <a href="mailto:msaad@beirutairport.gov.lb">msaad@beirutairport.gov.lb</a>
<b>Libya</b>		
<b>Oman</b>	Mr. Nasser Salim Al-Suleimani Chief ATM Systems Mr. Ibrahim Said Al-Hajri ATM Systems Engineer	Email: <a href="mailto:nassers@paca.gov.om">nassers@paca.gov.om</a> <a href="mailto:alhajri@paca.gov.om">alhajri@paca.gov.om</a>
<b>Qatar</b>		
<b>Saudi Arabia</b>	Ibrahim bash Senior Systems Engineer Automation Engineering Branch	Fax: +966 12 671 9041 Tel: +966 12 671 7717 Ext 1119 Mobile: +966 50 567 1231 Email: <a href="mailto:ibasheikh@gaca.gov.sa">ibasheikh@gaca.gov.sa</a>
<b>Sudan</b>	Eng. Yasir Eltayeb Sidahmed	Fax: +249 183 770001 Tel: +249 183 782701 Email: <a href="mailto:yasirts@gmail.com">yasirts@gmail.com</a>
<b>Syria</b>		
<b>UAE</b>	Greg Kurten A/Director CNS Communication, Navigation and Surveillance	Fax: +971 2 599 6872 Tel: +971 2 599 6860 Email: <a href="mailto:gegkurten@szc.gcaa.ae">gegkurten@szc.gcaa.ae</a>

COMMON AERONAUTICAL VPN (CRV)

IMPLEMENTATION PLAN – V2.0

---

State	Name/Title	Contact Details (Tel./Fax/Mobile/Email)
	Shahzad Chaudhary Senior CNS Engineer Communication, Navigation and Surveillance	Fax: +971 2 599 6872 Tel: +971 2 599 6865 Email: <a href="mailto:shahzad@szc.gcaa.ae">shahzad@szc.gcaa.ae</a>
<b>Yemen</b>		

-----

**Seventh Meeting of the Common aeronautical Virtual Private Network Operations Group (CRV OG/7)**  
(Bangkok, 20 – 22 January 2020)

**List of Participants**

	<b>STATE/NAME</b>	<b>TITLE/ORGANIZATION</b>	<b>TEL/FAX/E-MAIL</b>
<b>1.</b>	<b>AUSTRALIA (1)</b>		
	1. Mr. Terence Palmer	CRV OG Co-Chair/Networks Team Leader Airservices Australia 25 Constitution Avenue Canberra ACT 2601 <b><u>AUSTRALIA</u></b>	Tel: +61 45 919 1197 Fax: E-mail: <a href="mailto:terence.palmer@airserviceaustralia.com">terence.palmer@airserviceaustralia.com</a>
<b>2.</b>	<b>CHINA (3)</b>		
	2. Mr. Huang Zheng	Manager Operation Guarantee Department Civil Aviation Telecom Co., Ltd. (CATC) 3/F, Equipment Guarantee and Test Base of Air Traffic Management Bureau of CAAC 301 Dongwei Road, Chaoyang District, Beijing <b><u>CHINA (PEOPLE'S REPUBLIC OF)</u></b>	Tel: +86 (10) 5872 9977 Mobile: +86 (10) 134 0100 0524 Fax: +86 (10) 6733 1459 E-mail: <a href="mailto:huangzheng@catc.net.cn">huangzheng@catc.net.cn</a>
	3. Mr. Wang Tianyu	Engineer China Air Traffic Management Bureau of CAAC No. 12, Dong San Huan Middle Road Chaoyang District, Beijing <b><u>CHINA (PEOPLE'S REPUBLIC OF)</u></b>	Tel: +86 (10) 8778 6968 Fax: +86 (10) 8778 6910 E-mail: <a href="mailto:wangtianyu@atmb.net.cn">wangtianyu@atmb.net.cn</a>
	4. Mr. Xin Quan	Engineer China Air Traffic Management Bureau of CAAC B-802 Technology Fortune Center, No. 8 Xuqing Road, Haidian District, Beijing <b><u>CHINA (PEOPLE'S REPUBLIC OF)</u></b>	Tel: +86 (10) 8242 7400 Fax: +86 (10) 8424 7499 E-mail: <a href="mailto:xinquan@outlook.com">xinquan@outlook.com</a>
<b>3.</b>	<b>HONG KONG, CHINA (4)</b>		

