

## Editorial



Welcome to another issue of the EGNOS newsletter - keeping you up to date with EGNOS activities, and giving a glimpse to the future.

In this issue we concentrate on the role for EGNOS in public safety. Public safety is concerned with the mitigation, preparation, response and recovery from either local emergencies or major disasters – with the aim to save lives and return the situation to normal. Many actors are involved, from emergency services to civil protection agencies,

aid organisations and other private and public organisations.

We take a look at how, through a number of trials, EGNOS has been employed for public safety applications and what this might mean for the future.

As an example of the potential for EGNOS to support emergency services, we report on trials carried out in Spain for a simulated forest fire. Showing how EGNOS could save lives by improving the surveillance and management of fire fighters.

As an image of the future, we also report on an ambulance dispatch service planned to be rolled out in France, which will rely on EGNOS to support the efficient and effective management of emergency resources.

Providing accurate maps of fast changing disaster situations is key to providing the right response. We therefore take a look at field trials which

have indicated the potential for GNSS, including EGNOS, in accurately mapping disaster areas.

Finally, we provide a summary of other recent news on EGNOS. We report on how EGNOS is being continually explored for helicopters in the North-Sea, at ports for managing cargo and for road safety and management.

As always, we very much look forward to receiving your comments and any suggestions you have for future issues.

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## Fencing in the Fire

Throughout the years forest fires have struck Europe during the summer causing loss of life and people to be moved from their homes. Forest fires are also very challenging for fire fighters. Fires raging through forests can be very unpredictable, changing direction and in the worst case outflanking and trapping fire fighters.

Trials undertaken in Spain indicate that GNSS, including EGNOS, could help emergency workers to operate safely and avoid dangerous situations, ultimately saving lives.

These trials were undertaken as one of several under the Humanitarian Aid, Emergency Management and Law Enforcement Support Applications (HARMLESS) project which was recently completed.

The demonstration in Spain simulated a forest fire situation. GPS tracking devices capable of receiving the EGNOS signal were attached to the vehicles involved in the trial. Central command was then able to track humans, vehicles and risk alerts in real time, and process

the data using software and equipment provided by the commercial partners involved in the HARMLESS project.

In addition to today's GNSS, the EGNOS augmentation and integrity information can provide key advantages to the tracking and management of resources. Using EGNOS the location of vulnerable resources can be known more accurately and confidently, beneficial in the high risk environment of a forest fire.

The simulated test demonstrated that the use of GPS, EGNOS and Galileo in the future would improve the surveillance and management of those fighting forest fires, and what is more important, increase their safety.

HARMLESS is a European-funded project managed by the European GNSS Supervisory Authority (GSA) and conducted by a consortium integrating GMV, NSL, EADS Astrium, EADS Infoterra, EADS SN, INSA, Next, MapAction, IASL and ACPO.

Ensuring the safety of fire fighters is just one of the many possible applications identified for GNSS, and EGNOS in particular, by HARMLESS. Other interesting possibilities include:

- GNSS support to damage assessment for humanitarian aid;
- GNSS for people tracking, covert surveillance and as legal evidence for law enforcement;
- GNSS to support flood and fire management;
- Resource management for the emergency management community.

Further demonstrations for the use of EGNOS, and in the future Galileo, for public safety and humanitarian aid are to be performed in 2009 and 2010 in the Mature Application of Galileo in Emergency Scenarios (MAGES) project managed by the GSA and conducted by a consortium led by EADS Astrium.

## EGNOS Dispatched to Help



### Man-machine interface for the ambulance dispatch service

available emergency vehicles to the incident that have the appropriate on-board equipment.

The call centre personnel are then able to make an informed decision on what resources should be sent to the incident. Mission instructions are then sent to tablet PCs or PDAs in the vehicle ensuring quick and efficient dispatch.

Once at the scene, the same equipment can then be used by the medical team to send information back to the call centre which automatically finds and queries the nearest hospitals to find the closest hospital with the right resources. Once selected, the address for the hospital is then forwarded back to the ambulance's on-board navigation system.

In routing to the scene and the hospital the ambulance uses its navigation system to take the fastest route, taking account of traffic conditions.

### EGNOS getting the location right

Assigning the right vehicles to incidents relies on acquiring accurate and reliable information on their location. This is where EGNOS is vitally employed for the dispatch service.

