



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

**REPORT OF
NINTH MEETING OF THE COMMON AERONAUTICAL VIRTUAL
PRIVATE NETWORK OPERATIONS GROUP
(CRV OG/9)**

*Video Tele-Conference (VTC)
(25 to 27 January 2022)*

The views expressed in this Report should be taken as those of
the Meeting and not the Organization.

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1. Introduction

1.1 The Ninth Meeting of the Common aeRonautical Virtual Private Network Operations Group of APANPIRG (CRV OG/9) was held from *25 to 27 January 2022* via video tele-conference.

2. Attendance

2.1 The meeting was attended by **119** participants from **21** Member States/Administration namely Australia, Bhutan, China, Hong Kong China, Fiji Islands, France, India, Indonesia, Japan, Malaysia, Mongolia, Nepal, New Zealand, Pakistan, Philippines, Republic of Korea, Singapore, Sri Lanka, Thailand, USA, and Viet Nam, 1 International Organizations namely IATA and 1 industry namely PCCW Global, Hong Kong, China. The List of participants is provided in **Attachment 1**.

3. Opening of the Meeting

3.1 The meeting was opened by Mr. Vaughan Hickford, Team Leader Network Design, Airways New Zealand, Co-Chair (Asia) and Mr. Kelepi Dainaki, Manager Air Navigation Engineering Services, Fiji Airport Limited, Co-Chair (Pacific). Mr. Vaughan Hickford welcomed all participants, recalled the achievement made in CRV OG/8, and the main tasks that need to deal with by the CRV OG/9. He mentioned that pandemic continued to disrupt aviation and face to face meeting in 2022 but states are still joining and participating in CRV network. He reiterated that CRV is very important for facilitating AMHS and other ground to ground communication for safe flight operations. As CRV is also supporting Aireon for satellite-based ADS-B and SWIM over CRV is underway, CRV consumers would not need to buy other point to point circuits in future to expand the services. Mr. Kelepi Dainaki also extended warm welcome to all participants and expressed deep appreciation and gratitude to the efforts of all parties to make great achievements and expressed his thanks to the all contributors. He shared his wishes to delegates and hoped for productive meeting.

3.2 Ms. Soniya Nibhani, Regional Officer, ANS (CNS) Implementation highlighted the value of CRV implementation in the region and its role for SWIM Implementation. She extended warm welcome to all participants and expressed deep appreciation and gratitude to the efforts of co-chairs and all parties in supporting the setting up of this CRV OG/9 on-line meeting without compromising the values to the air navigation implementation in States.

4. Officers and Secretariat

4.1 Mr. Vaughan Hickford, Team Leader Network Design, Airways New Zealand, Co-Chair (Asia) and Mr. Kelepi Dainaki, Manager Air Navigation Engineering Services, Fiji Airport Limited, Co-Chair (Pacific) co-chaired the meeting.

4.2 Ms. Soniya Nibhani, Regional Officer ANS (CNS) Implementation, ICAO Asia and Pacific Regional Office, acted as the secretary for the meeting with the support of Ms. Zhong Wenhan, Regional Officer, CNS.

5. Organization, Working Arrangements and Language

5.1 The CRV OG/9 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 **Twenty (20)** Working Papers, **Thirteen (13)** Information Papers, One (1) Presentation for the CRV Service Report of PCCW Global (PCCWG) for 2021, under its thirteen agenda items. A List of Working Papers, Information Papers, and other resources is provided at **Attachment 2**.

6. Conclusions/Decisions - Definition

6.1 The CRV OG of APANPIRG records its actions in the form of Draft Conclusions, Draft Decisions and Decisions with the following significance:

- a) **Draft Conclusions** deal with matters which, in accordance with the Sub-Group's Terms of Reference, require the attention of States/Organization or actions by ICAO in accordance with established procedures;
 - b) **Draft Decisions** relate solely to matters dealing with the internal working arrangements of APANPIRG and its contributory bodies; and
 - c) **Decisions** relate solely to matters dealing with the internal working arrangement of the CRV OG.
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Agenda Item 1: Adoption of Agenda*Adoption of Agenda- Sec (WP/01)*

1.1 The tentative agenda items presented in **WP/01** were adopted as agenda for the meeting.

Agenda Item 2: Review outcomes of relevant meetings*Review of Relevant Meetings - Sec (WP/02)*

2.1 The paper summarized relevant information and updates with the highlight on the reviewed outcomes of CRV OG/8, ACSICG/8, SWIM TF/5, SURSG/1, and relevant discussions of other meetings of CNS SG/25 and APANPIRG/32.

2.2 The CNS SG/25 meeting adopted **Eight** (8) Conclusions and **Five** (5) Decisions. In addition, based on the outcome of discussions on various agenda items, the CNS SG/25 meeting developed **Four** (4) Draft Conclusions for consideration by APANPIRG/32 Meeting, which was adopted by APANPIRG/32. The meeting noted Conclusion/Decision adopted by CNS SG/25 and also reviewed the different Conclusions and Decisions adopted by APANPIRG/32 in December 2021 of interest to the group and discussed the follow-up.

Outcomes of CRV Webinar – Sec (IP/03)

2.3 The ICAO Asia Pacific Implementation of CRV Webinar was held on *20 July 2021* via VTC with 121 participants from 18 States/Administrations, 2 airlines industries and a telecommunication provider.

2.4 Total Four (4) presentations were delivered by CRV experts from New Zealand, Fiji, USA, and Hong Kong China. During the Webinar, Questions and Answers (Q & A) sessions were held at end of each presentation through the Pigeonhole tool. Throughout the Webinar, a total of 40 questions were asked and *more than 15 feedbacks* for the Webinar were provided by Participants with 100% positive responses.

2.5 Meeting was informed that based on Q&A sessions and submitted survey responses from Member States in the webinar, *the need for potential discussion with PCCWG for extension of CRV Implementation deadline beyond the end of 2022 due to COVID-19 crisis as it is continued in 2021, the need for flexibilities in the package options selection by Member States, and the need for a platform for sharing lessons learnt and best practices based on experiences by Member States, which are using CRV, were felt.*

2.6 ICAO Secretariat took necessary action to above proposed feedbacks. The action taken was further presented through WP/08, WP/09, and WP/10 in CRV OG/9.

Agenda Item 3: CRV OG Reference documents*Outcomes of Ad-hoc expert Strategy, Design, Transition and, Operations Groups – New Zealand (WP/03)*

3.1 This paper presented an update on the progress of the Ad Hoc expert groups for Strategy, Design, Transition and Operations.

3.2 CRV OG/8 meeting held via VTC during 17-19 May 2021 created an Ad Hoc Group of experts to progress sections of the CRV Operations Manual.

3.3 The outcomes of three ad-hoc group meeting held on 13th September 2021, 12th November 2021, and 13th January 2022, all by VTC, were presented to the meeting. The meeting noted that the next meeting of ad-hoc group is planned for 10th March 2022 with the aim to publish the next version by 31st March 2022.

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

3.4 The paper presented the ICAO ATN/AMHS Guidance Document Tree and proposed to add CRV reference documents into the ATN Guidance Document Tree for consideration by the meeting.

3.5 Meeting was informed that the current ATN/AMHS Documentation Tree published on ICAO APAC Website is not updated for few years and some documents may be required to add/delete into the tree. Additionally, as the ATN/AMHS Documentation Tree catalogues all relevant ATN/AMHS planning and guidance material and other documents that are related to the planning and implementation of the ATN/AMHS for the APAC Region, the CRV reference documents, including CRV operations manual, CRV Implementation Plan, Voice over Internet Protocol (VoIP) and Analog Voice Interface Control Document for CRV, and [CRV Landing Page](#) published on ICAO APAC Website, may be considered to be added into the ATN/AMHS Document Tree to provide integrated ATN/AMHS structure for APAC States/Administrations.

3.6 Meeting noted that the proposal to take necessary action to update the ATN/AMHS Documentation Tree will be presented into ACSICG/9 to be held from 19 April-22 April 2022 via Video Tele Conferencing (VTC).

3.7 The meeting was requested to review the ATN/AMHS Documentation Tree and consider if addition of CRV reference documents is required, including the document locations on the ATN/AMHS Documentation Tree and necessary modifications on the ATN/AMHS Documentation Tree structure, if any.

3.8 Mr. Hoang Tran, ACSICG Chair suggested that ASIA/PAC Regional ATN Documentation Tree should include CRV Reference documents. It was suggested that CRV manual may be added under Policy & Service Definition documents, Voice over Internet Protocol (VoIP) and Analog Voice Interface Control Document for CRV may be added under Interface Control Documents (ICDs) and CRV Implementation plan may be added under Implementation Documents.

3.9 The meeting recommended that ACSICG/9 to be held from *19 April 2022 to 22 April 2022* may create an ad-hoc group to update the ATN/AMHS Guidance Tree.

3.10 The meeting concluded that the Member States would take some time to take reference of the ATN/AMHS Guidance Tree to review it and to provide the suggestion for modification in the ATN/AMHS Guidance Tree along with locating the position to add different CRV reference documentation. **ACTION ITEM 9-1**

CRV Implementation Plan – Sec (WP/05)

3.11 The ICAO Secretariat shared the information about published CRV Implementation plan on ICAO APAC e-documents portal and concern raised by some states for publication of some information.

3.12 The meeting was informed that the latest version of CRV Implementation plan is version 2.1, which was adopted by CNS SG/25 by Conclusion CNS SG/25/01 - *CRV Implementation Plan Version 2.1*. The document has been circulated to APAC Member States by State Letter Ref: T

8/9.1 – AP006/22 (CNS), 10 January 2022 and is available on the ICAO APAC website at <https://www.icao.int/APAC/Pages/eDocs.aspx> under CNS section.

3.13 It was added that the details included in Table 1, Table 2, Appendix A, and Appendix B of CRV Implementation plan are a list of National Points of Contact, a list of Local Points of Contact, APAC IPv4 Address Plan along with Network Assignment for APAC and MID IPV4 Address plan respectively of all States/ Administrations concerned. Especially, the information about National and Local point of contact for CRV which is used for bilateral coordination with peers' states for CRV Implementation is outdated and required updates from member States and Administration. Meeting noted that the list of National Points of Contact and Local Points of Contact are also available on CRV portal hosted by Airways New Zealand at <https://airwayscorporation.sharepoint.com/teams/APAC-CRV/SitePages/Home.aspx>.

