EGNOS BULLETIN

EGNOS, it's there. Use it.

ESSP

Issue 13. Q4 2014

IN THIS ISSUE:

New Service Definition Documents available:

- EGNOS Safety of Life Service SDD v2.1
- EGNOS Open Service SDD v2.1
- EDAS Service SDD v2.1

European Global Navigation Satellite Systems Agency

Precise navigation, powered by Europe

EGNOS Service Provision Workshop

Around 170 participants, more than 26 countries represented, two full days of Presentations… the 2014 EGNOS Service Provision Workshop has been once again a success this year, being held in Lisbon last 7-8 October.

Opening speeches from the European GNSS Agency (GSA), ESSP, European Commission and Nav Portugal (as hosting country) welcomed the Workshop attendees.

Day 1 was devoted to explain the latest updates in EGNOS services & markets, and the actual situation of the EGNOS market. The afternoon was lighten up by various presentations regarding successful EGNOS implementation stories in Aviation, debriefed by Skyguide, DSNA, Aviation Southwest and VLM. Another presentation from the US Federal Aviation Administration (FAA) was particularly appreciated by the participants. And to end the day, CMC Electronics and an Airbus test flight pilot gave a practical symposium on SBAS avionics.
The first day session was closed awarding four European ANSPs that have recently signed an EGNOS Working Agreement (EWA) with ESSP: Cambridge Airport; Wolverhampton Green Airport; ROMATSA and LPS SR.

Another highlight of the day was the signature of a Cooperation Agreement between ESSP and ASECNA, the Agency for Aerial Navigation Safety in Africa and Madagascar.

Other applications of EGNOS out of the Aviation world were the main subject for the second day, mainly in regards to EGNOS land and maritime applications: there were presentations from UNIFE, Telespazio, RSOE, TOPCON and the General Lighthouse Authority of the UK & Ireland. The EDAS service for added value applications was also a main theme of the day. Previous to these presentations, the GSA and ESSP explained in deep the actual status of EGNOS markets, and the actions that taken for further EGNOS adoption in multimodal domains.

Cover page photograph *Barcelona's Port heliport (Barcelona, Spain) . Courtesy of Cathelicopters & Pildo Labs*

Agusta Westland certified deliveries

Agusta Westland, the Italian rotorcraft manufacturer, has delivered more than 250 units of their new AW 109 SP and AW139 models in Europe which are certified for the use of EGNOS. Actually, the AW 109 SP (GrandNew) was the first helicopter to obtain in February 2012 the EASA certification to conduct RNP APCH operations with vertical guidance. New models currently in development such as the AW169 and AW189 will be also certified for that.

AW 109 SP

Credits: Agusta Westland

AW139

Credits: Agusta Westland

1st LPV in Sweden at Gothenburg-City

On the 18th of September 2014, the first Swedish approach procedure to LPV minima became operational in Goteborg-City Airport. Actually, it was two of them, one to runway end 01 and one to runway end 19.

The ten-month project was managed by LFV, who is providing Air Traffic in that airport. It covered the procedure design, safety assessment, flight validation, ATS training and publication. The initiative received support from the European GNSS Agency (GSA) under the Pilot LPV Implementation Program which is also covering the publication of a third LPV in Storuman airport (RWY15) scheduled for 11th of December 2014.

These publications have raised the interest on EGNOS from other Swedish airports. Halmstad (RWY01) will most likely be the next LPV to be published in 2015 and LFV is currently under discussions with other airports too. In addition, ACR, another Swedish ANSP, has entered into partnership with the Swiss ANSP Skyguide for the publication of LPVs at various other Swedish airports.

Under a separate initiative, the GSA is also supporting the publication of two more LPVs in Ljungbyhed (RWY11R and RWY29L) and Trollhattan-Vanersborgs (RWY 15 and RWY 33) which are expected by summer 2015. In addition, one local flight school will receive support to retrofit a Diamond DA40 aircraft with EGNOS.

ENAC Retrofitting campaign

ENAC, the French National Civil Aviation School, has retrofitted 29 TB20 aircraft of their 37 in fleet with SBAS avionics and is planning to retrofit the remaining ones during 2015.