**Seventh Meeting of the Common aeronautical Virtual Private Network Operations Group (CRV OG/7)**  
(Bangkok, 20 – 22 January 2020)

	<b>STATE/NAME</b>	<b>TITLE/ORGANIZATION</b>	<b>TEL/FAX/E-MAIL</b>
5.	Mr. Vincent Wong	Senior Electronics Engineer (Projects) 1 Air Traffic Engineering Services Division Hong Kong Civil Aviation Department Civil Aviation Department Headquarters 1 Tung Fai Road Hong Kong International Airport, Lantau <b><u>HONG KONG, CHINA</u></b>	Tel: +852 2910 6508 Fax: +852 2845 7160 E-mail: <a href="mailto:vpwong@cad.gov.hk">vpwong@cad.gov.hk</a>
6.	Mr. Henry Chan	Electronics Engineer (26) Air Traffic Engineering Services Division Hong Kong Civil Aviation Department Civil Aviation Department Headquarters 1 Tung Fai Road Hong Kong International Airport, Lantau <b><u>HONG KONG, CHINA</u></b>	Tel: +852 2910 6574 Fax: +852 2845 7160 E-mail: <a href="mailto:hhlchan@cad.gov.hk">hhlchan@cad.gov.hk</a>
7.	Mr. Lai Kin-chung	Senior Aeronautical Communications Supervisor Air Traffic Management Division Hong Kong Civil Aviation Department Civil Aviation Department Headquarters 1 Tung Fai Road Hong Kong International Airport, Lantau <b><u>HONG KONG, CHINA</u></b>	Tel: +852 2910 6200 Fax: +852 2910 1160 E-mail: <a href="mailto:kclai@cad.gov.hk">kclai@cad.gov.hk</a>
8.	Mr. Cheung Chi-keung	Acting Aeronautical Communications Supervisor Air Traffic Management Division Hong Kong Civil Aviation Department Civil Aviation Department Headquarters 1 Tung Fai Road Hong Kong International Airport, Lantau <b><u>HONG KONG, CHINA</u></b>	Tel: +852 2910 6262 Fax: +852 2910 1160 E-mail: <a href="mailto:ckcheung@cad.gov.hk">ckcheung@cad.gov.hk</a>
<b>4.</b>	<b>FIJI (1)</b>		

**Seventh Meeting of the Common aeronautical Virtual Private Network Operations Group (CRV OG/7)**  
(Bangkok, 20 – 22 January 2020)

	<b>STATE/NAME</b>		<b>TITLE/ORGANIZATION</b>	<b>TEL/FAX/E-MAIL</b>
	9.	Mr. Kelepi Dainaki	Manager Air Navigation Engineering Services Fiji Airports Private Mail Bag Nadi Airport <b><u>FIJI ISLANDS</u></b>	Tel: +673 1623 Mobile: +679 9 906 110 Fax: +673 1123 E-mail: <a href="mailto:KelepiD@fijiairports.com.fj">KelepiD@fijiairports.com.fj</a>
<b>5.</b>	<b>INDIA (2)</b>			
	10.	Mr. Ajay Kumar Kapur	General Manager (CNS) Airports Authority of India Room No. 301, 3 <sup>rd</sup> Floor, Rajiv Gandhi Bhavan Safdarjung Airport, New Delhi – 110003 <b><u>INDIA</u></b>	Tel: +91 (11) 2462 0287 Mobile: +91 85 2790 3456 Fax: +91 (11) 2462 0287 E-mail: <a href="mailto:akkapur@aai.aero">akkapur@aai.aero</a>
	11.	Mr. Arvind Singh Yadav	Joint General Manager (CNS) Airports Authority of India Rajiv Gandhi Bhavan, Safdarjung Airport New Delhi – 110003 <b><u>INDIA</u></b>	Tel: +91 95 9910 6558 Fax: +91 (11) 2462 0287 E-mail: <a href="mailto:asyadav@aai.aero">asyadav@aai.aero</a>
<b>6.</b>	<b>INDONESIA (5)</b>			
	12.	Mr. Hary Wibowo	Head off Aeronautical Communication Section DGCA Indonesia Jl. Medan Merdeka Barat No. 8 Jakarta 10110 <b><u>INDONESIA</u></b>	Tel: +62 813 1438 5188 Fax: E-mail:
	13.	Mr. Arian Nurahman	Air Navigation Inspector DGCA Indonesia Jl. Medan Merdeka Barat No. 8 Jakarta <b><u>INDONESIA</u></b>	Tel: +62 856 9541 4428 Fax: E-mail: <a href="mailto:arian.nurahman@gmail.com">arian.nurahman@gmail.com</a>

