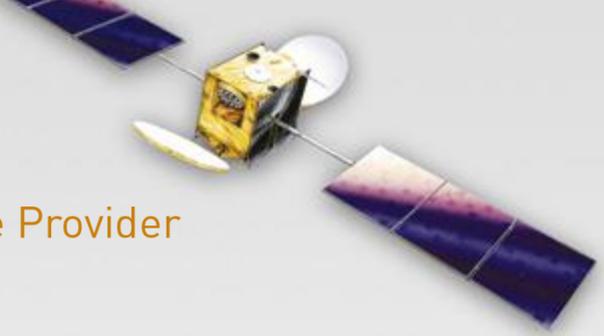


The **EGNOS** Service Provider



Service Provision Yearly Report (April 2014 - March 2015)

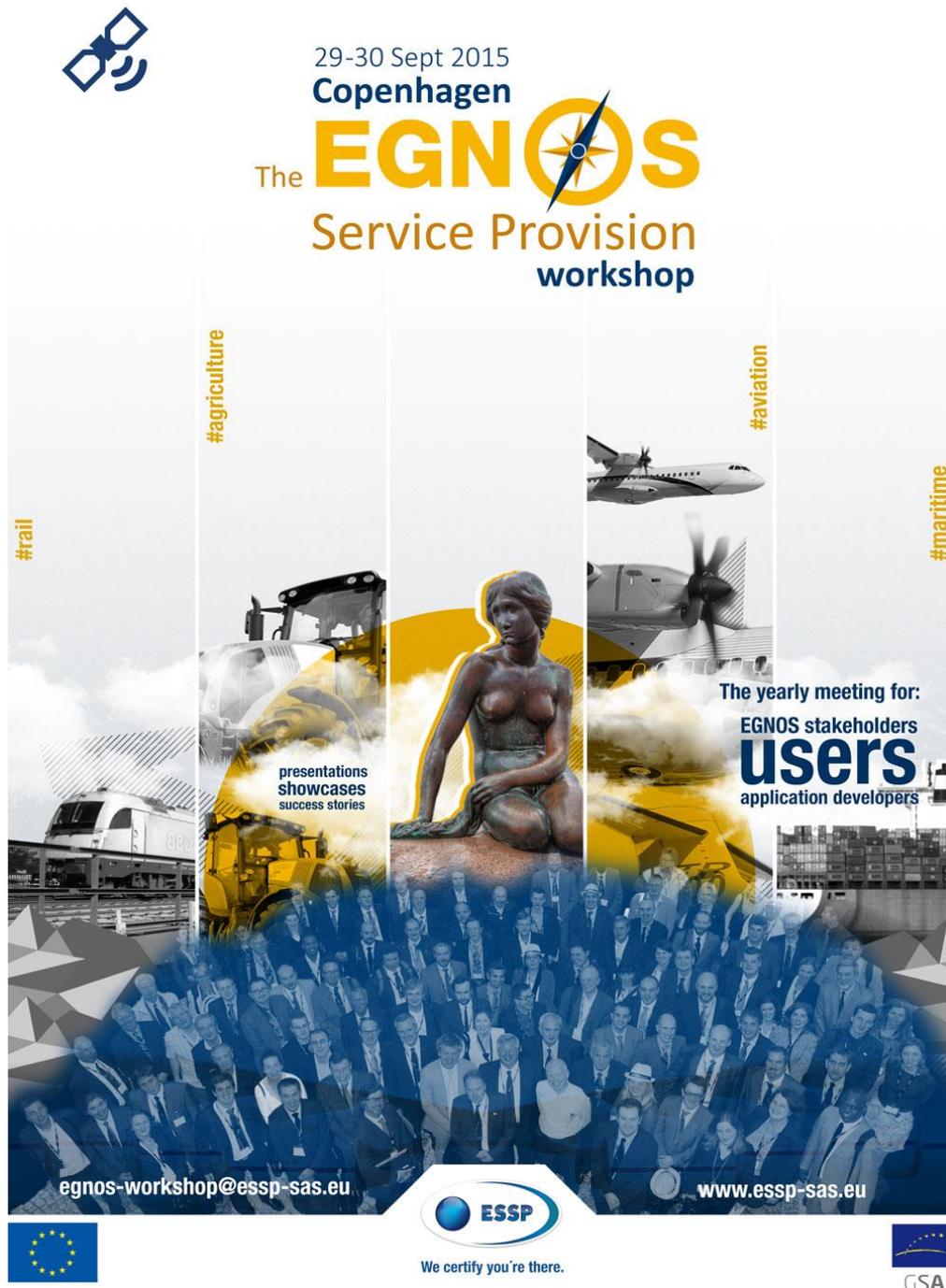
EGNOS Service Provision



ESSP-DRD-14691P Iss. 01-00 Date: 10/07/2015

ESSP organises an annual EGNOS Service Provision Workshop for EGNOS users and stakeholders, the perfect place to receive updated information on the EGNOS system and services, implementation information and success stories and to gather feedback from users and share ideas and experiences among EGNOS users in different domains.

The 2015 EGNOS Service Provision Workshop will be held on 29th-30th September in Copenhagen.



29-30 Sept 2015
Copenhagen

The **EGNOS**
Service Provision
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1 A WORD FROM ESSP'S PRESIDENT

Following a 6-month transition phase during the second half of 2013, 2014 was the first year of the EGNOS Service Provision contract at its "cruising level". During that year, the service was safely delivered and ESSP's ANSP certificate was renewed by EASA for another 2 years.

Although no EGNOS version was deployed and no additional service was declared during that period, 2014 was a busy year for ESSP in many ways:

- The ramp-up of the company, which began in July 2013, reached its apex with more than 40 staff joining the Toulouse and Madrid teams;
- The new delivery and reporting scheme required all staff to apply new processes and interfaces, whilst continuing to deliver first-class services;
- An important effort has been devoted to the EGNOS Adoption, aimed at increasing EGNOS use within different user communities: Aviation, Rail, Maritime, Surveying, Agriculture, etc. This effort has contributed, among other results, to the signature of 12 additional EGNOS Working Agreements with European Air Navigation Service Providers;
- Major preparatory works were kicked off for the deployment of new versions, for EGNOS extensions or releases to come (ESR241M/YSR1, ESR 241N, ...) and for the new LPV-200 service planned for Q4 2015;
- The EGNOS Yearly Event in Lisbon was a success, with more than 170 attendees;
- ESSP has supported the GSA, the EC and the industry in the definition of an approach for the EGNOS service provision in non-EU countries.

I would like to thank our customer -the GSA- for their support throughout this year and for the constructive relationships established at all levels.

Lastly, let me congratulate the teams from ESSP and its partners for their involvement, their commitment and their customer orientation demonstrated at all times. However, whilst the overall level of satisfaction has improved in 2014 (reaching 7.9/10), more is expected from our customer and from the EGNOS users: improvement actions have been identified for 2015 to ensure that ESSP delivers an even better service to an increasing number of European users.

Thank you,



Thierry Racaud
President of ESSP SAS



We certify you're there.

2 EXECUTIVE SUMMARY

This document covers the period from 1st April 2014 to 31st March 2015:

2.1 EGNOS Service Performance

During this yearly period, the EGNOS service performance measured has been good, covering in large part the values committed in the Open Service and Safety of Life SDD (see http://egnos-user-support.essp-sas.eu/new_egnos_ops/content/egnos-sdds).

The EGNOS service performance during this yearly period can be summarised as follows:

Signal In Space (SIS) Availability		
PRN120 (EGNOS OP)	99.917%	
PRN126 (EGNOS OP)	99.862%	
EGNOS OP (at least one SIS)	100%	
EGNOS Safety of Life (SoL) Service		
NPA Availability	100% of the service area (Message Type 27)	
NPA Integrity	No integrity event	
NPA Continuity	Values between 1×10^{-3} /h and 2.5×10^{-4} /h in continental Europe	
APV-I Availability	94.95% of the Service Area	
APV-I Integrity	No APV-I integrity event	
APV-I Continuity	99.48% of the commitment area ($5 \cdot 10^{-4}$ /15seconds)	
EGNOS Open Service (OS)		
Horizontal Accuracy	1.9 metres (95 percentile of the cumulative data for all stations)	
Vertical Accuracy	2.7 metres (95 percentile of the cumulative data for all stations)	
Open Service Availability	Above 99% for all locations except Madeira, Kirkenes, Jan Mayen and Reykjavik stations	
EGNOS Data Access Service (EDAS)		
Service Level 0	99.72% availability	577.92 ms latency
Service Level 2	99.71% availability	585.16 ms latency
Ntrip	99.64% availability	409.71 ms latency
SISNeT	99.24% availability	152.35 ms latency
Data Filtering	99.70% availability	615.47 ms latency
FTP	99.72% availability	Not Applicable

Table 1: EGNOS service performance during April 2014 – March 2015 period

The main causes for the performance degradations were:

- Ionosphere monitoring: As for last year, ionosphere issues related to the increase in the solar activity (linked to solar cycle #24) have been the main cause of underperformances.
- GPS monitoring: The lower number of satellites in view (due to the configuration of the GPS constellation) in the South-western region and Northwest of ECAC during some periods of the day has contributed to degrading the performance over these areas, including Portugal and the South and West of Spain. In general, the impact is more significant when additional causes occur at the same time (mainly ionosphere degradations or monitoring problems in one or more GPS satellites).
- Exceptional RIMS unavailabilities: in particular the lack of Lappeenranta C station from mid-December 2014 to early February 2015 was especially significant, degrading the EGNOS performance in the South, mainly South East, of the Service Area.



Jan Mayen island

2.2 Service Provision and Development

Service Definition Documents

Following the deployment of the EGNOS system release ESR 2.3.2 and the relevant improvements made to the EDAS Service during 2014, the EGNOS Services' SDDs were updated (V2.1 and V2.2).

The EGNOS Services' SDDs contents were complemented by the publication of three Service Notices (see section 4.1.5)

In addition, the three Service Implementation Roadmaps (EGNOS SoL, OS and EDAS) were updated on the 25/11/2014 to their version 3.1 to include the last service evolutions implemented and planned.

Finally, a detailed action plan is under implementation in order to be ready to declare the LPV-200 service by Q4/2015.



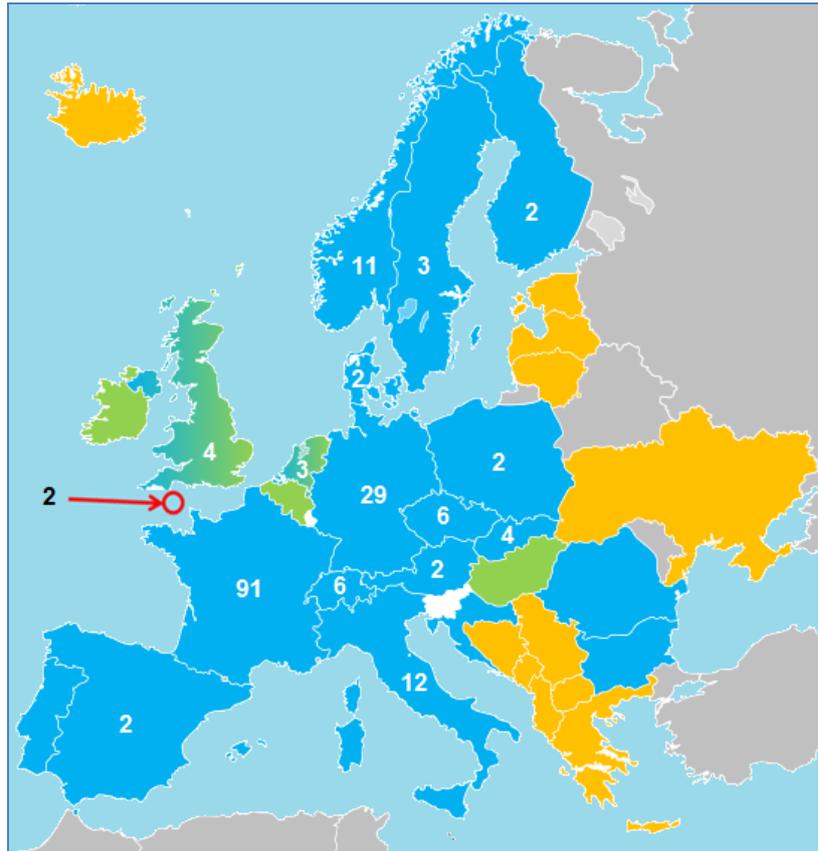
EGNOS Service Definition Documents (<http://egnos-user-support.essp-sas.eu/>)

User Agreements:

EGNOS Working Agreement (EWA)

Concerning the EGNOS Service Development in aviation, the ESSP continued its specific dissemination and awareness campaign related to the EGNOS Working Agreement (EWA). As a result of this process, the ESSP has signed 14 new EWA (over a total of 31) and the new countries under EWA are the UK, Sweden, Denmark, Slovakia, Romania, Bulgaria, Jersey, The Netherlands, Croatia and the Czech Republic.

The following figure provides the status of the EWA negotiations with European ANSPs (EU and non-EU). The following colour code is used to allow easy identification of the progress that has been made with each ANSP to date (see legend).



	Initiated Discussions
	Advanced Discussions
	EWA signed
3	Number of published LPV procedures

Figure 1: EGNOS Working Agreement status

EGNOS procedures implementation

Through the ESSP's Service Provision activities with the various Air Navigation Service Providers, the different GSA and European Commission initiatives (FP7 projects, Incentive schemes, H2020 projects) and EGNOS stakeholders such as Eurocontrol, EASA and the National Supervisory Authorities, a steady increase of implemented EGNOS-based approach procedures was achieved in different countries and airports: 183¹ LPV procedures at 118 airports and 76 APV-Baro at 31 German and Czech airports (approved to be flown with EGNOS vertical guidance by the German, French and Czech NSAs).

¹ As of 01/05/2015.

User Service Implementation:

EGNOS Multimodal Adoption (EMA) Action Plan:

In 2014, 47 actions were conducted within the framework of the EMA Action Plan. 47% of them aimed to foster EGNOS adoption in aviation: namely to convince airports authorities to publish procedures, operators to get equipped and LPV certified as well as to develop a number of promotion tools such as guidelines, third-party catalogue of services and Cost Benefit Analyses.

Agriculture and Surveying actions (18% out of the total) focused in developing the methodologies for CBA assessment and active promotion, as well as understanding the main technical evolutions in those market segments to evaluate EGNOS possibilities.

Actions performed within the framework of Maritime and Rail (35%) were intended to understand the regulatory framework governing those market segments, as well as the main stakeholders involved. In the case of maritime, understanding DGPS and AIS networks deployed in EU shores and inland waters are the main focus of activity in order to identify potential benefits that could be derived from the use of EGNOS/EDAS in this domain.

The EMA Action Plan 2015 was prepared and agreed to by GSA in Q1 2015 based on the GSA EMA provided to ESSP in December 2014. A total of 67 actions are defined and under implementation.

User satisfaction action plan:

The User Satisfaction Action plan for 2014 was implemented and agreed with the GSA. This plan consisted of fifteen actions to be implemented in 2014 and covered domain-specific and crossover actions mainly related to documentation, processes, tools, user requirements, EGNOS services promotion and EDAS services.

The User Satisfaction Action plan for 2015 is being defined and will take into account the EGNOS Users' Satisfaction surveys done in 2014 as its primary input.

EGNOS Service Provision Workshops:

The 2014 EGNOS Service Provision Workshop was held in Lisbon in October 2014 with more than 170 participants from 23 countries, including African and North American representatives, who were highly satisfied with the event. According to the survey that was distributed among the attendees, the overall satisfaction was 8.7/10.

The programmatic presentations from EC, GSA and ESSP provided attendees with a clear status of the EGNOS services and the evolutions planned in the coming years. Several EGNOS users (Airbus, DSNA, Skyguide, Topcon, General Lighthouse Authority, CMC Electronics, etc.) shared their successful experiences and areas of activity in specific sessions oriented to different market segments (aviation, maritime, land applications). Finally, representatives from other regions also participated and shared their SBAS systems implementation status or plans (Federal Aviation Administration from the US, ASECNA from Africa).

The 2015 EGNOS Service Provision Workshop is planned in Copenhagen on 29-30 September and is under preparation. The "Save the date" notification and the high level agenda were notified to the expected participants. Regular updates as the event comes closer will be posted at the ESSP (www.essp-sas.eu) and EGNOS User Support Websites (<http://egnos-user-support.essp-sas.eu/>). Interested parties may contact egnos-helpdesk@essp-sas.eu for registration and/or additional event information.

EGNOS Users' Satisfaction Surveys:

This survey was launched in July 2014 to cover 2013 and 2014 calendar year within the OS, SoL and EDAS services. Global satisfaction score shows a good level of satisfaction with respect to EGNOS in general terms, with a global satisfaction score of 7.6.

Some recommendations were brought up to improve user satisfaction.

User Support:

195 user requests were received in the period under report, representing a 5% increase with respect to the previous Yearly reporting. Both standards and urgent requests were resolved according to the committed response time (1 hour for urgent ones, 3 days for standard ones), although the complexity of the questions increased. The majority of them (40%) were related to EDAS (either technical or registration requests) while, in terms of market segment, the most active one was the aviation sector.

Regarding the EGNOS User Support Website improvements, at the end of the reporting period, the EGNOS User Support website had 1599 registered users. The new registered users in this period were 255. The main domains of applications are aviation (38%) and agriculture (13%), followed at some distance by road (10%), personal mobility (9%) and maritime (6%).

New website functionalities enable the user to check the status of EDAS Services in real time, as well as the history of data gaps observed in these services. Additionally, the speed and performance of some web pages was optimised in order to provide the user a better browsing experience.



EDAS Service evolutions:

Several EDAS releases were deployed for continuous improvement of service stability, data quality, robustness and operations, and in particular very stable performance has been achieved since October 2014.

The number of registered users has increased constantly, reaching a total of 190 at the end of March 2015. At the beginning of the reporting period (beginning of April 2014) the total number of EDAS users was 152, so the number of EDAS users has increased by 25% in the last 12 months.

Customer Support:

A customer escalation procedure has been defined and implemented between GSA and ESSP to manage major service outages or underperformances with the aim of ensuring coordinated communication and actions towards EGNOS users and stakeholders.

2.3 System Operations and Maintenance

During the past period, the main non-recurrent activities that were achieved in the Operational domain were the preparation for the introduction of a new RIMS in the EGNOS system and the the rationalisation programme to reduce the number of Control Centres from four to two.

Additionally, ESSP has procured and deployed the new SPEED (Support Platform for EGNOS Evolutions & Demonstrations) platform, which allows replaying previous EGNOS scenarios with different system configurations. First simulations were performed especially to show added value of ESR 241M in degraded ionosphere conditions with respect to the release that is in operation during specific past periods of time.

As regards routine activities, in early October 2014, the ESSP inherited the EGNOS system release 241M. This release will be deployed during summer 2015 and will bring performance enhancements and more robustness to ionosphere degradations, will solve some obsolescence issues and will enable the introduction of a new GEO PRN136 in the EGNOS operations (ASTRA 4B). ESSP has prepared the deployment of the ESR 241M/YSR#1 release by performing a series of activities devoted to update the baseline and training materials and to perform onsite integration tests.



EGNOS RIMS Station in Longyearbyen (Svalbard, Norway)

3 SERVICE PERFORMANCES

3.1 EGNOS SIS Availability

This section presents the yearly performance of the SIS availability. It provides the yearly average performances for the SIS Operational mode for each GEO PRN 120 and 126 and for the operational SIS (at least one SIS is available). It also provides the yearly trend based on the monthly data. SIS availability of EGNOS TEST PRN is not provided in this report.

From April 2014 to March 2015, the average (per month) EGNOS message availability was the following:

- PRN120 (EGNOS OP): 99.917 %
- PRN126 (EGNOS OP): 99.862 %
- EGNOS OP (at least one SIS): 100 %

Monthly results are given in the following figure:

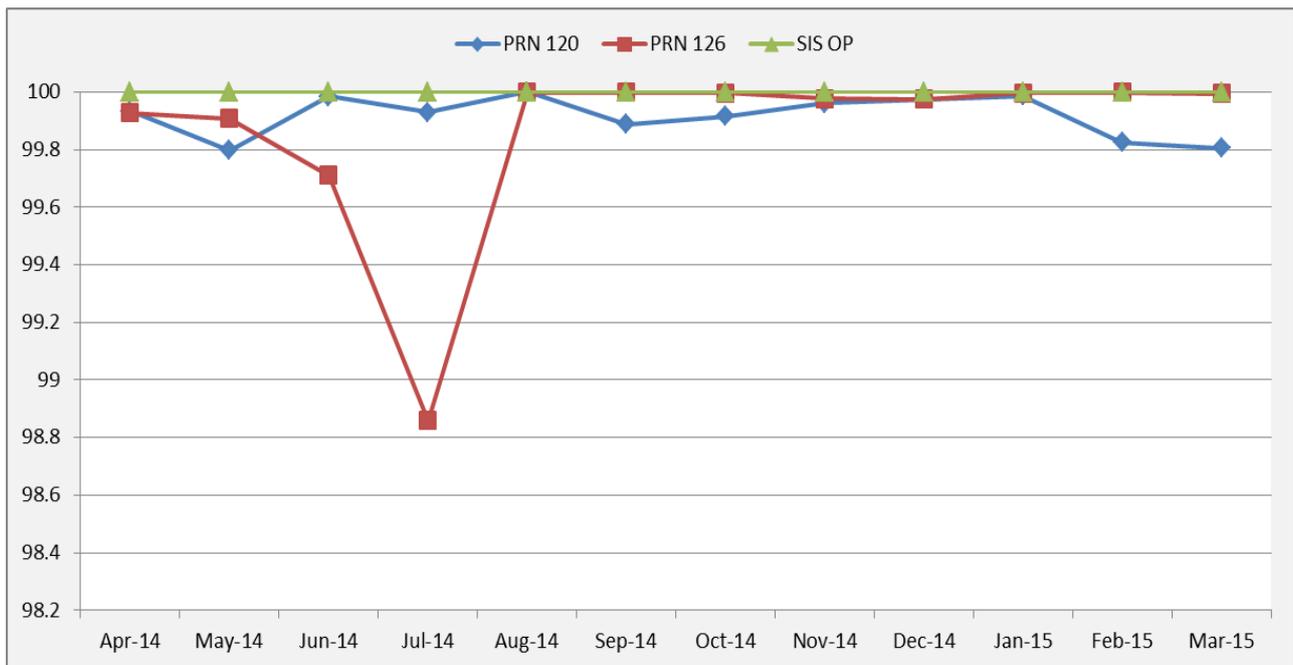


Figure 2: EGNOS SIS OP availability trend April 2014 to March 2015(%)

Numerical values for each month and for each PRN are given in the following table:

DATE	PRN 120	PRN 126	SIS OP
Apr-14	99.933	99.928	100
May-14	99.798	99.908	100
Jun-14	99.985	99.711	100
Jul-14	99.929	98.858	100
Aug-14	100	99.999	100
Sep-14	99.888	99.998	100
Oct-14	99.916	99.997	100
Nov-14	99.961	99.976	100
Dec-14	99.974	99.975	100
Jan-15	99.987	99.997	100
Feb-15	99.825	99.999	100
Mar-15	99.805	99.994	100
Average	99.91675	99.8616667	100

Table 2: EGNOS SIS OP availability trend April 2014 to March 2015 (%)

3.2 SoL Service - Non Precision Approach (NPA)

3.2.1 NPA Availability - Yearly Performance

EGNOS NPA Availability is defined as the percentage of samples in which the Horizontal Protection Level (HPL) is below the Alert Limit for NPL (HAL: 556m), computed over the total period.

The following figure provides NPA availability for the reporting period, for combined GEO:

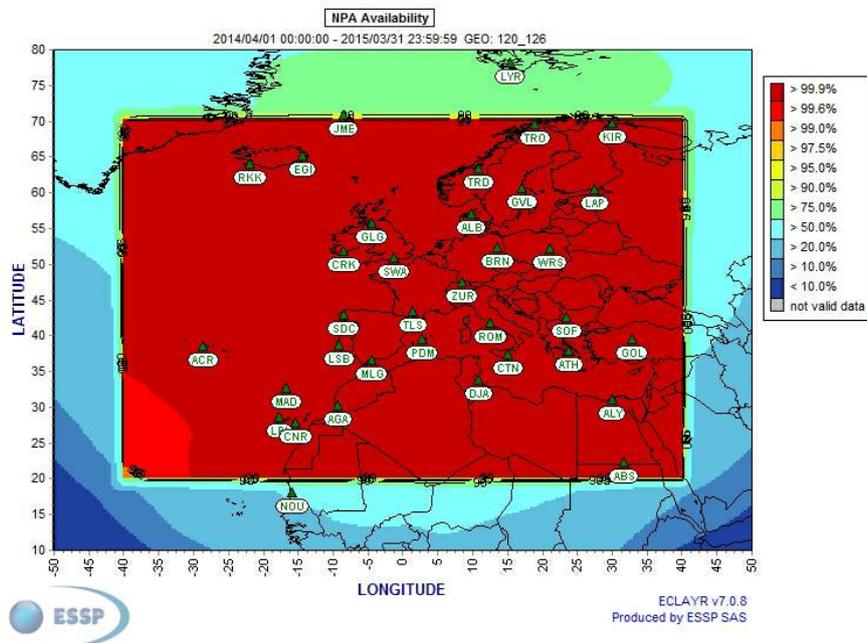


Figure 3: NPA Availability from 01/04/14 to 31/03/15

3.2.2 NPA Availability - Achievement Against Target

The following figure shows the evolution of the NPA availability 99% compliance with respect to the reference area defined in the EGNOS SoL SDD (see http://egnos-user-support.essp-sas.eu/new_egnos_ops/content/egnos-sdds). It must be taken into account that, since January 2015, the commitment areas to be used as reference are the published ones in SoL SDD v2.2; for previous dates, they are the ones in SoL SDD v2.0.



Figure 4: NPA Availability 99% compliance evolution

The underperformance detected on the 5th March 2015 is especially noticeable. It affected the West and Southwest of the MT27 region and was mainly caused by the lack of GPS PRN14 due to a NANU for a period in which the number of visible satellites was low (together with the lack of PRN21 monitoring during some periods). Note that the Civil Global Positioning System Service Interface Committee reported, with respect to the GPS PRN14 NANU, that users in certain parts of the world may experience a very short period of high Dilution of Precision (DOP >6) in the vicinity of Western Sahara and Morocco at their border and within a large area offshore the United Kingdom and Ireland in the Atlantic, affecting the observed performance.

Other degradations also affected the Southwest and were linked to the low number of satellites that are visible in that area during some periods of the day that makes performance highly susceptible to any additional issue related to GPS constellation monitoring.

