

E-NEWS n°2 - January 2011

In this issue:

- 1 - EGNO how does it works**
- 2 - EGNOS governance and How to use it**
- 3 - EGNOS Data Access Service**
- 4 - Galileo FP7 2nd call projects**
- 5- Second ESESA workshops approaching**

Disclaimer

This E-News is published by the ESESA project whose aim is to support European and South African authorities to implement EGNOS Services in Southern Africa (SADC).

ESESA is a Collaborative Project co-funded by the European GNSS Supervisory Authority under the 7th Framework Programme and the Government of South Africa.

The views expressed in this E-News are those of the authors and do not necessarily represent those of the GSA or the European Commission.

All photos credits courtesy of EC, ESA and GSA





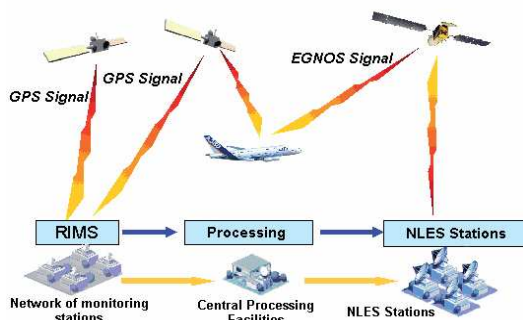
How does it works

EGNOS service provision requires the following steps:

- Step 1 : Collection of measurements and data from the GPS satellites.
- Step 2 : Calculation of differential corrections, estimation of residual errors and generation of EGNOS messages.
- Step 3 : Transmission of EGNOS messages to users via the geostationary satellites.

A data integrity verification process is conducted in parallel with these steps.

EGNOS infrastructure



EGNOS, like GPS, consists of three segments: a space segment, which comprises the payloads of the three geostationary satellites, a ground segment, which is composed of the terrestrial infrastructure, and a user segment, made up of all the receivers.

The operational components are all interconnected via the EGNOS Wide Area Network (EWAN) and are designed to transmit data in near real time.

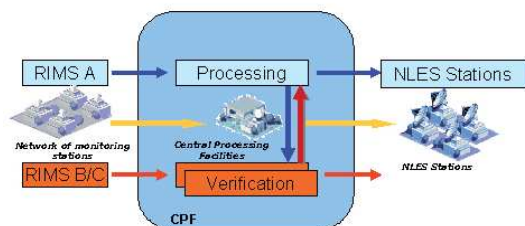
Step 1: RIMS network

To ensure optimum, continuous gathering and observing of measurements and data from the various visible GPS satellites and of ionospheric variations, a network of observing stations called Ranging and Integrity Monitoring Stations (RIMS) was set up, in Europe, but also in Canada, French Guiana and South Africa to improve orbit determination performance.

Main EGNOS sites



CPFS processing



Step 2 : Corrections Calculation

Data gathered by the RIMS are processed by the Central Processing Facilities (CPFs), which estimate the differential corrections and integrity information and generate the EGNOS messages.

Step 3 :Transmitting EGNOS messages to Users

EGNOS messages received by the three geostationary satellites through the 6 Navigation Land Earth Stations (NLES) are transmitted directly to users.





EGNOS governance and how to use it

Governance

The European Commission took over ownership of EGNOS' infrastructure from the European Space Agency on behalf of the European Union on 1 April 2009. EGNOS and Galileo, the future global navigation satellite system, are now part of Europe's GNSS programmes managed by the European Commission.

The development of EGNOS arose from a tripartite agreement between the European Space Agency (ESA), the European Commission (EC) and Eurocontrol, the European Organisation for the Safety of Air Navigation.

EGNOS was developed by the EGNOS Operator and Infrastructure Group (EOIG) with the support of the European Commission (EC), the European Space Agency (ESA) and Eurocontrol.

ESA had overall responsibility for the design and development of the EGNOS system. It placed a contract with a consortium lead by Thales Alenia Space of France to develop the system, which has been formally delivered.