The STC was designed by Daher Socata and it includes the installation of a G500 receiver.

Credits: ENAC

WAAS benefits for aviation, by FAA

The FAA is the operator of WAAS (counterpart of EGNOS in the USA), which was commissioned for civil aviation service more than 11 years ago. In this article, Bill Wanner, Navigation Systems Manager, kindly reviews the role of WAAS during these years, which is a reference for EGNOS.

The Federal Aviation Administration (FAA) commissioned the Wide Area Augmentation System (WAAS) as a safety of life air navigation service on July 10, 2003. The agency has continually improved the system in the years since then. These system improvements have increased the WAAS service area, availability, and reliability. Each development kept the WAAS aviation users in mind so they would have the most reliable and accurate service available.

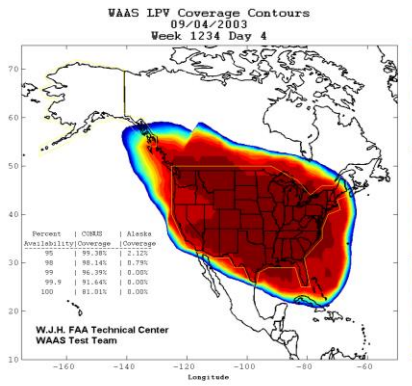
WAAS provides consistent service to users throughout the service area for all phases of flight. The system delivers an accurate position solution, typically one to two meters, no matter where the user is in the WAAS service area. This accuracy is a significant improvement over the typical accuracy obtained using GPS alone. WAAS also provides timely integrity for the GPS signal. If a GPS satellite unexpectedly provides erroneous signals, the WAAS will detect this failure and mark that satellite as "not usable" within six seconds. The WAAS also provides integrity parameters that ensure that WAAS accuracy is within integrity bounds. With very high probability, the user is assured the information WAAS is transmitting will result in a safe and accurate position.

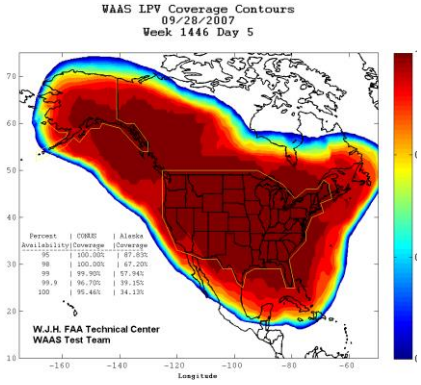
WAAS offers many benefits in approach operations. GPS alone does not meet the aviation requirements for availability, accuracy, and integrity for different phases of flight, such as final approach. WAAS allows pilots to use satellite navigation to perform a precision approach down to a 200-foot decision height with a one-half mile visibility.

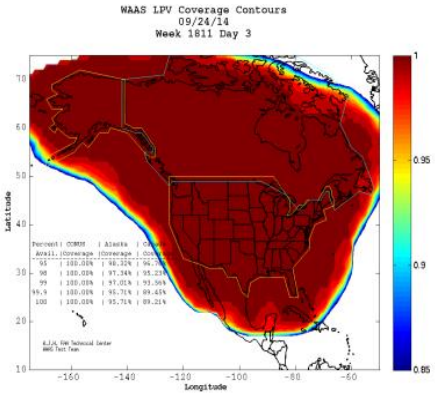
> "LPV approaches are vey similar to ILS approaches , from the pilot's perspective"

WAAS has opened up thousands of runways to aviators who previously did not have access to a precision approach capability. The FAA has published 3,498 Localizer Performance with Vertical guidance (LPV) approaches, 2,321 to runways with no ILS capability, by November 13, 2014. LPV approaches are very similar to ILS approaches, from the pilot's perspective.

The figures below show the evolution of WAAS service. The dark red color in each picture shows where WAAS LPV is available 100% of the time. Outside that dark red color, the WAAS availability reduces until the color is blue. The blue color indicates where the WAAS LPV service is available 85% of the time. WAAS LPV service is available less than 85% of the time in the white area of the pictures. The picture on the left shows WAAS LPV service coverage on September 4, 2003. The picture in the center shows WAAS LPV service coverage on September 28, 2007. This is the performance after new reference stations in Alaska, Canada, and Mexico were added to WAAS.