The combination of the 99% NPA Availability map and the Reference area, splitting the year into two periods according to the applicable SDD version, gives the following:

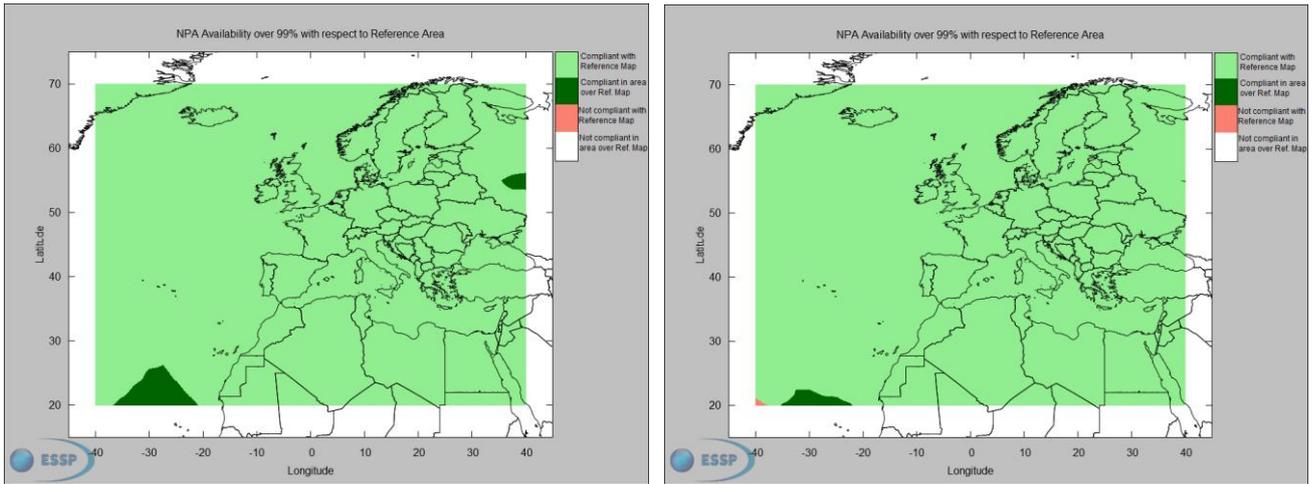


Figure 5: NPA Availability map wrt the reference map – 01/04/14 - 31/12/14 (SDD v2.0) (left) & 01/01/15 - 31/03/15 (SDD v2.2) (right)

If the entire year is referred to the current SDD (v2.2), the result is:

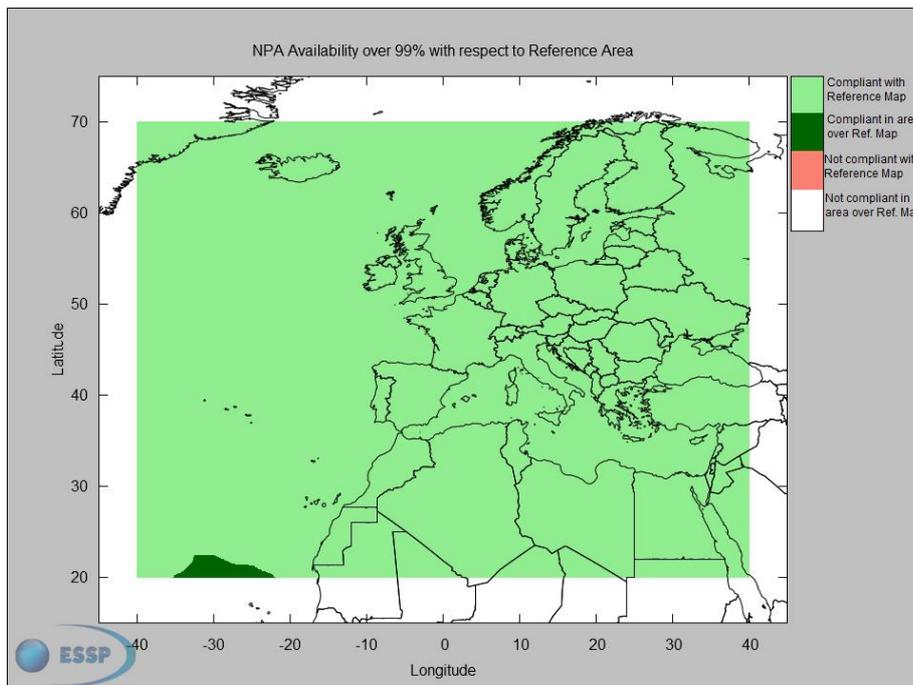


Figure 6: NPA Availability map wrt the reference map (SDD v2.2) - 01/04/14 to 31/03/15

Considering the SDD v2.2 map used as the reference, the percentage of points that were compliant with the reference area is **100%**.

3.2.3 NPA Availability - 99% Daily Compliance

The percentage of days over the reporting period in which the daily NPA availability was over 99% is shown in the following figure:

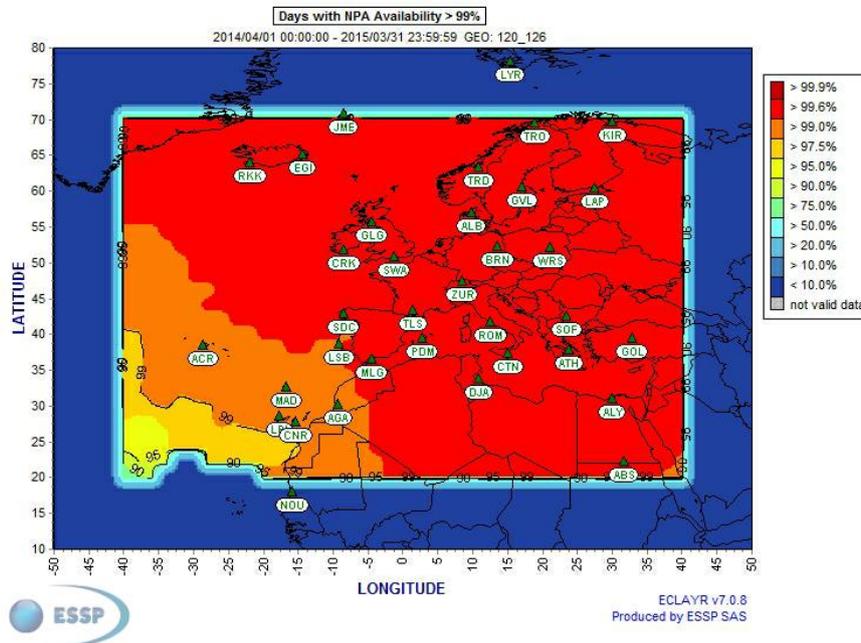


Figure 7: NPA Availability – Days over 99% - 01/04/14 to 31/03/15

As can be observed, the worst results are obtained in the Southwest of the MT27 region; this is mainly caused by a low number of monitored satellites visible from this region.

3.2.4 NPA Integrity

EGNOS NPA Integrity Event is defined as an event when the Navigation System Error is greater or equal to the corresponding Protection Level for NPA.

None of the RIMS stations within the SDD commitment area has been impacted by integrity events in the position domain during the analysed period.

Table 3 shows the maximum HSI at each RIMS inside of the NPA reference area (see http://egnos-user-support.essp-sas.eu/new_egnos_ops/content/egnos-sdds) for each operational GEO.

Station	HSI	
	PRN120	PRN126
Aalborg	0.26	0.26
Azores	0.40	0.43
Berlin	0.23	0.25
Canary Islands	0.67	0.63
Catania	0.67	0.57
Cork	0.22	0.24
Warsaw	0.22	0.23
Djerba	0.77	0.76
Egilsstadir	0.30	0.29
Glasgow	0.23	0.23
Golbasi	0.33	0.31
Lisbon	0.31	0.32
Swanwick	0.30	0.30
Madeira	0.59	0.58
Málaga	0.51	0.52
Alexandria	0.66	0.67
Kirkenes	0.43	0.41
Palma de Mallorca	0.49	0.50
Reykjavik	0.28	0.26
Roma	0.37	0.38
Lappeenranta	0.35	0.31
S. de Compostela	0.33	0.33
La Palma	0.64	0.66
Sofia	0.29	0.29
Gävle	0.33	0.35
Toulouse	0.32	0.30
Trondheim	0.29	0.29
Tromsøe	0.41	0.42
Zürich	0.21	0.21
Abu Simbel	0.44	0.41
Agadir	0.69	0.70
Athens	0.32	0.33

Table 3: NPA Safety Index (maximum) at reference stations

The following figure provides the histogram for HSI (Horizontal Safety Index), gathering measurements from the different EGNOS stations and for both operational GEOs over the entire period.

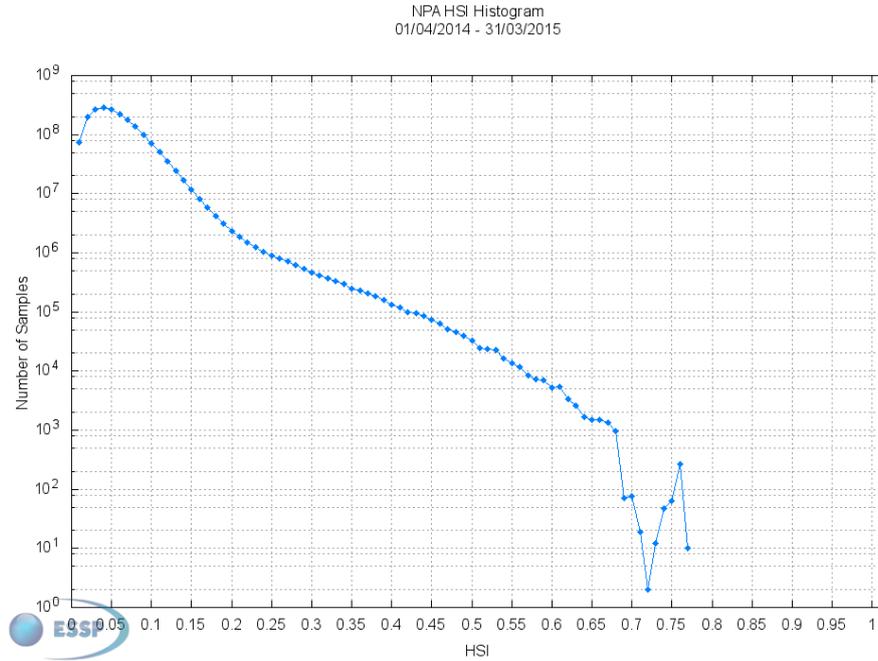


Figure 8: NPA Horizontal Safety Index

3.2.5 NPA Continuity - Yearly Performance (MTR-PFR-6)

EGNOS NPA Continuity is computed by dividing the total number of continuity events by the number of NPA valid and available epochs. The result is presented as the probability per hour of occurrence of one discontinuity event.

The following figure shows the NPA Continuity Risk obtained for the GEO combined over the entire analysed period.

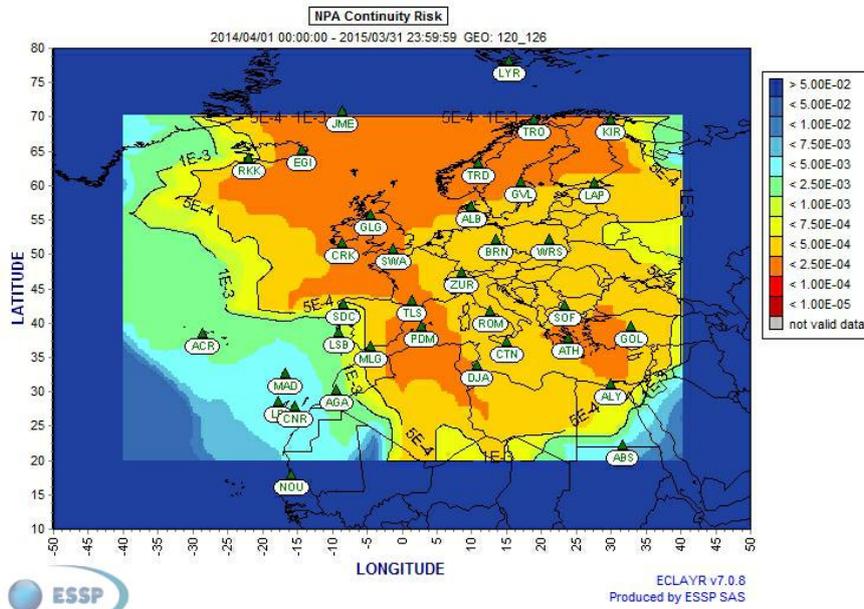


Figure 9: NPA Continuity Risk from 01/04/14 to 31/03/15

3.3 SoL Service - Approach with Vertical guidance (APV-I)

3.3.1 APV-I Availability - Yearly Performance

EGNOS APV-I Availability is defined as the percentage of epochs in the period in which the Protection Level (both HPL and VPL) are below Alert Limits for this APV-I service (HAL: 40m; VAL: 50m) over the total number of SBAS messages in the period.

The following figure provides, for the combined, the GEO APV-I availability for the reporting period:

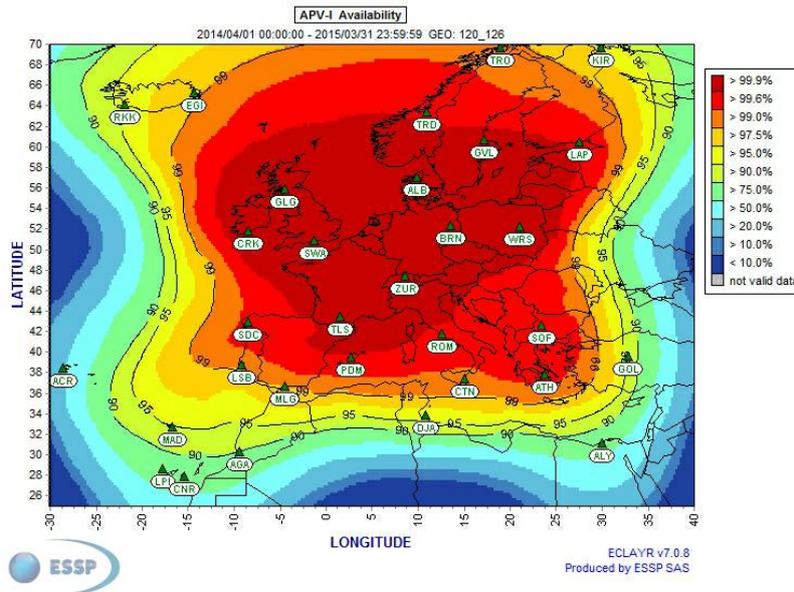


Figure 10: APV-I Availability from 01/04/14 to 31/03/15

3.3.2 APV-I Availability - Achievement Against Target

The following figure shows the evolution of the area compliant with the APV-I availability requirement (99% of the reference area defined in the EGNOS SoL SDD, see http://egnos-user-support.essp-sas.eu/new_egnos_ops/content/egnos-sdds). It must be noted that, since January 2015, the commitment areas to be used as reference are the ones published in SoL SDD v2.2; for previous dates, they are the ones in SoL SDD v2.0.

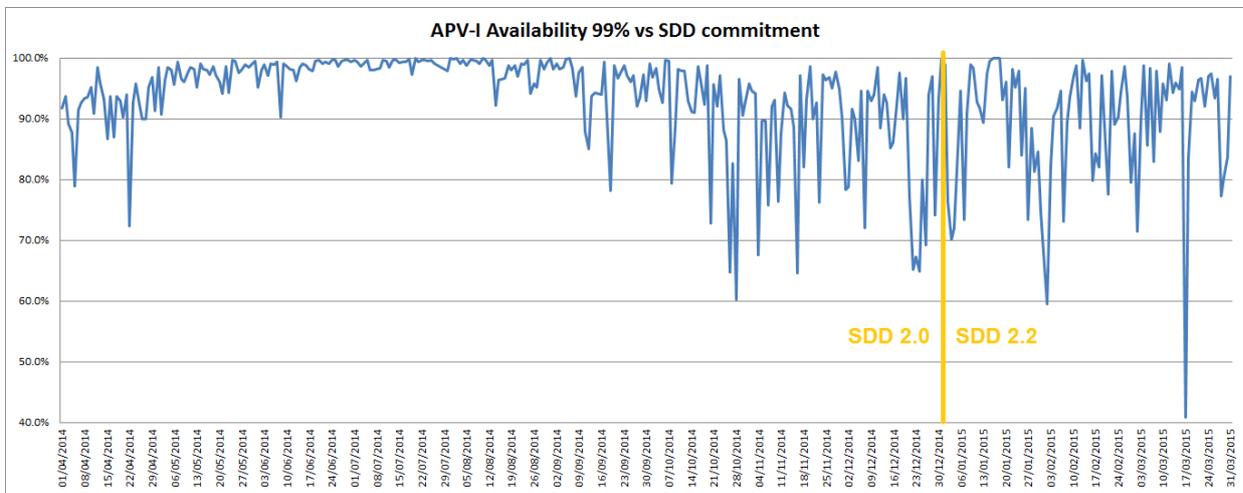


Figure 11: APV-I Availability 99% compliance evolution

The combination of the 99% APV-I Availability map and the Reference area, splitting the year into two periods according to the applicable SDD version, gives the following:

- April 2014-December 2014: 96.79% coverage with respect to the EGNOS SoL SDD v2.0 commitment map.
- January 2015-March 2015: 88.92% coverage with respect to the EGNOS SoL SDD v2.2 commitment map.

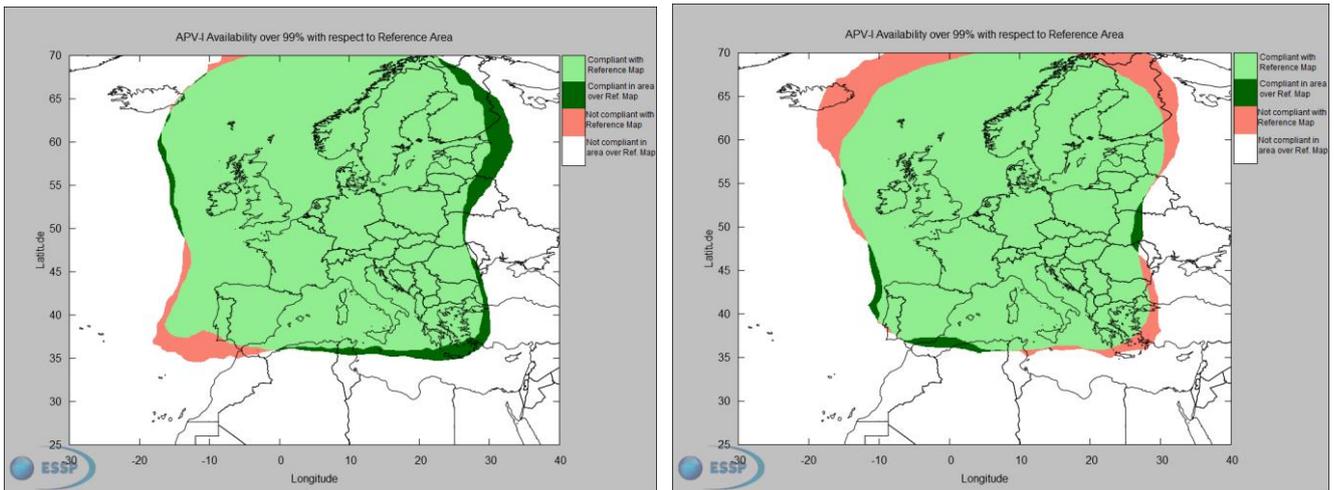


Figure 12: APV-I Availability map wrt the reference map – 01/04/14 - 31/12/14 (SDD v2.0) (left) & 01/01/15 - 31/03/15 (SDD v2.2) (right)

If the entire period is referred to the current SDD (v2.2), the result is:

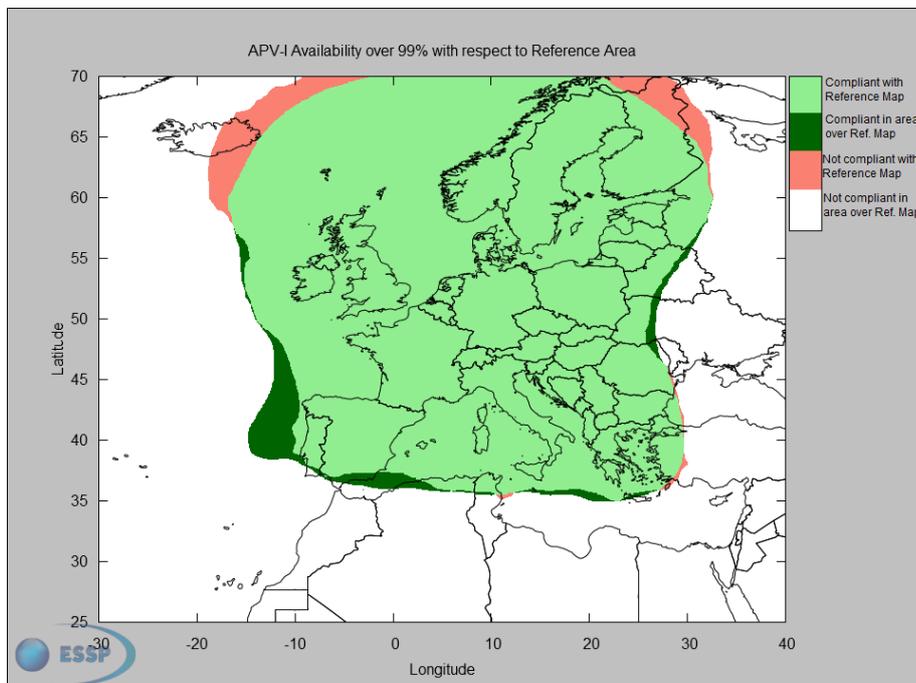


Figure 13: APV-I Availability map wrt the reference map (SDD v2.2) - 01/04/14 to 31/03/15

Considering the SDD v2.2 map used as the reference, the percentage of points that were compliant with the reference area is **94.95%**. Despite this high level of compliance, significant degradations were faced during the October 2014-March 2015 period mainly due to the issues related to the increase in the solar activity (linked to the solar cycle #24). The EGNOS programme continues to work to progressively introduce performance improvements and increased robustness in the upcoming EGNOS system releases (improvements already included in the ESR v2.4.1M).

3.3.3 APV-I Availability - 99% Daily Compliance

The percentage of days over the reporting period in which the daily APV-I availability was over 99% is shown in the following figure.

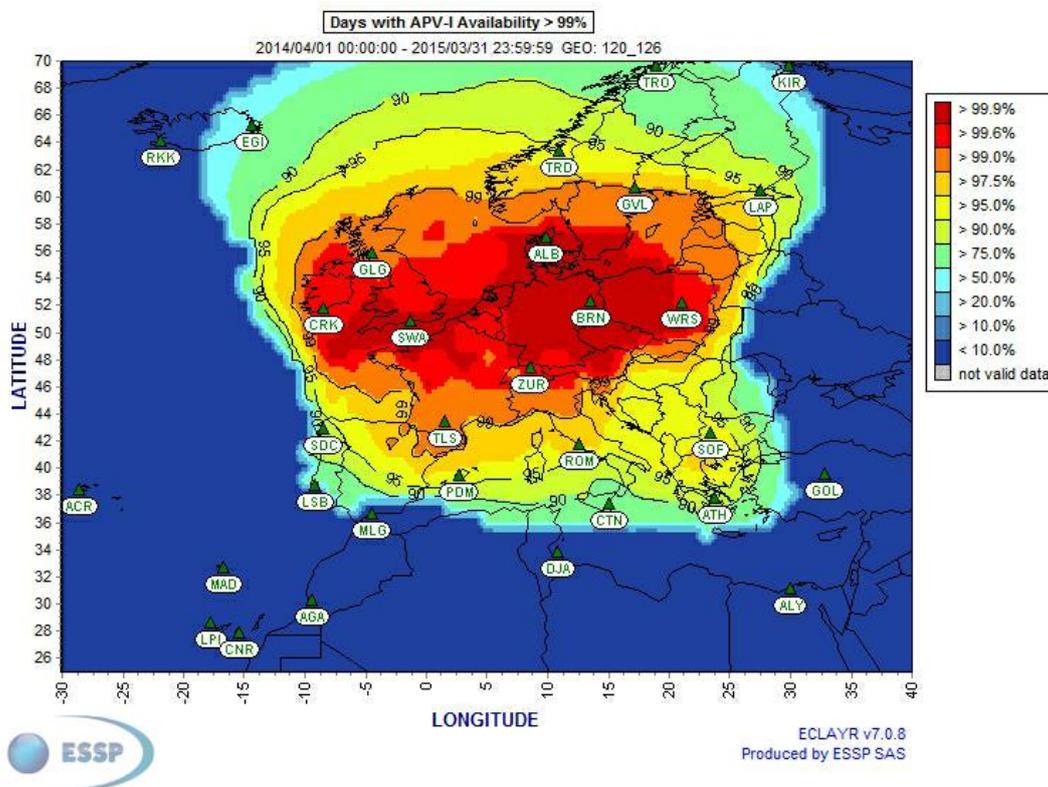


Figure 14: APV-I Availability – Days over 99% - 01/04/14 to 31/03/15

The previous figure shows that the APV-I Availability was higher than 99%:

- 100% of the time in the 12.2% of the reference area defined in the SDD v2.2².
- 99% of the time in the 33.9% of the reference area defined in the SDD v2.2².
- 95% of the time in the 59.7% of the reference area defined in the SDD v2.2².

² See http://egnos-user-support.essp-sas.eu/new_egnos_ops/content/egnos-sdds

The following figure shows the APV-I availability compliance with respect to 99% target at the airports with published EGNOS-based operations:

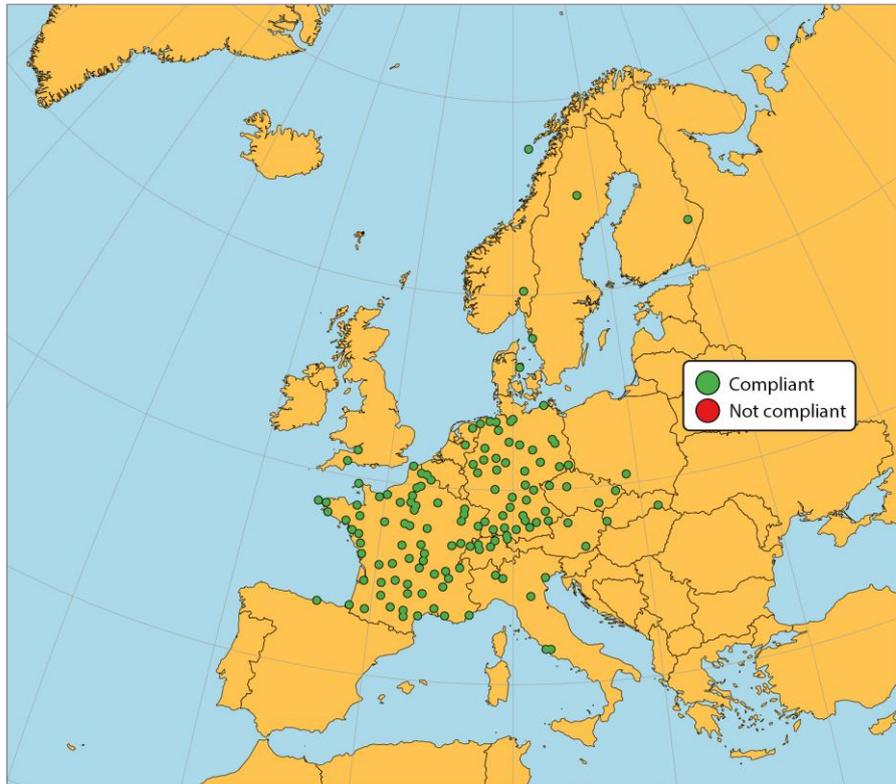


Figure 15: APV-I Availability compliance at airports with published EGNOS-based operations



Aircraft at Storuman airport

3.3.4 APV-I Integrity events

EGNOS APV-I Integrity Event is defined as an event in which the Navigation System Error is greater or equal to the corresponding Protection Level for APV-I.

No integrity events were detected.

Safety Index is defined as the relation between Navigation System Error versus Protection Level (assuming PA algorithms to compute $xNSE$ and xPL) for each second. If the xPE/xPL ratio is over 1, it indicates that a Misleading Information situation has occurred.

Table 4 shows the maximum HSI and VSI at each RIMS inside of the APV-I reference area³ for each operational GEO. Moreover, Stanford plots are available on the operations website (<http://egnos-user-support.essp-sas.eu/>).

Station	HSI		VSI	
	PRN120	PRN126	PRN120	PRN126
Aalborg	0.26	0.27	0.28	0.32
Berlin	0.24	0.26	0.32	0.32
Catania	0.31	0.28	0.29	0.30
Cork	0.23	0.24	0.29	0.30
Warsaw	0.23	0.23	0.29	0.30
Djerba	0.44	0.44	0.29	0.31
Egilsstadir	0.31	0.29	0.32	0.31
Glasgow	0.24	0.23	0.36	0.37
Golbasi	0.25	0.28	0.25	0.29
Lisbon	0.34	0.37	0.38	0.37
Swanwick	0.31	0.31	0.37	0.38
Madeira	0.34	0.34	0.27	0.30
Málaga	0.48	0.48	0.31	0.31
Kirkenes	0.33	0.31	0.32	0.32
Palma de Mallorca	0.35	0.33	0.47	0.48
Reykjavik	0.29	0.27	0.29	0.31
Roma	0.34	0.26	0.41	0.30
Lappeenranta	0.36	0.32	0.31	0.30
S. de Compostela	0.31	0.30	0.25	0.24
Sofia	0.30	0.30	0.33	0.34
Gävle	0.28	0.27	0.32	0.29
Toulouse	0.22	0.23	0.31	0.31
Trondheim	0.27	0.28	0.33	0.33
Tromsoe	0.33	0.31	0.43	0.44
Zürich	0.22	0.22	0.34	0.34
Athens	0.23	0.24	0.30	0.31

Table 4: EGNOS APV-I Safety Index (maximum) at reference stations

³ See http://egnos-user-support.essp-sas.eu/new_egnos_ops/content/egnos-sdds

The following figures provide the histogram for HSI (Horizontal Safety Index) and VSI (Vertical Safety Index) for each second when collecting measurements from the different EGNOS stations and for both operational GEOs over the reporting period.

