The EGNOS Service Provider

Service Provision Yearly Report (April 2013-March 2014)

EGNOS Service Provision

ESSP

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ESSP is organizing on a yearly basis the EGNOS Service Provision Workshop for EGNOS users and stakeholders, the perfect place in order to receive updated information on the EGNOS system and services, implementation information and success stories and to collect feedback from users and interchange ideas and experiences among EGNOS users in different domains.

2014 EGNOS Service Provision Workshop will be held on 7-8 October in the city of Lisbon.

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1 A WORD FROM ESSP'S PRESIDENT

2013 was a pivotal year for ESSP. Being awarded the new "EGNOS Service Provision 2014-2021" contract demonstrated ESSP's high performance levels, as well as its commitment to excellence in providing the EGNOS service.

During 2013, the service maintained a high level of availability and continuity, while EGNOS implementation in Europe continued to grow: no fewer than 9 new working agreements were signed with European ANSPs, and 50 new EGNOS-based flight procedures were published.

2013 was also the start of an ambitious programme for EGNOS Multimodal Adoption (EMA); this programme not only relates to Aviation, but also focuses on new domains, such as Agriculture, Rail, Maritime and ITS, and a many of these activities are being deployed this year. Full implementation is still a long way off, but ESSP and the GSA are working closely together to achieve this goal.

These achievements were all challenges, since at the same time ESSP almost doubled in size and set-up an operational organisation together with its partner TeleSpazio, in order to meet the GSA's requirements for the new ESP contract. New staff were trained and internal processes were adapted efficiently or even deployed without disrupting service provision or availability for EGNOS users. Let me congratulate both ESSP and TeleSpazio staff for their unfailing contribution during this ramp-up period.

Lastly, I would like to thank our customer – the GSA – for the confidence they have placed in us. Now that I have been leading the company for a few months, and having worked with such a motivated and committed team, ESSP is undoubtedly the right partner to provide a first-class service to its customer and boost EGNOS adoption in the coming years.

Thank you,

Thierry Racaud

President of ESSP SAS

We certify you're there.

2 EXECUTIVE SUMMARY

This document covers the period from 1st April 2013 to 31st March 2014.

2.1 EGNOS Service Performance

During this yearly period, the EGNOS measured service performance has been good, largely fulfilling the values agreed in the Open Service and Safety of Life SDDs (see http://www.essp-sas.eu/service_definition_documents).

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

- *Signal In Space (SIS) Availability:*

  Over the past year, the availability of an SBAS message achieved the following:

  - PRN120 (EGNOS OP): 99.30%
  - PRN126 (EGNOS OP): 99.32%
  - EGNOS OP (at least one SIS): 99.99%

- *Open Service (OS):*
  - **Horizontal and Vertical Accuracy**: The 95 percentile of the cumulative data (all stations during the whole period) provide very good results, i.e. around 1.7 metres for horizontal error, and 2.6 metres for vertical errors; the requirement being 3 metres for horizontal accuracy and 4 metres for vertical accuracy.
  - **Open Service Availability**: The value for OS Availability (percentage of time in the month in which HNSE<3m and VNSE<4m) was above 99% for all locations with the exception of five stations: Tromso, Madeira, Kirkenes, Jan Mayen and Reykjavik.

- *Safety of Life (SoL)- Non Precision Approach (NPA)*:
  - **NPA Availability**: Coverage was 100% of the service area defined by Message Type 27.
  - **NPA Integrity:** No integrity event has been identified for NPA for any of the monitored sites.
  - **NPA Continuity:** NPA continuity results in continental areas of Europe present values between $2.5x10^{-3}$/h and $5x10^{-4}$/h.

- *Safety of Life (SoL)- Approach with Vertical Guidance (APV-I):*
  - APV-1 Availability: the requirement was met over 91.90% of the Service area.
  - APV-1 Integrity: No APV-I integrity event occurred during the period.
  - APV-1 Continuity:
    - continuity at 5e-04/15 seconds was met over 96.10% of the commitment area.
    - continuity at 1e-04/15 seconds was met over 90.05% of the commitment area.
    - continuity at 1e-03/15 seconds was met over 97.37% of the commitment area.

  The main causes for performance degradations were:

- Ionospheric monitoring: As for the previous year, ionospheric issues relating to the increase in solar activity (linked to solar cycle #24) have been the main cause of underperformance.
- GPS monitoring: different issues relating to loss of monitoring of some GPS satellites have represented a problem in some areas, especially when combined with other factors.
- RIMS unavailability: in particular, the lack of Jan Mayen station from mid-May to mid-August 2013 was especially important, degrading EGNOS performance in the North of the Service Area.

- *EDAS:*

  The average availability of the different EDAS services has been well above the SDD commitments (see http://www.essp-sas.eu/service_definition_documents):

  - SL0: 99.54% Availability.
  - SL1: 99.54% Availability.
  - SL2: 99.55% Availability.
  - NTRIP: 97.56% Availability.
  - SISNET: 96.50% Availability.
  - Data Filtering: 99.59% Availability.
  - FTP: 98.67% Availability.

2.2 Service Provision and Development

Service Definition Documents

Following the deployment of the new EGNOS system release ESR 2.3.1i and the relevant improvements made to the EDAS Service during 2013, the three EGNOS Services' SDDs were updated as follows:

- EGNOS OS SDD (EGN-SDD OS, V2.0): Published on 11/03/2013
- EGNOS SoL SDD (EGN-SDD SoL, V2.0): Published on 28/06/2013
- EDAS SDD (EGN-SDD EDAS, V2.0): Published on 10/04/2013

Moreover, the EGNOS Services' SDDs contents were supplemented by the publication of five Service Notices (http://www.essp-sas.eu/service_notices).

Finally, the three EGNOS Service Implementation Roadmaps (SoL, OS and EDAS respectively) were updated on 14/05/2013 to their version 2.0 (http://www.essp-sas.eu/printed_documents).

User Agreements

With regards to the EGNOS Service Development in aviation, ESSP continued its specific dissemination and awareness campaign relating to the EGNOS Working Agreement (EWA). As a result of this process, ESSP has signed 9 new EWA (of a total of 19) with ANS CR (Czech Rep), HIAL (UK), NAV (Portugal), Finavia (Finland), Avinor (Norway), LFV (Sweden), London Southend

Airport (UK), Marshall Aerospace (Cambridge airport – UK) and Kent Airport (Manston Airport – UK).

Thanks to ESSP's Service Provision activities with the various Air Navigation Service Providers and EGNOS stakeholders such as Eurocontrol, the EASA, National Supervisory Authorities, the GSA and the European Commission, a steady increase of EGNOS-based approach procedure implementation was achieved in different countries and airports: 107[1] LPV procedures in 77 airports and 76 APV-Baro in 31 German and Czech airports (approved to be flown with EGNOS vertical guidance by the German, French and Czech NSAs).

User Service Implementation

During the first half of 2013, the EGNOS User Satisfaction Surveys, covering the year 2012 were launched. The results of these surveys (one specific survey for each EGNOS service), together with the user feedback received through all ESSP interfaces, were used to define the 2014 User Satisfaction Action Plan which is now being implemented. This plan consists of fifteen actions covering domain-specific and cross-domain actions mainly relating to documentation, processes, tools, user requirements, EGNOS services promotion and EDAS services.

Significant improvements in the EGNOS user interfaces provided by ESSP have been implemented. Since January 2013, the EGNOS Helpdesk answer time has been reduced from 6 to 3 working days for standard questions and from 2 to 1 hour for urgent questions (those signalling potential problems on EGNOS or EDAS). Also, the existing set of automatic alerts available to the users registered to the EGNOS User Support Website was extended in early 2014.

