



Republic of the Philippines

CIVIL AVIATION AUTHORITY OF THE PHILIPPINES

Appendix B to the Report

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



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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 equipment 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 **changes** 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 Assessment
SRM	- Safety Risk Management
SWIM	- System Wide Information Management System
S3TIG	- SWIM Surveillance Sharing Technical Implementation Group