



*International Civil Aviation Organization*

**FIFTEENH MEETING OF THE ADS-B STUDY AND IMPLEMENTATION  
TASK FORCE (ADS-B SITF/15)**

Bangkok, Thailand, 18 - 20 April 2016

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**Agenda Item 4: Review States activities and interregional issues of ADS-B and  
Multilateration**

**IMPLEMENTATION OF ADS-B IN THE NEW ZEALAND  
FLIGHT INFORMATION REGION**

(Presented by New Zealand)

**SUMMARY**

This paper presents an update on New Zealand's implementation of Automatic Dependent Surveillance – Broadcast (ADS-B) OUT as the main component of a future surveillance system replacing the current secondary radar system.

**1. INTRODUCTION**

1.1 New Southern Sky (NSS) is a ten year, three stage programme, to modernize New Zealand's aviation system. Implementation of ADS-B is a central component of the future surveillance system.

1.2 The surveillance system in New Zealand's Flight Information Region (FIR) comprises a network of three primary surveillance radars at the main international airports of Auckland, Wellington, and Christchurch and six secondary surveillance radars (MSSR). A wide area Multilateration (WAM) system provides coverage in the lower South Island where radar is not practicable due to mountainous terrain.

1.3 The current primary and secondary radar network will reach the end of its operational life at the end of 2021. This provides an opportunity for Airways Corporation of New Zealand (ACNZ), the air navigation service provider (ANSP), to implement ADS-B in accordance with ICAO global and Asia-Pacific guidance for surveillance system improvements.

1.4 The future surveillance network key components are proposed to be:

- ADS-B OUT as the primary main source of surveillance source
- Non-cooperative surveillance where required at international airports (e.g. PSR)
- Retention of the WAM system for the lower South Island airspace
- Implementation of a co-operative, non-GNSS dependent contingency surveillance system to cover main air routes in the event of degraded global navigation satellite system (GNSS) performance affecting one or more aircraft or a total GNSS failure.

## **2. DISCUSSION**

### **Regulation for ADS-B OUT**

2.1 The Civil Aviation Authority of New Zealand (CAANZ) is developing amendments to the Civil Aviation Rules to introduce ADS-B OUT mandates detailed in 2.2. The first of these rules is scheduled to come into force in early 2017.

2.2 The key components of the regulatory framework are:

- ADS-B OUT equipment requirement for all aircraft operating in controlled airspace above FL 245 from 1 January 2019
- ADS-B OUT equipment requirement for all aircraft operating in controlled airspace from 1 January 2022
- A forward fit requirement for ADS-B equipage on all newly registered aircraft.

2.3 New Zealand will develop performance-based regulations which establish the mandates for aircraft equipage, and provide for the setting of performance standards which aircraft equipment must meet in order to operate in ADS-B OUT mandated airspace. The Rule will not specify particular Technical Standing Orders (TSO), or transponder GNSS receiver models for position input into ADS-B.

2.4 The regulation will require the use of the 1090 MHz extended squitter (ES) ADS-B OUT transponder. The current proposal is that aircraft already equipped with RTCA DO-260 and DO-260A will be able to continue to use that equipment, provided it meets the minimum performance standards. New equipage is likely to need to comply with DO-260B or later.

2.5 The rationale for performance-based regulations is to future-proof against the need for further changes to the regulations in an area of rapidly evolving technologies, including equipment that may offer lower cost, lower weight solutions for general aviation aircraft.

2.6 New Zealand does not anticipate mandating ADS-B IN, or allowing self-separation using ADS-B in the foreseeable future. New Zealand will not adopt the Universal Access Transceiver (UAT) system.

2.7 CAANZ has provided initial guidance to air transport operators on ADS-B OUT (and associated GNSS receiver requirements) to assist with investment decisions ahead of the indicated mandate dates. The implementation of Performance Based Navigation (PBN) in New Zealand is closely aligned with the surveillance system work, focused on the shared dependence of both ADS-B OUT and PBN on GNSS.

### **ADS-B system acquisition**

2.8 ACNZ provides the surveillance infrastructure and is currently tendering for supply of the proposed ADS-B surveillance network and will initiate a tender for a non-GNSS dependent contingency surveillance system later in 2016. The first stage of ADS-B implementation will be operational in late 2016, followed by two more phases coming on stream through to late 2019. Contingency surveillance acquisition and implementation will begin in mid-2017.

**Stage 1: ADS-B above FL 245**

2.9 FL 245 has been selected as the nominal division between upper and lower airspace in the New Zealand Flight Information region (FIR). The staged implementation allows the ADS-B system to be implemented and monitored while the current MSSR network provides a safety net.

2.10 ACNZ data indicates that 97+% of aircraft operating above FL 245 are already equipped with ADS-B OUT (see graphs appendix A). The main impact may be on operators with aircraft due for withdrawal in the near future, and older aircraft that may be difficult and expensive to retrofit for ADS-B. CAANZ will work with identified operators to agree a plan for safely accommodating the aircraft until they are retired and do not anticipate approving exemptions to the 2018 mandate on any other grounds.