WAAS benefits for aviation, by FAA

The picture on the right shows WAAS LPV service coverage on September 24, 2014. It clearly shows that LPV service is available 100% of the time in a large portion of North America. The current level of service compared to previous service is attributable to several system changes that increased the robustness of WAAS.

WAAS enables the FAA to reduce operations costs by decommissioning ground-based navigational aids. For example, the FAA is moving from a VOR-based route structure to a Performance Based Navigation (PBN) route structure. Aircraft can fly direct routes instead of the VOR defined routes. The new routes that WAAS enables are called 'T' and 'Q' routes. T routes are low altitude Area Navigation (RNAV) routes (less than 18,000 feet) and Q routes are RNAV routes at higher altitudes (18,000 – 45,000 feet). These routes also can be flown using GPS without being augmented by WAAS. Also, the number of operational VORs in the NAS can be reduced. The FAA is now developing the plan to reduce the number of VOR transmitters in the United States, as well as the number of Instrument Landing Systems (ILS).

"WAAS enables the FAA to reduce operations costs by decommissioning ground-based navigational aids"

The FAA's policy calls for any new Category I precision approach to be an LPV approach.
Aviation use of WAAS continues to grow. More than 100,000 aviation-certified WAAS receivers have been sold, as of September 30, 2014. The FAA estimates that nearly 80,000 aircraft are equipped with the WAAS-LPV capability. FAA analysis also shows an increase in the number of approaches during instrument meteorological conditions (IMC), and those increases are being attributed to the substantial number of LPV approaches available. Many LPV approaches are published to runway ends that do not have an existing ILS, yet even the runways with an ILS offer greater access and flexibility to pilots who fly LPV using WAAS. For example, a runway with ILS and LPV instrument approach procedures would still support a precision approach if the ILS is out of service.

There are many non-aviation users of WAAS, even though the FAA developed it for aviation use. The system's repeatable and precise positioning supports applications for farming, boating, hiking, surveying, and other many uses. Many GPS chip manufacturers now include WAAS in their chip designs. These GPS/WAAS chips are in many consumer GPS products such as cell phones, automobile navigation units, and other products. The FAA recognizes that WAAS has become a national utility that makes GPS better, even though the FAA does not keep track of non-aviation uses of WAAS.

The future of WAAS includes updating the system with the latest technologies. The FAA will update the WAAS reference station receivers to receive the full set of signals transmitted from GPS satellites. Other components of the WAAS will also continue to be upgraded to ensure the availability of replacement parts in case of component failure. The FAA also will ensure the WAAS geostationary satellite constellation, currently at three satellites, continues to provide the WAAS corrections to users. The FAA is pursuing new satellite leases with satellite providers as the current geostationary satellite constellation ages. Other future enhancements to WAAS include providing a dual frequency capability that will take advantage of the two civilian GPS frequencies, L1 and L5. When the L5 signal is ready for operation and is being transmitted by a proper number of GPS satellites, the WAAS will be ready to provide dual frequency service to users. Other future enhancements include adding other Global Navigation Satellite System (GNSS) constellations, such as Galileo.

WAAS has been operational for more than 11 years. The system continues to provide accurate and reliable augmentation to GPS. The FAA will ensure that the current level of service will continue and future service will become even better than it is today.

William Wanner
Manager, Navigation Systems
Verification and Monitoring Branch
Federal Aviation Administration

Talking about EGNOS benefits with… Geograma

Credits: Geograma

By Alejandro Guinea and Juan Miguel Álvarez, Geograma

Q: When did Geograma know about EGNOS?
Engineers working at Geograma have know EGNOS since 2006. By that time, we used EGNOS to inventory milestones in the municipalities' boundaries. Thanks to EGNOS signal we could locate such boundary stones easily and once located, other GNSS techniques were used to position them precisely.