3.14 Previously, during CRV ad-hoc expert group discussion for CRV OG Operations Manual update in 2021 and 2022, some member States shared their concern for publication of Network Assignment for APAC and MID region, National Points of Contact, and Local Points of Contact information on public portal. The meeting was requested to get other member States opinions for this issue and find an agreed way to update required information in CRV Implementation plan.

3.15 Singapore and New Zealand supported the concern raised in ad-hoc expert group and recommended to remove above mentioned information from the latest version of CRV Implementation Plan uploaded on public portal.

3.16 The meeting agreed that publication of Network Assignment for APAC and MID region, National Points of Contact, and Local Points of Contact information should not be shared on public portal and suggested to put this information on ICAO APAC CRV Secure portal or/and on CRV portal hosted by New Zealand. It was concluded that ICAO Implementation Plan will be continued to upload on ICAO APAC e-documents portal. However, the information contained under Table-1, Table-2 and Appendix A and B would not be provided on the public portal. Under Table-1, Table-2 and Appendix A and B, a message would be added to refer to ICAO APAC CRV Secure portal or CRV Portal hosted by New Zealand to get required information along with the instructions needed. **ACTION ITEM 9-2**

VoIP Regional dial plan- USA (WP/16)

3.17 The paper provided an overview of the Voice over Internet Protocol (VoIP) dial plan implemented in the CRV network. The meeting noted that the dialing plan was created to bridge the gap between these voice switches to allow seamless communications between the different ANSPs, which is a document that outlines the digits dialed from an originating site, how the digits are manipulated within the CRV network equipment, and the digits that are sent to the destination switch to allow the voice call to be completed. Guidance for the dial plan is given in section 7 of the PCCW System Engineering Plan.

3.18 The digits format which are manipulated by the CRV network routing equipment were introduced with some examples given in this paper. There are three different sections that make up the digits format as they are transferred from one voice switch to the other voice switch within the CRV network, including AA (Area Identifier utilizes the E.164 country code), CC (ANSP's Centre Code), and OO (ANSP's operator position). The meeting was informed that USA has accepted responsibility for maintaining the CRV dial plan for all member states and any updates/changes should be submitted to be added to the dial plan.

3.19 The meeting noted that all Member States should contact Mr. Will Turner, NEMC Operations Support, FAA Atlanta NEMC at will.ctr.turner@faa.gov or Mr. Hoang Tran, International Telecommunications Lead Federal Aviation Administration at hoang.tran@faa.gov for updating the

VoIP regional dial plan. Alternatively, member states may also contact CRV OG Co-Chairs for updates in their VoIP dial plan.

CRV Operations Manual- New Zealand (WP/20)

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

Agenda Item 4: CRV operational performance report

Latest CRV operational performance report- PCCWG (SP/01)

4.1 PCCWG shared Latest CRV Updates and CRV Network Yearly Service Review for 2021. Meeting was informed about 2021 Ticket Summary by Ticket Type and their overview.

4.2 PCCWG informed that there are 45 circuits in 27 cities with different CRV packages, A, B+, C+, C and D. There are 2 service providers in the CRV network and 5 circuits (A, B+ and C+) are under implementation. It was further informed that 9 cities are joining CRV in 2022, which are Mumbai (India), Jakarta (Indonesia), Makassar (Indonesia), Kathmandu (Nepal), Moscow (Russia), Khabarovsk (Russia), New Caledonia, Sri Lanka, and French Polynesia.

4.3 China queried that Mongolia is not listed into countries who are joining CRV in 2022 in PCCWG operational performance report while Mongolia has already initiated the action to join CRV in 2022. PCCWG informed that as Mongolia has not signed CRV order form yet, their name is not in the list.

4.4 CRV OG Co-Chair (Asia) shared his appreciation to Member States, who are in process to join CRV, and encouraged all member states to join CRV by December 2022.

Agenda Item 5: Review and Update the APAC CRV Implementation Status Table

Update the APAC CRV Implementation Table- Sec (WP/06)

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

Agenda Item 6: CRV contract management

Extension of CRV Contract – Sec (WP/10)

6.1 The paper presented the request received by APAC Member States for extension of current contract of CRV with PCCWG for one year due to current pandemic situation.

6.2 The meeting was informed the CRV contract was established to begin on 31st December 2017, and Individual Contract would be signed by member states with PCCWG by selecting desired services from the common package. It was added that as per the contract, the validity of CRV program shall commence from the date of letter of award issued by ICAO/CRV OG to PCCW Global, which is 31 December 2017 and shall remain in full force and effect for an initial fixed term of 5 years

(the “Initial Term”), irrespective of the date of joining the CRV program or signing of the relevant Service Contract by any individual Authority. As per the current contract, all Authorities shall join the CRV program and sign the relevant Service Contract(s) with PCCWG with the billing start date on or before **31 December, 2022**. For authorities, which join CRV after 31 December, 2022, any additional charges may be imposed. As an action item of CRV OG/8, a State Letter **Ref.: T 8/2.10-AP007/22(CNS)**, 12 January 2022, was issued as a reminder.

6.3 Based on request from participants of CRV webinar on 20 July 2021 to extend current contract, CRV OG/9 was invited to deliberate the requirements of extension of current contract. The meeting was also requested to ask consent of PCCWG for extension of current contract on same terms and conditions.

6.4 It was proposed to take following actions by the meeting:

- To get confirmation from ICAO TCB that the contract can be extended as per current terms and conditions.
- To ensure by all BBIS states that all BBIS will join CRV before 2022 or required extension.
- Request expression of interest from other BIS states to join CRV by 2022 or after that.

6.5 ICAO TCB informed that the role of ICAO TCB in current contract was to select the service provider and the procurement of service provider was one time exercise. In addition, the selection of service provider was not time bound and project document did not state any time limitation. Additionally, there was no contract issued by ICAO. Therefore, CRV OG may decide autonomously to extend the contract.

6.6 France informed that it has plan to join CRV by 2022 and to add New Caledonia in phase-1. New Polynesia and Walls & Futuna under France would be added later into the contract.

6.7 The meeting invited Member States who have not already contracted or initiated CRV contract process to share their intention to join CRV in next few year, if there is any plan. No new Member States shared their interest to join CRV in next few years.

6.8 Further discussion on this paper is summarised under WP/09 of CRV OG/9.

Upgrade/Downgrade CRV Circuits Subscribed – Sec (WP/08)

6.9 The paper summarized the outcomes of discussion of ad-hoc group formed by action item 8-3 of ACSICG/8.

6.10 Meeting was reminded that during the CRV OG/8, Bhutan put forward some problems being faced by Bhutan related to CRV post implementation and to follow up this issue, the Ad-hoc group was formed by CRV OG/8. Additionally, as per ACTION ITEM 8-3 from ACSICG/8, States should have option to upgrade/downgrade the circuits based on the need. The ad-hoc group proposed one of the potential solutions to downgrade the CRV Package for Bhutan by PCCWG. However, Bhutan was informed by PCCWG that PCCWG has not agreed to downgrade CRV Package C to Package D.

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

Upgrade/Downgrade CRV Circuits Subscribed – PCCWG (WP/09)

6.12 PCCWG highlighted the CRV contract T&Cs and listed some examples to illustrate the cost implications in related to upgrade / downgrade the existing CRV services within the contract period.

6.13 PCCWG informed that the CRV contract is bound by the agreed Terms & Conditions document and Additional Terms & Conditions in the “Service Order Form” of the common packages. CRV user committed to pay the agreed monthly charges over the contract period known as TCV (The total contract value (TCV) = one time installation charge + monthly charges x 60 months (i.e., 5 years)). It was added that PCCW Global endeavors to minimize the cancellation charges in the consideration of the customer will subscribe another CRV package.

6.14 The hypothesis cases were listed in order to illustrate different scenario, including *Terminate “Package C (1M)” contract in the third year, Downgrade from “Package C (1M)” to “Package C (512k) or Package D” in the third year, and Upgrade from “Package C(1M)” to “Package C(2M) or Package A (1M)” in the third year.* The meeting was informed that termination will require cancellation charges(= monthly charge x remaining months), while downgrade or upgrade if the new “Package” contract is less than 5-year term, the new monthly charge will be confirmed once a formal request is submitted. The estimation of budget based on remaining contract period was presented to the meeting as follows:

Contract period	
5 years	Quotation is based on "price sheet_6 Package"
4 years	budgetary 10% increase loading under on "price sheet_6 Package"
3 years	budgetary 20% increase loading under on "price sheet_6 Package"
2 years	budgetary 30% increase loading under on "price sheet_6 Package"
1 year	budgetary 40% increase loading under on "price sheet_6 Package"

6.15 PCCWG invited States/Administrations to understand their contract commitment as well as the cost implications due to amendment of the contract and suggested States to plan and dimension their CRV requirement before placing the order. CRV OG might consider to extend the contract framework end date in view of postponed implementation plan due to COVID-19.

6.16 ICAO Secretariat asked if Member States didn’t request to upgrade/downgrade/terminate in initial term of 5 years, but afterwards, during renewal period on year-to-year basis, will states be able to upgrade/downgrade/terminate without any cancellation charges. PCCWG responded that after initial 5 years contract, states may terminate the contract by providing notice period. However, for any upgrade/downgrade, or addition of CRV services or addition of a new site, States would need to sign the contract for another 5 years starting from the date of upgrade/down grade/addition of new site/services.

6.17 India explained that addition of new services or new sites cannot be considered as a new contract as per current Terms and conditions. ICAO Secretariat supported India’s comments and added that states are bound to sign the contract for initial term of 5 years and then renewal automatically on year-to-year basis. Any upgrade/downgrade/addition of new services/ addition of new sites, should not considered as a new contract.

6.18 Bhutan queried about the difference between Service order and the contract and asked if current terms and conditions included the proposal presented by PCCWG for upgrade/downgrade of services. CRV OG Co-Chair (Asia) informed that the current terms and conditions did not mention the cases of upgrade/downgrade of services as it was not anticipated at that time. PCCWG informed that contract was devised initially in 2017 which was very high level and service order form was discussed

and finalised afterwards after several deliberations done in CRV OG. PCCWG shared the willingness to further discuss the provisions provided in the paper.

6.19 In response to Singapore comments about previous discussion about no additional charges in case of upgrading CRV packages, ICAO Secretariat reminded that in CRV OG/8, during discussion of Bhutan issues, PCCWG informed to the meeting that there will be no additional charges for upgradation as Total Contact Values (TCV) mentioned in service order is being maintained by Member States, while in CRV OG/9, PCCWG is presenting the provision of cancellation charges along with mandate of 5 years additional term and higher package price in case 5 years term is not possible, which is not consistent.

