



**FANS Interoperability Team Meeting  
(FIT/20)**

**Auckland, New Zealand  
26 – 27 February 2013**

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**Agenda Item 5 – Working Papers**

**ADS-C Status on Airbus Aircraft**

**Presented by Airbus**

**SUMMARY**

The goal of this paper is to make a status on the ADS-C issues and to present the considered improvements for ADS-C reports on Airbus aircraft

**1. INTRODUCTION**

- 1.1 For some years of ADS-C operations, several cases of poor ADS-C behavior have been reported by several ATSU's.

The goal of this paper is thus to make a status on the different ADS-C Problem Reports and to present the considered evolutions to drastically reduce the occurrences of wrong ADS-C reports on board Airbus aircraft.

**2. DISCUSSION**

- 2.1 As evidenced in the following PRs (1116, 1084, 959, 634A, 928, 868, 940, 1079, 1114, 1116), two types of misbehaviors can be noted. ADS-C reports with Invalid Data and ADS-C reports with erroneous time to go.

2.2 ADS-C Invalid Data

Refer to PRs 1116, 1084, 959

The issue of Invalid Data has been reproduced with FMS Honeywell P3. Under some specific conditions the ADS-C reports can be issued with Invalid Data.

Specific tests were carried out to “force” the re-calculations of the FMS predictions which have led to Invalid Data. The invalid reports seen by the FANS ADS-C and/or Ground ATC centers correspond to the time slots where the FMS predictions are re-calculated and are thus not available at the time the ADS-C report is being built up for delivery. Once predictions become available again, valid ADS reports are sent by the FMS to the FANS system.

The following cases give some examples which lead to some quite significant times for FMS re-calculations of predictions and thus to unavailable data at the time the ADS-C report is being built:

- Managed or selected speed modification (or switch from one to another mode of guidance)
- ADR loss (in this case the ADS-C reports will be invalid as long as the ADR are lost)
- Use of DIR TO
- Suppression of a F-PLN discontinuity

The above reported cases were reproduced with HNW FMS but could not be reproduced for Thales FMS in Airbus laboratory

A study has been launched with FMS suppliers to identify whether possible optimisation during re-calculations could be envisaged or not. If this study does not succeed, then the following improvement is currently considered to drastically reduce the occurrences of invalid data:

- 1) For On-Demand contract: upon request reception, to wait for up to 30s to get FMS data before sending the report.
- 2) For Periodic contract: Upon trigger of the periodic, to wait for up to 30s, to get FMS data before sending the report.
- 3) For Event contract: Upon occurrence of the event, to wait for up to 30s, to get FMS data before sending the report.

### 2.3 ADS-C Erroneous Time To Go

Refer to PRs 634A, 928, 868, 940, 1079, 1114, 1116

The problem of ETG in ADS-C happens to be more difficult to reproduce than that of Invalid Data. So far Airbus lacks of appropriate data to investigate on these cases as available traces (if any) are not sufficient.

Numerous tests to try to reproduce these issues on Airbus bench have so far not led to the root cause of the problems.

## 3. ACTION BY THE MEETING

### 3.1 The meeting is invited to:

- a) Note the information and considered proposals as to improvement of ADS-C reports on Airbus aircraft
- b) Make remarks / comments / criticisms as to these proposals