



International Civil Aviation Organization

**REGULATOR'S WORKSHOP ON ADS-B
AVIONICS EQUIPAGE REQUIREMENTS**

Jakarta, Indonesia, 16 – 17 August 2010



Agenda Item: 7 Brief review of need to harmonise standards and compliance timing for aircraft mandate

- Reasons for States to harmonise

**HARMONIZATION OF AIRCRAFT ADS-B EQUIPAGE IN
THE ASIA-PACIFIC REGION**

(Presented by Australia)

SUMMARY

This WP identifies some of the benefits that arise if a harmonized approach to aircraft ADS-B equipage requirements is taken by aviation regulators of the APAC States intending to use ADS-B for ATC surveillance.

1. INTRODUCTION

1.1 World-wide, a number of aviation regulatory authorities of ICAO States are implementing ADS-B as an advanced ATC surveillance system. In planning aircraft ADS-B avionics standards and requirements, it is apparent that somewhat differing standards and different compliance timings are being proposed or established by the regulators. This seems to reflect the differing needs, applications and timings that States have in their planned future use of ADS-B OUT-based surveillance.

1.2 At its nineteenth meeting held in September 2008, APANPIRG adopted **“Conclusion 19/37 – Revised Mandate – Regional ADS-B OUT Implementation”** relevant to Asia-Pacific States intending to implement ADS-B based surveillance service. That APANPIRG Conclusion is repeated below as it is considered fundamental to the establishment of harmonised regulations by the Asia-Pacific States:

- “States intending to implement ADS-B based surveillance service be urged to:*
- a) determine ADS-B OUT equipage mandates based upon the ability to provide ADS-B OUT separation services;*
 - b) expedite the implementation of ADS-B OUT in accordance with the regional Air Navigation Plan and the provision of separation services based on ADS-B OUT;*
 - c) publish their equipage mandates as soon as possible, with a target publication date of no later than 2010 so that operators can plan ahead their forward purchasing and retrofit; and*
 - d) choose a date after mid-2012 on which the ADS-B OUT equipage mandate will become effective in airspace served by ADS-B ground stations with sufficient transition period to enable fleet equipage.*

1.3 This WP proposes that Asia-Pacific States intending to implement ADS-B surveillance services should harmonise the standards and compliance timings for aircraft ADS-B avionics requirements or mandates.

2. DISCUSSION

2.1 The above APANPIRG Conclusion reflected the need for the regulatory authorities of States to develop their regulatory approach in consultation with, and with a clear knowledge of, the State ANSP's plans for the operational use of ADS-B in its airspace. It was realised that the operational role essentially determines the aircraft avionics equipage standards.

2.2 It is also important that regulators consider the existing fleet makeup of the airline operators and the extent and standards of existing ADS-B fitment. For unequipped aircraft, or aircraft that may require retrofit modification to comply, consideration should be given to the period of time that airlines would reasonably need to equip their aircraft to the required standard of ADS-B avionics. In the Australian situation, an industry study estimated it could take Australian and foreign airlines about four to five years to equip their existing fleets to the proposed Australian ADS-B standards. For States planning to establish an avionics equipment requirement rule prior to 2015 timeframe, the setting of equipage standards that most of the aircraft fleet does not presently meet seems to be self-defeating.

2.3 **Australian ADS-B Mandate.** In March 2009, CASA mandated ADS-B aircraft equipment for aircraft flight in the upper airspace (at and above FL290 of Australian territorial airspace), with a compliance date of 12 December 2013. This mandate is applicable to Australian aircraft and also to foreign registered aircraft operating in Australia after that date. The purpose of the mandate is to provide for 'radar-like' surveillance for ATC in enroute upper airspace where radar coverage had not previously been available.

2.4 The advent of ADS-B in Australian airspace will significantly enhance safety and efficiency and provide an environmental benefit stemming from the potential for aircraft to reduce fuel burns. After 12 December 2013 unequipped aircraft or aircraft not having equipment that meets the specified standard will generally not be permitted to operate at or above FL 290 without a prior exemption by CASA. However, there will remain within Class A enroute airspace flight levels between FL245 and FL290 that will be available for any unequipped aircraft. These levels will be subject to procedural air traffic control where radar cover is not available.

2.5 **Benefits of Asia-Pacific harmonisation.** At this stage, the regulatory authorities of many Asia-Pacific States have yet to establish rules for ADS-B equipage. A harmonised approach in keeping with the APANPIRG/19 Meeting Conclusion by the Asia-Pacific States offers a number of significant potential benefits, particularly for international air service operators:

- a) Harmonisation would support more even take-up of ADS-B in the Region and encourage compliance by aircraft operating international services, to the mutual benefit of all member States, the international airline operators, and ANSPs.
- b) Harmonisation of rules will provide assurance of inter-operability of avionics having the necessary levels of integrity and accuracy for ATM separation services with ADS-B ground stations provided by ANSPs across the APAC region.
- c) ADS-B –OUT surveillance for ATM in non-radar areas represents a significant advancement in safety and efficiency. Fleet fitment with ADS-B OUT to a defined standard will also provide the integrity and accuracy for emerging ADS-B IN technology in the cockpit of airline aircraft, providing traffic situational awareness and conflict avoidance – another major advance in safety in the future.

- d) Some aircraft used on international services may need major retrofit to equip for ADS-B. Those existing airline aircraft typically used on international services that may require complete GNSS + ADS-B equipage include B767 and B737-400 type aircraft. Other aircraft already equipped with ADS-B may need to have equipment service bulletins incorporated to correct known software problems (e.g. B747-400 and aircraft with known transponder software deficiency.) In most existing aircraft, the GNSS units have SA ON, not SA Aware. The extent of the provision or retrofit of the GNSS and ADS-B equipment and thus the potential cost is significantly affected by the standards that are decided on by regulators. A harmonised approach to equipage standards with similar requirements across the Region may result in lower or no retrofit kit costs for the aircraft types involved.
- e) In deciding on compliance timing, regulators need to take into account the factors involved in completing the retrofit of the non-equipped aircraft. Those factors include the availability of a service bulletin and retrofit kits and manufacturer supplied LRUs, actual installation work including possible new antennae fitment - substantial modification work that is normally only implemented during maintenance such as C maintenance (interval of 2 years).
- f) The operational use of ADS-B by the Asia-Pacific States will be predominantly for the purpose of enroute surveillance in non-radar airspace both now and well into the decade, or to a lesser extent as a back-up to existing radar coverage in terminal or enroute applications. There will possibly be some applications of terminal use in what is presently non-radar airspace, at a later time. GNSS and ADS-B equipment currently installed on most of the existing aircraft used on international services will fully satisfy those operational surveillance requirements in terms of accuracy and integrity standards.

3. ACTION BY THE WORKSHOP

3.1 The Workshop is invited to note that, for coordinated take-up of ADS-B in the Asia-Pacific Region there is a need for the regulatory authorities of the States intending to implement ADS-B based surveillance services to establish aircraft equipage requirements (the equipment standards and compliance timing) which are harmonised across the Region.
