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EGNOS BULLETIN

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DFS Deutsche Flugsicherung



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Global Navigation
Satellite Systems
Agency

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EGNOS

ANNUAL WORKSHOP

ATHENS

3-4 OCT 2017



EGNOS

Success Stories

EGNOS used in bathymetries to compile official nautical charts



Cabo Sacratif (Spain)

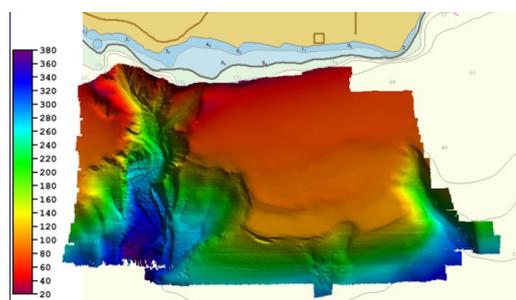
EGNOS open service is commonly used by a wide range of users in different domains to achieve better position accuracy than the one provided by GPS alone. This is the case of surveying applications in the maritime domain, where EGNOS plays a role as an affordable positioning solution under certain circumstances.

The Hydrographic Institute of the Spanish Navy (IHM) is the official organism in charge of performing the hydrographic surveys, i.e. bathymetric and topographic submarine studies in the Spanish coasts and other maritime areas appointed by the International Hydrographic Organization (IHO). The IHM is responsible for the formation and maintenance of the Spanish Official Nautical Charts, as well as writing, producing and publishing different nautical publications as the Sailing Directions, List of lights and fog signals, List of radio signals, Tide tables, Notices to Mariners among others.

Hydrographic surveys shall follow the IHO standard S-44, which is the one establishing the minimum requirements for surveys conducted for the safety of navigation, including positioning system tolerable errors known as Total Horizontal Uncertainty (THU) at the 95% confidence level. Different Orders are set for nautical charts

according to the areas where the surveys are to be performed and, for some of them, EGNOS accuracy is enough to meet the minimum THU required. This is well-known by the IHM, who has been using EGNOS for several years now to perform bathymetries in those areas away from the coastline, where positioning requirements are not so demanding and the coverage of other positioning systems is limited. Particularly, some areas of the so called "Spanish Exclusive Economic Zone" (ZEEE), that is, the marine area surrounding Spanish coast within the 200 nautical miles limit, were surveyed using EGNOS, for instance, the ZEEE in the Cantabrian Sea.

“An average area of 685000 square kilometres has been surveyed using EGNOS by the IHM”



Bathymetry corresponding to Cabo Sacratif (meters) done using EGNOS. Courtesy of IHM

New government mission aircraft ready for LPV operations

The new series of Airbus Defence & Space C-295 and CN-235 turboprop aircraft are baseline-equipped with LPV avionics. These aircraft are commonplace in search and rescue, marine patrol and utility transport missions which opens up an area of development of EGNOS into this segment of multi-role applications.

Apart from major improvements in flight planning, performance predictions and efficiency, this upgrade enables operators to access to the latest generation of airspace navigation procedures including LPV approaches.

Agustín Gil, avionics expert at Airbus D&S, stressed that “the LPV capability in the new C-295 is included within a complete change of the avionics system, i.e. it is not a modification on the current avionics”.

This is a substantial breakthrough in the industry, as double-use aircraft like the C295 are not usually taking the LPV capability onboard. Gil showed to our EGNOS Bulletin correspondents the C295 avionics test bench hosted in the Getafe Airbus facilities, and, there, it was possible to witness how EGNOS was actually being used in a live scenario. The test bench, fitted with a Rockwell-Collins avionics suite, replicates the new C295 cockpit and is able to inject simulated inputs with a very high degree of flexibility.



Credits: Airbus Defence & Space

This LPV feature is also provided in the new CN-235 portfolio, this time with Universal avionics, according to Gil.

The new LPV capability will be a baseline fit in the sixteen fixed-wing search and rescue units of the Canadian government recently procured to Airbus Defence & Space, after a hard 14-year acquisition process. Deliveries for the Canadian SAR contract will run between 2019 and 2022. Gil explained that the certification flights for the C295's LPV functionality are on-going and will be performed in Spanish and French airports with published GNSS (LPV) approach procedures such as Santander (LEXJ).