The European Commission has assigned the operational management, the service provision and maintenance of EGNOS to the European Satellite Services Provider (ESSP), a company founded in 2001 by seven air European air navigation service providers:

- AENA (Spain)
- DFS (Germany)
- DSNA (France)
- ENAV (Italy)
- NATS (UK)
- NAV (Portugal)
- Skyguide (Switzerland)



How to use EGNOS

To benefit from the advantages provided by EGNOS, users need simply use an EGNOS-compatible GPS receiver. Thanks to the broadcasting of signals that are compatible and interoperable with GPS signals (with frequency and modulation identical to GPS), these receivers differ very

little from standard GPS receivers and do not require a communications connection to reference stations.

Access to the EGNOS signal is, like the civil GPS signal, free of charge. Most commercially available receivers for professionals and the general public use the EGNOS signal.

It is also possible to access EGNOS messages by means of other distribution channels available on the internet such as SISNeT and EDAS.

EGNOS Useful links

<http://egnos-portal.gsa.europa.eu/>

<http://www.gsa.europa.eu/go/egnos/edas>

http://ec.europa.eu/enterprise/policies/satnav/galileo/index_en.htm

<http://www.essp-sas.eu/>

<http://www.esa.int/esaNA/egnos.html>



EDAS the EGNOS Data Access Service

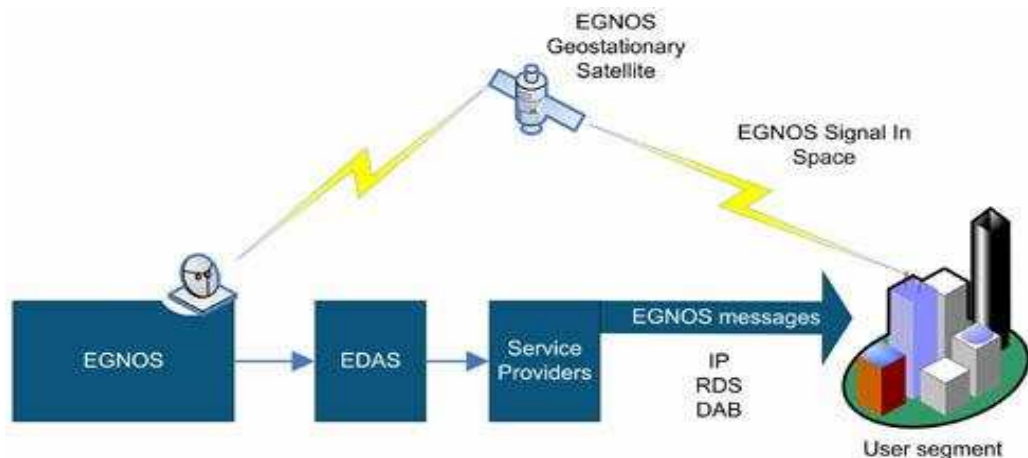


EGNOS is now providing a terrestrial commercial data service called EDAS (EGNOS Data Access Service) which offers ground-based access to EGNOS data. EDAS therefore provides the opportunity for service providers to deliver EGNOS data to users who cannot always view the EGNOS satellites (such as in urban canyons) or to support a variety of other value added services, applications and research programs.

EDAS is the single point of access for the data collected and generated by the EGNOS infrastructure which is composed of ground stations (currently 34) distributed over Europe and Africa. The main types of data provided by EDAS are:

- Raw GPS, GLONASS and EGNOS GEO observations and navigation data collected by the entire network of Ranging and Integrity Monitoring Stations (RIMS) and Navigation Land Earth Stations (NLES)
- EGNOS augmentation messages, as normally received by users via the EGNOS Geostationary satellites

In addition, EDAS provides the Antenna Phase Centre Coordinates, which is a list of the geographical coordinates of all RIMS station



EDAS advantages

- Reliability and assurance: EGNOS will be a certified Safety-of-Life system requiring a highly reliable and resilient infrastructure. This infrastructure is the basis for EDAS
- Data delivery: EGNOS data is provided in real-time through a standard internet connection or direct fixed-line
- Data content: EDAS not only provides EGNOS broadcast data, but also Ranging and Integrity Monitoring Stations (RIMS) raw data and satellite status messages
- European and North African coverage: EDAS data is sourced from the 34 EGNOS RIMS generating unique Global Navigation Satellite System (GNSS) datasets from Europe and North Africa
- Commercial contracts: in the future, EDAS can be provided to service providers on a long-term basis with reliable performance levels.



