EGNOS

EGNOS, it's there. Use it.

Credits: Embraer 190

European
Global Navigation
Satellite Systems
Agency

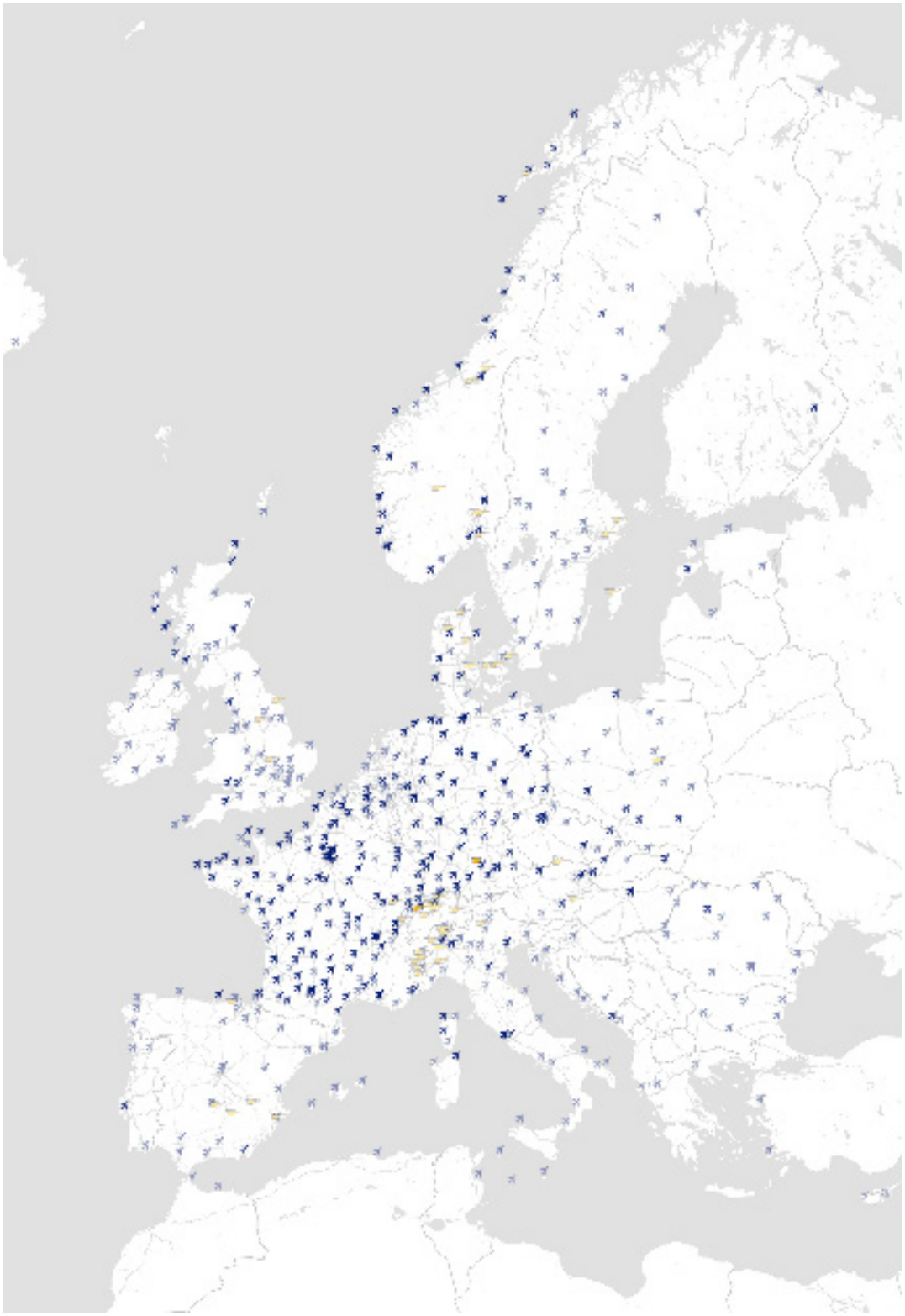
Precise navigation,
powered by Europe

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

ESSP

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

EGNOS implementation



Implementation status

- Operational airport
- Operational heliport
- Planned airport
- Planned heliport