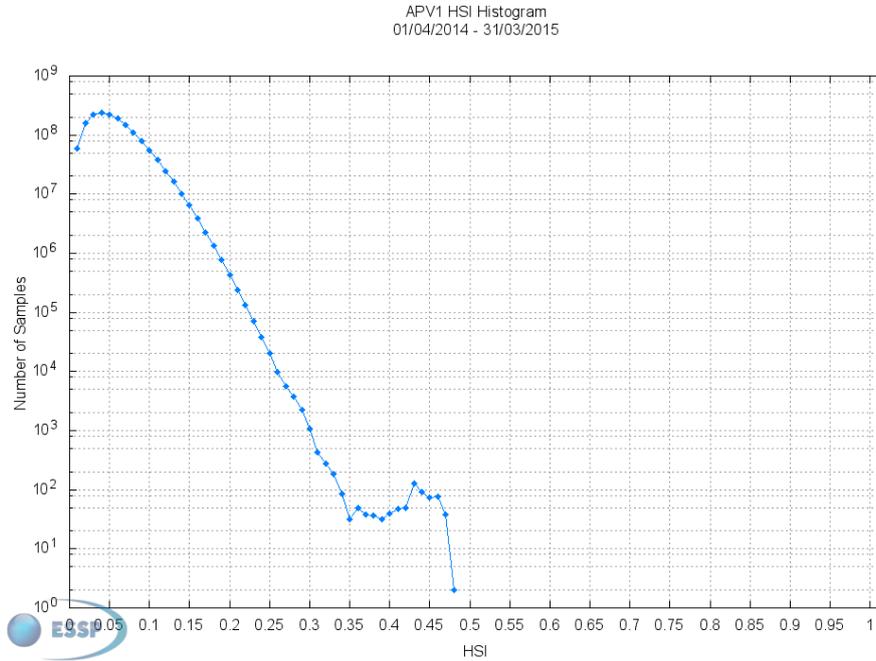


Figure 16: EGNOS APV-I Horizontal Safety Index

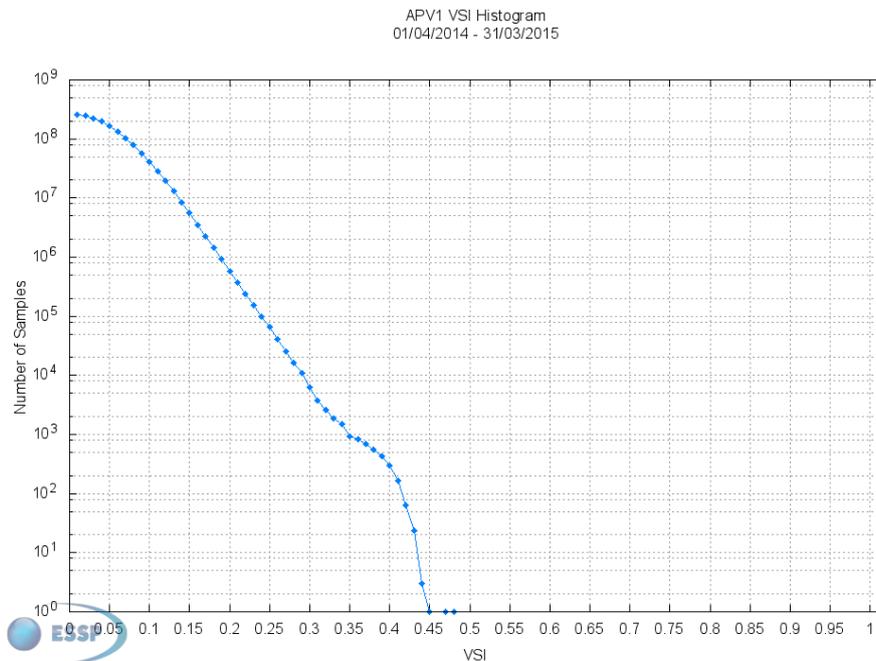


Figure 17: EGNOS APV-I Vertical Safety Index

3.3.5 APV-I Continuity Risk - Yearly Performances

EGNOS APV-I Continuity Risk is defined as the result of dividing the total number of single continuity breaks using a time-sliding window of 15 seconds by the number of samples with valid and available PA navigation solution. A single continuity break occurs if the system is available at one epoch and becomes unavailable during the following 15 seconds.

The following figure provides the GEO combined APV-I continuity risk for the reporting period:

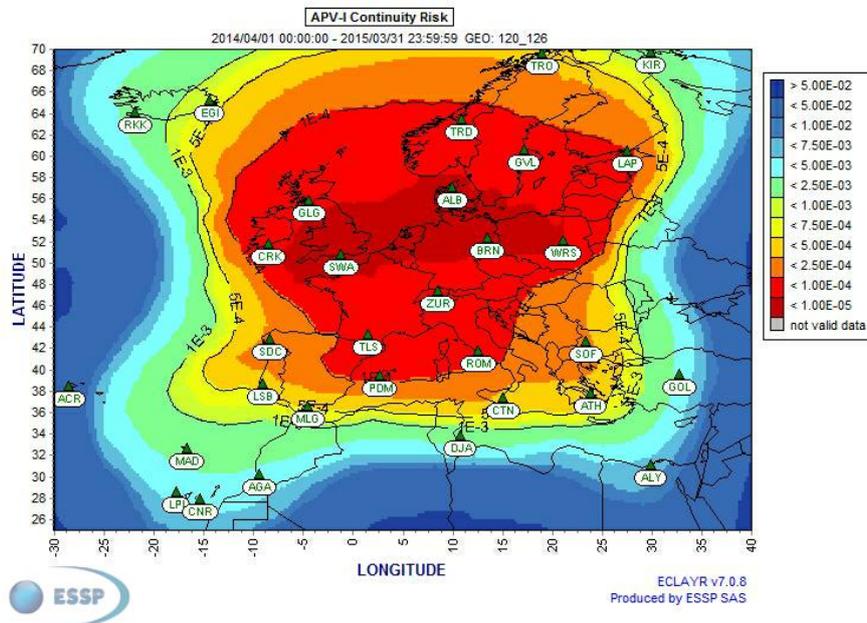


Figure 18: APV-I Continuity Risk from 01/04/14 to 31/03/15

3.3.6 APV-I Continuity - Achievement Against Target

The following figure shows the evolution of the APV-I continuity risk 5×10^{-4} compliance with respect to the reference area defined in the EGNOS SoL SDD (see http://egnos-user-support.essp-sas.eu/new_egnos_ops/content/egnos-sdds). It should be noted that, since January 2015, the commitment areas to be used as reference are the ones published ones in SoL SDD v2.2; for previous dates, they are the ones in SoL SDD v2.0.

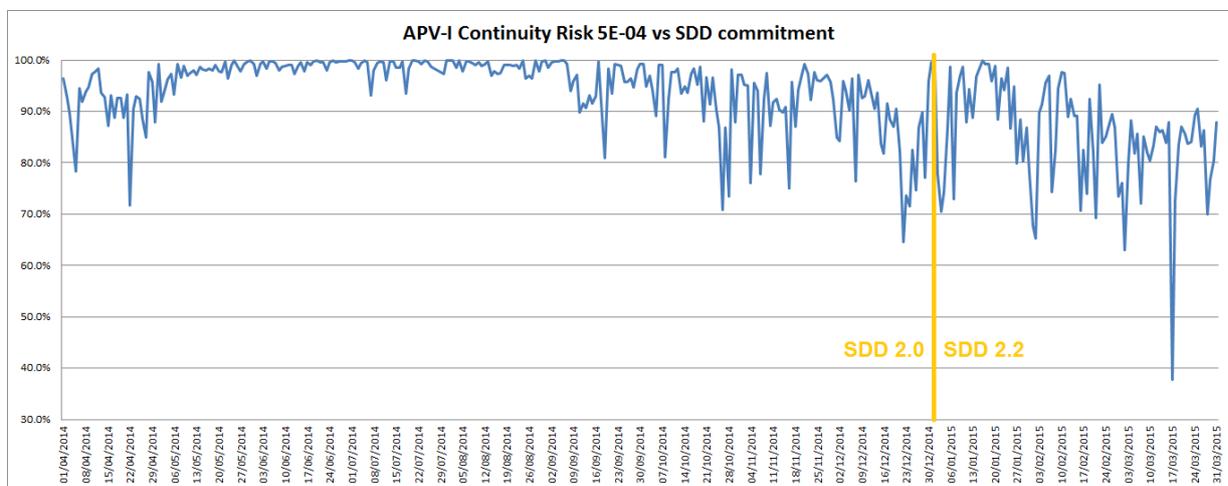


Figure 19: APV-I Continuity Risk 5×10^{-4} compliance evolution

The combination of the 5×10^{-4} APV-I Continuity Risk map and the Reference area, splitting the year into two periods according to the applicable SDD version, gives the following:

- April 2014-December 2014: 97.39% coverage with respect to the EGNOS SoL SDD v2.0 commitment map.
- January 2015-March 2015: 86.93% coverage with respect to the EGNOS SoL SDD v2.2 commitment map.

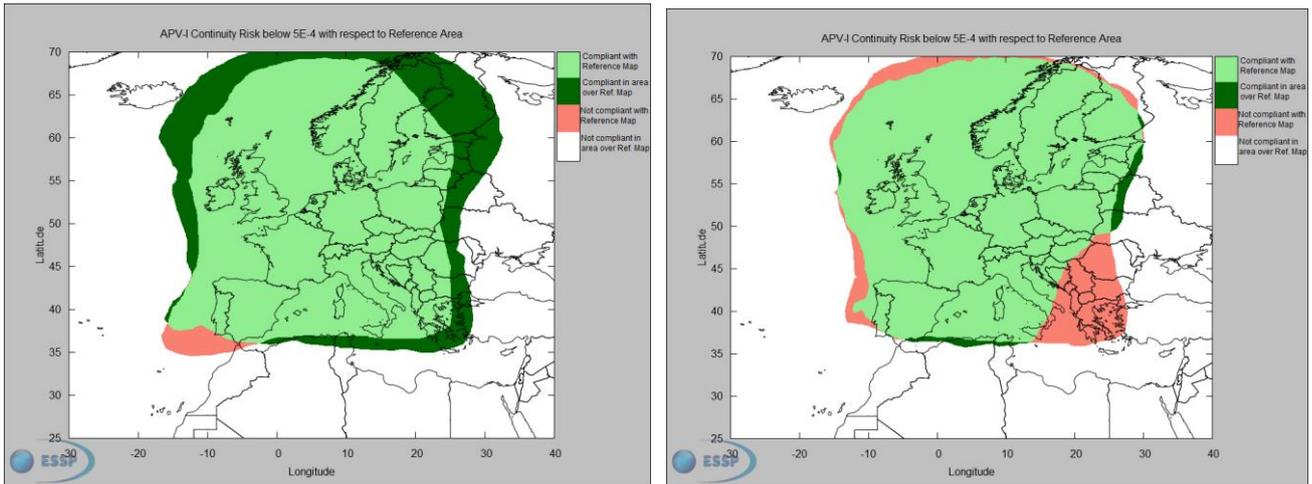


Figure 20: APV-I Continuity Risk map wrt the reference map – 01/04/14 - 31/12/14 (SDD v2.0) (left) & 01/01/15 - 31/03/15 (SDD v2.2) (right)

If the entire period is referred to the current SDD (v2.2), the result is:

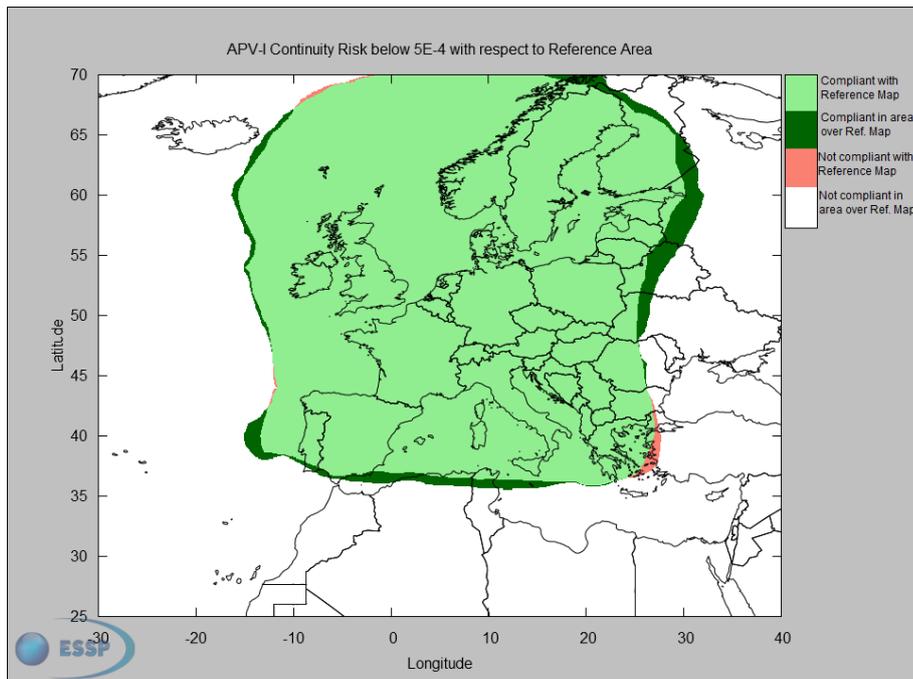


Figure 21: APV-I Continuity Risk ($5E-04$) map wrt the reference map (SDD v2.2) - 01/04/14 to 31/03/15

Considering the SDD v2.2 map used as the reference, the percentage of points that were compliant with the reference area ($5 \times 10^{-4}/15\text{sec}$) is **99.48%**.

For information purposes, the differences with respect to the Reference Map for the area corresponding to a continuity risk of 10^{-3} and 10^{-4} are included. For both levels, the results obtained, as for the 5×10^{-4} case, are quite good (99.97% for continuity risk of 10^{-3} and 90.23% for continuity risk of 10^{-4}).

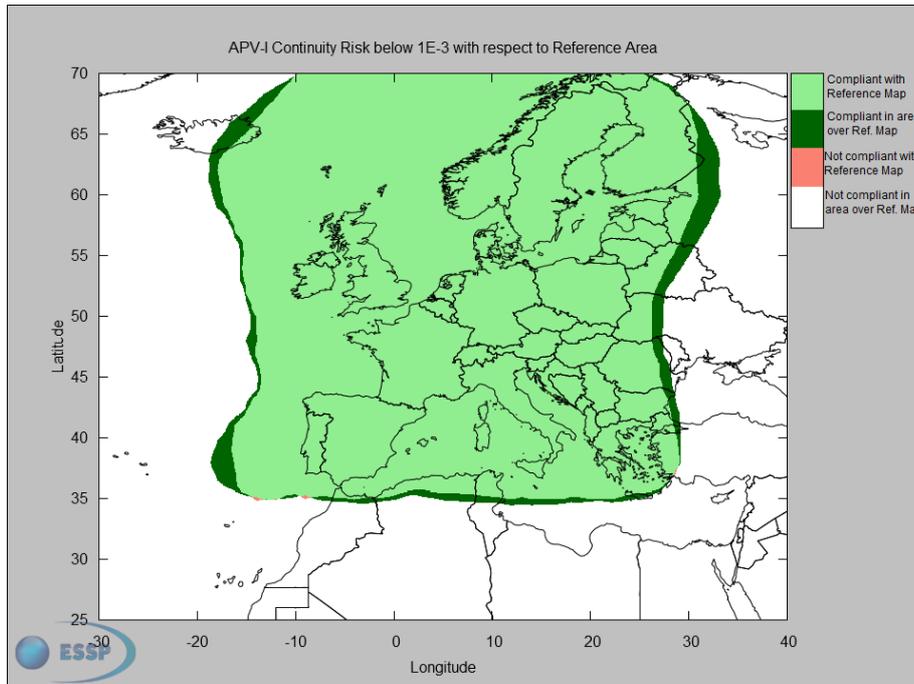


Figure 22: APV-I Continuity with respect to Reference Map (SDD v2.2) – 10^{-3} area - 01/04/14 to 31/03/15

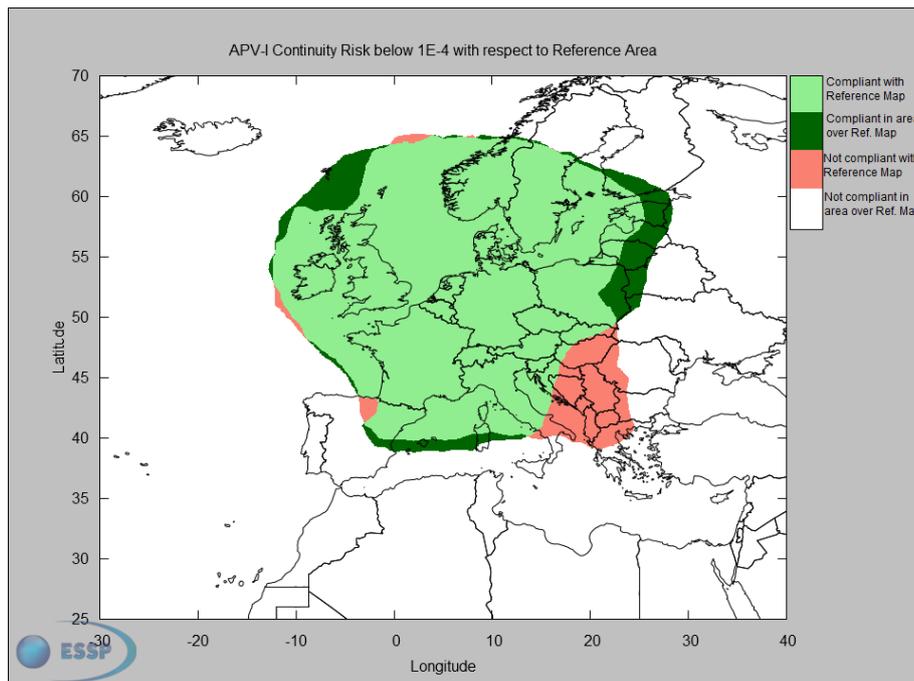


Figure 23: APV-I Continuity with respect to Reference Map (SDD v2.2) – 10^{-4} area - 01/04/14 to 31/03/15

3.4 Open Service (OS)

3.4.1 RIMS Monitoring Network

The following map shows the location of the deployed RIMS:



Figure 24: RIMS locations⁴

The reference zone for the provision of the Open Service is detailed in OS SDD⁴.

The receiver network used to report Open Service corresponds to the subset of RIMS that are inside the OS SDD⁴ commitment map.

⁴ Source: EGNOS SDDs (OS, SoL, EDAS). See http://egnos-user-support.essp-sas.eu/new_egnos_ops/content/egnos-sdds

ID	Location	Country	ID	Location	Country
TRO	Tromsoe	Norway	TRD	Trondheim	Norway
CRK	Cork	Ireland	LSB	Lisbon	Portugal
ZUR	Zürich	Switzerland	WRS	Warsaw	Poland
MLG	Málaga	Spain	ROM	Rome	Italy
BRN	Berlin	Germany	ALB	Alborg	Denmark
TLS	Toulouse	France	GLG	Glasgow	United Kingdom
SWA	Swanwick	United Kingdom	GVL	Gävle	Sweden
SDC	S. de Compostela	Spain	CTN	Catania	Italy
PDM	Palma de Mallorca	Spain	MAD	Madeira	Portugal
KIR	Kirkenes	Norway	LAP	Lappeenranta	Finland
JME	Jan Mayen	Norway	EGI	Egilsstadir	Iceland
RKK	Reykjavik	Iceland	SOF	Sofia	Bulgaria
ATH	Athens	Greece	DJA	Djerba	Tunisia
GOL	Golbasi	Turkey			

Table 5: List of RIMS sites where performances are reported

3.4.2 Horizontal and Vertical Accuracy

EGNOS OS Horizontal (resp Vertical) Accuracy is reported as the 95th percentile of the Horizontal (resp Vertical) Navigation System Error (HNSE/VNSE) over the month. The HNSE/VNSE requirement is measured only when there is a valid PA position solution.

The following table provides the values of accuracy (95%) in metres measured for the reporting period.

Station	HNSE 95% (metres)	VNSE 95% (metres)
Aalborg	0.8	1.5
Berlin	0.8	1.3
Catania	1.0	1.4
Cork	1.0	1.4
Warsaw	0.9	1.5
Djerba	1.3	1.7
Egilsstadir	1.1	2.0
Glasgow	0.9	1.5
Golbasi	1.4	2.1
Lisbon	1.4	1.9
Swanwick	1.2	1.7
Madeira	1.8	2.2
Málaga	1.3	1.4

Station	HNSE 95% (metres)	VNSE 95% (metres)
Kirkenes	1.4	2.5
Palma de Mallorca	1.0	1.2
Reykjavik	1.4	2.4
Roma	1.0	1.4
Lappeenranta	0.9	1.8
S. de Compostela	1.3	1.3
Sofia	1.3	2.3
Gävle	0.8	1.7
Toulouse	1.0	1.2
Trondheim	0.9	1.7
Tromsoe	1.4	2.5
Zürich	0.9	1.2
Jan Mayen	1.5	2.6
Athens	0.9	1.5

Table 6: EGNOS Open Service accuracy (95%)

The horizontal accuracy results for all the stations remained below 1.8 metres (95%), and the vertical accuracy below 2.6 metres (95%), what represents a very good level of accuracy.

The following figures show the histogram and cumulative distribution function of HNSE (Horizontal Navigation System Error) and VNSE (Vertical Navigation System Error), which are computed at the previous stations for each second over the entire period, across the range of values.

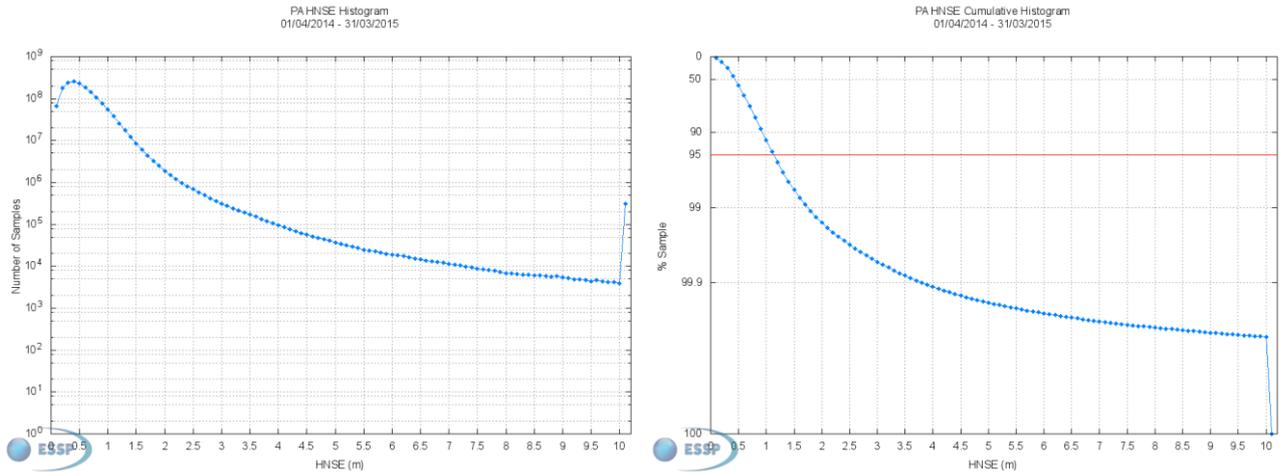


Figure 25: EGNOS Open Service HNSE Histogram and Cumulative Probability

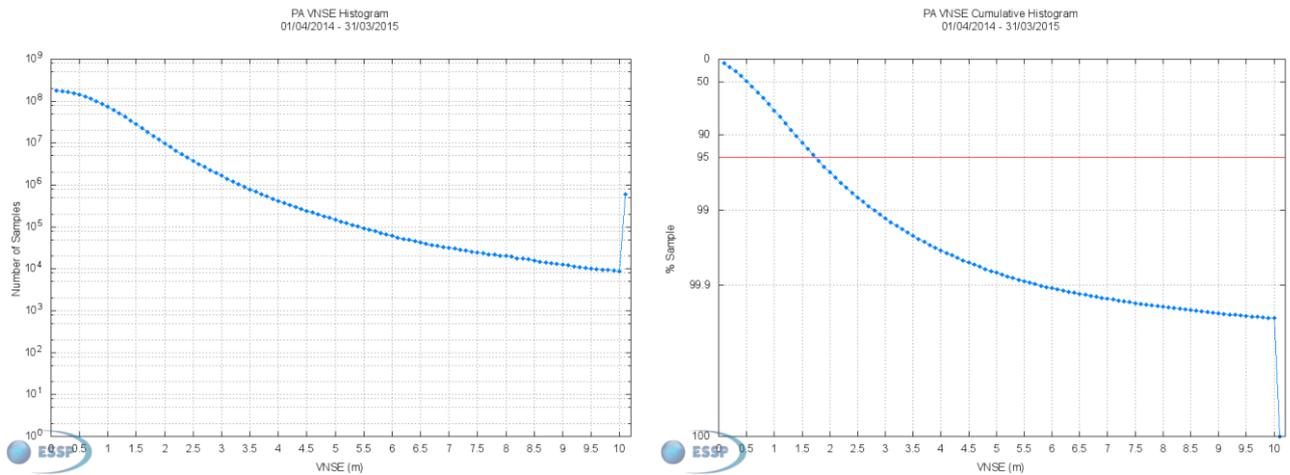


Figure 26: EGNOS Open Service VNSE Histogram and Cumulative Probability

As it can be observed, the cumulative results confirm the good values observed at the stations. The 95th percentile is below 1.2 metres in the horizontal domain and below 1.8 metres in the vertical one.



EGNOS for rail: environment characterisation

Table 7 and Table 8 below provide the monthly maximum of the daily values for Horizontal and Vertical Accuracy (95%) while using EGNOS message broadcast by PRN120 and PRN126 respectively.

