



EGNOS, it's there. Use it.

EGNOS BULLETIN

Issue 27, Q3 2018



Credits: Florian Weiss

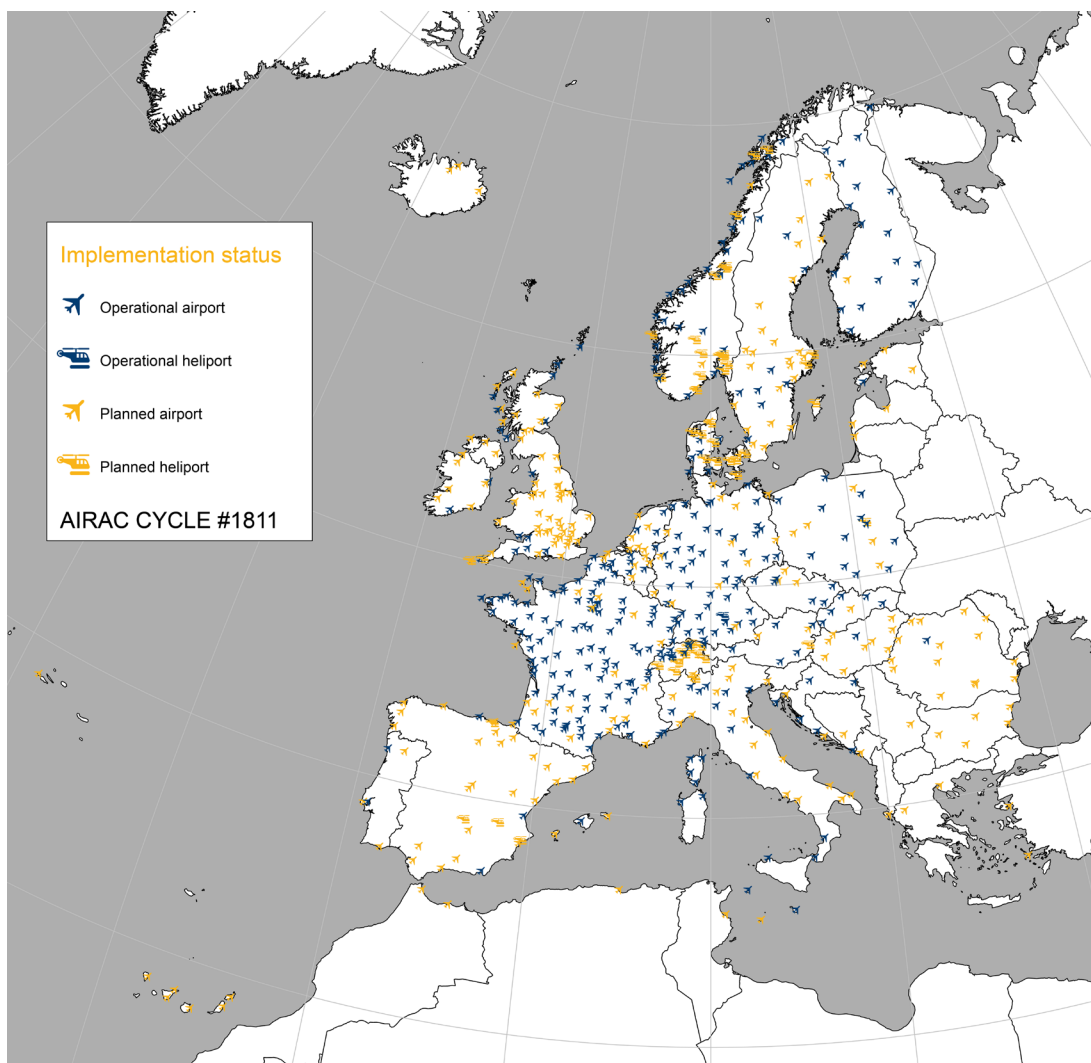


European
Global Navigation
Satellite Systems
Agency

Precise navigation,
powered by Europe



EGNOS implementation



**EGNOS ANNUAL WORKSHOP WILL TAKE
PLACE DURING THE EU SPACE WEEK THIS YEAR**

3 - 6 DECEMBER 2018, MARSEILLE

SAVE THE DATE

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SPACE
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PBN Implementing Rule



The long awaited PBN Implementing Rule was finally published as [Commission Implementing Regulation \(EU\) 2018/1048](#) on the 16th of July 2018 underlining the benefits of PBN to the increasing demands on the use of airspace in terms of safety, capacity and efficiency through the optimization of air traffic routes and instrument approach procedures. In particular, the Rule emphasizes the safety and cost-efficiency considerations brought by EGNOS when establishing LPV approaches. The Regulation applies to Air Traffic Management/ Air Navigation Services (ATM/ANS) providers and aerodromes operators responsible for establishing instrument approach procedures or air traffic service (ATS) routes. It enquires them to ensure a smooth and safe transition and to consult all involved parties while drafting a transition plan which must be deferred to the competent authority.

