GNSS applications for the maritime navigation

Fabio Riva
Vitrociset Belgium
Maritime transports in the Action Plan on GNSS

- Maritime transport is an important domain in the action plan GNSS – present and future
Action 5
Adoption of EGNOS, then GALILEO, will be sought for maritime transport in cooperation with the International Maritime Organization (IMO), taking into account International Conventions such as the International Convention for the Safety of Life at Sea (SOLAS).

Maritime transport monitoring and surveillance would be greatly improved by EGNOS and GALILEO applications for navigation, including in ports, coastal areas or dangerous shipping lanes like the English Channel. GNSS is also a key tool for new European traffic monitoring systems (LRIT — Long Range Identification and Tracking). Used in mountains and desert areas too, the GALILEO Search and Rescue (SAR) service is being designed specifically for the safety of fishermen and sailors.

By making it easier to track ships, GALILEO can also facilitate customs procedures.

Another application is on inland waterways where GNSS, with its improved accuracy, should be an important source of data for the River Information Services (RIS). For all such safety-critical applications certification is required.
A strategy for maritime transport

• Vitrociset and the partner companies are carrying out many projects (past, present and future) compliant with the GNSS action plan, giving indications on the needs of the sector and on the next action plan too.
Goals & vision in maritime transport

- Commercial applications
- Regulated applications
- Certified equipments
- Certified environment
Experimenting applications

• Project COSMEMOS - Commercial applications
  A cooperative system to gather meteo data and supplying weather routing commercial services

• Project MEDUSE - Regulated applications
  Use of AIS with chipset GALILEO – develops services Pay per Use and Low-enforcement – provide a quality test on EGNOS performance
Certificated services & equipment

• The harbour – as control and regulation centre for the landing of the ships and boats

  A certified area with a GNSS-EGNOS signal available robust, integer, continuous, authenticated.

• Ships and boats - certified equipment for interactive positioning and safety

  All maritime users will be equipped with terminals for collision avoid, meteo warning and other services.
Projects on maritime transport can give:

• indirect economic (including energy consumption) and social benefits

• positive influence on emissions and other types of pollution

• positive influence on the operation of the single market and cross-border trade

• positive influence on the interoperability of applications
Thanks to GNSS good news from the meteorology for maritime navigation.

COSMEMOS

GSA presents a collaborative project, focused on the maritime navigation needs, developing new sensors based on the GNSS signal and new data processing.

The COSMEMOS research project has received funding from the European Union Framework Programme (FP7/2007-2013) under grant agreement n° [287162]
The problem facing us
Meteorological factors influence fuel consumption

- Propelling: 82.66%
- Wind: 6.59%
- Waves: 5.02%
- Current: 2.53%
- Non-optimal trim: 2.21%
- Unknown factors and error margin: 0.38%
- Maneuvering: 0.60%
Weather routing is available only for long leg.
Seas are scarcely covered from meteomarine data.
What COSMEMOS proposes?

1. A **collaborative system** to gather meteo and position data over the seas

2. Two additional sensors based on the GNSS signal: waves and vertical profile

3. Two new **commercial services** for short leg navigation based on an innovative meteo data fusion and modelling
How to gather data from ships underway
A collaborative scheme

GNSS signal
Wave height measurement

Innovative application

COSMEMOS project
Vertical profile of meteo parameters
Dynamic re-routing at Mediterranean scale
Navigation assistance

COSMEMOS project

service #2
COSMEMOS evolution

Ro-Ro

Container carriers

Sails and boats
Other information

www.cosmemos.eu

f.riva@vitrocisethelgium.com