



Position paper

Surveillance Performance and Interoperability Review of Implementing Rule 1207/2011

Towards a proper implementation of ADS-B 09.07.2015

Aviation, by its very nature, crosses borders and oceans and success requires global airborne and ground solutions. Implementing a globally harmonised communication-navigation-surveillance (CNS) infrastructure is essential and specifying these solutions is an immediate priority.

Automatic Dependent Surveillance Broadcast (ADS-B) provides unparalleled traffic information which enables a “cooperative surveillance environment” between pilots and controllers. ADS-B enables the air-to-air and air-to-ground receipt of aircraft position, velocity and other data about the location of the aircraft. Tracking being more accurate, controllers are better able to manage the aircraft at congested airports, resulting in additional gains in capacity whilst pilots are able to spot other movements in the skies. ADS-B is being implemented in key aviation regions around the world.

According to the ATM Master Plan, ADS-B will be one of the key future surveillance technologies to be implemented in Europe with a supporting layer of secondary surveillance¹. In Europe, there is concern, among many operator groups, that the current requirements for ADS-B have not fully addressed the operational needs of all airspace users. Consequently, a technical review of any ADS-B mandate should address the following aspects:

I- Facilitate an expanded implementation of ADS-B

The current European requirements for ADS-B will only include aircraft weighing more than 5.700kg (or flying faster than 250kts). It is recognised that for the benefits of ADS-B equipage to be realised in Europe (including benefits for business, general aviation and RPAS), an airspace-based model could enable broader benefits. However, the airspace in which ADS-B would be deployed must also be based on the benefits it delivers to users, the options for

¹ Provided by Secondary Surveillance Radars (SSR) / Monopulse Secondary Surveillance Radars (MSSR), MSSR Mode S, or Wide Area Multilateration (WAM).

deployment that exist, and the total cost of equipage. It would be unacceptable to force out today's airspace users by pricing them out, with poorly thought-out equipment mandates.

The use of an airspace-based ADS-B mandate, supporting a wider deployment of ADS-B, must acknowledge the needs of all airspace users and therefore consider the following requirements:

- Potential for a phased approach that enables new technical solutions to be proposed, whilst allowing immediate benefits to be realised above specified flight levels or within specific airspace regions.
- In cases where an airspace-based implementation is beneficial to some segments of aviation but not to others, financial incentives should be widely available to address the negative business case of these airspace users at least seven years prior to a mandate date.
- Alternative technologies to 1090MHz Mode S extended squitter must be investigated to address both cost and performance limitations. This should include consideration for modified "B0" equipment, FLARM, UAT or TIS-B, with a focus on interoperability.
- Additional capabilities which provide additional benefits, such as broadcast weather or flight information, should be investigated to make a more solid case for broader equipage. This type of approach would also incentivize ADS-B in equipage across the entire European fleet, accelerating the broader benefits of the overall program.

Expansion of ADS-B requirements (i.e. including <5.700kg), without regard for the issues identified below, will have the potential to cause significant risks to wider system benefits for all users of the airspace. Any expansion of the ADS-B mandate must assure a proper implementation timeframe, which may differ, depending on the airspace (i.e. controlled or uncontrolled) and traffic mix targeted. Considering the scale of European aviation that could be potentially impacted, technical information to develop appropriate solutions must be in place and then appropriate time provided to design, certify and install those solutions, before any new mandate should go into effect. Sufficient time for voluntary equipage must be provided prior to any mandate where the necessary equipage is not operational on the majority of the fleet.

II- Clarify the ANSP obligations

In order to assure ADS-B equipage can achieve all of the potential benefits, a cohesive ground implementation is required. Air navigation service providers (ANSPs) must implement ADS-B by 2018 within the current mandate, to support an expectation that the ground infrastructure must be working and in place before aircraft are required to carry this equipment. It is critically important that in doing this, ADS-B is integrated into the air traffic management process and a uniform and integrated level of ADS-B ground coverage is already in place across Europe.