**Seventh Meeting of the Common aeronautical Virtual Private Network Operations Group (CRV OG/7)**

(Bangkok, 20 – 22 January 2020)

	<b>STATE/NAME</b>		<b>TITLE/ORGANIZATION</b>	<b>TEL/FAX/E-MAIL</b>
	14.	Mr. Nono Sunariyadi	Head of Division Technical Facility Readiness AirNav Indonesia AirNav Indonesia Support Building, 1 <sup>st</sup> Floor Ir. H. Juanda Street, Tangerang, Banten, 15121 <b><u>INDONESIA</u></b>	Tel: +62 81 8250748 Fax: +62 (21) 5591 5100 E-mail: <a href="mailto:Nonosoc9@gmail.com">Nonosoc9@gmail.com</a>
	15.	Mr. Joko Nugroho Iwan Prasetyo	ATS System Specialist Gedung AirNav Indonesia Ir. H. Juanda Street, Tangerang, Banten, 15121 <b><u>INDONESIA</u></b>	Tel: +62 812 5057 6673 Fax: E-mail: <a href="mailto:zhokione@gmail.com">zhokione@gmail.com</a>
	16.	Mr. David Farich Nugroho	Network Infrastructure TI AirNav Indonesia Ir. H. Juanda Street, Tangerang, Banten, 15121 <b><u>INDONESIA</u></b>	Tel: +62 81 127 6665 Fax: E-mail: <a href="mailto:david.farich@airnavindonesia.co.id">david.farich@airnavindonesia.co.id</a>
<b>7.</b>	<b>JAPAN (1)</b>			
	17.	Mr. Akiyoshi Onigata <i>(Attend as Observer)</i>	Senior Engineer Japan Radio Navigation Systems Association Kaiji Center Building, 4-5 Kojimachi Chiyoda-ku, Tokyo 102-0083 <b><u>JAPAN</u></b>	Tel: +81 (90) 5203 0553 Fax: +81 (3) 5214 1359 E-mail: <a href="mailto:onigata-a190@jrnsa.or.jp">onigata-a190@jrnsa.or.jp</a>
<b>8.</b>	<b>MALAYSIA (4)</b>			
	18.	Mr. Sahrol Nizal Ab Rashid	Senior Assistant Director Civil Aviation Authority of Malaysia No. 27, Persiaran Perdana, Precinct 4 Level 4, Block Podium B 62618 Putrajaya <b><u>MALAYSIA</u></b>	Tel: +603 8871 4278 Fax: +603 8881 0530 E-mail: <a href="mailto:sahrol@caam.gov.my">sahrol@caam.gov.my</a>

**Seventh Meeting of the Common aeronautical Virtual Private Network Operations Group (CRV OG/7)**  
(Bangkok, 20 – 22 January 2020)

	<b>STATE/NAME</b>	<b>TITLE/ORGANIZATION</b>	<b>TEL/FAX/E-MAIL</b>
	19. Mr. Mohd Azizul Hageem Bin Tamarun	Senior Assistant Director Civil Aviation Authority of Malaysia No. 27, Persiaran Perdana, Precinct 4 Level 4, Block Podium B 62618 Putrajaya <b><u>MALAYSIA</u></b>	Tel: +603 8871 4278 Fax: +603 8881 0530 E-mail: <a href="mailto:azizulhageem@caam.gov.my">azizulhageem@caam.gov.my</a>
	20. Mr. Anwar Awang Man	Senior Consultant Telekom Malaysia DSV, Level 12, Menara TM One No. 1, Jalan Damansara, 60000 Kuala Lumpur <b><u>MALAYSIA</u></b>	Tel: +60 13 364 8629 Fax: E-mail: <a href="mailto:anod@tm.com.my">anod@tm.com.my</a>
	21. Mr. Nor Azman Azit	Technical Officer Telekom Malaysia DSV, Level 12, Menara TM One No. 1, Jalan Damansara, 60000 Kuala Lumpur <b><u>MALAYSIA</u></b>	Tel: +60 13 336 6949 Fax: E-mail: <a href="mailto:azmanaz@tm.com.my">azmanaz@tm.com.my</a>
<b>9.</b>	<b>MYANMAR (2)</b>		
	22. Mr. Win Maw	Deputy General Manager Department of Civil Aviation, Myanmar DCA HQ Building, Airport Road Mingaladon TS, Yangon 11021 <b><u>MYANMAR</u></b>	Tel: +95 (1) 533 020 Mobile: +95 92 5018 3029 Fax: +95 (1) 753 3016 E-mail: <a href="mailto:winmaw@dcamyanmar.aero">winmaw@dcamyanmar.aero</a>
	23. Mr. Kyaw Zay Ya	Assistant General Manager (CNS) Department of Civil Aviation, Myanmar DCA HQ Building, Airport Road Mingaladon TS, Yangon 11021 <b><u>MYANMAR</u></b>	Tel: +95 (1) 753 3042 Mobile: +95 92 5029 0470 Fax: +95 (1) 753 3000 E-mail: <a href="mailto:kyawzayya.27@gmail.com">kyawzayya.27@gmail.com</a>
<b>10.</b>	<b>NEPAL (4)</b>		