Additionally, for the specific case of aviation users, the NOTAM Proposals service was upgraded to the so-called Service Level 4 in January 2014, now providing a 2 hours reaction time in front of GNSS unscheduled events on H24 7/7.

Regarding the EDAS Service, a new set of services was officially declared available in April 2013 in order to extend the initial EDAS portfolio and enable EDAS support for new application domains. Currently, the services provided by EDAS are the Main Data Streams (Service Level 0 and 2), Data Filtering, the SISNET Service, the FTP Service and the Ntrip Service.

Currently, the implementation of the ESSP EGNOS Multimodal Adoption (EMA) Action Plan for 2014, prepared and agreed with the GSA by Q4 2013, which aims at fostering EGNOS adoption in all application domains, is ongoing. This ambitious action plan covers regulatory and standardisation, awareness and promotion, contacts with end users, support to users (Cost-Benefit-Analysis, performance assessments, guidelines) and market aspects in the aviation, maritime, rail, agriculture and surveying domains.

[1] As of 03/04/2014

2.3 System Operations and Maintenance

During the reporting period, EGNOS operations ran nominally.

The most important highlights were the deployment of the ESR 2.3.2 during autumn 2013 and the upgrade of the EGNOS network in early 2014.

Some other significant changes at EGNOS system level, which were managed in the reported period were: the inclusion of PRN126 into EGNOS TEST for some days between end of March and beginning of April 2013, the stoppage of PRN124 (ARTEMIS) as of 31st December 2013 and the decommissioning of uplink stations Scanzano (Italy) and Torrejon (Spain) in early 2014.

EGNOS RIMS Station in Jan Mayen (Norway)

3 SERVICE PERFORMANCES

3.1 EGNOS SIS Availability

3.1.1 SIS Availability trending

This section presents SIS availability yearly performance. It provides the yearly average performance for the SIS Operational mode (OP) per PRN. It also provides the yearly trend based on the monthly data. *NB: Performance of the PRN124 used for the SIS TEST mode is not provided in this report.*

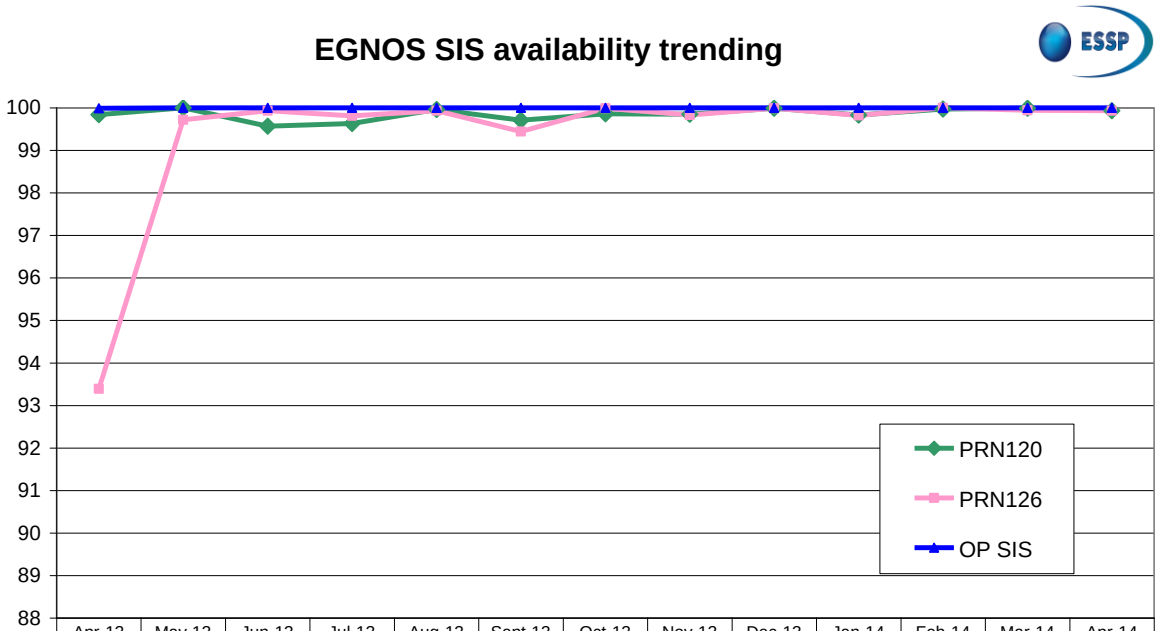
Comment: in April 2013, PRN126 and PRN124 were swapped between EGNOS Operational mode and TEST mode partitions (linked to the Inmarsat 4F2 Band C antenna replacement maintenance, first swap in March 2013).

PRN126 stopped broadcasting in TEST mode and started to broadcast again in SoL mode on 26/04/2013 at around 11:30 UTC. PRN124 stopped broadcasting in SoL mode on 26/04/2013 at around 10:15 UTC. In this section, for the month of April 2013, the figures provided for PRN126 correspond to the following combination:

- 01/04 to 26/04 11:32:15 GPST: PRN124
- 26/04 11:32:16 GPST to 30/04: PRN126

Over the last year, SBAS message availability was as follows:

- PRN120 (EGNOS OP): 99.30%
- PRN126 (EGNOS OP): 99.32%
- EGNOS OP (at least one SIS): 99.999%



	Apr-13	May-13	Jun-13	Jul-13	Aug-13	Sept-13	Oct-13	Nov-13	Dec-13	Jan-14	Feb-14	Mar-14	Apr-14
PRN120	99,84	100	99,57	99,63	99,96	99,71	99,86	99,85	99,99	99,83	99,97	99,99	99,93
PRN126	93,39	99,72	99,93	99,81	99,93	99,44	99,99	99,83	99,99	99,82	100	99,94	99,93
OP SIS	99,99	100	100	100	100	100	100	100	100	100	100	100	100

Figure 1: EGNOS SIS OP & PRN Availability (%)

3.1.2 SIS outages

This section presents the trends in the number of SIS outages (also called interruptions) per PRN. From a system point of view, a distinction is made between short interruptions (less than 4 minutes) due to NLES switches and longer interruptions due to system issues or maintenance/deployment activities.