Did you know...?

that Bombardier CS100 aircraft have recently received EASA certification for steep approaches? Validation flights took place in March at London City Airport (see [link](#)), where Swiss International Air Lines, who is already approved for LPV operations, is the first airline operating the C Series. To be certified for operations at LCY, Bombardier crew had to show that the aircraft could perform at a greater approach angle, take-off and land on the airport's short runway and meet the local noise requirements. LCY has plans for LPV200 publications at the two runway ends by 2018

EGNOS used for parcels inspection in CAP subsidies

The CAP is the common agricultural policy followed by the European Union gathered in regulations 1305/2013, 1306/2013, 1307/2013 and 1308/2013. It implements a system of agricultural subsidies and programs for rural development, representing now near 40% of the overall European Union budget. These four legislative texts reflect the political agreement between the European Commission, EU Member States Agriculture Ministers and the European Parliament which aims to improve agricultural productivity, so that consumers have a stable supply of affordable food, and to ensure that EU farmers can make a reasonable living. Establishing a higher accuracy requirement for the land parcel system identification applicable to all Member States is one of the priorities established by the CAP. Currently, the EU regulation requires that the parcels identified as agricultural ones should be registered with an accuracy (rms) of 1.25m. It is responsibility of each Member state to establish such Land Parcel Identification systems, and to verify that farmers declare correctly areas in the subsidies. It is in this verification process done by CAP inspectors when EGNOS plays a role. In particular, in Catalonia region (Spain), technicians in charge of this CAP inspection activity use EGNOS. Their equipment is a Royaltek 2210 (approved by [JRC](#), with an accuracy of 0.75m) and a Garmin GLO (in process of approval). These devices are configured to use EGNOS, because the service provides the accuracy that matches their needs –recall that LPIS have to be identified with and maximum accuracy of 1.25 rmse-, it is



CAP technicians measuring parcels. Courtesy of the Direcció general de Desenvolupament Rural. Departament d'Agricultura, Ramaderia, Pesca i Alimentació

free, equipment is portable and easy to use. Every year, usually in spring and summer time, more than 120 inspectors in Catalonia check over 600 million square meters using EGNOS. "We have been using EGNOS since 2010, year after year we rely on it because it works, it is simple and it is free. It makes the process of verifying parcels much easier, and the results agree with the European Regulation standards for the integrated administration and control system" says Valentí Marco, Deputy Director for management and control of direct aids.

Did you know...?

... that a new Call for Proposals for the acceleration of EGNOS adoption in the field of civil aviation will be published by GSA by the end of this year? The Call will be similar to the ones launched in 2014 and 2015. You can see more details in the [GSA EGNOS Annual 2017 Grants Plan](#). Stay tuned and do not to miss this opportunity!

Talking about EGNOS with... DFS, Deutsche Flugsicherung GmbH (German Air Navigation Services Provider)

DFS is a company wholly owned by the Federal Republic of Germany whose core business is controlling air traffic from control towers and control centres throughout Germany. DFS is represented at 16 international airports and at nine regional airports by its subsidiary DFS Aviation Services GmbH. In this issue of the EGNOS Bulletin, we interview the DFS Director of Airspace & ANS-Support, Mr Andre Biestmann, and Mr Stefan Naerlich from the Systems Infrastructure Department

First of all, could you please give us an overview of the current implementation status of EGNOS-based operations in Germany?

We have a long tradition of working with GPS signals and with the ESSP. We started to work with the first GPS procedures in the middle of the 1990s and now 85% of our airports have a GPS approach. In 2008, the planning process with vertical guided approaches was launched and in 2009 the BaroVNAV concept was implemented in Germany. After the ESSP declared the EGNOS service useable for Safety of Life operations in 2011, the signals added the benefit of geometric 3D guidance on the final approach: We then implemented APV approaches with LPV minima and commissioned the first operations with CAT I approaches using satellite services in 2012 with a GBAS station. SBAS CAT I operations followed in Bremen in March 2017.

We also implemented special procedures at the heliport in Donauwörth (including a steep angle approach with a glide path of 6.3°).

