EGNOS

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EGNOS BULLETIN

Issue 21, Q4 2016

PHOTO: GLOBE AIR

European Global Navigation Satellite Systems Agency

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ESSP

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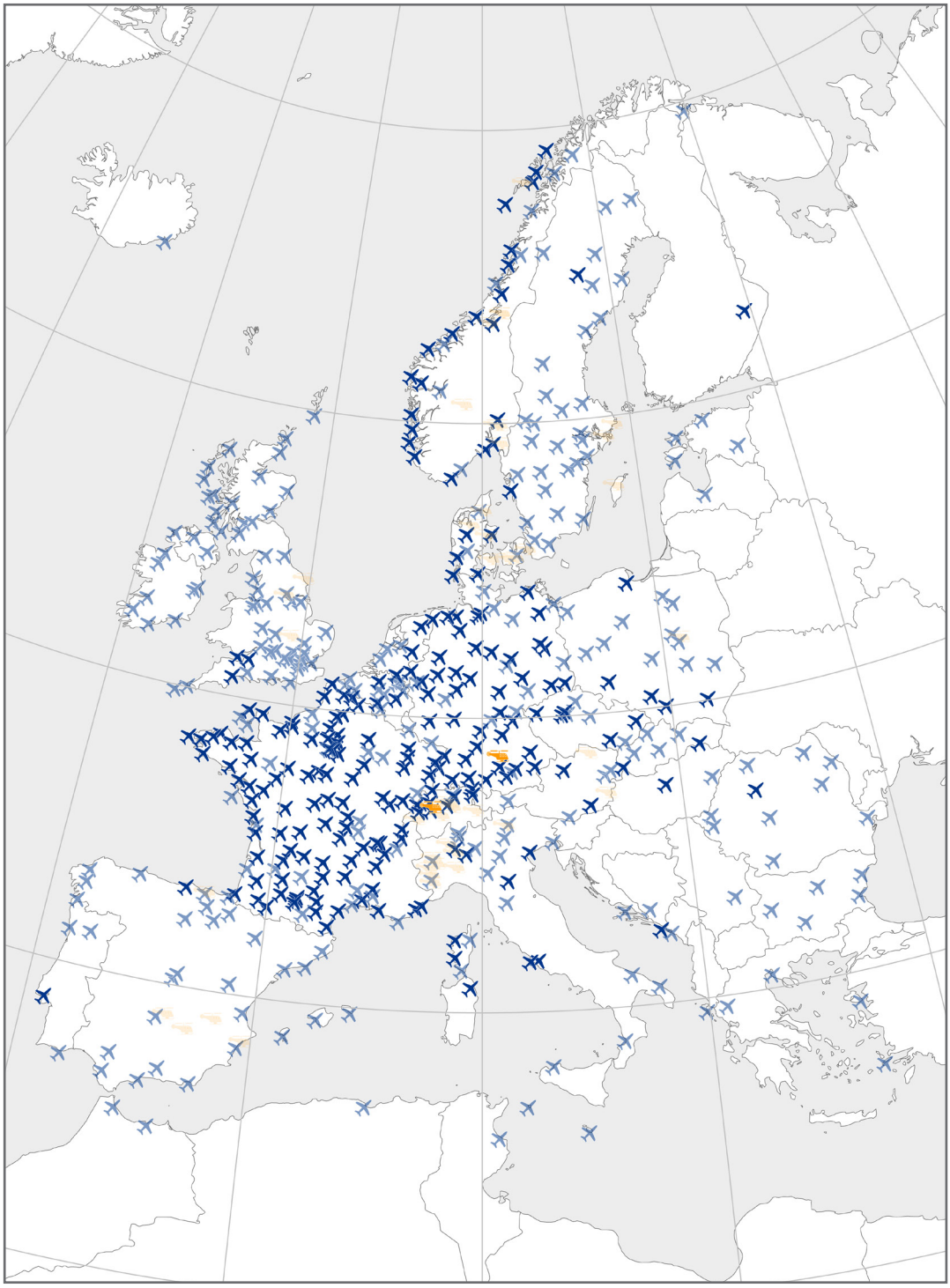
EGNOS implementation



Implementation Status

- Operational Airport
- Planned Airport
- Operational Heliport
- Planned Heliport

EGNOS Success Stories

Credits: GlobeAir

GLOBEAIR

Founded in 2007 and headquartered in Austria, GlobeAir was the first mover in the Air Taxi sector in Europe and it is currently one of the fastest growing private jet charter operators.