EGNOS Success Stories

LPV Certification for Embraer E-Jet Family by Honeywell

Embraer achieved certification of the latest Honeywell Epic Load 27.1 Next Generation Flight Management System (NGFMS) for the Embraer E-Jet family (E170 / 175 / 190 / 195) in July 2016 (see link). Apart from major improvements in flight planning, performance predictions and efficiency, this upgrade enables operators to access to the latest next generation airspace navigation procedures including LPV approaches.

Credits: Embraer 175

LPV Approach capability was already certified and available today on the Embraer ERJ-135/140/145 as part of the FMS 6.1 Enhanced retrofit package to the FMZ-2000. With the certification of Epic Load 27.1 and the NG FMS, LPV approach became a selectable option on the E-Jet E1 too.

The Epic Load 27.1 retrofitting package includes the Basic NG FMS software, upgrades to the GNSSU and antennas along with the latest displays software upgrades to deliver LPV functionality to this workhorse of many regional fleets. The retrofitting costs are $83k per tail with an additional $66k for those units requiring also an upgrade to Pentium-M (i.e. those manufactured before Q2 2010 approx.). Honeywell has also enabled the development of LPV capabilities to other platforms such as Airbus A350s through their Multi Mode Receiver (MMR).

On the Boeing side, they are also working on the development of a next-generation Multi-Mode Receiver with SBAS capability to respond to the FAA's ADS-B out mandate; however, full LPV capability is not offered so far by Boeing in any of their programmes, being customer demand the driver for its introduction. According to our records, an optimistic timeframe for its entry into service in the Boeing platforms would be around 2020.

LPV upgrade at Spanish Air Force CECAF aircraft

Credits: Spanish Air Force CECAF's 403 Squadron

The Spanish Air Force is in the process of upgrading its flight inspection *mission* so as to flight validate EGNOS-based LPV approaches. The first aircraft should be ready during 2017 and it is expected this will facilitate the future deployment of the first procedures at some of their airbases.

According to Major Rubén Aladrén, 403 Squadron Leader at the Cartographic and Photographic Center (CECAF), *'Our Squadron has been pursuing for some time the introduction of this PBN capability. With the upgrade of our aircraft and due to the performances provided by EGNOS-based LPVs, we expect to accomplish RNAV flight inspection missions and operations'.*

Talking about EGNOS with... CONAPA

José Javier Santiago Ortiz, is Technical Director for Compañía Nacional de Peritos Agrícolas (CONAPA), with more than 15 years of experience Developing and Implementing new technologies in the Agricultural Sector. We are pioneers in the use of Drones, Soil Mapping and Monitoring Systems in real time of agricultural farms, developing projects and meeting the needs of both small farmers, large companies and Agri-food companies

Please can you explain the activities done by CONAPA that require positioning?

CONAPA develops a new business model, whose main objective is based on the implementation and development of new technologies in the agricultural sector. These technologies, based on the sensing, monitoring and data collection and parameters of crops and plantations, need a precise positioning to geo-refer the set of information obtained, in order to compare data from different periods, and to identify and adopt solutions with accuracy from the information obtained.

What kind of equipment are you using? Is there any new element entering into the scene?

Actually, RPAS are changing the way we work, as they allow to save time (in pre- RPAS times, we had to move with our sensors and positioning devices along the parcel) . Now we work with eBee drones of the Swiss brand Sensefly, with thermal and multispectral sensors. In the short term CONAPA will invest in a new equipment of soil mapping, Veris U3, which will obtain data of the soils analyzed (CE, pH, Organic matter).

Tracking control points in the field for soil mapping. CONAPA Courtesy

RPAS, the new way of of mapping fields Photos: CONAPA Courtesy

What are, in your opinion, the key elements and main benefits that EGNOS offers to companies providing services like the ones from CONAPA?