PRN 120		04/14	05/14	06/14	07/14	08/14	09/14	10/14	11/14	12/14	01/15	02/15	03/15	Average
MLG	HPE	1.98	1.87	1.53	1.89	1.54	1.79	1.59	1.51	1.40	1.21	1.62	1.78	1.64
	VPE	1.81	1.68	1.39	1.69	1.83	2.35	2.38	1.72	1.65	1.63	2.62	2.20	1.91
SDC	HPE	1.64	1.56	1.54	1.71	1.71	1.49	1.50	1.39	1.29	1.31	1.50	2.10	1.56
	VPE	1.64	1.48	1.60	1.48	1.64	1.51	1.64	1.58	1.34	1.37	1.41	2.76	1.62
PDM	HPE	1.93	1.31	1.17	1.35	1.41	1.51	1.20	1.07	4.72	0.90	1.02	1.41	1.58
	VPE	2.15	1.54	1.33	1.38	1.46	1.41	1.41	1.58	9.29	1.38	1.55	1.79	2.19
LSB	HPE	2.04	1.99	2.30	2.51	1.87	1.89	1.97	1.54	1.56	1.35	1.62	2.06	1.89
	VPE	2.44	2.87	3.28	2.13	2.05	2.27	2.48	2.28	2.14	1.94	2.18	2.64	2.39
TRD	HPE	1.55	1.08	0.77	0.77	1.12	1.23	1.41	1.82	1.88	1.29	1.28	2.61	1.40
	VPE	3.18	1.91	2.01	1.72	2.49	3.00	2.53	2.73	2.77	1.96	2.41	4.79	2.63
CRK	HPE	1.26	1.20	1.13	1.24	1.38	1.51	1.06	1.05	1.18	1.16	1.42	2.65	1.35
	VPE	1.72	1.65	1.70	1.53	1.55	1.52	1.83	1.58	1.74	2.00	1.94	2.99	1.81
ZUR	HPE	1.20	1.03	1.06	1.26	1.13	1.09	0.90	0.93	0.88	0.96	1.23	1.61	1.11
	VPE	1.38	1.38	1.35	1.37	1.36	1.33	1.58	1.43	1.50	1.62	1.55	2.34	1.52
BRN	HPE	1.09	0.97	0.96	0.96	0.96	1.06	1.02	0.95	0.87	0.96	0.96	2.17	1.08
	VPE	1.73	1.49	1.61	1.52	1.38	1.34	1.40	1.50	1.55	1.50	1.62	3.15	1.65
TLS	HPE	1.30	1.25	1.15	1.46	1.23	1.24	1.13	1.01	0.98	1.01	1.17	0.91	1.15
	VPE	1.51	1.38	1.34	1.31	1.59	1.45	1.49	1.33	1.56	1.51	1.48	1.56	1.46
TRO	HPE	1.95	1.32	1.08	1.22	1.56	2.00	2.03	2.58	3.06	1.96	1.89	3.32	2.00
	VPE	3.55	2.71	2.57	2.88	3.32	3.34	3.42	3.93	3.57	3.05	4.20	5.89	3.54
SWA	HPE	1.41	1.39	1.41	1.46	1.43	1.66	1.20	1.24	1.18	1.25	1.58	2.60	1.48
	VPE	1.92	1.93	1.69	1.87	1.76	1.76	1.77	1.81	1.78	2.17	2.30	2.80	1.96
ROM	HPE	1.42	1.22	1.38	1.32	1.19	1.29	1.22	1.11	0.94	1.08	1.14	1.16	1.21
	VPE	1.78	1.71	1.55	1.74	1.51	1.61	1.80	1.74	1.60	1.55	1.67	2.04	1.69
ALB	HPE	0.96	0.76	0.75	0.80	1.02	1.12	1.01	1.17	0.93	1.16	0.94	1.95	1.05
	VPE	1.93	1.68	1.49	1.56	1.60	1.51	1.79	1.82	1.94	2.22	2.39	3.09	1.92
GLG	HPE	1.04	0.90	0.95	0.88	1.32	1.32	1.18	1.21	1.28	1.08	1.09	2.46	1.23
	VPE	1.87	1.65	1.70	1.53	1.55	1.73	1.60	1.61	1.97	2.20	2.50	3.80	1.98
GVL	HPE	1.34	1.01	0.75	0.79	1.13	1.18	1.15	1.48	2.15	1.17	1.37	2.04	1.30
	VPE	2.59	1.85	1.86	1.76	2.17	1.88	2.06	2.56	2.50	2.06	2.25	4.63	2.35
WRS	HPE	1.30	1.13	1.22	1.18	1.14	1.00	1.14	1.02	0.98	1.03	1.01	2.18	1.19
	VPE	1.79	1.72	1.40	1.67	1.76	1.69	1.72	1.99	1.85	1.79	1.93	2.80	1.84
CTN	HPE	1.43	1.33	1.28	1.25	1.10	1.45	1.22	1.22	0.94	0.98	0.81	1.35	1.20
	VPE	2.35	1.83	1.75	1.92	1.82	1.48	1.55	1.69	1.50	1.47	1.70	1.95	1.75
MAD	HPE	4.33	1.63	1.75	3.56	2.11	3.78	4.11	2.52	3.49	2.18	4.32	5.28	3.26
	VPE	3.75	2.38	2.34	2.83	2.25	3.46	4.82	3.26	4.08	4.17	6.14	6.21	3.81
TOR	HPE	1.73	1.46	1.42	1.63	1.60	1.59	1.40	1.22	1.18	1.06	1.22	1.78	1.44
	VPE	1.54	1.57	1.55	1.93	1.57	1.71	1.70	1.64	1.53	1.50	1.54	2.10	1.66
ATH	HPE	1.34	1.31	1.13	1.23	1.11	1.14	1.10	1.13	0.87	0.92	0.95	1.33	1.13
	VPE	2.45	1.92	1.84	2.06	1.81	1.77	1.89	1.89	1.59	1.48	1.91	2.29	1.91
DJA	HPE	2.16	1.46	1.47	1.41	1.35	1.94	3.74	2.52	1.63	1.27	1.45	3.29	1.97
	VPE	2.97	2.31	2.17	2.26	1.89	2.46	2.88	2.45	1.77	2.01	1.96	2.58	2.31
SOF	HPE	1.58	1.46	1.48	1.75	1.60	1.43	1.84	1.39	1.40	1.22	1.33	1.69	1.51
	VPE	2.47	2.64	2.57	2.74	2.91	2.75	3.08	2.20	2.44	2.48	2.48	3.03	2.65
LAP	HPE	1.51	1.25	0.85	0.85	1.40	1.42	1.21	1.52	2.23	1.52	1.39	2.75	1.49
	VPE	2.94	1.91	2.13	1.95	2.30	2.32	2.55	2.95	2.26	2.29	2.56	5.86	2.67
KIR	HPE	2.41	1.26	1.12	1.42	1.74	2.38	2.82	3.33	2.70	3.00	2.19	4.22	2.38
	VPE	4.15	2.43	2.10	2.56	3.33	3.87	5.20	4.41	4.14	3.95	4.19	6.45	3.90
JME	HPE	2.39	1.73	1.33	7.44	1.81	1.89	2.39	3.30	2.51	2.47	2.22	2.80	2.69
	VPE	3.50	3.12	2.63	18.73	3.20	3.25	3.83	4.92	4.00	3.43	3.74	5.47	4.99
EGI	HPE	1.62	1.27	1.14	1.11	1.50	1.62	1.73	2.42	2.24	1.97	1.73	3.14	1.79
	VPE	3.35	2.02	2.33	2.03	2.98	4.17	2.91	3.37	4.63	3.69	3.91	4.72	3.34
RKK	HPE	2.06	1.38	1.16	1.56	2.14	2.19	2.42	2.65	2.43	3.01	2.09	4.14	2.27
	VPE	3.29	2.27	2.36	2.28	4.22	4.11	3.59	4.64	4.56	4.77	3.73	5.23	3.75
LPI	HPE	6.03	3.83	2.81	3.12	2.74	6.09	7.95	5.38	6.02	4.64	5.84	9.17	5.30
	VPE	5.04	2.94	2.49	4.29	2.96	5.54	7.03	4.60	6.12	6.23	8.96	10.80	5.58
CNR	HPE	6.22	4.07	2.47	3.06	3.07	5.61	7.11	5.37	6.79	4.60	6.44	9.89	5.39
	VPE	6.06	3.02	2.61	3.89	3.08	5.85	6.41	4.83	6.60	4.83	7.84	11.67	5.56
GOL	HPE	2.02	1.74	1.99	1.73	1.74	1.83	1.83	2.04	1.38	2.77	1.35	1.84	1.86
	VPE	3.10	2.82	2.57	2.51	2.40	2.85	3.25	3.04	2.43	2.71	2.27	3.65	2.80

Table 7: Monthly Horizontal/Vertical Accuracy at RIMS-A sites for PRN120 (in metres).

PRN 126		04/14	05/14	06/14	07/14	08/14	09/14	10/14	11/14	12/14	01/15	02/15	03/15	Average
MLG	HPE	2.06	1.87	1.56	1.83	1.54	1.78	1.64	1.48	1.40	1.22	1.57	1.84	1.65
	VPE	1.83	1.64	1.38	1.70	1.86	2.25	2.41	1.70	1.60	1.57	2.67	2.11	1.89
SDC	HPE	1.63	1.55	1.53	1.70	1.72	1.52	1.53	1.42	1.29	1.30	1.51	2.11	1.57
	VPE	1.57	1.48	1.63	1.46	1.61	1.51	1.65	1.60	1.33	1.38	1.45	2.76	1.62
PDM	HPE	1.92	1.33	1.17	1.36	1.39	1.50	1.21	1.09	5.34	0.89	1.03	1.53	1.65
	VPE	2.17	1.53	1.33	1.39	1.46	1.40	1.42	1.59	10.49	1.36	1.56	1.97	2.31
LSB	HPE	2.03	1.98	2.42	2.50	1.87	1.94	2.02	1.56	1.52	1.34	1.69	2.09	1.91
	VPE	2.44	2.82	3.36	2.18	2.02	2.30	2.40	2.27	2.12	1.85	2.17	2.61	2.38
TRD	HPE	1.54	1.09	0.77	0.76	1.13	1.18	1.40	1.74	1.99	1.26	1.22	2.64	1.39
	VPE	3.19	1.90	1.98	1.73	2.48	2.98	2.52	2.76	2.61	1.95	2.43	4.85	2.62
CRK	HPE	1.26	1.20	1.13	1.26	1.36	1.49	1.05	1.05	1.17	1.16	1.45	2.62	1.35
	VPE	1.71	1.59	1.69	1.54	1.54	1.53	1.84	1.54	1.75	2.00	1.93	3.09	1.81
ZUR	HPE	1.19	1.03	1.06	1.26	1.14	1.11	0.91	0.93	0.88	0.96	1.25	1.64	1.11
	VPE	1.39	1.38	1.37	1.37	1.37	1.34	1.57	1.43	1.48	1.65	1.55	2.38	1.52
BRN	HPE	1.10	0.97	0.95	0.99	0.97	1.04	1.00	0.95	0.87	0.97	0.97	2.15	1.08
	VPE	1.74	1.50	1.57	1.54	1.36	1.35	1.39	1.50	1.52	1.52	1.58	3.16	1.64
TLS	HPE	1.30	1.24	1.17	1.44	1.22	1.25	1.14	1.00	0.97	1.01	1.21	0.93	1.16
	VPE	1.50	1.38	1.36	1.31	1.59	1.46	1.47	1.37	1.57	1.49	1.49	1.56	1.46
TRO	HPE	1.96	1.30	1.07	1.17	1.59	2.02	2.15	2.48	3.07	1.95	1.89	3.49	2.01
	VPE	3.49	2.72	2.57	2.85	3.34	3.31	3.44	3.93	3.51	3.08	4.21	6.49	3.58
SWA	HPE	1.42	1.39	1.43	1.43	1.45	1.70	1.21	1.24	1.18	1.24	1.60	2.64	1.49
	VPE	1.92	1.93	1.66	1.87	1.76	1.75	1.76	1.82	1.76	2.17	2.24	2.84	1.96
ROM	HPE	1.47	1.25	1.40	1.32	1.17	1.26	1.20	1.11	0.95	1.07	1.12	1.28	1.22
	VPE	1.78	1.73	1.55	1.73	1.52	1.61	1.77	1.72	1.62	1.58	1.64	2.03	1.69
ALB	HPE	0.95	0.77	0.74	0.80	1.04	1.11	1.00	1.19	0.94	1.14	0.93	1.89	1.04
	VPE	1.81	1.68	1.50	1.56	1.63	1.49	1.79	1.80	1.95	2.28	2.39	3.29	1.93
GLG	HPE	1.03	0.90	0.94	0.89	1.31	1.32	1.18	1.17	1.33	1.08	1.11	2.43	1.22
	VPE	1.88	1.68	1.69	1.54	1.60	1.71	1.59	1.58	2.04	2.17	2.49	4.00	2.00
GVL	HPE	1.34	1.01	0.75	0.78	1.15	1.17	1.12	1.46	2.13	1.21	1.37	2.10	1.30
	VPE	2.58	1.86	1.86	1.78	2.17	1.88	2.14	2.54	2.49	2.01	2.29	4.62	2.35
WRS	HPE	1.29	1.10	1.21	1.33	1.12	0.99	1.13	1.00	1.00	1.08	1.04	2.11	1.20
	VPE	1.80	1.75	1.40	1.66	1.77	1.69	1.67	1.93	1.83	1.81	1.95	2.98	1.85
CTN	HPE	1.46	1.31	1.28	1.26	1.13	1.39	1.25	1.15	0.96	0.95	0.85	1.46	1.20
	VPE	2.32	1.82	1.77	1.93	1.81	1.48	1.53	1.69	1.50	1.50	1.70	2.13	1.77
MAD	HPE	4.39	1.62	1.78	3.50	2.13	3.81	4.22	2.50	3.48	2.23	4.19	5.07	3.24
	VPE	3.55	2.40	2.42	2.83	2.26	3.70	5.24	3.30	3.73	4.11	5.84	6.18	3.80
TOR	HPE	1.72	1.45	1.27	1.54	1.60	1.57	1.40	1.25	1.18	1.06	1.26	1.86	1.43
	VPE	1.57	1.58	1.36	1.55	1.59	1.73	1.69	1.60	1.53	1.47	1.55	2.17	1.62
ATH	HPE	1.34	1.12	1.13	1.25	1.10	1.15	1.09	1.07	0.86	0.90	0.95	1.31	1.11
	VPE	2.38	1.81	1.83	2.05	1.79	1.76	1.91	1.94	1.54	1.52	1.92	2.40	1.90
DJA	HPE	2.17	1.47	1.46	1.44	1.31	1.97	3.72	2.21	1.67	1.25	1.51	3.56	1.98
	VPE	2.96	2.26	2.20	2.27	1.89	2.55	2.85	2.39	1.75	2.01	1.92	2.99	2.34
SOF	HPE	1.59	1.31	1.47	1.75	1.60	1.53	1.82	1.39	1.38	1.20	1.33	1.73	1.51
	VPE	2.57	2.64	2.56	2.65	3.03	2.77	3.13	2.12	2.49	2.49	2.48	3.19	2.68
LAP	HPE	1.50	1.27	0.86	0.86	1.41	1.37	1.23	1.73	2.32	1.52	1.44	2.88	1.53
	VPE	2.96	1.91	2.15	1.96	2.30	2.30	2.52	2.96	2.20	2.28	2.53	5.83	2.66
KIR	HPE	2.42	1.29	1.10	1.40	1.76	2.33	2.76	3.15	2.60	2.89	2.16	4.23	2.34
	VPE	4.19	2.45	2.07	2.60	3.34	3.84	5.56	4.46	4.10	3.85	4.08	6.67	3.93
JME	HPE	2.36	1.76	1.32	3.57	1.82	1.91	2.36	3.51	2.40	3.01	2.14	2.95	2.43
	VPE	3.49	3.04	2.63	11.11	3.28	3.19	3.71	4.89	3.95	3.63	3.84	5.60	4.36
EGI	HPE	1.74	1.29	1.15	1.05	1.51	1.63	1.68	2.45	2.35	2.08	1.77	3.13	1.82
	VPE	3.33	2.01	2.35	2.01	3.01	4.14	2.83	3.35	4.72	3.73	3.97	4.90	3.36
RKK	HPE	2.05	1.39	1.19	1.43	2.35	2.25	2.37	2.69	2.52	3.09	2.18	4.21	2.31
	VPE	3.25	2.31	2.33	2.28	4.16	4.45	3.52	5.08	4.44	4.58	3.68	5.49	3.80
LPI	HPE	6.00	3.86	2.86	3.05	2.79	6.15	7.27	5.34	6.01	4.60	5.60	9.18	5.23
	VPE	4.83	2.94	2.41	4.31	3.02	5.50	6.74	4.84	6.30	6.64	9.72	10.64	5.66
CNR	HPE	6.10	4.07	2.49	3.10	3.00	5.63	7.44	5.50	6.76	4.47	6.13	9.96	5.39
	VPE	5.90	2.92	2.61	3.85	3.19	5.88	6.36	5.14	6.46	4.84	7.30	11.57	5.50
GOL	HPE	2.02	1.76	2.06	1.73	1.71	1.86	1.97	1.55	1.40	2.91	1.33	1.95	1.85
	VPE	3.10	2.95	2.47	2.55	2.38	2.86	3.20	3.03	2.43	2.48	2.25	3.82	2.79

Table 8: Monthly Horizontal/Vertical Accuracy at RIMS-A sites for PRN126 (in metres)

3.4.3 Open Service Availability

EGNOS OS Availability performance is defined in this document as the percentage of time in the month when the position error (computed in PA mode) is below the established values for the Open Service (3 metres for horizontal error and 4 metres for vertical error) over the total number of samples with valid PA navigation solution.

The following tables provide the values measured using PRN120 and PRN126 respectively.

PRN120	04/14	05/14	06/14	07/14	08/14	09/14	10/14	11/14	12/14	01/15	02/15	03/15	Average
MLGA	99.27%	99.79%	99.90%	99.80%	99.78%	99.50%	99.76%	99.87%	99.80%	99.95%	99.65%	99.43%	99.71%
SDCA	99.81%	99.86%	99.93%	99.90%	99.94%	99.95%	99.94%	99.96%	99.85%	99.93%	99.92%	99.79%	99.90%
PDMA	99.82%	99.95%	100.00%	99.99%	99.98%	99.98%	99.93%	99.98%	99.53%	99.98%	99.97%	99.81%	99.91%
LSBA	98.79%	98.78%	98.65%	99.02%	99.47%	99.37%	99.20%	99.54%	99.15%	99.78%	99.34%	98.82%	99.16%
TRDA	99.80%	99.98%	100.00%	100.00%	100.00%	99.93%	99.86%	99.76%	99.61%	99.98%	99.92%	99.68%	99.88%
CRKA	100.00%	100.00%	100.00%	100.00%	100.00%	99.99%	100.00%	100.00%	100.00%	100.00%	100.00%	99.85%	99.99%
ZURA	99.98%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	99.99%	100.00%	99.97%	99.99%
BRNA	99.99%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	99.97%	100.00%	99.89%	99.99%
TLSA	99.97%	100.00%	100.00%	100.00%	100.00%	99.99%	99.99%	100.00%	100.00%	99.99%	100.00%	99.33%	99.94%
TROA	99.27%	99.89%	99.96%	99.88%	99.72%	99.82%	99.16%	98.28%	98.40%	99.40%	98.84%	98.39%	99.25%
SWAA	99.90%	99.99%	99.98%	99.99%	100.00%	100.00%	100.00%	100.00%	100.00%	99.99%	99.97%	99.80%	99.97%
ROMA	99.94%	99.97%	99.96%	99.82%	99.92%	99.82%	99.86%	99.90%	99.97%	99.93%	99.94%	99.95%	99.92%
ALBA	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	99.99%	100.00%	99.99%	99.99%	99.93%	99.99%
GLGA	99.99%	100.00%	100.00%	100.00%	99.99%	100.00%	99.98%	100.00%	99.94%	99.99%	99.98%	99.76%	99.97%
GVLA	99.99%	100.00%	100.00%	100.00%	100.00%	100.00%	99.98%	99.91%	99.79%	99.98%	99.98%	99.70%	99.94%
WRSA	99.95%	99.99%	100.00%	100.00%	100.00%	99.99%	100.00%	100.00%	100.00%	99.98%	99.98%	99.93%	99.98%
CTNA	99.75%	99.91%	100.00%	99.98%	99.99%	99.77%	99.78%	99.94%	99.99%	99.99%	99.93%	99.79%	99.90%
MADA	97.11%	98.61%	99.37%	99.27%	99.72%	98.02%	97.42%	98.25%	97.12%	98.68%	97.34%	95.38%	98.02%
SPU1	99.83%	99.85%	99.84%	99.77%	99.84%	99.90%	99.92%	99.89%	99.84%	99.91%	99.89%	99.71%	99.85%
KIRA	98.89%	99.63%	99.85%	99.88%	99.41%	98.13%	96.59%	97.85%	97.64%	98.63%	97.81%	97.07%	98.45%
LAPA	99.98%	100.00%	99.99%	100.00%	99.97%	99.99%	99.95%	99.90%	99.55%	99.85%	99.85%	99.50%	99.88%
ATHA	99.97%	99.96%	99.99%	99.95%	100.00%	99.97%	99.57%	99.94%	99.88%	99.95%	99.95%	99.89%	99.92%
DJAA	99.39%	99.90%	99.97%	99.90%	99.95%	99.27%	98.54%	99.50%	99.73%	99.91%	99.70%	99.18%	99.58%
SOFA	99.90%	99.89%	99.95%	99.79%	99.68%	99.69%	99.49%	99.90%	99.94%	99.88%	99.79%	99.61%	99.79%
JMEA	98.98%	99.65%	99.89%	99.14%	99.57%	99.69%	98.78%	98.00%	98.23%	99.00%	98.63%	97.55%	98.93%
EGIA	99.57%	99.96%	99.97%	100.00%	99.91%	99.65%	99.62%	99.45%	98.98%	99.23%	99.07%	99.35%	99.56%
RKKA	99.02%	99.72%	99.82%	99.87%	99.49%	99.08%	98.55%	98.06%	97.74%	98.40%	98.33%	97.76%	98.82%
LPJA	90.59%	98.03%	99.34%	98.78%	99.10%	91.03%	86.47%	89.61%	88.24%	94.13%	88.22%	85.91%	92.46%
CNRA	88.08%	97.85%	99.31%	98.63%	98.47%	88.30%	82.08%	84.36%	84.62%	93.62%	84.16%	83.42%	90.24%
GOLA	98.31%	99.17%	99.49%	98.73%	98.81%	98.35%	98.57%	99.15%	99.65%	99.51%	99.81%	99.45%	99.08%

Table 9: OS Availability at RIMS-A sites for PRN120



EGNOS Station Site at Fucino (Italy)

PRN126	04/14	05/14	06/14	07/14	08/14	09/14	10/14	11/14	12/14	01/15	02/15	03/15	Average
MLGA	99.29%	99.80%	99.91%	99.81%	99.77%	99.47%	99.74%	99.88%	99.81%	99.96%	99.65%	99.40%	99.71%
SDCA	99.83%	99.87%	99.94%	99.89%	99.93%	99.96%	99.93%	99.96%	99.87%	99.94%	99.92%	99.80%	99.90%
PDMA	99.82%	99.95%	100.00%	99.99%	99.99%	99.99%	99.93%	99.99%	99.51%	99.97%	99.97%	99.77%	99.91%
LSBA	98.75%	98.80%	98.64%	99.06%	99.52%	99.30%	99.21%	99.55%	99.14%	99.82%	99.33%	98.75%	99.16%
TRDA	99.80%	99.98%	100.00%	100.00%	100.00%	99.94%	99.85%	99.80%	99.61%	99.97%	99.93%	99.68%	99.88%
CRKA	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	99.86%	99.99%
ZURA	99.98%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	99.98%	100.00%	99.98%	99.99%
BRNA	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	99.97%	100.00%	99.88%	99.99%
TLSA	99.99%	100.00%	100.00%	100.00%	100.00%	99.99%	99.99%	100.00%	100.00%	99.99%	100.00%	99.22%	99.93%
TROA	99.30%	99.90%	99.94%	99.88%	99.72%	99.80%	99.18%	98.49%	98.48%	99.36%	98.84%	98.39%	99.27%
SWAA	99.91%	99.99%	99.98%	99.99%	100.00%	100.00%	100.00%	100.00%	100.00%	99.99%	99.98%	99.79%	99.97%
ROMA	99.94%	99.97%	99.96%	99.83%	99.92%	99.82%	99.86%	99.91%	99.97%	99.94%	99.95%	99.94%	99.92%
ALBA	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	99.99%	99.99%	99.92%	99.99%
GLGA	99.99%	100.00%	100.00%	100.00%	99.99%	100.00%	99.99%	100.00%	99.93%	99.98%	99.98%	99.74%	99.97%
GVLA	99.99%	100.00%	100.00%	100.00%	100.00%	100.00%	99.98%	99.92%	99.80%	99.98%	99.98%	99.70%	99.94%
WRSA	99.95%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	99.98%	99.98%	99.92%	99.98%
CTNA	99.74%	99.92%	100.00%	99.97%	99.99%	99.79%	99.81%	99.96%	99.97%	99.99%	99.91%	99.77%	99.90%
MADA	97.17%	98.63%	99.36%	99.30%	99.75%	98.00%	97.38%	98.31%	97.10%	98.67%	97.37%	95.39%	98.04%
SPU1	99.84%	99.86%	99.89%	99.88%	99.89%	99.91%	99.92%	99.89%	99.86%	99.92%	99.88%	99.70%	99.87%
KIRA	98.93%	99.63%	99.86%	99.89%	99.43%	98.17%	96.67%	97.86%	97.64%	98.78%	98.23%	97.32%	98.53%
LAPA	99.98%	99.99%	100.00%	100.00%	99.96%	99.99%	99.96%	99.91%	99.54%	99.87%	99.84%	99.50%	99.88%
ATHA	99.98%	99.97%	99.99%	99.97%	100.00%	99.97%	99.59%	99.97%	99.90%	99.97%	99.95%	99.90%	99.93%
DJAA	99.41%	99.91%	99.96%	99.88%	99.94%	99.25%	98.55%	99.61%	99.73%	99.92%	99.69%	99.11%	99.58%
SOFA	99.90%	99.91%	99.95%	99.83%	99.64%	99.69%	99.51%	99.92%	99.92%	99.88%	99.77%	99.58%	99.79%
JMEA	99.01%	99.70%	99.89%	99.29%	99.55%	99.69%	98.75%	98.03%	98.21%	98.98%	98.59%	97.51%	98.93%
EGIA	99.56%	99.96%	99.97%	100.00%	99.92%	99.63%	99.61%	99.47%	98.97%	99.20%	99.05%	99.28%	99.55%
RKKA	99.01%	99.73%	99.82%	99.83%	99.48%	99.03%	98.59%	98.06%	97.83%	98.41%	98.32%	97.64%	98.81%
LPIA	90.53%	98.08%	99.26%	98.80%	99.09%	90.99%	86.59%	89.62%	88.22%	94.14%	88.31%	86.07%	92.47%
CNRA	88.21%	97.82%	99.28%	98.62%	98.46%	88.28%	82.31%	84.40%	84.73%	93.74%	84.33%	83.49%	90.31%
GOLA	98.33%	99.19%	99.46%	98.85%	98.82%	98.30%	98.55%	99.23%	99.62%	99.48%	99.80%	99.45%	99.09%

Table 10: OS Availability at RIMS-A sites for PRN126

The following map shows, for each location, the value of the average OS availability value during the year. The worst value between PRN120 and PRN126 is shown:

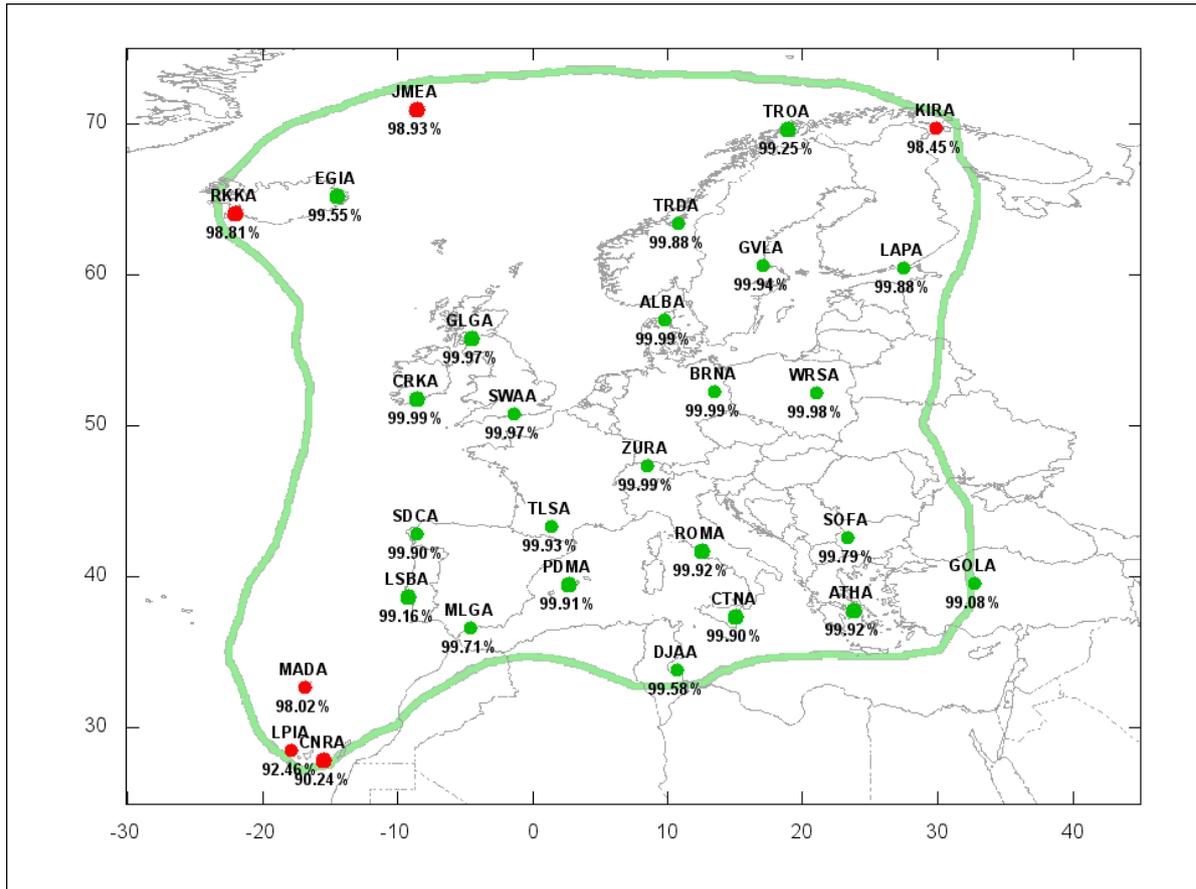


Figure 27: OS average availability for the RIMS stations

3.5 EGNOS Data Access Service (EDAS)

EDAS (EGNOS Data Access Service) is the free-of-charge ground-based access (through the Internet) to EGNOS data in real-time and also in a historical archive, which collects all the data generated by the EGNOS infrastructure, making use of EGNOS ground stations mainly distributed over Europe and North Africa.

Currently, the Services provided by EDAS are the following:

Mode	EDAS Service	Type of Data				Formats
		Observation & navigation	EGNOS messages	RTK corrections	DGNSS corrections	
Real Time	Service Level 0	X	X			ASN.1
	Service Level 2	X	X			RTCM 3.1
	SISNET		X			RTCA DO-229D
	NTRIP	X		X	X	RTCM 2.1, 2.3, 3.1
Archive	FTP	X	X			RINEX 2.11, RINEX B 2.10, EMS, IONEX, SL0 and SL2

Table 11: Serviced provided by EDAS

For further details, please refer to the EDAS Service Definition Document available at http://egnos-user-support.essp-sas.eu/new_egnos_ops/content/egnos-sdds.

