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IMPLEMENTATION OF THE *C*OMMON AE*R*ONAUTICAL *V*IRTUAL PRIVATE NETWORK (CRV)

1.0 INTRODUCTION

1.1 The Aeronautical Fixed Services (AFS) provides information exchange between States for Air Navigation Services include AIM, MET and ATM.

1.2 These AFS include the

1.2.1   Aeronautical Fixed Telecommunication Network

1.2.2   ATS Direct speech circuit between ATSUs;

1.2.3   Aeronautical Information Direct Communications AIDC

1.2.4   Satellite broadcast distribution of MET information

1.3 The AFS are operated over point-to-point international private lines (IPL). Such arrangement in most cases are made through bilateral LOA between States/Administration The AFTN requirements are stipulated in Annex 10 Vol.III (Technical Requirements) and Vol II(procedure).

1.4 These IPS lines or Satellite channels use various underlying protocols and physical interfaces such as X.25, X25/IP conversion. To achieve cost benefits between two locations, the voice/data MUX are used.

1.5 Currently, aeronautical ground-ground communications in the ICAO Asia/Pacific Region, and in particular Aeronautical Fixed Telecommunication Network (AFTN) and AMHS services, operate over point-to-point international leased circuits. However, this network configuration exhibits a number of limitations such as the inability to switch new protocols like Voice Over IP (VoIP) or System Wide Information Management (SWIM) efficiently, high cost for every connection and limited flexibility for increase in bandwidth.

1.6 Due to the growth of air traffic, there has been demand for new services outlined by the ICAO Global Air Navigation Plan (GANP) to achieve a harmonized global ANS system. The GANP (2016) includes the Aviation System Block Upgrades (ASBUs).

1.7 ASBUs define a programmatic and flexible global system engineering approach allowing all States to advance their air navigation capacities based on their individual operational requirements to ensure global interoperability and harmonization of air traffic management.

1.8 The CRV, is a cross-border cost-effective telecommunications network for APAC States, provided by a common network service provider for ground/ground

communication that enables the Global Air Navigation Plan and Seamless ATM Objectives that would mitigate a number of current deficiencies in ANS communications.

1.9 Common arrangements on cybersecurity and safety assessment need to be conducted to assist ICAO member States meet its service obligations while implementing CRV in a secure and cost-effective manner.

1.10 The ICAO APANPIRG has set 2022 as the target for CRV implementation in the Asia Pacific region.

2.0 AERONAUTICAL FIXED SERVICES to be provided by CRV

2.1 The CRV operates using dedicated multiprotocol label switching (MPLS) Internet Protocol (IP) based Virtual Private Network (VPN) communication network provided by a common network service provider and shall support all Aeronautical Fixed Service (AFS) in the APAC region. Telecommunication costs shall be reduced as States/ Administrations will only require minimal connections to a far-reaching network instead of individual connections to each neighbouring State/ Administration.

2.2 The CRV service provider shall provide the service to allow CRV members to exchange voice and data information with each other.

2.3 Each CRV member shall determine the amount of bandwidth they require for each Quality of Service (QoS) sub queue. In addition, each CRV Member will determine the total access bandwidth that they need to subscribe.

2.4 These ground/ground communications include:

- ATS direct speech voice communications;
- ATS surveillance data such as ADS B sharing data;
- AMHS message/data
- AIDC messages/data;
- AIM information/data;
- ATFM data exchange;
- MET information/data;
- Support initial SWIM data exchange for AIXM/FIXM/IWXXM services;
- Miscellaneous data or carried for TEST purposes.

2.5 The CRVOG (CRV Operations Group) shall be the guiding and coordinating body for all activities conducted within the ICAO concerning the Common Regional VPN for the Asia and Pacific Regions.

2.6 The CRV shall be guided by the APANPIRG Procedural handbook, "CRVOG Operations Manual" to ensure that work arrangements are consistent with its parent body. is an informal publication prepared by the CRV Task Force, intended to provide, for easy reference of interested parties, a consolidation of material, particularly of a procedural nature, about the work of the CRV OG and its contributory bodies.

2.7 The CRV OG Operations Manual, Part II contains the Terms of Reference of the CRVOG established by the Asia/Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG) APANPIRG) (Decision 27/34).