What were the main lessons in this process?

DFS was a co-founder of the ESSP and has gained a lot of expertise and experience using GPS signals for aviation. Especially in the area of augmentation, there was a long process moving from Differential GPS (DGPS) to EGNOS and GBAS. With the strategic partnership between



DFS and ESSP, a fundamental basis is available to provide the aviation industry the best way to use satellite signals. Project management is essential when transitioning from conventional procedures to PBN. Any transition plan must consider the available resources. Many stakeholders have to be consulted when implementing SBAS procedures. It starts from an ADQ-compliant transfer of aeronautical data at the airport, consultation with local noise committees, airports, airspace users and authorities. One special area is the training of the flight procedure designers regarding the criteria for the different approach procedures. After the publication of the procedures, the flight inspection/validation, compiling of procedures by nav-data base providers and the training of controllers/pilots followed. Finally, safety surveys had to be successfully completed before publishing the procedure.

What has been the feedback from the business and general aviation communities? What about airlines and helicopters?

The feedback from business and general aviation has been excellent. The handling of the RNP approach including the SBAS signal on final approach is very easy, because there is no sensor change involved in the procedure. It is easier than using ILS.

We started discussions with airlines to install SBAS receivers on board their fleets. The SBAS CAT I will make it possible to reduce the number of ILS installations in the future and therefore the overall costs for the aviation system.

SBAS systems are enablers of the ICAO PBN concept. What is the role of EGNOS within the German PBN implementation plan?

We are now rolling out APV approaches with EGNOS across Germany. Wherever possible and a precision runway is available, we are implementing a precision approach with SBAS CAT I (Karlsruhe Baden and Lahr in 2017).

The EU Navigation Strategy is under discussion. What is DFS's position with respect to that?

DFS supports the continued evolution towards a PBN-centric system. To make the most of these new services, there has to be close cooperation between the air navigation service providers

(enabling the services) and the airspace users (equipping their aircraft correspondingly). Aviation as a whole has not been able to exploit its full potential when two decades after GNSS-based services became available, the corresponding on-board equipment is not even mandated as a firm requirement. In 2012, DFS and the German Ministry of Transport developed a PBN implementation plan for Germany.

Significant parts of the plan have already been implemented with utmost care and drawing on a great deal of airspace users' and DFS experience. Frankfurt-Hahn was the launching customer airport regarding the conversion from conventional to PBN procedures (RNAV 1 and RNP APCH APV and LPV) with conventional procedures as the back-up. The conversion was finished in 2015. The experience gained was very valuable and formed the basis for further work in this area.

And to finish, our readers ought to know that DFS also participates in R&D projects related to GNSS. Is there any significant outcome from your last programmes you could share?

It is particularly positive to note that the industry is developing hybrid augmentation solutions, which can improve the performance of Ground-based Augmentation Systems (GBAS) when using input data from an SBAS such as EGNOS. Such solutions promise a better service for airspace users with their existing (GBAS) avionics.

Meet the interviewees



Andre Biestmann was trained at DFS as an air traffic controller and acquired his first en-route licence in 1991. He worked for eight years in Bremen Area Control Centre (ACC) before obtaining an additional qualification as a Certified Project Manager Level C (GPM/IPMA). After leading a number of projects, he returned to operations and worked as watch supervisor and Head of the Operations Office at the Bremen Area Control Centre. In a Leadership Programme, he took on various positions at the DFS Headquarters before taking on his present position as Director of Airspace and Air Navigation Services Support. His main task is the upgrade of German airspace to a PBN Airspace Architecture. He represents Germany in the ICAO Instrument Flight Procedure Panel (IFPP) and Separation and Airspace Safety Panel (SASP).



Stefan Naerlich obtained his degree in Electrical Engineering in 1984. Following this, he worked for 12 years in industry with responsibility for the design and development of Inertial Navigation Systems and ring laser gyros. He joined DFS German Air Navigation Services in 1996 and is currently the head of the navigation infrastructure department. His responsibilities include the provision of precision and non-precision navigation aids within Germany. For more than 15 years, his focus has been on the increased provision of satellite-based services, namely through EGNOS and GBAS. Stefan is the vice-chair of the Navigation Systems Panel in ICAO.

