International Civil Aviation Organization

THE FIFTEENTH MEETING OF THE COMMON AERONAUTICAL VIRTUAL PRIVATE NETWORK OPERATIONS GROUP (CRV OG/15)

Mumbai, India, 15-19 June 2026

Agenda Item 3: CRV OG Reference documents

SOP FOR CONTRACTING SPACE-BASED ADS-B SERVICES OVER CRV

(Presented by the Philippines)

This working paper presents the SOP for contracting Space-Based ADS-B services over CRV.

1. INTRODUCTION

1.1. The Common aeRonautical Virtual Private Network (CRV) utilizes the worldwide Multi Protocol Label Switching (MPLS) infrastructure of PCCW Global, the CRV service provider, to deliver secure and reliable connectivity for the exchange of aeronautical communications and data.

1.2. These CRV services include ground-to-ground direct speech circuits, AFTN/AMHS messaging, ADS-B data sharing, future System Wide Information Management (SWIM) connectivity, and other services as may be agreed upon by participating members.

2. DISCUSSION

Meeting Outcomes ACSICG/13 and CRV OG/13

2.1 During the Thirteenth Meeting of the Common aeRonautical Virtual Private Network Operations Group (CRV OG/13), it was informed that in 2019, Aireon signed a contract with NSPL to provide ADS-B services for Papua New Guinea (PNG) for the complete PNG FIR. The initial architecture included 2x MPLS connections from the USA to PNG, which involved expensive and unreliable MPLS connections.

2.2 To enhance reliability and cost-efficiency, Aireon collaborated with NSPL and PCCW to leverage the CRV Network, establishing dual tunnels connecting the US to Hong Kong and ultimately improving service delivery.

2.3 In the reviewed relevant meetings during the Thirteenth Meeting of the Aeronautical Communication Services Implementation Coordination Group (ACSICG/13), as stated in the CRV OG/13 Meeting, requested documentation on the process to follow if they want to utilise CRV for space-based ADS-B data transmission. Aireon suggested that the Philippines draft the document initially based on their recent experience contracting space-based ADS-B services over CRV. Aireon will provide further additions to the process, including the coordination required between Aireon and the CRV service provider. The Philippines will draft the procedure and present it at the next CRV OG

Ad-hoc Expert Group Meeting on 12 June 2025. The procedure will be reviewed and adopted by the CRV OG/15 Meeting in June 2026.

STATE CONSIDERATION

2.4 In the Philippines, as required by law, a contractor must possess the necessary registration and legal qualifications prior to entering into any contract. The procurement process may be conducted through either competitive bidding or direct contracting, in accordance with applicable government procurement regulations. The project is awarded by the Bids and Awards Committee (BAC), and upon execution of the contract, a Notice to Proceed (NTP) is issued to the contractor, authorizing the commencement of the project.

BASELINE REQUIREMENTS

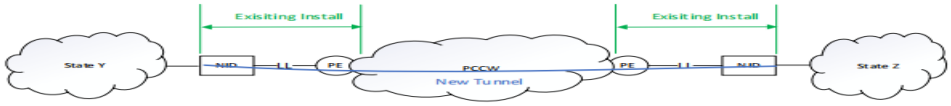
2.5 The final design shall be implemented in accordance with the approved technical requirements, including network integration required to receive and consume Space-Based ADS-B data services.

COORDINATION with SPACE-BASED SERVICE PROVIDER

2.6 Regular coordination meetings shall be held among the concerned parties to discuss project requirements, establish implementation timelines, and oversee activities related to the procurement process, culminating in contract award.

ADS B (SPACE-BASED) INTEGRATION in CRV NETWORK

2.7 In reference to the COMMON AERONAUTICAL VPN (CRV) IMPLEMENTATION PLAN – V1.0, section 2.3.3 ADS-B page 9/69. To deliver the ADS-B data stream to the PCCW gateway, each participating State/Administration must ensure that an appropriate multicast path is available from its local system to the CRV ingress point. Likewise, the receiving ANSP is responsible for ensuring that a multicast path is available from the CRV egress point to its flight data management system or other designated receiving application.



State Y and State Z have decided to have a CRV connection between each other. Both States already have an established CRV circuit and tunnels to other States.

The LOA between the States, details the testing and commissioning dates.

The addition of a GRE tunnel between states does not formally initiate the need for the 3-day Test Window, however it is suggested the connectivity test is carried out prior to application testing.

2.8 Under this arrangement, the participating States/Administrations shall agree with the implementation of Space-Based ADS-B data exchange in accordance with their respective policies, regulatory requirements, and operational needs.

2.9 Upon approval by the participating parties, the CRV service provider shall configure a secure tunnel using agreed CRV IP addresses to facilitate the delivery of Space-Based ADS-B data from the Space-Based ADS-B service provider to the Service Delivery Point (SDP) at the customer ANSP site. The tunnel configuration shall be implemented in accordance with the CRV network design, security requirements, and applicable provisions of the CRV OG Manual.