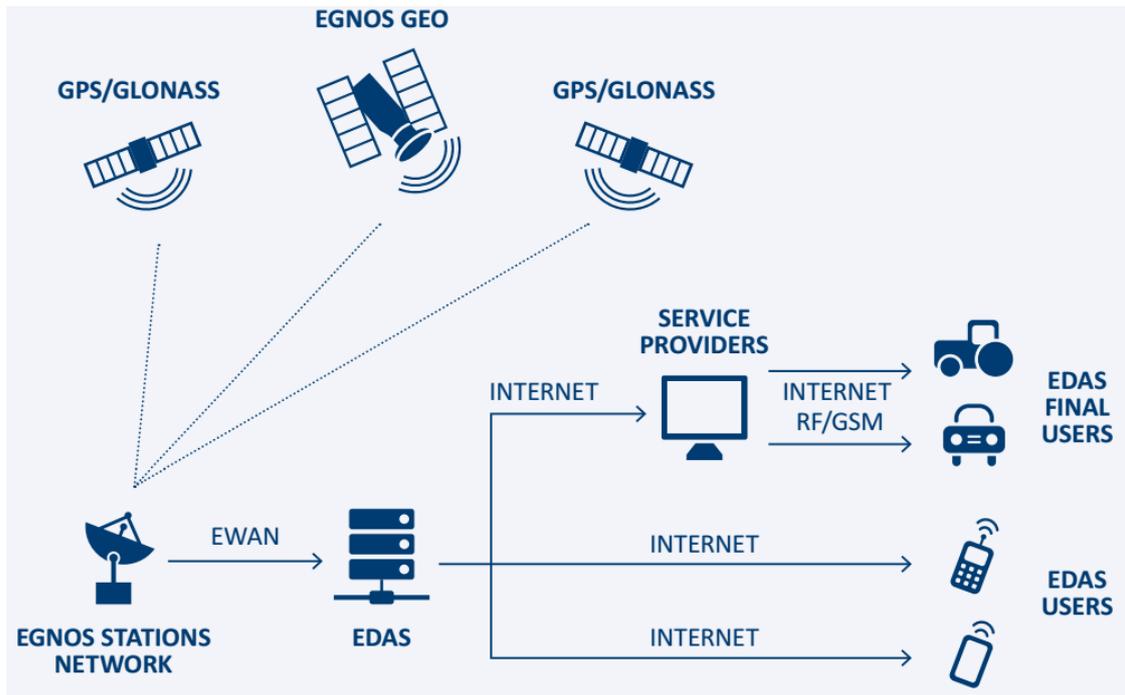


Figure 28: EDAS high level architecture (source: EDAS Service Definition Document)

EDAS, as with all the other EGNOS Services, has its own EDAS SDD (Service Definition Document, see http://egnos-user-support.essp-sas.eu/new_egnos_ops/content/egnos-sdds). Among other content, the EDAS SDD defines the committed performances for EDAS (those that should always be met in a nominal situation) in terms of availability and latency:

- **Availability:** percentage of time in which EDAS is providing its services according to specifications. The availability of EDAS services is measured at the EDAS system output (excluding external network performance).
- **Latency:** time elapsed since the transmission of the last bit of the navigation message from the space segment (EGNOS and GPS/GLONASS satellites) until the data leave the EDAS system (formatted according to the corresponding service level specification). EDAS latency is a one-way parameter defined for real-time services.

Based on the above definitions, the tables below provide minimum availability and maximum latency for EDAS services:

SL0	SL2	SISNeT	FTP	Data Filtering	Ntrip
98.5%	98.5%	98%	98%	98%	98%

Table 12: EDAS services minimum availability

SL0	SL2	SISNeT	FTP	Ntrip	Data Filtering	
					SL0	SL2
1,3 seconds	1,450 seconds	1,150 seconds	N/A	1,75 seconds	1,6 seconds	1,75 seconds

Table 13: EDAS services maximum latency for EDAS Services

EDAS performance is reported through the EGNOS Monthly Performance reports, available on the ESSP website (http://egnos-user-support.essp-sas.eu/new_egnos_ops/content/monthly-performance-reports).

The achieved availability during the last yearly period is shown in the figure below.

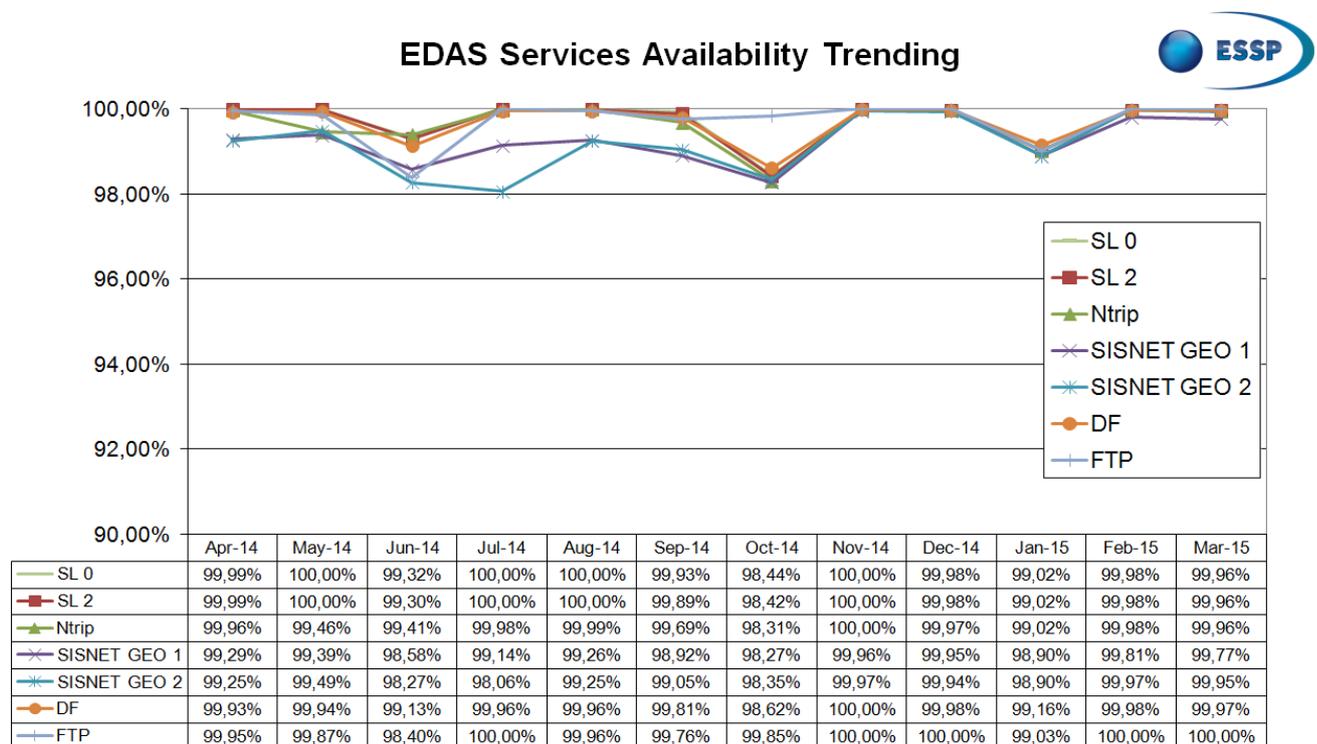


Table 14: EDAS Services Availability (April 2014-March 2015)

As shown above, the EDAS availability performance has been consistently above the target (98% to 98.5% depending on the service) during the entire period. As a significant milestone from the performance point of view, looking at October 2014 in the figure above, it is clear that EDAS availability has been much more stable since then. The reason for this improvement is that, on 20th October 2015, modernisation of the EDAS system was undertaken, consisting of the replacement of the EDAS V1 legacy components.

EDAS Services Latency (ms)

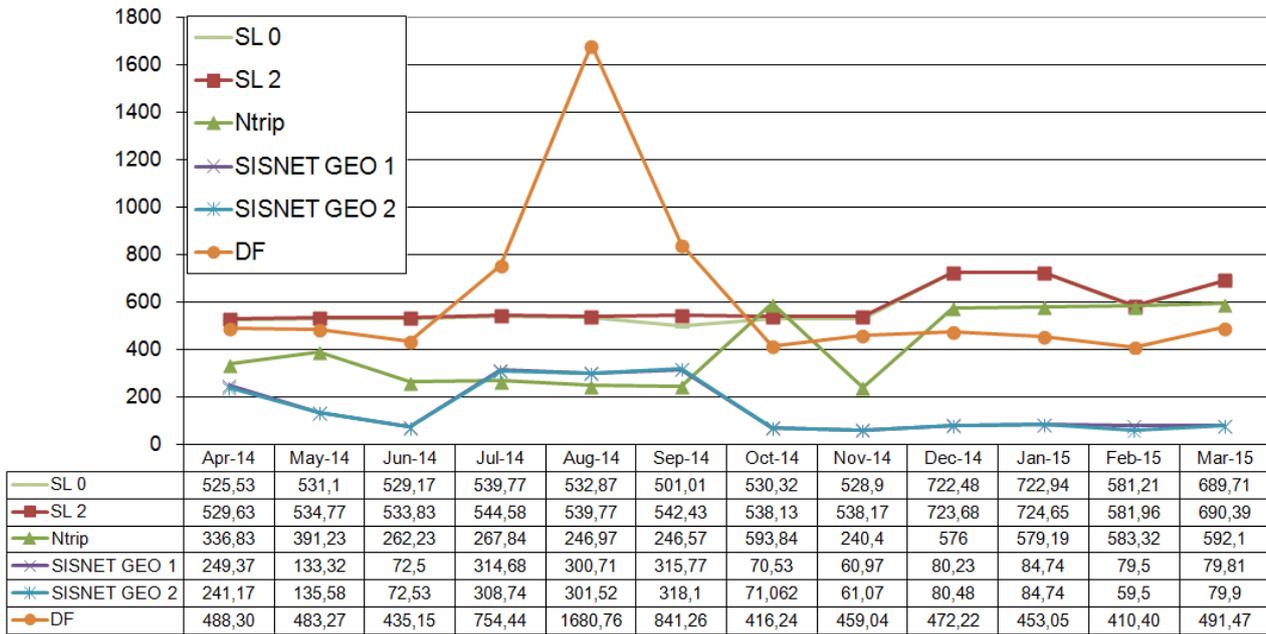


Figure 29: EDAS Services Latency (April 2014-March 2015)

As shown above, the EDAS services latency has been consistently below the target delays for all the services throughout the entire reporting period. Moreover, except for the specific case of the EDAS Data Filtering service in August 2014, measured delays have been below the 1 second threshold.



Large container ship

4 EGNOS SERVICES PROVISION

4.1 SoL Aviation Service Status

4.1.1 ESSP Participation / Support to Key Aviation Supporting Cells

ESSP actively participated to the following meetings/fora to ensure EGNOS Service Provider involvement in the relevant EGNOS/GNSS developments, aviation users' need detection and appropriate information sharing with the civil aviation community:

Event	Dates
RAISG Meeting #7	15/10/2014
RAISG Meeting #8	16-17/04/2015
EUROCONTROL NSG Meeting #19	01-03/04/2014
Joint ICAO PBNTF9-Eurocontrol-NSG20	27-31/10/2014
Joint ICAO PBNTF10-Eurocontrol-NSG21	27-31/04/2015
EUROCONTROL -CNS Tech Info Day	25/09/2014
8 th EASA Rotorcraft Symposium	03-04/12/2014
EASA Regulatory Event on General Aviation	15-16/10/2014
MEDUSA final event on GNSS for aviation	04/06/2014
2nd meeting on legal/regulatory aspects for non-EU	29/09/2014
EASA NPA 2015-01 Workshop	09/03/2015

Table 15: Key aviation supporting cells with ESSP participation

SBAS IWG (Interoperability Working Group): ESSP attends the SBAS IWG regular meetings participating in the last 2 IWG meetings in the reporting period - IWG#27 (in Tampa, Florida, on 8th and 10th September 2014) and IWG#28 (ESTEC, Noordwijk, The Netherlands on 31st March and 1st April 2015).

4.1.2 EGNOS Working Agreement (EWA) Status

The EGNOS Working Agreement (EWA) lays operational and legal foundations formalising the working procedures and required interfaces between ESSP and the SES Certified Air Navigation Service Provider (ANSP) willing to use the EGNOS Safety-of-Life Service as a navigation aid. The Agreement is the necessary step before the publication of SBAS based operations.

4.1.2.1 EWA Dissemination and Awareness Activities

ESSP continued its proactive dissemination and awareness campaign related to the EWA, presenting the proposed EWA approach, as consolidated at European level, and providing all required support to the interested ANSPs upon request.

Many ANSPs (at European and non-EU level) have shown interest in either discussing or being informed about the EWA which is identified as a key driver with regards to EGNOS implementation in civil aviation.

ESSP has also provided support to EWA for non-EU users (MEDA region).



EGNOS equipped cockpit

4.1.2.2 *EWA negotiations/signature status*

During the reporting period, 14 new EWAs were signed, for a total of 31 EWAs in place:

EGNOS Working Agreement (EWA)	Signature Date	Country
MADG (Cambridge Airport)	04/03/2014	United Kingdom UK
Kent Airport (Manston)	26/03/2014	United Kingdom UK
Storumans Flygplats AB	20/05/2014	Sweden SE
Naviair	15/07/2014	Denmark DK
Wolverhampton Airport Limited	05/08/2014	United Kingdom UK
LPS SR	11/09/2014	Slovakia Republic SK
Romatsa	26/09/2014	Romania RO
Bulatsa	27/10/2014	Bulgaria BG
Jersey Airport	27/10/2014	Jersey JE
LVNL	04/11/2014	Netherlands NL
Land's End Airport Limited	28/11/2014	United Kingdom UK
ACR-Sweden	10/03/2015	Sweden SE
Croatia Control Ltd	25/02/2015	Croatia HR
Letiště Vodochody	01/04/2015	Czech Republic CZ

Table 16: EWAs signed during March 2014 – April 2015 period

4.1.3 EGNOS Procedures Implementation

The growth in the number of EGNOS-based LPV approach procedures is continuously growing since the EGNOS SoL declaration in March 2011. In fact, it is expected that by the end of 2015 the total number of operational LPVs deployed in Europe will be close to 250, serving more than 160 European destinations.

Since ESSP started providing EGNOS NOTAM Proposals for Pau Airport in France (17th March 2011), the EGNOS NOTAM Proposals Provision has grown both in terms of countries subscribed (following the signature of an EGNOS Working Agreement between the ESSP and the corresponding ANSP) and operational airports. By end of March 2015 (AIRAC cycle 1503 - 5th March -), 31 ANSPs were subscribed to the EGNOS NOTAM Proposals Provision (see Figure 1).

The full list of airports having at least one EGNOS-based approach procedure, including the type and number of procedures available per airport, can be found on the EGNOS User Support website (<http://egnos-user-support.essp-sas.eu/>). The aforementioned list is regularly updated by ESSP. Moreover, a summary of the airports subscribed and procedures published in each country is detailed in the following figure:



Figure 30: Airports subscribed and procedures published in each country

The evolution of the number of published APV SBAS (LPV) procedures is depicted below.

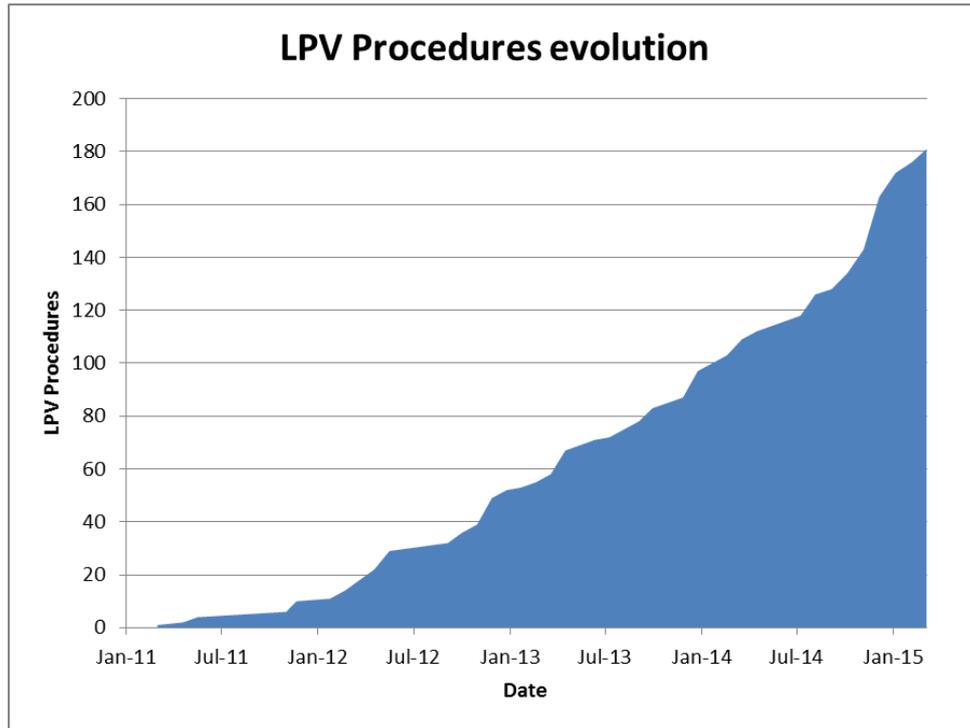


Figure 31: EGNOS-based procedures – publication status as of 31/03/2015

To sum up, at the end of the reporting period (31st March, 2015), ESSP was providing EGNOS NOTAM proposals to 16 countries and 141 airports for a total of 181 EGNOS-based approach procedures.

The introduction of an airport in the EGNOS NOTAM Proposals Provision (following the publication of the corresponding EGNOS-based approach procedure at the airport) is quite straightforward and is done upon request by the concerned ANSP. The ANSP requests ESSP the activation of a certain airport by providing the following information:

1. Airport ICAO code
2. Airport name and country
3. FIR for the airport
4. AFTN address to use for NOTAM proposal for this airport
5. Coordinates of the Airport Reference Point (ARP) – LAT, LONG and elevation
6. EGNOS based approach procedures including runway(s) and minima line (s).
7. Date from which the EGNOS NOTAM proposals shall be provided to the NOF

The above process is also described in the EGNOS Working Agreement (EWA), which includes a specific annex covering the EGNOS NOTAM Proposals Provision. This annex defines the level of service provided and establishes the appropriate communication processes between ESSP and the ANSP.

4.1.4 NOTAM Proposals Service Status

Since 1st January 2014, the ESSP is providing the EGNOS NOTAM Proposals Service Level with the following requirements:

- GNSS scheduled events notified a minimum of 72 hours in advance.
- GNSS (EGNOS and GPS) unscheduled events notified within 2 hours (7D/H24).

Thus, the current service is compliant with the ICAO recommendation for notification of scheduled events (72 hours' notice) but is not yet in line with the recommendation for unscheduled events.

In this situation, the ESSP defined an improvement plan for the service. In terms of evolution strategy, an incremental approach was chosen. Intermediate objectives and service levels were defined. As already mentioned, this roadmap has been updated in the last months, leading to an earlier H24 service operation for the EGNOS NOTAM Proposals Service.

The table below details the different evolution objectives with the associated service level expected.

GNSS events	Notification Timeliness			
	SL1	SL2	SL4(NOW)	SL5
Scheduled	72 h in advance			
Unscheduled (Working hours)	16h max	2h max	2h max	10 min max
Unscheduled (Non-working hours)	16h max	16h max	2h max	10 min. max

Table 17: NOTAM Proposals Service Levels –Reaction Times

The upcoming Service Level 5 definition is provided below:

- **Service Level 5 (Fully ICAO Compliant):** compared to Service Level 4, Service Level 5 provides a reduced reaction time for unscheduled events at EGNOS and GPS systems level applicable every day of the week on an H24 basis.
 - **Target date for entry into service:** to be defined.
 - **Definition:** NOTAMs resulting from:
 - GNSS scheduled events notified minimum 72 hours in advance.
 - GNSS (EGNOS and GPS) unscheduled events notified within 15 minutes (7D/H24).

4.1.4.1 What's next in 2015?

In the coming months, the EGNOS NOTAM Proposals provision is expected to progressively evolve in order to support new EGNOS based operations.

For instance, as detailed in the excerpt of the ICAO PBN Manual included below, EGNOS could be a key enabler for the publication of RNP 0.3 routes:

“Operators relying on GNSS are required to have the means to predict the availability of GNSS fault detection (e.g. ABAS RAIM) to support operations along the RNP 0.3 ATS route

[...].This prediction will not be required where the navigation equipment can make use of SBAS augmentation [...].

Should the State permit the operator of an SBAS-equipped aircraft to disregard the requirement for a RAIM prediction when the RNP 0.3 operation occurs in an SBAS service area, then it is recommended the State consider establishing a requirement for that operator to check SBAS NOTAMS prior to the flight to ensure the availability of the SBAS SIS”

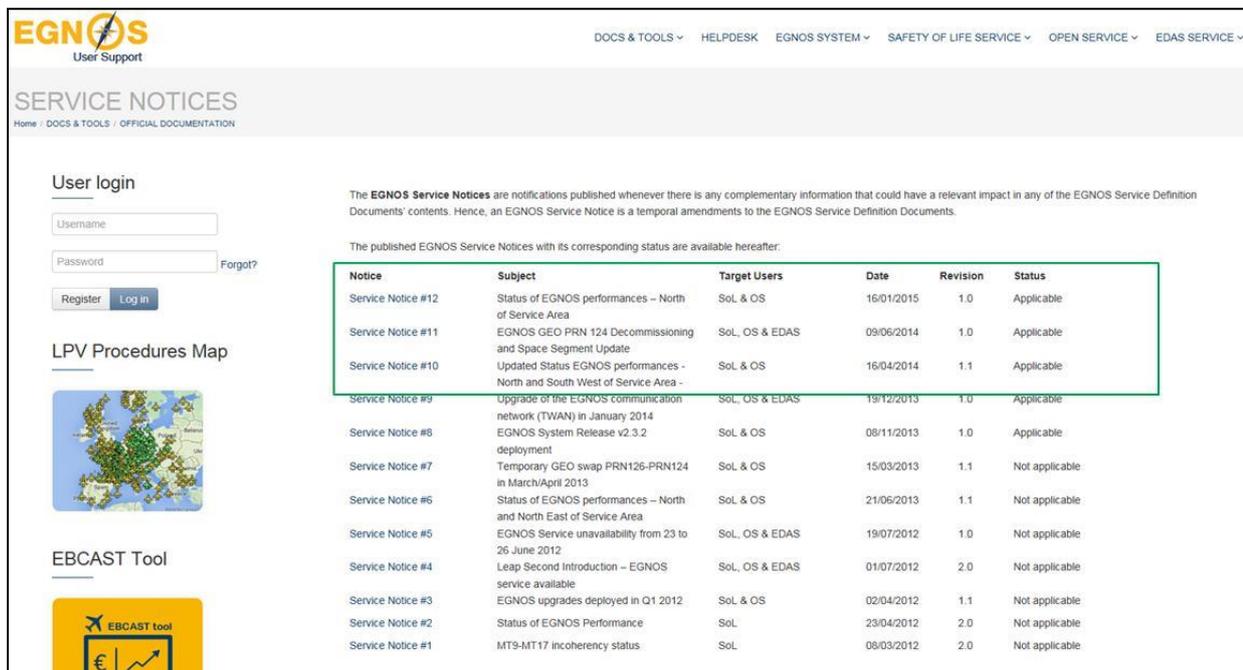
In order to support the publication of RNP 0.3 routes based on EGNOS, the EURONOTAM prediction engine responsible for assessing the level of service available at each airfield, will be modified to predict the EGNOS service availability not only in airport-specific locations but also along the waypoints defining a RNP 0.3 route.

Additionally, the next version of EGNOS system (ESR241M) will provide LPV-200 capability, enabling the publication of RNP APCH procedures down to 200 feet (considered as SBAS CAT I Precision Approach according to the new ICAO Approach Classification scheme). In line with this, the EGNOS NOTAM Proposals provision will support the publication of SBAS CAT I operations.

4.1.5 Service Notices & Contingencies Over the Period

Service Notices

The Service Notices are generated whenever there is any complementary information to be provided to users that could affect any SDD content. Thus, an EGNOS Service Notice is a temporal amendment to the EGNOS Service Definition Documents. During the period reported here on ESSP published/updated 3 new Service Notices (#10 updated to v1.1 and two new notices #11 and #12 v1.0) – highlighted inside a green square in the figure below- available on the EGNOS User support website (<http://egnos-user-support.essp-sas.eu/>).



The EGNOS Service Notices are notifications published whenever there is any complementary information that could have a relevant impact in any of the EGNOS Service Definition Documents' contents. Hence, an EGNOS Service Notice is a temporal amendments to the EGNOS Service Definition Documents.

The published EGNOS Service Notices with its corresponding status are available hereafter:

Notice	Subject	Target Users	Date	Revision	Status
Service Notice #12	Status of EGNOS performances – North of Service Area	SoL & OS	16/01/2015	1.0	Applicable
Service Notice #11	EGNOS GEO PRN 124 Decommissioning and Space Segment Update	SoL, OS & EDAS	09/06/2014	1.0	Applicable
Service Notice #10	Updated Status EGNOS performances - North and South West of Service Area -	SoL & OS	16/04/2014	1.1	Applicable
Service Notice #9	Upgrade of the EGNOS communication network (TWAN) in January 2014	SoL, OS & EDAS	19/12/2013	1.0	Applicable
Service Notice #8	EGNOS System Release v2.3.2 deployment	SoL & OS	08/11/2013	1.0	Applicable
Service Notice #7	Temporary GEO swap PRN126-PRN124 in March/April 2013	SoL & OS	15/03/2013	1.1	Not applicable
Service Notice #6	Status of EGNOS performances – North and North East of Service Area	SoL & OS	21/06/2013	1.1	Not applicable
Service Notice #5	EGNOS Service unavailability from 23 to 26 June 2012	SoL, OS & EDAS	19/07/2012	1.0	Not applicable
Service Notice #4	Leap Second Introduction – EGNOS service available	SoL, OS & EDAS	01/07/2012	2.0	Not applicable
Service Notice #3	EGNOS upgrades deployed in Q1 2012	SoL & OS	02/04/2012	1.1	Not applicable
Service Notice #2	Status of EGNOS Performance	SoL	23/04/2012	2.0	Not applicable
Service Notice #1	MT9-MT17 incoherency status	SoL	08/03/2012	2.0	Not applicable

Figure 32: Service Notices section on the EGNOS User support website

The next steps planned for the improvement of the EGNOS Service Notices are the modification of the current classification or categorisation applied to the status of the Service Notices will be implemented for the sake of improving the understanding of the applicability of the information provided. At least an update of the Service Notice # 11 to v2.0 concerning the EGNOS GEO Space Segment Update and a new Service Notice #13 v1.0 with regards to the deployment and entry in operations of ESR v2.4.1M are foreseen in the coming months.

Service Contingencies Managed over the period:

EGNOS performance degradation (North and South of the service area) from November 2014 to January 2015 as in SN#12 linked to ionosphere degradations.

4.2 Open Service Status

The EGNOS Open Service (OS) was declared available by the European Commission to European citizens on 1st October 2009, officially enabling EGNOS capable devices available over Europe to obtain benefits from this service.

The conditions for access to the service and the minimum performance achievable by OS enabled equipment are described in the EGNOS Open Service SDD v2.2 published on 12th February 2015 (http://egnos-user-support.essp-sas.eu/new_egnos_ops/content/egnos-sdds).

ESSP is actively supporting Open Service user communities via the EGNOS Helpdesk and EGNOS User Support website.

The following figure shows the relative number of OS-related questions versus the total number of questions arriving at the EGNOS helpdesk over the reporting period.

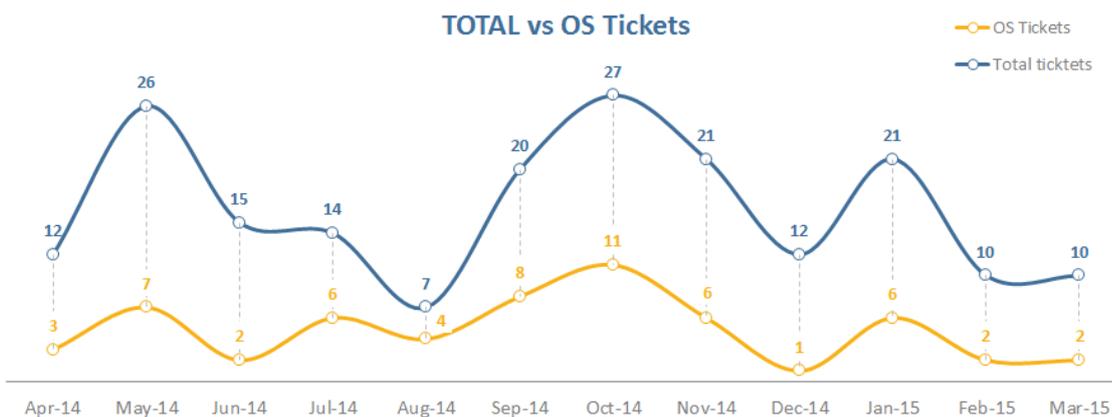


Figure 33: Number of total questions and OS-related arrived to the Helpdesk

Based on the EGNOS Helpdesk requests⁵, the Open Service user distribution per area of activity can be shown in the following figure:

⁵ Since Open Service users do not need to register, ESSP cannot know the exact distribution of these users with respect to their area of activity, as is the case with EDAS users. Because of that, an estimation based on EGNOS Helpdesk requests has been computed, taking into account that this approximation gives a partial view of the Open Service usage distribution.