They operate a homogeneous fleet of 14 Citation Mustang jets and are certified for landing in more than 1,200 airports across Europe, which provides them with competitive charter flights solutions to modern executive travelers.

Back in 2015, and given the increasing number of LPV publications at their most frequent destinations, GlobeAir soon realised the potential of this technology for their daily operations. They then decided to pursue the necessary airworthiness certification and operational approval.

Samule Cortesi, Head of Flight Operations at that time, commented that "When we started to work on it, Austrocontrol had planned a few workshops in order to train personnel in their team. It was a subject completely new for our Authority as well. We retrieved the necessary evidences and documentation information, as well as guidance from other authorities like France and the UK, during 3 to 4 months. Afterward, the approval process itself was, fortunately, very fast, as no findings were reported."

> "The approval process itself was, fortunately, very fast"

GlobeAir had to provide appropriate training to the crew both theoretical and practical, which was carried out in a simulator or in dedicated training flights. Finally, they received the operational approval for LPV before the end of that year.

During the last 6 months (May to October 2016), GlobeAir has carried out over 2,300 flights to 125 different European destinations with published LPV or LPV-200 procedures, which accounted for over half of their flights during this period. Another 103 additional GlobeIAir destinations, representing 35% of their remaining traffic, have announced plans to implement LPV in the short term too. So, in practice, GlobeAir will be able to use their LPV functionality in the majority (i.e. 85%) of their regular flights.

Navigators in sailing competition choose EGNOS

Certainly, navigators are the ones within sailing competition who benefit the most from technological advances. Tablets, applications, tools and satellites have arrived to change their professional lives. In the past, the main role of the navigator was "to calculate the position of the boat, which consumed all the regatta time", as Nacho Postigo explains, navigator at Provezza, one of the monohulls competing in the 52 Super Series.

This monohulls' race brings together the best sailors in the world. Boat crews are made up of Olympic champions, America's Cup winners and also sailors that have been enshrined in offshore sailing as the Volvo Ocean Race.

> "EGNOS has been a great breakthrough for us"

Juan Vila, one of the most experienced sailors in the world, explains that "with the advent of GPS we got a helpful tool to navigate but its errors, which in some cases could reach until 16 meters, were of no use when we were fighting for each centimetre on the start line. We remained relying on human eye and the indications of the Bow, who told us how long it would take to reach the line".

Fortunately now, with the inclusion of EGNOS in the navigation system of the sailing boats, Vila has managed to substantially reduce the interval of error provided by GPS: "EGNOS has been a great breakthrough for us. Nowadays we can rely much more on computers to find out if we are well positioned in the start line. We can be much more accurate to reach the line between the Committee and the buoy. We are more confident on what the computer is telling us".

Sailors at the EGNOS Cascais Cup

The decisive step forward has been the arrival of EGNOS to the sailors' tablets

The decisive step forward has been the arrival of EGNOS to the sailors' tablets; a rather simple functionality in terms of implementation within the complex navigation systems used by professional sailors. In Vila's words: "SBAS is a feature that is usually configured in new navigation systems; therefore it is quite simple to take advantage of all the potential that EGNOS is offering".

Positioning under control makes the difference between success and failure in the 52 SUPER SERIES.

One of the turning points of the 52 Super Series, as in many other regatta, is the start line. It is probably the trickiest time, when the Navigator must rely on the accuracy of its on-board computer. The start is an equation driven by speed, position and choice of the perfect place on the line. In the past, the battle in the start line was a process of learning and expertise in which the Helmsman, the Bow and the Navigator had to mentally calculate the right moment to pass the start line without skipping the kickoff time.
Thanks to EGNOS, positioning is more accurate than the one obtained relying only in GPS. Navigation equipment provides the boat with data on its position and velocity, letting the navigators calculate when to cross the imaginary line that sets the race's start. This information, provided by EGNOS meets the accuracy needed for this demanding case. "Is extremely important to accurately measure our position with an error not greater than one meter and that is what EGNOS offers", says Nacho Postigo. His counterpart in the Italian team, the Azzurra, Bruno Zirilli, claims that "Europeans should be pleased of having our own European augmentation system".

Watch the video to learn more about the use of EGNOS in sailing competition.

EGNOS 52 SUPER SERIES Cascais Cup

Last regatta of the sixth edition of the 52 SUPER SERIES took place in Cascais from October 11th to October 15th 2016. ESSP sponsored this last regatta to promote EGNOS services in Europe.

The EGNOS 52 SUPER SERIES Cascais Cup, closed the season and Agustín Zulueta, CEO of the 52 SUPER SERIES, commented shortly before the regatta:
"We are excited to have the support of EGNOS at what promises to be a great finale to the season. Their partnership and interest adds real value to the regatta, a great endorsement of our circuit by a pan global operation which is fundamental to sailors worldwide."