EGNOS augmentation and integrity information was judged essential in gaining reliable positions for the vehicles – GPS alone being insufficient. Furthermore, Novacom Services' realised that an accuracy of less than 5 meters was required as at

critical times it is important to know what side of a road a vehicle is on. Especially on roads where turning round is not easy or there are large gaps between junctions.

GPS alone would be insufficient for this task so EGNOS-enabled tracking equipment was deployed on the vehicles to meet the requirements.

Using EGNOS, the Geo Urgence ambulance dispatch service is able to reduce the time to respond to life-and-death emergencies, enabled by the improved accuracy EGNOS can provide. Novacom Chief Operating Officer Marc Leminh says "EGNOS is useful as soon as you want to provide services where better tracking and quality is needed".

The development of the Geo Urgence service was led by France-based Novacom Services along with its partners.



EGNOS-equipped ambulance in Toulouse

Getting the right help quickly at an emergency saves lives. Many people talk about the "golden hour": that critical time after an incident occurs when providing the right aid greatly increases the chances of survival.

Therefore, health services are constantly striving to reduce the response time for ambulances to increase the chance of survival for patients.

Novacom Services' new Geo Urgence EGNOS-enabled ambulance dispatch service helps to ensure that the right help arrives as quickly as possible. Excitingly, with the planned uptake by French ambulance services this provides a promising example of future operational use of EGNOS for emergency services.

### How does Geo Urgence help?

Geo Urgence was created to ensure optimal exploitation of mobile medical resources by health services. Using the system, the emergency service call centre personnel are able to locate the closest

## Mapping Disaster Areas



USAR teams engaged in a disaster relief simulation

team ran several simulated urban search and rescue (USAR) activities over a 48-hour period. They worked in a derelict factory complex, representing a built up area hit by a disaster.

The urban setting was prepared to allow various typical USAR tasks to be practised. The area was searched by the team and subsequently removing simulated casualties from a variety of locations.

During the operations EGNOS-enabled GPS equipment was used to record the location of features and conduct GNSS surveys, plot paths, enabling a map of the area to be assembled by systems at the management centre.

The survey and mapping activities, conducted in realistic field exercises working with USAR teams, yielded outcomes that demonstrate the current and potential uses of GNSS in varying damage assessment tasks, ranging in scale from specific structures to broader urban areas.

The trials demonstrated the high utility of GNSS in humanitarian damage assessment situations through a range of navigation, operational control and worksite-level tasks. Through the use of current and future GNSS, including EGNOS (where available), rescue teams can be increasingly provided with accurate maps enabling them to work effectively and safety in disaster-hit areas. In particular, increased positional accuracy will provide benefits for several tasks.

Providing accurate maps of fast changing disaster situations is key to coordinating humanitarian aid and emergency response.

Tests undertaken late last year, the first phase conducted in the UK, demonstrated current and future GNSS could be used to enhance the ability to map an area hit by a disaster, such as an earthquake or flood. In the aftermath of such major disasters, the landscape can be transformed and previous maps unusable.

The trial was conducted by MapAction, a Non-Government Organisation (NGO) under the HARMLESS project. The first exercise was undertaken in partnership with the search and rescue organisation SARAID. The SARAID

For example, in setting the boundaries between search areas reducing the chance that a search area is missed.



Collecting GNSS survey information in a disaster scenario

Other work conducted under HARMLESS in early 2008 demonstrated the further potential for GNSS in major disasters. The test in France and other simulations, integrating equipment from EADS Astrium, EADS Secure Networks, and GMV, were used to determine how GNSS could be used to manage emergency responses to flooding in the South of France, and to identify where EGNOS or Galileo would add value.

## EGNOS News Reel

In addition to EGNOS applications for public safety, we take a look at a selection of other ways that EGNOS is being continually explored. We report how EGNOS is being demonstrated for helicopters in the North-Sea, at ports for managing cargo and for road safety and management.

### North Sea helicopter trials

Recent trials undertaken in Aberdeen, UK have started the assessment for the viability of EGNOS to support helicopter approaches in the North Sea – such as to off-shore oil rigs. There are 300 such helidecks in the UK sector alone.



