

Galileo

*The European Programme for
Global Navigation Services*

Energy



The design, construction and operation of energy networks for electricity, oil and gas require accurate localisation systems. Galileo offers new possibilities for energy transport and distribution. Transferring the maximum amount of power is a challenge for the electricity-distribution sector. To ensure efficient

operation, grids are continuously monitored by instruments spread around them. When a power line breaks or a weakness appears in the grid, it is vital that these instruments are synchronised. Similarly, in the oil and gas sector, marine seismic exploration will increasingly profit from navigation services to seismic acquisition vessels and the seismic streamer arrays and gun arrays. High-resolution surveys of new sites and identification of any geomorphological or geophysical risks will increase the safety of drilling activities.

Some examples of practical uses of Galileo

*** Network synchronisation for power generation and distribution**

The growing integration of networks for energy distribution and the emphasis on energy savings and efficiency require increasingly precise and accurate synchronisation. Galileo can provide the synchronisation to achieve efficient power flow. For example, measurements of perturbations must be time-tagged with errors of less than 0.001 sec. Moreover, the management of high-power generators, such as large turbo gas and large steam turbines, requires strict timing.

Electrical energy is not easily stored and, in the case of malfunctions, current or voltage surges propagate along the lines. There is a tremendous potential for cost savings through the reliable remote reading of meters. Surges are sometimes large enough to damage line equipment and cause long interruptions in service. For tracing the origin of the problem and deciding on what action to take, time-tagging the individual events is mandatory. With time synchronisation at the microsecond level, the fault can be located to within 300 m – the distance between power line towers.

*** Infrastructure mapping**

Electronic mapping systems can reduce power outage time by about 20% and lead to more efficient operation

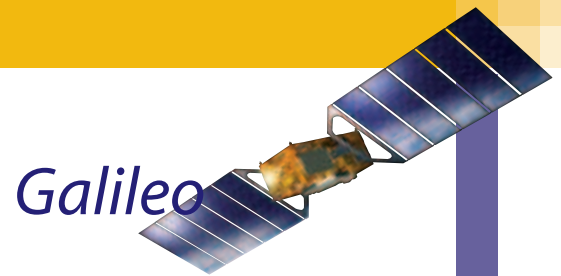
of electrical facilities. The precise locations of utility poles, transformers and even customers can be mapped using Galileo receivers. During power outage or other failures, the critical infrastructure can be identified immediately. With larger outages, maintenance crews can be dispatched to locations that will help the most customers. This kind of system can also be used by water, wastewater and gas facilities.



*** Rig anchoring and marine seismic exploration**

Infrastructure planning, construction and maintenance will rely increasingly on the use of satellite positioning techniques.

As the oil and gas sector moves away from established finds to remote sites where there is little local infrastructure, satellite positioning and communications are of vital importance. Real-time data transmission enables oil companies to make rapid decisions on drilling operations. Reliable information from Galileo may be of paramount importance, especially when a



drilling platform is approaching the target and preparing to lower and anchor the legs. Geographically, this application is global.

Accurate positioning information can be provided during transit and final positioning of tow tugs relative to the rig, and the anchoring of semi-submersibles and other seabed independent drilling rigs. The final position of the drilling facility can be determined, as well as the final orientation of the drilling platform to within 1 deg.

Many techniques in the oil and gas sector can benefit from Galileo. For instance, marine seismic exploration uses a positioning system for the seismic acquisition vessel and the seismic streamer arrays and gun arrays. This will increase the safety of drilling activities, and enable a high-resolution survey of the site and the identification of any geomorphological or geophysical risks. In particular, the positioning of the rig and the anchor-handling vessel will be significantly improved with the use of Galileo, increasing efficiency and security.

Galileo Benefits

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

- improved control of energy infrastructures
- improved power flow
- improved time synchronisation of power-related instruments
- increased safety and efficiency in oil exploration
- improved control of drilling facilities
- timely decision-making thanks to faster positioning information, even in remote areas

How is Galileo different from other systems?

- √ 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