Q: What was the objective of the project you made for the Spanish General Traffic Directorate (DGT / Dirección General de Tráfico)?
In Spanish roads, whenever there is an incident (landslide, animal killed, accident, etc..), traffic agents have to notify the location of the event in relation with the distance to the nearest kilometer stone. The work done by Geograma for the Dirección General de Tráfico (DGT from now onwards) was to provide the technical assistance for optimizing the cartography used by DGT and in particular to settle a linear reference system for locating any event on the road network.

> "The objective was to settle a linear reference system for locating any event of the Spanish road network"

The project had three objectives:

- **Coverage**: To make the inventory of all the kilometer stones of secondary roads in Spain (those roads under local management). It was needed to cover the 120.000km out of the 165.000km that set up the overall Spanish roads.
- **Integration**: To match the identification of the roads (ie: JA-4310) with the kilometer stone, stablishing in this way a linear reference system that allows to identify any point in a road by means of a road identifier and kilometer stone
- **Consulting**: To elaborate reports that allow defining more efficient and economic working schemes for DGT.

Q: What was the main reason that made Geograma choose EGNOS for this project?
The first objective was to make the inventory and position the kilometre stones of the secondary roads in Spain, what meant more than 120,000 km. For that purpose we needed to design a working scheme that allowed accomplishing the objective in a year time frame and with an accuracy below five meters. We designed a scheme based on a car equipped with an EGNOS enabled receiver and a Leica smart antenna that allowed the positioning of those kilometre stones without stopping the vehicle (safety requirement by DGT on the project did not allow us to stop the car at each milestone).

On top of that, many roads were in rural areas where GPRS coverage was low or in some cases even inexistent, what implied that the system to be used had to be such that the GPS corrections should be received by other means than the mobile data service. With EGNOS, we had accuracies within the range of two meters: much better than the uncertainties specified in the project. Even, EGNOS covered all Iberian Peninsula, Baleares and Canary islands.

Talking about EGNOS benefits with… Geograma

Summing up, we chose EGNOS because it was a positioning service that fitted perfectly the needs of an inventory of hundred thousand kilometers: the accuracy offered, the fact that the coordinates were obtained in real-time (no post-processing) and it was a free service were key issues in our decision.

Q: What are, in your opinion, the key elements and main benefits that EGNOS offers to users?

A positioning service is neither good nor bad, it is just a matter if it fits or not specific needs. We would highlight the following characteristics or benefits from EGNOS:

> "We chose EGNOS because it was a positioning service that fitted perfectly the needs of an inventory of hundred thousand kilometers"

Credits: Geograma

- **Positioning accuracy** around 2 meters, enough for positioning in low accuracy inventories as milestones, road-axis, interest points in a road, etc.
- **Good coverage**, that allows enhancing GPS accuracy in almost all Europe without any care on the connectivity issues for GPRS signal (needed for other positioning methods).
- **Simple and low cost equipment**: without accessories for connectivity and with just one receiver. And even, the service is free.
- **Positioning solution in real time**, no calculation, no post-processing needed.
- **Stable and continuous service** (24x7).

Q: To conclude, what would be your message to other companies that need positioning services?

As already mentioned, EGNOS is the ideal positioning service for accuracies in the meter range, because the equipment needed is simple, the signal is free, there is wide coverage in Europe and its service is stable.

Alejandro Guinea is a Surveying Engineer with a Master of Cartographic Geotechnologies for Engineering and Architecture. Over 15 years of experience managing projects of cartography, mapping and GIS. Registered in the Pool of Experts of INSPIRE Maintenance an Implementation Framework (MIF), Executive Board Member and Liaison Officer for GeoInformation of the Spanish Geodetic Surveyors Association and Executive Board Member of the Spanish Association of Liberal Property Surveyors.

Juan Miguel Álvarez Paredes is a Surveying Engineer with a Master of Cartographic Geotechnologies for Engineering and Architecture. Since 1998, GeoInformation Manager in Geograma, managing projects of surveying, industrial surveying, cartografphy, mapping and GIS, asset inventories and paper maps. With extensive experience in consulting of GeoInformation projects

What's new since last bulletin?