CHC Scotia Super Puma G-PUME used for the flight trials

Currently the only equipment available for conducting low visibility operations to offshore platforms is an aircraft's weather radar. This is neither designed nor certified for the task. Furthermore the bad weather conditions and plethora of obstacles and hazards makes these approaches very stressful for pilots.

A review of helicopter accidents – 94 lives lost since 1976 - identified the need for an accurate and reliable instrument approach aid for conducting offshore approaches - EGNOS presents a potential solution.

These trials aim to determine if EGNOS can support approaches in northern latitudes, particularly considering the obstruction of EGNOS signals which can occur due the helicopter structure – known as masking. The trials obtained metrics on the visibility of the EGNOS geostationary satellites at northern latitudes where the approach procedure would be expected to be implemented.

A flight trial to collect data was undertaken from Aberdeen Airport in September 2008 using a Eurocopter Super Puma AS.322L aircraft. The sortie aimed to collect general visibility data during routine flight manoeuvring as well as during simulated approaches.

The flight trials demonstrated the reception of all of the EGNOS Geostationary satellite signals at Aberdeen. However, when airborne and undertaking dynamic manoeuvres there was evidence of obscuration of satellites due to the airframe.

Further trials will assess further if EGNOS can fulfil its potential to support helicopter approaches in northern latitudes, ultimately defining future EGNOS-enabling approaches and validating them through pilot simulations and safety analysis.

GIANT is a 6th FP project coordinated by INECO, managed by the GSA and supported by EUROCONTROL acting as technical manager. The most recent trials have been undertaken by GIANT member Helios.

### Tracking shipping containers at the Port of Antwerp

Have you ever lost something by putting it in the wrong place? It's a common problem at the world's largest ports, and a problem EGNOS has helped to solve.

Belgium-based Septentrio Satellite Navigation has developed an EGNOS-enabled receiver used to help track and manage shipping containers at the Port of Antwerp. The Port of Antwerp handled almost 7.2 million containers in 2006. Handling these large amounts of containers requires a complex organization to avoid losing or misrouting containers.

However, as the loading systems are operated by human operators there is always the risk of human error. Working under constant time pressure, they sometimes pick up the wrong container or drop it at a wrong location on the yard, thereby becoming 'lost'.

The new receiver can be used to log the pick-up and drop location of each container allowing loading mistakes to be detected and corrected quickly. They are capable of an accuracy of 1.2 meters to 2 cm depending on the technique used. Simple GPS on its own cannot provide the required accuracy. To be able to provide the required accuracy, 99.9% of the time, Septentrio decided to use information from EGNOS.

Using the EGNOS-enabled receivers the number of 'lost' containers has greatly reduced. It has led to an increased performance of the container yard, reducing throughput cost and time, whilst increasing safety as no one needs to go looking for the 'lost' containers.



Port of Antwerp container handling helped by EGNOS-enabled receivers

### EGNOS road safety

The final workshop for a major GNSS project – ARMAS, was completed in September 2008. The overall goal of the Active Road Management Assisted by Satellite (ARMAS) project was to demonstrate the benefits and advantages of GNSS technology in general, and of Galileo and EGNOS in particular for:

- Improving safety;
- Increasing dynamic traffic management capabilities;
- Providing electronic free collection mechanisms.

Ultimately ARMAS developed prototype GNSS on-board units and in-car systems to support low cost solutions to enabling a range of applications and services.

ARMAS found that including EGNOS resulted in the following benefits:

- Improved Accuracy: EGNOS provides corrections that increase the accuracy of the resulting position;
- Area Coverage: EGNOS provides a single and seamless service over Europe (contrary to other augmentation systems).
- Availability and Integrity: System availability and integrity is a key issue. EGNOS ensures that the most stringent accuracy and integrity performances are available for most of the time.

In one demonstration to test the benefits from EGNOS, the ARMAS consortium equipped a vehicle with an on-board unit and performed routes through urban and rural environments. Relevant improvements were found when the EGNOS corrections were "added" to the "raw GPS" signals. The average position error reduced by 25% in a dense urban environment when EGNOS was used in addition to GPS. During this trial and throughout ARMAS the added benefit of EGNOS was repeatedly demonstrated for road safety and efficiency.