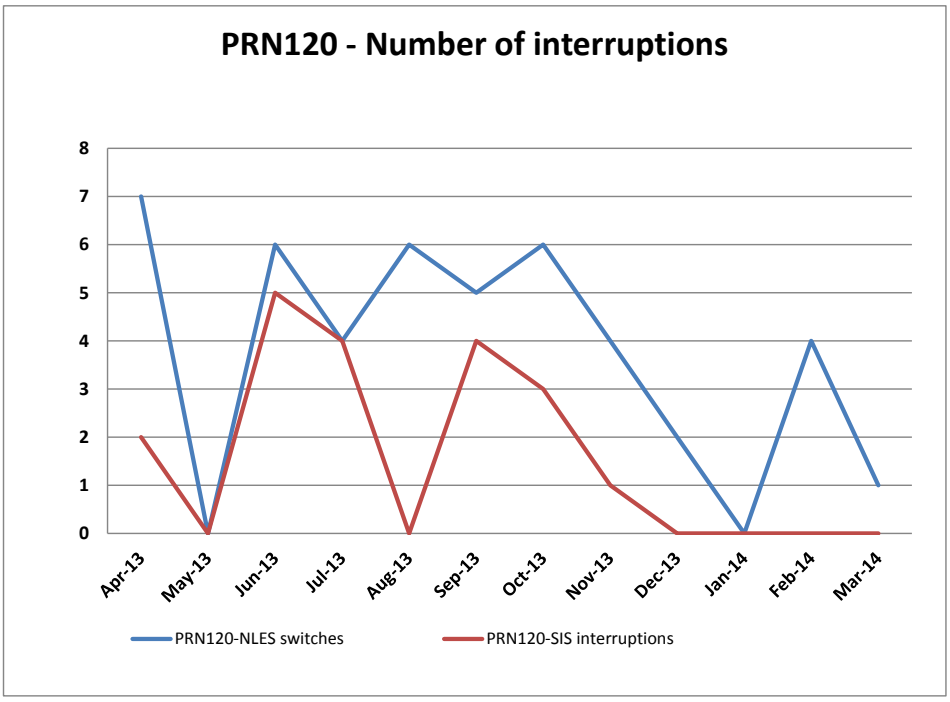


Figure 2: Number of SIS interruptions on PRN120

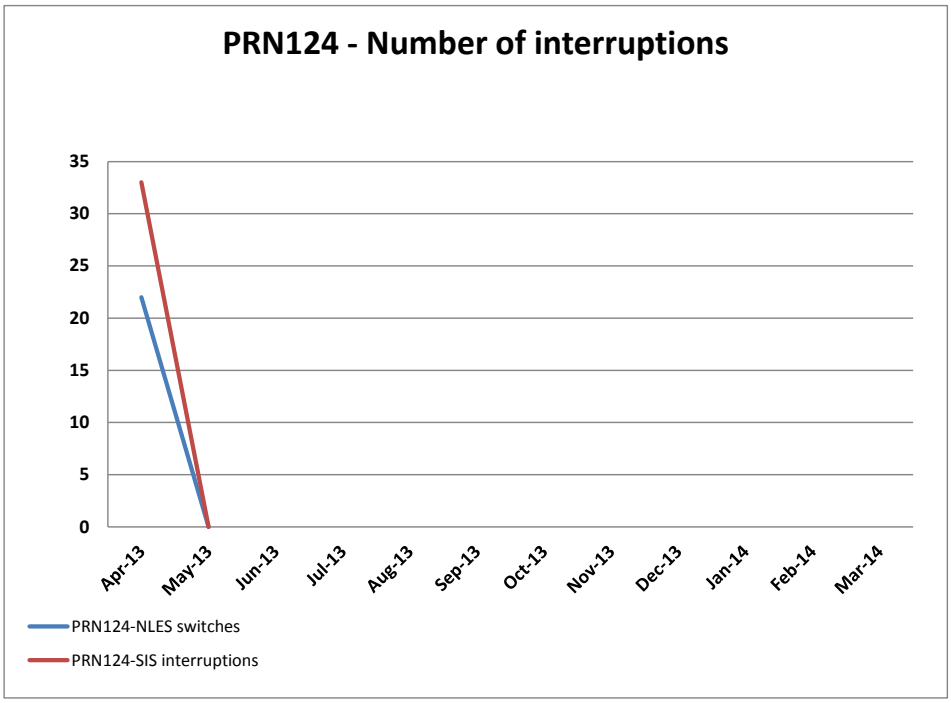


Figure 3: Number of SIS interruptions on PRN124[2]

[2] PRN 124 was in the EGNOS OP from 01/04/2013 to 26/04/2013.

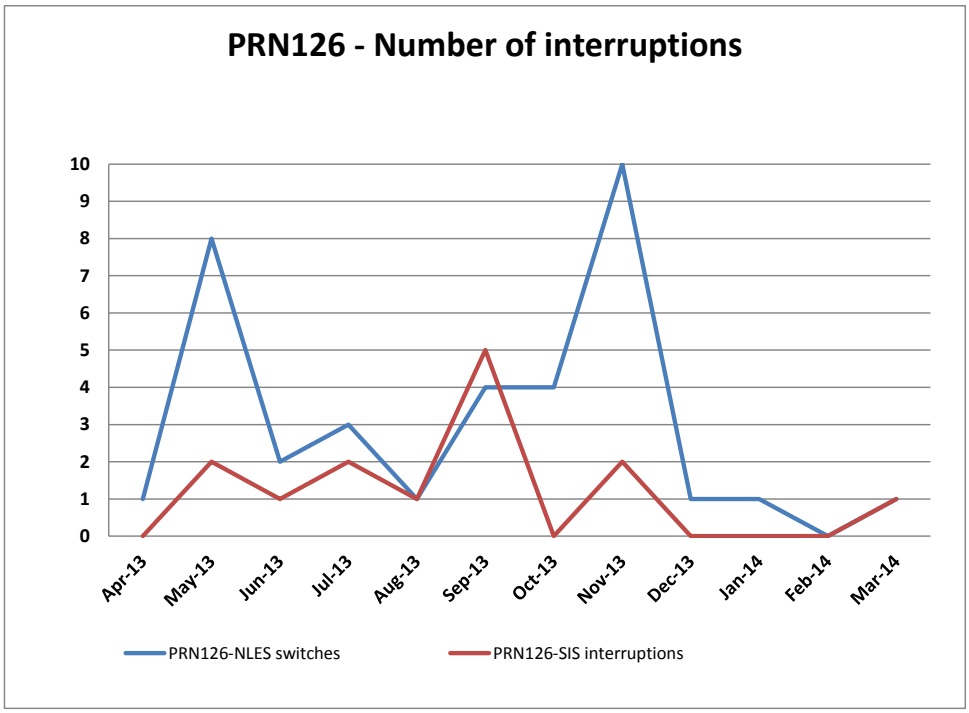


Figure 4: Number of SIS interruptions on PRN126[3]

[3] PRN 126 has been introduced in EGNOS OP on 26/04/2013

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:

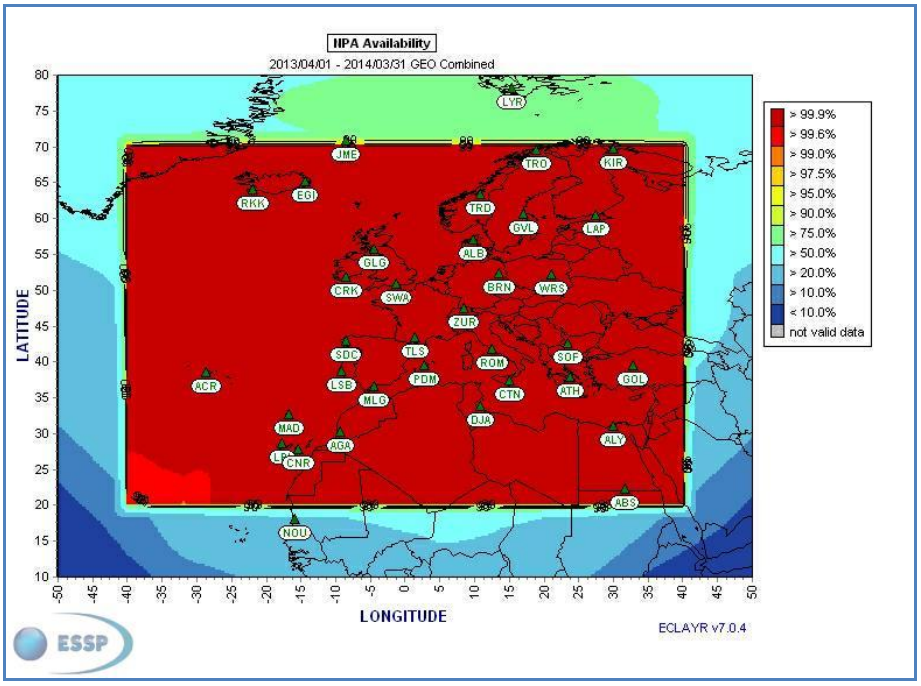


Figure 5: NPA Availability from 01/04/13 to 31/03/14

3.2.2 NPA availability – Achievement against target

The next figure shows the evolution of NPA availability at 99% compliance with respect to the reference area defined in the EGNOS SoL SDD (see http://www.essp-sas.eu/service_definition_documents).