**Stage 2: ADS-B in all controlled airspace**

2.11 New Zealand proposes extending the ADS-B mandate to cover all aircraft operating in controlled airspace as of 1 January 2022. This will include general aviation participants and does not differentiate between instrument flight rule (IFR) and visual flight rule (VFR) operations.

2.12 This approach is to ensure safety and separation by ensuring all aircraft are visible to air traffic control in controlled airspace. The benefits for general aviation operators may extend to areas of ADS-B OUT coverage (as distinct from surveillance service) by potentially improving the ability of search and rescue services to locate crashed aircraft. In the event of loss of navigation function in an IFR aircraft, or loss of situational awareness in a VFR flight, ADS-B OUT may enable ATC to provide assistance to the affected crew.

2.13 The majority of the fleet operating below FL 245 is not equipped for ADS-B OUT. CAANZ estimates that approximately 2,000 aircraft will need to be equipped to meet the mandate. Challenges for the second mandate include:

- Cost of equipage, in particular GNSS receivers for general aviation VFR aircraft that would not normally install or use this equipment for navigation; and
- Access to avionics engineers and technicians to install and test ADS-B OUT equipment

2.14 Performance-based regulation is intended to enable operators to install and use lower cost, lower weight ADS-B OUT options (e.g. single integrated ADS-B OUT and GNSS boxes), provided the equipment meets the performance requirements. The aim is to support informed decision-making by operators, and promote early uptake wherever possible.

2.15 New Zealand is monitoring the trials of TSO-C199 and Low Power ADS-B Transceiver (LPAT) systems in Australia, the United States, and the United Kingdom. There is the potential for ACNZ to run a trial of an LPAT or Traffic Awareness Beacon System (TABS) type system as part of the system testing for ADS-B implementation.

2.16 There is limited potential for use of the co-operative contingency surveillance system to provide an alternative to ADS-B for GA VFR aircraft that would not otherwise equip with a GNSS receiver. ACNZ and CAANZ are exploring this option and considering whether it could be offered to operators in areas covered by the contingency system, without compromising safety.

**3. ACTION REQUIRED BY THE MEETING**

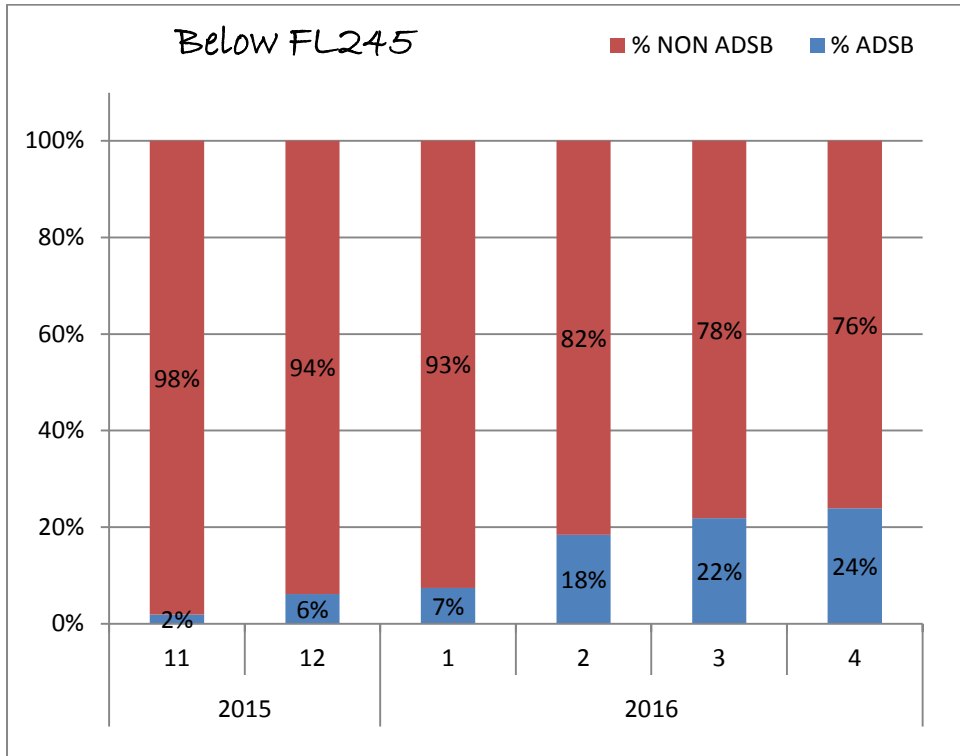
3.1 The meeting is invited to:

- a) note the information contained in this papers; and
- b) discuss any relevant matters as appropriate.

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## Appendix A

### ADS-B equipped traffic below FL245



### ADS-B equipped traffic above FL245