In a nutshell, the Regulation mandates by December 2020 the implementation of LNAV, LNAV/VNAV and LPV approach procedures at all

instrument runway ends and, where required due to traffic density or traffic complexity, radius to fix (RF) legs.

For those instrument runway ends already served by precision approach procedures the mandate is extended until January 2024.

Additionally, the Regulation requests that all ATS routes for en-route operations shall be implemented in accordance with the requirements of RNAV 5 specification by December 2020 for that above FL 150 and by January 2024 for that below FL 150. Similarly, by the latter date, where SID routes or STAR routes have been established, at least one shall be based on RNAV 1 specification extending the mandate to all routes by June 2030. From that date onwards, June 2030, all phases of flight should be based on PBN implementations, being conventional navigation restricted to a backup role (with the exception of CAT II, CAT IIIA or CAT IIIB operations).

This significantly remarks the role and importance of EGNOS as a key enabler of PBN.

Talking about EDAS NTRIP benefits with... TOPCON

EDAS NTRIP: A NEW CORRECTION SERVICE FOR TOPCON AGRICULTURE CUSTOMERS

Julián Rioja oversees Product Marketing and Business Analytics at Topcon Precision Agriculture Europe. He is continuously looking for new technological solutions to provide a better answer to user needs. His next step is the implementation of the necessary business development actions within the company to make those solutions available to the farmer.

Could you, please, tell us a little bit about your company?

Topcon has two main divisions: eye care (solutions for eye surgery and medical treatments) and positioning. The positioning division includes the construction/machinery and agriculture sections. Topcon's Agriculture division, already well positioned as one of the main players, provides products and services for the precision farming industry worldwide; and is expected to significantly grow in the coming years due to the increase in food demand and the necessary field yield maximization.

Topcon Agriculture offers a wide range of GNSS based solutions to their customers. What is the importance of GNSS for precision agriculture?

Precise positioning is the key utility for the efficient implementation of any agriculture application. When talking about efficiency in this context, we need to think about the farmer who aims at maximizing the production with a limited number of resources (product, field extension, fuel, etc.); with great regards for the environmental aspects (e.g. controlled use of fertilizers and pesticides, reduced tillage, waste management, etc.); not forgetting the legal requirements (i.e. compliance to applicable laws demonstrated using georeferenced data).

Considering the expected growth of the worldwide population and hence of the food demand while the arable land surface is reduced, GNSS and precision farming will be two of the key assets, in order to maintain and improve over the current living standards in the coming years.



Tractor guided by EDAS Ntrip during the tests in York (UK)

Topcon Agriculture provides diverse GNSS solutions to a huge range of farming applications: from GPS standalone, for the most basic set-ups, to RTK radio based solutions for the most demanding use cases. Could you please explain the reasons for your interest in EDAS within this scenario in which several GNSS positioning solutions are already offered to your customers?

Based on the tests performed last year¹, with the support of ESSP, EDAS DGPS corrections consistently contributed in keeping the pass-to-pass accuracies in the range of 10-20cm, while up to a distance of approximately 250 km from the target EGNOS station.



Topcon Agriculture and ESSP teams during the EDAS Ntrip test campaign in Seville area (Spain)

The EDAS DGNSS corrections can clearly support a performance level which, for the appropriate users and locations, will fill the gap between the L-band commercial correction services and the free-of-charge alternatives by improving the latter's rest of performance levels.

We consider the EDAS DGNSS corrections can be a very attractive alternative for many European farmers with no need for centimeter level accuracies and reluctant to pay for a subscription: EDAS will improve the efficiency of their operations with a free-of-charge correction service. This service would be even more attractive if the whole EU territory were covered by a denser EGNOS stations network.

From a marketing perspective, the fact that EDAS is a European public service represents an added-value when approaching customers.

Based on your experience, who could be the typical farmer using EDAS DGNSS corrections?

We expect different types of users to benefit from EDAS:

- In the cereal business, EDAS DGNSS corrections can be of interest for those farmers that are

currently working with a basic GNSS solution.

- In general, those farmers which are reluctant to pay for a subscription to a commercial correction service.

- Those farmers who are subscribers of a centimeter level performance service, but do not require so much accuracy for their applications.

- Finally, we also think that EDAS DGNSS corrections can be an interesting fall-back service for RTK users (allowing them to perform at least some of their tasks when their RTK primary service is down).

