



International Civil Aviation Organization

THE THIRD MEETING OF ADS-B STUDY AND IMPLEMENTATION TASK FORCE (ADS-B TF/3)

Bangkok, Thailand, 23 – 25 March 2005.

Agenda Item 4: Review States' activities on trials and demonstration of ADS-B

ADS-B VALIDATION TRIALS IN FRANCE

(Presented by France)

This information paper presents the ADS-B validation trials performed in France based on an 1090 MHz ES Ground station installed in Toulouse Airport within EUROCONTROL ADS-B validation activities (CRISTAL Toulouse). Validation of ADS-B data is performed using already equipped commercial flights, Airbus flight tests aircraft, Airbus delivery and ferry flights, and vehicle equipped with transponders. This enables data collection, comparison with radar, separation minima assessment study and analysis of Airbus aircraft installation performances.

French DSNA is also involved with EUROCONTROL, ENAV (Italy), AENA (Spain) and HCAA (Greece) in the CRISTAL MED project that will deploy an ADS-B 1090 MHz ES infrastructure for the Mediterranean airspace.

1. ADS-B Validation in Toulouse

- 1.1. The CASCADE program within EUROCONTROL is dealing with the implementation of new data-link applications and also with a subset of ADS-B package 1 applications. Part of CASCADE, a number of validation activities have been launched called CRISTAL.
- 1.2. CRISTAL Toulouse has started with the participation of consortium made of French DSNA, Airbus, Thales ATM and Alticode. It includes the installation of an ADS-B ground station on the airport and validation activities through data collection and analysis.
- 1.3. A 1090 MHz ES ground station, provided by Thales-ATM, has been installed at Toulouse airport by DSNA. It has a good coverage of the airport and of the surrounding airspace. Equipped aircraft are detected with a very good detection quality at 200 Nm at high altitude and sometimes up to 250 Nm. The data are transmitted to DSNA facilities in Toulouse for recording and analysis. They can also be compared with radar data recorded from the test Mode S radar installed in DSNA facilities in Toulouse, but also from operational monopulse secondary radars.
- 1.4. Data collection will be performed using ADS-B data from equipped commercial flights, Airbus flight tests aircraft, Airbus delivery and ferry flights, and vehicle equipped with 1090ES equipment provided by Thales ATM. Data analysis will assess the percentage of equipped aircraft, the performance of ADS-B compared to radar and also will also be compared with Airbus data recorded on board.
- 1.5. The objectives of the data analysis task are:
 - To analyse collected data and identify non compliance to standards,
 - To feed a theoretical study on separation minima using ADS-B for ATC surveillance application.

- To provide a status of certified installations on Airbus aircraft.
 - To define a potential certification roadmap in order to qualify the 1090ES content for Package 1 ground surveillance applications (except ADS-B Aircraft Derived Data for ATC tools).
- 1.6. A final public report will be delivered to Eurocontrol and can be made available to the ADS-B community at the end of 2005.
 - 1.7. For Airbus, this study will complement other current validation activities. The validation activities are essential for the standardisation work performed in RFG (e.g. interoperability, safety and performance of Non Radar Area application). It is also a support for the ADS-B out function certification for the Non Radar Area application on Airbus aircraft
 - 1.8. For French DSNA, this study will also prepare the operational implementation of ADS-B especially in La Réunion Island (Indian Ocean) by gaining confidence in ADS-B data and identifying potential issues.

2. ADS-B in the Mediterranean airspace

- 2.1. CRISTAL MED project aims at deploying an ADS-B infrastructure that supports the validation of the selected ADS-B surveillance applications and is certifiable for operational use (not only R&D).
- 2.2. The geographic scope of the project is the Mediterranean area, and the project shall be conducted in two phases. In the first phase (2005-2007), the geographic scope shall be limited to the following countries: France, Greece, Italy and Spain. Malta and Cyprus are also expected to join this first phase. In a second phase (2007+) more Mediterranean countries will be invited to participate.
- 2.3. A 1090 ES network will be deployed in addition to the existing surveillance infrastructure to support both mixed ADS-B/radar and ADS-B only operations. In the second phase, more 1090 ES ground stations will be deployed to extend coverage to additional airspaces within the Mediterranean.
- 2.4. The operational scope is ground ATC en route, TMA, and airport surface surveillance, and the use of aircraft derived data (restricted to display of Controller Access Parameters). ADS-B will be used to allow radar-like procedures even in areas without radar coverage and currently under procedural control. Both IFR and VFR will be considered.
- 2.5. French DSNA will perform a feasibility study to identify the need for extension of radar coverage in the Mediterranean area. Some terminal areas are not covered by radar at lower flight level and other areas including en route airspace have a single radar coverage. For those areas, a site survey for ADS-B ground station installation will be performed in order to find the best implementation sites taking into account existing radio installation hosting capabilities. It is also envisaged to use or install ADS-B ground stations for airport surface surveillance on some major airport close to the Mediterranean area. This option is linked to the deployment of A-SMGCS on those airports. The ADS-B data could support aircraft identification and vehicle tracking.
- 2.6. A specific effort will be made to converge towards the definition of a standardised ADS-B ground station possibly through the preparation of a EUROCAE Technical Specification for ground stations.

- 2.7. CRISTAL MED shall produce validation reports for use by the CRISTAL MED partners in their certification and implementation planning. The reports shall be provided also to the CASCADE program and ICAO/EUROCAE/RTCA standardisation bodies as appropriate.

3. Conclusion

The Meeting is invited to take note of the information provided in this paper.