2.10 The connection is provisioned with a minimum bandwidth of 400 kbps (Data CS4/AF21) to support the operational data requirements according to the technical parameters in the system engineering plan. Reference(s): CRV System Engineering Plan (SEP).

2.11 Below is the proposed checklist related to the contracting of Space-Based ADS-B services over the Common Regional Virtual Private Network (CRV).

Item	Description	Responsible	Remarks
1. Project Realization	Contracting Process as required by the states	States/Space-Based ADS B Service Provider	Documents and Legal Requirements
2. Coordination	Project collaboration through meetings about the project	States/Space-Based ADS B Service Provider	End user requirements, Consensus
3. Technical Design Review	Present the requirements for comment and approval	Space-Based ADS B Service Provider	Architectural Design, Interface Control Document, Cyber
4. Implementation Requirements	Integration requirements and coordination with CRV Service Provider	States / Space-Based ADS B Service Provider / CRV Service Provider	IP address Allocation, Routing/Security, SEP update, Propose WP/IP in CRV OG
5. Integration and Testing	Network configurations and reliability monitoring	States / Space-Based ADS B Service Provider / CRV Service Provider	Connectivity tests and Data validation/verification
6. Operationalization	Live operations	States / Space-Based ADS B Service Provider / CRV Service Provider	Maintenance and Monitoring

CONCLUSION

2.12 This Standard Operating Procedure (SOP) for contracting and implementing Space-Based ADS-B services over the CRV, provided in Appendix A, presents the practical implementation scenario for establishing connectivity between a Space-Based ADS-B data provider and an ANSP data consumer.

2.13 The implementation activities described herein are based on and shall be conducted in accordance with the CRV Operations Group (CRV OG) Manual, the approved CRV Implementation Plan, and the applicable System Engineering Plan (SEP).

3. ACTION BY THE MEETING

3.1 The Meeting is invited to:

a) note the information contained in this paper;

b) review and amend proposed SOP provided in **Appendix A**; and

c) discuss any relevant matter as appropriate

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Republic of the Philippines
CIVIL AVIATION AUTHORITY OF THE PHILIPPINES

SPACE-BASED ADS B IMPLEMENTATION PROCEDURES
- CAA Philippines Perspective -

OUTLINE

I. Background

The Philippine FIR has comprehensive existing surveillance, with the exception of areas of the Northern West corner of the FIR and Eastern FIR. Currently, these areas are outside surveillance coverage and present challenges in the provision of terrestrial surveillance.

The Northern FIR is within the busy West Philippine Sea (WPS) routes where CAAP and neighboring Air Navigation Service Providers (ANSP) are cooperating to improve efficiency along this backbone route in Asia Pacific

To improve the surveillance coverage and promote safe and efficient air traffic management in the Philippine FIR, support the ICAO ANS seamless plan, and realize the commitments made under the 2018 Beijing Declaration, the Philippines, with the current CNS/ATM system will implement Space-Based ADS B surveillance in the North-West to cover the oceanic area.

II. Requirements

Relevant documents and requirements are necessary to proceed the project.

ii1. Industry

Under Philippine laws, a Contractor must have a valid PhilGeps registration. This registration provides opportunity for Contractors to bid or participate in government procurement ensuring fair and transparent bidding process. The procurement of the SBA was conducted through alternative methods of procurement by direct contracting with a Philippine registered and sole SBA provider in the region. A Notice-to-Proceed is issued informing the Contractor that works shall be started in accordance with the contract within 7 days from its receipt.

Reference(s): *RA9497*

ii2. Documents

Below are the technical baseline documents to implement the Space-Based ADS B project.

ii3.1 Equipment Manual

The Space-Based ADS B service provider shall submit a design and installation manual.

ii3.2 Interface Control Documents

The Space-Based ADS B service provider shall submit an interface control document.

Ii3.3 Method of Working Plan

The Space-Based ADS B service provider shall provide a Method of Working Plan document related to the design and installation manual.

III. Coordination

Referring to the procurement processes to the extent of contract awarding and Notice to Proceed, the following is considered of the project:

iii1. Space-Based ADS B Service Provider (Principal)

A series of discussions online and/or face to face about the project proposal.

Regular meetings to clearly identify the technical requirements and the target timelines to complete the project.

iii2. Principal Local Partner

To ease communication on behalf of the contractor to assess unseen requirements.

iii3. CRV Service Provider

As part of the network integration process for connectivity over CRV, correspondence with the CRV service provider through email to discuss requirements as required in the CRV system engineering plan.

iii4. Telecom MPLS Provider

Recommend a local service provider for one communication channel to ensure diversity of leased line connections.