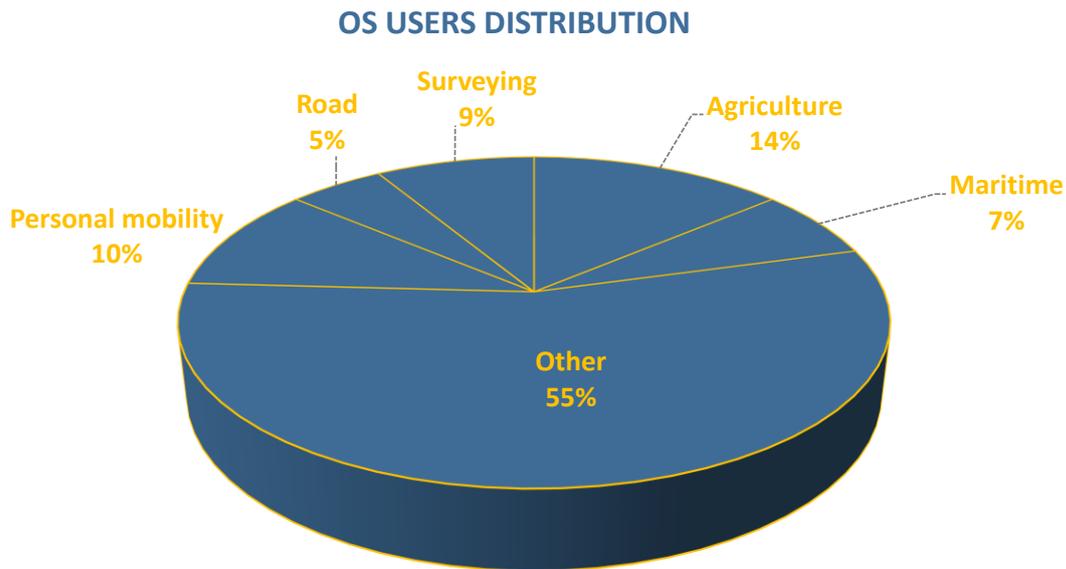


Figure 34: Open Service user distribution based on EGNOS Helpdesk information

ESSP is also in close contact with OS users and stakeholders via different GNSS transversal or domain-specific events and working groups, in particular:

- Contribution to the adoption of EGNOS OS in different application domains via the different actions included in the EGNOS Multimodal Adoption (EMA) Action Plan (section 4.7).
- Attendance to different multimodal events. See section 4.8.2 for more details.
- Organisation the EGNOS Service Provision Workshop (section 4.8.1) as the key EGNOS event gathering users and stakeholders from the different EGNOS Services (including OS) and from different application domains.
- Establishment of close contacts with OS receiver manufacturers within the framework of the SBAS Receiver Platform.
- Collection of all valuable feedback from OS user communities via the corresponding Customer/User Satisfaction process as described section 4.4.

4.3 EDAS Service Status

4.3.1 EDAS Evolutions

The following table summarises the types of data that can be retrieved through the different EDAS services. For further details on the formats and protocols, users are kindly advised to check the EDAS Service Definition Document –EDAS SDD- (http://egnos-user-support.essp-sas.eu/new_egnos_ops/content/egnos-sdds).

Mode	EDAS Service	Type of Data			
		Observation & Navigation	EGNOS Messages	RTK Corrections	DGNSS Corrections
Real Time	Service Level 0&2	✓	✓		
	Data Filtering 0&2	✓	✓		
	SISNET		✓		
	NTRIP	✓		✓	✓
Archive	FTP	✓	✓		

Table 18: EDAS data sheet

The EGNOS data coming from the EDAS Services can be used for the development of applications based on GNSS streams or for the provision of added value services based on EDAS. EDAS services are currently used for tracking of hazardous goods, high-precision positioning, engineering activities in the EGNOS programme, monitoring of GNSS performances, atmospheric investigation and R&D activities.

GNSS receivers with Internet access (usually through wireless networks - GSM or GPRS) can access EGNOS, DGPS or RTK corrections, regardless of the GEO visibility conditions and improve accuracy with respect to GPS only (see table below) and even compute EGNOS protection levels in order to bound the navigation position error.

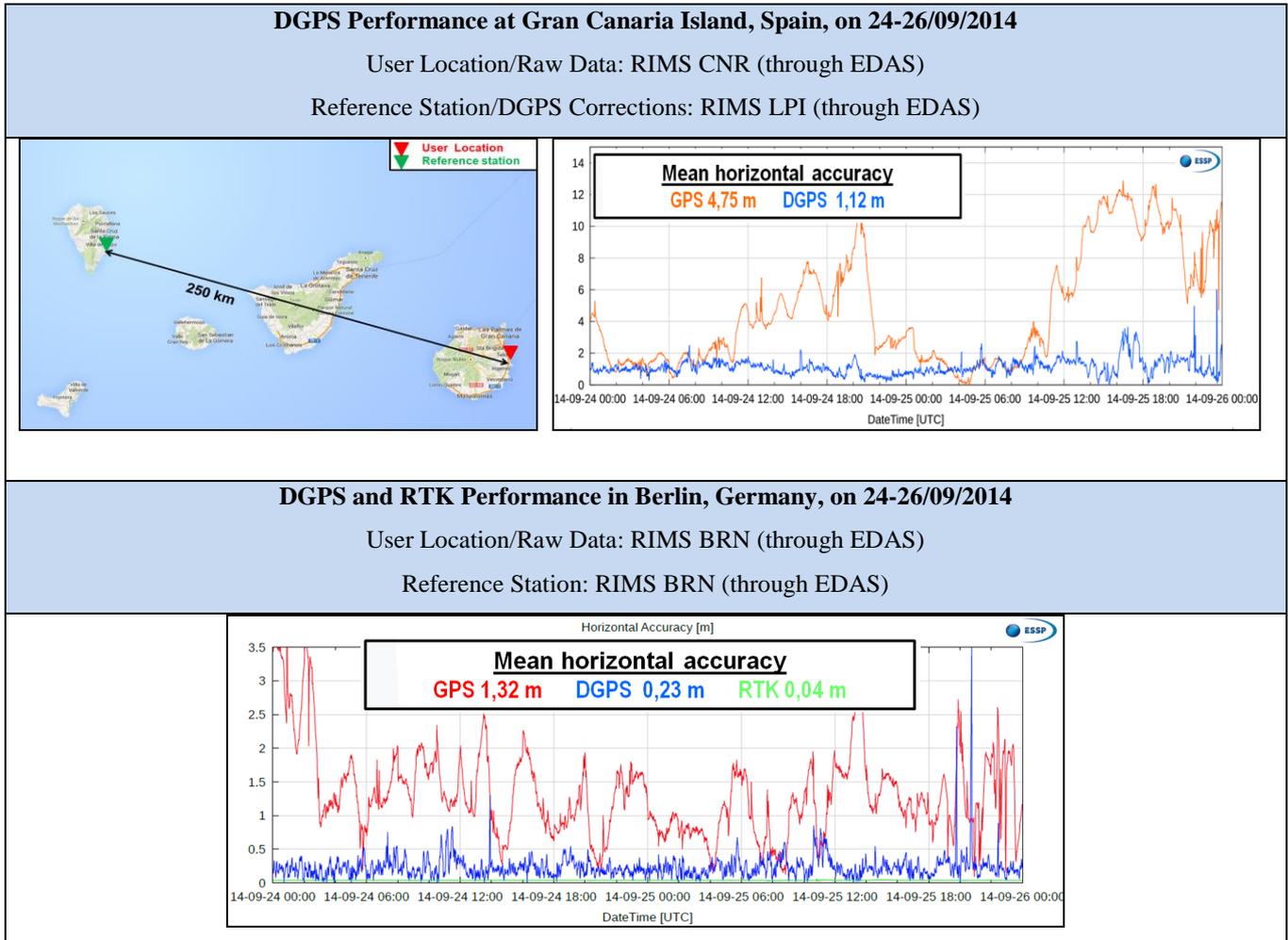


Table 19: EDAS based DGPS and RTK performance.

The performance of all EDAS services in terms of availability and latency is very stable and in line with the EDAS SDD commitments (please refer to http://egnos-user-support.essp-sas.eu/new_egnos_ops/content/egnos-sdds to check EDAS monthly performance) or to section 3.5 of the present document for an overview of the last yearly period.

During the last year, ESSP continued to closely monitor and analyse the EDAS services status, performance and data quality. As a result of that, several corrective releases were deployed with no impact on the services availability (except for the one mentioned below) and that have contributed to improve EDAS robustness and stability. Also, a significant effort has been made in identifying deviations to the applicable data formats and standards, paying special attention to the interpretation made by the user community of some implementation details.

The most important release of the period was deployed in October 2014, when a modernisation of the EDAS system consisting of the replacement of the EDAS V1 legacy components was performed to secure the EDAS performance and quality of service in the mid-term. The positive impact that this evolution had on EDAS performance is confirmed by the performance results provided in section 3.5.

In order to request an EDAS account, users must follow the steps detailed below:

1. Visit and register on the EGNOS User Support Website:

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

2. Complete and submit the EDAS registration form:

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

4.3.2 EDAS Usage

The number of registered users has been continuously increasing, reaching a total of 190 at the end of March 2015. At the beginning of the reporting period (beginning of April 2013) the total number of EDAS users was 152, so the number of EDAS users has increased by 25% in the last 12 months.

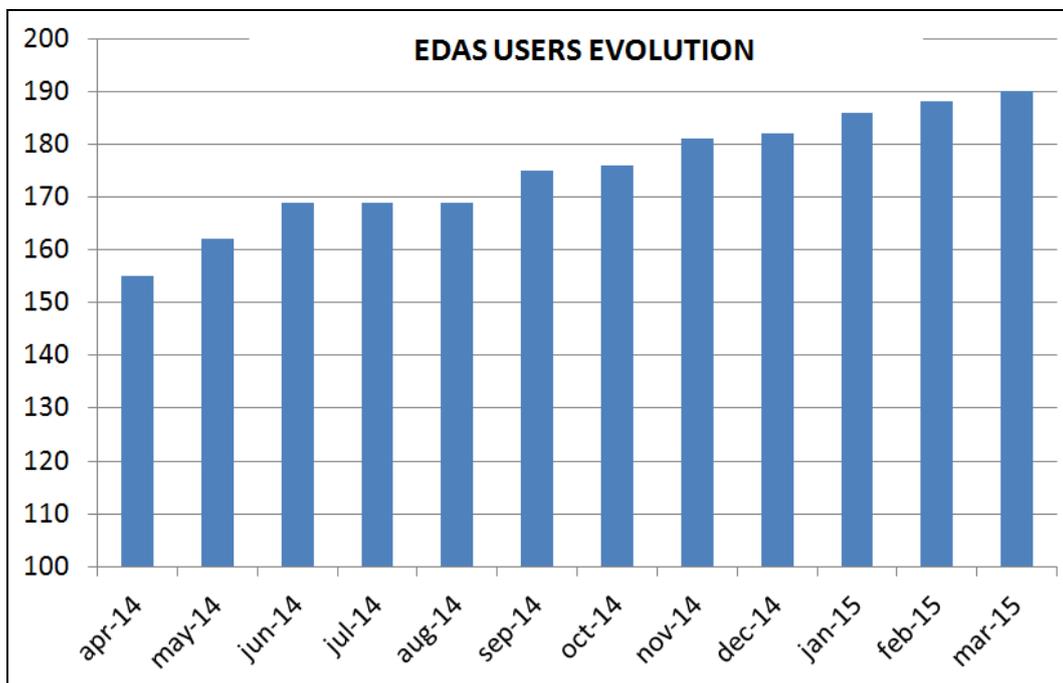


Figure 35: EDAS user evolution

The above figure reflects the total number of different users registered for one or more EDAS services. However, most users are not registered for just one service and tend to use different services for different purposes. The figure below shows the number of active accounts for each EDAS Service individually which, when combined, add up to roughly 500 accounts.

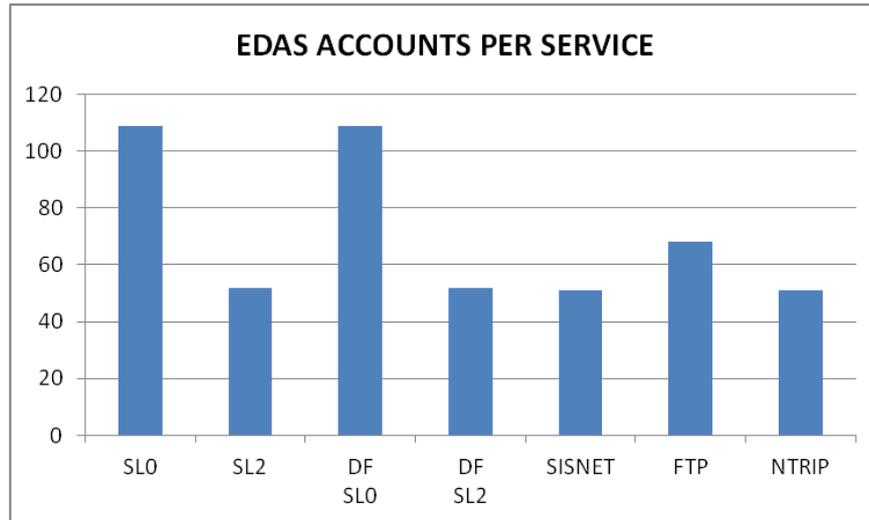


Figure 36: EDAS accounts per service

It should be noted that the use of EDAS is not only linked to the aerospace sector. EDAS provides the opportunity for service providers to deliver EGNOS data to users who cannot always view the EGNOS satellites or to support a variety of other value-added services, applications and research programmes. The area of activity of the registered EDAS users covers all market segments, as depicted in the figure below:

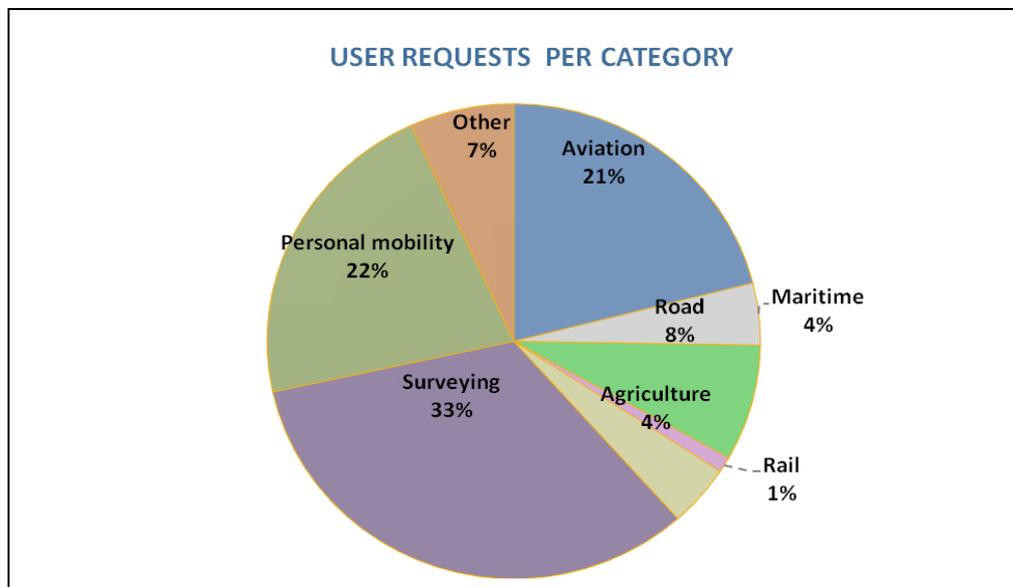


Figure 37: EDAS users and area of activity

An important measure of the popularity and use of EDAS Services is the significant weight of the EDAS-related requests received at the EGNOS Helpdesk (40% overall during the reporting period). Also, the fact that EDAS users are increasingly becoming experts on the services, is reflected by the fact that requests linked to EDAS are becoming highly complex, as reflected by the number of iterations (question + answer) that are needed to close the EDAS requests. As depicted below, the

weight of EDAS related activities in the context of the EGNOS Helpdesk when measured in terms of iterations with the user is even larger, accounting for roughly 52% of overall exchanges.

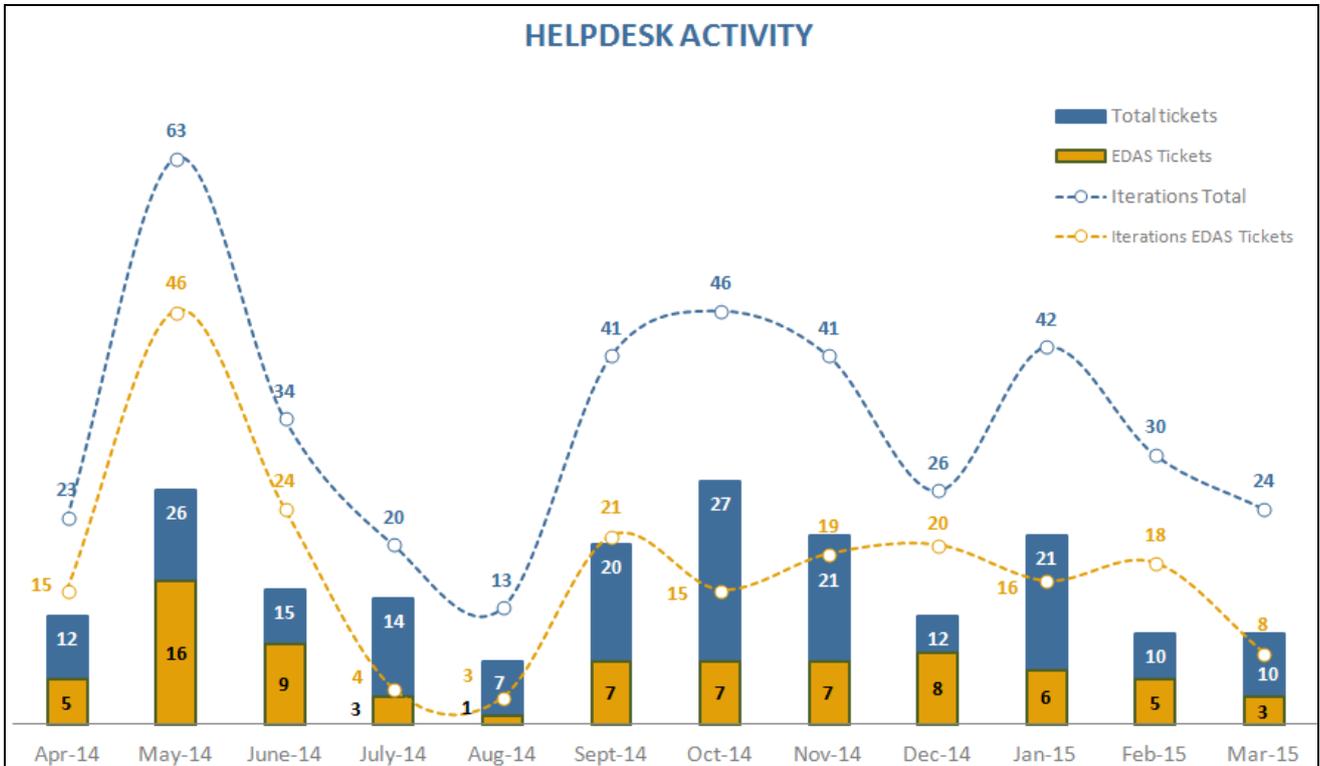


Figure 38: EDAS related request in the EGNOS Helpdesk



High-Speed Train

4.4 User Consultations and Improvements Actions

4.4.1 User Support Improvement Process

The EGNOS User Support Improvement process describes a flexible methodology built on the basis of close coordination with the GSA, driven by a joint identification/definition of objectives, priorities and tasks, and absolutely user oriented. The EGNOS User Support Improvement Process pursues EGNOS adoption and ensures that users' satisfaction in all application domains.

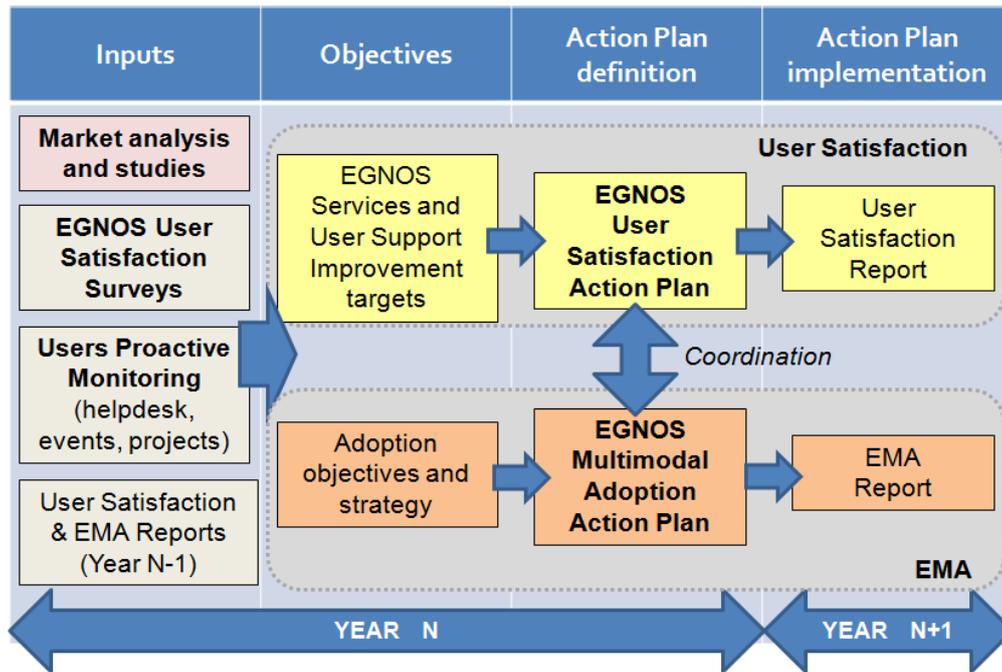


Figure 39: User Support Improvement Process

4.4.2 EGNOS User Satisfaction Process

EGNOS user satisfaction is measured by ESSP as part of the internal Customer Satisfaction Process covering both EGNOS users and customers with contractual relationship with the ESSP.

Each year, ESSP launches overall global EGNOS User Satisfaction Process covering the three EGNOS Services (SoL, OS and EDAS), obtaining valuable feedback on EGNOS and ESSP performance in order to define areas of improvement and recommendations on EGNOS and ESSP activities as the EGNOS Services Provider.

This process considers the feedback received from different means and interfaces:

- EGNOS Helpdesk
- EGNOS Service Provision Workshop 2014:.
- Relevant multimodal fora, working groups and events in different domains.
- EGNOS Service specific questionnaire distributed to the identified relevant users and stakeholders.

Apart from supporting the continuous improvement of ESSP and EGNOS services, this process covers specific regulatory and quality requirements applying to ESSP:

- As certified Air Navigation Service Provider (ANSP) according to the EC Single European Sky (SES) regulation.
- As certified organisation according to ISO9001:2008.

In addition, the corresponding satisfaction reports are used as one of the main inputs for the User Support Improvement process.

The EGNOS user satisfaction report issued in 2015 (covering 2013 & 2014) has provided very valuable information and recommendation that have been inserted in the definition of the User Satisfaction Action Plan 2015 and EGNOS Multimodal Adoption (EMA) Action Plan 2015, currently under implementation.

In the reporting period, ESSP, together with GSA, finalised the user satisfaction survey and completed the corresponding user satisfaction report, using a questionnaire that was distributed to the main stakeholders and users of each EGNOS service market in all application domains. The main summary is included in the following figure:

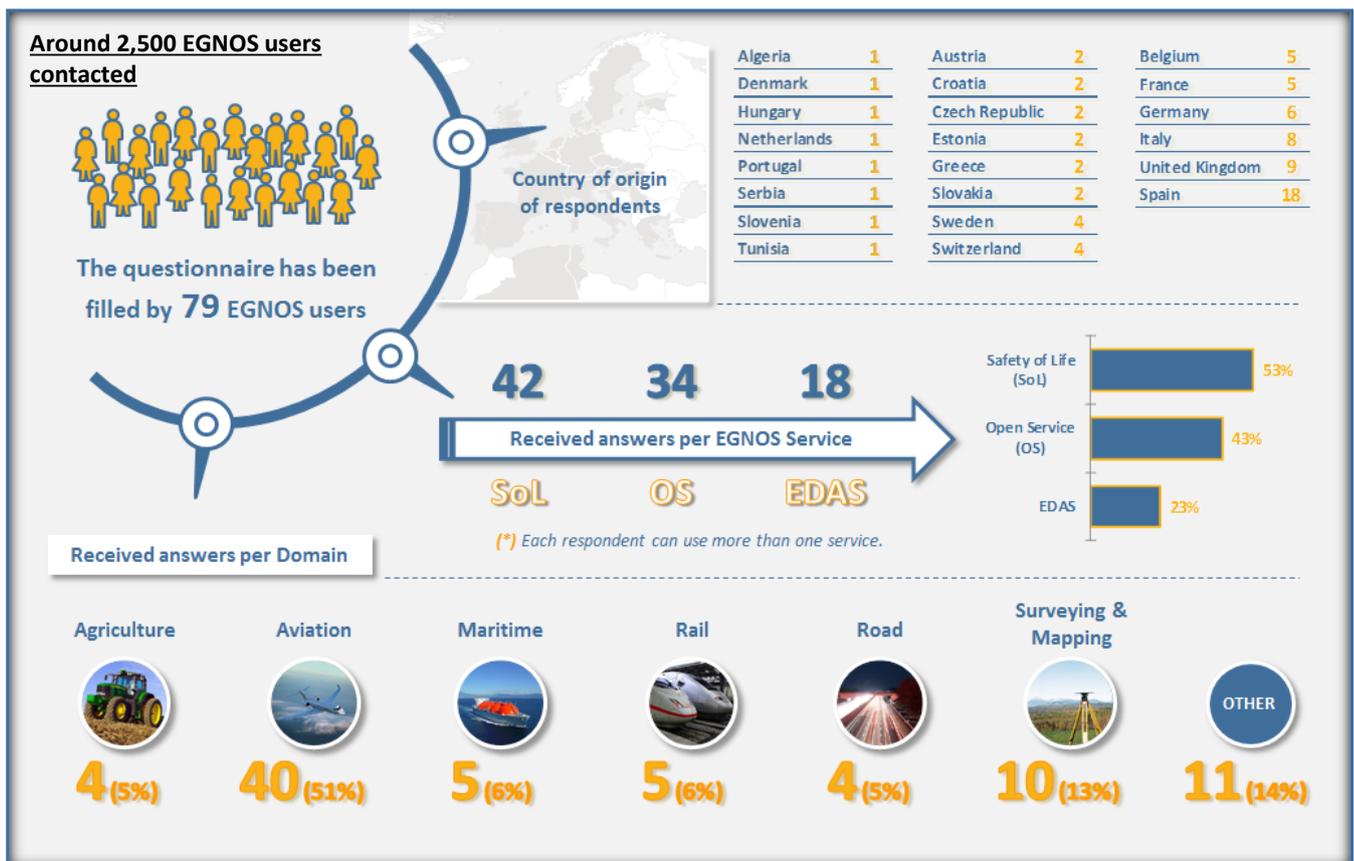


Figure 40: Number of respondents & Distribution per Country, EGNOS service & Domain

4.4.3 EGNOS User Satisfaction Survey

The EGNOS User Satisfaction Survey was launched in July 2014 to cover the 2013 & 2014 calendar years. The survey was open from 10th July 2014 to the end of the year using a specific online platform, and 79 answers were received from a universe of 2,500 consulted users. This year the SoL survey, the OS survey and the EDAS survey have been included in a global survey.

The output of this survey was also included in the ESSP annual report (www.essp-sas.eu) and in the EGNOS Bulletin Q2 2015 (<http://egnos-user-support.essp-sas.eu/>). Overall, 25 recommendations covering different aspects of the EGNOS Service provision have been extracted.