Talking about EGNOS benefits with…

Letové Prevádzkové Služby Slovenskej Republiky

LPS SR is a state enterprise that provides Air Navigation Services at 5 locations in the Slovak Republic. The first EGNOS-based instrument approach procedures became available at Bratislava and Košice airports during early 2015 and, in this issue of the EGNOS Bulletin, we interview Ing. Rastislav Primus at LPS SR to find out how the implementation of new air navigation concepts is progressing in the Slovak Republic.

First of all, could you please give us a historical overview about the EGNOS-based procedures implementation in Slovakia? What were the drivers for the implementation?

With the background of an Air Traffic Controller and a Procedure Designer I was monitoring the development of B-RNAV procedures in the late 1990s, the appearance of variety of navigation applications afterwards and finally in 2008 introduction of the PBN concept, which brought more clarity on the area navigation, definitions and terminology. Consequently I attended a PBN - related courses organised by EUROCONTROL. The important event for EGNOS-based procedures implementation in the Slovak Republic was Toulouse ESSP service provision workshop in 2011, where the first implementation plans and contacts were established. Supported by ICAO A36-23 and A37-11 recommendations I got a green light as Head of ATM Planning and Procedures Department to implement RNP approaches, LPVs included. The important driver fostering the use of EGNOS in aviation domain was European grant system given by the GSA.

Which were the first Slovak airports covered by the EGNOS-based LPVs?

The first RNP approaches down to all three minima (LNAV, LNAV/VNAV and LPV) were published at the main Slovak airports, Bratislava/M. R. Štefánik and Košice, on 23.12.2014. The whole implementation process was carried out under the framework of the project ACCEPTA (ACCelerating EGNOS AdoPTion in Aviation) funded by GSA. It took us almost 3 years from the feasibility report, through procedure design, validation, safety assessment, EWA preparation and ATCO training to make the procedures effective. The project was a great opportunity for all the parties involved to learn and gain experience from related activities. LPS SR was awarded for the first LPV implementation at World ATM Congress 2015 in Madrid accordingly.

Which will be the next Slovak airports benefitting from LPVs?

The next Call for Proposals for the acceleration of EGNOS adoption in the field of civil aviation launched by the GSA found LPS SR prepared. LPS SR together with AustroControl and DLR has succeeded in the project IMPROWE (IMPlementing RNP APCH Operations With Egnos). Among the main project objectives counts the implementation of RNP approaches down to all three minima at regional airports (where ANS

Žilina Airport. Photo credit: Jan Stehlik

are provided by LPS SR); namely Pieštany, Žilina and Poprad-Tatry. Since EGNOS allows the aircraft to fly down to LPV minima, as low as 200 ft DH, we decided to design SBAS CAT I procedures by applying precision approach criteria. As for the milestones - RNP approaches at Pieštany Airport are going to be published on 22. 12. 2016, at Žilina Airport on 16.3.2017 and Poprad-Tatry Airport on 06.07.2017. A significant operational benefit will be the implementation of procedures to RWY09 at Poprad-Tatry Airport.

How are you progressing in Performance Based Navigation concept implementation, and which do you consider are the most benefits brought by PBN, especially by EGNOS?

In November 2016 the Grant Agreement for new project SPICE was signed. The third PBN – related project is funded by INEA CEF Transport for the period of 2016-2020 and contains three objectives:

- to implement RNAV1/RNP1 operations within all TMAs where ANS are provided by LPS SR to fill the gap between PBN en-route operations (RNAV 5) and PBN approach procedures (RNP APCH). This enhancement of the procedures in terms of narrower legs, less distance flown and hence less fuel consumed and less emissions, makes the implementation of these kinds of operations very beneficial for the environment. Better noise abatement figures will be achieved with these improved procedures as well, as more urban areas can be avoided.
- to upgrade APV SBAS procedures in Bratislava and Košice to SBAS CAT I procedures, which improve the safety during the final phase of a flight significantly. It reduces the minima to a level equivalent to ILS CAT I approach, which can allow successful approaches in bad weather conditions (even in case the ILS is out of operation), which would otherwise cause a missed approach, delay or cancellation of the flight.
- the last but not least activity within the SPICE project is improvement of DME/DME coverage in main TMAs to have GNSS back-up available for the RNAV1 procedures. This redundancy to GNSS improves the safety of the PBN concept significantly.

Once the PBN concept with 3D approach procedures is implemented, what will be the next?