It must be taken into account that, since July 2013, the commitment areas to be used as reference are the ones published in SoL SDD v2.0; for previous dates, there are the ones in SoL SDD v1.0.

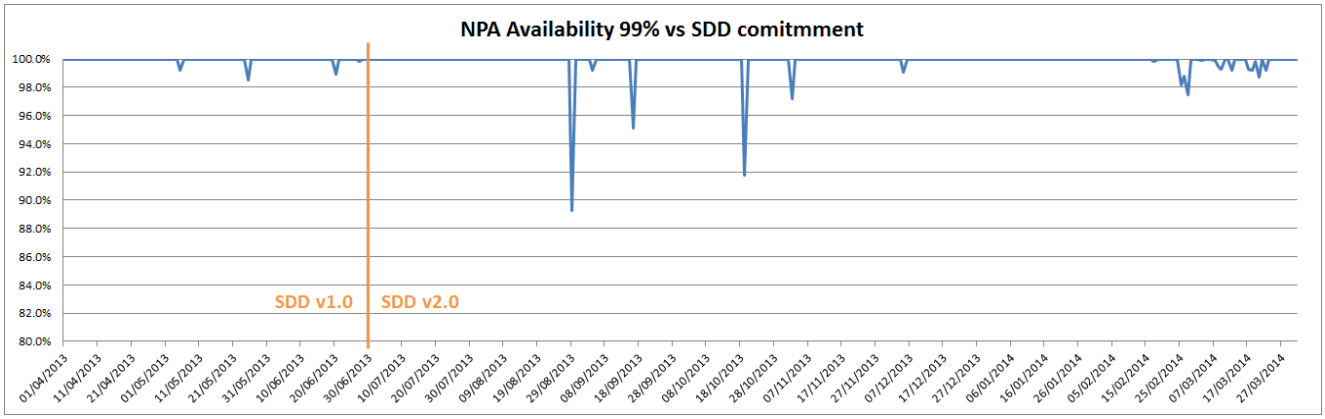


Figure 6: NPA Availability 99% compliance evolution

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:

NB: Please note that, in this type of figure, which compares the achieved coverage against the target (provided for different performance indicators), the colour codes should be read as follows:

- *Light green: part of the reference map where the target performance is achieved.*
- *Dark green: regions outside the reference map where the target performance is achieved*
- *Red: part of the reference map where the target performance is not achieved.*

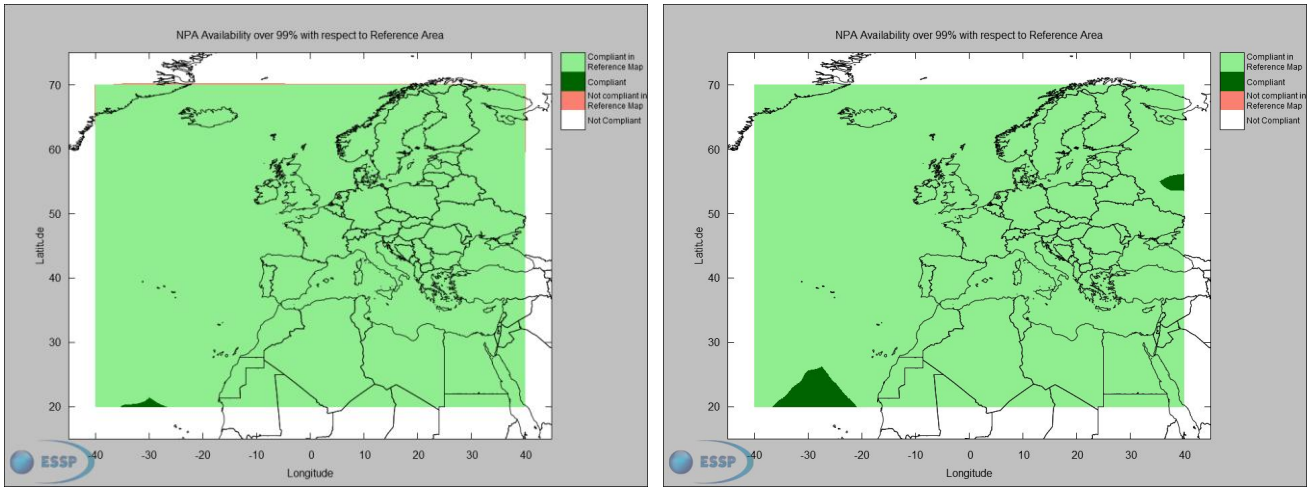


Figure 7: NPA Availability map with respect to the reference map – 01/04/13 - 30/06/13 (SDD v1.0) (left) & 01/07/13 - 31/03/14 (SDD v2.0) (right)

If the whole year is related to the current SDD (v2.0), the result is:

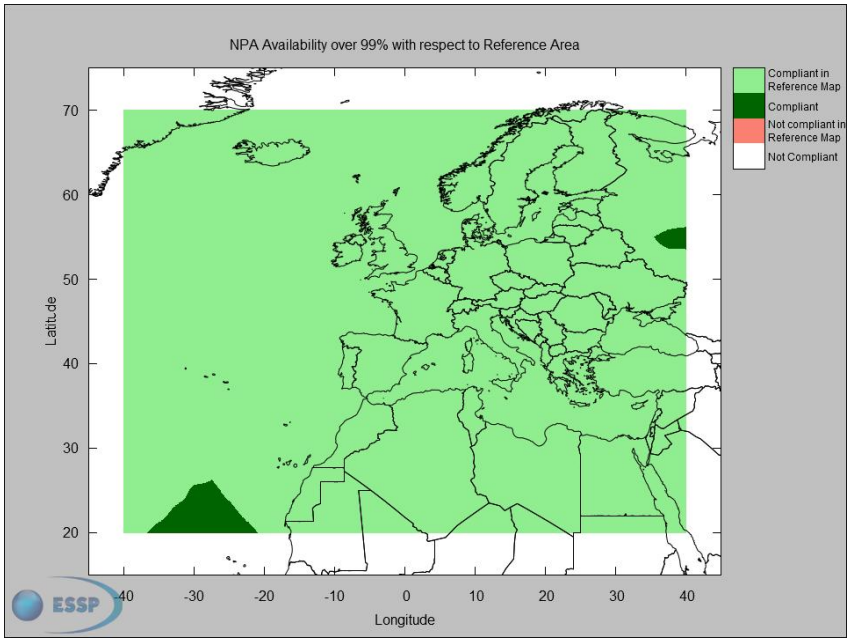


Figure 8: NPA Availability map with respect to the reference map (SDD v2.0) - 01/04/13 to 31/03/14

Considering the SDD v2.0 map used as 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 daily NPA availability was over 99% is shown in the figure below.

