



ICAO

International Civil Aviation Organization

**Seventh Meeting of the Surveillance Implementation
Coordination Group (SURICG/7)**

Video Teleconference, 24 – 27 May 2022

Agenda Item 9: Review Regional Surveillance Strategy

REVIEW APAC REGIONAL SURVEILLANCE STRATEGY

(Presented by the Secretariat)

SUMMARY

This paper presents the Surveillance Strategy for the Asia/Pacific Region for review and actions by the meeting.

1. INTRODUCTION

1.1 The Surveillance Strategy for APAC Region was reviewed in SURICG/1 and SURICG/4 respectively to reflect the amendments required from discussions in relevant meetings. The last amendments of Surveillance Strategy for APAC Region was reviewed and proposed in SURICG/4, endorsed in CNS SG/23 and adopted via **Conclusion APANPIRG/30/15: Revised Surveillance Strategy for the APAC Region**.

1.2 This paper serves the purpose to perform regular review to the Surveillance Strategy for the Asia/Pacific Region to keep the document updated with the latest developments.

2. DISCUSSION

2.1 The revised Surveillance Strategy for the APAC region with initial proposals for amendment received from experts and member of the Group are provided in tracked changes in **Attachment 1** to this paper.

2.2 Inputs collected would be discussed and agreed in this meeting. The consolidated inputs to the Strategy would be proposed to CNS SG/26 for adoption.

3. ACTION BY THE MEETING

3.1 The meeting is invited to review and provide suggestions to **Attachment 1** the Surveillance Strategy for Asia and Pacific Regions.

NOTES ON THE PRESENTATION OF THE PROPOSED AMENDMENT

1. The text of the amendment is arranged to show deleted text with a line through it and new text highlighted with grey shading, as shown below:

a) Text to be deleted is shown with a line through it.	text to be deleted in
b) New text to be inserted is highlighted with grey shading.	new text to be inserted in
c) Text to be deleted is shown with a line through it followed by the replacement text which is highlighted with grey shading.	new text to replace existing text

REVISED SURVEILLANCE STRATEGY FOR THE APAC REGION

Considering that:

1. States are implementing CNS/ATM systems to gain safety, efficiency and environmental benefits, and have endorsed the move toward satellite and data link technologies;
2. The future air traffic environment will require increased use of aircraft-derived surveillance information for the implementation of a seamless automated air traffic flow management system;
3. The 11th Air Navigation Conference endorsed the use of ADS-B as an enabler of the global air traffic management concept and encouraged States to support cost-effective early implementation of ADS-B applications;
4. The 12th Air Navigation Conference endorsed the ICAO Aviation System Block Upgrades (ASBU) Framework with Modules specifying effective use of ADS-B/MLAT and associated communication technologies in bridging surveillance gaps and its role in supporting future trajectory-based ATM operating concepts. Cooperation between States is the key to achieve harmonized ATM system operations;
5. The 13th Air Navigation Conference endorsed the multilayer structure for the GANP, the ASBU and initial version of basic building block (BBB) frameworks and its change management process, which are available in an interactive format as part of the web-based GANP Portal. This allows ICAO to incorporate a flexible framework for new/emerging surveillance-related concepts such as space based ADS-B into future editions of the GANP;
6. APANPIRG has decided to use the 1090MHz Extended Squitter data link for ADS-B air-ground and air-air applications in the Asia/Pacific Region;
7. Use of surveillance systems that do not require GNSS will continue to meet many critical surveillance needs for the foreseeable future;
8. SARPs, PANS and guidance material for the use of ADS-B have been developed;
9. Availability of new technologies, such as space based ADS-B which is now operationally used by some States;

10. Mode S and ADS-B avionics (including DAPs) and processing systems are available;
11. ADS-B IN applications and equipment are now available in commercial airliners and ICAO ASBUs include ADS-B IN applications;
12. There are continuing significant pressures on the radio spectrum for purposes outside aviation, particularly in the primary radar spectrum; and
13. ADS-B security issues are addressed by the ADS-B regional guidance material and security issues of Mode S surveillance may need to be further considered in the future.