Once the RNAV1/RNP1 STARS will be connected with either RNP approaches and/or ILS systems, we would like to direct our attention to the Slovak military airports where LPS SR is providing procedure design. Furthermore, one or two RNP AR approaches in Bratislava and/or Žilina to non-instrument RWYs could be beneficial. In parallel we could expect some requests for EGNOS based operations by small non-instrument airfields or by helicopter operators. The project of covering main hospital heliports by PinS operations could be of significant usefulness.

And to finish, are you already slowing down? Christmas time is coming…

Actually yes, in December we managed to organize a PANS-OPS Advanced recurrent/refresher course at LPS SR headquarters provided by the Air Navigation Institute of Switzerland. The course covered the last amendments 6 & 7 to ICAO Doc 8168 PANS-OPS including the SBAS CAT I criteria. It was attended by participants from all over Europe and their positive feedback right after the course inspired us to organize this kind of event regularly in the future.
And this week we are awaiting a PBN Christmas present – publication of the first SBAS CAT I procedure in the Slovak Republic – at Pieštany Airport. Finally I would like to express my thanks to PBN community for the cooperation in 2016, wishing you a very happy festive season and all the best in the coming 2017.

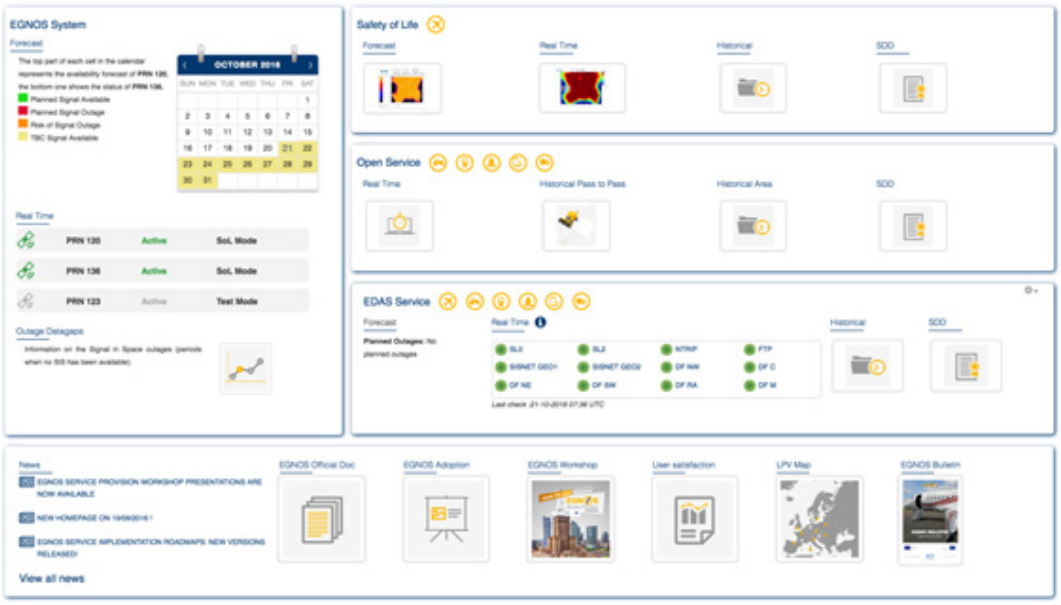
Meet the users

Rastislav Primus, Head of ATM Planning and Procedures Department at LPS SR. Graduated from Technical University Bratislava as an electrotechnical engineer in 1988. He started working for Slovak Air Navigation Services Provider in 1990. After almost 20 years of being an Air Traffic Controller at airport Sliac and Bratislava he has stepped into the field of procedure and airspace design in 2008. Since that time he has been involved in or managed projects related to Procedure and Airspace Design, focused mainly on PBN concept implementation at airports within the Slovak Republic.

EGNOS Services Highlights

EGNOS User Support

During 2016, some new features have been added to EGNOS User Support website. The most relevant change was the new dashboard added to the Home page:



New dashboard

This dashboard is created to ease users the access to information relevant to their domain.

The dashboard has 5 sections containing the following information:

- **EGNOS System:** General information for the past (Outage Datagaps), present (real time) and future (forecast) about EGNOS Signal Availability.
- **Safety of Life:** Forecast, real-time and historical information about SoL. When clicking on the availability maps, they are maximized to fit the size of the screen. There is also a direct link to the SoL Service Definition Document.
- **Open Service:** Open Service availability in Real Time, Historical pass-to-pass and navigation system error (NSE) information for all RIMSs. There is also direct a link to the OS Service Definition Document.
- **EDAS Service:** Planned outages, real time information of all EDAS services and Historical EDAS data gaps. There is also direct a link to the latest EDAS Definition Document.
- **News, documentation and tools:** Section to display the latest news, documentation, EGNOS adoption tools and any other relevant information for using EGNOS.

