



ADS-B Workshop – SP/11

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- ADS-B (OUT) based on Mode-S Extended Squitter (1090ES) is the preferred surveillance technology to replace radar



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- ADS-B implementation worldwide must be harmonized, compatible and interoperable in respect of operational procedures, supporting data link and ATM applications

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- Can be Cost effective solution to
 - Enhance surveillance
 - Replace existing ground infrastructure
- Relies on aircraft equipage
- Ability to data share
 - Can extend own surveillance coverage
 - Reduce coordination issues
 - Potential to apportion costs
- Can be co located with VHF capability

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- Enhanced surveillance solutions offer:
 - More efficient routing
 - Increased airspace capacity
 - Lower cost ATM infrastructure
 - Return on investment



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- Developments on-going
- Must be harmonised

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- New rule making in effect
 - FAA mandate 1 Jan 2020
 - EUR mandate
- Operational benefits can still be derived in this region in the short term
- Must be compatible with what is already available



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- AUS
 - Fully operational since Dec 2009
- Canada (Hudson Bay/ Minto Sector)
 - Operational since early 2009
- Both programs make use of current capabilities/
equipage



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- In the short-medium term States wishing to implement ADS-B must ensure compatibility with existing programs
- Part of the agreed ASPAC Regional Strategy for Surveillance endorsed by APANPIRG (recognising both DO-260 (until 2020) and DO-260A)
- Needs to be supported by DCPC (VHF)
 - To enable radar like separations (i.e. 5nm)



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- Without duplication of radar coverage will need to establish a mandate (exclusivity)
- Must ensure timeline for compliance is appropriate
- Lead has been established



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Conclusion 19/37 –Revised Mandate Regional ADS-B Out Implementation

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.



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Note: The implementation would require aircraft equipped with avionics compliant with either;

1) 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 the Technical Provisions for Mode S Services and Extended Squitter (ICAO Doc 9871) (Equivalent to DO260) to be used till at least 2020.

Or

2) Version 1 ES as specified in Chapter 3 of the Technical Provisions for Mode S Services and Extended Squitter (ICAO Doc 9871) (Equivalent to DO260A)

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- Originally Conclusion 18/35 was amended as 19/37 for added clarity
- Originally formulated in 2007 and amended in 2008
- Calls for publication of aircraft equipage requirements as soon as possible (and no later than 2010)
- Associated mandate no earlier than 2012
- That would give airlines 4-5 years to plan for equipage/retrofit plans



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- APANPIRG conclusion remains unchanged
- It is now 2010
- Based on APANPIRG conclusion, earliest mandate for States who have not published any equipage requirements 2014/2015.

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- Operational benefits can still be derived in the near term
- ADS-B needs to be operational
- Equipage requirements need to be published
- Radar like separations can be applied between suitably equipped aircraft

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- After a suitable period, priority handling could be introduced before a mandate becomes effective
 - Equipped aircraft get priority
 - Non equipped are not excluded
 - Cannot implement priority handling at the outset
 - Need to allow sufficient time for operators to begin equipping (weight of numbers?)
 - Time frame dependent on circumstances

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- Airlines continue to equip their aircraft with ADS-B (OUT) capability
- Where justifiable by operational/ business cases, ATC replace ground surveillance radar with ADS-B (OUT)
- New implementations consider ADS-B in preference to radar
- ATS ground systems should continue to recognise both DO-260 and DO-260A transponders in the short-medium term
- As a region need to consider timeline for DO-260B



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- Need Certification or Approval of aircraft equipage
- In Asia Pacific two methods currently available
- Certification to AMC 20-24 or
- Approval by CASA (AUS)
 - Individual airframe and equipage
 - CAO 20.18
 - Recognises AMC 20-24
 - 28 June 2012

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- Most modern comm aircraft can enable the capability
- Proportion will increase in the short term
 - Fleet refresh
 - State Regional Mandates become valid
- Older aircraft can be extremely costly
- By recognising the existing approvals/ process can reduce burden
 - Reduce costs
 - Reduce administrative process



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Conclusion 20/55 - Regional ADS-B Equipage Requirement

That, States be urged to issue ADS-B authorizations for the interim period 2010-2020 (or until requirements can be harmonized globally) in Non-Radar Areas (NRA) airspace based on:

- AMC20-24 certification or
- Approval by CASA Australia or
- The requirements of the CASA Civil Aviation Order 20.18 Amendment (No. 1) 2009 and Advisory Circular AC21-45



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Note: States that have not yet published regulations should implement necessary regulations that recognize that any one of the above requirements is acceptable and not specify an individual requirement



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AMC 20-24 v Australian?

Approval Standards

- Australian
- ✓ Easy to implement
- ✓ More aircraft capable
- ✓ Some State capability required

- AMC 20 - 24
- ✓ EUR/Canada
- ✓ Ops Spec way
- ✓ AFM Certification
- ✓ Ground test required
- ✓ Older aircraft require certification



Global ADS-B OUT Approvals

Australia	BY EQUIPAGE & PART NUMBERS (2006)	Most operators qualify
EUR	AMC 20-24 ADS-B OUT NRA (2008)	Few pioneer EUR airlines approved
Canada Hudson Bay	AMC 20-24 ADS-B OUT NRA Ground test & AFM certification required (2008-9)	Slow take-up rate

COMPLYING TO AMC 20-24

- 2 Costs - Equipage Certification & Upgrading Costs
- ✓ **Airbus – Ramp test and Certification costs**
= \$\$\$
- ✓ **Boeing non MMR – GP 01 Ramp test and Certification**
= \$\$\$\$
- ✓ **B747 non MMR - GC01 to GC02 Upgrade costs & Certification cost**
= \$\$\$\$\$

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Airlines require clear benefits to support upgrades & certification

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improved ATM, better operational efficiency and reduction in over-flight charges

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- Need to consider the future requirements and migration to revised standards
 - DO-260B
 - SA
- 2020?



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- States need to publish their requirements
- Recognise existing standards
 - Certified AMC 20-24
 - Approved by Australia
- Sharing of databases
- Future standards must also be harmonised



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Questions?