What's new?

Since last bulletin...

EGNOS WORKING AGREEMENTS SIGNED (EWA)

The following EWAs have been signed in the last quarter:



Humberside International Airport Limited **United Kingdom**



Waterford Airport **Ireland**

LPV & APV Baro procedures published per country(including last AIRAC cycle 2017/7 – 22/06/2017)

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 – SBAS APV procedures | # SBAS APV Procedures | Airports – SBAS CAT-I procedures | # SBAS CAT-I procedures | SBAS RNP0.3 routes | Airports – APV baro Procedures | # APV baro Procedures |
|-----------------|--------------------------------|-----------------------|----------------------------------|-------------------------|--------------------|--------------------------------|-----------------------|
| Austria | 2 | 2 | 2 | 4 | 0 | 0 | 0 |
| Belgium | 4 | 10 | 0 | 0 | 0 | 0 | 0 |
| Croatia | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| Czech Republic | 4 | 8 | 0 | 0 | 0 | 1 | 4 |
| Denmark | 4 | 8 | 0 | 0 | 0 | 0 | 0 |
| Estonia | 1 | 2 | 0 | 0 | 0 | 0 | 0 |
| Finland | 1 | 2 | 0 | 0 | 0 | 0 | 0 |
| France | 90 | 141 | 10 | 18 | 0 | 4 | 5 |
| Germany | 22 | 36 | 3 | 5 | 0 | 22 | 60 |
| Guernsey | 1 | 2 | 0 | 0 | 0 | 0 | 0 |
| Hungary | 0 | 0 | 1 | 4 | 0 | 0 | 0 |
| Ireland | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| Italy | 9 | 19 | 0 | 0 | 0 | 0 | 0 |
| Netherlands | 2 | 3 | 0 | 0 | 0 | 0 | 0 |
| Norway | 16 | 24 | 5 | 10 | 0 | 7 | 16 |
| Poland | 5 | 9 | 0 | 0 | 0 | 0 | 0 |
| Portugal | 1 | 2 | 0 | 0 | 0 | 0 | 0 |
| Romania | 1 | 2 | 0 | 0 | 0 | 0 | 0 |
| Slovak Republic | 2 | 4 | 2 | 2 | 0 | 0 | 0 |
| Spain | 2 | 4 | 0 | 0 | 0 | 0 | 0 |
| Sweden | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| Switzerland | 7 | 9 | 2 | 2 | 5 | 0 | 0 |
| United Kingdom | 14 | 31 | 0 | 0 | 0 | 0 | 0 |
| Total | 191 | 321 | 25 | 45 | 5 | 34 | 85 |

SBAS in the world

MSAS

MSAS has been using MTSAT to deliver NPA en-route navigation services since September 27th 2007. The Japan Civil Aviation Bureau (JCAB) is announcing the decommissioning of this GEO satellite in 2020 due to depleted fuel and its replacement by one vehicle from the QZSS (Quasi-Zenith Satellite System) constellation, developed by Cabinet Office of Japan (CAO), as well as the conversion of ground equipment to continue the service. In addition, QZSS has a plan to deploy three satellites in 2017, one of them being geostationary. Therefore, JCAB will enter this geostationary satellite into functional test and performance evaluation phase from 2018 before starting the next MSAS service stage in 2020. JCAB is also reporting the existence of a performance improvement plan capable of providing LPV services once QZSS deployment achieves 7 satellites in orbit around 2023. Furthermore QZSS has equipped their vehicles with L5 transponder, and the Electronic Navigation Research Institute (ENRI) of Japan is going to begin a full-scale process of R&D in order to contribute to a validation activity of DFMC (Dual-Frequency Multi-Constellation) SBAS SARP from 2017.

Interoperability Working Group

From 7th to 9th June, the 32nd meeting of the SBAS Interoperability Working group took place in Seoul, Korea, where plans for the Korean Augmentation Satellite System (KASS) were presented. By 2021 it is expected to have KASS certified and ready for use in aviation by 2022.

WAAS

The table below shows the WAAS list of satellite-based approach procedures. You can find further information on [SatNav news](#).