6.20 The meeting did not agree to the proposal presented by PCCWG by WP/09 and it was proposed to create an ad-hoc group named as **ICAO CRV Steering Group** comprised of Fiji, India, Japan, Singapore, New Zealand, USA, PCCWG, and ICAO Secretariat. The ad-hoc group would devise the terms and conditions for addition of new services, for upgrade/downgrade of packages along with addition of new sites by contracted states into their contract. **ACTION ITEM 9-3**

6.21 The meeting recommended that ICAO APAC Office would send a State Letter to APAC Member States, who have not joined/not initiated process to join CRV to share their intention to join CRV and when they intend to do so. **ACTION ITEM 9-4** The abovementioned **ICAO CRV Steering Group** will discuss and finalise the requirements of current CRV contract extension based on feedback received from Member States who would join CRV in next few years. **ACTION ITEM 9-5**

6.22 Mr. Hoang Tran, ACSICG Chair informed that the decision of extension of contract need to be taken before CNS SG/26 for its recommendation to adopt the draft conclusion by APANPIRG/33. As CNS SG/26 is scheduled in July 2022, the meeting is required to take necessary action to finalise the decision of current contract extension before that.

6.23 ICAO Secretariat recommended that next CRV OG may met before ACSICG/9 to be held from *19 April 2022 -22 April 2022* for **one day** to discuss the outcomes of ICAO CRV Steering Group related to extension of contract along with to note the progress made by the group for devising terms and conditions related to other conditions mentioned above. The meeting may also propose a draft conclusion for contract extension, if required, for ACSICG/9 adoption. Alternatively, CRV OG may delegate authority to ICAO CRV Steering Group for the same. Most Member States prefer for one day CRV OG/10 meeting on **18 April 2022** before ACSICG/9 meeting. The CRV OG/10 would recommend draft conclusion related to extension of contract, if required, for CNS SG/26 consideration.

Non-aviation providers joining CRV-PCCWG (WP/17)

6.24 PCCWG introduced PCCW Console Connect Aviation Platform for non-ANSP users to exchange SWIM Data with CRV members. PCCWG informed that in order to provide an easy, managed, flexible and scalable mechanism for non ANSP users to exchange SWIM data with those CRV users, PCCW Global planned to extend its EMS node with its own developed software defined interconnection platform - Console Connect for Aviation and purposed built SWIM as Service Platform.

6.25 PCCW Global added that Console Connect platform makes the exchange of the critical SWIM data between ANSPs & Non-ANSP Users simple, predictable and secure. Comparison among CRV, Console Connect Platform for Aviation, and Internet on Network Options, Information Security, Daily Support, and etc. were explained in the paper and added that Console Connect Platform provides web base user interface for SWIM application. Lastly, PCCWG informed that the SWIM services from ANSPs on CRV will be listed on PCCW SWIM Registry where users can select and subscribe and concluded that the Console Connect Platform provides an alternative path for non-ANSP users to exchange SWIM data with ANSPs who are on the CRV Network.

6.26 CRV OG Co-Chair (Asia) asked if the paper is already presented to SWIM TF. PCCWG responded that the paper is not presented to SWIM TF yet.

6.27 Fiji added that if ANSPs will be SWIM providers, SWIM data can be shared on CRV among ANSPs.

Agenda Item 7: States CRV Implementation and operations experience sharing

CRV Post Implementation Issues in Bhutan – Sec, Bhutan & New Zealand (WP/11)

7.1 The meeting was informed about the issues faced by Bhutan related to CRV post implementation due to the non-readiness of peer States and the action taken by CRV OG and ACSICG for its resolution.

7.2 The meeting was reminded that during the CRV OG/8 meeting, Bhutan put forward some problems related to CRV post-implementation, as the follow-up action, an ad-hoc group with experts from six countries, including Australia, Bhutan, India, New Zealand, Singapore, and Thailand was established to discuss a way out for Bhutan to use its CRV service to some extent temporarily. After first meeting, the ad-hoc group agreed that Bhutan connects to AMHS through CRV tunnel directly to New Zealand, and New Zealand acts as a bridge between CRV and existing AMHS circuits for Bhutan. Bhutan also sent a State Letter to ICAO APAC Office to support on the issue. The second meeting of the Ad-hoc group discussed the AFTN Routing Directory changes and agreed that Bhutan and New Zealand will bilaterally coordinate to implement CRV connectivity and the next meeting will be based on the request from Bhutan and New Zealand.

7.3 Bhutan and New Zealand further updated that they have completed System Engineering Plan (SEP), signed a technical letter, managed router service, were ready to perform the acceptance and bidirectional test.

7.4 Bhutan appreciated support of all member states involved in the discussion and necessary action for resolving CRV post implementation issues in Bhutan.

7.5 PCCWG informed that tentative date for CRV implementation in Thailand is 1 May 2022 while India is expected to sign contract by February 2022. After contract signing process, installation process would be initiated by PCCWG for India.

Status Update and Experience Sharing of CRV Operations in Hong Kong China (IP/04)

7.6 The meeting was informed about the status update and experience sharing of CRV operations in Hong Kong, China since its first operational use in 2018, including the cost benefits achieved and network performance observed.

7.7 Hong Kong, China informed that since 2018, Hong Kong, China has also put into operations AMHS connections over CRV to exchange ATS messages with aeronautical network centres of Manila, Fukuoka and Beijing. Hong Kong China further explained the cost benefits of migration to CRV, which can not only save the cost for subscribing to traditional services, but also save efforts in managing each point-to-point connection in contracts and cost sharing arrangement.

7.8 In addition, Hong Kong China analysed one major incident and five minor impact incidents since the operational use of CRV connections and concluded that the network performance of CRV has been stable and satisfactory. However, Hong Kong China also encouraged States to explore additional backup communication means to minimize operational impact since CRV is not immune to service outage despite all its resilience. Furthermore, the future plan for AMHS on CRV operations and migration to CRV to replace the legacy AFTN connection in Hong Kong China were shared.

7.9 Sri Lanka appreciated the information provided by Hong Kong, China. Sri Lanka requested Member States' experience about performance of Package D in comparison to International Private Leased Circuit (IPLC) as the performance of current IPLC in Sri Lanka is very satisfactory and Sri Lanka want to assure that the performance of CRV Package D is also satisfactory. Fiji informed that the reliability of PCCWG Package D depends upon the reliability of internet connection. If internet connection performance from Internet Service Provider (ISP) is good, Package D performance would be as good as for IPLC. Fiji added that in terms of cost benefits analysis, currently cost saving are being achieved by Member States where POP of PCCWG is available. But as Fiji required to pay POP up to Sydney, Fiji is not getting cost saving as it is being received by many member states. Fiji requested PCCWG to look into the issue to add more POPs in required location. Fiji also informed that as per Fiji's view, Package D may be better option for small ANSP and for small Pacific states for AMHS and voice services but not for SWIM services.

7.10 In response to a request to get more information about CRV Packages, CRV OG Chair (Asia) shared that Package details can be found on CRV portal hosted by New Zealand by the link given here [\(d\) Addendum to the Specific Terms.docx](#). It was added that if Member States cannot get access to the document by the link mentioned, they can request access to the portal <https://airwayscorporation.sharepoint.com/teams/APAC-CRV/> and may send an email to vaughan.hickford@airways.co.nz for information.

Updates on Korea's New AMHS System Upgrade and CRV Implementation Plan - Republic of Korea (IP/05)

7.11 Republic of Korea presented an update on the ROK's new AMHS system upgrade and the 2022 CRV implementation plan. The meeting was informed that Republic of Korea has completed installation of the hardware and software of the new AMHS (Extended version) in the 4th quarter of 2021, and successfully conducted IOTs with China and Japan in December 2021. ROK shared the POT plan with China and Japan, and planned to cut over the connections to the new CRV-based AMHS in the 4th quarter of 2022. In addition, the meeting was informed that Republic of Korea and China had successfully converted the satellite communications network to wired AFTN line in the 4th quarter of 2021 and agreed to maintain the satellite communications line as a spare communications line through March 2022.

7.12 CRV OG Chairs shared their wishes to Republic of Korea for the achievements in AMHS system upgradation and CRV implementation.

Current Status of CRV Implementation in India (IP/06)

7.13 The meeting was informed about the latest progress of CRV implementation in India. India informed that India had planned to implement the CRV after the CRV trials were successful but the implementation got delayed due to issues related to taxation and some other clauses along with delay due to the COVID-19 Pandemic.

7.14 India further shared the initial CRV implementation plan and further plan to replace the existing AMHS. Meeting noted that AAI and PCCW are in agreement over the draft Purchase Order, which is under final approval and expects to issue by Feb, 2022. The revised High-Level questionnaire has been shared with PCCW and initial site survey at Mumbai has also been done by the Indian partner of PCCW.

7.15 Furthermore, India has been informed by PCCW that lead time requirements for setup of CRV network in India may take 8 months after signing of the agreement, and India requested PCCW to keep themselves in the readiness and reduce the lead-time to get the network established at the earliest after signing of the agreement.

7.16 The meeting shared the concern of high lead time of 8 months given the situation that many states are waiting for India to join CRV, as India is BBIS, in order to initiate action to join CRV and the target date to join CRV is 31 December 2022. PCCWG informed that high lead time is due to shortage of chips for the NID routers, local fiber providers need to install fiber at customer site with approval from local government, and due to pandemic situation. PCCWG added that all new contract would be impacted by this shortage, however, PCCWG is trying its best to take necessary action to reduce the lead time.

7.17 Sri Lanka shared a concern for high lead time and requested PCCWG that based on current progress of Sri Lanka to join CRV, if Sri Lanka would be able to join CRV by the end of 2022 and requested lead time information for Sri Lanka. PCCW indicated that if there are lead time issues for a state, they would work with member state on the agreed installation date. PCCWG informed the meeting that PCCWG is considering the current situation and will provide an official response if there is any contractual and commercial impacts for member states who sign the contract in 2022 but the installation date exceeds the standard lead time in **4 weeks** to Sri Lanka, CRV OG Chairs, and ICAO Secretariat. **ACTION ITEM 9-6.**

Operation Status and Experience Sharing of CRV – China (IP/07)

7.18 China shared the CRV operation status and experience, including the connections status and performance since joining CRV from October 2020. China informed that currently it has single access point that connect to CRV network for data with 3M bandwidth Package A implemented in Beijing while the domestic network of China interface has been setup to connect the CRV.