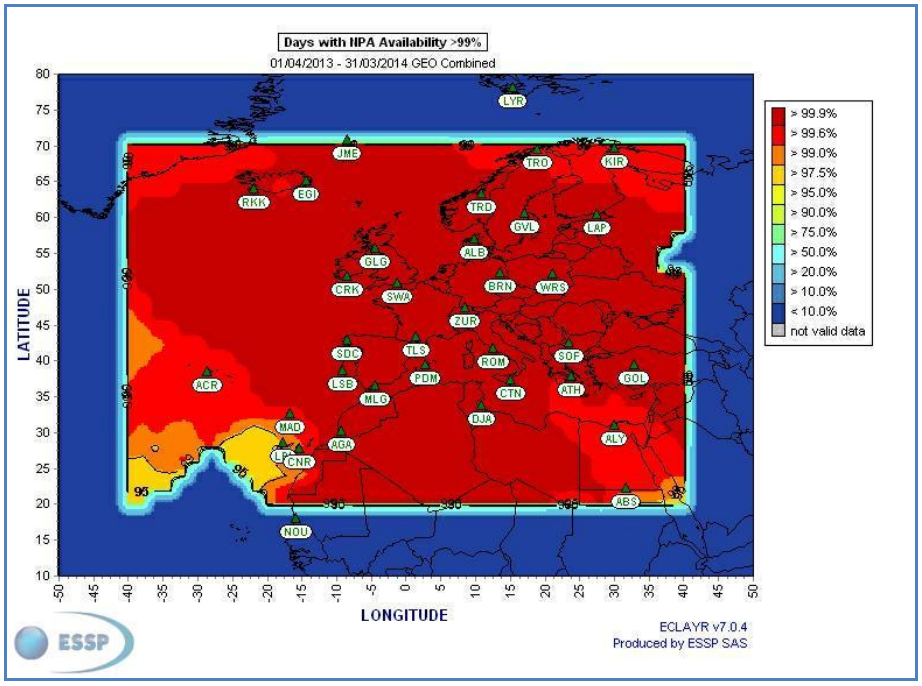


Figure 9: NPA Availability – Days over 99% - 01/04/13 to 31/03/14

3.2.4 NPA Integrity

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

None of the analysed RIMS have been impacted by integrity events in the position domain during the analysed period.

Table 1 shows the maximum HSI at each RIMS inside of the NPA reference area (see http://www.essp-sas.eu/service_definition_documents) for each operational GEO.

Station	HSI	
	PRN120	PRN126
Aalborg	0.24	0.26
Azores	0.45	0.46
Berlin	0.23	0.23
Canary Islands	0.75	0.80
Catania	0.47	0.48
Cork	0.26	0.26
Warsaw	0.29	0.28

Station	HSI	
	PRN120	PRN126
Djerba	0.80	0.80
Egilsstadir	0.24	0.26
Glasgow	0.32	0.24
Golbasi	0.30	0.33
Lisbon	0.42	0.44
Swanwick	0.31	0.31
Madeira	0.72	0.72
Málaga	0.69	0.70
Kirkenes	0.27	0.38
Palma de Mallorca	0.69	0.68
Reykjavik	0.23	0.24
Roma	0.31	0.31
Lappeenranta	0.25	0.31
S. de Compostela	0.28	0.34
La Palma	0.68	0.71
Sofia	0.36	0.36
Gävle	0.28	0.27
Toulouse	0.30	0.30
Trondheim	0.28	0.28
Tromsoe	0.31	0.36
Zürich	0.28	0.34
Abu Simbel	0.42	0.39
Agadir	0.77	0.77
Athens	0.45	0.45

Table 1: NPA Safety Index (maximum) at reference stations

The figure below provides the histogram for HSI (Horizontal Safety Index) accumulating measurements from the different EGNOS stations and for both operational GEOs over the whole period.

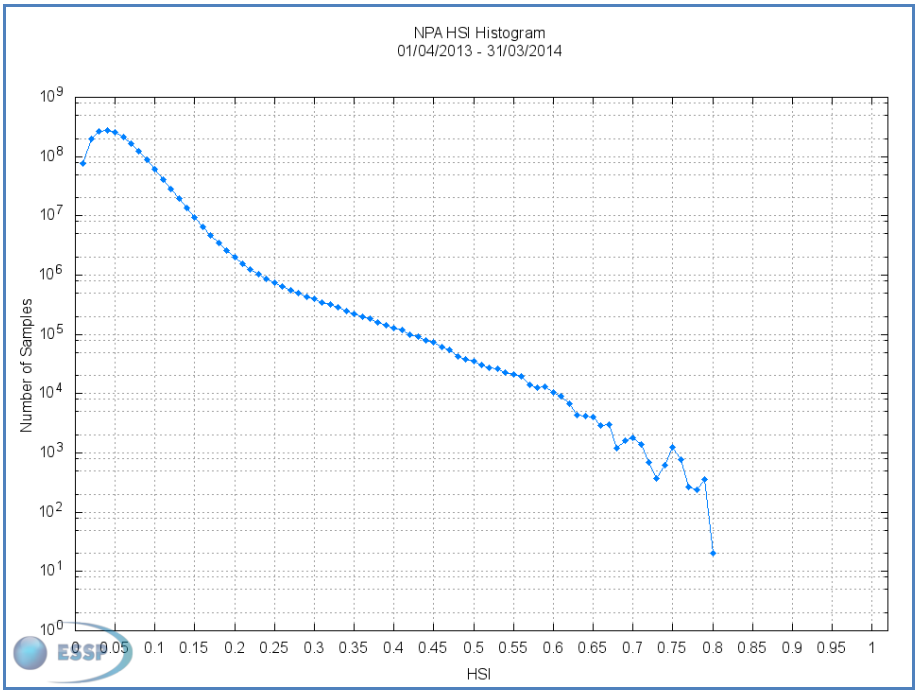


Figure 10: NPA Horizontal Safety Index

3.2.5 NPA Continuity – Yearly performance

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 next figure shows the NPA Continuity Risk obtained for the GEO combined over the whole analysed period.

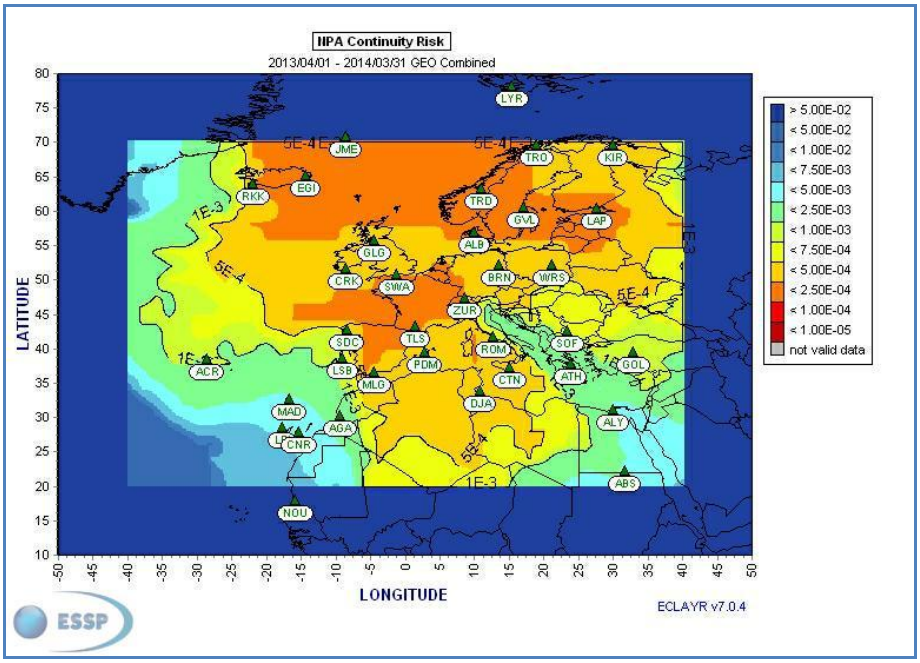


Figure 11: NPA Continuity Risk from 01/04/13 to 31/03/14

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

Arlanda airport in Sweden

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 GEO combined, the GEO APV-I availability for the reporting period:

