

# EUROCONTROL CASCADE Programme

**A partnership approach to the deployment of ADS-B  
and Wide Area Multilateration (WAM) in Europe**



## New Surveillance techniques

- Automatic Dependent Surveillance-Broadcast (ADS-B) is a surveillance technique that relies on aircraft broadcasting their identity, position and other information derived from on board systems. This signal can be captured for surveillance purposes on the ground (ADS-B Out) or on board other aircraft (ADS-B In). The latter will enable airborne traffic situational awareness (ATSAW), spacing, separation and self-separation applications.
- Wide-area multilateration (WAM) is a surveillance technique that exploits the 1090 MHz transmissions from aircraft. From these signals it can create a track containing parameters such as identity, position, height, etc. Active interrogation is also possible in order to trigger transmission.

## The role of the EUROCONTROL CASCADE Programme

The EUROCONTROL CASCADE Programme (part of the Directorate Network Management), co-ordinates the deployment of initial ADS-B applications and WAM in Europe. The Programme covers both ground Surveillance (i.e. ADS-B Out and WAM) as well as airborne surveillance applications (i.e. ADS-B In/ATSAW). It works actively to ensure global interoperability.

## Partnerships with the stakeholders: Focusing on deployment and benefits

The Programme focuses on deployment delivering benefits to the European ATM Network. It achieves its objectives through strong partnerships with its stakeholders and other international organisations (ANSPs, airspace users, industry, regulators, European Commission, EASA, EUROCAE, SJU, ICAO, FAA, RTCA, Airservices Australia, NAV Canada etc.). These partnerships drive the progress and achievements in all Programme areas: Operations, standardisation, support to certification (with EASA), safety (with regulators and ANSPs), trials (with more than 15 ANSPs in the CRISTAL projects), pioneer airline projects (with more than 20 airlines and 500+ aircraft), ADS-B equipment performance analysis, Cost-Benefit Analysis, support to Rule making (with the European Commission), Implementation Planning etc.

## Contribution to the European ATM Network

The introduction of ADS-B and WAM in the Surveillance infrastructure provides important features which can be exploited by the ATM Network:

- Full “Network-wide” surveillance coverage
  - Surveillance “everywhere”, i.e. no gaps from gate-to-gate
  - Air-to-air surveillance possible, i.e. traffic situational awareness picture available on board
    - The aircraft is integral part of the Network
  - Surveillance data provided directly from on-board systems
- High performance
- Improved safety
- Increased capacity
- Cost-efficiency
  - Reduced cost of the Surveillance infrastructure (ADS-B and WAM are cheaper than radar)
  - More efficient flight profiles (in areas where, previously, surveillance was not cost-effective)
  - Fuel savings etc.
- Environmental sustainability (CO2 reduction)
- Reduced RF pollution (leading to an increased viability of the 1090 MHz datalink)
- Global Interoperability
- Foundation for future SESAR ATC applications (spacing, separation, self-separation)

## European Commission Implementing Rule on Surveillance Performance and Interoperability (SPI IR)

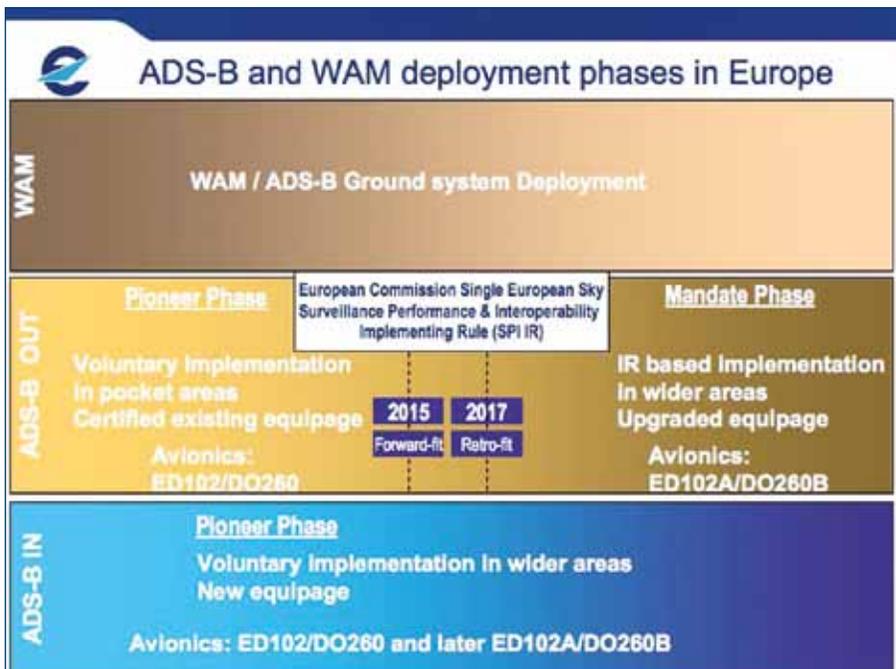
The European Commission Surveillance Performance and Interoperability Implementing Rule (SPI IR) Nr. 1207/2011 which was approved and published in the Official Journal of the European Union in November 2011, includes a mandate for ADS-B Out. It establishes mandatory carriage and operation of ADS-B 1090 MHz Extended Squitter by aircraft weighing more than 5700kg or with a maximum cruising speed of more than 250 kt when flying IFR/GAT in European airspace. The compliance dates are January 2015 for forward-fitting and December 2017 for retrofitting.