In terms of agriculture applications, the EDAS DGNSS corrections

can support, at least, spraying/ spreading of any crop type and tilling and harvesting of cereal; therefore, we are convinced

that a large number of Topcon's customers will benefit from EDAS DGNSS corrections in the near future.

“ We are convinced that a large number of Topcon's customers will benefit from EDAS DGNSS corrections in the near future ”

¹ "EDAS (EGNOS Data Access Service) differential GPS corrections: a reliable free-of-charge alternative for precision farming in Europe"; ION GNSS+ 2018, J. Vázquez et al., ESSP SAS and Topcon Agriculture.

EGNOS Success Stories

JETCALL: EXPERIENCING EGNOS WHEN ILS WAS OUT OF SERVICE IN FRANKFURT

Credits: Reto Grubenmann



Jetcall is a German air ambulance operator transporting an excess of 400 patients each year, with missions from and to Europe, Asia, Africa, America and Australia.

Typically, air ambulance services are provided in an environment requiring a lot of flexibility in planning, very short activation times, 24h execution capability or mission profile.

Jetcall operations are available 24/7, which means that flight crews will frequently fly during night time or may have to face challenging and demanding situations from a meteorological point of view. In these conditions, availability of the most capable technology on board the aircraft becomes crucial to ensure the patient/s are transferred safely and on time to the medical centres where to continue their treatments and/or cares.

During the last quarter of 2017, the benefits provided by EGNOS became clear to ensure the resilience of Jetcall's services. In fact, by 14th September 2017, a couple of NOTAMs were published for Frankfurt Hahn (EDFH) airport, due to NDB maintenance works. As a consequence, "ALL STANDARD ILS OR LOC APCH PROC FROM IAF HAN NDB" were temporarily suspended.

The EGNOS-based LPV approaches published for EDFH remained unaffected by the NDB unavailability, and Jetcall's LPV-capable Learjet 45 was able to conduct SBAS CAT-I approaches during the period.

The pilots and patients on-board benefitted, in addition, from the smooth transitioning between flight segments of the on board avionics, down to the 200ft minima and the runway.

INNSBRUCK AIRPORT JOINS THE EGNOS FAMILY



Credits: Cristoph Plank

Performance Based Navigation (PBN) has a long history in Innsbruck, the picturesque capital city of the Austrian province Tyrol. Innsbruck has around 125,000 inhabitants and is located in the Inn Valley, surrounded by two mountain ranges with an elevation of up to 2,500m/8,200 feet.

Since its beginnings, **Innsbruck Airport** has always faced the challenge of accessibility under instrument flight rules (IFR) in inclement weather situations. Early ground-based navigation procedures evolved from a NDB approach to a localizer approach (a full ILS is not possible due to the winding Inn Valley's geometry) in the 1970s but always resulted in high approach minima in order to comply with ICAO regulations. Thus, in low ceiling or reduced visibility situations, the accessibility of Innsbruck airport became vastly compromised, leading to chronically high missed-approach and diversion rates. A first PBN revolution came in 2005, when **Austro Control** designed one of the world's first RNP AR (Required Navigation Performance, Authorization Required) approaches to Innsbruck's runway 26, cutting the decision height by half and being a major breakthrough in stabilizing all-weather operations, whilst attracting additional winter traffic. Later in 2012, Austro Control together with a number of operators who were involved in all phases of the development, also pioneered a PBN/conventional "hybrid procedure", by combining the existing localizer approach with the missed approach phase of the RNP procedure, providing

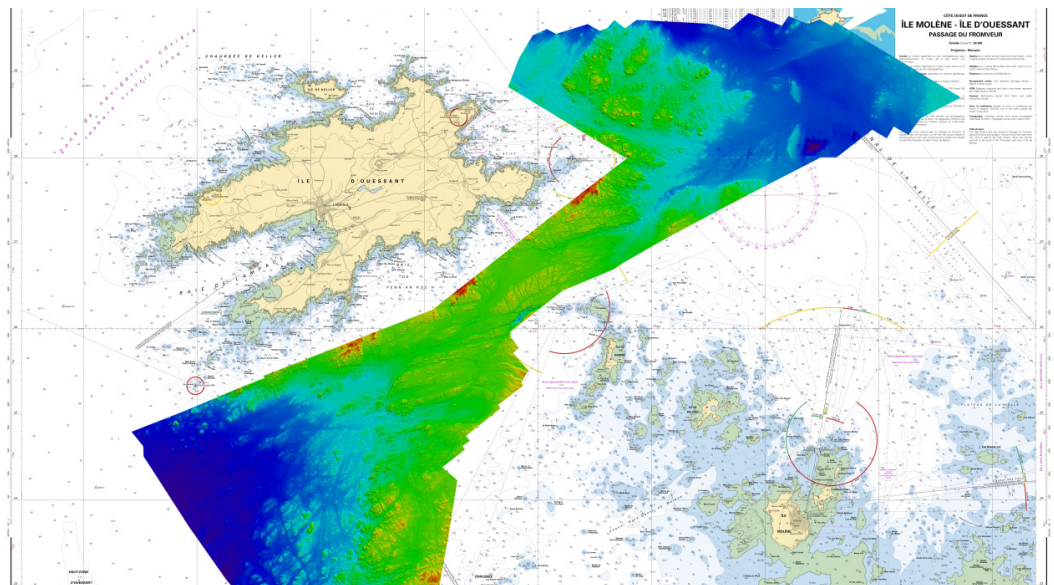
an additional 300ft reduction in the decision height over the RNP AR approach.