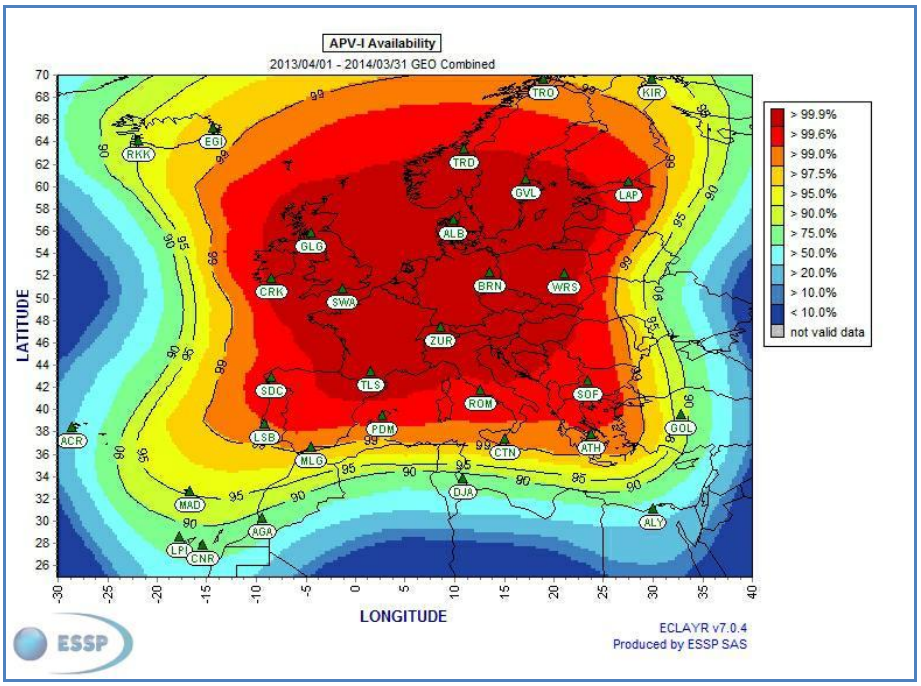


Figure 12: APV-I Availability from 01/04/13 to 31/03/14

3.3.2 APV-I availability – Achievement against target

Next figure shows the evolution of the APV-I availability 99% compliance with respect to the reference area defined in the EGNOS SoL SDD (see http://www.essp-sas.eu/service_definition_documents). It must be taken into account that, since July 2013, the commitment areas to be used as reference are the ones published in SoL SDD v2.0; for previous dates it is the ones in SoL SDD v1.0.

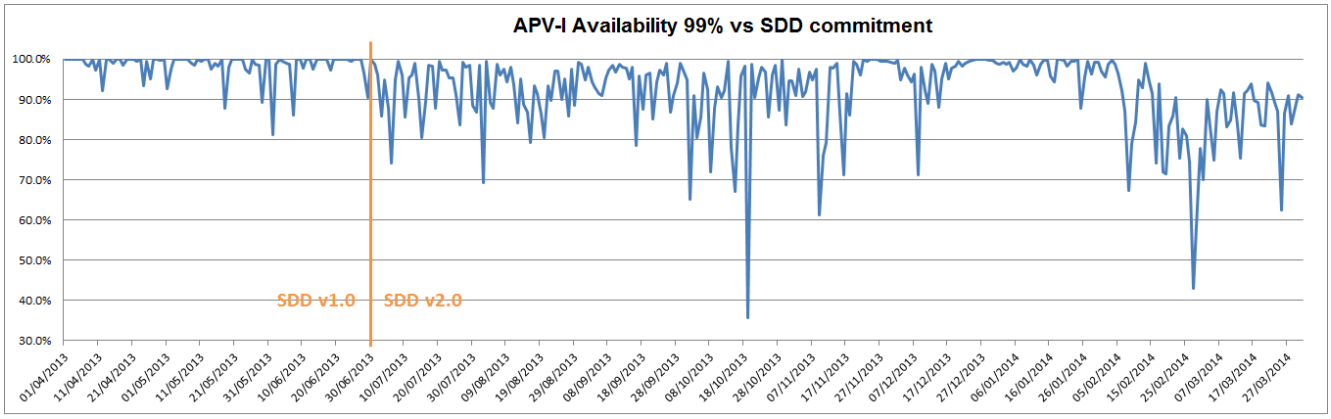


Figure 13: APV-I Availability 99% compliance evolution

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:

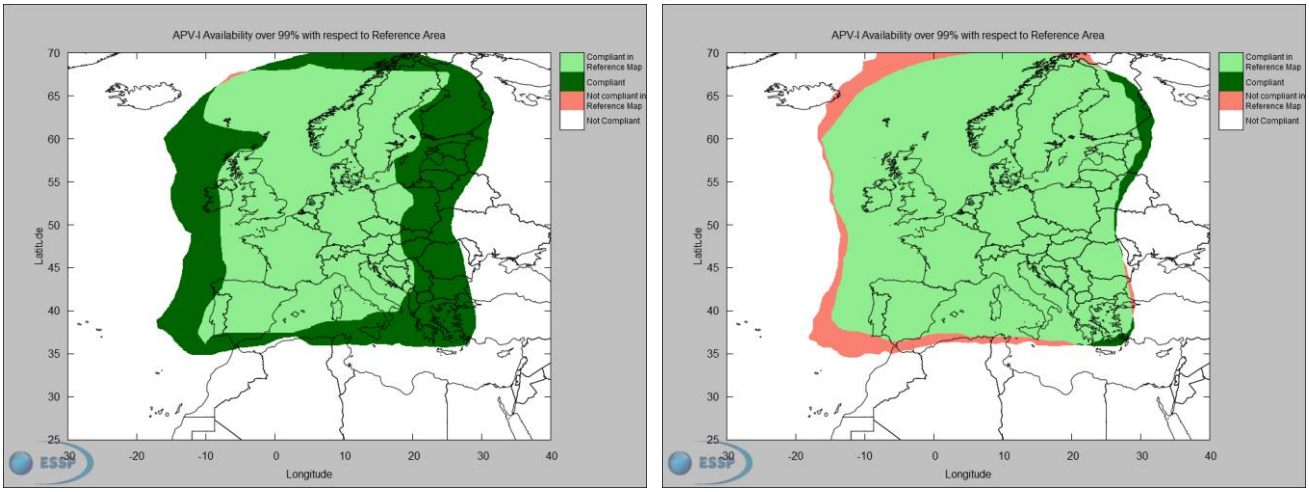


Figure 14: APV-I Availability map with respect to the reference map – 01/04/13 - 30/06/13 (SDD v1.0) (left) & 01/07/13 - 31/03/14 (SDD v2.0) (right)

If the whole period is referred to the current SDD (v2.0), the result is:

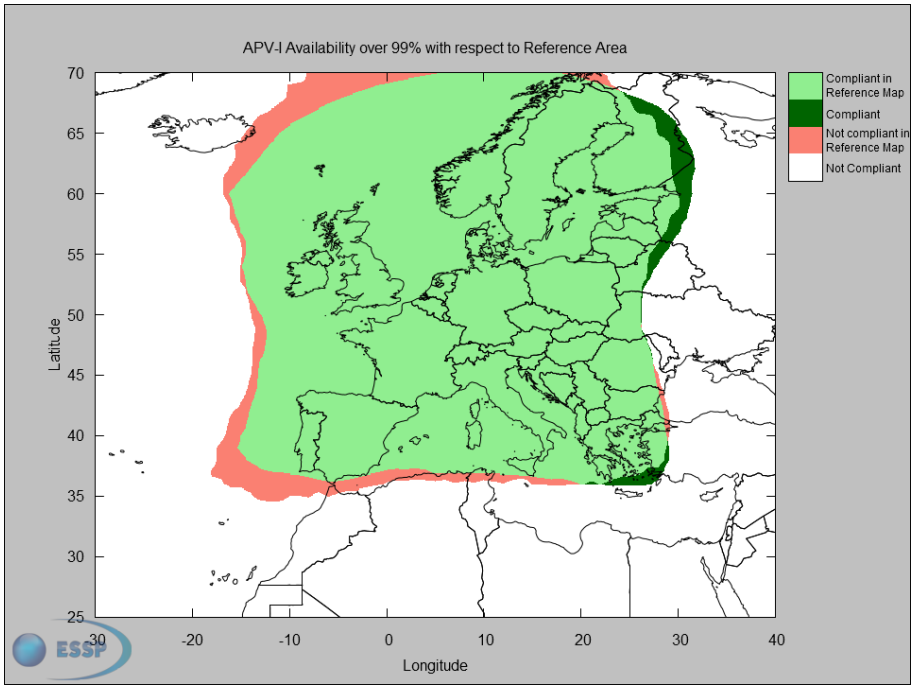


Figure 15: APV-I Availability map with respect to the reference map (SDD v2.0) - 01/04/13 to 31/03/14

Considering the SDD v2.0 map used as the reference, the percentage of points that were compliant with the reference area is **91.90%**.

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 figure below.

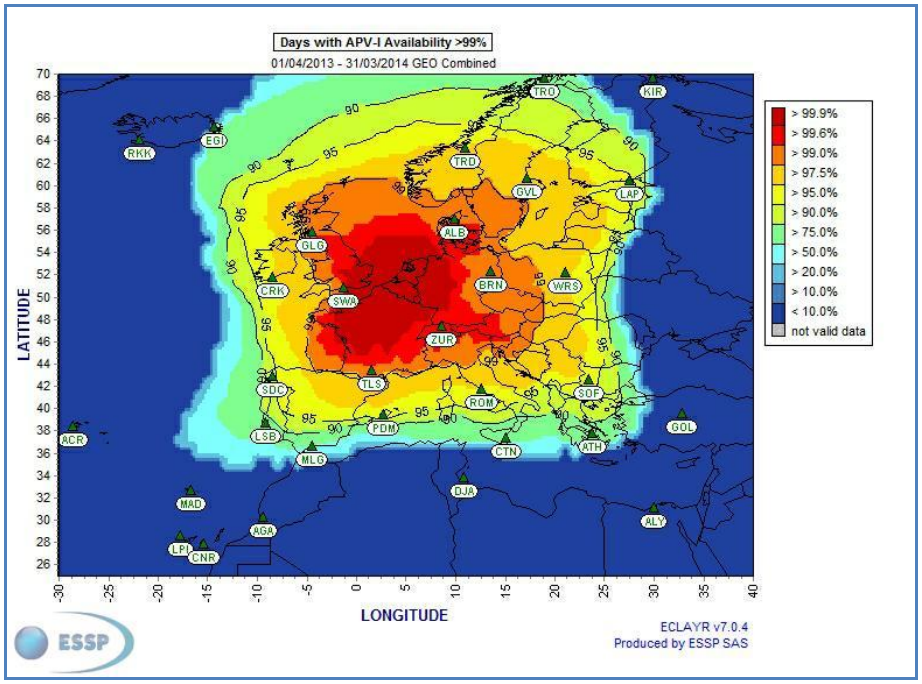


Figure 16: APV-I Availability – Days over 99% - 01/04/13 to 31/03/14

From the previous figure, it can be concluded that the APV-I Availability was greater than 99%:

- For 100% of the period in the 7% of the reference area defined in the SDD v2.0[4].
- For 99% of the period in the 24% of the reference area defined in the SDD v2.0[4].
- For 95% of the period in the 58% of the reference area defined in the SDD v2.0[4].

3.3.4 APV-I Integrity events

An EGNOS APV-I Integrity Event *is defined as an event where the Navigation System Error is greater than 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. In case of ratio xPE/xPL is over 1; it indicates that a Misleading Information situation has occurred.*

Table 2 shows the maximum HSI and VSI at each RIMS inside of the APV-I reference area (see http://www.essp-sas.eu/service_definition_documents) for each operational GEO. Moreover, Stanford plots are available on the operations website (http://egnos-user-support.essp-sas.eu/egnos_ops/index.php).

Station	HSI		VSI	
	PRN120	PRN126	PRN120	PRN126
Aalborg	0.25	0.23	0.38	0.35
Berlin	0.24	0.24	0.35	0.32
Catania	0.28	0.27	0.30	0.30
Cork	0.27	0.27	0.26	0.27
Warsaw	0.30	0.29	0.31	0.29
Djerba	0.36	0.38	0.27	0.29
Egilsstadir	0.25	0.27	0.29	0.30
Glasgow	0.24	0.25	0.29	0.29
Lisbon	0.31	0.27	0.26	0.27
Swanwick	0.32	0.32	0.32	0.33
Madeira	0.32	0.32	0.29	0.27
Málaga	0.27	0.26	0.24	0.25
Kirkenes	0.27	0.28	0.32	0.31
Palma de Mallorca	0.34	0.32	0.29	0.27
Reykjavik	0.22	0.22	0.31	0.32
Roma	0.31	0.31	0.33	0.33
Lappeenranta	0.26	0.32	0.31	0.30
S. de Compostela	0.24	0.24	0.32	0.26

[4] See http://www.essp-sas.eu/service_definition_documents

Station	HSI		VSI	
	PRN120	PRN126	PRN120	PRN126
Sofia	0.33	0.33	0.35	0.34
Gävle	0.25	0.27	0.38	0.34
Toulouse	0.24	0.28	0.26	0.27
Trondheim	0.29	0.27	0.35	0.33
Tromsoe	0.31	0.33	0.33	0.33
Zürich	0.28	0.28	0.29	0.29
Athens	0.25	0.27	0.29	0.30