Courtesy of the FAA WAAS Team.

| Satellite-based Approach Procedures | | | |
|-------------------------------------|-------------|----------------|--------------|
| RNAV (GPS) Approaches | ILS Runways | Non-IL Runways | Total |
| LPV Line of Minima | 1,160 | 2,634 | 3,794 |
| <250' Decision Altitude | | | 1,021 |
| Exactly 200' Decision Altitude | | | 977 |
| LP Line of Minima | 3 | 625 | 628 |
| LNAV Line of Minima | 2,437 | 3,715 | 6,152 |
| LNAV/VNAV Line of Minima | 1,939 | 1,731 | 3,670 |
| GPS Stand-Alone Procedures | 6 | 0 | 79 |
| GLS Approach | 11 | | 11 |

(Data as of May 25, 2017)

Did you know...?



... that there is a couple of LPV procedures published in Yeovil airport (EGHG - South West England, UK) since June 2017? This would not be surprising, were not the approaches serving a 1200 metres grass runway, quite a unique but instrumented environment!

EGNOS services highlights

EGNOS Services Implementation roadmaps (SIRs)

A new version of EGNOS Services Implementation roadmaps (SIRs) has been recently published in the EGNOS User Support website (<http://egnos-user-support.essp-sas.eu/>) describing the current status of the EGNOS Services as well as the foreseen evolutions in a 3-year timeframe.

More information [here](#).

EGNOS User Support Website: new evolutions

In the past months new functionalities have been developed in the user support website

SKYPLOTS: Skyplots show information for the satellites being tracked centered on the receivers antenna location of the selected RIMS. In addition to the position of the satellite (elevation, azimuth) the skyplot provides information about the type of satellite (GPS or SBAS) and the usability status (used for PA, used for NPA or not used). This information is available [here](#) for the SPU Receiver in Madrid for NPA and PA Performances.

VIDEOS: The evolution of the hourly EGNOS availability for the previous day is now represented in video format for APV-I and LPV-200 availability maps. You can check these videos in the "Yesterday" tab for [APV-I maps](#) and [LPV-200 maps](#).

SDD Commitment area coverage: Performance maps now represent the percentage of the commitment area where the coverage requirement is met. This consists in a transparent text box appearing on top of the existing images. "Commit. Covered" is the percentage of 99% area in SDD EGNOS APV-I or LPV 200 availability map covered by "Map Availab." performance. These images are already available in the [LPV200 Maps](#) and the [APV-I Maps](#) pages.

Image resize, multi-image viewer and preloaded data: EGNOS User Support Website images are now rendered in a smaller size to allow them to be visible at a glance.

Did you know...?

First contribution of GNSS in ERTMS

As the end of ERSAT EAV project approaches, an operational demonstration took place in Sardinia closely followed by representatives of the rail industry, railway service provision and relevant European agencies. The signalling system in this rail test journey was based on positioning provided by European GNSS. Full news [here](#)

What's going on...



in aviation.

AERO FRIEDRICHSHAFEN

The 25th edition of Aero Expo held in Friedrichshafen from the 5th of April to the 9th of April counted with over 700 exhibitors of the general aviation world and thousands of visitors, especially private pilots. Several EGNOS conferences took place at the event to introduce the benefits of EGNOS to those pilots which still were not aware of them. Additionally, a rounded table allowed visitors to ask to some experts in different aeronautic fields about questions related with the introduction of GNSS in general aviation. The ongoing regulations that will request every single instrument-rated pilot a special PBN endorsement in the following years was one of the most interesting topics for private pilots and flight schools. On the other hand,



airport managers and aircraft manufacturers were very interested in the regulation concerning the implementation of PBN routes for all phases of flight and PBN approaches to hundreds of European airports in the near future.

EBACE

As in past editions, EBACE 2017 hosted the key European Business Aviation stakeholders, being EGNOS represented with an impressive stand. A flight simulator was available to let interested people experience the benefits of LPV. Several conversations were held with aircraft operators and aviation enthusiasts, stating the growing interest of the community about the system and its applications. Organised by the European Business Aviation Association (EBAA) and their American counterpart (NBAA), EBACE'17 attracted in



Geneva (May, 22 - 24) thousands of professionals, featuring more than 400 exhibitors and having 56 aircraft on display. Organizers consider this edition an absolute success.

