

Galileo

*The European Programme for
Global Navigation Services*

Aviation



In the major transport domains, and notably in aeronautical applications, satellite navigation has long been an additional means of localisation. The development of GPS has provided a supplementary positioning service for many flight phases, in leisure flying as well as commercial air transport. Refining and improving satellite navigation

through EGNOS and Galileo will assist pilots in all flight phases, from movement on the ground, to take-off, en-route flying, and landing in all weather conditions, reaching the level of safety that will be required to cope with the continuous increase in the number of flights.

Some examples of practical uses of Galileo

*** Commercial air transport**

Galileo will be used in all the flight phases of commercial aircraft. During en-route flight, the availability of both GPS and Galileo will ensure high robustness through the redundancy and high reliability of the service.

Free flight

In the future, higher accuracy and service integrity will allow aircraft separation to be reduced in congested airspace, to cope with traffic growth. In recent years, scheduled traffic has increased by about 4% per year worldwide. This trend would double the number of flights within 20 years. As a consequence, several intense pressure points and bottlenecks are forming in some areas of the network. There needs to be a significant rise in traffic capacity in the short term. Augmentation of the capacity requires increasingly reliable and accurate positioning systems and associated monitoring – provided by adding Galileo to the existing radio navigation network.

Critical flight phases

The major need of commercial operators during critical flight phases, such as take-off and landing, is to operate in all weather conditions. As a consequence, precision approach is mandatory for a gate-to-gate navigation system. Galileo, with the aid of ground-based

augmentation (local elements), will satisfy the needs for precision approach as defined in the aeronautical standards, and could replace or complement the navigation infrastructure of airports in regions where the system is inadequate. For example, some airports are not equipped with instrument landing systems. Galileo offers many benefits for overall safety and optimisation of schedules and routes. It will also help to increase runway capacity by shortening runway occupancy time. There will be savings in time and fuel, and reductions in noise.

Monitoring and Surveillance

Position, heading, speed and time information are needed by air traffic controllers for the continuous management of all aircraft. Some areas of the world lack the appropriate ground infrastructure, including secondary radar and communication links. For example, in the Canary Islands it is available only intermittently, and the radar service is limited and without backup. The standardised transmission from the aircraft of navigation data obtained via Galileo will lead to advanced systems and techniques for safer air traffic monitoring.

*** Surface movement and guidance control**

Moving an aircraft on the ground requires assistance from the air traffic controllers as precise as that during

flight. The airport may have surface radar, but sometimes the taxi movements are reported manually by the pilots and the aircraft is managed using visual aids only. Severe accidents have occurred during this supposedly safe phase. Galileo – together with its local elements and communication links – will improve the safety of these operations, creating the means for integrated surface movement guidance and control.

*** Leisure**

Galileo and satellite navigation will be available for all kinds of aviation activities, such as ultra-light aircraft, balloons and recreational flights. The integration of position information and communication links opens up a wide range of applications.

*** Helicopters**

The safety-of-life service of Galileo and the EGNOS signal can be used to guide and land Search and Rescue helicopters in bad weather conditions such as low visibility and fog, where helicopter operations were previously not possible. This will significantly improve

Galileo



the availability of medical helicopter services for severe road accidents, which often occur in bad weather conditions. Galileo and EGNOS technology will also lead to more reliable use of helicopters in general for urgent hospitalisations.



Galileo Benefits

By integrating Galileo with other technologies, the Aviation community can benefit from:

- increased safety through an additional independent satellite constellation with no common modes of failure
- a navigation system built to aeronautical safety requirements
- high performance to complement ground infrastructure
- increased safety of navigation in all flight phases
- increased efficiency in flight operations management, improving exploitation of airspace
- safer navigation of rescue helicopters under all weather conditions

How is Galileo different from other systems?

- ✓ Galileo is specifically designed for civil and commercial purposes
- ✓ increased accuracy, service guarantees, certification and liability of the service operator
- ✓ traceability of past performance and operation transparency
- ✓ increased availability of signals in demanding environments

Galileo: The European Satellite Navigation Programme is a joint initiative of the European Commission and the European Space Agency. Galileo will offer positioning and timing services worldwide.



For additional information, please contact the Galileo Joint Undertaking: JU@galileo-pgm.org or visit the websites http://www.europa.eu.int/comm/dgs/energy_transport/galileo/ <http://www.esa.int/navigation/galileo/>