7.19 Meeting was informed that China has completed the transition and creation of AMHS and ATFM connection with Japan, Republic of Korea, and Hong Kong China. According the cost-benefit analysis, CRV service has saved cost at least three circuits from multinational telecom operators and at least five circuits cost are expected to be saved over the next few years. It was concluded that the performance of CRV service is stable after one year of operation with the SLA percentage better than goal value (99.97%). The meeting was informed that total 20 tickets have been created in the past year with 18 tickets closed successful and 2 tickets under progress. It is recommended that CRV users use the PCCW Customer Service Portal for get adequate information and help that PCCW can improve service quality through proactive service and reflection.

7.20 Fiji questioned about China plan to keep back up for CRV. China informed that as per current data, CRV performance is very good and currently China is also maintaining AFTN circuits as a backup between China and Hong Kong, China and between China and ROK. China added that China would keep AFTN circuits for at least one more year.

FAA CRV Service – USA (IP/08)

7.21 The paper presented the current status of FAA (Federal Aviation Administration) telecommunications using CRV. FAA informed that it has completed transition of all of its telecommunications infrastructure with the APAC region to CRV. Additional new services with Indonesia, Papua New Guinea and the Russia Federation are planned when these States join CRV.

7.22 The meeting was informed that FAA has been a user of the CRV since January 2018 with initial services to Australia, Fiji and New Zealand. FAA's Oakland Center is configured with Package A and 2MB/s bandwidth, while Salt Lake City and Atlanta (AMHS Com centers) both have Package C with 2MB/s bandwidth. USA shared the current status of FAA CRV service, including Salt Lake City NEMC with Australia, Fiji, New Zealand, Japan, and Philippines, and Oakland Center with Australia, Fiji, New Zealand, Japan, PNG, and Philippines. USA further introduced their future plan with Papua New Guinea on AMHS services, Indonesia on direct AMHS and voice services, Russia Federation on direct voice service when these States join CRV.

CRV Implementation Status of Mongolia (IP/10)

7.23 The paper introduced the current progress on the CRV implementation in Mongolia. The meeting was informed that Mongolia had shared its plan to start transmitting data on CRV in 2021 through CRV OG/6, which was delayed due to the outbreak of COVID-19 pandemic. It is estimated that the cost of interconnection between Mongolia and the air traffic control centers of Russia and China will increase 4-5 times with the transition to the CRV B+ package. However, Civil Aviation Authority of Mongolia (CAAM) believes overall cost will be reduced once all systems start exchanging data through CRV. Furthermore, Mongolia shared the CRV Implementation progress since 2019 and informed the meeting that CAAM will initially use D package connection to CRV then upgrade to package B and B+ as usage is extended, and AMHS and ADP data exchanges with Beijing is to be implemented within 4th quarter of 2022.

7.24 China questioned about the status of AMHS upgradation of Mongolia. Mongolia informed that AMHS upgradation is in progress and delayed due to pandemic.

7.25 France questioned that in Package D+, second router is a backup router, however, it is not as per the figure presented in the paper. Mongolia informed that Mongolia planned to add two lines as a main and backup with two ISP while implementing Package D+ and requested with PCCWG if it is possible to implement. PCCWG informed that if a state wanted to proceed with a new Package D+, PCCWG would work with the State to achieve Package D first and then D+. Additionally, the meeting would need to formalise the new Package D+ in the Common Package Documentation.

7.26 CRV OG Chair (Asia) informed that there is no package D+ in CRV packages offered to Member States. Therefore, Package D+ may be considered as Package D with additional backups.

7.27 In response to a question regarding maintenance impacting SLA, PCCWG informed that SLA did not include planned maintenance.

Update on Fiji's CRV Network Upgrade – Fiji (IP/12)

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

7.29 Fiji explained that since PCCWG does not provide redundancy at the MPLS POP for single connection for CRV Package C and C+ and the plan for outage was required, Fiji has to upgrade its CRV connection to ensure service reliability over the CRV network. Meantime, the current measure to deal with any failure on the connection on CRV NID was explained. Fiji shared the plan to upgrade the voice interface between the CRV NID and the VCS to VoIP, intended to start initial testing in Q1 of 2022 which will include the configuration of automatic switchover of the voice & AMHS services between CRV NID 1 & CRV NID 2 through local layer 3 network switches in implementing CRV package B, and will migrate from static to BGP routing for voice and AMHS services after implementing CRV package B+.

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

Current Status of CRV Implementation at DSNA-France (IP/13)

7.31 The paper provided information on the latest progress of CRV implementation in French Pacific Territories (New-Caledonia, French Polynesia and Wallis & Futuna). Only one contract is foreseen for the three of them, including three different possible options (packages) for the connection to CRV network. In June 21, DSNA administration board acknowledged the principle of joining CRV. A progressive solution was envisaged with a phased implementation by Phase 1 in New-Caledonia only, Phase 2 in French Polynesia (foreseen), and optional Phase 3 in Wallis & Futuna.

7.32 DSNA informed that a security assessment has been done that concluded in adding a layer of encryption over CRV in order to meet the European Union requirements. The solution is not fully designed yet but it is under process. This point has yet to be discussed with our counterparts Fiji and New-Zealand in a MOC (Memorandum Of Content).

7.33 DSNA further shared that a security assessment has been done, and a legal and a financial feasibility studies have been set up on DSNA HQ in Paris as well as a local project structure. The issues/questions faced by DSNA in legal matters were explained in detail in the paper. From the 1st January, DSNA has initiated the contacted with PCCW France bureau to speed up the exchanges that the PCCW HQ has not yet agreed. PCCWG was invited to have discussions with DSNA in order to see the contract signed before 31th July 2022.

7.34 France shared the concern by referring WP/09 and hoped that in proposed staged approach adopted by France for CRV Implementation, there would not be any penalty charges, otherwise, it would be difficult to join CRV. France requested meeting to take necessary action to resolve the issues to charge penalties from Member States by PCCWG in case of upgrade/downgrade/addition of sites later in order to provide flexibility and to add more Member States specifically small ANSPs and Pacific States into CRV.

Agenda Item 8: Review the requirement of CRV for SWIM

- **Subscriber**
- **GEMS**
- **ANSP**

SWIM User Network Requirements analysis –USA (WP/18)

8.1 USA presented an analysis of the network requirements for SWIM users. CRV has been considered as an underlying Internet Protocol (IP) network for SWIM services. CRV is currently used to provide the Aeronautical Telecommunication Network (ATN) service that is required for time-sensitive information distribution, as mandated by ICAO Annex X. Even though CRV is able to inter-connect any of its users, connections are only made between members with bi-lateral agreements and implemented using Generic Routing (GRE) tunnels. The meeting was informed that from the network point of view, SWIM users can be categorized into three different groups: a) SWIM subscribers (can be ANSPs or any entities), b) Global Enterprise Messaging Service (GEMS) providers, and c) ANSP based SWIM providers (and subscribers).

8.2 SWIM subscriber, GEMS, and ANSP based SWIM providers definition were explained. USA added that the use of CRV to support SWIM may result in additional bandwidth demands due to the nature of XML based messages. However, CRV can provide a reliable and better secured network compared with the Public Internet. The Public Internet cost will be considerably cheaper than CRV but require additional security measures. However, it might be considered as a backup to CRV service.

8.3 The meeting was recommended to consider this approach and coordinate with the SWIM Task Force for network connection planning.

8.4 The meeting agreed that ICAO Secretariat would present a paper to SWIM TF on behalf of CRV OG to inform about the relevant discussion in CRV OG. **ACTION ITEM 9-7.** It was also agreed that CRV ad-hoc expert Strategy and Design group would join SWIM TF meetings to note important discussions related to CRV and to inform CRV OG about the relevant outcomes. **ACTION ITEM 9-8**

SWIM Providers joining CRV- New Zealand (WP/19)

8.5 The paper presented discussion on SWIM Meteorological providers joining CRV for the delivery of SWIM based Meteorological Data. The meeting was informed that concerns were raised at the SWIM TF/5 Meeting held 9-11 August 2021 via VTC regarding principally using the CRV network to transport SWIM traffic. The SWIM Terms of Reference (ToR) states that principally CRV is used, as the CRV ToR does not provide for non-ANSPs to join CRV. It was clarified that whilst the CRV ToR does not specifically state that non ANSPs such as Meteorological Service Providers can join CRV, it also does not exclude them from joining. The relevant section of CRV ToR and CRV Tender ToR were referred to the meeting.

8.6 It was added that the Operations Manual Definition of a service states: **Service** - Any service provided over the CRV supporting Meteorological Service for International Air Navigation or Air Traffic Control Services. New Zealand concluded that whilst it appears the CRV network has been built to only support AFTN, AMHS, Flow and Voice services, reviewing the CRV documentation, there does not appear to be any documented limitation for a Meteorological Service to not be able to join the CRV network. Therefore, what needs to be discussed is *whether or not Meteorological Services need to go through the documented process to add a new service to the CRV as a Service Provider.*

8.7 The meeting agreed that the process to join CRV by non-aviation service providers such as Meteorological Service providers required detailed deliberations. The meeting agreed that a **specialised meeting** would be organised to discuss and devise a method for non-aviation service provider's joining process to CRV. **ACTION ITEM 9-9** The meeting will be comprised of minimum members of CRV OG Chairs, ACSICG Chairs, SURSG Chairs, PCCWG, and ICAO Secretariat. India and Singapore also volunteered to participate in specialised meeting.

8.8 Hong Kong, China suggested that WP/17 by PCCWG for Non-aviation providers joining CRV should be also considered to discuss in the specialised meeting, which was supported by Singapore. The meeting agreed the proposal.

Agenda Item 9: MPLS/IP based inter-regional connection

Technical Proposal for Regional IP Network Interconnection – PCCWG (WP/07)

8.9 PCCWG shared the meeting how States in CRV Network can communicate with States in REDDIG II Network. PCCWG proposed to establish two (2) Interconnection Points between CRV Network and REDDIG II Network for Primary and Backup respectively. Additional resources are required to build these connections, such as Co-location rack, Interconnection router, Interconnection link, Connection to CRV Network and Connection to REDDIG II Network, the details of technical requirements were explained in the paper.