**Seventh Meeting of the Common aeronautical Virtual Private Network Operations Group (CRV OG/7)**  
(Bangkok, 20 – 22 January 2020)

	<b>STATE/NAME</b>		<b>TITLE/ORGANIZATION</b>	<b>TEL/FAX/E-MAIL</b>
	24.	Mr. Mukul Mishra	Deputy Director Civil Aviation Authority of Nepal Head office, Babar Mahal, Kathmandu <b><u>NEPAL</u></b>	Tel: +977 (1) 426 2387 Fax: +977 (1) 426 2516 E-mail: <a href="mailto:mukulmishra@fulbrightmail.org">mukulmishra@fulbrightmail.org</a>
	25.	Mrs. Reenu Mool	Deputy Director Civil Aviation Authority of Nepal Head office, Babar Mahal, Kathmandu <b><u>NEPAL</u></b>	Tel: +977 (1) 426 2387 Mobile: +977 98 4133 0855 Fax: +977 (1) 426 2516 E-mail: <a href="mailto:rmool@hotmail.com">rmool@hotmail.com</a>
	26.	Mr. Bhupendra Bhatta	Manager Civil Aviation Authority of Nepal Head office, Babar Mahal, Kathmandu <b><u>NEPAL</u></b>	Tel: +977 (1) 426 2387 Fax: +977 (1) 426 2516 E-mail: <a href="mailto:bhatta0415@gmail.com">bhatta0415@gmail.com</a>
	27.	Mr. Samit Kumar Singh	Manager Civil Aviation Authority of Nepal Head office, Babar Mahal, Kathmandu <b><u>NEPAL</u></b>	Tel: +977 (1) 426 2387 Fax: +977 (1) 426 2516 E-mail: <a href="mailto:samit.sing@gmail.com">samit.sing@gmail.com</a>
<b>11.</b>	<b>PAPUA NEW GUINEA (1)</b>			
	28.	Mr. Herman Rai	Chief Engineer Air Traffic Services Papua New Guinea Airservices Ltd. (PNG) P.O. Box 273 Boroko, NCD <b><u>PAPUA NEW GUINEA</u></b>	Tel: +675 7615 5455, 312 1500 Fax: E-mail: <a href="mailto:hrai@pngairservices.com.pg">hrai@pngairservices.com.pg</a>
<b>12.</b>	<b>PHILIPPINES (2)</b>			

**Seventh Meeting of the Common aeronautical Virtual Private Network Operations Group (CRV OG/7)**  
(Bangkok, 20 – 22 January 2020)