THE SURVEILLANCE STRATEGY FOR THE ASIA/PACIFIC REGION IS TO:

1. Minimize the reliance upon pilot position reporting, particularly voice position reporting, for surveillance of aircraft;
2. Maximize the use of ADS-B on major air routes and in terminal areas, giving consideration to the mandatory carriage of ADS-B Out as specified in *Note 1* and use of ADS-B for ATC separation service;
3. Reduce the dependence on Primary Radar for area surveillance, consider the ongoing need for primary radars in terminal areas with a view to reducing primary surveillance coverage or use of phased array radar or other technologies with coverage focusing on areas of concern, and the potential use of alternate technologies or procedures (e.g. transponder veil regulations);
4. Encourage deployment of Mode S systems instead of Mode A/C only radars when replacement is required;
5. Provide maximum contiguous ATS surveillance coverage of air routes using 1090MHz Extended Squitter (1090ES) ADS-B, Wide Area Multilateration and Mode S SSR to meet operational and safety requirements;
6. Make full use of aircraft Mode S capabilities, where suitable surveillance systems and ATM automation systems are available, to reduce reliance on 4-digit octal codes. Mode S capabilities such as DAPs should also be considered for use to support ATM services where appropriate and when equivalent information is not available via ADS-B;
7. Make use of alternative technologies where technical constraint or comparative cost benefit analysis does not support the use of ADS-B, SSR or Multilateration;
8. Make use of Multilateration and/or ADS-B for surface, terminal and area surveillance where appropriate, feasible and cost effective;
9. Monitor ADS-B OUT developments such as Version 3 (DO-260C) MOPS development, and Version 2 (DO260B) equipage in the APAC region. At an appropriate time (circa 2020) APAC States should review progress and consider development of transition plans where cost/benefit studies indicate positive advantages for the region;
10. Monitor ADS-B IN development and cost benefits to ensure that APAC States are able to take advantage of ADS-B IN benefits when appropriate, through procedures, rules and ATC automation capabilities;

11. To the extent possible, implement ADS-B in the non-radar environment as a priority. In the radar or other surveillance environment, use ADS-B to supplement or replace existing surveillance coverage, subject to local factors and risk assessment;
12. Make use of surveillance capability to support the GADSS as appropriate;
13. Implementation of surveillance capability should also include consideration of contingency surveillance requirements ^{Note 2}; ~~and~~
14. Monitor development of surveillance systems to support integration of UAS including new technology capable to detect non cooperative targets such as UAS.
15. Encourage sharing of surveillance data, utilizing provisions in the Region such as CRV, to improve safety and efficiency in air traffic management with a justifiable cost; and
16. Monitor potential congestion on 1090 MHz and availability of 24-bit aircraft address due to operation of UAS, or other emerging aircraft types by means of routine measurements of channel occupancy, at both terrestrial and airborne levels.

Note 1:

- a) *Version 0 ES as specified in Annex 10, Volume IV, Chapter 3, Paragraph 3.1.2.8.6 (up to and including Amendment 82 to Annex 10) and Chapter 2 of Technical Provisions for Mode S Services and Extended Squitter (ICAO Doc 9871) (Equivalent to DO260) to be used till at least 2020.*
- b) *Version 1 ES as specified in Chapter 3 of Technical Provisions for Mode S Services and Extended Squitter (ICAO Doc 9871) (Equivalent to DO260A);*
- c) *Version 2 ES as specified in Chapter 4 of Technical Provisions for Mode S Services and Extended Squitter (ICAO Doc 9871) (Equivalent to DO260B).*
- d) *States/Administrations in APAC region are strongly encouraged to mandate aircraft with a maximum take-off mass exceeding 5 700 kg or having a maximum cruising true airspeed capability greater than 250 knots, to be equipped with ADS-B OUT avionics compliant with Version 2 ES (DO-260B) or later version with date of manufacture on or after 1 January 2020.*

Note 2:

Contingency surveillance requirements are requirements to handle contingency situations in surveillance thus retain capacity to continue providing/using air navigation services. Such situations include but are not limited to the followings:

- *failure of surveillance system or infrastructure such as ground stations or GNSS failure;*
 - *avionics failure or equipped aircraft transmitting bad data in flight with good data integrity indicators.*
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