



*International Civil Aviation Organization*

**AUTOMATIC DEPENDENT SURVEILLANCE –  
BROADCAST SEMINAR AND TWELFTH MEETING  
OF AUTOMATIC DEPENDENT SURVEILLANCE –  
BROADCAST (ADS-B) STUDY AND  
IMPLEMENTATION TASK FORCE (ADS-B SITF/12)**



Kolkata, India, 15-18 April 2013

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**Agenda Item 6: Review States' activities and interregional issues on trials and implementation of ADS-B**

**THE NEED FOR ADEQUATE LOGISTICS AND SPARES SUPPORT  
FOR ADS-B GROUND STATIONS**

(Presented by Australia)

**SUMMARY**

The purpose of this WP is to inform discussion on the need for ANSPs of the need to have sufficient support systems (e.g. spares, support tools, etc) to ensure high operational availability is being maintained during the support phase of system life.

**1. Background**

1.1 To achieve acceptable operational availability of an ADS-B service used to support separation services, the system is expected to be duplicated. If one system fails, the service continues using an unduplicated system (one system is not operational).

1.2 This is acceptable for a short period, whilst the faulty element is repaired, because the probability of a second failure during the short time window is low.

1.3 However, it is necessary to ensure that the repair does not take too long. A long repair time

- Increases the risk of an unexpected failure (loss of continuity) and safety impact;
- Loss of service for a period (low availability) and loss of aircraft operational efficiency

**2. Short repair times depend on support**

2.1 To achieve short repair times, ANSPs usually provide a range of logistics, including the following, to ensure that the outage is less than a few days :

- ensure the procured system is designed to allow for quick replacement of faulty modules to restore operations;
- provide remote monitoring to allow maintainers to identify the faulty module for transport to site;
- provide support tools to allow technician to repair faulty module or to configure/setup replacement module;
- provide technician training to identify & repair the faulty module(s);
- provide local maintenance depots to reduce the time it takes to get to the site;
- provide documentation and procedures to “standardize” the process;
- use an in-country spares pool to ensure that replacement modules are available within reasonable times; and
- use a maintenance contract to repair faulty modules within a specified turnaround time. i.e: to replenish the spares pool quickly.

2.2 Whilst technical training and remote monitoring are usually considered by ANSPs, sometimes there is less focus on spares support.

Difficulties can be experienced if States

- a) Fail to establish a spares pool – because procurement of spares at the time of failure can bring extensive delays due to :
  - Obtaining funds
  - Obtaining approval to purchase overseas
  - Obtaining approval to purchase from a “sole source”
  - Difficulties and delays in obtaining a quotation
  - Delays in delivery because the purchase was unexpected by the supplier
- b) Fail to establish a module repair contract resulting in
  - Long repair times
  - Unplanned expenditure
  - Inability for a supplier to repair modules because the supplier did not have adequate certainty of funding of the work.

### **3. Spares pool**

3.1 ANSPs can establish, preferably as part of their acquisition purchase, adequate spares buffer stock to support the required repair times. The prime objective is to reduce the time period that the system operates un-duplicated. It allows decoupling of the restoration time from the module repair time.

### **4. Module repair contract**

4.1 ANSPs can also enter into a Maintenance repair contract, preferably as part of their acquisition purchase, to require the supplier to repair or replace and deliver failed modules within a specified time

The advantages of a Module repair contract are:

- The price can be determined whilst in the competitive phase of acquisition – hence avoids excessive costs;
- It can include options for the ANSP to choose to exit the maintenance contract after specified periods (eg at 7 years and 15 years);
- Can specify maximum repair times and can include agreed financial penalties if the supplier fails to deliver in time;
- The contract can include the supplier bearing all shipping costs;
- Can be funded by a specified and contracted amount per year, which will support the budget processes. If the costs are fixed, the supplier is encouraged to develop a reliable system minimizing module repairs; and
- It avoids delays and funding issues at the time of the module failure

## **5. Conclusion**

5.1 The Meeting is invited to

- a) consider the advantages of spares pools and maintenance repair contracts to support modern Air Traffic Control systems such as ADS-B. Such systems continue to need adequate spares support. It is desirable that these items be included in acquisition contracts; and
- b) Include the principles of this paper in the revised AIGD.

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