	<b>STATE/NAME</b>		<b>TITLE/ORGANIZATION</b>	<b>TEL/FAX/E-MAIL</b>
	29.	Mr. Elmer E. Gomez	Division Chief, Air Navigation Operations Dept. Airways Navigation Services (ANS) Civil Aviation Authority of the Philippines ANS Technical Center Building Mia Road, Pasay City <b><u>PHILIPPINES</u></b>	Tel: +63 (2) 7944 2192 Mobile: +63 91 5505 1052 Fax: E-mail: <a href="mailto:elm_gomez@yahoo.com">elm_gomez@yahoo.com</a>
	30.	Mrs. Mary Lyn C. Santamaria	Assistant Facility In-charge, Manila Aeronautical Data Communication Center Air Traffic Service (ATS) Civil Aviation Authority of the Philippines Manila ADCC, 1 <sup>st</sup> Floor ATM Center MIA Road, Pasay City 1300 <b><u>PHILIPPINES</u></b>	Tel: +63 (2) 8672 7734 Fax: +63 (2) 8672 7736 E-mail: <a href="mailto:santamariamarylyn@yahoo.com">santamariamarylyn@yahoo.com</a>
<b>13.</b>	<b>REPUBLIC OF KOREA (4)</b>			
	31.	Mr. Mim Soo Kim	Deputy Director Ministry of Land, Infrastructure and Transport (MoLIT) #11, Doum-ro 6 Sejong Special Self-governing City, 30103 <b><u>REPUBLIC OF KOREA</u></b>	Tel: +82 (44) 201 4359 Fax: +82 (44) 201 1639 E-mail: <a href="mailto:casa@korea.kr">casa@korea.kr</a>
	32.	Mr. Kyung Joom Jang	Assistant Director Ministry of Land, Infrastructure and Transport (MoLIT) #11, Doum-ro 6 Sejong Special Self-governing City, 30103 <b><u>REPUBLIC OF KOREA</u></b>	Tel: +82 (44) 201 4362 Fax: +82 (44) 201 5639 E-mail: <a href="mailto:skyjjam@korea.kr">skyjjam@korea.kr</a>
	33.	Mr. Kim Won Joong	Manager Korea Airports Corporation 78, Haneul-Gil, Gangseo-Gu, Seoul <b><u>REPUBLIC OF KOREA</u></b>	Tel: +82 (2) 2660 2931 Fax: +82 (2) 2666 6590 E-mail: <a href="mailto:togran1684@airport.co.kr">togran1684@airport.co.kr</a>

**Seventh Meeting of the Common aeronautical Virtual Private Network Operations Group (CRV OG/7)**  
(Bangkok, 20 – 22 January 2020)

	<b>STATE/NAME</b>		<b>TITLE/ORGANIZATION</b>	<b>TEL/FAX/E-MAIL</b>
	34.	Mr. Yoon Tae-Yeon	Manager Korea Airports Corporation 78, Haneul-Gil, Gangseo-Gu, Seoul <b><u>REPUBLIC OF KOREA</u></b>	Tel: +82 (2) 2660 2864 Fax: +82 (2) 2660 2890 E-mail: <a href="mailto:tyyoon13@airport.co.kr">tyyoon13@airport.co.kr</a>
<b>14.</b>	<b>RUSSIAN FEDERATION (4)</b>			
	35.	Mr. Dmitriy A. Abanin	Head of ATM Aeronautical Telecommunications State ATM Corporation Building 7, 37, Leningradksy prospect Moscow 125993 <b><u>RUSSIAN FEDERATION</u></b>	Tel: +7 (495) 531 3264 Fax: E-mail: <a href="mailto:abanin@matfmc.ru">abanin@matfmc.ru</a>
	36.	Ms. Elena V. Gracheva	Head of International Relations Division State ATM Corporation Building 7, 37, Leningradksy prospect Moscow 125993 <b><u>RUSSIAN FEDERATION</u></b>	Tel: +7 (495) 601 0808 Fax: E-mail: <a href="mailto:gracheva@matfmc.ru">gracheva@matfmc.ru</a>
	37.	Mr. Oleg B. Tregubenkov	Head of Message-switching Centre State ATM Corporation Building 3, 37, Leningradksy prospect Moscow 125993 <b><u>RUSSIAN FEDERATION</u></b>	Tel: +7 (499) 231 5295 +7 916 567 7398 Fax: +7 (499) 231 5535 E-mail: <a href="mailto:olegtr@rto.ru">olegtr@rto.ru</a>
	38.	Mr. Nikolai V. Oleinik	Head of Khabarovsk CNS Service State ATM Corporation Khabarovsk Matveevskoye Shosse 28A <b><u>RUSSIAN FEDERATION</u></b>	Tel: +7 (4212) 418 566 Fax: E-mail: <a href="mailto:noleinik@dv.gkovd.ru">noleinik@dv.gkovd.ru</a>
<b>15.</b>	<b>SINGAPORE (3)</b>			
	39.	Mr. John Chong	Head (Communications/Nav aids Systems) Civil Aviation Authority of Singapore Singapore Changi Airport, P.O. Box 1 <b><u>SINGAPORE</u></b>	Tel: Fax: E-mail:

**Seventh Meeting of the Common aeronautical Virtual Private Network Operations Group (CRV OG/7)**  
(Bangkok, 20 – 22 January 2020)

	<b>STATE/NAME</b>		<b>TITLE/ORGANIZATION</b>	<b>TEL/FAX/E-MAIL</b>
	40.	Mr. Augustine Lau	Senior Engineer Civil Aviation Authority of Singapore Singapore Changi Airport, P.O. Box 1 <b><u>SINGAPORE</u></b>	Tel: Fax: E-mail:
	41.	Mr. Joel Ng	Senior ATC Manager (Systems Planning) Civil Aviation Authority of Singapore Singapore Changi Airport, P.O. Box 1 <b><u>SINGAPORE</u></b>	Tel: Fax: E-mail:
<b>16.</b>	<b>THAILAND (7)</b>			
	42.	Mr. Kriangsak Moonsurin	Air Navigation Services Standards Officer Civil Aviation Authority of Thailand 333/105 Laksi Plaza, Khamphaeng Phet 6 Road Talat Bang Khen, Laksi, Bangkok 10210 <b><u>THAILAND</u></b>	Tel: +66 (2) 568 8825 Fax: E-mail: <a href="mailto:kriangsak.m@caat.or.th">kriangsak.m@caat.or.th</a>
	43.	Ms. Nattaporn Pornsawat	Air Navigation Services Standards Officer Civil Aviation Authority of Thailand 333/105 Laksi Plaza, Khamphaeng Phet 6 Road Talat Bang Khen, Laksi, Bangkok 10210 <b><u>THAILAND</u></b>	Tel: +66 (2) 568 8825 Fax: E-mail: <a href="mailto:nattaporn.p@caat.or.th">nattaporn.p@caat.or.th</a>
	44.	Mr. Chonlawit Banphawattharak	Chief, Policy and Strategy Management Bureau (Group of Organization Development) Aeronautical Radio of Thailand Ltd. 102 Ngamduplee, Rama IV Tungmahamek, Bangkok 10120 <b><u>THAILAND</u></b>	Tel: +66 (2) 285 9578 Fax: E-mail: <a href="mailto:chonlawit.ba@aerothai.co.th">chonlawit.ba@aerothai.co.th</a>

**Seventh Meeting of the Common aeronautical Virtual Private Network Operations Group (CRV OG/7)**  
(Bangkok, 20 – 22 January 2020)

	<b>STATE/NAME</b>	<b>TITLE/ORGANIZATION</b>	<b>TEL/FAX/E-MAIL</b>
	45. Mr. Sutthisan Thansuwanwong	Air Traffic Engineering Manager Aeronautical Radio of Thailand Ltd. 102 Ngamduplee, Rama IV Tungmahamek, Bangkok 10120 <b><u>THAILAND</u></b>	Tel: +66 (2) 285 9151 Fax: E-mail: <a href="mailto:sutthisan.th@aerothai.co.th">sutthisan.th@aerothai.co.th</a>
	46. Mr. Dhivatbodi Sivajdhanachoti	Strategic Planning Assistant Manager (Engineering) Aeronautical Radio of Thailand Ltd. 102 Ngamduplee, Rama IV Tungmahamek, Bangkok 10120 <b><u>THAILAND</u></b>	Tel: +66 (2) 287 8577 Fax: E-mail: <a href="mailto:dhivatbodi.si@aerothai.co.th">dhivatbodi.si@aerothai.co.th</a>
	47. Mr. Jatuporn Nootapong	Executive Air Traffic Systems Engineer Aeronautical Radio of Thailand Ltd. 102 Ngamduplee, Rama IV Tungmahamek, Bangkok 10120 <b><u>THAILAND</u></b>	Tel: Fax: E-mail: <a href="mailto:jatuporn.no@aerothai.co.th">jatuporn.no@aerothai.co.th</a>
	48. Mr. Jatooron Suwannarut	Senior Chief, Research & Strategic Management Department Thai Airways International Public Co., Ltd. 89 Vibhavadi Rangsit Road Bangkok 10900 <b><u>THAILAND</u></b>	Tel: +66 (2) 545 4232 Fax: E-mail: <a href="mailto:jatooron.s@thaairways.com">jatooron.s@thaairways.com</a>
<b>17.</b>	<b>USA (3)</b>		
	49. Mr. Michael Watkins	Senior Air Traffic Representative, Asia Pacific Federal Aviation Administration Air Traffic Organization, System Operations American Embassy, Singapore 27 Napier Road <b><u>SINGAPORE</u></b> 258508	Tel: +65 6476 9462 Fax: E-mail: <a href="mailto:michael.w.watkins@faa.gov">michael.w.watkins@faa.gov</a>

