International Civil Aviation Organization

THE NINTH MEETING OF AUTOMATIC DEPENDENT SURVEILLANCE – BROADCAST (ADS-B) STUDY AND IMPLEMENTATION TASK FORCE (ADS-B SITF/9)

Jakarta, Indonesia, 18 -19 August 2010

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

-Harmonization of ADS-B regulations, rules and procedures

PROHIBITION OF "BAD" TRANSMISSIONS

(Presented by Airservices Australia)

SUMMARY

This paper discusses the need to prohibit "bad" transmissions and recommends inclusion of appropriate words in Guidance material

1. Background

A number of ADS-B avionics products transmit ADS-B data which could be considered misleading.

If a State provides ADS-B based separation services or allows ADS-B IN operations, then these transmissions could be considered a safety hazard because of the potential for unavoidable misuse.

Examples of this are :

- A product which transmits messages formats similar to, but not the same as DO260, DO260A or DO260B. When interpreted as DO260 messages, these can be misinterpreted as a good integrity messages with an incorrect position.
- A product which transmits DO260 NUC based solely on the accuracy value HFOM instead of the integrity value HPL. This can be interpreted as a DO260 message with good integrity when in fact integrity is poor.
- A GPS product that fails to correctly generate HPL messages
- An aircraft that fails to correctly transmit FlightID matching the filed flight plan.

2. Mandatory and non mandatory airspace

In environments where all airspace participants are required to have compliant equipment, the risk of use of such misleading data is low because legislation, rules, and regulator controls manage the airspace entry.

However, in airspace in which does not have a mandate, ADS-B transmissions may be used, and the risk of use of such misleading data is high. Examples include the following :

- In Airspace where ADS-B processing by ATC is under trial
- In Airspace where ADS-B is used for ATC situational awareness only and ADS-B equipage is not mandatory
- In Airspace where ADS-B IN may be used

3. Australian regulation

Regulators normally require legislative power to ensure that misleading data is not transmitted.

Australia's regulations have prohibited transmission of data which does not comply to the standards since 2007. An updated version of this regulation is applicable today in Australian airspace even during the period before mandatory fitment applies. The following extract from the Australian Civil Aviation Order 82.5 illustrates the rule.

> *5 If an aircraft carries ADS-B transmitting equipment which does not comply with an approved equipment configuration, the aircraft must not fly in Australian territory unless the equipment is:*
>
> *(a) deactivated; or*
>
> *(b) set to transmit only a value of zero for the NUCp or NIC.*
>
> *Note: It is considered equivalent to deactivation if NUCp or NIC is set to continually transmit only a value of zero.*

The exception related to transmission of NIC or NUCp=0 is made because NIC or NUCp = 0 indicates that the data has no integrity and the Australian ATC system will discard such messages. Many aircraft with compliant ATC transponders, without GPS systems, transmit inertial positional data in ADS-B messages with NUC or NIC=0. It is also expected that ADS-B IN systems will discard NUC, NIC=0 data.

4. Conclusion

4.1 It is recommended that any ADS-B Task Force Guidance Material related to ADS-B regulations include the following :

> *After* ***<insert earliest date that ADS-B may be used for any relevant operational purpose>*** *if an aircraft carries ADS-B transmitting equipment which does not comply with* ***<insert technical requirement, including relevant positional data source requirement>*** *the aircraft must not fly in* ***<description of airspace volume or route>*** *unless the equipment is:*
>
> *(a) deactivated; or*
>
> *(b) set to transmit only a value of zero for the NUCp or NIC.*
>
> *Note: It is considered equivalent to deactivation if NUCp or NIC is set to continually transmit only a value of zero.*

4.2 It is recommended that Regulators take appropriate action to ensure that such regulations are complied with.

4.3 It is recommended that ATC systems discard ADS-B data when NUC or NIC=0

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