Did you know...?

that the first RNP 0.3 low-level routes for helicopters, whose integrity is based on EGNOS, will be formally published in Switzerland next August? Besides, in Italy, ENAC is aiming at the publication of departure and arrival PinS procedures and RNP 1 routes for helicopters in the Piemonte and Trentino regions after summer? The routes, which were designed by ENAV, will be used by "Vigili del Fuoco," from the Trentino's local Firefighting Department and by Airgreen, which is HEMS operator at Piemonte. Although the routes will be initially based on RNP 1 specifications, an eventual upgrade to RNP 0.3 is expected in the near future. First procedures at Trento and Cles will be flight validated by a helicopter from Vigili del Fuoco.

What's going on...



in aviation.

BEYOND FINAL USER FORUM

The BEYOND Final User Forum held in Tallinn (Estonia) the days 14 and 15 of June 2017, was dedicated to presenting the main results of the activities performed by the project in the past two years.

The first day, several presentations about the BEYOND Project achievements and capacity building took place, while during the second day, the focal point was the future of E-GNSS and its potential applications in multiple domains.

Additionally to the forum's program, the coffee breaks and the social event brought new networking opportunities to the more than 20 companies that participated in the Project with other external stakeholders and European bodies that attended the event.

At these coffee breaks, they also had the chance to fly in a simulator the Debrecen's LPV approach designed by the project team - even though it has not been published yet -.



Did you know...?

... that the first NextJet SAAB 340 aircraft equipped with EGNOS avionics from the GSA-funded grant project initiated last year flew a series of LPV approaches in Aarhus (Denmark) last 20th of April? The second unit is already being modified at the Scandinavian Avionics facilities in Billund and it is expected to be ready by the end of this month. Thanks to this European funds mechanism, this Swedish regional operator will soon be able to fly EGNOS-based LPV procedures with all their SAAB 340 fleet. Read the full story [here](#).

in maritime.



INTERSESSIONAL IALA WG5 SESSION IN PUERTOS DEL ESTADO, SPAIN

After the 20th edition of the IALA ENAV Committee on the e-Navigation concept held in March 2017, it was decided that Working Group 5, dealing with Position, Navigation and Timing (PNT), meets again before the second Committee of the year in September.

Puertos del Estado hosted this intersessional WG 5 meeting in their Madrid premises during the 27th and 28th of June. This special session

was devoted to progress on the Guidelines on the maritime use of SBAS and representatives from maritime authorities of the UK, France, Spain and Germany attended the meeting, together with GSA and ESSP staff.

The objective was to prepare a stable release of this document for the next IALA ENAV Committee, which will reach its 21st edition and will be held from the 18th to the 2nd of September 2017.

in agriculture.



DEMOAGRO: EGNOS IN FARMING DEMOS

From the 9th up to the 11th May, the most relevant fair of farming machinery in Spain took place in San Clemente, Cuenca. Demoagro received over 20000 visitors. Tractor manufacturers performed different demos in which guidance systems are key. Kubota, Fendt, Group CNH they all configured EGNOS and farmers could see in real time those tractors in labour.



PAC INSPECTORS: COPERNICUS & E-GNSS

On the 7th June, the Spanish Ministry of Agriculture, organized a training session for CAP Inspectors in Spain. More than 200 people received information about Copernicus and EGNOS. Due to satellite technologies, CAP management is in front of a paradigm change, from inspecting to continuous monitoring. After the conference a number of working sessions with the different participants were held in which it could be shown that GNSS equipment is key in the activities performed in the CAP inspection:



EGNOS is known (although awareness is still to be done) and used. The main benefits: it is free, equipment is easy to handle and it is available in all across Europe.

What's going on...



in road.

