



**Twenty First Meeting of the
Informal South Pacific ATS Co-ordinating Group (ISPACG/21)**

Auckland, New Zealand, 6-8 March 2007

Agenda Item 4: Review progress on Open Action Items
Action Item 17-5

Australian ADS-B update

(Presented by Airservices Australia)

SUMMARY

This working paper provides an update on Australian ADS-B activities.

1. INTRODUCTION

1.1 As part of the Upper Airspace Program (UAP), Airservices Australia committed to the installation of 28 ADS-B ground stations across continental Australia. Within VHF coverage, this would permit the application of 5NM separation – as well as other radar-like services – between ADS-B-equipped aircraft.

1.2 Investigation has also been conducted into other remote areas that could also return benefits by the installation of an ADS-B ground station.

1.3 The original ADS-B project brief expected that all sites would be installed and operational by the beginning of 2006. This was dependent on a telecommunications project which was required to provide the path duplication necessary to meet the requirements for the provision of radar-like services.

2. ADS-B UPDATE

2.1 The final project implementation has been delayed due to problems experienced by the communication service provider in installing the necessary hardware to permit duplicated (independent) data paths between the ADS-B site and the air traffic services centres. This delay has resulted in a revision to the ground station implementation schedule, the analysis of refresher training needs for controllers, and may result in a revision of the transition strategy outlined in the ADS-B Implementation Phase Safety Case.

2.2 On 28 June 2006, data from four (non-duplicated) ADS-B sites was made available to Australian air traffic controllers (this was in addition to the data from the existing duplicated ADS-B site at Bundaberg). This followed the development of appropriate procedures and the completion of

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relevant controller training. The new sites are located at Bourke (BKE), Longreach (LRE), Woomera (WR), and Esperance (ESP). The approximate coverage from these sites is shown in Figure 1.

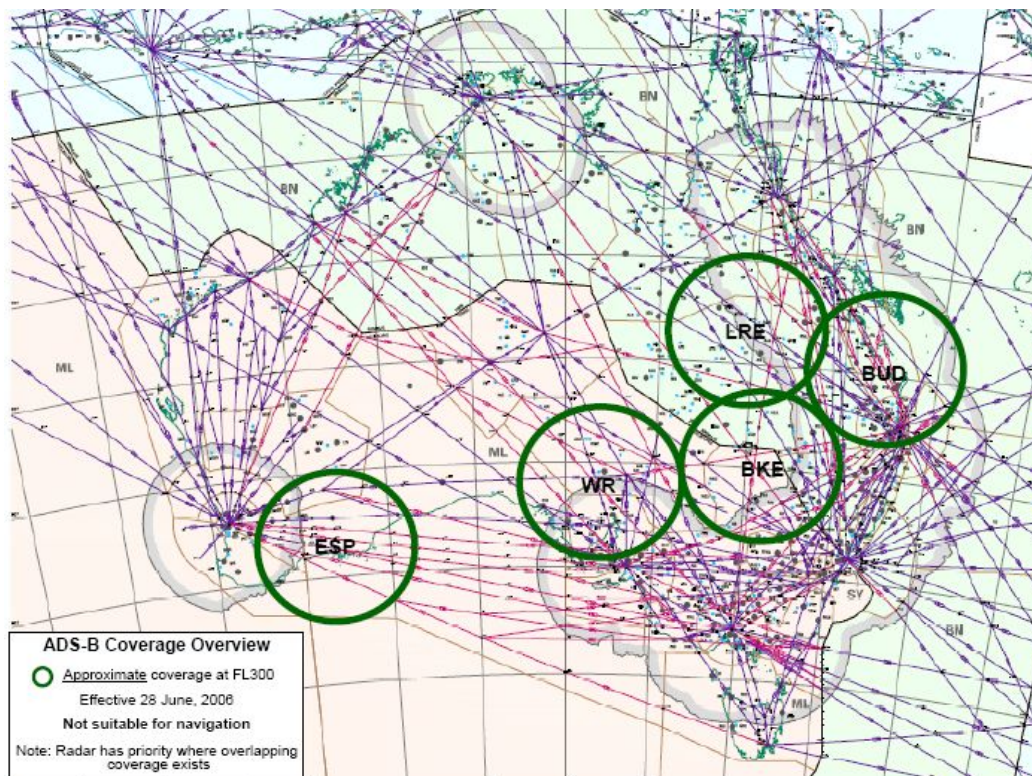


Figure 1. Current ADS-B coverage

2.3 Procedures and phraseologies that have been adopted by Airservices Australia are in accordance with those proposed by the OPLINK Panel. These changes are expected to be included in the amendment to PANS-ATM Doc 4444 scheduled for November 2007. The main phraseology change that may have been noticed by pilots operating in Australian airspace is “IDENTIFICATION TERMINATED”, which has replaced “RADAR SERVICE TERMINATED”. Other ADS-B-related phraseologies that have been commonly used by ATC are “TRANSMIT ADS-B IDENT” and “RE-ENTER ADS-B AIRCRAFT IDENTIFICATION”.