New Alerts available

Registered users can subscribe to new notifications which can be enabled in the profile section.

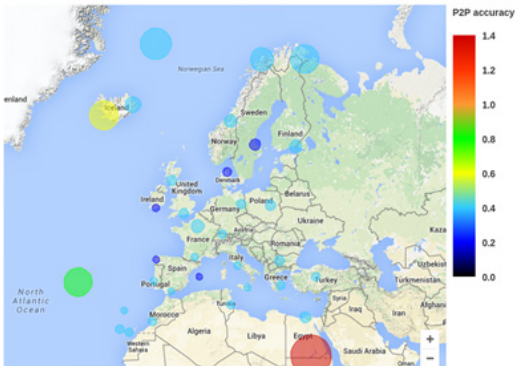
- **LPV-200 Availability Degradation Notifications.** Reporting by e-mail when the daily 99% LPV-200 availability is covering less than 80% of the LPV-200 service area as described in the applicable EGNOS SoL Service Definition Document (SDD). These notifications are sent when planned degradations are foreseen or when unplanned degradations occur.

- **Open Service Availability Degradation Notifications.** Reporting by e-mail when the daily OS availability is lower than 99% for more than 50% of the RIMS active according to the EGNOS OS Service Definition Document (SDD). These notifications are sent when planned degradations are foreseen or when unplanned degradations occur.

Pass-to-Pass accuracy

Another new feature added to EGNOS User Support Website is the short-term dynamic accuracy charts:

They represent, in a map or a table, the maximum cross-track error (in meters), for the North-South and East-West directions, computed according to ISO 12188 standards. This magnitude, calculated using static data at every RIMS site, provides a measure of the **EGNOS pass-to-pass** accuracy parameter widely used in agriculture. Although two directions (N-S and E-W) are taken as reference for calculations, any other direction selected by the user would show similar pass-to-



New RIMS deployed in Israel

On the 21st of September, 2016, a new Receiver Integrity Monitoring Station (RIMS) was deployed in Haifa, Israel. It will be integrated in the EGNOS TEST platform in the coming months. This deployment was announced on the European Global Navigation Satellite Systems in Israel (EGNIS) technical workshop.

What's new?
Since last bulletin...

EGNOS WORKING AGREEMENTS (EWA) SIGNED

The following EWAs have been signed in the last quarter:

Malta Air Traffic Services Ltd (MATS)
Malta

AFIS Sonderborg
Denmark

Norwich Airport Ltd
United Kingdom

LPV & APV BARO PROCEDURES PUBLISHED PER COUNTRY

(including last AIRAC cycle 2016 #13 – 08/12/2016)

Next table shows, for each country:

- the number of airports with LPV (APV and CAT-I) procedures, as well as the total number of procedures;
- the number of airports with APV Baro procedures authorised to be flown with EGNOS vertical guidance as well as the total number of 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	0	0	0	0
Belgium	3	5	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
Finland	1	2	0	0	0	0
France	86	140	6	11	4	5
Germany	22	37	0	0	24	63
Guernsey	1	2	0	0	0	0
Hungary	0	0	1	4	0	0
Italy	7	17	0	0	0	0
Netherlands	2	3	0	0	0	0
Norway	13	22	1	4	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	0	0	0	0
Spain	1	2	0	0	0	0
Sweden	2	3	0	0	0	0
Switzerland	7	9	1	1	0	0
United Kingdom	3	6	0	0	0	0
Total	**168**	**284**	**9**	**20**	**36**	**88**

SBAS in the world

Satellite-based Approach Procedures	Procedures (Part 139 Airports)	Procedures (Non-Part 139 Airports)	Total Number of Procedures
RNAV (GPS) Approach **LNAV Line of Minima**	1,775	4,332	6,107
RNAV (GPS) Approach **LNAV/VNAV Line of Minima**	1,401	2,198	3,599
RNAV (GPS) Approach **LPV Line of Minima**	1,403	2,319	3,722
Non-ILS runway	*51*	*1,724*	*1,775*
ILS runway	*1,352*	*595*	*1,947*
RNAV (GPS) Approach **LPVs w/200' HAT**			949
RNAV (GPS) Approach **LP Line of Minima**	88	533	621
GPS Approach **GPS Stand-Alone Procedures**	8	78	86
GLS Approach	11	0	11
(Data as of September 15, 2016)			

WAAS APPROACH PROCEDURES

Table shows the WAAS list of satellite-based approach procedures. You can find further information on SatNav news.