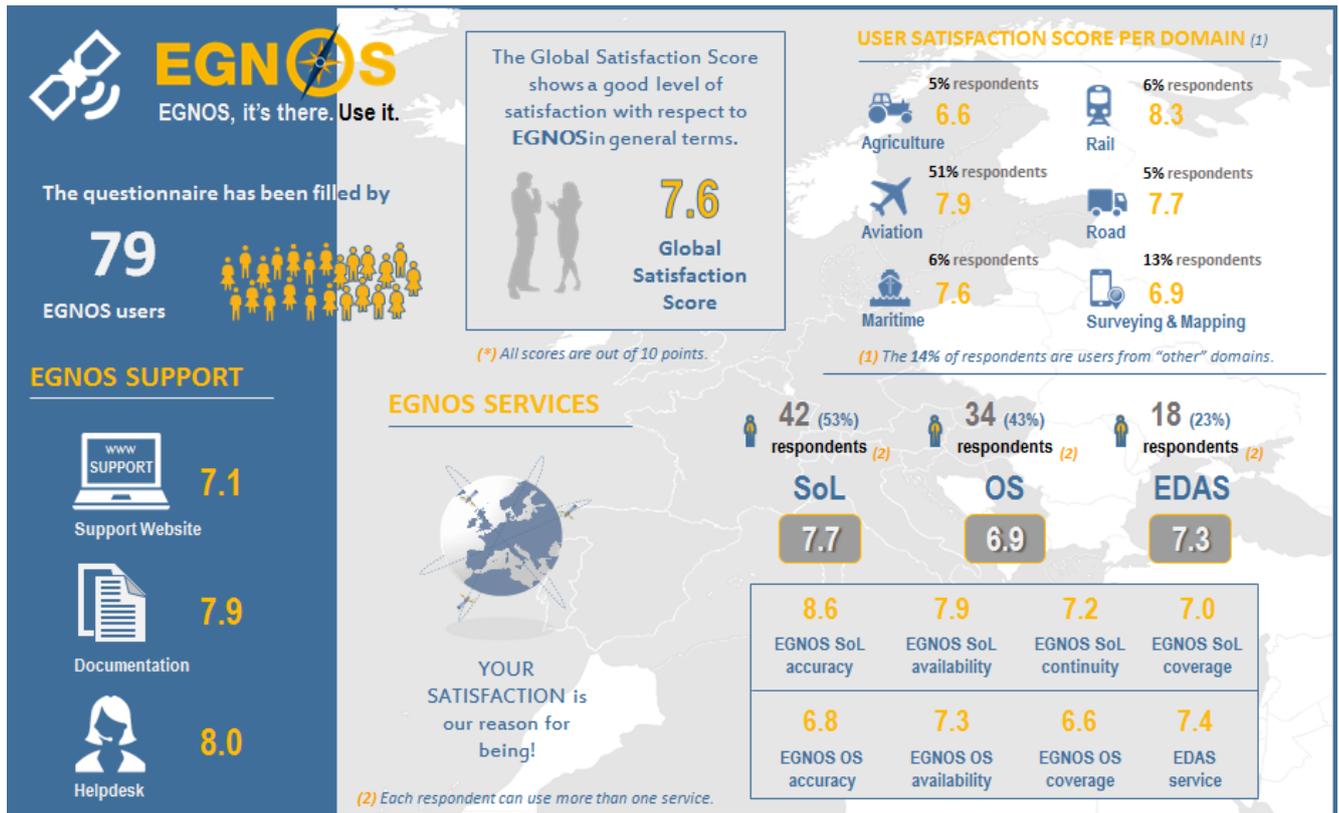


Figure 41: Summary of results from User Satisfaction Survey

4.5 User Support

4.5.1 EGNOS Helpdesk

Between 1st April 2014 and 31st March 2015, the EGNOS Helpdesk operated by the ESSP has managed 195 user requests, which represented an increase of 5% with respect to the previous Yearly reporting period, where a total of 185 requests were managed.

The EGNOS Helpdesk is available H24/7d and is accessible by e-mail (egnos-helpdesk@essp-sas.eu) and by telephone (+34 911 236 555). There were 13 requests via phone on the previous telephone number.

Of the total number of questions received, 8 were catalogued as urgent requests (asking about the current status of the EDAS service or a technical failure of the EGNOS system) and all of them were resolved according to the committed response time (1 hour since 2014). Standard questions (those

considered non-urgent) were committed to be answered within 3 working days from 2014, and this response time was always respected for the 195 user requests that arrived during the reporting period.

It should be noted that, in general, the questions received at the EGNOS helpdesk followed the same trends shown for last period (see the following pictures), with increasing complexity and generally requiring different iterations with the user. On average, the number of questions per month was 16.25, while the average number of iterations per month represented around 33.58, for an average of 2.07 iterations per user question.

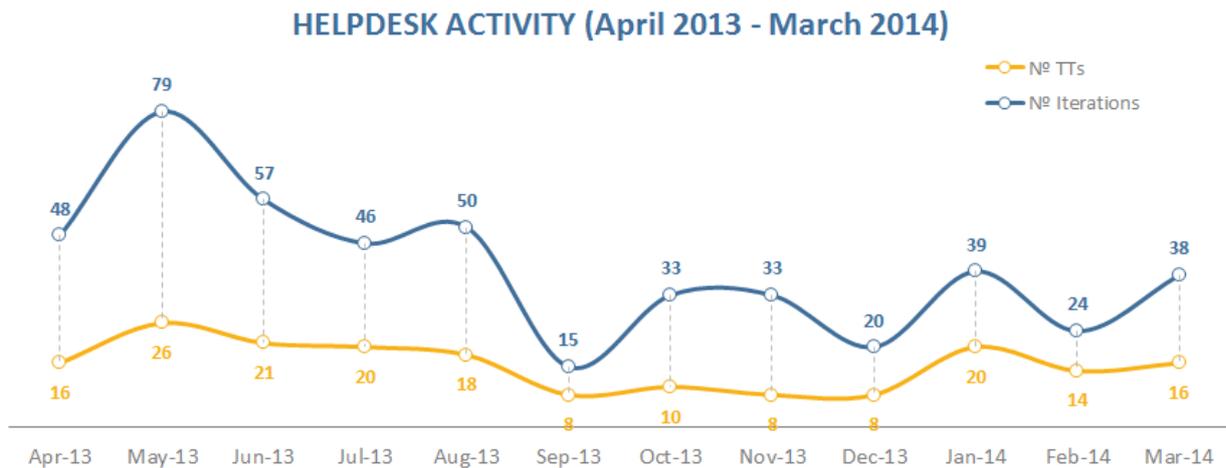


Figure 42: Helpdesk activity evolution on previous period (April 2013 – March 2014)

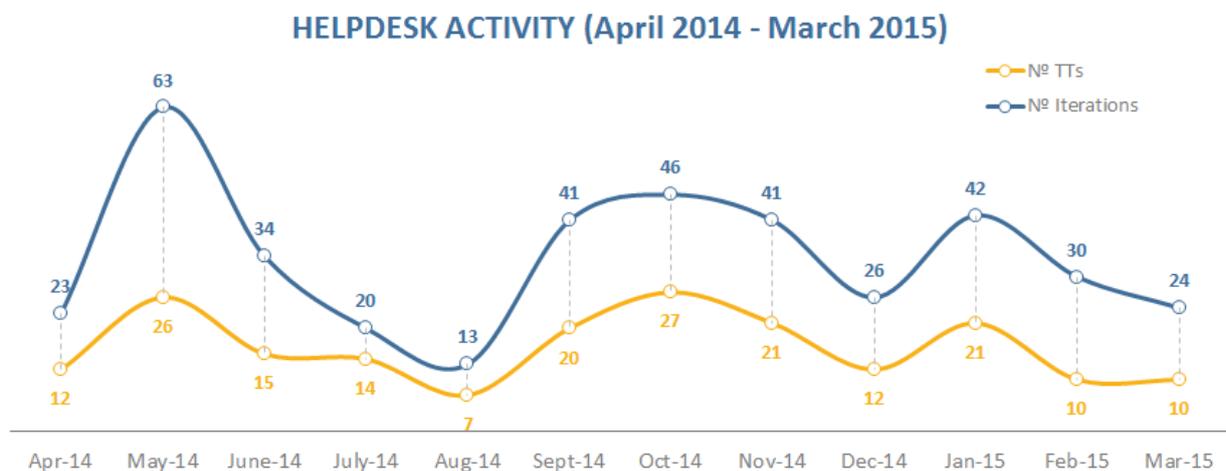


Figure 43: Helpdesk activity evolution on current period (April 2014 – March 2015)

According to the following figure, most of questions were related to EDAS (EDAS technical questions represented 16% and EDAS registration requests showed 24%). With respect to the previous reporting period, the percentage of EDAS technical questions and the EDAS registration requests decreased (from 22% -41- to 16% -31- and from 32% -60- to 24% -46- respectively). Also, there was a reduction in percentage and absolute number in questions related to performance (from 9% -16- to 5% -10-). On the other hand, the questions about documentation (from 8% -14- to 16% -31-) and services (from 1% -2- to 15% -29-) increased.

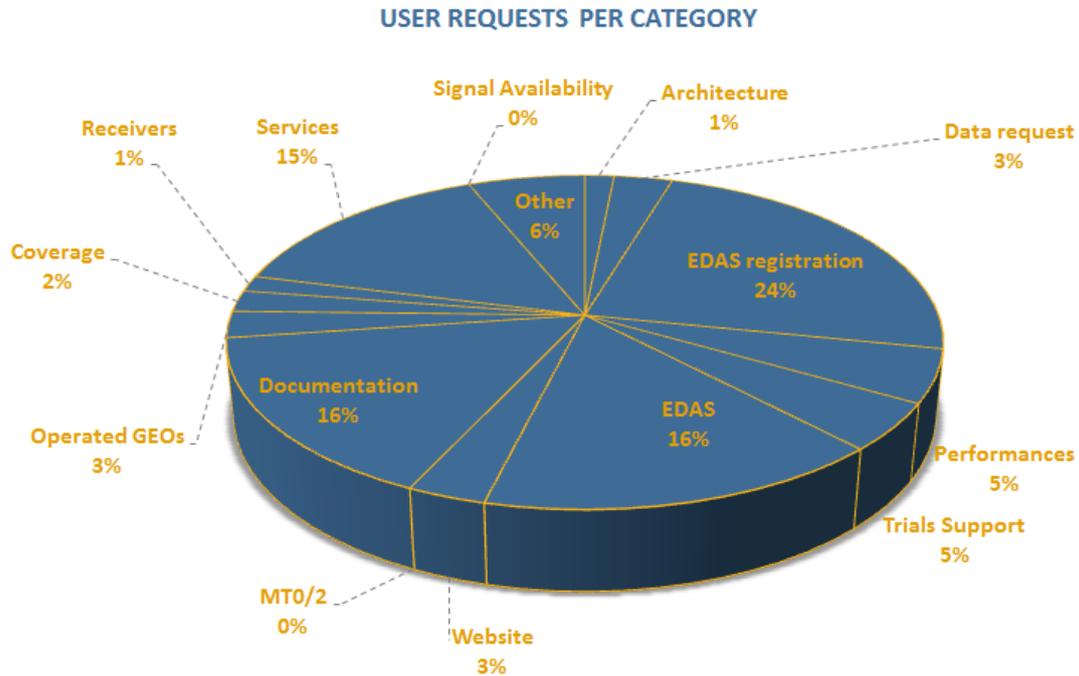


Figure 44: Helpdesk user requests per category

Meanwhile, most of the questions received during the reporting period were related to aviation (43%), followed by personal mobility (10%), surveying (8%), agriculture (7%), road and maritime (3%). Other questions were generic and could not be classified in a specific domain of application.

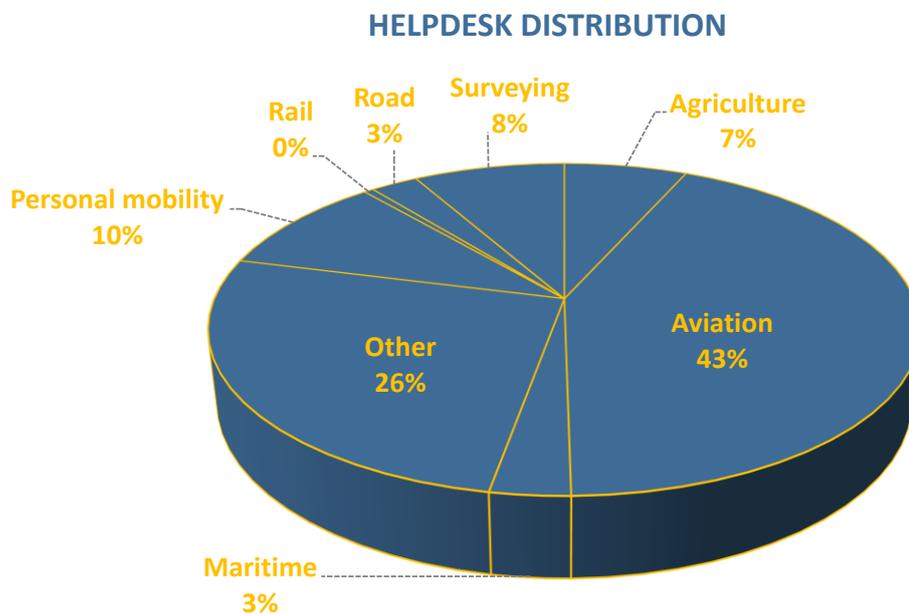


Figure 45: Helpdesk user requests per domain

A similar distribution can be found amongst the EDAS-related questions (including technical questions and registration requests). OS questions came mainly from agriculture (14%), personal mobility (10%)

and surveying (9%) users. All SoL questions were aviation-related, as this is the only domain where SoL applications have been developed so far.

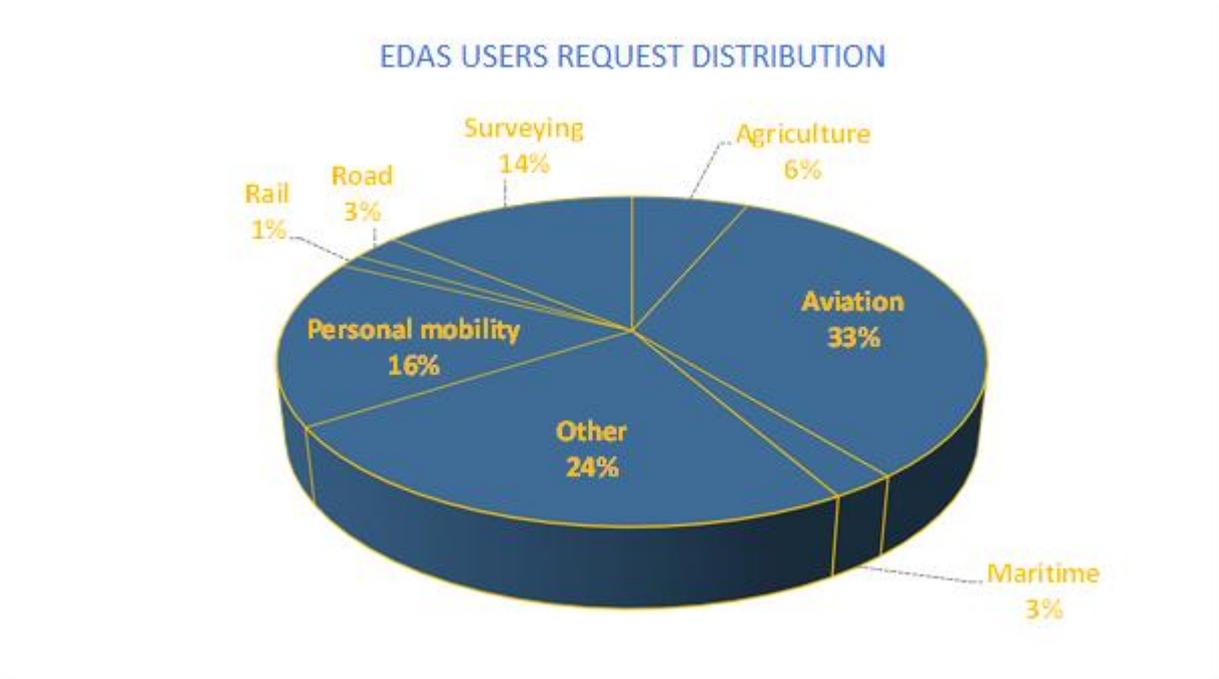


Figure 46: Helpdesk user requests by domain for EDAS

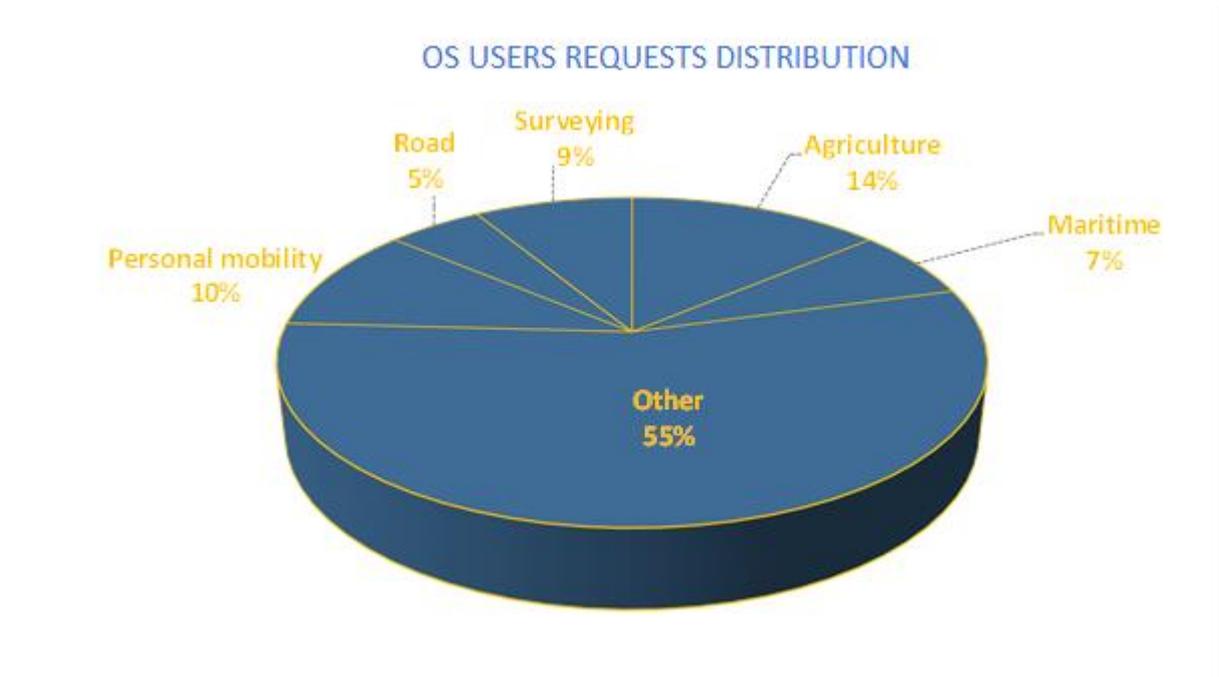


Figure 47: Helpdesk user requests by domain for OS

4.5.2 EGNOS User Support Website

At the end of the reporting period, the EGNOS User Support website had 1599 registered users. There were 255 new registered users in this period. The different areas of activity of the website registered users are shown in the following figure. As illustrated, the main domains of applications are aviation (38%) and agriculture (13%), followed at some distance by road (10%), personal mobility (9%) and maritime (6%), and finally, rail (1%). A significant number of users (23%) selected “other” domain during the registration process.

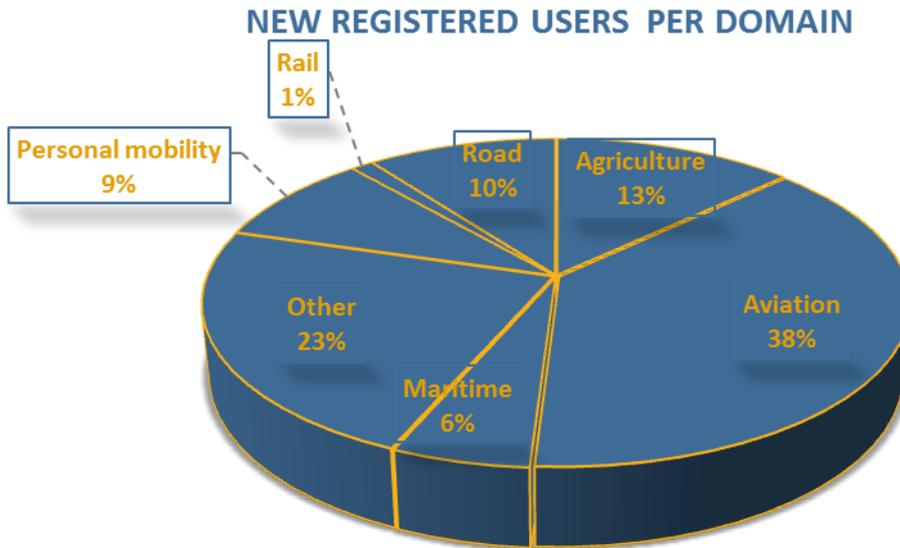


Figure 48: Area of activity of the EGNOS User Support website’s **new** registered users

Domain	New Users
Agriculture	33
Aviation	97
Maritime	14
Other	59
Personal mobility	23
Rail	3
Road	26
Total	255

Table 20: Number of **new** registered users per domain

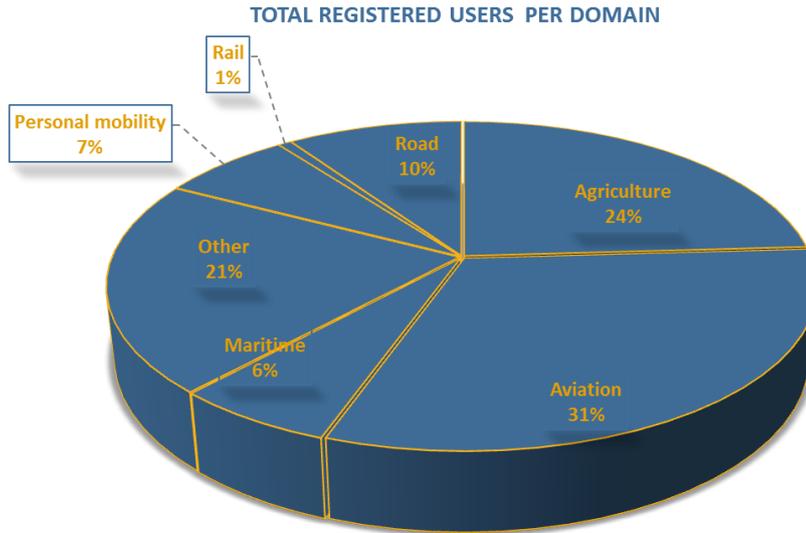


Figure 49: Area of activity of the EGNOS User Support website’s **total** registered users

Domain	Total Users
Agriculture	385
Aviation	501
Maritime	101
Other	336
Personal mobility	113
Rail	11
Road	152
Total	1599

Table 21: Total number of registered users by domain

The percentage of users by domain has changed significantly with respect to the previous reporting period. The main differences are a significant increase in the percentage of road users (6% to 9%) and a reduction in the percentage of agriculture users (26% to 13%). It also highlights new users of the rail domain with 3 questions and 1% in percentage.

The main improvements of the website during this reporting period were:

- **EDAS Services Status:** This section provides information on the EDAS services status. On the one hand, this new functionality enables the user to check the status of all EDAS Services (SL0, SL2, Data Filtering, NTRIP, SISNeT and FTP) in real time.

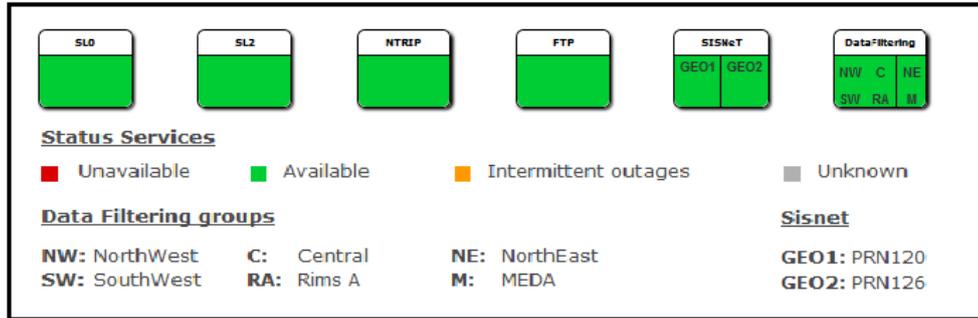


Figure 50: EDAS Services Status in real time

On the other hand, users can check the history of data gaps observed in the EDAS Services (SLO, SL2, Data Filtering, NTRIP, SISNeT and FTP) according to different criteria.

- Improvement of the performance and the speed of the some webpages: The speed and performance of some web pages was optimised in order to provide users with a better browsing experience. The result was that the loading speed of these webpages was increased significantly. In addition, these improvements enabled a greater number of simultaneous connections without loss of speed.

4.6 SDD Plans & Service Implementation Roadmaps

4.6.1 SDD Plans

1. EGNOS Service Definition Documents (SDD) describing the characteristics and conditions of access to each EGNOS service (OS, SoL and EDAS). Following the deployment of the ESR 2.3.2 and the changes performed in the EDAS Service during 2014, also taking into account the EDAS SL1 decommissioning and the reduced resolution time for EDAS urgent requests, the three EGNOS Services' SDDs were updated to v2.1. The three SDDs v2.1 were published on 19th December 2014.
2. Next steps:
 - a. On April 2015, new OS and SoL SDDs v2.2 was published to correct a typo in the figure concerning the offset between EGNOS and GPS Times.
 - b. On-going activities for the SoL SDD update for the LPV-200 service level declaration (planned in Q4/2015) after the deployment of ESR 2.4.1M.
 - c. New OS and SoL SDDs will be published based on ESR2.4.1M performances.

4.6.2 Service Implementation Roadmaps

1. EGNOS Services' Roadmaps provide a high-level overview of the EGNOS Services' current status and their expected evolutions in a 3-year timeframe linked to the consecutive EGNOS System Releases' deployments and information/interfaces improvements/changes. These roadmaps are mainly focused on 4 different areas: Service Area / Data availability, Service Level, Service Robustness and User Interfaces. The three EGNOS Services' Roadmaps were updated three times from April 2014 to March 2015, going from v2.0 (in June 2014) to v3.0 (in Oct 2014) and finally to v3.1 (in Nov 2014). The current applicable versions are:
 - i. ESSP-COM-7462 (EGN_OS_ROADMAP) v3.1.
 - ii. ESSP-COM-7463 (EGN_SOL_ROADMAP) v3.1.
 - iii. ESSP-COM-7464 (EDAS_SERV_ROADMAP) v3.1.

These documents can be found through this link:

http://egnos-user-support.essp-sas.eu/new_egnos_ops/content/service-implementation-roadmaps.

2. Next steps: The next update of these roadmaps is scheduled for end of May 2015 covering the period 2015-2017.

4.7 EGNOS Multimodal Adoption Action Plan 2015

When looking at the coming years and asking about what the natural path EGNOS should follow might be, there is undoubtedly an answer: **EGNOS has to be used as much as possible, as much as feasible.**

It is at this point when the EGNOS Multimodal Adoption Action Plan, in closed coordination with GSA, plays its role; as part of the necessary machinery to make EGNOS usage a reality, not only in aviation but also in other domains.

EMA activities in aviation revolve around two key aspects. First, the need to have a clear view of what is being done and who is involved; elaborating a vast database with this information. Second, there is a need to present the convincing arguments and examples showing EGNOS benefits: Cost Benefit Analyses, guidelines for ANSPs and operators, list of companies that provide given services, online library with relevant documentation/material, etc.

In rail and maritime, all activities are oriented towards a deeper understanding of those domains, and understanding which are the best strategies to be followed to foster its usage. In the case of maritime, understanding DGPS and AIS networks deployed on EU shores and inland waters are the main focus of activity.

Finally, EGNOS promotion in surveying and agriculture involves keeping an eye on technology evolution and new needs for users in the domain.

	Aviation 	Maritime 	Rail 	Surveying & Agriculture 	Total
	19	25	7	14	67
Transversal Actions: 2					

Table 22: Actions in each domain to be done during 2015

4.8 EGNOS Promotion Activities

The ESSP supports the GSA in promotion initiatives, also conducting communication activities on its own in order to promote the use of EGNOS in different fields.

Two main tools have been used during the period 2014-15 to inform and promote EGNOS services:

- Quarterly publication of the EGNOS Bulletin as the primary platform for announcing EGNOS news, service improvements, implementation status, etc., as well as to inform the users about performance status and any other occurrence related to the service provision.
- Active participation and attendance at different conferences, workshops and events related to the GNSS world and also related to some specific domains where the EGNOS services are being used or have a real expectation to be used in the near future (mainly Aviation domain, but also rail, road, maritime and agriculture).

The ESSP participates in events in three different ways:

- Exhibiting with an EGNOS Stand, supported by ESSP staff
- Submitting and presenting a Paper related to the EGNOS Services.
- Supporting other EGNOS stakeholders' stands (i.e. GSA, EC, ESA).

Another major event for EGNOS communication and promotion is the organisation of the EGNOS Service Provision Workshop.

4.8.1 EGNOS Service Provision Workshop 2014

Every year, ESSP organises the EGNOS workshop for EGNOS stakeholders to get together and learn about the latest news, projects and improvements related to the EGNOS services. This two-day event serves as a milestone in the EGNOS service provision, where users, manufacturers, industry, institutions and regulators can get together and share information.

The event configuration changes every year, but the core objective remains the same: **information, success stories from EGNOS users, promotion, networking.**

The EGNOS Service Provision Workshop 2014 took place in Lisbon, on 7th and 8th October. Opening speeches from the European GNSS Agency (GSA), ESSP, European Commission and Nav Portugal (as hosting country) welcomed the 170 Workshop attendees.