EGNOS Working Agreements (EWA) signed

The following EWAs have been signed in the last quarter:

Romatsa
Romania

Luchtverkeersleiding Nederland (LVNL)
Netherlands

Bulatsa
Bulgaria

Land's End Airport Ltd
United Kingdon

Jersey
Jersey

LPV & APV Baro procedures published per country (including last AIRAC cycle #13 – 11/12/2014)

Next table shows, for each country:

- the number of airports with LPV procedures, as well as the total number of LPV procedures;
- the number of airports with APV Baro procedures authorised to be flown with EGNOS vertical guidance as well as the total number of APV Baro procedures.

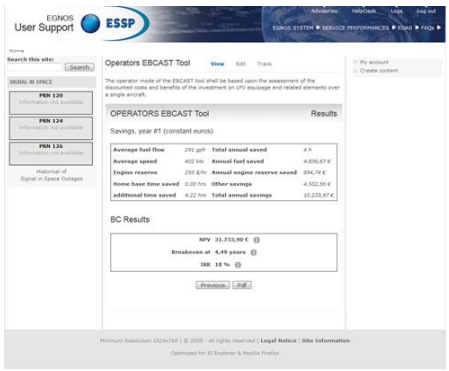
Country	Airports – LPV procedures	# LPV Procedures	Airports – APV baro Procedures	# APV baro Procedures
France	62	86	1	1
Switzerland	6	6	0	0
Guernsey	1	2	0	0
Germany	11	19	31	71
Italy	6	12	0	0
Spain	1	2	0	0
Finland	1	2	0	0
Austria	2	2	0	0
Czech Republic	3	6	1	4
Norway	2	6	0	0
Poland	1	2	0	0
United Kingdom	2	4	0	0
Sweden	2	3	0	0
Netherlands	2	3	0	0
Total	102	155	33	76

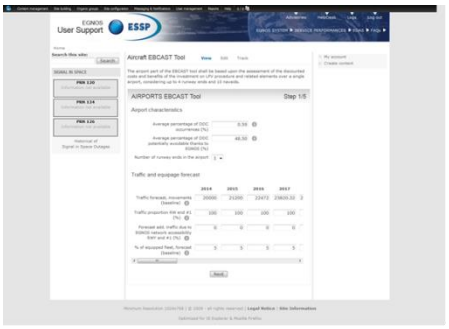
Warm welcome to Sweden and The Netherlands as the "newcomers" in the EGNOS LPV publications list!

What's new since last bulletin?

User Support Website new features

A new tool (EBCAST, EGNOS Business Case ASsessment Tool) has been included in the EGNOS User Support website:





The tool is intended to support aircraft operators and airport/ANSP stakeholders in the process of deciding whether to implement or not LPV avionics/flight procedures.

A comprehensive (but pragmatic) model has been built, trying to be simple but close to reality. The methodology is scalable, that is, one large operator can aggregate the results for one aircraft whilst they may be enough for a small entrepreneur; a big ANSP could gather the individual results for all airports and derive global conclusions whereas the managers of a small airfield could tune the general models to fit their specific needs. Besides, the model can be parameterized to be valid for any segment or customer.

This initiative is one more of the resources made available to EGNOS users in the frame of the EGNOS Multimodal Adoption plan performed by ESSP under GSA mandate.

Apart from this development, the EGNOS User Support Website will be largely improved soon, to enhance robustness and user experience and to include new contents.

EGNOS USER SATISFACTION SURVEY CLOSED (*)

In October, the EGNOS Satisfaction Survey has been closed after receiving 82 responses (topic distribution showed in the diagram).

ESSP and GSA are currently analyzing the feedback and will soon get the main outcomes of this satisfaction survey.

(*) Comments are still wellcome – they will be analyzed in a subsequent phase-

Thank you for your collaboration. Your opinion is essential to improve the EGNOS services!