8.10 Meeting was informed that Interconnection Link will be connected between PCCWG provided Router and Lumen provided Router. This link will be shared responsibility between PCCWG and Lumen. In case of any fault issue, States in CRV Network will report to PCCWG and States in REDDIG II Network will report to Lumen respectively. PCCWG invited the meeting to confirm which

States will require communication between CRV Network and REDDIG II Network to determinate the sizing and cost of the interconnection solution.

8.11 PCCWG added that the meeting also needs to discuss if the additional resources cost for interconnection would be shared by all member States or by the Member State which would like to join REDDIG II. The meeting did not receive any immediate request and interest from Member States to join REDDIG II network. However, France informed that in future France is interested to interconnect with REDDIG II as well as with New PENS.

MPLS/IP Based Inter-Regional Connection- Sec (WP/12)

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

9.2 The meeting was informed that there were communications requirements between APAC ANSPs and SAM ANSPs in order to set up the AMHS P1 connection between AMHS COM Centers of Christchurch (New Zealand) and Santiago (Chile). Noting interconnecting requirements, early discussion among regional networks service providers for CRV and REDDIG II and the CRV OG was initiated.

9.3 Three possible solutions were envisaged to connect the AMHS COM Centers of Santiago (Chile) and Christchurch (New Zealand):

1. *Installing a CRV node in Chile or a REDDIG node in New Zealand*
2. *Using the FAA nodes (CRV and REDDIG II) to redirect packets between the two networks*
3. *MPLS Network-to-Network Interface (NNI) between Lumen and PCCW Global connecting CRV and REDDIG II*

9.4 After further discussion, the interested proposal was Solution-3. Further discussion on the administrative and technical aspects to establish the required aeronautical communications between APAC and SAM ANSPs through MPLS NNI were done on 3 November 2021 by teleconference. The teleconference participants agreed for the proposal presented by PCCW Global, and agreed that Lumen and PCCW Global will work on the proposal and will present a document, not later than December 15th 2021, in order to be analyzed by the Board/Committee of both networks (CRV and REDDIG II). Final technical proposal agreed by Lumen on 15th December 2021 was presented by PCCWG through WP/07 to CRV OG/9.

9.5 ICAO Secretariat informed that the third Meeting of the European Aviation System Planning Group (EASPG) held from 30 November to 2 December 2021 adopted EASPG Conclusion 3/15 – *Coordination on the Interregional AFS Gateways* to initiate necessary interregional coordination with other Regions (i.e., APAC, SAM) in order to support the AFS to SWIM Transition Task Force (AST TF). In response ICAO APAC Office and ICAO EUR/NAT Office coordinated internally as well as with the service providers of regional network in respective region. Further discussion for interconnection of CRV and New PENS will be done.

Agenda Item 10: Review the progress on the next step for using the rest of CRV Pioneer State Contribution to the ICAO Managed Service Agreement (MSA)

Updates on CRV Pioneer State Contribution to the ICAO Managed Service Agreement (MSA) - Sec (WP/13)

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

10.2 After selection of the common service provider in 2016, a fund balance of USD 104,596 remained as on 31 March 2017, when abovementioned Annex 1 to Management Service Agreement (MSA) was prepared and approved. As on 31 December 2021, the remaining fund for use are approximately USD 88,000 because of the return of funds to two pioneer Member States.

10.3 The offline discussion to formalise the way to utilise the remaining fund as well as to take necessary action for outstanding discussion was accelerated after CRV OG/8 held from 17-19 May 2021. First need was to amend Annex 1 to Management Service Agreement (MSA) to propose and present the revised draft of Annex 1 to Management Service Agreement (MSA) in CRV OG/9 meeting for approval.

10.4 With the efforts of ICAO Secretariat, ICAO TCB, CRV OG co-chairs and ACSICG Chair, the Revised Annex 1 to Management Service Agreement (MSA) is prepared and attached in Appendix B to the paper. As per Revised Annex 1 to Management Service Agreement (MSA), the fund will be utilised in the span of 5 years starting from 31 March 2022 to 31 March 2027. The starting and ending date of the project would be revised based on the actual date of adoption of revised document by APANPIRG.

10.5 It was proposed that through this Revision, the following services will be provided by ICAO within the scope of supporting the CRV Network (Stage 2), as may be required:

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

10.6 The meeting requested Member States to provide examples of activities under different categories provided in scope of supporting CRV Network as described in section 10.5. **ACTION ITEM 9-10**

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

10.8 The following draft conclusion for the next step for using the rest of CRV Pioneer State Contribution to the ICAO Managed Service Agreement (MSA) was proposed for consideration by the meeting. The draft conclusion was endorsed by the meeting for ACSICG/9 consideration.

Draft Conclusion CRV OG/09/01: Revised Amendment of the Management Service Agreement for CRV project (RAS14801)		
What:	Recognizing that ICAO Technical Cooperation Bureau satisfactorily completed all the defined work items in the initial Management Service Agreement (MSA) and Project Document of RAS14801, that the required payments were settled, and that in end 2016,	Expected impact: <input type="checkbox"/> Political / Global <input type="checkbox"/> Inter-regional <input checked="" type="checkbox"/> Economic

all the requirements of both parties have been fully completed and closed on record, That, i) all Pioneer States are encouraged to counter-sign the Revised amended Pro Document provided in Appendix B to the report; ii) any Pioneer State not countersigning is entitled to get its share of the remaining fund balance back. and iii) a Pioneer State for which a direct CRV connection is not considered feasible in 2017 by the selected vendor is entitled to get its initial contribution in full	<input type="checkbox"/> Environmental <input checked="" type="checkbox"/> Ops/Technical
Why: The initial scope of MSA was completed by ICAO TCB which allowed for a successful evaluation process and selection of a best and final offer; a majority of Pioneer States is willing to use the rest of their initial contribution to continue to support CRV implementation.	Follow-up: <input type="checkbox"/> Required from States
When: 27-Jan-22	Status: Draft to be adopted by PIRG
Who: <input checked="" type="checkbox"/> Sub groups <input checked="" type="checkbox"/> APAC States <input checked="" type="checkbox"/> ICAO APAC RO <input type="checkbox"/> ICAO HQ <input type="checkbox"/> Other:	

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

10.10 The meeting discussed the action to be taken by 16 pioneer member states for the proposed draft conclusion after APANPIRG/33 adoption, if adopted, and endorsed draft conclusion for consideration of ACSICG/9.

Estimate of work for safety assessment/ security assessment- New Zealand (WP/15)

10.11 New Zealand presented an estimate of work for a safety assessment or security assessment of the CRV network. Reference was given to the decision of CRV OG/6/3 - Using the Rest of CRV Pioneer State Contribution to the ICAO Managed Service Agreement (MSA) money for a safety assessment/security assessment and added If we decide to carry out a Safety or Security Assessment of the CRV network, we will need to determine what we are wanting to have assessed, how this would be assessed and who would carry out this assessment. Are we concerned about the CRV network, the CRV users security, the applications or a combination of these?

10.12 It was explained that the possible assessments are Physical Inventory, Overall Security Review, Visibility and Management Audit, Performance Analysis and Quantitative Data. These assessments are usually carried out by some form of consultancy that has experience in carrying out these assessments. Examples are Nokia Bell Labs, Price Waterhouse Cooper (PWC), Aura, Moore Global. How the assessment is carried out depends on the outcome we are after. It was added that assessments are normally carried out as follows:

- i. Intrusive – a device or someone is allowed access to the network/application.
- ii. Onsite interviews and over the shoulder configuration review.
- iii. Offsite assessment based on provided information, usually configurations, design documents and drawings.
- iv. A combination of i, ii or iii.
- v. A combination of i, ii or iii as well as Policy, Process and Procedures

10.13 The meeting was informed that the pricing of the assessments does vary quite significantly. Various ways were proposed for assessment for CRV and explained along with requirements of fund.

10.14 The meeting deliberated the paper in detailed. New Zealand volunteered to lead the task to prepare the Terms of Reference (ToR) of Security and safety assessment of CRV. **ACTION**

ITEM 9-11. The meeting requested more volunteered for this action and informed that interested member/subject matter experts may contact CRV OG Chair (Asia) to contribute to prepare ToR.

Agenda Item 11: Share best practices on cyber-safety/security and resilience among ACSICG/CRV OG/SWIM TF

CRV Diversity and Security Implementation- USA (IP/09)

11.1 The meeting was informed about the methods used by the FAA in the CRV network to provide security and diversity for AMHS and voice services. USA informed that FAA has a total of 4 connections into the CRV network: **two** for data traffic (AMHS) and **two** for voice traffic. Diversity implementation for AMHS traffic and voice traffic which both have primary and backup method were introduced respectively in detail. Additionally, FAA shared that in the event of failure on CRV access, the FAA and Airservices have implemented a backup Internet VPN which can be used for carrying AMHS traffic.

11.2 Although data security is not a requirement of the CRV network, some degree of privacy is accomplished using GRE (Generic Routing Encapsulation) tunnels over MPLS between corresponding CRV users. Each tunnel only allows routing between the member states that the particular tunnel services. In this way, users can limit traffic only to partners who have agreed to establish tunnels and, in a security incident, could deny traffic from one or more tunnels. Furthermore, the meeting was informed that additional network level security is provided within the FAA's framework by the FAA's firewall infrastructure that terminates external sessions and performs data inspection.

11.3 Co-Chair (Asia) shared with meeting [PCCWG Security Management Plan](#) which can be accessed on CRV portal hosted by New Zealand.

11.4 In response to a question for VoIP Bandwidth calculation, CRV OG Chair (Asia) shared [PCCWG System Engineering document](#) for more information. It was added that if Member States cannot get access to the document by the link mentioned here and above, they can request access to the portal <https://airwayscorporation.sharepoint.com/teams/APAC-CRV/> and may send an email to vaughan.hickford@airways.co.nz for information.

Agenda Item 12: Review ToR and update Subject/Task list of CRV OG

Action Item 7-8 Charging structure for an ANSP service provider on Surveillance-Australia, Fiji, and PCCWG (IP/11)

12.1 This paper presented the procurement process for ANSP to operate surveillance services like Space ADS-B over the CRV network. Meeting noted that PNG & Aireon LL have commissioned the operation of the Space ADS-B in the PNG FIR in 2021 using the CRV network. Based on CRV OG/7 meeting paper IP03, presented by PNG Air Services Limited and Aireon LLC for the use CRV for Space Based ADS-B, a number of participants asked for cost and benefit comparison between CRV and dedicated circuits used for delivery of 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.