2.4 An additional ADS-B 6 sites are expected to be operational prior to Q3 2007. Similarly to the 4 ground stations rolled out in June 2006, the data paths will be non-duplicated therefore ADS-B data received from these sites cannot (initially) be used for the provision of radar-like services. However there are other benefits that will still be available:

- Alerting such as RAM, CLAM, STCA etc will be available for ADS-B-equipped aircraft;
- Pilot position reports for identified aircraft will not be required;
- Reduced ADS-C reporting rate for ADS-B-coupled aircraft;
- ADS-B may be used to establish and continue to monitor traditional procedural separation minima (e.g. DME distance standards);
- Increased situational awareness for non-routine occurrences (e.g. diversions);
- Identified aircraft will receive propriety over non-identified aircraft.

2.5 The scope of the Upper Airspace Program has been increased with the approval to purchase an additional 20 sets of ground stations which will be co-located at enroute radar sites and other locations to enhance ADS-B coverage.

2.6 Aircraft approval process

2.6.1 Prior to the operational use of ADS-B by Australian air traffic controllers, an aircraft operator must apply to the ADS-B Aircraft Approval Authority of Airservices Australia to:

- Obtain approval from the Australian Regulator (CASA) for the ADS-B avionics installed in each aircraft (Airservices Australia liaises with CASA on the operator's behalf); and
- Provide confirmation to Airservices Australia that appropriate dispatcher and crew training in the use of ADS-B and the associated procedures has been completed.

2.6.2 Once this process has been completed, the 'aircraft address' (aka "24 bit code") of the airframes that have been nominated by the operator are added to the ADS-B filter table. This filter table determines whether ADS-B data transmitted by the aircraft is used by TAAATS to update the flight plan information held by ATC.

2.6.3 At the time of writing this working paper, applications for ADS-B avionics approval have been successfully processed for a total of 383 individual airframes belonging to 18 operators. With effect 15th February 2006, 299 of these airframes were included in the ADS-B filter table, allowing ATC to use ADS-B information transmitted by these aircraft. The increasing numbers of aircraft being added to the ADS-B filter table is shown below.

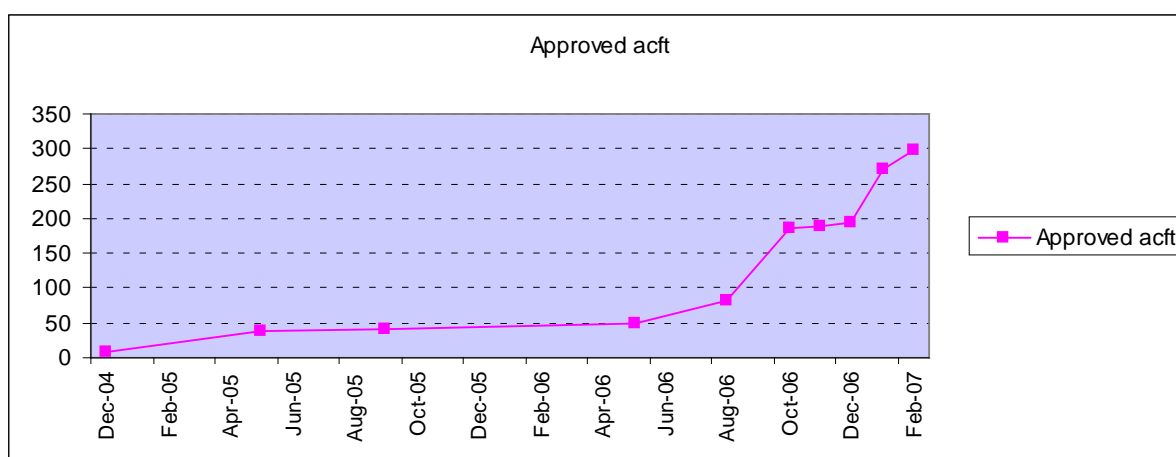


Figure 2. Graph showing the increasing numbers of ADS-B-approved aircraft

2.6.4 Of the remaining 84 airframes, all have avionics approval. Crew training is now complete for 15 airframes and their details will be added to the ADS-B Filter Table in March 2007. The required crew training has not yet been completed for the remaining 69 airframes.

2.6.5 The aircraft types from which ADS-B reports are currently received include:

- A330, B737, A320, B777, B747, A340, DHC-8, B200, BK117, B206, Jabiru 200, PA34

2.7 ADS-B procedural issues

2.7.1 **Flight identification.** “Flight identification” is the identity information that is contained in ADS-B “squits” (or transmissions) that may be used to link the ADS-B report with a corresponding flight planned held by ATS. In a similar way to the FANS logon, the entered Flight Identification must match the aircraft identification as indicated in the ATS flight plan. In extreme cases, incorrect entry of flight identification may lead to the updating of an incorrect flight plan. The procedure for resolving Flight identification errors is to request the pilot to RE-ENTER ADS-B AIRCRAFT IDENTIFICATION.

