



International Civil Aviation Organization

**THE TENTH MEETING OF AUTOMATIC
DEPENDENT SURVEILLANCE –
BROADCAST (ADS-B) STUDY AND
IMPLEMENTATION TASK FORCE
(ADS-B SITF/10)**



Singapore, 26 -29 April 2011

**Agenda Item 7: Development of Asia/Pacific Regional ADS-B implementation plan and
sub-regional ADS-B implementation plan**

RECOMMENDATION REGARDING NUC=0

(Presented by Australia)

SUMMARY

This paper proposes that ICAO Bangkok advises States of the safety impact of using ADS-B with no integrity.

1. ADS-B from Inertial Navigation Systems

1.1 Some aircraft transmit ADS-B messages with positional data derived from aircraft Inertial Navigation Systems (INS). The accuracy of INS positional data degrades over the duration of each flight. Thus such aircraft can report positions which are significantly different to the true aircraft position. It could be a safety risk for ATC staff to use such positional data.

1.2 Fortunately, aircraft with such installations do not report integrity values to the ATC transponder, and the transponder reports NUC or NIC =0. The RTCA & Eurocae standards say that NUC=0 or NIC=0 corresponds to Horizontal Protection limit greater than 20 nautical miles and 95% containment radius greater than 10 nautical miles.

2. ADS-B from GPS

2.1 When some GPS receivers detect a faulty ranging signal that cannot be excluded from the positional calculation they flag the erroneous situation to the ATC transponder by setting “flags” in the messages to the transponder. In such a case, the transponder is expected to set the transmitted integrity to zero, indicating that the positional data is not safe to rely on.

3. Use of NUC (or NIC)=0

3.1 ATC systems should discard all ADS-B data with NUC=0 (or NIC=0). Clearly it is unsafe to use for separation purposes, whether for radar like separation or procedural separation.

3.2 Some ATC systems in the Asia Pacific region use the ADS-B positional data to update the flight plan data, triggering waypoint overflight and updating future waypoint estimates. Thus, if the ADS-B data is erroneous it can result in incorrect waypoint estimates and hence loss of procedural separation.

3.3 Thus ADS-B data without integrity (such as NUC=0) should not be used to support procedural control in this way.

4. Recommendation

4.1 It is recommended that ICAO Bangkok bring this risk to the attention of all Asia Pacific States and re-iterate the importance of discarding ADS-B data without integrity.
