

Galileo

The European Programme for
Global Navigation Services

Maritime



The sea and waterways are the most widely used mode for transporting goods worldwide. A wide variety of vessels moves around the world each day. The efficiency, safety and optimisation of marine transportation are key issues. Galileo will be a fundamental tool for bringing innovation and progress in

navigation and many other marine activities such as fishing, oceanography and oil and gas exploitation. Satellite navigation benefits all maritime applications, including leisure boats, commercial vessels, and unregulated and SOLAS-regulated ships. Each application will take advantage of the new characteristics offered by Galileo: increased accuracy and integrity, certified services and high availability.

Some examples of practical uses of Galileo

*** Navigation**

Galileo will be used in every phase of marine navigation: ocean, coastal, port approach and port manoeuvres, under all weather conditions.

Offshore navigation

The high accuracy and signal availability of a combined Galileo/GPS receiver are ideal for navigation in the open sea. Moreover, the integrity information contained in the Galileo signal adds confidence in the calculated position of a vessel.

For marine navigation regulated by the International Maritime Organisation, Galileo will be an additional means of implementing the regulations on Automatic Identification Systems (AIS) and vessel traffic management systems to increase navigation safety and collision prevention. AIS depends on satellite navigation. For the time being, the only source is GPS. Galileo will improve AIS reliability and thus contribute to increased safety and vessel traceability.

Harbour operations

Approach and manoeuvres in ports are critical operations, particularly under poor weather conditions. Locally-assisted satellite navigation is a fundamental tool for all kinds of harbour operations and precision docking. The increased availability of satellites will improve the economic sustainability of operations with

satellite navigation in an environment where limited sky visibility might be an issue. Local components in the harbour and communication links transmitting the exact position of vessels will encourage innovative and safe automated operations. Galileo's local elements will improve the accuracy and availability of the navigation service to meet the specific needs of harbour operations.

Inland waterways navigation

Satellites provide precise navigation along inland waterways, especially in critical geographical environments or meteorological conditions. This includes navigation on rivers and canals, where the accuracy and integrity of navigation data are essential to automate accurate manoeuvres in the narrow waterways. Galileo will increase the availability of satellite navigation and, through its integrity service, contribute to the reliable and safe use of automated vessel navigation and traffic control.

*** Survey and marine engineering**

Satellite navigation has revolutionised hydrographic surveying. Galileo will further improve the availability and accuracy of the satellite navigation signal, thus allowing surveys without substantial infrastructure. Many other marine engineering activities will benefit from Galileo, like dredging and maintenance of harbours and

waterways, mapping underwater obstacles during hydrographic surveys, pipe and cable laying, and mineral and aggregate extraction. For example, ice-breaking ships in the Arctic could use satellite navigation to adjust their paths in the shipping lines according to ice thickness.

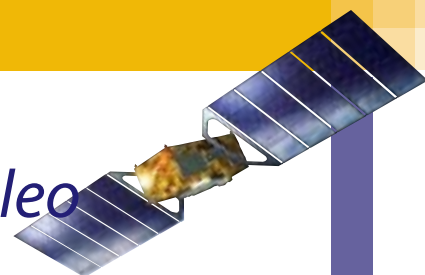
* Science

Galileo will provide a useful tool for science and environmental studies like the observation of tides and currents. The deployment of moving buoys reporting their positions helps scientists to study the oceans and seas, generating information to merge with data from different sources (e.g. Earth observation and remote sensing) in a comprehensive and integrated approach to the study of the environment.

* Search and Rescue

The Galileo system will contribute to the international search and rescue service, enhancing the worldwide performance of the current COSPAR-SARSAT system. The positioning accuracy of today's system is very poor (typically a few kilometres) and the alert is not always issued in real-time. The Galileo SAR service will drastically reduce the time to alert, and the position of the distress beacon will be determined to within a few metres.

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The Galileo SAR service foresees the rescue centre acknowledging the distress message. This will increase victim survivability and reduce the number of false alarms that dog the current system.

* Commercial maritime operations

Commercial maritime activities will be assisted by Galileo. In fishing, it will help to locate traps and nets. Fleet management, cargo monitoring, and delivery and loading schedules will be optimised via Galileo. Even the location of shipping containers can be facilitated, and satellite navigation could be used for automatic piloting of barges. Within harbours, a system for information services tailored to each ship's location is being considered.



Galileo Benefits

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

- a reliable, safe and accurate tool for maritime navigation in any phase
- integrity information for Safety-of-Life
- increased performance with integrated GPS/Galileo receivers
- improved SAR services

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/>