

**Twenty Third Meeting of the  
Informal South Pacific ATS Co-ordinating Group (ISPACG/23)**

**Santiago, Chile, 26-27 March 2009**

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**Agenda Item 4: Review Open Action Items**

**AUSTRALIAN ADS-B UPDATE**

(Presented by Airservices Australia)

**SUMMARY**

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

**1. INTRODUCTION**

- 1.1 This working paper provides an update on Australian ADS-B related activity since ISPACG/22.

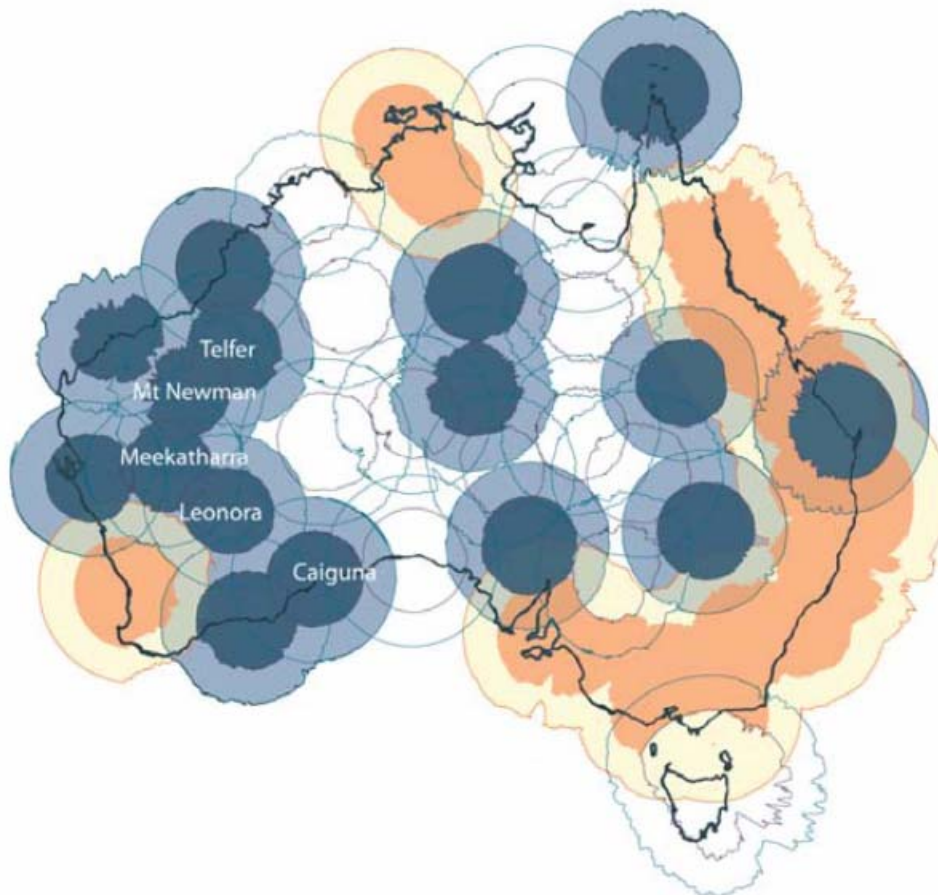
**2. DISCUSSION**

- 2.1 The 12 months since ISPACG/22 has seen the deployment of an additional 5 ADS-B sites, resulting in an increase in Australian ADS-B coverage, as well as continued growth in the numbers of ADS-B approved aircraft.
- 2.2 The emphasis on ADS-B ground station implementation during 2008 was in Western Australia to provide ATS surveillance for the numerous aircraft servicing the mining communities north of Perth.
- 2.3 ADS-B equipment for the remaining installations is in the process of being installed. Almost all the remaining sites have ADS-B equipment installed and connected to antennas and upgraded power supplies. Installation and end to end testing of the new communications links will be completed before each site can be operationally commissioned during 2009.

2.4 A list of ADS-B sites, including those commissioned during 2008 is included in **Table 1**. Australian ADS-B coverage as of December 2008 is depicted in **Figure 1**.

Existing ADS-B sites (pre ISPACG/22)	New ADS-B sites (post ISPACG/22)
Alice Springs	Caiguna
Billabong	Leonora
Bourke	Meekatharra
Broome	Newman
Bundaberg	Telfer
Esperance	
Karratha	
Longreach	
Tennant Creek	
Thursday Island	
Woomera	

**Table 1. ADS-B sites currently operational in Australia**



**Figure 1. Current Australian ADS-B/radar coverage**

## 2.5 Airframes

2.5.1 As of Feb 2009, 757 airframes are ADS-B approved and receiving the operational and safety benefits associated with ADS-B surveillance.

2.5.2 Based on flight plan data in Australia during the month of February 2009:

- 60 % of all international flights in Australia were by ADS-B approved aircraft.
- 23 % of all domestic scheduled flights were by ADS-B approved aircraft.
- 21 % of all flights with a flight plan, operating in Australia were by ADS-B approved aircraft.

2.5.3 Current applications for ADS-B approvals will see these numbers continue to grow.

## 2.6 Problems encountered

2.6.1 By far the biggest problem that has been encountered is the incorrect entry of Flight Identification into the FMS/MCDU. In a similar way to the FANS-1/A logon, this identification must exactly match the aircraft identification contained in the ATS flight plan.