Courtesy of the FAA WAAS Team

MSAS

As of September 2016, RNAV / RNP approaches in 60 Japanese airports:

RNAV Approach serving **19** airports

RNP AR Approach serving **17** airports

RNP Approach serving **18** airports

Basic RNP 1 serving **24** airports

RNAV1 serving **37** airports

For further details click here (slide 92).

GAGAN MANDATE

Indian Civil Aviation released on 15th June 2016 an Aviation Policy (see link) recognizing the benefits of SBAS implementation and mandating all aircraft being registered in India from 1st January 2019 to be GAGAN enabled. The Airports Authority of India (AAI) will explore opportunities to incentivize airlines by way of concessions in ANS charges for getting their existing aircraft retrofitted with GAGAN receivers.

Additionally, AAI has carried out extensive ground/obstacle surveys at 24 airports and designed instrument flight procedures for 8 runway ends.

Find out more on latest GAGAN newsletter here.

What's going on... in aviation.

ERA GENERAL ASSEMBLY 2016

Madrid hosted the 2017 ERA General Assembly taking place on 11-13 October. Gathering a total of around 340 delegates, including 93 from 39 different airlines, this event constitutes the main European event on regional aviation. EGNOS was again present through a stand where visitors were briefed about the benefits of EGNOS for Civil Aviation, including the latest updates about available retrofit solutions for their fleets of regional jets and turboprops. Attendees to the ERA Operations Group meeting, taking place in parallel to the event, were briefed about how to benefit from European funding programmes in order to start flying with EGNOS at their destinations.

Did you know…?

…that there are currently two funding opportunities available for EGNOS related topics:

- The 2016 CEF Transport Calls for Proposals was launched on 13th October 2016 and will remain open until 7th February 2017. There are around €100M available for the so called cohesion countries (at 80% funding rate) and around €300M for the general call, which provides 50% funding for land based components and 20% for on-board. In the "Other Projects" category within the general call, the use of EGNOS is clearly identified aiming at achieving at least LPV-200 approach minima by the end of 2019.
- A new H2020-Galileo-2017-1 Call was launched on the 8th of November 2016 and will remain open until the 1st of March 2017. Specifically, the call addresses four European GNSS topics: EGNSS transport (€14.5M), mass market (€9M) and professional (€8M) applications (70% funded) as well as awareness rising and capacity building (€1.5M, 100% funded).

HELITECH 2016

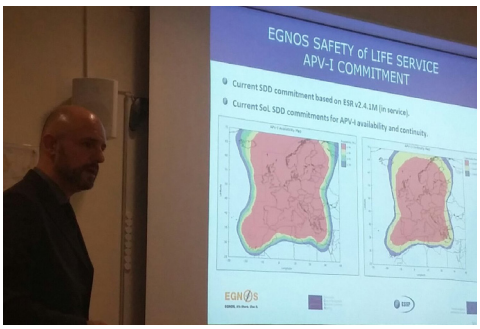
The most prominent sectorial meeting for the European helicopters industry took place last 11-13 October in Amsterdam. EGNOS was represented there with a stand. A keynote on helicopter EGNOS operations was also part of the Conference Sessions agenda.

PBN WORKSHOP IN BODØ

The Norwegian CAA invited ESSP to a PBN workshop on the 17th of November in Bodø (Norway), where a number of operators (Widerøe, SAS, Norwegian Air Shuttle, Lufttransport and CHC), plus Avinor, the Military, the Norwegian Space Agency and representatives of the CAA itself met to know about the new Norwegian PBN plan and related topics.

Two representatives from ESSP attended this meeting, and the audience received the presentation on EGNOS very positively; some of them provided questions which showed particular interest on the system, remarkably on the EGNOS signal coverage and company SBAS procedures for helicopters.

The Norwegian stakeholders are quite motivated about the implementation of PBN and EGNOS operations in particular, being this just an example of their commitment.



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.

What's going on... in maritime.

WORKSHOP ON THE MARITIME USE OF EGNOS

Co-organised by the European Maritime Radionavigation Forum (EMRF), the European GNSS Agency (GSA) and the European Space Agency (ESA), the last edition of the EMRF/NMSP Workshop on the Maritime Use of EGNOS was held on September 29th in Warsaw.

After a joint introduction from the organisers, this one-day workshop began with the GSA presentation of the main objectives and activities for the provision and adoption of an EGNOS service for maritime navigation.