12.2 The meeting was informed that PCCWG has confirmed that there is no special charging structure for adding the Space Based ADS-B services and stated that for ANSP that have implemented CRV, there is no additional cost to setup the new GRE tunnel between CRV Users under the CRV network noting that Aireon LLC has already connected to the CRV. The standard GRE set up lead time is around 2-3 weeks after received CRV users' written confirmation. However, CRV Users have to consider whether the CRV bandwidth is enough to do so (Assumed CRV users have no additional interface port requirement on NID). The additional bandwidth cost is provided the CRV Pricing

Schedule in the CRV Common Packages. It was concluded that for State that is planning to implement CRV and wishes to have a GRE tunnel for connection to Aireon LL for the provision of Space Based ADS-B services, they will need to specify this clearly in the System Engineering Plan (SEP) in the procurement of the required bandwidth from PCCWG to operate these services over the CRV network.

12.3 Two scenarios were presented in the paper. Scenario-1 was that the State is using 2MB Package C, currently using 1M, still have 1M bandwidth remain in the moment and scenario 2 was State is using 2M package C, but 2M are almost full. State will need to upgrade package C from 2MB to higher bandwidth e.g., from 2MB to 3Mb. The meeting was informed that PCCWG has also confirmed that States that wishes to change their existing contractual agreement with PCCWG like upgrading the bandwidth as stated in Scenario 2 will require a new 5-year contract for Package C - 3MB.

12.4 The meeting noted that the provision presented in section 12.3 would be discussed in ICAO CRV Steering Group under ACTION ITEM 9-3.

Review ToR and Subject Task List - Sec (WP/14)

12.5 The meeting reviewed the ToR of CRV OG and reviewed and further updated the Subject Task list for CRV OG. The Meeting identified that there is no need for revision of ToR of CRV OG other than minor editorial correction while the meeting identified some new Items for the work programme of CRV OG. The ToR of CRV OG after minor editorial is provided in **Appendix C** to this report and revised updated Subject Task list for CRV OG is provided in **Appendix D** to this Report.

Agenda Item 13: Next meetings and any other Business

ICAO APAC Regional Webinars - 2022 – Sec (IP/02)

13.1 The ICAO Secretariat reminded the meeting about the ICAO APAC series of 18 webinars held in the year 2021 with highlight on the 4 webinars related to CNS i.e., ICAO APAC Cybersecurity Webinar, Webinar on Implementation of CRV in APAC region, SWIM workshop, and Webinar on Implementation of ADS-B.

13.2 The meeting was informed that in 2021, ICAO APAC office proposed to organise 3 days face-to-face workshop on Cybersecurity in 2022. However, due to the uncertainty caused by the COVID-19 pandemic even in 2022, all face-to-face meetings and other face-to-face events would be kept on hold until situation gets normal and allows people to travel. The meeting recommended the title of abovementioned workshop title should be **Cybersecurity for AFS**.

13.3 It was added that ICAO APAC Office is organising **Mode S Workshop** on 22 March 2022 via Video Tele Conferencing (VTC). The workshop will be organised along with Fifth Meeting of Mode S Downlinked Aircraft Parameters Working Group (Mode S DAPs WG/5) to be held on 23-25 March 2022 by VTC. The State Letter Ref.: T 8/5.11-AP199/21 (CNS) dated 22 December 2021 is already shared on this subject.

13.4 The meeting noted that ICAO APAC office is also planning a webinar on Implementation of CRV on 29th June 2022 to facilitate better usage and understanding of the CRV OG Operations Manual and other important information required for implementation of CRV in APAC region. States/Administrations would be informed in due course detailed information about the webinar.

13.5 Lastly, it was added that ICAO APAC Office is planning for other webinars to be done in the year 2022 in CNS and other domains. The information about all webinars would be shared with member states in first quarter of this year. Member States/administration are encouraged to take advantage of above-mentioned virtual events by participating and contributing for the webinars/workshops.

Date and Venue for the Next Meeting

13.6 The meeting identified the need to organize face to face meeting, if possible, to further progress tasks listed in the Terms of Reference.

13.7 Based on the need for current CRV OG contract extension decision before ACSICG/9, CRV OG/10 is planned on **18 April 2022 via VTC**. The Secretariat will take necessary action to issue invitation letter to members States of the group after this meeting.

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CRV IMPLEMENTATION TABLE

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

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SN	State/ Administrati on (with* is BBIS; marked in blue- not yet join CRV/ no updates provided)	States /Administrati ons connected	Intended date for CRV cut- over	Applications targeted	Migration scheme	Prerequisites/ dependencies
				Voice Oct 2021		
3	Bangladesh					
4	Bhutan		<p>Contract signed on Oct 2019.</p> <p>CRV installed successfully in Dec 2021.</p> <p>CRV P2P Test between Paro-Mumbai & Paro-Bangkok to be done once India and Thailand join CRV</p>	AMHS first and Voice & ADS-B will follow up after AMHS.	Staged Approach	Dependent on India and Thailand for utilization of CRV network.
5	Brunei Darussalam					

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

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SN	State/ Administrati on (with* is BBIS; marked in blue- not yet join CRV/ no updates provided)	States /Administrati ons connected	Intended date for CRV cut- over	Applications targeted	Migration scheme	Prerequisites/ dependencies
8	Hong Kong, China*	Philippines China Japan Thailand Vietnam	Contract signed on 6 April 2018. Connection was installed successfully in June 2018.	With Manila CRV-Voice put into operation in August 2018 CRV-AMHS put into operation in May 2019 With Fukuoka CRV-AMHS put into operation in September 2020 With Beijing CRV - AMHS POT in March and operation in April 2021 Bangkok and Hochiminh Subject to their readiness	staged approach	Need to coordinate with relevant CAAs/ANSPs in joining CRV in a harmonized manner, etc.
9	Macau China		Service readiness in Q4 2021	To be confirmed	Staged approach	Migration from X.25 to IPS
10	Cook Islands					
11	Democratic People's Republic of Korea		Contract in 3Q2018 and service readiness in 4Q2018	AFTN and VoIP		

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SN	State/ Administrati on (with* is BBIS; marked in blue- not yet join CRV// no updates provided)	States /Administrati ons connected	Intended date for CRV cut- over	Applications targeted	Migration scheme	Prerequisites/ dependencies
12	Fiji*	Australia New Zealand USA	Contract in May 2018 and service readiness in 3Q 2018.	Data (AMHS) and VoIP With: Australia ATS voice April 2019 completed, AMHS completed in July 2019, NZ ATS voice completed April 2019 and USA ATS voice completed in March 2019 and AMHS completed in April 2019.	Staged approach	CBA, safety case
13	France: -New Caledonia -French Polynesia	Fiji New-Zealand &USA	Q2/2022 Q1/2023	ATS Voice, AMHS AIDC, AMHS with USA, AFTN/AMHS with NZ.	Staged approach	Depends on : - solving legal issues raised in 2021 with PCCWG - an agreement with peer States on adding a layer of encryption (PSK) over CRV if we are able to sign the contract in 2022

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

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SN	State/ Administrati on (with* is BBIS; marked in blue- not yet join CRV// no updates provided)	States /Administrati ons connected	Intended date for CRV cut- over	Applications targeted	Migration scheme	Prerequisites/ dependencies
17	Kiribati					
18	Lao PDR					
19	Malaysia		Contract to be signed 4Q 2020 and service readiness in 1Q 2021	AFTN, AMHS, ADS-B and ATS voice	staged approach	New ATC centre operational in 2021 Contract issue with the new ATC main contractor. COM Project is part of the main contract.
20	Maldives					
21	Marshall Islands					
22	Micronesia (Federated States of)					
23	Mongolia	CAAM and PCCWG made ICMP package test in 2021.	Contract in 1Q2022 and service readiness in 4Q2022	AFTN, ADS-B, AMHS, Voice With: China Dec, 2022(AMHS), (ADP) TBD Voice, ADS-B, AFTN Russia TBD (AFTN, ADS-B, AMHS, Voice)	staged approach	Negotiations with neighbouring countries and stakeholders on CRVs and its use are critical to implementation.

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SN	State/ Administrati on (with* is BBIS; marked in blue- not yet join CRV// no updates provided)	States /Administrati ons connected	Intended date for CRV cut- over	Applications targeted	Migration scheme	Prerequisites/ dependencies
24	Myanmar		Contract will be signed 4Q2020.	AFTN/AMHS, AIDC, ADS-B and voice	staged approach	One of counterparts join in
25	Nauru					
26	Nepal		SO signed with PCCW	AFTN/AMHS	Staged Approach	BBIS-state India joining the CRV network, as most traffic is routed through it
27	New Zealand	Australia USA Fiji French Polynesia Chile	Contract signed in July 2018 and service implemented December 2018	Australia Voice Completed March 2019 and AMHS June 2019 Completed USA Voice Completed March 2019 and AMHS March 2019 Completed Fiji Voice Completed April 2019 French Polynesia AMHS and Voice Chile AMHS (SAM regional network REDDIG)	Awaiting French Polynesia joining. Awaiting outcome of inter-regional network connectivity discussion. For Chile	CBA attractive if all counterparts join in.
28	Pakistan					
29	Palau					
30	Papua New Guinea					

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

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

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

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SN	State/ Administrati on (with* is BBIS; marked in blue- not yet join CRV/ no updates provided)	States /Administrati ons connected	Intended date for CRV cut- over	Applications targeted	Migration scheme	Prerequisites/ dependencies
41	United States*	Australia Fiji Japan Philippines New Zealand Papua New Guinea Tahiti Russia	Contract in January 2018	1) AMHS with Australia Fiji Japan Philippines New Zealand Papua New Guinea (2021) Indonesia (2022) 2) AIDC with Fiji Japan New Zealand Papua New Guinea (Direct planned 2021) Tahiti (via New Zealand) Indonesia (Direct planned 2022) Russia (when join CRV) 3) VoIP with Fiji Japan Philippines New Zealand Papua New Guinea (direct planned 2021) Indonesia (2022)	Staged approach	

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

Appendix B to CRV OG/9 Report



INTERNATIONAL CIVIL AVIATION ORGANIZATION

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

Project Title:	Common Regional Virtual Private Network (CRV) multinational service with a common service provider
Project No.:	RAS/14/801 – Revision B
Duration:	5 years
Sector and Sub-Sector:	Transport and Civil Aviation
Country Implementing Agency:	Civil Aviation Authorities and/or related ANSPs
Executing Agency:	International Civil Aviation Organization (ICAO)
Location:	Asia Pacific
Estimated Start Date:	31 March 2022
Estimated Project Cost:	US\$ 88,000