Finally, and in a logical evolution of innovative PBN tools available, Innsbruck has quite recently also entered the world of EGNOS approaches by featuring a full SBAS CAT-I procedure to runway 26, which particularly aims at serving the considerable business aviation operating at the alpine Airport. Again, the design was especially complex and challenging due to the surrounding mountains of the area. Actually, prior to the design phase we performed a quality assessment of the GPS/EGNOS Signal-In-Space by means of simulations and measurements on site. The analysis was carried out, within the framework of the GSA-funded IMPROWE project, by the German Aerospace Center (DLR) taking into account signal shading effects. The result showed that EGNOS LPV-200 Service Level is available despite potential high terrain masking values. As with any other flight procedure that has to be published in the national AIP, the procedure was properly flight inspected/validated.

Despite not having a lower minima than the above-mentioned LOC/RNP approach, the resulting LPV approach offers a high-quality vertical guidance based on SBAS CAT-I for the very first time in Innsbruck. The outcome is therefore a great success for airspace users and proves once again the fruitful cooperation between Austro Control, DLR, GSA, ESSP and the diverse airspace user community.

SHOM TAKES ADVANTAGE OF EGNOS IN HYDROGRAPHIC SURVEYS

Illustration of a survey carried out using EGNOS
Credits: Shom



As a public institution under the supervision of the French Ministry of Defence since 2007, **Shom** (The French Hydrographic Office) carries out different activities including the duties of a national hydrographic service and the support to defence and to government maritime and coastal policies. From Brest, Shom performs hydrographic activities to satisfy the needs of surface navigation in those waters under French jurisdiction and in the areas under the charting responsibility of France. Shom's mission is to describe the marine physical environment in its relations with the atmosphere, with the seabed and the coastal areas, to predict their evolution and to ensure the official dissemination of information necessary for maritime navigation.

As part of its mission to describe and forecast the marine physical environment, Shom is in charge of developing nautical charts in the French maritime boundaries, the second largest in the world with 11 million square kilometres. Following the international standard **IHO S-44**, some of the surveys required to get the data to compile the nautical charts are carried out using EGNOS to correct errors in the position. This S-44 standard specifies the maximum horizontal and vertical uncertainties of the soundings, and it is worth

mentioning that the positioning of the vessel is one of the major sources of the sounding position error budget.

Indeed, Shom is using EGNOS to correct the horizontal position error during IHO Order 2 hydrographic surveys "because this is as simple as using **GPS Standard Positioning Service** but is more accurate and insure minimal integrity". During IHO Order 1a/1b hydrographic surveys EGNOS is also used to reach a maximum horizontal uncertainty of $5m + 5\%$ of the depth at the position of the vessel. In these cases, EGNOS is used both close and far to the shore. "No need of RTK corrections that is an over shooting solution close to the shore. A real-time PPP service could be an alternative solution but EGNOS is free."

As an example, Shom has performed hydrographic surveys using EGNOS in some areas of the Mediterranean Sea, "Golfe de Gascogne" and "La Manche".

Over the years 2015-2017 Shom have used EGNOS in approximately 120 surveys.

Those surveys have been done using both Leica or Trimble GNSS receiver and Applanix motion sensor onboard survey vessels (BH2) Laplace, Borda and Lapérouse together with their hydrographic launches.

NEW HOLLAND: EGNOS PRESENT IN A WIDE RANGE OF PRODUCTS



Isabel González and Alfonso Majadas from New Holland's Ibérica in the training centre of Segovia (Spain)

New Holland is one of the top selling machinery manufacturers for agriculture, providing tractors, combine harvesters, balers, ploughs and tillage equipment, among others in Europe. GNSS guidance systems are nowadays essential equipment offered with New Holland's agricultural vehicles, as they allow farmers to improve the performance of their different tasks. In that sense, EGNOS is the basic GNSS correction solution, enhancing at no cost the accuracy provided by standalone GPS. For this reason, EGNOS is currently included by default in all the GNSS guidance devices commercialized, along with the farming vehicles, by New Holland.