Note. Flight crews in some aircraft types (e.g. Airbus) have indicated that they are unable to reset the Flight Identification in flight.

2.7.2 **RMK/ADSB.** One of the purposes of the ICAO flight plan is to provide information to ATS concerning the avionics with which an aircraft is equipped. However, there is currently no flight plan indication to show that an aircraft is ADS-B equipped. Until new ICAO indicators are introduced, Airservices Australia requires an interim indication (RMK/ADSB) in the flight plan submitted to ATS to indicate that an aircraft is suitably equipped and capable of receiving ADS-B services in Australia.

3. ADS-B ON LORD HOWE ISLAND

3.1 Over the last few years, a study into the feasibility of installing an ADS-B ground station on Lord Howe Island (LHI) has been undertaken. The Airservices Australia Chief Executive Officer recently (December 2006) approved a project to install a replacement NDB, an ADS-B ground station as well as a VHF receiver/transmitter on Lord Howe Island.

3.2 The expected ADS-B coverage at or above 30 000 feet for a LHI ground station is shown in Figure 3. The area of reduced ADS-B coverage to the south of the island is due to the presence of Mount Gower and Lidgbird.

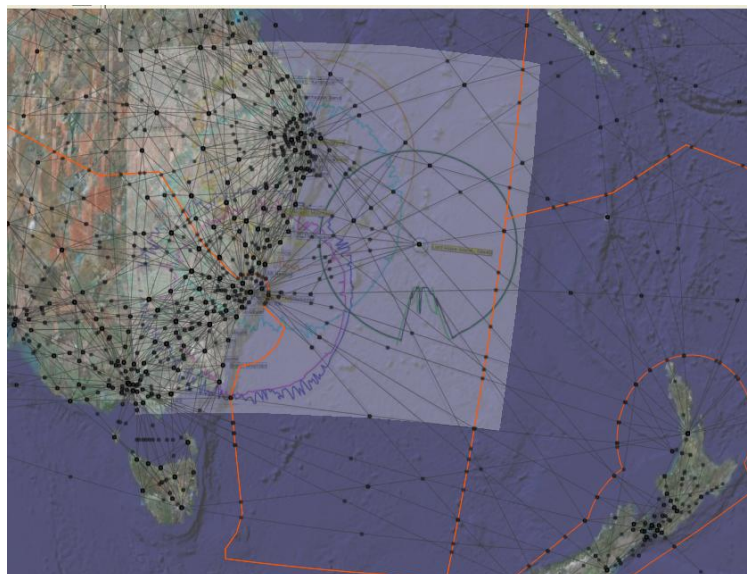


Figure 3. Expected LHI ADS-B coverage above 30 000 feet

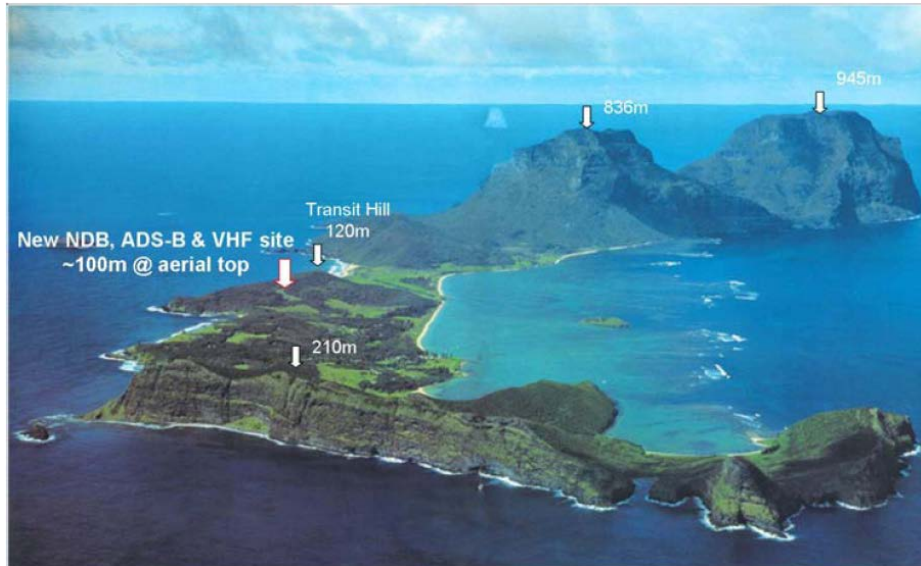


Figure 4. Proposed location of ADS-B site on LHI

3.3 Data analysis indicates that during current traffic peaks, nearly half the aircraft in this airspace are ADS-B-equipped and are already approved to receive ADS-B services, a proportion that is expected to increase.

3.4 This project is expected to be completed by Q3 2008.

4. ACTION BY THE MEETING

4.1 The meeting is invited to note:

- a) the operational implementation of ADS-B within Australian airspace;
- b) the increasing numbers of ADS-B-approved aircraft; and
- c) the planned ADS-B site on Lord Howe Island.