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

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1. BACKGROUND

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

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

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

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

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

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

2. SCOPE OF SERVICES TO BE PROVIDED

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

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

3. IMPLEMENTATION STRATEGY

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

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

4. BUDGET

4.1 The detailed budget is as attached at Appendix A.

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

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

5. RISK ASSESSMENT

5.1 Delay in the signing of this project document.

Risk Level: Medium

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

6. PROJECT MONITORING, REVIEW AND REPORTING

6.1 Monitoring activities

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

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

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

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

6.2 ICAO roles and responsibilities include:

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

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

7 PROJECT RULES AND REGULATIONS

7.1 International experts/personnel

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

7.2 Procurement

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

7.2 Finance

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

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

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

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

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

7.3 General regulations

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

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

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

8 LEGAL FRAMEWORK

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

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

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

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

9 LIABILITY

9.1 The Parties shall indemnify, defend, and hold and save harmless, ICAO and its

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

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

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

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

APPENDIX A

PROJECT BUDGET COVERING MSA CONTRIBUTION (IN UNITED STATES DOLLARS)

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

	TOTAL		2022		2023		2024		2025		2026	
	w/m	\$	w/m	\$	w/m	\$	w/m	\$	w/m	\$	w/m	\$
PROJECT PERSONNEL												
INTERNATIONAL PROFESSIONAL POSTS												
11.501												
		35 000		5 000		10 000		10 000		10 000		
		35 000		5 000		10 000		10 000		10 000		
16.001												
		11 000		2 000		2 000		2 000		3 000		2 000
		46 000		7 000		12 000		12 000		13 000		2 000
EQUIPMENT												
41.001												
		30 000		10 000		20 000						
		30 000		10 000		20 000						
MISCELLANEOUS												
51.001												
		2 200										2 200
52.001												
		2 000		500		800		300		300		400
B807F												
		7 500		2 100		2 700		1 200		1 300		200
		12 000		2 600		3 500		1 500		1 600		2 800
		88 000		19 600		35 500		13 500		14 600		4 800

**Common ~~Regional~~ aeRonautical 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.

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SN	Reference	Who	What	Due date	Status	Completed on	Result	Comment
1	1-1	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.	20 February 2017 1/22/2022	close	The revised Annex 1 had been developed in CNS SG/21 report but no concrete proposal.	Close as it will be covered in 4-4 (CRV OG/9)	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	1-2	All member States	All States to complete their CBA and send to ICAO APAC Office	28-Apr-17	close	CRV OG/6	CBA by DSNA, Jordon, UAE, Behrain, Saudi, Egypt, Bhutan, New Caledonia, Myanmar, Fiji, Malaysia	Not all CBA have been received by CRV OG/2 - action postponed to 1 dec 17 (CRV OG/3) Not all CBA have been received by CRV OG/2 - action postponed to 1 dec 18 (CRV OG/5) Not all CBA have been received by CRV OG/4 - action postponed to 10 May 19 (CRV OG/6)
3	1-3	Terence Palmer, Australia	Australia to include provisions in the CRV-OG operating manual for a small implementation team	1-Dec-17	close	CRV OG/7		CRV OG/5: Need to confirm whether the small implementation team is still required after its two meetings had been conducted. The draft COR Operating Manual has been posted to CRV OG/6 for review. CRV OG/06: No record CRV OG/07: Item removed from the list
4	2-1	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	7-Jul-17	close	CRV OG/7	CRV Operating Manual	Flow chart had been developed by CRV OG/4 and it will be included in the CRV Operating Manual. CRV OG/6: Identify sections where to be inserted? CRV OG/7: No record
5	2-2	Tom Beschler, USA	to share the 10 key points of the validation of the pioneer implementation once they are agreed on	30-May-17	close	1-Apr-18		
6	2-3	all points of contact for the review of engineering	to submit their comments to husnaeen@icao.int at their earliest convenience but no later than 7 July 2017	7-Jul-17	close	CRV OG/3		
7	2-4	Vaughan Hickford, New Zealand:	to review the procedure to establish a contract with PCCW Global, Ltd and present it as a flowchart to be included in the CRV operating manual	30-May-17	close	CRV OG/3	CRV Operating Manual	
8	2-5	Augustine Lau, Singapore:	to include the updated CRV Implementation schedule into the v0.5 of the implementation plan and circulate the v0.5 to all participants for acceptance	30-Aug-17	close	1-Apr-18	CRV Implementation Plan	
9	2-6	USA/Hong Kong China/New Zealand/Secretariat	to propose a way forward regarding the MSA	1-Dec-17	close			Realloted as action item 4-4 Meeting of 15 Nov 2021 for outstanding conclusion recommended to revise Decision OG/6/3 and add global interconnectivity a proposed task

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10	4-1	All member States	Complete contract with PCCW Global by no later than 12/2020	12/31/2021 Dec 2022 (in CRV OG/9)	Open	on-going		Report on the status at each CRV OG meeting & update the CRV Implementation status table Pakistan contacted to get more information. Contact estb with PCCWG
11	4-2	ICAO Secretariat	conduct CRV OG/6 and SWIM TF currently for joint development SWIM Architecture based on construction of CRV	8-May-19	close			It has been coordinated and the meetings are scheduled in May 2019- COMPLETED
12	4-3	PCCW Global & Member States	PCCW Global to reissue an updated (a)-1 Terms and Conditions on starting and ending dates of initial contract. States to note the changes and take necessary action in the contract.	1-Dec-18	close	CRV OG/7		CRV OG/5: The contracts with States are still being processed
13	4-4	CRV OG co-chair (Asia) and & poineer CRV member States	To investigate use the MSA funds to undertake the independent safety assessment and seek approval from Pioneer States	1/1/2022 CRV OG/11 (in CRV OG/9)	Open		Depend on final fund decision from poineer MS.	same as item 2-6 Meeting of 15 Nov discussed to revise Appx D of conclusion and will be presented to CRV OG/9
14	4-5	New Zealand	further develop and maintain an additional CRV portal for use by the APAC CRV members and provide access procedure to those members that wish to access the portal.	Apr.19	close	CRV OG/5		CRV OG/5: COMPLETED, New Zealand to provide updates.
15	4-6	New Zealand	Finalize the draft CRV Operations Manual	Apr.19	close	CRV OG/7	Conclusion CNS SG/24/4 - Publishing of CRV operational manual to provide the information and directions required for CRV OG performance and CRV operations	CRV OG/5: Progress updates; Draft to be ready for reviews by CRV OG/6 meeting 2019. SL Ref.:T 8/9.1 – AP262/20 (CNS), 22 December 2020, Subject: The availability of various regional guidance materials for implementation of Air Navigation Facilities and Services in the Asia and Pacific Regions, Conclusion CNS SG/24/4 - Publishing of CRV operational manual to provide the information and directions required for CRV OG performance and CRV operations
16	4-7	USA	Develop a WP on AMHS over IPS protocol only for BBIS	1-Jun-18	close	CRV OG/5		
17	5-1	Australia, Hong Kong China and Japan	Prepare a working paper for SWIM TF/3 meeting on the CRV suport for SWIM	30-Apr-19	close	SWIM TF/3	SWIM TF/3: (7-10 May 2019) WP/06 - APAC Regional SWIM Implementation Options ; WP/20 - Network Capability and Security of CRV in Carrying SWIM Data; and WP/05 - SWIM-Enabled MET Information Services Developed by Hong Kong China;	Inform SWIM TF about the Conclusion of CRV OG/5 on the relation between CRV and SWIM.

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18	5-2	ICAO RO	Disribute a State Letter to inform States of POC result	15-Mar-19	close	6-Mar-19	State Letter Ref.: T 8/2.10 – AP025/19 (CNS), 6 March 2019, Subject: Notification of successful result of the CRV Proof of Concept Testing and Urging earlier implementation of CRV in APAC Region	the ICAO Secretariat was requested to notify States/Administrations of the successful result of the Proof of Concept Testing carried out over the period from 7/1/2019 to 18/1/2019 by Pilot Project States (New Zealand, Australia, Fiji, USA and PCCW Global).
19	7-1	China, Nepal, PCCWG	Study on use of existing VSAT infrastructure linking with CRV	Jan-22	close			feasibility on use the existing infrastructure email sent on 10 November 2021 to China and Nepal for coordiation and action In CRV OG/7, China, Nepal and PCCW have a discussion in the meeting break and reached a consensus.Currently the Vsat station can not applicate in CRV network due to the technical and management issues
20	7-2	PCCW Global & New Zealand	Pacific solution on inter-connection with PASNET, Feasibility for interconnection	5/1/2022 Dec 2022 (CRV OG/9)	Open			The PASNET is hosted by Airways, New Zealand. PCCW and Airways couldn't finalise and agreed on a proposals. Hence, the option we now have for the islands is either: 1. Use the Airways CRV connection into PASNet and the islands are treated as LAN Traffic on PASNet. 2. The Islands use Package D.
21	7-3	Australia and New Zealand	Polishing draftt First CRV Operations Manual	May-20	close		Conclusion CNS SG/24/4 - Publishing of CRV operational manual to provide the information and directions required for CRV OG performance and CRV operations	get it ready for endorsement and adoptpion SL Ref.:T 8/9.1 – AP262/20 (CNS), 22 December 2020, Subject: The availability of various regional guidance materials for implementation of Air Navigation Facilities and Services in the Asia and Pacific Regions, Conclusion CNS SG/24/4 - Publishing of CRV operational manual to provide the information and directions required for CRV OG performance and CRV operations
22	7-4	PCCWG & USA,Australia	maintain APAC dial plan and posted on CRV OG portal	Jan-22	close			consolidated by PCCWG and posted on the portal
23	7-5	AFSSP WG	encourging member states of CRV to participate	20-Jan-22	close		State Letter Ref.: T 8/2.10: AP018/20 (CNS) Subject: 2020 APAC Aeronautical Fixed Service Safety and Protection Planning Working Group Meeting (AFSSP WG 2020), 16 January 2020.	Inform Administration to participate and contribute The meeting of 2020 postponed till further notice The meeting is cancelled, proposed to close
24	7-6	Hong Kong China	SWIM demonstration over mini-CRV by HK, Singapore and Thailand	1/1/2022 CRV OG/11 (CRV OG/9)	Open		HK is conducting POC with PCCWG in terms of concept for sharing surveillance data (CRV OG/9)	present the outcome of the demo to ACSICG/7 and SWIMTF/4 Postponed due to COVID-19