… in aviation

Great success of the GSA call for grants

As anticipated in the previous EGNOS Bulletin in September 2014, the European GNSS Agency (GSA) has launched a competitive call to foster the use of EGNOS in the European aviation sector. The Call for Grants specifically addressed operators looking to equip their aircraft and rotorcraft with SBAS enabled avionics and Air Navigation Service Providers and aerodromes willing to implement EGNOS based operations, namely Localiser Performance approaches with Vertical Guidance (LPV) in Europe.

The call had a very good response. A total of **38 proposals were received** before the deadline for submission on the 31st of October 2014. The total **requested EU contribution for this call amounted roughly to €12M** (€20M of total projects cost) which is twice the **available budget of €6M** for this call.

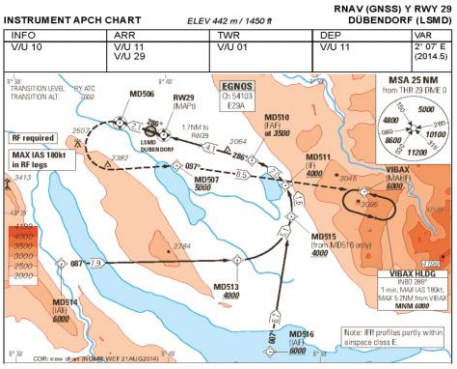
The GSA assessed the eligibility and selection criteria of these proposals during November 2014. The technical evaluation is planned for December 2014. The notifications to awarded applicants and the signature of the Grant Agreements are expected before the end of January 2015 so that the individual projects can **kick off in February 2015**. The selected projects are to be funded at a maximum of 60% of their eligible costs.

European GNSS Agency

Did you know…?

… that Alderney Airport, in the Channel Islands, has published an article based on their experience with EGNOS? Please find the link here: http://www.eurisy.org/good-practice-alderney-egnos-use-for-small-airport_127

Advanced flight procedure in Dübendorf



As a result of a joint effort between Skyguide (the Swiss ANSP) and the Swiss Air Force, an advanced LPV approach procedure is in operation at Dübendorf (Switzerland) Air Base since last 21st August.

For the first time in Europe, a series of Radius-To-Fix (RF) legs are inserted, as part of the initial and intermediate approach segments, immediately before the LPV segment as part of an operational RNP APCH procedure. The RF legs place the aircraft perfectly aligned with the final approach segment while avoiding the high mountainous terrain located east of the airport.

During the final approach segment, users take advantage of the superior LPV performances to reduce the OCH in more than 250ft with respect to the non-precision LNAV minima.

…in aviation

ERA General Assembly

Once again, EGNOS was present at the ERA General Assembly. The event took place between the 30th September and 2nd October in Barcelona. Our stand was visited by several regional airlines looking at EGNOS with increasing interest as the number of LPV approach procedures available in Europe keeps growing.

This year's event was particularly an excellent opportunity to present EGNOS in front of the ERA Operations Advisory Group. Víctor Álvarez of the European Satellite Services Provider and Carmen Aguilera of the GSA considered how **the use of PBN and EGNOS services in particular can enhance regional operations**, particularly for Europe's more remote areas that are lacking ground-based systems.

Successful tests of Simultaneous Airplane-Helicopter IFR operations

A series of flight trials conducted at Barcelona airport during August, one of its busiest periods with over 1,000 movements a day, showed the feasibility of introducing new EGNOS-based operations that allow helicopters to operate in airports without interfering with regular airport traffic.

The concept is known as **Simultaneous Non-Interfering (SNI)** operation and allows introducing rotorcraft instrument flight procedures at busy airports without interfering at all with the fixed-wing traffic or with the existing instrument flight procedures. Therefore, SNIs enable helicopters to operate to and from airports without requiring runway slots. These procedures employ satellite guidance technology to fly low-level corridors, often perpendicular to the direction of the duty runway, down to a given point-in-space in the close vicinity of the airport followed by a final visual landing.


Credits: Pildo Labs

The SNI flight procedure under test was a Point In Space (PinS) LPV enabled by EGNOS and designed by Pildo Labs. It was flown by the Barcelona-based operator CatHelicopters using Pildo Labs' GNSS Flight Validation Platform, while the approach air traffic controllers from ENAIRE (former AENA) supported the trials too. The flight demonstrations were run as part of NASCIO, a SESAR demonstration project.