The project has been undertaken by ESA and the ARMAS consortium, lead by Skysoft Portugal and included Mapflow, Logica, GMV, Euro Telematik as partners, plus a plethora of end users from Portugal, Ireland and The Netherlands.

## Forthcoming Events

European Space Agency (ESA)  
NAVITEC 2008,  
10-12 December, 2008  
<http://www.congrex.nl/08c19/>

Institute Of Navigation International Technical Meeting (ION ITM),  
Anaheim, California,  
26-28 January, 2009  
<http://www.ion.org/meetings/>

Munich Satellite Navigation Summit,  
Munich, Germany,  
03-05 March, 2009  
<http://www.munich-satellite-navigation-summit.org/>

International Conference on Integrated Navigation Systems (ICINS),  
St. Petersburg, Russia,  
25-27 May, 2009  
[ICINS@eprub.ru](mailto:ICINS@eprub.ru)

JSDE/ION Joint Navigation Conference (JNC)  
Orlando, Florida,  
2-4 June, 2009  
<http://www.ion.org/meetings/>

European Navigation Conference (ENC-GNSS 2009),  
Naples, Italy,  
3-6 May, 2009  
<http://www.enc-gnss09.it/>

Institute Of Navigation GNSS (ION GNSS)  
Savannah, Georgia,  
22-25 September, 2009  
<http://www.ion.org/meetings/>

International Global Navigation Satellite Systems Society (IGNSS),  
Queensland, Australia,  
01-03 December, 2009.  
<http://www.ignss.org/?D=5>

## Links and Contacts

ESA Navigation Web Page:  
<http://www.esa.int/navigation>

ESA EGNOS Web Page:  
<http://www.esa.int/EGNOS>

ESA EGNOS for Professionals Web Page:  
<http://www.esa.int/navigation/egnos-pro>

ESA EGNOS Real Time Performance Web Page:  
<http://www.esa.int/navigation/egnos-perfo>

ESA EGNOS Help Desk:  
[Egnos@esa.int](mailto:Egnos@esa.int)

EGNOS News:  
[EGNOS-News@esa.int](mailto:EGNOS-News@esa.int)

EGNOS Operations User Support:  
<http://www.asqf-gnss.com>

ESA Galileo Web Page:  
<http://www.esa.int/Galileo>

ESA Artemis Web Page:  
<http://www.esa.int/artemislaunch>

EC Galileo Web Page:  
[http://ec.europa.eu/dgs/energy\\_transport/galileo/index\\_en.htm](http://ec.europa.eu/dgs/energy_transport/galileo/index_en.htm)

European Satellite Services Provider:  
<http://www.essp.be>

FAA GPS Product Team:  
<http://gps.faa.gov>

USCG Navigation Center GPS Page:  
<http://www.navcen.uscg.gov/gps/default.htm>

GNSS Supervisory Authority:  
<http://www.gsa.europa.eu/>

## Help Us To Help You

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The Editorial Team welcomes your comments, inputs and suggestions for the next issue. Please send emails to [EGNOS-News@esa.int](mailto:EGNOS-News@esa.int).

## Disclaimer

The EGNOS system Signal in Space (SIS) is already available. The SIS is planned to be certified for safety critical usage in aviation by end of 2009. The EGNOS SIS (irrespective of either MT 0 or MT 0/2 is transmitted) is currently provided without any warranties regarding availability, continuity, accuracy, and reliability. The EGNOS SIS is provided on an "as is" and "as available" basis. Until further notice, messages associated with the EGNOS SIS are not certified for Civil Aviation or other safety critical purposes.

The use of the EGNOS SIS is therefore at the user's own risk. ESA expressly disclaims all warranties of any kind (whether express or implied), including, but not limited to

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### Note for Civil Aviation

The Certification process of the EGNOS SIS for Civil Aviation use is still under development. Until further notice, the EGNOS SIS is broadcasting a Type 0 or the equivalent Type 0/2 ("Do not Use") message as specified in ICAO SARPS. Despite the fact that the use of certified receivers by civil aviation users will automatically prevent the use of the EGNOS SIS as it is today, it is reminded here that **Civil Aviation Users should not use the EGNOS SIS for safety critical purposes before full EGNOS certification process is completed and that users should consult the relevant ICAO SARPS.**