Galileo FP7 2nd call projects

The 7th Framework Programme for research and development is the European's Union's main instrument for funding research in Europe in the period 2007-2013. FP7 provided support to R&D and innovation on GNSS, to accelerate the European market for satellite navigation applications creating opportunities for European industry. Within its second FP7 call launched in December 2008 has funded numerous EGNOS related projects highlighting the potential interest of EGNOS for the Community.

<http://www.gsa.europa.eu/go/randdxv-2/project-portofolio/>



PUMA project will develop a prototype of GNSS/EGNOS GSM tracking module that can interpret the wheel speed data from the car diagnostic system in order to provide anti-jamming and anti-spoofing functionality.

<http://www.project-puma.eu>

SCUTUM aimed at a wide adoption of Satellite Navigation EGNOS/ Galileo based technology and services for the safe hazardous goods transport management. SCUTUM pursues a concrete path for the adoption of the EGNOS capabilities for the transport of dangerous goods via road.

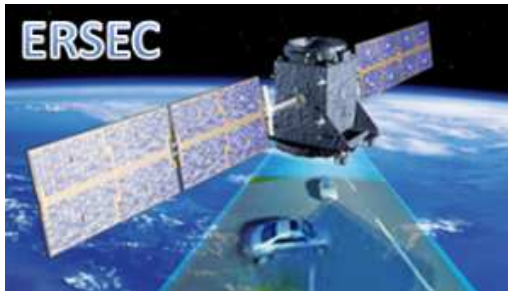
Because of its enhanced stability and accuracy, ENI, a leading Italian oil company, operating at international level, is using EGNOS (European Geostationary Navigation Overlay Service) to monitor its fleet transporting hydrocarbon in Italy. More than 400 hundred vehicles are presently equipped with EGNOS tracking & tracing on-board units.

Based on the eni experience in Italy, SCUTUM implements a best practice programme performing EGNOS large-scale trials in Europe. The eni/ Italian system is enhanced and extended on a cross-border basis towards a wider adoption of EGNOS in neighbouring countries Austria and France, for further exploitation in other Member States and other freight types.

<http://www.scutumgnss.eu>



ERSEC project is concerned with the broadening of the scope of application to road transport of EGNOS/GNSS through an appropriate integration and data . More specifically, the S&T objective of the project is to develop a measuring system - to be used on board of vehicles - able to output the position on the road map of the equipped vehicle and of all the obstacles (such as other vehicles, peoples and any kind of fixed or mobile objects) around it with a measurement accuracy of the order of 0.1 metre at a sampling rate of 100 Hz.



The proposed approach is based on an intelligent data fusion of the EGNOS/GNSS sensor positioning measurement, the Road-GIS digital local

map data and the measurement data obtained from an instrument set installed on board of the vehicle, including vehicle dynamic sensors and environmental sensors.

<http://www.ersecproject.eu>

2nd ESESA workshop March 2nd and 3rd 2011 Cape Town.

After the success of the first workshop on general, business and regional aviation that took place the 11th and 16th October 2010 in South Africa, ESESA is now launching its second workshop dedicated to Road, Maritime, Rail, Surveying and precision agriculture applications.

This event that will gather actors of the service chain (regulators, service providers, end users and industry) will constitute one of the key points to validate ESESA findings, to improve the frameworks schemes and to provide sound information on EGNOS and Galileo.

Workshop Programme :

- EGNOS tutorials,
- Status of EGNOS programme and of EDAS service,
- EGNOS applications in
 - Road
 - Precision agriculture
 - Rail
 - Maritime

More information on this workshops (detailed programme, location, registration etc.) will be regularly available on the ESESA web site and in the next release of the ESESA Newsletter.

**Further information to come on
<http://www.esesa.org>**