2.6.2 Common flight identification errors that have been observed include:

**ABC\_123**

Added spaces

**AB123**

IATA airline designator used

**AB0123**

Combination of IATA callsign and the addition of a zero

**123**

ICAO airline designator omitted

**ABC0123**

Additional zero inserted

**BNEMEL**

DEP/DEST/Alternate details used instead of Flight ID

2.6.3 If the flight identification is entered incorrectly ATC will use the phraseology: “RE-ENTER ADS-B AIRCRAFT IDENTIFICATION” to notify the flight crew.

- If they are able to do so, the flight crew must then reset the flight identification to match the ATS Flight Plan;
- If they are unable to reset the flight identification in flight, the flight crew must advise ATC that they are unable to comply.

2.6.4 Failure to enter the flight identification correctly means that the ATS flight plan is not automatically updated with any ADS-B information that may be received. This results in:

- Screen clutter on air traffic control displays – multiple position symbols and track labels are displayed instead of just a single target;
- Increased controller and pilot workload to resolve the FLTID error;
- Increased pilot and controller workload in transmitting and manually processing position reports;
- Loss of any benefits associated with ADS-B that may have been available.

**Incorrect entry of flight identification by an Air Transport Operator is a reportable event – ATC is required to raise a Safety Incident Report**

## 2.7 Equipment problems

2.7.1 The ADS-B monitoring programme has detected a small number of ADS-B related equipment problems.

### **Position jumps**

On a small number of occasions, ADS-B ground stations have detected an unreasonable “position jump” in the position of an aircraft. Such position jumps can occur as a result of avionics faults and sometimes, for unknown reason, at the edge of ADS-B coverage. When the Australian ADS-B ground stations detect an unreasonable jump, the NUC (FOM) value transmitted to ATC is forced to zero, so that the position information will not be used by the ATC system.

### **Erroneous position information**

Two aircraft belonging to one operator were occasionally squitting erroneous position information for several seconds. Investigations could not detect any error with the actual ADS-B equipment on the aircraft, but the fitment of the equipment (possibly the cabling) was suspected to be at fault. These airframes have been removed from the ADS-B filter table, pending further investigation.

(Note: This is a benefit of being able to filter ADS-B aircraft data, particularly as the majority of installations do not allow for isolation of ADS-B transmissions without disabling the transponder. If required, it is possible to produce and deploy a new filter table within approximately 2 hours.)

### **No ADS-B emissions**

On a small number of occasions, no ADS-B reports were being received from aircraft that had flight planned as ADS-B approved. In a number of cases, investigations identified a problem with a single transponder which was highlighted by the common practice of conducting inbound legs on one transponder, and outbound legs on the other transponder.

An ATC procedure was implemented which requested that the flight crew switch transponders if ADS-B data was not being received (similar to what occurs within radar coverage). This procedure has assisted in identifying equipment failure and also allowed ADS-B services to be restored.

## 2.8 Flight planning ADS-B approval

- 2.8.1 Operators who meet the Australian requirements for ADS-B operations are requested to indicate their ADS-B capability in the flight notification when operating in Australian airspace.
- 2.8.2 This capability is indicated by entering “ADSB” following the RMK/ indicator in Item 18 of the ATS flight plan (e.g. “RMK/ADSB”).
- 2.8.3 Operators are also request to note that the inclusion of multiple RMK/ indicators within Item 18 may cause flight plans to be rejected by some automated ATC systems.

## 2.9 ADS-B mandate

- 2.9.1 On 27 February 2009, the Director of Aviation Safety issued the following:
  - [Civil Aviation Order 20.18 Amendment Order \(No. 1\) 2009](#);
  - [Civil Aviation Order 82.1 Amendment Order \(No. 1\) 2009](#);
  - [Civil Aviation Order 82.3 Amendment Order \(No. 2\) 2009](#);
  - [Civil Aviation Order 82.5 Amendment Order \(No. 2\) 2009](#); and
  - [CASA 41/09 – Direction – use of ADS-B in foreign aircraft engaged in private operations in Australian territory](#)
- 2.9.2 These instruments describe new requirements for the use of ADS-B transmitting equipment for aircraft operating in Australian territory. The new requirements make fitment and operation of approved ADS-B avionics equipment mandatory on, and from, 12 December 2013 for all Australian aircraft operations at, or above, FL 290 (unless CASA has authorised otherwise).
- 2.9.3 Although specific compulsion commences from 12 December 2013, from 6 March 2009, if ADS-B is carried voluntarily for operational purposes (in any airspace at any altitude), it must be approved equipment that makes specific flight identification transmissions and it must be operated continuously (unless authorised otherwise by air traffic control). Non-approved equipment must be deactivated (except in VMC test flights below FL290).
- 2.9.4 The CAO amendments and direction 41/09 were registered on the Federal Register of Legislative Instruments on 5 March 2009 and came into effect on 6 March 2009.

2.9.5 Further information on the ADS-B mandate is contained on the CASA website:  
<http://casa.gov.au/rules/changes/index.htm>

## **2.10 Lord Howe Island**

2.10.1 The Lord Howe Island ADS-B and VHF installation and commissioning is now scheduled for the end of 2009.

## **2.11 Additional information**

2.11.1 Additional information concerning ADS-B can be obtained via the following links.

Flight Operations Information Package:

<http://www.airservicesaustralia.com/projects/services/projects/adsb/operatortraining.asp>

Additional educational material:

<http://www.casa.gov.au/pilots/download/ADS-B.pdf>

## **3. ACTION BY THE MEETING**

3.1 The meeting is invited to:

- a) Note the continued expansion of ADS-B activities in Australia;
- b) Discuss any issues of concern (e.g. ADS-B mandate).