**Seventh Meeting of the Common aeronautical Virtual Private Network Operations Group (CRV OG/7)**  
(Bangkok, 20 – 22 January 2020)

	<b>STATE/NAME</b>		<b>TITLE/ORGANIZATION</b>	<b>TEL/FAX/E-MAIL</b>
	50.	Mr. Hoang Tran	International Telecommunication Lead Federation Aviation Administration Air Traffic Organization, Programme Management Organization 800 Independence Avenue, SW Washington, DC 20591 <b><u>USA</u></b>	Tel: +1 (202) 267 7142 Fax: E-mail: <a href="mailto:hoang.tran@faa.gov">hoang.tran@faa.gov</a>
	51.	Mr. Will Turner	Telecommunications Specialist Federal Aviation Administration ATL NEMC International Programme Office Support 41 Woolsey Road, Hampton, GA 30228 <b><u>USA</u></b>	Tel: +1 (404) 434 8187 Fax: E-mail: <a href="mailto:will.ctr.turner@faa.gov">will.ctr.turner@faa.gov</a>
<b>18.</b>	<b>AIREON (1)</b>			
	52.	Mr. Greg Dunstone	Senior Engineer Sales Aireon AIREON	Tel: +61 41 133 2964 Fax: E-mail: <a href="mailto:greg.dunstone@aireon.com">greg.dunstone@aireon.com</a>
<b>19.</b>	<b>PCCW Global (6)</b>			
	53.	Ms. Bowie Lam	Sales Manager Strategic Account Management 20th Floor, Telecom House, 3 Gloucester Road, Wanchai <b><u>HONG KONG, CHINA</u></b>	Tel: +852 2883 8905 Mobile: +852 6381 0415 E-mail: <a href="mailto:bowiel@pccwglobal.com">bowiel@pccwglobal.com</a>
	54.	Ms. Gigi Chan	Senior Consultant 20th Floor, Telecom House 3 Gloucester Road, Wanchai <b><u>HONG KONG, CHINA</u></b>	Tel: +852 2883 6670 E-mail: <a href="mailto:gpcchan@pccwglobal.com">gpcchan@pccwglobal.com</a>

**Seventh Meeting of the Common aeronautical Virtual Private Network Operations Group (CRV OG/7)**  
(Bangkok, 20 – 22 January 2020)

	<b>STATE/NAME</b>		<b>TITLE/ORGANIZATION</b>	<b>TEL/FAX/E-MAIL</b>
	55.	Mr. Boaz Lau	Senior Engineer 18 <sup>th</sup> Floor, Telecom House 3 Gloucester Road, Wanchai <b><u>HONG KONG, CHINA</u></b>	Tel: +852 3419 6179 Mobile: +852 9239 7173 E-mail: <a href="mailto:blau@pccwglobal.com">blau@pccwglobal.com</a>
	56.	Mr. CK Mak	Programme Manager Global Services & Operations 18 <sup>th</sup> Floor, Telecom House 3 Gloucester Road, Wanchai <b><u>HONG KONG, CHINA</u></b>	Tel: +852 2883 2317 Mobile: +852 6710 4491 Fax: +852 2802 3212 E-mail: <a href="mailto:ckmak@pccwglobal.com">ckmak@pccwglobal.com</a>
	57.	Ms. Lorriane Kwan	Regional Service Manager Global Services & Operations 18 <sup>th</sup> Floor, Telecom House 3 Gloucester Road, Wanchai <b><u>HONG KONG, CHINA</u></b>	Tel: +852 3419 6645 Mobile: +8529139 6913 E-mail: <a href="mailto:lwykwan@pccwglobal.com">lwykwan@pccwglobal.com</a>
	58.	Mr. Eddy Lee	Assistant Vice President Presales 20 <sup>th</sup> Floor, Telecom House 3 Gloucester Road, Wanchai <b><u>HONG KONG, CHINA</u></b>	Tel: +852 2888 6112 Mobile: +852 9301 5639 E-mail: <a href="mailto:elee@pccwglobal.com">elee@pccwglobal.com</a>
<b>20.</b>	<b>ICAO (2)</b>			
	59.	Mr. Li Peng	Regional Officer CNS International Civil Aviation Organization Asia and Pacific Office 252/1, Vibhavadi Rangsit Road Ladyao, Chatuchak Bangkok 10900 <b><u>THAILAND</u></b>	Tel: +66 (2) 537 8189 ext. 158 Fax: +66 (2) 537 8199 E-mail: <a href="mailto:pli@icao.int">pli@icao.int</a>