This Rule will accelerate both the aircraft ADS-B equipage and the ADS-B ground system deployment.

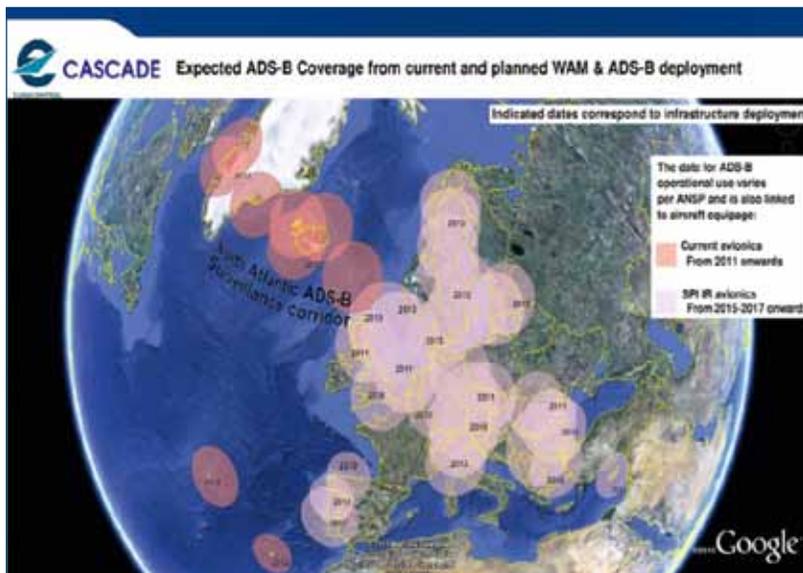
# ADS-B and WAM deployment phases in Europe

The ADS-B and WAM deployment in Europe is ongoing, following three paths:

- Voluntary implementation of ADS-B sole means or with WAM in local Non Radar airspace of Europe (“pocket areas”), using currently existing (certified) equipment (ongoing)
- Deployment of WAM/ADS-B systems in Radar Airspace, in which WAM is used first, followed by the additional use of ADS-B Out. The latter requires enhanced ADS-B avionics and will be driven by the Implementing Rule (SPI IR).
- In parallel, voluntary implementation of Airborne Traffic Situational Awareness (ATSAW) applications in oceanic areas (ongoing).



The deployment of ADS-B and WAM in Europe is progressing. More ANSPs are opting for a combined deployment of WAM and ADS-B demonstrating the complementary characteristics of the two techniques and the strong trend for their integration:



## Airlines installing and certifying ADS-B equipment

More than 1200 aircraft are already certified and operationally approved for ADS-B operations in Non-Radar Airspace. Of these, the certification of more than 500 aircraft (from 18 airlines and of 14 different types) was supported by the CASCADE ADS-B Pioneer airline project.

**Pioneer Airspace User partners for ADS-B Out/ Non-Radar Airspace**

18 Pioneer Operators / 522 Aircraft


**AIRBUS TRANSPORT INTERNATIONAL**

In parallel, the first aircraft with certified avionics, compliant with the European Commission SPI IR, are available already. This process will be accelerated driven by the mandate dates.

Furthermore, EUROCONTROL CASCADE Programme through the ATSAW Pioneer Project partnering with airlines, ANSPs, and industry, is catalysing the operational use of ADS-B to provide an airborne traffic situation picture to the flight crew. Five airlines (with 25 aircraft) are currently equipping with certified ATSAW equipment. ATSAW operations in Europe started in February 2012.

The graphic features the EUROCONTROL logo on the left. The main title is "Pioneer Airspace User partners for ADS-B Out & ADS-B In/ATSAW". Below the title, a box states "5 Pioneer operators – 25 aircraft". A central vertical stack of logos includes: swiss (with "swiss" in white on a red background and "swissair" in red on a white background), DELTA (with the red triangle logo), U.S AIRWAYS (with the American flag), BRITISH AIRWAYS (with the red tail logo), and virgin atlantic (with the red and white logo). To the right of the logos, a box states "First ATSAW operations on 7 February 2012".

## International Outlook

ADS-B and/or WAM are currently being deployed not only in Europe, but also in other regions worldwide (Asia, Australia, Canada, USA).

**For further information:** [www.eurocontrol.int/cascade](http://www.eurocontrol.int/cascade)  
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