EGNOS significantly improves both the accuracy and stability of the GPS equipment. Our projects are developed in rural environments, and the reliability and coverage it provides, is fundamental to the success of our projects.

To conclude, what would be your message to other companies that need positioning services about the use of EGNOS?

It is an easy-to-use and very helpful tool to improve the GPS positioning of any equipment that requires high accuracy and maximum reliability. The agricultural sector is experiencing a new revolution through the introduction of certain information technologies such as the internet or the big data. In this area is where EGNOS and its positioning services are an indispensable aid to achieve this goal.

EGNOS services highlights

PRN Change

The GEO Satellites broadcasting EGNOS messages are going to be changed. On the 20th March, PRN 123 (now in test) will be introduced in the operational platform and on March the 21st, PRN 136 will be moved from the operational platform to the test one. For those users equipped with non (E)TSO certified SBAS receivers (ie. those used in agriculture, surveying, mapping, maritime –except aviation-), it is recommended to reassess the equipment configuration after the change is made, to ensure that both operational EGNOS GEO satellites (PRN 120 and PRN 123) are configured in the equipment. More details on this change are available in the official Service Notice#15.
Depending on the receiver, users can check equipment manuals or contact their product manufacturer/dealer.
Here, it can be found some material that explains how to configure an EGNOS receiver for some of the most common equipment used in agriculture. For any question or support you can contact EGNOS Helpdesk (egnos-helpdesk@essp-sas.eu)

EGNOS PROGRAMM UPDATE

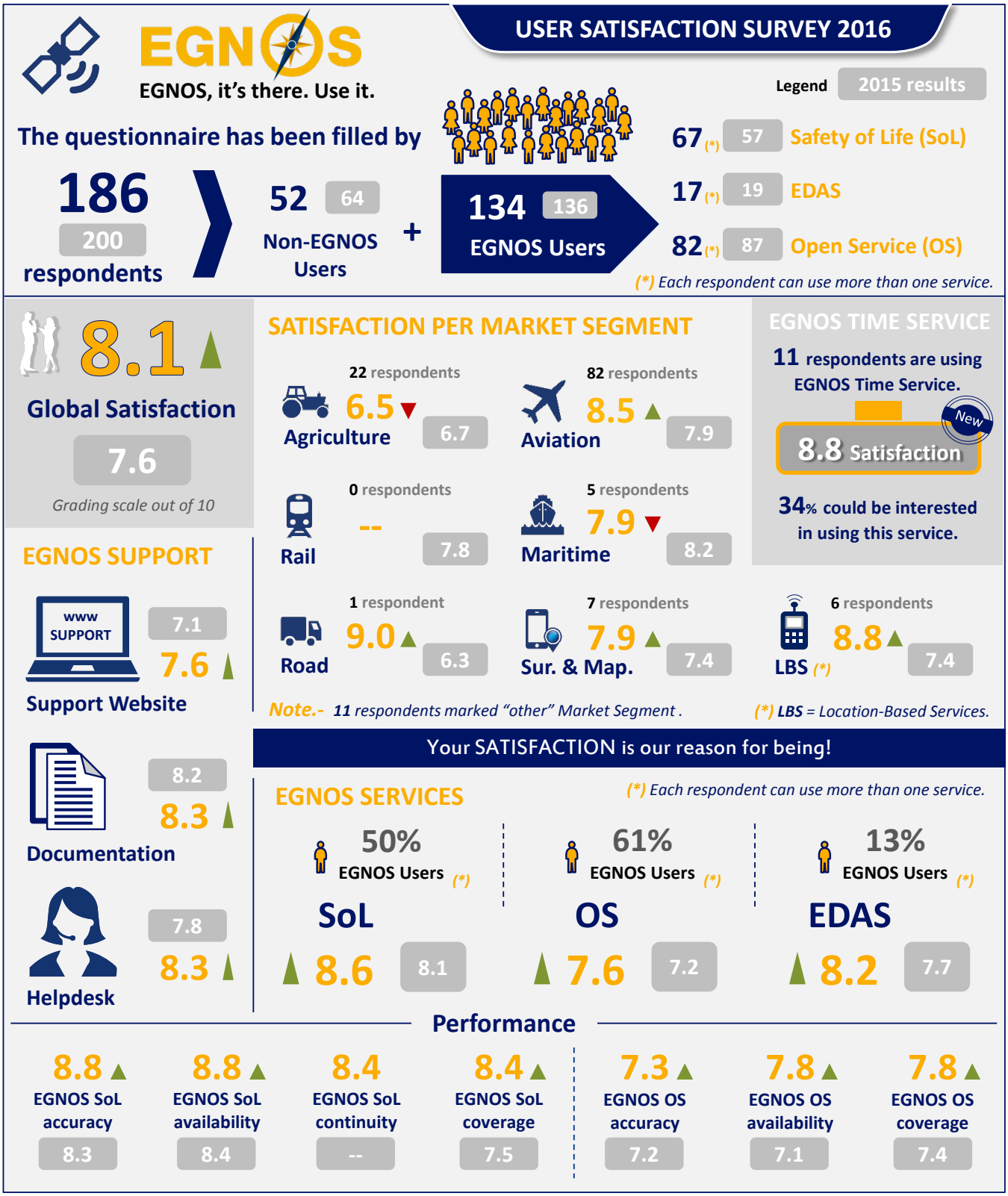
The organizing Institute of Space Technology and Space Applications (ISTA) of the Universitaet der Bundeswehr Muenchen invited experts from all over the world to the Munich Satellite Summit to talk about the latest news on Positioning, Navigation, and Timing as well as the necessity for backup solutions.
The conference started on March 14, 2017 with the Exhibition Opening and Champagne Reception at 16:30 hrs, followed by the Opening Plenary Panel at 17:15 hrs. Afterwards the Bavarian State Reception gave opportunities for high-level networking with experts from industry, science and government.
There was a dedicated session covering GNSS PROGRAM UPDATES with an specific EGNOS update presentation by Jean-Marc Pieplu, EGNOS Exploitation Program Manager, European GNSS Agency (GSA).