In order to see first-hand how EGNOS works with New Holland's agricultural machinery, we visited the "Campus New Holland" located in Segovia (Spain). It is the only training centre that New Holland has in Europe, offering a wide variety of tractors and other machinery to be tested over a large field. During the tests, we could experience how easily EGNOS can be configured with the tractor's guidance display and applied to assist the farmer's driving along the defined guidance pattern.

EGNOS can even be employed with the New Holland's hydraulic autosteering solution, avoiding manual driving errors and reducing the farmer's fatigue.

Actually, New Holland's technical support may sometimes clarify EGNOS-related aspects to their customers, "farmers contact New Holland mainly to get information about EGNOS performance in field and to request technical support when having problems with the signal", comments Alfonso Majadas, responsible of Final Customer Training Support in New Holland Ibérica.

In order to better assist New Holland's dealers and customers, "all support teams are registered in the [EGNOS User Support Website](#) to consult EGNOS data and receive notifications related to current issues, such as outages or PRN changes", reports Isabel González, responsible of Marketing and Business Development for Precision Land Management in New Holland Ibérica. From their experience, Isabel and Alfonso confirm that EGNOS is especially useful for "those agricultural activities that do not require very high accuracy. We are talking, for instance, about tilling and spreading of cereal crops".

EGNOS services highlights

EGNOS APP : NEW FEATURES



The EGNOS App has been upgraded to version 2.0! This release comes full equipped with new functionalities, bug fixes and security improvements intended to ease comprehension and place at your disposal all the information you need. Being informed has never been so easy!

Dynamic real-time information is now a fact; with the brand new push notifications, the Apple Watch compatibility (iOS) and the real-time LPV-200 maps you will not miss out any relevant information related to the EGNOS Signal or its services.

You can manage your subscription to these notifications by yourself at any time through the "Settings" window within the EGNOS App.

Moreover, we have improved documents and graphs usability by enabling their download directly from the app. Images are now zoomable enabling you to delve into more details when looking for more information.

Upgrade now your app and stay tuned for future releases

Play Store



Apple Store



What's new?

Since last bulletin...

EGNOS WORKING AGREEMENTS SIGNED (EWA)

The following EWAs have been signed in the last quarter:



Arvidsjaur Airport **Sweden**



Härjedalen Sveg Airport **Sweden**

LPV & APV Baro procedures published per country(including AIRAC cycle 2018 #011 – 11/10/2018)

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	0	0	5	8	0	0	0
Belgium	5	9	0	0	0	0	0
Croatia	5	9	1	1	0	0	0
Czech Republic	5	9	0	0	0	1	4
Denmark	4	8	1	2	0	0	0
Estonia	1	2	0	0	0	0	0
Finland	1	2	0	0	0	17	33
France	68	103	48	67	0	3	4
Germany	23	37	9	14	0	21	53
Guernsey	1	2	0	0	0	0	0
Hungary	0	0	1	4	0	0	0
Ireland	2	4	0	0	0	0	0
Italy	11	25	4	4	0	0	0
Malta	1	2	1	2	0	0	0
Netherlands	3	4	0	0	0	0	0
Norway	17	26	9	19	0	5	10
Poland	0	0	12	26	0	0	0
Portugal	2	3	0	0	0	0	0
Romania	1	2	0	0	0	0	0
Slovak Republic	2	4	3	4	0	0	0
Spain	4	9	0	0	0	0	0
Sweden	8	14	0	0	0	0	1
Switzerland	7	8	3	5	5	0	0
United Kingdom	15	32	0	0	0	0	0
Total	186	314	97	156	5	47	105

NEW SAFETY OF LIFE SDD V3.2 RELEASED!



The GSA, under collaboration with ESSP, has published a new version of the [Service Definition Document \(SDD\) for the EGNOS Safety of Life service](#)! This long awaited release comes with a whole new collection of many important topics and improved performances.

The EGNOS Safety of Life service, supporting in particular safety-critical operations in the aviation domain such as Approaches with Vertical Guidance (APV-I) and Category I precision approaches, has extended the availability coverage in the APV-I and LPV-200 service levels. In particular, we congratulate to announce a significant LPV-200 extension in the North of Europe, with an important increase declared over Norway, Sweden and Finland. Now covering excellently most of the ECAC member states, check the new maps in the SDD and see how EGNOS Service Area has been improved!

