



Dangerous liaisons

The SCUTUM project has been looking at the use of EGNOS to enhance tracking and tracing of dangerous and hazardous goods; interview with project manager Antonella Di Fazio

The trail with eni involved 225 vehicles fitted with an integrated platform featuring a GPS-EGNOS receiver and sensors/peripherals to get positional data and other vehicle parameters

When it comes to the movement by road of dangerous and hazardous goods, there is an on-going appreciation of safety as a priority. This has led to various initiatives, especially amongst oil companies, to reduce risk as far as possible and to look at how transportation enterprises interact with other agencies with an interest in monitoring such movements.

There has already been progress in terms of safety, with a significant reduction in the total number of accidents over the last decade. However, there are also some commercial interests – as a tanker-load of fuel is a high-value ‘target’, there is a significant risk of theft.

What is clear is that the first responsibility for the safe and efficient

movement of dangerous and hazardous goods rests with the transporting companies. However infrastructure managers are also involved in the case of incidents and accidents and institutions (primarily transport and interior ministries) as well due to the relevant social aspects (for which read ‘safety’).

International nature

What is also clear is that dangerous and hazardous goods movements are international in nature and so harmonised legislation (at the European level) enhances safety and efficiency; the requirement of the wide range of operators within the sector are best served through a common set of rules and regulations and through enhancing information exchange over and across the

administrative borders of European Union Member States.

The application of telematics has obvious benefits in this instance, although the international nature of the issue at hand is in many ways a driver of technology choice. In this instance, satellite tracking and tracing has obvious benefits given its ability to provide support over wide geographical areas with minimal terrestrial infrastructure. The SCUTUM (from the Latin for ‘shield’) project, managed by the European GNSS Supervisory Authority through European Union Seventh Framework for Research (FP7) funding, has been looking at the application of EGNOS (the European Geostationary Overlay Service – see Sidebar, ‘European GNSS, EGNOS and Galileo’) to support Hazmat transport. In particular, SCUTUM has concentrated on the benefits generated by the provision of reliable and guaranteed positional information relating to the transport of dangerous goods.

National trial

Trials with eni, the biggest Italian oil, gas and petrochemical company (which also operates internationally), have proven to be very successful says Telespazio’s Antonella Di Fazio, the project coordinator. Italy made especially good sense as an initial test location, she notes, as in that country roads are the primary means of moving goods and road safety is a priority item for the country’s various institutions. It also falls in line with two of the project’s main criteria: to develop a best practice use case in one location and then look to expand cross-border (of which more later).

“All of the major international oil, gas and petrochemical companies have

Information from the various onboard integrated devices is processed and forwarded to eni’s logistic and emergency management centres, one of which is shown here



implemented tracking and tracing on their vehicle fleets which is based on GPS integrated with sensors to provide information on vehicle status," she adds. "There has been a big rise in third-party carriers in this sector and these have also been encouraged to do the same. In the case of the third-party companies there's an additional criterion to safety in the form of quality of service and guaranteed delivery times."

The trail with eni involved 225 vehicles fitted with a Transport Integrated Platform (TIP). The tracking and tracing devices integrate a GPS-EGNOS receiver and sensors/peripherals to get data on the load, door and transport operational status, and vehicle parameters. The devices send time-tagged EGNOS positions combined with the information gathered from the sensors/peripherals to the TIP, which properly processes and forwards them to eni's logistic and emergency management centres.

Overall, the TIP implements various functions, such as the control of transport and monitoring of deliveries, the statistical analysis and incident reporting.

"Galileo doesn't yet exist but EGNOS can be seen to presage the levels of accuracy which it will offer. By comparison with previously existing GPS-only solutions, EGNOS provides higher accuracy and the ability to implement guaranteed positioning plus a protection level that



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gives a degree of confidence in the positional information. That has a lot of perceived value for the oil companies," Di Fazio continues. "Operators and end-users see an X-Y position on a map and a circle of confidence which is around 8-9 m in diameter. They can be sure that their vehicle is within that circle."

Heading to market

Having proven EGNOS's technical performance, the next step has to be to 'export' best practice, not technology, to the market, she continues.

"We expect to move from the R&D stage to commercialisation and operations. Public and commercial interests share a

lot of common interests, and that suggests common solutions. Obstacles in this instance are the awareness and reluctance to take-up of some of the various stakeholders in the sector, especially market champions of technology and tracking solution providers who've invested on GPS technology. That's a sensitive issue which has to be dealt with at the institutional level. Since the trials, eni has declared EGNOS to be its technology of choice. The company has a total fleet of over 1,500 vehicles and major interests in other countries including France, so that's a major step forward for us. Moreover, in Italy the Ministry of Transport is supporting the SCUTUM experience."

Many of the GPS-based tracking and tracing systems already on the market are already EGNOS-enabled, so it is just a matter of enhancing those systems' settings to be able to take advantage of its enhanced capabilities.

"When it comes to roll-out it's important to note that SCUTUM did not involve major changes to existing onboard technologies," Di Fazio says. "We can't go to other companies and ask or expect that they simply change their technology or ignore what is often quite a considerable sunk cost."

"That said, the system tested on the 225 eni vehicles can be considered to be a very sophisticated one for hydrocarbon transport."

"There won't be a 'SCUTUM II' in the most literal sense as the technology has already been proven for this application. However, there will be a follow-on project of sorts which will look at how we can develop a 'leaner' tracking and tracing solution with fewer sensors for less dangerous goods, suitable for the transport of chemical products." ■

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European GNSS, EGNOS and Galileo

EGNOS and Galileo are the two systems implementing the European GNSS (Global Navigation Satellite System) strategy. Galileo is scheduled to be operational in 2014 and will be Europe's own global navigation satellite system, under civilian control. With respect to GPS, currently available for civilian uses but conceived and managed for military purposes, Galileo will provide highly accurate, guaranteed positioning services.

EGNOS is a Satellite-Based Augmentation System (SBAS) that improves the accuracy of

the GPS satellite navigation signals over Europe. Conceived for civil aviation needs, EGNOS has interesting commercial utilisation potential in other markets ahead of Galileo going live.

EGNOS improves GPS position accuracy down to 1m and provides integrity information, making it suitable for applications requiring very accurate and guaranteed positioning. It provides three levels of service. The Open Service, operational since October 2009, is freely available and suitable for most common applications.

The Safety of Life Service is to be certified according to European regulations and will provide a service with the safety levels required by civil aviation operations. The Commercial Service, which has been running as an experimental service since 2008, is to be officially declared operational this year. The EGNOS CS is based on controlled access, with guaranteed delay, security and performance, and enables specific applications for professional markets requiring enhanced performances.

Think Tank event at ITS Europe

On 7 June at Cité Internationale, 50 Quai Charles de Gaulle, Lyon, France the SCUTUM project team is hosting a Think Tank on the use of advanced technologies in support of the transport of dangerous goods. This has been timed to coincide with the ITS Europe 2011 event.

During this one-day event, attendees will have the opportunity to learn about the present initiatives demonstrating the benefits of up-to-date technologies adoption for the management of dangerous goods transport in various transport modes.

The SCUTUM Think Tank will allow a large panel of

stakeholders, including representatives from institutions, users and solution/service providers to present and share their visions and ideas, in the light of their experiences. Those looking for more details of the agenda and how to register should visit the SCUTUM website.