Did you know...?

...that the Latvian operator AirBaltic has received EASA certification for the modification of their Bombardier Dash8 Q400 to perform LPV operations? The STC, which was developed by the Canadian design organisation Canard, had been previously approved by the FAA in November and received EASA certification under STC number 10061069 on the 22nd of February.
The STC is based on the installation of Universal Avionics UNS-1Ew FMS, GPS/SBAS antennas and Blue Avionics BA-440 router/filter which feeds FMS data into the EGPWs computer during LPV approach to comply with former EASA regulation on "Excessive Downward Deviation From Glideslope" alerting for TAWS.

User satisfaction survey

The results from the User Satisfaction Survey 2016 are already available! Find in the infographics below some highlights



What's new?
Since last bulletin...

EGNOS WORKING AGREEMENTS SIGNED (EWA)

The following EWAs have been signed in the last quarter:


North West Airport CO.LTD **Ireland**


Donegal Airport **Ireland**

LPV & APV BARO PROCEDURES PUBLISHED PER COUNTRY (including last AIRAC cycle 2017#4 - 30/03/2017)

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	Airports – APV baro Procedures	# APV baro Procedures
Austria	2	2	2	4	0	0
Belgium	4	8	0	0	0	0
Croatia	1	1	0	0	0	0
Czech Republic	4	8	0	0	1	4
Denmark	4	8	0	0	0	0
Estonia	1	2	0	0	0	0
Finland	1	2	0	0	0	0
France	89	143	8	14	4	5
Germany	22	37	0	0	24	63
Guernsey	1	2	0	0	0	0
Italy	7	17	0	0	0	0
Netherlands	2	3	0	0	0	0
Norway	14	23	2	6	7	16
Poland	5	9	0	0	0	0
Portugal	1	2	0	0	0	0
Romania	1	2	0	0	0	0
Slovak Republic	2	4	1	1	0	0
Spain	2	3	0	0	0	0
Sweden	1	1	0	0	0	0
Switzerland	7	9	1	1	0	0
United Kingdom	10	20	0	0	0	0
Total	**181**	**306**	**15**	**30**	**36**	**88**