Even more, are you a user from a state which is not member of the European Union? Now, with EGNOS plans to extend its use to the neighbouring countries, the service can be provided outside the EU territories, providing that certain SES Regulation requirements and conditions are met. If interested, we strongly encourage you to contact the corresponding actor, defined in section 3.2.2 (table 3-2) within the SDD. In addition, the use of EGNOS in some special cases as those airspace environments where Air Traffic Services (ATS) may not be provided, has been explicitly reflected for the first time, thus paving the way to extending the use of EGNOS to very challenging scenarios. Rotorcraft operators interested in EGNOS based Helicopter Emergency Medical Services (HEMS) operations, aerodrome operators functioning in non-ATS environments and other organisations with the corresponding approval of their competent authority are examples of actors who are not ANSPs but are eager to benefit from the use of EGNOS SoL services!

Finally, this new SDD release analyses for the first time the Performance Based Navigation (PBN) specifications and their relationship with SBAS, in particular with all EGNOS SoL Service Levels. This is displayed in a table that summarizes in a very comprehensive manner the relationship among International Civil Aviation Organization (ICAO) SiS performance requirements described in Annex 10, the PBN Navigation specifications described in the PBN Manual and the three EGNOS Service Levels (NPA, APV-I and LPV-200), profusely described in the SDD and considered key enablers.

Take a close look to the new SoL SDD, and do not hesitate to contact us in case you have any question!

NEW SERVICE IMPLEMENTATION ROADMAPS

The **Service Implementation Roadmaps (SIRs)** is one of the most important documentation releases from EGNOS, as its main target is to provide a high-level overview of the expected evolution for each of the EGNOS services: Safety of Life, Open Service and EDAS.

These evolutions are usually linked to the different EGNOS System Releases' (ESR) deployments and additional improvements and changes which are described within the documents. These enhancements are mainly focused and classified in 4 different areas, when relevant: System Evolutions, Service Area/Service Level, Service Robustness and User Interfaces.

Last July, a new highly improved version of the SIRs was published, and thus the information on the EGNOS evolution roadmap for the next three years has been made available to the community.



Credits: GSA

EGNOS SPACE SEGMENT UPDATE

Astra SES-5 GEO (PRN 136) was placed into the Operational Platform from 23/08/2018 at 9:45 UTC, while Inmarsat 3F2 GEO (PRN 120) was placed into Test Platform from 30/08/2018 at 11:36 UTC, as previously announced on the Service Implementation Roadmaps. Please note that GEO PRN 120 was kept on operational mode for one week to ease the transition to the new configuration.

Find below a summary table describing the operational GEOs during the mentioned time frame:

EGNOS GEO Name	PRN Number	Orbital Slot	Status BEFORE 23 rd August 2018 (09:45h UTC)	Status ON 23 rd August 2018 (09:45h UTC)	Status FROM 30 th August 2018 (11:36h UTC)
INMARSAT 3F2	PRN 120	15.5 W	Operational	Operational	Test
ASTRA-5B	PRN 123	31.5 E	Operational	Operational	Operational
SES-5	PRN 136	5 E	Test	Operational	Operational

We encourage EGNOS Users to configure the GEO Satellites described on the table above accordingly in order to retrieve the optimal solution. Nevertheless, you can contact the EGNOS Helpdesk at egnos-helpdesk@essp-sas.eu, submitting an EGNOS Helpdesk form or calling at +34 911 236 555

SBAS in the world

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.

WAAS LPVs

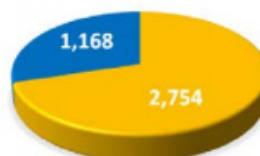
The table to the right reflects the continuing growth of satellite-based approach procedures. For more detailed information about satellite-based instrument approach procedures, please visit our GPS/WAAS Approach Procedures web page. http://www.faa.gov/about/office_org/headquarters_offices/ato/service_units/techops/navservices/gnss/approaches/index.cfm

Satellite-based Approach Procedures			
RNAV (GPS) Approaches	ILS Runways	Non-ILS Runways	Total
LPV Line of Minima	1,168	2,754	3,922
<250' Decision Altitude			1,073
Exactly 200' Decision Altitude			1,023
LP Line of Minima	4	664	668
LNAV Line of Minima	1,219	4,820	6,039
LNAV/VNAV Line of Minima	1,147	2,662	3,809
GPS Stand-Alone Procedures	1	52	53
GLS Approach	11		11

(Data as of July 19, 2018)

LPV UPDATE
3,922 TOTAL LPV'S PUBLISHED TO DATE

■ LPVs Published to non-ILS Runways
■ LPVs Published to ILS Runways



LP UPDATE
668 TOTAL LP'S PUBLISHED TO DATE

■ LPs Published to non-ILS Runways
■ LPs Published to ILS Runways



as of July 19, 2018

Did you know...?