The next point in the agenda was focused on the transmission of EGNOS corrections over the existing maritime infrastructure: IALA beacons and AIS stations. A detailed assessment of more than 20 EGNOS based architectures was performed (proposed by different parties) and presented by ESSP. The objective of this analysis was to identify the most promising EGNOS based architecture(s) to be considered for deployment in an operational environment. Besides, ESSP also provided an overview of the CBA methodology for recapitalization of IALA DGNSS and AIS networks using EGNOS.

After that, it was time to address the status of the EGNOS Service Provision activities, developed in the framework of the Service Provision Working Group (SP-WG). The chair of the WG described the objectives and the concept of EGNOS Service Provision, together with the four potential service provision schemes defined within the technical note for maritime.

The next point in the agenda was the presentation of the draft Guidelines for SBAS Receivers developed by ESSP in coordination with GSA, EC and ESA. The objective of these guidelines is to serve as the basis for the development of a minimum standard (test specifications) for SBAS receivers. This work is progressing in the frame of RTCM SC-104.

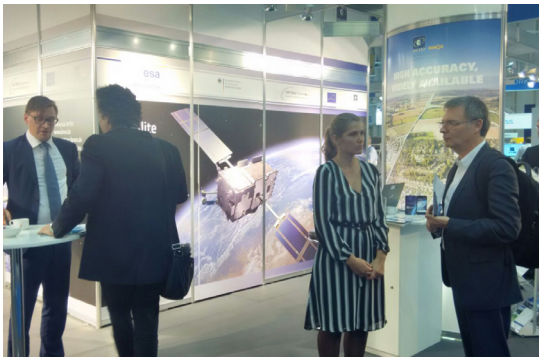
As a summary, the whole progress of the activities related to the EGNOS use for maritime was presented during the meeting. The workshop was very productive, with many interactions from the maritime community. The topics addressed during the workshop had a very good reception by the different meeting attendees, providing feedback and comments to each topic presented.

EGNOS WAS PRESENT AT METS

It is the third consecutive year that EGNOS is present at METS, the world's largest marine equipment trade show for the leisure industry that took place in Amsterdam from the 15th to the 17th of November.
The 2016 edition of the the Marine Equipment Trade Show has once again broken all previous records for exhibitor and visitor attendance, joining together more than 21,000 international marine industry professionals.

EGNOS was located in the exhibition at Hall 1, surrounded by the most representative manufacturers of navigation equipment and AIS devices: Furuno, Navico, Garmin, Comnav, Raymarine, McMurdo, Standard Horizon, Weatherdock, etc.

in agriculture & mapping.



INTERGEO

DVW – the German Society for Geodesy, Geoinformation and Land Management, organized one more year INTERGEO, from 11th to 13th October. This event is one of the largest and more relevant in Europe in relation with Surveying, GNSS and GIS Solutions within other topics. EGNSS and EGNOS in particular were present in a stand. For further information on EGNSS presence, click here.

MONITORING AGRICULTURAL RESOURCES CONFERENCE 2016

On the 24th and 25th November, it took place the MARS conference, a platform to present Member State experiences on the Integrated Administration and Control System (IACS) as well as the so-called On the Spots Checks (OTSC).

It was great opportunity to get in contact with Member State Paying Agencies involved in the CAP administrations to assess the use of GNSS and EGNOS in particular in their routine operations.

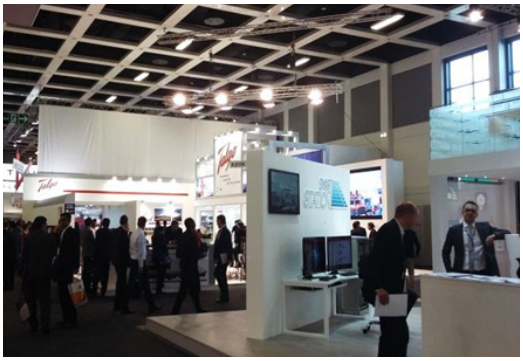
Did you know…?

…that a large number of VFR Avionics are already EGNOS equipped? This is the case for example of German manufacturer Moving Terrain and its MT-EFIS, which incorporates a GPS/SBAS sensor to increase the accuracy and reliability of its displayed information. See link.

What's going on... in rail.

INNOTRANS 2016

Innotrans is the most important showroom on railway technology in Europe, which is scheduled every two years. This edition took place on 20-23 September in Berlin. EGNOS and Galileo had also its corner in this huge exhibition. From last event, some differences are worth highlighting: the interest about E-GNSS seems growing and the first SBAS-enabled products are starting to be advertised.