EGNOS PRESENT AT THE 12TH ITS EUROPEAN CONGRESS

From the 19th to the 22nd of June, the 12th European edition of the ITS Congress took place in Strasbourg. This is a relevant event for EGNOS, as ITS represents an important piece of the GNSS market. The Congress provides a unique opportunity for diverse stakeholders to meet, discuss and make new contacts to make projects initiatives up and to develop their business by showcasing the state of the art and achievements of ITS solutions. The Congress format includes demonstrations of current ITS technology being developed and deployed throughout the world; exhibition booths and dedicated events; and sessions and presentations of the latest developments in ITS. Within this last part, ESSP provided a presentation with regard to EGNOS use in ITS. This presentation provided an overview of the EGNOS added value and how to take advantage from its benefits by using EGNOS capable receivers. It was highlighted that EGNOS allows overcoming some weaknesses of standalone GNSS positioning by providing



enhanced accuracy, availability and continuity over GPS. As a consequence, EGNOS allows enhancing current applications and creating new ones to solve the main issues dealing with ITS. Along the Congress, the GSA provided several sessions on satellite technology applied to mobility, with a special focus on the challenges of a future automated transport and how space technologies can reduce costs, increase safety and respond to cyber security threats. To know more about this interesting event, click [here](#).



in GNSS.

EUROPEAN NAVIGATION CONFERENCE

From the 9th to the 12th of May, the ENC took place in Laussane, Switzerland. Three papers related to EGNOS were presented (Capacity Building in E-GNSS for Aviation: the Beyond Project Experience; EGNOS Multimodal Performance: Aviation, Maritime, Mapping and Agriculture, and EDAS for a DGPS Maritime Service: EGNOS-Based VRS Performance with Pre-Broadcast Integrity Monitoring). To know more about this conference, click [here](#).

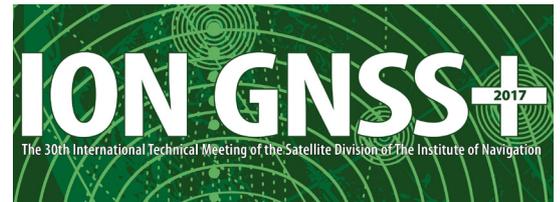


Upcoming Events

ION GNSS+

25 - 29
Sept.

ION GNSS+ is the world's largest technical meeting of GNSS technology, products and services. This year's conference will take place in September 25-29, at the Oregon Convention Center in Portland. As every year, this event will bring together international leaders and researchers in GNSS and related positioning, navigation and timing fields to present their new studies, technologies and products, providing the suitable environment for the exchange of ideas. EGNOS will be present in the **Land Applications** session with the topic "Differential GPS Corrections Performance Test with State-of-the-art Precision Agriculture System". Abstract available [here](#). In the **Marine Applications** session "EGNOS for Inner Waterways: Performance and Multipath Model on the Danube River". Abstract available [here](#). In the **Applications in Sectorial Policies** session with the title "SBAS Service Based in IMO Res. A.1046 (27): EGNOS Maritime Performance » . Abstract available [here](#).



HELITEC 2017

3 - 5
Oct.

The most prominent exhibition and conference related to Helicopters in Europe returns to London in 2017. It is scheduled from the 3rd to the 5th of October. EGNOS will be present one more year. Details of the stand location and participation of GSA/ESSP with the experts Conferences will be announced through different portals and EGNOS social media. See you in London!



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<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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Disclaimer: EGNOS is a complex technical system and the users have certain obligations to exercise due care in using the EGNOS services. Before any use of the EGNOS services, all users should review the EGNOS SoL Service Definition Document ("SDD") and/or EGNOS Open Service SDD (both available on the ESSP SAS website <http://www.essp-sas.eu/>) in order to understand if and how they can use these EGNOS services, as well as to familiarise themselves with their respective performance level and other aspects the services may offer. Use of an EGNOS service implies acceptance of its corresponding SDD specific terms and conditions of use, including liability. In case of doubt the users and other parties should contact the ESSP SAS helpdesk at egnos-helpdesk@essp-sas.eu. Aviation Users may also contact their National Supervisory Authority. Data and information (the "Data") provided in this document are for information purpose only. ESSP SAS disclaims all warranties of any kind (whether express or implied) to any party and/or for any use of the Data including, but not limited to, their accuracy, integrity, reliability and fitness for a particular purpose or user requirements. Text and pictures that are part of the Data may be protected by property rights. Any use shall require the prior written agreement of ESSP SAS.



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Precise navigation,
powered by Europe



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