During the last IWG held in Madrid (Spain) last January, the "SBAS facts" brochure, with information and figures from WAAS, EGNOS, GAGAN, MSAS and other SBAS systems currently under development, was revised and updated. This one-sheet document is available [here](#)

What's going on... in aviation.



EUROPEAN REGIONS AIRLINE ASSOCIATION: GENERAL ASSEMBLY



Over 300 delegates from European regional aviation leaders and key industry figures gathered in Edinburgh over the three days (9–11 October 2018) that the ERA General Assembly lasted. The event constitutes the main European congress on regional aviation and the EGNOS stand offered visitors once more the possibility to experience first-hand the benefits of EGNOS for Civil Aviation on a simulator.

Loganair staff had the chance to flight simulate the LPV approach to the Scottish Barra airport two days after their real scheduled flight to that beach as part of the congress side activities.

Attendees to the ERA Operations Group meeting, taking place in parallel to the event, were briefed by GSA on the status of the two current European satellite navigation programmes EGNOS and Galileo.

Did you know...?

that DFS has recently declared an ambitious plan for ILS rationalisation in Germany? A total of 14x CAT III and 11x CAT I ILS installations will be decommissioned by the end of 2030 or 2035 at 15 key airports including Frankfurt Main, Munich, Düsseldorf, Berlin-Schönefeld, Hamburg, Köln-Bonn, Stuttgart, Hannover, Leipzig-Halle, Nuremberg, Bremen, Dresden, Muenster-Osnabruck, Saarbrücken, and Erfurt-Weimar. DFS intends to replace these by GBAS and/or SBAS based approach procedures in accordance to the new European legislation that is expected to be in place by then



What's going on...



in aviation.

HELITECH



Netherlands' capital city Amsterdam was again the setting of the most prominent sectorial shows about the European helicopters and MRO (Maintenance, Repair and Overhaul) industries. The shows took place during the 16th and 18th October 2018.

Like during previous year, the EGNOS stand at Helitech raised a significant interest amongst

SAR&HEMS helicopter operators, avionics manufacturers and Part-21 (aka STC houses) organisations. The interest from the helicopter industry on LPV and PinS LPV approach procedures keeps growing year after year and both GSA and ESSP keep dedicating their efforts so as to facilitate the adoption of EGNOS by helicopter users.

Did you know...?

...that, starting from 1st January 2019, aircraft inbound to Nice-Côte d'Azur Airport (LFMN) under general air traffic using IFR must be equipped with an area navigation system in conformity with the RNP APCH navigation specification? Actually, the default approach procedures to be used for in RWYs 04L/R and 22L/R will be RNP APCH, and conventional approaches, including ILS, will be in use in exceptional circumstances. All information can be found in [AIC FRANCE A 10/18](#)

in surveying.



INTERGEO 2018



INTERGEO, the main European conference and trade fair for geodesy, geoinformation and land management, took successfully place again last October in Frankfurt (Germany).

INTERGEO is one of the most important communications and networking forum for the geospatial community, with a high level of innovation from multiple industry segments: geolocation, UAVs (unmanned aerial vehicles), smart cities, digital construction, etc. This year's slogan was "Geoinformation – the DNA of digitalisation," stressing the importance of geospatial data as uniting element in the current technological era.

EGNOS was present in INTERGEO 2018, sharing the booth with the other two main European Commission space programmes: Copernicus and Galileo. Visitors were very interested in the capabilities of EGNOS for mapping and surveying, as it is a consolidated free-of-charge solution that provides submetric geolocation accuracy all over Europe. EGNOS can therefore support activities such as determination of areas and perimeters, inventory and control of assets, and management of natural environments, among others. In addition, the combination of EGNOS with Galileo and Copernicus widens the range and scope of these geospatial applications.

What's going on...



in maritime.

PILOT PROJECTS FOR THE TRANSMISSION OF EGNOS CORRECTIONS VIA IALA BEACONS AND AIS/VDES STATIONS

Photo by kinsey on Unsplash!



The four pilot projects implemented in phase 2 will allow the generation of a full operational performance assessment together with a detailed Cost Benefit Analysis on the transmission of EGNOS corrections through IALA beacons and AIS stations

The use of SBAS corrections for navigation, in both coastal waters and inland waterways, has already brought the attention of many European authorities, which are interested in its potential to complement or replace their DGPS radio beacon networks.

