International Civil Aviation Organization

AUTOMATIC DEPENDENT SURVEILLANCE – BROADCAST SEMINAR AND FOURTEENTH MEETING OF AUTOMATIC DEPENDENT SURVEILLANCE – BROADCAST (ADS-B) STUDY AND IMPLEMENTATION TASK FORCE (ADS-B SITF/14)

Christchurch, New Zealand, 14 – 17 April 2015

Agenda Item 4: **Review States' activities and interregional issues on implementation of ADS-B and multilateration**

HANDLING OF B787 POSITION ERROR ISSUE

(Presented by Singapore)

SUMMARY

This paper updates the Task Force on Singapore's approach to deal with the B787 position error issue.

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1. Introduction

1.1   Following an observation by Singapore ATC on 28 October 2015, it was discovered that the B787 aircraft could transmit inaccurate ADS-B positional data, whilst declaring the data as high integrity. A series of data captures led by Australia were carried out and the results were sent to Boeing for investigation. It was eventually concluded by Boeing that all B787 aircraft equipped with DO-260A could potentially exhibit this error, though infrequently.

1.2   The description of the error is as follows:

Following a heading change, the ADS-B data appeared to be extrapolated along the previous heading until it is auto-corrected. A jump in the track would be observed following the correction.
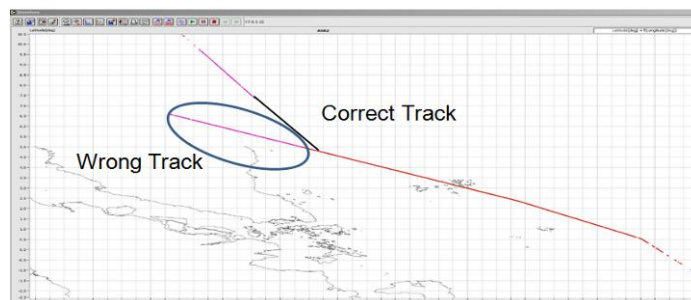

Fig 1: screen capture on a typical B787 position error

1.3   This paper updates the meeting on the approach adopted by Singapore on "black-listing the B787", in view of the B787 position error issue.

2.   **Discussions**

2.1   In view of the infrequent error occurrence , the safety enhancement contributed by ADS-B position reports, and that the blacklisting of all B787 with DO-260A would deprive the entire fleet of ADS-B services, Singapore ATC reviewed whether blacklisting of the entire fleet can be avoided. To do this, Singapore ATC studied the existing safeguards in the Air Traffic Management automation system.

<u>If problem occurs within radar environment</u>

2.2   In the radar environment, the automation system will generate a system track in the background, fusing the ADS-B data with the radar data. If the position deviation of the ADS-B track and the radar track is significant, the automation system will display both the radar and the ADS-B tracks on the screen with alerts of 'duplication' on both tracks. Controllers will hence be alerted (see Fig 2) and will take the appropriate actions.

Fig 2: Automation system displaying DUP alerts

<u>If problem occurs outside radar environment</u>

2.3   When outside radar environment, automation system will perform 'reasonableness' check on the ADS-B reported position by comparing it with the flight plan route. In the event that the reported track deviates from the assigned route, the Route Adherence Monitor alert will be activated and the controllers will take the appropriate actions.
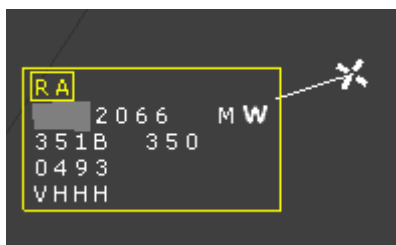

Fig 3: Typical Route Adherence Monitor alert

2.4   So far, there has only been one reported occurrence of such a problem in the Singapore FIR.

<u>Conclusion</u>

2.5   In view that the automation system has built-in safe-guards to alert controllers on the B787 positional error and the other considering factors mentioned in paragraph 2.1, Singapore currently adopted the approach of not blacklisting the entire fleet of B787. The B787 situation will be monitored and the policy will be reviewed as and when necessary.

3.   Action by the meeting

3.1   The meeting is invited to note the approach adopted by Singapore on the B787 positional error issue.

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