2.8 The CRVOG Operations manual, Part III contains the working arrangements and internal instructions developed by the Group for the practical application of its Terms of Reference.

3.0 CRV Implementation Plan V2.1 (17 May 2021)

3.1 The purpose of this CRV Implementation Plan is to provide guidance on the operation requirements for the upcoming Common aeRonautical Virtual Private Network (CRV) used in Asia/ Pacific (APAC) Region

3.2 The PCCW Global has been selected as the common network service provider in the APAC region.

3.2 The ANSP shall refer to the implementation roadmap to take note of the CRV implementation date provided by other States/Administrations they wish to exchange data/voice via the CRV.

3.3 The implementation date, type of data, voice, bandwidth and QoS between the two States/ Administrations shall be negotiated and agreed bilaterally (and supported by the CRV service provider.

3.4 PCCW Global, the CRV service provider is to put up individual service contracts for the two connecting States/ Administrations. The work processes and CRV implementation roadmap provides a breakdown of the estimated schedule and serve as a guide.

4.0 Different Connectivity packages

4.1 The PCCW Global recommends the following package designs and provides a project plan on each package. The prices, schedules and terms and conditions are between PCCW and the State/ANSP.
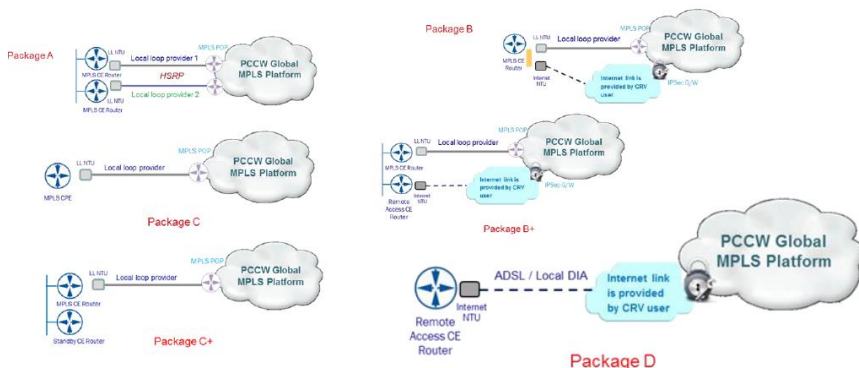
5.0 CONTRACT PROCESS PLAN with PCCW Global

5.1 State notifies CRV OG Chair(s) and ICAO Regional Office the intention to join update CRV implementation plan

5.2. State contact PCCW who sends the High-level survey

5.3 State downloads the Common Package from CRV portal

5.4 State submits the High-level survey to PCCW

5.5 PCCW recommends a package (design) and submits a Project Plan

5.6. State cross checks with its peers and starts coordination of implementation (CRV OG can facilitate)

5.7. State and PCCW discuss Price, Schedule and Terms and Conditions:

Local optimizations and additional requirements may be required

5.8 State and PCCW agree and record any variation from the common provisions in the Order Form

5.9 State and PCCW sign the Order Form which is governed by:

a) Terms and Conditions between PCCW Global and CRV Authority;
(b) The CRV Terms of Reference (including all
(c) Specific Terms for MPLS VPN Service, Specific Terms for Managed Router Service and Specific Terms for Satellite VSAT Serv ice s
(the "Specific
(d) Addendum to the Specific
(e) The price schedule in their latest applicable
(f) The Project Management Plan in its latest applicable version; and
(g) The CRV implementation plan in its latest applicable

5.10. Installation occurs

5.11. Testing is carried out

5.12 Service Commencement Notice provided from PCCW to the State, includes all drawings and documentation

5.13 State notifies CRV OG about the service commencement

5.14. State carries out service migrations in coordination with peers

REFERENCES

<u>Publications / Websites</u>

- Annexes 10–

- Common aeRonautical Virtual (CRV) Network – Operations Manual

<u>Training / Events</u>

- CRV Workshop 16 April 2018 https://www.icao.int/APAC/Meetings/Pages/2018-CRV-WS---CRV-OG4.aspx

- Eight Meeting of the Common aeRonautical Virtual Private Network Operations Group (CRV OG/8) 17-19/05/21 https://www.icao.int/APAC/Meetings/Pages/2021-CRV-OG8.aspx