Iii5. Other Considerations

Data on the equipage of aircrafts is necessary to determine present capability of local airlines in operating in an ADS-B based surveillance environment. Experiences of other States with regard to implementing SBA is also considered. Issues and concerns of air traffic service should be well factored-in in drafting the requirements of the project. Early coordination with the Regulator on the issuance of the necessary mandate is also important.

IV. Safety Consideration

To identify risks associated with the project.

iv1. Risk Assessment

Formulate a safety risk assessment to identify c**hanges** that might have operational impact prior to the project implementation.

V. Network Connection

A reliable connection to transport space-based data stream up to the service delivery equipment.

v1. Internet

An interim connection, a firewall with VPN and security, is configured to deliver space-based ADS B non-surveillance data streams from the provider.

v2. Leased

Another communication channel to deliver Space-Based ADS B data streams through MPLS technology.

v3. CRV

Standard aeronautical telecommunication network of all member states in the Asia/Pacific International Civil Aviation Organization. The network is managed by CRV-OG.

v3.1 Governance

Guidance for connectivity over CRV to use the CRV network to transport data from external partners as agreed by CRV-OG.

Reference(s): *CRV-OG Operation Manual page 22, CRV OG/11 WP/05 6.7*

v3.2 IP Address Allocation

Identify the IP range to use for a particular service, assign it and establish end-to-end connectivity from the Space-Based Service Provider up to the client Surveillance Data Processor.

Reference(s): *CRV IP Implementation Plan ver1*

v3.3 CRV Service Provider Agreement

Allow the CRV service provider to open a tunnel as requested with additional technical parameters according to the system engineering plan document.

Reference(s): *CRV System Engineering Plan (SEP)*

VI. Installation and Verification

A baseline requirement for consuming space-based ADS B data prior to utilization in ATM operations.

vi1. Equipment Installation

Space-Based ADS B service providers shall install their end point equipment based on contract and design plan.

vi2. Data Stream Verification

Capturing Space-Based data streams to verify asterix parameters in preparation for the tuning process. This phase of space-based ADS B data recording is by way of an interim Internet VPN connection receiving data from the service provider, while the final phase is on the output of SDP right after the equipment is installed.

vi3. Track Display Validation

Configuring parameters for space-based ADS B data on an ADS B monitoring platform to validate display tracks.

VII. Surveillance Tuning Process

Standard process by the ATM vendor for integrating new surveillance feeds into a multi-sensor tracking system.

vii1. Data Stream Recording

Records Space-Based ADS B data and sends it to the ATM vendor for the tuning process as part of software support services.

vii2. Tuning and Performance Report

This is the assessment submitted by the ATM provider to validate the Space-Based ADS B data if it is stable, accurate and passes by their standard tuning process.

VIII. Test and Integration

For further assessment and safety considerations, these stages are adopted to analyze track display.

viii1. Test and Evaluation System
A configurable ATM system resource running in the same software version as the operational system to process and display surveillance tracks.

viii2. EVAL Platform
A mini-configurable platform running on the same software version as the operational system to process and display surveillance tracks.

viii3. Aerion SDP Test Validation
Standard process in preparation for commissioning to validate the integrity of the output of the Surveillance Data Processor (SDP).

viii4. ATMS Operation
The final stage of integration is when all requirements are verified and passed for live operations.

IX. System Operations

Live situational awareness of Space-Based ADS B data for the Air Traffic Controller.

ix1.Live ATM Operations
Integrated into a multi-sensor tracking system and put into operational state for situational awareness pending issuance and effectivity of mandate by the Regulatory.

ix2. Trainings
Technical training for maintenance and operator provided onsite and e-Learning.

ix3. Maintenance
To sustain operational requirements for surveillance availability.

Ix4. Service Level Agreement
Contractual obligation to support 24/7 service.

Ix5. Acceptance
Commissioning process to formally accept the completion of deliverable requirements of the project.

Acronym

ADS B	- Automatic Dependent Surveillance Broadcast
ADS C	- Automatic Dependent Surveillance Contract
ATMAS	- Air Traffic Management System Automation Software
AMHS	- Aeronautical ATS Message Handling System
Bandwidth	- Capacity of Network Connection
CRV	- Common Aeronautical Virtual Private Network
EMS	- Enterprise Messaging System
EEMS	- Edge Enterprise Messaging System
GEMS	- Gateway Enterprise Messaging System
ICD	- Interface Control Document
IP	- Internet Protocol
IPv4	- Internet Protocol version 4
IPv6	- Internet Protocol version 6
MOWP	- Method of Working Plan
MoC	- Management of Change
MPLS	- Multi Protocol Layer 2 Switching
MSTS	- Multi Sensor Tracking System
SDP	- Surveillance Data Processor
Space-Based ADS B	- Also known as Satellite-Based ADS B
SRA	- Safety Risk Assesmemt
SRM	- Safety Risk Management
SWIM	- System Wide Information Management System
S3TIG	- SWIM Surveillance Sharing Technical Implementation Group