**Seventh Meeting of the Common aeronautical Virtual Private Network Operations Group (CRV OG/7)**  
(Bangkok, 20 – 22 January 2020)

	<b>STATE/NAME</b>	<b>TITLE/ORGANIZATION</b>	<b>TEL/FAX/E-MAIL</b>
	60. Mr. Luo Yi	Regional Officer CNS International Civil Aviation Organization Asia and Pacific Office 252/1, Vibhavadi Rangsit Road Ladyao, Chatuchak Bangkok 10900 <b><u>THAILAND</u></b>	Tel: +66 (2) 537 8189 ext. 155 Fax: +66 (2) 537 8199 E-mail: <a href="mailto:ylo@icao.int">ylo@icao.int</a>



# ICAO

*World International Civil Aviation Organization*

## Seventh Meeting of the Common aeRonautical Virtual Private Network Operations Group (CRV OG/7)

Bangkok, Thailand, 20 – 22 January 2020

### LIST OF WORKING, INFORMATION PAPERS & FLIMSY

WP/IP No.	Agenda	Subject	Presented by
<b>WORKING PAPERS</b>			
WP/1	-	Provisional Agenda	Secretariat
WP/2	2	Update the AMHS/ATN Implementation Status Table and the APAC CRV Implementation Table	Secretariat
WP/3	3	The Initial Edition of CRV Operations Manual	Secretariat
WP/4	2	Feasibility of Utilising Existing Satellite Link between China and Nepal while Implementing CRV	Nepal
WP/5	7	Voice over IP Dial Table Upgrade	FAA/USA
WP/6	7	Common aeRonautical Virtual Private Network (CRV) Safety and Protection Planning	FAA/USA
WP/7	5	Connection to CRV AMHS Centres of the Russian Federations Interacting with COM Centres of Countries of the ICAO APAC Region	Russian Federation
WP/8	9	SWIM Demonstration on CRV	Hong Kong China, Singapore, Thailand and PCCW Global
WP/9	8	Review Subject/Tasks of CRV Operations Group	Secretariat
WP/10	6	MPLS/IP Based Inter-regional Connection	Australia
<b>INFORMATION PAPERS</b>			
IP/1	-	Meeting Bulletin	Secretariat
IP/2	2	Outcome of APANPIRG/30 on AFS Related Matters	Secretariat
IP/3	9	PNG Propose to Use CRV for Space Based ADS-B	Papua New Guinea Air Services & ICCAIA (Aireon)

<b>WP/IP No.</b>	<b>Agenda</b>	<b>Subject</b>	<b>Presented by</b>
IP/4	7	FAA International User Portal (IUP) Implementation	FAA/USA
IP/5	2	CRV Adoption Status for DSNA	DSNA/France
IP/6	2	Progress of CRV Implementation in India	India
IP/7	2	Fiji Implementation of Voice & AMHS/AIDC Services over CRV Network	Fiji
IP/8	2 & 7	Implementation Plan of Common aeRonautical Virtual Private Network and Cyber Security Concern in Indonesia	Indonesia
IP/9	2	Report on the Status of Implementation of Common aeRonautical Virtual Private Network (CRV) in the Philippines	Philippines
IP/10	2	Airservices Australia CRV Update	Australia
IP/11	2	ATN/AMHS/AIDC Implementation Status in the APAC Region and CRV Implementation Plan	Myanmar
IP/12	4	CRV Pioneer State Contribution to the ICAO Managed Service Agreement (MSA)	Australia
<b>FLIMSY</b>			
Flimsy 1	3	APAC CRV Operational Manual 2019	Secretariat

-----