What's going on…

… in aviation

Helitech 2014

The Helitech Expo and conference took place last October, from the 14th to the 16th, in the Amsterdam RAI.

EGNOS was present there with a dedicated stand. A substantial interest about EGNOS was noticed from key emergency medical services (HEMS) and oil rig operators (Norwegian ambulances, CHC, ADAC). Besides, an increasing presence of SBAS capabilities was confirmed in new helicopters (e.g. Airbus, Bell, AgustaWestland helicopters; Avidyne, CMC Electronics or Honeywell avionics suites).

EASA Conference on GA regulation

The goal of EASA Conference on General Aviation Regulation (Rome, 15th and 16th October 2014) was to present the progress on Regulation applying to the General Aviation sector, and open the debate about concerning issues at different levels. The Conference was organized in panels, where experts on the subject presented key aspects about the different panel topics.

EASA is now taking a different approach to GA Regulation. So far, a too heavy Regulation was provided for this sector; balance is seen now a must. A specific GA department has been created at EASA, and a tailored roadmap has been defined, both devoted to find solutions to the specific issues identified in this particular aviation segment.

…in maritime

First time EGNOS is present at METS

MARINE EQUIPMENT TRADE SHOW
METS 2014
18-20 | NOV | AMSTERDAM | NL

From 18th to 20th November, the Marine Equipment Trade Show (METS) took place in Amsterdam. It is considered one of the world leading B2B event in marine equipment. **EGNOS was present at stand 11.110**. There were a great number of Automatic Identification System (AIS) and GPS manufacturers present: Vespermarine, McMurdo, Seareq, Standard Horizon, Raymarine, Furuno, Garmin, Seareq, Simrad, B&G, Humminbird etc.

This event allowed the possibility to reinforce contacts with those EGNOS stakeholders, and ask them about their equipment compatibility with EGNOS. For GPS-like equipment, EGNOS is supported although not always shown in the products specifications. In AIS, EGNOS is not much known, although it was great to find that Vespermarine already has AIS transponders SBAS/EGNOS enabled!

…in rail

InnoTrans 2014

The last appointment for the most important railway technology stakeholders in Europe took place in Berlin, from the 23th to the 26th of September, 2014. EGNOS was represented in this huge exhibition with a dedicated stand. In addition, EGNOS was introduced by Gian Gherardo Calini, Head of the Market Development department at GSA, in a round table at the European Railway Agency stand: "*How heaven could support ETCS*".

This event was a good opportunity to gather contacts and spread word about the benefits of EGNOS. Contacted people noted with interest the information about the system and several company representatives thought it could bring additional value to their propositions in the future, which is already a change in the sector's prevailing paradigm.

TESTING EGNOS PERFORMANCE IN A RAILWAY-LIKE ENVIRONMENT

As a result of one of the actions for railways in the EGNOS multimodal adoption plan (EMA), the outputs from a test performed last Summer in a "greenway" located in the Southern area of Madrid (Spain) have been processed and pretty-printed, and will be available soon in the EGNOS User Support website. A greenway is an old disused railway line, often built in the first half of the last century, which has been recovered and reconditioned for use by walkers and cyclists.

This activity consisted in showing the expectable level of performance which can be achieved with EGNOS when used in a railway-like environment. Interested actors in the rail domain, aiming to perform dedicated, full-scale test campaigns in railway environment will be able to take advantage of the information. Different railway stakeholders that would like to have a basic introduction to what is EGNOS actually able to deliver will find it interesting as well.

…in mapping and surveying

INTERGEO

On the 7th and 8th of October, 2014, EGNOS was present at the INTERGEO event in Berlin with a GSA stand. This event is the most important one for the surveying and mapping technologies in Europe, with the participation of more than 700 companies. Several exchanges were made with the main GNSS manufacturers, allowing to confirm that most of their products are EGNOS-capable. Discussions with agriculture stakeholders were also held during the two-days event, which allowed to gather a positive feedback in relation to the pass-to-pass accuracy performance that EGNOS can provide (stable and in the range of 20 to 30 cm).