"EGNOS POSITIONING IN RAIL DOMAIN" PRESENTED AT INC

The GNSS electromagnetic environment of a railway line is characterised through the identification of interference sources and GNSS blockers. Besides, some parameters are defined as key to monitor them in real time. The target of this GNSS monitoring is to mitigate in advance unavailable GPS+EGNOS positioning by switching to PVT solutions which could use different sensors. The presentation provided in the Internation Navigation Conference at Glasgow, organized by the Royal Institute of Navigation, and the corresponding paper to be published in the Conference proceedings ("EGNOS positioning in rail domain (ERSAT EAV)") is to show, on one hand, the use of EGNOS for positioning in a true railway line and dynamic conditions and, on the other hand, the track environment characterisation when GPS+EGNOS positioning is unavailable.
Both the presentation and the paper contain information from a GNSS data campaign performed in Sardinia on January 27th 2016 by ESSP in collaboration with CEIT in the framework of the ERSAT project.

in GNSS.

SATELLITE MASTERS

From 25th to 27th October, the 2016 Satellite Masters Conference took place in Madrid, devoted to innovative applications for Copernicus and EGNSS. This event is the innovation marketplace for satellite downstream business connecting high-level representatives from leading institutions and forward-thinking industry with thriving startups and award-winning entrepreneurs. Click here to download all the presentations or read the article on GPS World about the European Satellite Navigation Competition winning project, GUAPO.

ION GNSS+ 2016

This year, the ION GNSS+ conference took place on 12-16 September, at the Oregon Convention Center in Portland. ION GNSS+ is the world's largest technical meeting of GNSS technology, products and services, bringing 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.
ESSP attended this edition and presented three papers addressing different EGNOS related subjects and targeting different user communities:

- "EDAS (EGNOS Data Access Service): Differential GNSS Corrections for Land Applications" as part of the Land-Based Applications session.
- "EDAS for a DGPS Maritime Service: EGNOS Based VRS Performance with Pre-Broadcast Integrity Monitoring" within the Marine Applications session.
- "Impact of TEC depletion in EGNOS accuracy" as part of the Atmospheric Science session.

ITSNT

On 15th and 16th November 2016, the International Technical Symposium on Navigation and Timing (ITSNT) took place in the Ecole Nationale de l'Aviation Civile (ENAC), in Toulouse, France. This annual event gathered together internationally recognized speakers, professionals and researchers working in navigation and timing technologies. GNSS/SBAS Navigation System and Performance, Positioning in Challenging Environments, Air Navigation and a session devoted to PhD studies were the main topics covered during the Symposium. Round tables facilitated discussions at the end of each session, giving the possibility to share opinions, concerns and ideas within the scientific and technologic community and to increase its worldwide network. This was an opportunity for key GNSS experts to share their knowledge on EGNOS.

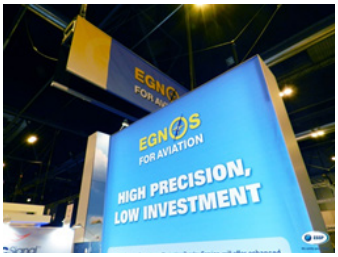
Upcoming Events

World ATM Congress 2016
Operated by CANSO in association with ATCA

WORLD ATM CONGRESS

7-9 March

A new edition of the World ATM Congress, the most important Air Navigation Services Providers (ANSPs) congress in the world, will be held again in Madrid between 7th and 19th March, 2017. Operated by CANSO BV in association with the Air Traffic Control Association (ATCA), the event provides an excellent opportunity for worldwide ANSPs and the ATM Industry to meet. Visitors will have the chance to walk the exhibition and enjoy a large number of free conferences. EGNOS, the European SBAS enabling the implementation of Localiser Procedures with Vertical guidance approach operations, will take part in this important showcase of the latest developments in Air Traffic Management, Communications, Navigation and Surveillance.



EGNOS will be present at booth 478. On March 7, a presentation will be provided at 16:15 in the Frequentis Arena.

EGNOS Adoption

Docs + Tools

LPV MAP

Where to fly an EGNOS-based Instrument Approach Procedure?

EBCAST

An EGNOS Business Case Assessment Tool for airports and airlines

BULLETINS

Access to all EGNOS Bulletins

Brochures

EGNOS benefits and success stories

GUIDANCE MATERIAL

Find-out how to use EGNOS

TRAINING MATERIAL

Information package to be used by Approved Training Organisations

USER SATISFACTION

User satisfaction surveys

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

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

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