SBAS test bed in Australia

The Government of Australia has launched a program to build a test bed for a nationwide Satellite Based Augmentation System.
The two-year project will test two satellite positioning technologies including next generation SBAS (providing some decimetre accuracies) and Precise Point Positioning (getting to up to 5-cm accuracy). Currently, positioning technologies in Australia perform in the order of five to ten meters, being highly accurate positioning resources only available in certain areas and for specific professional groups.
With this initiative, Australia will join other areas in the world such as Europe, the US, Russia, India and Japan in the aim to enhance productivity through GNSS innovation.
For more information about the initiative and updates, visit the Geoscience Australia website.

WAAS

Table 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

	Procedures (Part 139 Airports)	Procedures (Non-Part 139 Airports)	Total Number of Procedures
RNAV (GPS) Approach **LNAV Line of Minima**	1,777	4,353	6,130
RNAV (GPS) Approach **LNAV/VNAV Line of Minima**	1,411	2,232	3,643
RNAV (GPS) Approach **LPV Line of Minima**	1,413	2,354	3,767
Non-ILS runway	*51*	*1,753*	*1,804*
ILS runway	*1,362*	*601*	*1,963*
RNAV (GPS) Approach **LPVs w/200' HAT**			963
RNAV (GPS) Approach **LP Line of Minima**	91	531	622
GPS Approach **GPS Stand-Alone Procedures**	6	77	83
GLS Approach	11	0	11

(Data as of February 2, 2017)

SBAS in Korea

KARI (Korea Aerospace Research Institute), on behalf of the South Korean Ministry of Land, Infrastructure and Transport (MOLIT), will receive the KASS (Korea Augmentation Satellite System) relying on technology developed as part of Europe's satellite navigation EGNOS system. South Korea will initially be using KASS to provide aeronautical applications, including Safety of Life services so that it can be used during different flight phases, especially landings. It will eventually extend these services to other applications, including maritime, road and rail. More information can be found at https://www.kari.re.kr/eng/sub03_06.do

Did you know...?

…that the Indian Government has warned domestic airlines of "consequences" if they do not use GAGAN, against the local mandate for all aircraft registered in India to be capable of flying with this SBAS by Jan. 1, 2019?

What's going on... in aviation.

FINAL APPROACH OPERATIONS SYMPOSIUM

The Final Approach Operations Symposium meeting (link) held in Brussels from the 31st of January to the 2nd of February gathered around 200 attendees from European Air Navigation Service Providers (ANSPs), Civil Aviation Authorities (CAAs), European Safety Agencies, Air Operators, Aerodrome Operators and industry.

The 3-day meeting elaborated on technical, standardisation and regulatory aspects of modern approaches from both ANSPs and airlines' perspectives, including procedure design, validation and Air Traffic Management matters. EGNOS was acknowledged in several occasions as one of the preferred technologies for approach operations, given the competitive performances provided by the so called RNP APCH procedures to LPV minima when compared to other approaches based on conventional navigation aids.

For instance, DSNA, the French ANSP, commented that SBAS (EGNOS) CAT-I is the perfect solution for their ongoing ILS rationalization campaign, which contribution to the national tax reduction program is estimated at €5M yearly savings. To DSNA, GPS+Baro is somewhat acceptable for a transition period, but not as a viable ILS backup strategy for the long term given its temperature and pressure dependency, as well as other human factors linked to QNH settings, which have a negative impact in safety.

Airbus and IFALPA (the International Federation of Air Line's Pilots Association) noted that also pilots prefer LPV approaches due to the easier and steadier navigation provided by the angular geometric guidance which mirrors, and improves, the look and feel of so well-known ILS one.