Figure 51: Some of EGNOS Workshop 2014 attendees

Day 1 was devoted to explaining the latest updates to EGNOS services & status, and the current situation of the EGNOS market. The afternoon was lightened up by various presentations regarding EGNOS implementation success stories in Aviation, debriefed by Skyguide, DSN, Aviation Southwest and VLM. A presentation from the US Federal Aviation Administration (FAA) was particularly appreciated by the participants. And to end the day, CMC Electronics and an Airbus Test Flight pilot gave a practical symposium on SBAS avionics.

EGNOS' other applications beyond the Aviation world were the main subject for the second day, mainly with regards to EGNOS land and maritime applications –there were presentations from UNIFE, TeleSpazio, RSOE, TOPCON and the General Lighthouse Authority of the UK & Ireland. The EDAS service for value-added applications was also a main theme of the day.

The EGNOS Workshop was also the scenario for the signature of a Cooperation Agreement between ESSP and ASECNA, the Agency for Aerial Navigation Safety in Africa and Madagascar.

4.8.2 Event Participation April 2014 - March 2015

ESSP supports the EC and the GSA in promotion initiatives, while also developing communication initiatives of its own, in order to promote the use of EGNOS in different fields, mainly in the Aviation sector.

The events attended to promote EGNOS in the different market segments during April 2014-March 2015:

- General GNSS:
 - European Navigation Conference (ENC): 15th-17th April 2014, Rotterdam.
 - European Space Solutions: 11th-13th June 2014, Prague.
 - ION GNSS 2014: 14th-18th September 2014, Tampa.
 - MELAHA 2014: 1st-3rd September 2014, Alexandria.

- Aviation:
 - Aero Expo Friedrichshafen 2014: 9th-12th April 2014.
 - ACI Regional Airports Conference Europe: 13th-15th May 2014.
 - EBACE Geneva: 20th-22nd May 2014.
 - Farnborough Int. Air Show: 14th-20th July 2014.
 - ERA General Assembly: 30th September – 2nd October 2014.
 - Aviation Week MRO Europe: 7th-9th October 2014.
 - Helitech: 14th-16th October 2014.
 - World ATM, Madrid: 9th-10th March 2015.

- Maritime:
 - METS 2014: 18th-20th November 2014.
 - The Naples Shipping Week – Port & Shipping Forum: 26th-27th June 2014.

- Surveying & Agriculture:
 - CAPIGI, Amsterdam: 2nd-4th April 2014.
 - GEOSPATIAL World Forum: 5th-9th May 2014, Geneva.
 - INTERGEO 2014: 7th-9th October 2014, Berlin.

- Rail:
 - 11th UIC ERTMS World Congress: 1st-3rd April 2014, Istanbul.
 - Innotrans 2014: 23rd-26th September 2014.
 - INFRARAIL 2014: May 20th-22nd 2014.



EGNOS equipped aircraft

5 MAIN ACTIVITIES PLANNED FOR THE YEAR AHEAD

5.1 Service Provision and Development

5.1.1 EGNOS Working Agreement and Procedures Implementation

LPV-200 Operations

ESSP will prepare the LPV-200 service declaration in order to enable a successful declaration to the users by Q4/ 2015. First LPV-200 operations are expected by 2016.

EWA implementation

ESSP will continue the EWA dissemination and awareness activities to ensure the approach is understood and adopted by all European ANSPs supporting any additional discussion with non-EU countries upon EC's prior request.

Based on the status of the EWA discussions, GSA funded projects and the States' LPV implementation plans, the EWAs with Belgocontrol and some UK ANSPs (Saint Mary, Booker Airfield) could be advanced or signed in the year ahead. A total of more than 40 EWAs are targeted before mid-2016.

The EWA contents are expected to evolve and to be improved in line with the users' feedback. The main activities planned, if the required resources are made available, with regards to the EWA are:

- Procedure for EWA definition, signature and maintenance activities: To formalise and improve the existing process.
- Existing EWAs harmonisation analysis: To analyse the agreements in place and the possibility of performing a retro-update to ensure the consistency of all agreements in place.
- Improvement of the Collaborative Decision Making and GNSS Data recording provisions.
- Support for the GSA/EC in the establishment of an EWA for non-EU countries (non-SES countries, such as MEDA countries, Ukraine or similar) beyond the EU-28, and progress on the related discussions.



Aerial view of Santander airport (Spain)

RNP0.3 and LP Operations

Following the new services required by ANSP, develop tools and implement activities to support new services, such as LP and RNP0.3 by Q4/2015.

Contingency Management Process

Improve and optimise the contingency management process and related communication to users by mid-2015.

5.1.2 EGNOS Services' Related Documents Evolutions

EGNOS SDD

The EGNOS SoL SDDs will be updated to include the LPV-200 service by Q4/2015. Complementarily, in order to optimise the process for the three EGNOS SDDs management, ESSP plans to define and improve the procedure involving the triggers for the SDDs publication, their definition/issuance process and their corresponding update (when required). The objective is to incorporate the improvements for OS and SOL SDD related ESR241M.

EGNOS Services' Implementation Roadmaps

The structure and contents included in these documents, as agreed with the GSA during the Transition Phase, is to be consolidated by establishing a bi-annual update cycle (June – December) to ensure that the content is up-to-date and reflects the official message to be shared by ESSP/GSA/EC in all fora.



Jan Mayen Airlines (Norway)

5.1.3 EGNOS Helpdesk / User Support Web-site Evolution

With the aim of improving the EGNOS User Support website robustness, usability, user experience, and to keep the website contents updated, ESSP is implementing, in close coordination with GSA, an evolution plan based on the feedback provided by EGNOS users, covering different aspects:

- **Robustness:** COTS and Content Management System will be upgraded to improve maintainability and robustness and to secure the high availability performance.
- **Usability and user experience:** The current graphical user interface and structure is very much focused on EGNOS services performance, while the adoption of the EGNOS Services in all application domains requires tailored and application-specific contents. The new graphical user interface will better support different user needs in different application domains and at the same time will provide a more intuitive, easy and user-friendly interface.
- **Availability and content updated:** The website will be populated with new contents and reference/guidance material designed to provide better support to users willing to or already implementing EGNOS-based applications in any domain.

The new EGNOS user support website was launched by beginning of May 2015.



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

5.1.4 EGNOS Multimodal Adoption Action Plan

To prepare the 2016 EMA Action Plan, the different steps and the iterations required to agree on final actions, resources and planning still need to be fine-tuned with the GSA. The main steps ESSP will propose to the GSA are described below:

- ESSP will provide the GSA with the 2016 EMA inputs by early Q3 2015, including the main objectives for 2016 and an initial high-level proposal for the 2016 EMA Action Plan.
- Based on these inputs, the GSA will prepare, by the end of Q3, or the beginning of Q4 2015, the GSA 2016 EMA plan including the main activities delegated to ESSP.
- ESSP’s 2016 EMA Action Plan, further detailing the actions delegated by the GSA, will be ready and approved by the GSA by the end of Q4 2015.

5.1.5 EGNOS Promotion

5.1.5.1 EGNOS Service Provision Workshop 2015

The ESSP will implement a specific Communication Plan that has been designed to ensure large participation and proper promotion of EGNOS.

29 - 30 Sept 2015 Copenhagen The EGNOS Service Provision workshop		29 - 30 Sept 2015 Copenhagen The EGNOS Service Provision workshop	
HIGH LEVEL AGENDA		HIGH LEVEL AGENDA	
EGNOS SERVICE PROVISION WORKSHOP 2015		EGNOS SERVICE PROVISION WORKSHOP 2015	
<small>COPENHAGEN, September 29-30 2015</small>		<small>COPENHAGEN, September 29-30 2015</small>	
DAY 1		DAY 2	
08:30-09:00	Registration and Coffee	09:00-09:30	Registration and Coffee
09:00-09:30	Welcome and Introduction	09:30-10:00	Welcome and Introduction
09:30-10:00	EGNOS Programme Update	10:00-11:15	EGNOS market status and adoption plan
10:00-11:30	EGNOS Services Status	11:15-11:45	Coffee break
11:30-12:00	Coffee break	11:45-12:15	EDAS for added value applications
12:00-13:30	EGNOS Safety-of-Life Service for Aviation	12:15-13:30	EGNOS in multimodal application domains
13:30-14:30	Lunch	13:30-14:30	Lunch
14:30-15:45	Successful EGNOS implementation stories in Aviation	14:30-16:15	EGNOS in multimodal application domains (II)
15:45-16:15	Coffee break	16:15-16:45	Coffee break
16:15-17:15	Successful EGNOS implementation stories in Aviation (II)	16:45-17:00	Conclusions
17:15-17:30	EGNOS awards & Conclusions		
SOCIAL EVENT			
  		  	

EGNOS Workshop 2015 – High-level agenda

5.1.5.2 *Planned Event Participation April 2015 - March 2016*

The following table shows the events planned for 2015 (as of April 2015).

It is important to note that this table is part of the EGNOS communication plan that is included in the EGNOS Multimodal Adoption Plan (EMA).

The event planning reflects the GSA mandate to boost EGNOS adoption on multimodal domains.

Name of Event	Type of Event	Date	Description
European Navigation Conference (Bordeaux)	Navigation	April 2015	Annual congress organised under the auspices of the European Group of Institutes of Navigation (EUGIN). This event will include that latest research topics and applications development on European GNSS.
Aero Friedrichshafen	Aviation	April 2015	Main event/exhibition attended by General Aviation sector in Europe.
ACI Europe 8 th Regional Airports Conference and Exhibition (Reykjavik)	Aviation	May 2015	European Regional Airports Conference. The main needs from over 450 airports in 45 European countries are presented in this conference and exhibition.
ERAA Operations Advisory Group	Aviation	May 2015	The European Regions Airline Association (ERA) is a trade association representing the intra-European aviation industry. Members cover the entire spectrum of the aviation sector - airlines, airports, manufacturers and suppliers.
EGNOS FLIGHT EVENT (Toulouse)	Aviation	May 2015	Event devoted to promoting EGNOS by means of a real LPV landing with an ATR aircraft.
GEOSPATIAL World Forum (Lisbon)	Mapping	May 2015	Event devoted to the Surveying and Mapping industry. There is an exhibition floor, but the focus is on conferences.
EBACE (Geneva)	Aviation	May 2015	Main event/exhibition attended by Business Aviation sector in Europe.
LE BOURGET	Aviation	July 2015	One of the leading events in Europe bringing the Aerospace Industry together.
ION GNSS 2015	General GNSS	September 2015	The world's largest technical meeting and showcase of GNSS technology, products and services.

Name of Event	Type of Event	Date	Description
INTERGEO (Berlin)	Mapping	September 2015	This is the world's largest conference trade fair for geodesy, geoinformation and land management.
EGNOS Service Provision Workshop (Copenhagen)	EGNOS stakeholders	September 2015	The yearly meeting for EGNOS stakeholders, users and applications developers.
ERA General Assembly (Berlin)	Aviation	October 2015	Global meeting where all the ERA members meet (see description for the ERA Advisory group).
IAIN (Prague)	Navigation	October 2015	Conference organised by IAIN that aims to foster human activities at sea, in the air, in space and on land, and which may benefit from the development of the science and practice of navigation and related information techniques.
METS (Amsterdam)	Maritime	November 2015	The Marine Equipment Trade Show (METS) is one of the world leading events attracting marine equipment stakeholders.

Table 23: Planned event participation for the next period



Planet-class Research Ship

APPENDIX A FULL LIST OF EGNOS-BASED APPROACH PROCEDURES

The table below provides the full list of EGNOS-based procedures published by 31st March 2015. For the most up-to-date information, please refer to the EGNOS User Support website (http://egnos-user-support.essp-sas.eu/new_egnos_ops/content/lpv-procedures-map).

Operational Airports							
Airport	Country	ICAO Code	LPV Procedure	Activation LPV procedure ⁶	APV Baro Procedure	Total Nr Procedure (LPV+ APV Baro)	Purpose
Pau-Pyrénées	France	LFBP	1	17/03/2011	0	1	CIVIL
Clermont-Ferrand Auvergne	France	LFLC	1	05/05/2011	0	1	CIVIL
Paris-Le Bourget	France	LFPB	2	02/06/2011	0	2	CIVIL
Biarritz Bayonne Anglet	France	LFBZ	1	09/02/2012	1	2	CIVIL
Bordeaux Merignac	France	LFBD	3	08/03/2012	0	3	CIVIL
Brest Bretagne	France	LFRB	1	03/05/2012	0	1	CIVIL
Carcassonne Salvaza	France	LFMK	1	03/05/2012	0	1	CIVIL
Toulouse Blagnac	France	LFBO	4	03/05/2012	0	4	CIVIL
Vannes Meucon	France	LFRV	1	31/05/2012	0	1	CIVIL
Rodez Marcillac	France	LFGR	2	31/05/2012	0	2	CIVIL
Limoges	France	LFBL	2	28/06/2012	0	2	CIVIL
Orléans St. Denis De L'Hotel	France	LFOZ	2	28/06/2012	0	2	CIVIL
Nantes	France	LFRS	1	28/06/2012	0	1	CIVIL
Calais	France	LFAC	1	20/09/2012	0	1	CIVIL
Beauvais	France	LFOB	1	20/09/2012	0	1	CIVIL
La Rochelle	France	LFBH	1	20/09/2012	0	1	CIVIL
Nimes Garons	France	LFTW	1	18/10/2012	0	1	CIVIL
Beziers Vias	France	LFMU	1	18/10/2012	0	1	CIVIL
Albert Bray	France	LFAQ	1	15/11/2012	0	1	CIVIL
Le Mans	France	LFRM	1	15/11/2012	0	1	CIVIL
Merville	France	LFQT	1	15/11/2012	0	1	CIVIL
Nevers Fouchambault	France	LFQG	1	13/12/2012	0	1	CIVIL
Valence	France	LFLU	1	13/12/2012	0	1	CIVIL
La Roche Sur Yon	France	LFRI	1	13/12/2012	0	1	CIVIL
Lyon St Exupery	France	LFLY	4	07/02/2013	0	4	CIVIL
Grenoble Isere	France	LFLS	1	07/03/2013	0	1	CIVIL
Metz Nancy Lorraine	France	LFJL	1	04/04/2013	0	1	CIVIL
Colmar Houssen	France	LFGA	2	28/10/2014	0	2	CIVIL
Nancy Essey	France	LFSN	1	02/05/2013	0	1	CIVIL
Paris Orly	France	LFPO	5	30/05/2013	0	5	CIVIL
Rennes	France	LFRN	2	30/05/2013	0	2	CIVIL

⁶ First publication date of an LPV procedure

Operational Airports							
Airport	Country	ICAO Code	LPV Procedure	Activation LPV procedure ⁶	APV Baro Procedure	Total Nr Procedure (LPV+ APV Baro)	Purpose
Epinal Mirecourt	France	LFSG	1	30/05/2013	0	1	CIVIL
Amiens Glisy	France	LFAY	1	27/06/2013	0	1	CIVIL
Brive Souillac	France	LFSL	2	22/08/2013	0	2	CIVIL
Castres Mazamet	France	LFCK	1	22/08/2013	0	1	CIVIL
Anancy Meythet	France	LFLP	1	19/09/2013	0	1	CIVIL
Valenciennes Denain	France	LFAV	2	19/09/2013	0	2	CIVIL
Montluçon Gueret	France	LFBK	1	17/12/2013	0	1	CIVIL
Mende	France	LFNB	1	17/12/2013	0	1	CIVIL
Bergerac	France	LFBE	2	09/01/2014	0	2	CIVIL
Dole Tavaux	France	LFGJ	1	09/01/2014	0	1	CIVIL
Quimper	France	LFRQ	1	09/01/2014	0	1	CIVIL
Chateauroux Deols	France	LFLX	1	06/02/2014	0	1	CIVIL
Dinard	France	LFRD	2	06/02/2014	0	2	CIVIL
Agen La Garenne	France	LFBA	1	06/03/2014	0	1	CIVIL
Angouleme Brie Champniers	France	LFBU	1	03/04/2014	0	1	CIVIL
Reims Prunay	France	LFQA	1	03/04/2014	0	1	CIVIL
Pontoise Corneilles en Vexin	France	LFPT	2	01/05/2014	0	2	CIVIL
Aurillac	France	LFLW	1	26/06/2014	0	1	CIVIL
Lille Lesquin	France	LFQQ	2	26/06/2014	0	2	CIVIL
Moulins Montbeugny	France	LFHY	1	01/05/2014	0	1	CIVIL
Saint Etienne Boutheon	France	LFMH	1	24/07/2014	0	1	CIVIL
Auxerre Branches	France	LFLA	1	21/08/2014	0	1	CIVIL
Besancon La Veze	France	LFQM	1	18/09/2014	0	1	CIVIL
Deauville Saint Gatien	France	LFRG	1	18/09/2014	0	1	CIVIL
Saint Nazaire Montoir	France	LFRZ	1	28/10/2014	0	1	CIVIL
Caen Carpiquet	France	LFRK	1	11/12/2014	0	1	CIVIL
Ouessant	France	LFEC	2	11/12/2014	0	2	CIVIL
Marseille	France	LFML	2	08/01/2015	0	2	CIVIL
Cannes Mandelieu	France	LFMD	1	05/02/2015	0	1	CIVIL
Vichy Charmeil	France	LFLV	1	05/02/2015	0	1	CIVIL
Evreux Fauville	France	LFOE	2	15/11/2012	0	2	MILITAR
Orleans Bricy	France	LFOJ	2	18/09/2014	0	2	MILITAR
St. Gallen-Altenrhein	Switzerland	LSZR	1	17/11/2011	0	1	CIVIL
Les Eplatures	Switzerland	LSGC	1	17/11/2011	0	1	CIVIL
Berne-Belp	Switzerland	LSZB	1	07/03/2013	0	1	CIVIL
Grenchen	Switzerland	LSZG	1	25/07/2013	0	1	CIVIL
Emmen	Switzerland	LSME	1	03/04/2014	0	1	MILITAR
Dübendorf	Switzerland	LSMD	1	21/08/2014	0	1	MILITAR

Operational Airports							
Airport	Country	ICAO Code	LPV Procedure	Activation LPV procedure ⁶	APV Baro Procedure	Total Nr Procedure (LPV+ APV Baro)	Purpose
Alderney	Guernsey	EGJA	2	07/12/2011	0	2	CIVIL
Milano/Linate	Italy	LIML	2	13/12/2012	0	2	CIVIL
Roma/Ciampino	Italy	LIRA	1	10/01/2013	0	1	CIVIL
Roma/Fiumicino	Italy	LIRF	4	10/01/2013	0	4	CIVIL
Venezia/Tessera	Italy	LIPZ	3	27/06/2013	0	3	CIVIL
Milano/Malpensa	Italy	LIMC	1	21/08/2014;	0	1	CIVIL
Bologna Borgo Panigale	Italy	LIPE	1	18/11/2014	0	1	CIVIL
Allendorf/Eder	Germany	EDFQ	1	11/12/2014	1	2	CIVIL
Augsburg	Germany	EDMA	0		2	2	CIVIL
Barth	Germany	EDBH	0		1	1	CIVIL
Bautzen	Germany	EDAB	0		1	1	CIVIL
Bayreuth	Germany	EDQD	0		1	1	CIVIL
Berlin-Tegel	Germany	EDDT	0		4	4	CIVIL
Berlin/Schönefeld	Germany	EDDB	0		4	4	CIVIL
Braunschweig-Wolfsburg	Germany	EDVE	2	18/10/2012	0	2	CIVIL
Bremen	Germany	EDDW	0		2	2	CIVIL
Bremerhaven	Germany	EDWB	0		2	2	CIVIL
Coburg-Brandensteinebene	Germany	EDQC	1	11/12/2014	1	2	CIVIL
Donaueschingen-Villingen	Germany	EDTD	1	11/12/2014	1	2	CIVIL
Dortmund	Germany	EDLW	2	11/12/2014	2	4	CIVIL
Dresden	Germany	EDDC	0		2	2	CIVIL
Düsseldorf	Germany	EDDL	0		4	4	CIVIL
Eggenfelden	Germany	EDME	1	11/12/2014	1	2	CIVIL
Erfurt-Weimar	Germany	EDDE	0		2	2	CIVIL
Frankfurt Main	Germany	EDDF	0		4	4	CIVIL
Friedrichshafen	Germany	EDNY	0		2	2	CIVIL
Giebelstadt	Germany	EDQG	0		2	2	CIVIL
Hamburg	Germany	EDDH	0		4	4	CIVIL
Hamburg-Finkenwerder	Germany	EDHI	2	13/12/2012	0	2	CIVIL
Hannover	Germany	EDDV	0		4	4	CIVIL
Köln/Bonn	Germany	EDDK	0		6	6	CIVIL
Leipzig/Halle	Germany	EDDP	0		4	4	CIVIL
Magdeburg/City	Germany	EDBM	1	13/12/2012	0	1	CIVIL
Memmingen	Germany	EDJA	0		2	2	CIVIL
Mengen-Hohentengen	Germany	EDTM	1	11/12/2014	1	2	CIVIL
München	Germany	EDDM	0		4	4	CIVIL
Münster/Osnabrück	Germany	EDDG	0		2	2	CIVIL
Nürnberg	Germany	EDDN	0		1	1	CIVIL

Operational Airports							
Airport	Country	ICAO Code	LPV Procedure	Activation LPV procedure ⁶	APV Baro Procedure	Total Nr Procedure (LPV+ APV Baro)	Purpose
Oberpfaffenhofen	Germany	EDMO	1	13/12/2012	0	1	CIVIL
Paderborn/Lippstadt	Germany	EDLP	2		0	2	CIVIL
Schwäbisch-Hall	Germany	EDTY	2	13/12/2012	0	2	CIVIL
Straubing	Germany	EDMS	1	11/12/2014	1	2	CIVIL
Stuttgart	Germany	EDDS	0		1	1	CIVIL
Wilhelmshaven JadeWeserAirport	Germany	EDWI	0		2	2	CIVIL
Kassel-Calden	Germany	EDVK	2	04/04/2013	0	2	CIVIL
Donauwörth	Germany	EDPR	1	15/10/2013	0	1	CIVIL
Emden	Germany	EDWE	4	15/10/2013	0	4	CIVIL
Frankfurt Hahn	Germany	EDFH	2	11/12/2014	0	2	CIVIL
Lahr	Germany	EDTL	2	11/12/2014	0	2	CIVIL
Santander	Spain	LEXJ	2	17/10/2013	0	2	CIVIL
Joensuu	Finland	EFJO	2	12/12/2013	0	2	CIVIL
Linz	Austria	LOWL	1	09/01/2014	0	1	CIVIL
Graz	Austria	LOWG	1	09/01/2014	0	1	CIVIL
Praha	Czech Republic	LKPR	0		4	4	CIVIL
Brno	Czech Republic	LKTB	2	09/01/2014	0	2	CIVIL
Ostrava	Czech Republic	LKMT	2	09/01/2014	0	2	CIVIL
Karlovy Vary	Czech Republic	LKKV	2	13/11/2014	0	2	CIVIL
Rost	Norway	ENRS	2	06/03/2014	0	2	CIVIL
Gardermoen	Norway	ENGM	4	11/12/2014	0	4	CIVIL
Katowice	Poland	EPKT	2	03/04/2014	0	2	CIVIL
Exeter	United Kingdom	EGTE	2	21/08/2014	0	2	CIVIL
Bristol	United Kingdom	EGGD	2	21/08/2014	0	2	CIVIL
Göteborg/Säve	Sweden	ESGP	2	18/09/2014	0	2	CIVIL
Storuman	Sweden	ESUD	1	11/12/2014	0	1	CIVIL
Eelde	Netherlands	EHGG	2	13/11/2014	0	2	CIVIL
Teuge	Netherlands	EHTE	1	13/11/2014	0	1	CIVIL
Bratislava/M. R. Stefanik	Slovak Republic	LZIB	2	05/02/2015	0	2	CIVIL
Kosice	Slovak Republic	LZKZ	2	05/02/2015	0	2	CIVIL
Aarhus	Denmark	EKAH	2	05/03/2015	0	2	CIVIL

Table 24: Full list of EGNOS-based Approach Procedures

APPENDIX B LIST OF ACRONYMS

Acronym	Definition
ABAS	Airborne Based Augmentation Systems
ABS	Abu Simbel
ACI	Airports Council International
ACR	Azores
AFTN	Aeronautical Fixed Telecommunication Network
AGA	Agadir
AIRAC	Aeronautical Information Regulation And Control
ALB	Aalborg
ALY	Alexandria
ANSP	Air Navigation Service Provider
APCH	Approach
APV	Approach with Vertical Guidance
ARP	Airport Reference Point
ASN.1	Abstract Syntax Notation One
ATC	Air Traffic Control
ATH	Athens
ATM	Air Traffic Management
ATS	Air Traffic Service
BRN	Berlin
CBA	Cost-Benefit Analysis
CCF	Central Control Facility
CNR	Canary Islands
COTS	Commercial Off-The-Shelf
CRK	Cork
CTN	Catania
DGNSS	Differential GNSS
DGPS	Differential GPS
DJA	Djerba
DOP	Dilution of Precision
EASA	European Aviation Safety Agency
EBACE	European Business Aviation Conference & Exhibition

Acronym	Definition
EC	European Commission
ECAC	European Civil Aviation Conference
EDAS	EGNOS Data Access Service
EGI	Egilsstadir
EGNOS	European Geostationary Navigation Overlay Service
EMA	EGNOS Multimodal Adoption
ENMA	EGNOS Network Management Application
ERA	European Regions Airline Association
ESA	European Space Agency
ESR	EGNOS System Release
ESSP	European Satellite Services Provider
EU	European Union
EUGIN	European Group of Institutes of Navigation
EWA	EGNOS Working Agreement
FIR	Flight Information Region
FTP	File Transfer Protocol
GEO	Geostationary Satellite
GLG	Glasgow
GLONASS	Globalnaya Navigatsionnaya Sputnikovaya Sistema
GNSS	Global Navigation Satellite System
GOL	Gölbasi
GPRS	General Packet Radio Services
GPS	Global Positioning System
GSA	European GNSS Agency
GSM	Global System for Mobile Communications
GVL	Gävle
HAL	Horizontal Alert Limit
HBK	Hartebeeshoek
HNSE	Horizontal Navigation System Error
HPE	Horizontal Position Error
HPL	Horizontal Protection Level
HSI	Horizontal Safety Index
IAIN	International Association of Institutes of Navigation

Acronym	Definition
IALA	International Association of Lighthouse Authorities
ICAO	International Civil Aviation Organisation
ION	Institute Of Navigation
ISO	International Organisation for Standardisation
IWG	Interoperability Working Group
JME	Jan Mayen
KIR	Kirkeness
KOU	Kourou
LAP	Lappeenranta
LPI	La Palma
LPS	Letové Prevádzkové Služby
LPV	Localizer Performance with Vertical guidance
LSB	Lisbon
LVNL	Luchtverkeersleiding Nederland
LYR	Longyearbyen
MAD	Madeira
MCC	Mission Control Centre
MEDA	Euro-Mediterranean Partnership
METS	Marine Equipment Trade Show
MLG	Malaga
MON	Moncton
MRO	Maintenance, Repair & Overhaul
N/A	Not Applicable/ Not Available
NANU	Notice Advisory to Navstar Users
NLES	Navigation Land Earth Station
NOF	NOTAM Offices
NOTAM	Notice to Airmen
NOU	Nouakchott
NPA	Non-Precision Approach
NSA	National Supervisory Authority
NSG	Navigation Steering Group
OP	Operation
OS	Open Service

Acronym	Definition
PA	Precision Approach
PAR	Paris
PBN	Performance Based Navigation
PDM	Palma De Mallorca
PRN	Pseudo-Random Noise
R&D	Research and Development
RAIM	Receiver autonomous integrity monitoring
RAISG	RNAV Approach Implementation Support Group
RIMS	Ranging and Integrity Monitoring Station
RINEX	Receiver Independent Exchange Format
RKK	Reykjavík
RNAV	Area Navigation
RNP	Required Navigation Performance
ROM	Roma
RTCM	Radio Technical Commission for Maritime Services
RTK	Real Time Kinematic
SBAS	Satellite-Based Augmentation System
SDC	Santiago De Compostela
SDD	Service Definition Document
SES	Single European Sky
SIS	Signal-In-Space
SISNeT	Signal-In-Space through the Internet
SL0	Service Level 0
SL2	Service Level 2
SOF	Sofia
SoL	Safety-Of-Life
SWA	Swanwick
TF	Task Force
TLS	Toulouse
TRD	Trondheim
TRO	Tromsø
TWAN	Transport Wide Area Network
UK	United Kingdom

Acronym	Definition
VAL	Vertical Alert Limit
VDES	VHF Data Exchange System
VNSE	Vertical Navigation System Error
VPE	Vertical Position Error
VPL	Vertical Protection Level
VSİ	Vertical Safety Index
WRS	Warsaw
YSR	Yearly System Release
ZUR	Zurich

END OF DOCUMENT