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25	7-7	Australia and PCCWG	High level concept for inter-regional MPLS/IP connection	21-Apr-20	close		WP/09: MPLS/IP BASED INTER-REGIONAL CONNECTION, ICAO Sec WP/11: HIGH LEVEL NETWORK OPTIONS TO REDDIG, PCCWG	provide initial proposal at AFSSP WG
26	7-8	PCCWG & Australia, Fiji	Charging structure for an ANSP service provider on surveillance	20-Mar	close			as soon as possible for cba comparison
27	7-9	ICAO RO, Australia and USA	State letter to States to remind joining CRV	Mar-20	close		Ref.: T 8/2.10 - AP041 /20 (CNS) Subject: Reminder for implementation of Common aeronautical VPN (CRV) in APAC Region by 2020, 2 March 2020	late comer may compromise the benefits
28	8-1	Co chairs, ICAO RO, USA, PCCW	CRV webinar	20-Jul-21	close	20-Jul-21	The webinar was conducted successfully on 20 July 2021	Promote CRV implementation
29	8-2	ICAO RO, USA, HKCAD	Timeframe for CRV supporting SWIM	Jan-22	close		Ad-hoc group created in CRV OG/9 for this task. Under action item 9-8	Explore a timeframe for CRV planning to support SWIM Action 8-2 has been completed as we already concur to carry SWIM traffic. The timeframe is dependent on SWIM implementation. Ad-hoc group created in CRV OG/9 for this task. Under action item 9-8
30	8-3	Bhutan, Hong Kong, China, Singapore, India, Thailand, USA, Co-chairs, ICAO RO, concerned parties	Use CRV to support AMHS traffic for Bhutan	6/21/2021 June 2022 (CRV OG/9)	Open			As concerned BBIS in the process to implement CRV, Bhutan request to reroute its AMHS traffic through Hong Kong temporarily till CRV implemented in Mumbai or Bangkok.
31	8-4	ICAO RO, PCCW, co-chairs	State Letter to inform States about the additional charges may apply to new users with billing start date later than 31 December 2022.	1-Jan-22	close	12-Jan-22	CRV webinar requested to extend the date by one year due to pandemic	SL Ref.: T 8/2.10 – AP007/22(CNS) dated 12 January 2022 Subject: - To remind the target year of CRV Implementation by 31 December, 2022 in APAC Region and CRV Implementation for small Pacific Island and small ANSP in the region using CRV Solution, PCCWG SLA Package D
32	8-5	Co-Chairs, ICAO RO, Singapore, USA	Continue the feasibility study on inter-regional connection to support business case analysis	1/1/2022 CRV OG/11 (in CRV OG/9)	Open			Meeting of Lumen and PCCWG are done on 4 November. PCCWG and Lumen will submit high level proposal by 15 December 2021 Technical proposal submitted on 15 December 2021 and agreed by Lumen. The WP/07 was presented in CRV OG/9

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33	8-6	Fiji, PCCW	submit a paper to ACSICG/8	21-Jun-21	close	Done in ACSICG/8	IP/06: PRESENTATION OF PCCW NETWORK BASED IWXXM TRANSLATION AND EXCHANGE SERVICE	PCCW Network Based IWXXM Translation and Exchange Services
34	8-7	USA, co chairs, PCCW, ICAO RO, concerned parties (ad hoc)	Cyber threats protection for CRV	Jan-22	Open	Need to review this action item in CRV OG/11	ICAO Requirements proposed in WP/32 of CNS SG/25: a) ICAO needs to provide an IPv6 dedicated address block b) ICAO needs to propose a Name Space and field a DNS c) ICAO needs to deliver IAFT recommendations for security including a Trust Framework for Digital Identities	Look for common minimum requirements on cyber protection for CRV users including available ICAO guidances and industrial standards. Some suggestions: Currently, CRV has GRE tunnel which strictly allows only agreed IP addresses to be interfaced with one another. We need to have an independence security entity to assess end to end security threat (e.g. AMHS to CRV to AMHS interface: AMHS has address authentication built in and CRV GRE tunnel are good enough or should we do more but this is not CRV nor AMHS call) For DNS assignment and management, SWIM TF should look into it as AMHS does not use DNS as it strictly adheres to point-point connection and only process message based agreed addresses. For security, We can defer to security entity when ICAO is ready. We cannot and should not assess our own security.
35	9-1	All member States	The Member States would take some time to take reference of the ATN/AHMS Guidance Tree to review it and to provide the suggestion for modification in the ATN/AHMS Guidance Tree along with locating the position to add different CRV reference documentation.	CRV OG/11	Open			
36	9-2	ICAO Secretariat	ICAO Implementation Plan will be continued to upload on ICAO APAC e-documents portal. However, the information contained under Table-1, Table-2 and Appendix A and B would not be provided on the public portal. Under Table-1, Table-2 and Appendix A and B, a message would be added to refer to ICAO APAC CRV Secure portal or CRV Portal hosted by New Zealand to get required information along with the instructions needed	Jan-22	Open			
37	9-3	Fiji, India, Japan, Singapore, New Zealand, USA, ICAO Secretariat, and PCCWG	ICAO CRV Steering Group comprised of Fiji, India, Japan, Singapore, New Zealand, USA, and ICAO Secretariat would devise the terms and conditions for addition of new services, for upgrade/downgrade of packages along with addition of new sites by contracted states into their contract	CRV OG/10	Open			
38	9-4	ICAO Secretariat	ICAO APAC Office would send a State Letter to APAC Member States, who have not joined/not process to share their intention to join CRV and when they intend to do so.	Feb-22	Open			

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39	9-5	Fiji, India, Japan, Singapore, New Zealand, USA, ICAO Secretariat, and PCCWG	ICAO CRV Steering Group will discuss and finalise the requirements of current CRV contract extension based on feedback received from Member States who would join CRV in next few years	Mar-22	Open			
40	9-6	PCCWG	PCCWG is considering the current situation and will provide an official response if there is any contractual and commercial impacts for member states who sign the contract in 2022 but the installation date exceeds the standard lead time in 4 weeks to Sri Lanka, CRV OG Chairs, and ICAO Secretariat.	Feb-22	Open			
41	9-7	ICAO Secretariat	In resposne to WP/18, ICAO Secretariat would present a paper to SWIM TF on behalf of CRV OG to informed about the relevant discussion in CRV OG.	May-22	Open			
42	9-8	CRV ad-hoc expert Strategy and Design group	CRV ad-hoc expert Strategy and Design group would join SWIM TF meetings to note important discussions related to CRV and to inform CRV OG about the relevant outcomes	CRV OG/11	Open	Add it into next ad-hoc expert group meeting on 10 March 2022		
43	9-9	CRV OG Chairs, ACSICG Chairs, SURSG Chairs, PCCWG, India, Singapore, and ICAO Secretariat.	A specialised meeting would be organised to discuss and devise a method for non-aviation service provider's joining process to CRV. WP/17 by PCCWG for Non-aviation providers joining CRV should be also considered to discuss in the specialised meeting, which was supported by Singapore.	CRV OG/11	Open			
44	9-10	APAC Member States	The meeting requested Member States to provide examples of activities under different categories provided in scope of supporting CRV Network as described in section 10.5 of draft report and scope of wor defined in revised MSA	CRV OG/11				
45	9-11	New Zealand	Prepare the Terms of Reference (ToR) of Security and safety assessment of CRV	CRV OG/11	Open			

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List of Participants

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LIST OF WORKING, INFORMATION PAPERS, AND PRESENTARIIONS

WP/IP No.	Agenda	Subject	Presented by
WORKING PAPERS			
WP/01	1	Provisional Agenda	Secretariat
WP/02	2	Review of Relevant Meetings	Secretariat
WP/03	3	Outcomes of Ad-hoc expert Strategy, Design, Transition and, Operations Groups	New Zealand
WP/04	3	ICAO ATN/AMHS Guidance Document Tree	Secretariat
WP/05	3	CRV Implementation Plan	Secretariat
WP/06	5	Update the APAC CRV Implementation Tables	Secretariat
WP/07	9	Technical Proposal for Regional IP Network Interconnection	PCCWG
WP/08	6	Upgrade/Downgrade CRV Circuits Subscribed	Secretariat
WP/09	6	Upgrade/Downgrade CRV Circuits Subscribed	PCCWG
WP/10	6	Extension of CRV contract	Secretariat
WP/11	7	CRV Post Implementation Issues in Bhutan	Secretariat, Bhutan, and New Zealand
WP/12	9	MPLS/IP Based Inter-Regional Connection	Secretariat
WP/13	10	Review the progress on the next step for using the rest of CRV Pioneer State Contribution to the ICAO Managed Service Agreement (MSA)	Secretariat
WP/14	12	Review ToR and Subject Task List	Secretariat
WP/15	10	Estimate of work for safety assessment/ security assessment	New Zealand
WP/16	3	VoIP Regional dial plan	USA
WP/17	6	Non-aviation providers joining CRV	PCCWG
WP/18	8	SWIM User Network Requirements analysis	USA
WP/19	8	SWIM providers joining CRV	New Zealand
WP/20	3	CRV Operations Manual	New Zealand
INFORMATION PAPERS			
IP/01	-	Meeting Bulletin	Secretariat
IP/02	13	ICAO APAC Webinar-2022	Secretariat
IP/03	2	Outcomes of CRV Webinar	Secretariat
IP/04	7	Status Update and Experience Sharing of CRV Operations in Hong Kong China	Hong Kong, China
IP/05	7	Updates on Korea's New AMHS system upgrade and CRV implementation plan	Republic of Korea
IP/06	7	Current Status of CRV Implementation in India	India
IP/07	7	Operation Status and Experience Sharing of CRV	China
IP/08	7	FAA CRV Service	USA
IP/09	11	CRV Diversity and Security Implementation	USA
IP/10	7	CRV Implementation Status of Mongolia	Mongolia
IP/11	12	Updates on Action item 7-8	Fiji
IP/12	7	Update on Fiji's CRV Network Upgrade	Fiji

WP/IP No.	Agenda	Subject	Presented by
IP/13	7	Current Status of CRV Implementation at DSNA-France	France
LIST OF PRESENTATIONS			
SP01	04	CRV operational performance report	PCCWG