The case of Les Eplatures Airport, presented by Skyguide, was also of special interest for EGNOS. Situated in mountainous terrain, and being a non-instrument runway, ILS and LPV approach procedures are both limited to 500ft. In this scenario, where over 40% of served aircraft are EGNOS capable, LPV is much appreciated by pilots during ILS outages and even during ILS nominal conditions.

SESAR 2020 EXPLORATORY RESEARCH AND VERY LARGE SCALE DEMONSTRATIONS OPEN CALL

A new call for proposals was launched last 15th December 2016. The Call is included in the Horizon 2020 framework and managed by the SESAR Joint Undertaking. From a high level perspective, the SESAR JU call is divided into two blocks:

- Exploratory research activities, targeting to pushing the research state of the art beyond current paradigms, including the creation of the means to develop the best possible conditions for responsible collaborative research, and
- Very Large scale Demonstration activities, whose goal is to test new technological solutions on a comprehensive basis, showing the benefits and areas of improvement on a pre-operational environment.

Several EGNOS applications are aimed at being researched and demonstrated as part of this call, including, but not limited to, *Increased access to airports for low visibility mixed fleet operations, PBN Approaches, RNP transitions to LPV, Approaches with Vertical Guidance, Low-level IFR routes, or Safe Integration of Drones.*

Deadline for proposals submission is 11th May 2017. All the information, including the technical specifications, can be found in this link.

Did you know...?

...that there is a couple of LPV procedures published in Barra airport (Isle of Barra, Outer Hebrides, Scotland) since August 2016? This is the only airport in the world where scheduled flights use a beach as runway. No wonder why EGNOS is beneficial for this site…

Murdo MacLeod, courtesy of Guardian News and Media Ltd

What's going on... in aviation.

WORLD ATM CONGRESS 2017

Once again, EGNOS was present at the World ATM Congress. The event took place between the 7th and the 9th March in Madrid.

The EGNOS stand received dozens of visitors interested in the growing number of LPVs published in Europe. A lot of them also showed interest in extending the network of LPVs . Others that were not still aware of LPV benefits had the chance to experience them with the flight simulator.

Additionally, a presentation given by Victor Álvarez (ESSP) and Carmen Aguilera (GSA) showed the current implementation status, roadmap and funding opportunities for EGNOS in aviation.

Did you know...?

...that some States are already implementing the new procedure naming convention for PBN Instrument Approach Charts proposed by ICAO? An example of this adoption is Sweden. All the information is contained in Swedish circular AIC 3/2015, which in addition modifies the expected phraseology between pilots and ATC personnel.

in rail.

EGNOS (EDAS) FOR GOODS TRANSPORT TRACKING & TRACING APPLICATIONS

The European Research & Development project SCUTUM (SeCUring the EU GNSS adopTion in the dangeroUs Material transport), which ended in December 2011, succeeded in a wide adoption of EGNOS in Europe for tracking & tracing of dangerous goods transported by rail-road. This project demonstrated that EGNOS adds value to GPS alone thanks to a better accuracy and guaranteed positioning, resulting in higher confidence in the data. The SCUTUM project delivered a key document, laying out technical specifications to facilitate the development of products and applications based on EGNOS/EDAS: The CEN Workshop Agreement (CWA 16390), which defined a standardised set of data output from mass market receivers, enabling application developers and service providers to easily build their own software solutions based on EGNOS and EDAS.

CORE revising CWA 16390

On 18 January 2017, the CEN-CENELEC Management Centre hosted the kick-off meeting of a CEN Workshop aimed at the revision of CEN Workshop Agreement CWA 16390.
Launched within the frame of the European research project CORE (Consistently Optimized REsilient Secure Global Supply-Chains), the new CEN Workshop (CEN/WS CORE) will carry out a process of revision of CWA 16390 for considering obsolescence and technological evolutions, such as multi-GNSS capabilities (e.g. GLONASS, Galileo).

The new CORE project will also provide the necessary inputs to revised CWA 16390 for considering normal obsolescence and technological evolutions, such as multi-GNSS capabilities.