To assure ANSPs can meet obligations vis-à-vis a uniform and integrated level of ADS-B ground coverage across Europe, it would be appropriate to include a detailed review of implantation as the next steps in the SPI plan are reviewed. This review should also address the surveillance responsibilities and rules depending on use within both controlled and uncontrolled airspace.

III- Further analyse the 1090/1030 spectrum capacity

To assure that ADS-B on the 1090/1030MHz frequency can function properly, especially in the high density air traffic environments found in much of Europe, it will be important to consider the airborne broadcast power levels, the density of transmissions resulting from increased penetration of ADS-B within aviation and any integration of ADS-B ground infrastructure rebroadcasting traffic information; i.e., rebroadcast of UAT onto the 1090 link. The 1090/1030 spectrum currently supports ACAS (TCAS II) and SSR; i.e. Mode S / 1090ES equipped aircraft. ADS-B is an expansion of the message set currently required within 1090ES to also include additional parameters such as aircraft velocity, accuracy and integrity. Cooperative work has been underway to ensure appropriate protections of the link including the 2002 study undertaken with two scenarios (“Los Angeles 2020” and “Core-Europe 2015”). The studies identified spectrum constraints. Similar experiences with spectrum constraints were identified in the Netherlands recently.

Additional work underway by the U.S. FAA in 2008-2011 expanded the study to ensure the viability of the 1090-link through 2035 and identified options to help mitigate congestion on the link and to support those ADS-B IN applications that require specific range. The alternatives identified by the FAA include shifting ACAS to hybrid surveillance, passive WAM (no SSR), and near-term changes such as the removal of “Terra Fix”. Europe should work with the U.S. FAA and avail itself of its experience, work to mitigate congestion on the 1090 link and determine which options are appropriate for the European surveillance environment.

It is critically important that ADS-B not end up in a scenario similar to data link where the selected architecture limits the operational and safety benefits needed from the deployment. The ADS-B implementation must consider all issues related to frequency capacity and any additional issues related to real world implementation of ADS-B in Europe which could cause difficulties if not properly managed.

IV- Clarify the aircraft certification requirements

The existing mandate addresses aircraft equipped with ETSO-C166b (or later acceptable version), which is a similar requirement in other parts of the world.

In light of the need to undertake additional studies for spectrum constraints and consider alternative technologies beyond 1090MHz extended squitter, EASA should be empowered to determine the acceptability of alternative equipment and to issue any deviations that can be permitted within the functional ADS-B system. This should address requirements to ensure maintenance of global interoperability whilst considering the needs of a successful ADS-B solution within European airspace.

The need for new avionics (or alterations) to address future changes in certification requirements should be avoided. For example, with respect to EC IR 1028-2014 it appears that the basis for aircraft certification has changed from AMC 20-24 to CS-ACNS. If correct, the existing aircraft fleet would have to retrofit again to be compliant with these requirements. Clarification is necessary to understand the intent of changes of this type.

V- Conclusions

The European Commission has recently consulted stakeholders to gather views to:

- Assess the current efficiency of the European air transport policy; and,
- Define measures to improve the competitiveness of the sector.

The current EU legislation creates unnecessary hurdles in different ways, due to:

- Its high complexity;
- A lack of global harmonisation and consistency with existing technology and ATM procedures; and,
- A lack of consideration of small and medium stakeholders' specificities.

One size does not fit all and an inclusive and innovative European policy is a prerequisite for a sustainable and competitive air transport in Europe. The review of the SPI regulation provides a perfect opportunity to work towards a globally harmonised CNS infrastructure. The requirements for ADS-B in Europe must fully address the operational needs of all airspace users and consider current regulatory requirements and accept technical means of compliance existing elsewhere in the world.

EBAA, ECOGAS, ERAC, GAMA and IAOPA are committed to supporting the European Commission in this undertaking and EASA if it is enabled to undertake a rulemaking activity which addresses the issues of ADS-B outlined above.