…in GNSS

FIRST SATELLITE MASTERS CONFERENCE

On 22-24 October 2014, the first Satellite Masters Conference brought together more than 300 participants from 40 counties, connecting high-level representatives from leading institutions and industry with start-ups and award-winning entrepreneurs. The conference focused on entrepreneurial spirit and the impact that space technologies have on non-space sectors.

ESSP participated in a special workshop organized on the 22nd of October intended to introduce different initiatives and services at European level enabling the access to earth observation and positioning data.

EDAS Services were presented, explaining how they can ease the access to GNSS data collected and gathered by the EGNOS infrastructure.

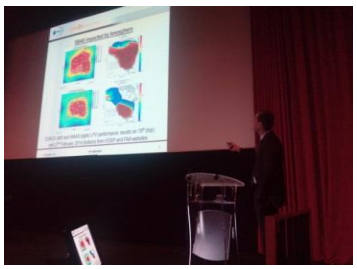
The presentation was a success and triggered important interest from the audience mainly willing to know more about the EDAS use and potential applications.

ION 2014

EGNOS was present at the ION GNSS 2014 event (September 8-13, 2014), the world's largest technical meeting and showcase of GNSS technology, products and services, in Tampa (Florida, USA). EGNOS was well represented at the event by several representatives from EC, GSA, ESA and ESSP, including an EGNOS stand at the exhibit which was hosted by EC.

ESSP participated in the technical sessions with one paper: 'EDAS for added value applications'. The European Commission provided important updates regarding the status and deployment schedule for Galileo, which were very positively received by the audience. Apart from the very interesting informal discussions with all the international representatives from public agencies and industry, the ION GNSS 2104 confirmed the prominent role of EGNOS (and also the high expectations on Galileo), being this one of the most popular subjects in the technical sessions and for a wide variety of applications.

11th Space Weather Week



The 11th Space Weather Week took place in November in Liège (Belgium). The SWW brings together diverse groups in Europe interested on different aspects of Space Weather. GNSS and EGNOS in particular are affected by different space weather phenomena and a better understanding of space weather might lead to an improved service to EGNOS users. ESSP presented its study on "Space Weather Effects over EGNOS Performance in the North of Europe" which is a novel approach to ionospheric effects on SBAS systems, tracing ionospheric effects to solar phenomena and interplanetary conditions.

Upcoming events

WATM Madrid 2015

The most prominent Air Navigation Services Providers in the world, as well as ATM Industry and interested stakeholders will meet again in Madrid next March (10-12/03/2015) in the World ATM Congress. EGNOS will take part of this important showcase of the latest developments in Air Traffic Management, Communications, Navigation and Surveillance.

World ATM Congress 2015
Operated by CANSO in association with ATCA

Workshop: European GNSS Applications in Horizon 2020

A workshop on European GNSS Applications in Horizon 2020 for the 2nd call will take place on 14th January 2015, 9.30 till 17.00 at the CTU Faculty of Electrical Engineering in Prague. More information can be found in the following link http://www.gsa.europa.eu/r-d/h2020/events

Munich Satellite Navigation Summit 2015

The Munich Satellite Navigation Summit will take place in Munich, Germany on March 24 - 26, 2015, with the theme "Future of PNT – A Glance into the Crystal Ball". This important summit counts not only with an outstanding technical, but also a superb scenario for the event, the Residenz München.

MUNICH SATELLITE NAVIGATION SUMMIT 2015

Several key presentations are expected from prominent spokespersons in the navigation world, including the one about the updated status of EGNOS.

Editorial Note:

EGNOS Bulletin has evolved in its appearance. Comments and suggestions to keep on improving it are welcomed, please contact egnos-helpdesk@essp-sas.eu

EGNOS, it's there. Use it.

http://egnos-user-support.essp-sas.eu

Information on historical and real-time EGNOS performance. EGNOS Signal in Space (SIS) status. Forecast on SIS availability and EGNOS performance. EDAS information and registration. EGNOS adoption material and tools.

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

EGNOS applications. Developers platform. Business support

For questions & information

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