Participate in CEN/WS CORE Workshop

If you are a chipset manufacturer, logistics company, or another entity interested in participating in the Workshop (CEN/WS CORE), now it is time to join! For additional information and for the registration form, click here.

EDAS users's experience

The European Commission has started a study called EDAS-N to determine user requirements for the next generation of the EGNOS Data Access Service (EDAS) and to identify and define value-added services and products for the future EDAS. More information here.

What's going on... in maritime.

NEW SBAS WORKING GROUP WITHIN RTCM SC-104

During the meeting held in Portland (Oregon, US) in September 2016, Radio Technical Commission for Maritime Services (RTCM) SC-104 agreed to create a SBAS Working Group chaired by Stig Erik Christiansen (Kongsberg) and assisted by Sergio Magdaleno (ESSP).

The objective of the SBAS WG is to elaborate Guidelines for Manufacturers for the Implementation of SBAS in Shipborne Receivers, and corresponding Methods of Testing and Required Test Results, which is a key stone for the standardization of SBAS shipborne receivers in support to a future Safety-of-Life SBAS maritime service.

GSA, EC, ESA and ESSP are working together with receiver manufactures and other relevant maritime institutions and authorities to achieve this goal and enable the use of enhanced SBAS-based positioning on-board."

E-NAVIGATION UNDERWAY: A SHOWCASE OF PROGRESS AND TRENDS

The 7th e-Navigation Underway International conference was held from 31 January to 2 February, 2017. The theme for the conference was "e-Navigation: A Showcase of Progress and Trends". The conference was attended by 154 delegates, representing 28 countries and 8 international organisations.The e-navigation perspectives of the main maritime stakeholders were addressed: IHO, Harbour Masters, ship-owners, Pilots, etc. Special focus was put on the presented most recent progress in e-navigation concepts and developments. To be highlighted the lectures and discussions on the topics related to the Maritime cloud, Autonomous shipping, Cybersecurity, Maritime Service Portfolios and SMART Navigation. It was pointed out in several occasions how GNSS and notably EGNOS can provide realistic benefits to different e-navigation applications.

An EGNOS representative was there presenting the status of the activities in progress for an EGNOS service introduction in maritime and the EC different funding opportunities to support safety of navigation and search and rescue operations.
Detailed information can be found here.

Did you know...?

...that at the beginning of 2017, the European Commission launched the SEASOLAS project to study what such an EGNOS Maritime Safety Service should provide, based on new shipborne receivers that utilise EGNOS Dual Frequency GPS/Galileo capability. The final goal is to get feedback from the maritime community to prepare the next EGNOS Maritime Safety Service. Know more here.

Upcoming Events

AERO EXPO

5 - 8 April

A new edition of the Aero Friedrichshafen will be organized from 5 to 8 April, 2017. This is the leading European show for General Aviation, and will also count with EGNOS representation at stand A6-404. The show will also provide space for UAS enterprises (AeroDrones).

Hall/Stand No. A6-404

EUROPEAN NAVIGATION CONFERENCE

9 - 12 May

From 9 to 12th May, in Luasanne, Switzerland it takes place a new edition of this conference, focused on the Challenges to develop navigation tools and processes. See the full programme conference here. A number of EGNOS papers will be presented.

EBACE

22 - 24 May

At EBACE, business aircraft manufacturers, avionics firms, handling organizations, fractional providers, charter/lease companies and aircraft resellers will display their latest products and services. EBACE exhibits will showcase more than 500 exhibitors and 60 business aircraft on static display. It is the right place to meet with new and existing customers within business aviation. EGNOS will be present at Stand K69.

Stand K69

EGNOS

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

EGNOS HELPDESK

+34 911 236 555

egnos-helpdesk@essp-sas.eu

European
Global Navigation
Satellite Systems
Agency

ESSP

Precise navigation,
powered by Europe

http://egnos-portal.gsa.europa.eu/
http://www.essp-sas.eu/