

Galileo

The European Programme for
Global Navigation Services

NAUPLIOS

Improving Safety in Maritime Navigation



Improving the monitoring of
maritime traffic and Search &
Rescue services using Galileo.

* What is NAUPLIOS?

NAUPLIOS is a pilot project under the Growth thematic programme of the 5th Research Framework Programme of the European Union. Together with the Galilei study, it forms part of on-going research work for the Galileo programme. It is managed by the EU Directorate General for Energy and Transport.

The project will demonstrate the added value of the Galileo positioning and SAR services for commercial shipping. It will make use of the EGNOS Test Bed and six vessels equipped with autonomous terminals – an EGNOS receiver, a satellite telecom link and an Automatic Identification System (AIS). NAUPLIOS Control Centres will monitor the results, which will be adapted in a geographical information system and formatted before being transmitted to several kinds of end users.

NAUPLIOS will demonstrate how monitoring and surveillance of European waters can be improved such that risks can be identified at an early stage and measures can be taken to avoid major pollution incidents.

* Objectives

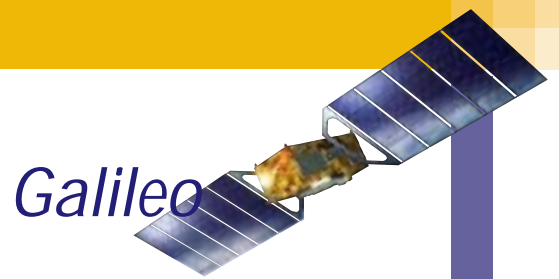
NAUPLIOS aims to:

- demonstrate the added value of the Galileo positioning and SAR services for maritime transportation of goods and hazardous materials;
- evaluate the measures that will have to be prepared at European level to take full advantage of Galileo;
- enhance safe navigation based on earlier identification of ships coming into coastal zones;
- contribute, through a Mission Control Centre simulating the main functions, to the setting-up of a European Maritime Safety agency.

* Applications

Following a number of maritime accidents within the coastal zones of European Union countries, there have been many calls for improved monitoring and surveillance of the transportation of hazardous goods. Incidents involving the *Erika* in France and the *Braer* in the Shetland Islands have highlighted the need for the earliest possible warning of such hazardous cargoes transiting an area. The cost of pollution can have a substantial impact upon many sectors of a country's economy, and the cost of damage to sites of special scientific interest or rare habitats can be beyond measure. The International Maritime Organisation has recognised the need for coastal states to be able to identify vessels within their waters, and has specified the mandatory carriage of a Universal AIS transponder by all SOLAS vessels from 2003. However, AIS information transmitted at VHF would enable a vessel to be tracked only when it is in line-of-sight of a coastal radio base station, and anyway could not guarantee the integrity of the navigation data. Each coastal state is responsible for managing its entire Exclusive Economic Zone, so any early warning facility must provide a similar identification and monitoring capability for the whole Zone.

For maritime applications, Galileo's built-in SAR facilities and Integrity measurement ensures that ship owners, operators and authorities can be confident of receiving reliable information. The use of Galileo for improving monitoring and surveillance of hazardous cargo transportation at sea will ensure that the European system is at the forefront of innovation in the management and protection of the marine and coastal zone environment. NAUPLIOS will demonstrate the benefits that can be achieved through the merging of technologies and the integration of the new facilities offered by Galileo. Overall, it will demonstrate how



monitoring and surveillance of European waters can be improved such that risks can be identified at an early stage and measures can be taken to avoid major pollution incidents.

★ Technical Information

At system level, the main functions of NAUPLIOS are:

- Navigation, which provides navigation information to ships (location, heading). In order to demonstrate the added value of Galileo, the EGNOS signal broadcast by the EGNOS System Test Bed (ESTB) will complement GPS signals to add integrity navigation data;
- Telecom, to exchange navigation data between the ship and the control centre;
- SAR, to represent the Galileo baseline configuration and to experiment and validate the SAR/Galileo operational concept;
- distress forward link, to relay the distress messages from the ships to the rescue centres via Cospar-Sarsat satellites;
- return (or feedback) link, for SAR acknowledgement and coordination message (to inform ships in the distress area). The added value of Galileo is this return link. The return message will be transmitted via the telecommand link and does not necessitate any modification of the ESTB.

★ Schedule

The 2-year project started at the beginning of 2002. It has passed its second milestone by presenting the overall architecture of the demonstrator. The design and specification of the subsystems are now underway. The subsystems will be designed and developed in the next phase, and the demonstrator will be integrated and tested in the first quarter of 2003. The experimentation phase will last until November 2003, followed by evaluation to conclude the project by end-2003.

★ Consortium

The NAUPLIOS consortium comprises leading specialists from all areas of maritime traffic monitoring, control and surveillance, and from the navigation field. The European team of private companies and public institutions encompasses all the expertise required to produce concise value-added results necessary for the European Union to construct an effective framework for maritime policy across all member states:

- the project is led by Centre Nationale d'Etudes Spatiales (CNES, F), which is also responsible for the system architecture;
- surveillance mission and shipping industry requirements are being evaluated by Direction des Affaires Maritimes et des Gens de Mer (DAMGM, F) and INFONAVE;
- the terminals are being designed, manufactured and implemented by SEATEX with input from Collecte Localisation Satellite (CLS, F);
- the NMCC software is being designed and developed by THALES TRACS;
- NMCC surveillance will be monitored by DAMGM in France, the Centre for Technical Maritime Research (CETEMAR) in Spain and CLS for the shipping industry;
- evaluation and recommendation by Netherlands Economic Institute.

NAUPLIOS Coordination

David Levy

david.levy@cnes.fr

European Commission

Directorate General Energy and Transport

tren-galileo@cec.eu.int

How is Galileo different from other systems?

- √ Galileo is specifically designed for civil and commercial purposes
- √ increased accuracy, service guarantees and certification
- √ 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/>