The GSA has an active long-term trajectory working to foster the EGNOS adoption in maritime. In this line, the GSA awarded the consortium made up of ALG-Indra, ESSP and Alberding with a Specific Contract to 'Support to Maritime Service Providers for the transmission of EGNOS corrections via IALA beacons and AIS/VDES stations'.

The main objective of this ongoing project is to demonstrate the operational performance of the transmission of EGNOS corrections converted to Differential GPS corrections over the existing transmission infrastructure (AIS or VDES base stations/IALA beacons) in the Maritime and Inland Waterways domains, while providing a detailed cost benefit analysis of the solutions proposed.

A total of seven European Maritime and Inland Waterways (IWW) authorities take part in the project: CEREMA (France), GLA (United Kingdom), Kystverket (Norway), MRCC (Latvia), Puertos del Estado (Spain), RSOE (Hungary), and WSV

(Germany). In addition, four of these authorities (MRCC, Puertos del Estado, RSOE and WSV) are also providing their infrastructure to host a pilot project to demonstrate the operational performance of the transmission of the EGNOS corrections. They are also supporting the project by providing information to generate realistic cost benefit analysis and reviewing their outcomes afterwards.

The first phase of the project concluded successfully in April 2018, after verifying the feasibility of using EGNOS as a source for the DGNSS corrections through a set of preliminary tests performed without signal broadcast. The second phase, ending in January 2019, is aimed at deploying and testing via four pilot projects the EGNOS-based solutions in various European locations, maximising the number of alternatives in terms of broadcasting stations (AIS, IALA beacons) and domains (Inland Waterways, Maritime).

It is expected that the results of the project will increase the EGNOS awareness among the maritime and the inland waterways communities, as well as acting as a catalyst for the adoption of EGNOS in other sites and countries.

in rail.



EUROPEAN GNSS PROGRAMMES AT INNOTRANS 2018



For four days during the third week of September the focus in Berlin was on **InnoTrans** and EGNOS was present there at Hall 6.2. This edition boasted record exhibitor and trade visitor numbers: around 160.000 trade visitors from over 110 countries and 3.062 exhibiting companies and institutions from 61 countries, all of them contributing to the success of the world's leading trade fair for transport technology.

The Shift2Rail Joint Undertaking was presenting more than 20 innovative developments through live demos and speeches. Its several members showed the initial results after less than two years after the start. And it is worth mentioning that satellite positioning is one of the technologies

included in S2R innovation programmes to boost the enhancement of railway signalling systems. Satellite Technology for railways was presented at UNIFE stand, focused on highlighting the latest achievements in European H2020 projects STARS and the recently launched ERSAT GCC. STARS was focused on developing a universal approach to predict the achievable GNSS performance in a railway environment and ERSAT GCC aims at launching an operational line using satellite technology into ERTMS and to accelerate the standardization process at European level for the inclusion of satellite requirements into the new ERTMS specifications.

Did you know...?

The GSA has recently published an update of the E-GNSS in rail signalling roadmap. Do not miss it out, [here](#)

What's going on...



in GNSS.

E-GNSS AT ION GNSS+ 2018



ION GNSS+, the most important technical meeting of GNSS in the world, took place on 24-28 September in Miami.

This event attracts the best companies and researchers in the field of GNSS from all over the world, making it the place to be updated with ongoing and future developments in satellite navigation. EGNOS has been mentioned in many

different papers and conferences, including topics as [application of raw measurements for smartphones](#) or [implementation of SBAS services for enhanced maritime navigation](#) amongst others. Apart from that, the European Commission placed a stand where visitors could know more about EGNOS and Galileo and where they could fly a LPV approach with a [web-based flight simulator](#).

Upcoming Events

METSTRADE

13 - 15
Nov.

METSTRADE Show is the world's largest trade exhibition of equipment, materials and systems for the international marine leisure industry. All sorts of technologies related to boat construction and equipment will be showed there. Over 24,000 visitors representing 116 nationalities gather last year in Amsterdam. This global business platform and community focuses on innovation, market developments, and on-site networking.

**METS
TRADE** MARINE
EQUIPMENT
TRADE
SHOW

EGNOS will be present at Hall 1, Stand 01.500, as in past editions.

24th MARS CONFERENCE

21 - 22
Nov.

JRC, in collaboration with DG AGRI and the Croatian Paying Agency for Agriculture Fisheries and Rural Development organized MARS 24 conference. It will provide a platform to present and discuss Member States' experiences and general observations regarding the Integrated Administration and Control System (IACS), including developments in shared management. E-GNSS is one of the core technologies together with Copernicus being used in IACS.



24th MARS Conference

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EU SPACE PROGRAMMES



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For questions & information

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