Table 2: EGNOS APV-I Safety Index (maximum) at reference stations

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

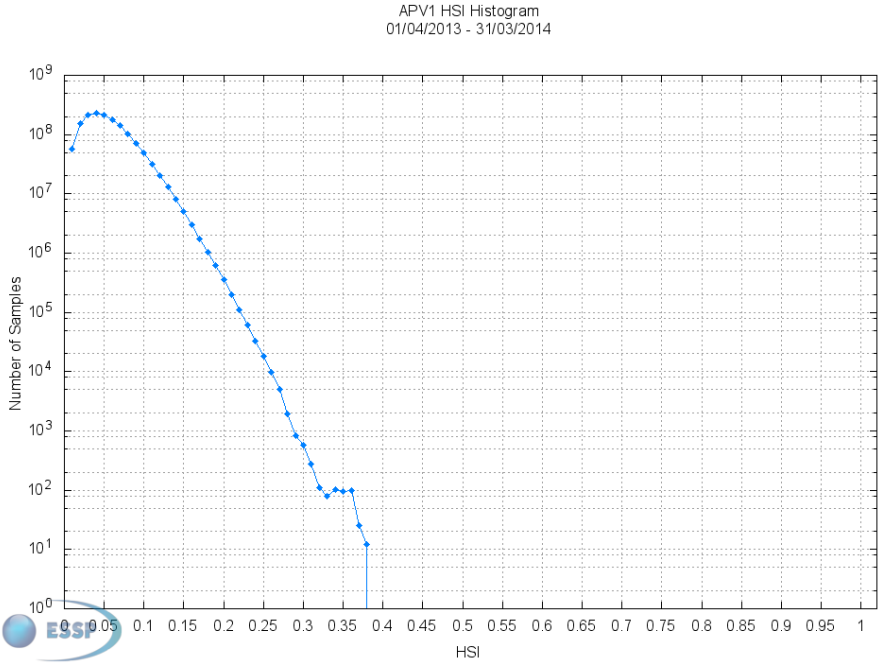


Figure 17 – EGNOS APV-I Horizontal Safety Index

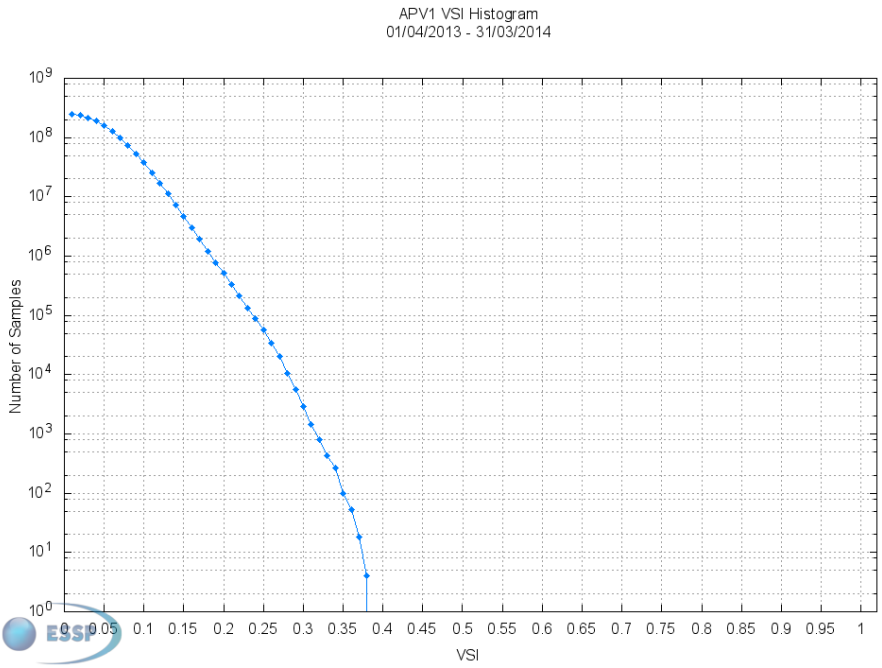


Figure 18 – EGNOS APV-I Vertical Safety Index

3.3.5 APV-I Continuity risk – Yearly performance

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 not available during the following 15 seconds.*

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

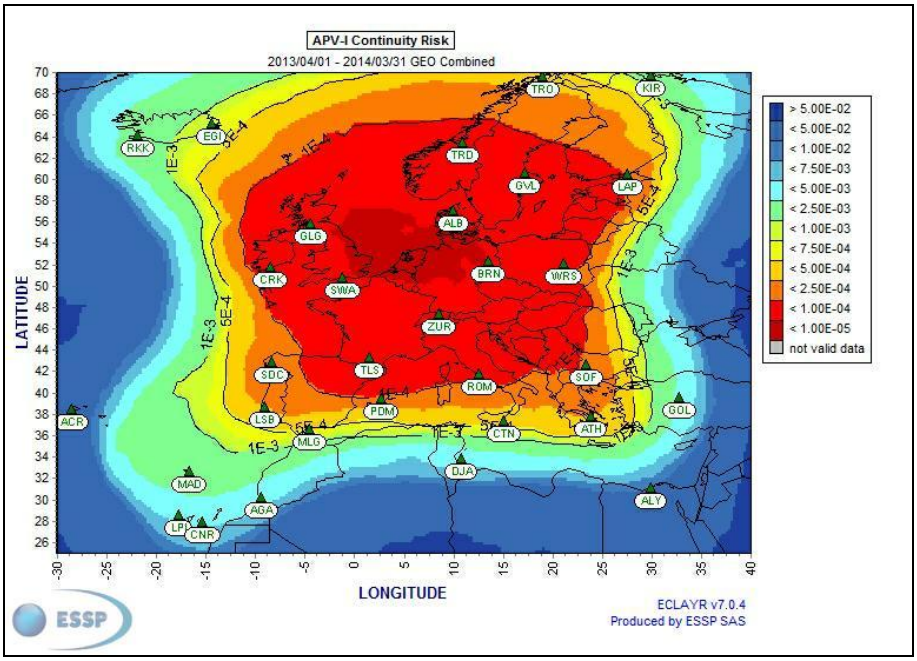


Figure 19: APV-I Continuity Risk from 01/04/13 to 31/03/14

3.3.6 APV-I Continuity – Achievement against target

The following figure shows the evolution of the APV-I continuity risk $5x10^{-4}$ compliance with respect to the reference area defined in the EGNOS SoL SDD (see http://www.essp-sas.eu/service_definition_documents). It must be taken into account that, since July 2013, the commitment areas to be used as reference are the ones published in SoL SDD v2.0; for previous dates, it is the ones in SoL SDD v1.0.

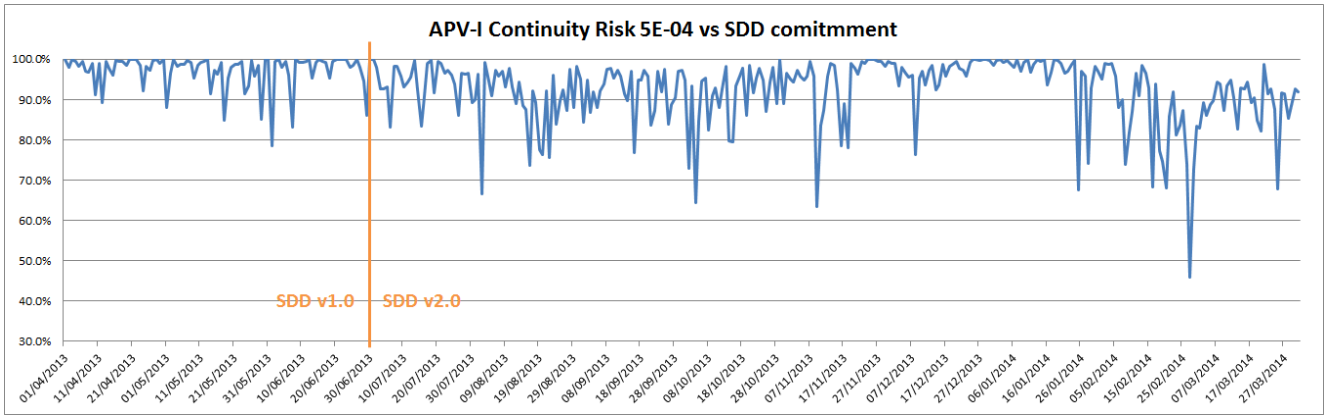


Figure 20: APV-I Continuity Risk 5E-04 compliance evolution

The combination of the $5x10^{-4}$ APV-I Continuity Risk map and the Reference area, splitting the year into two periods according to the applicable SDD version, gives the following:

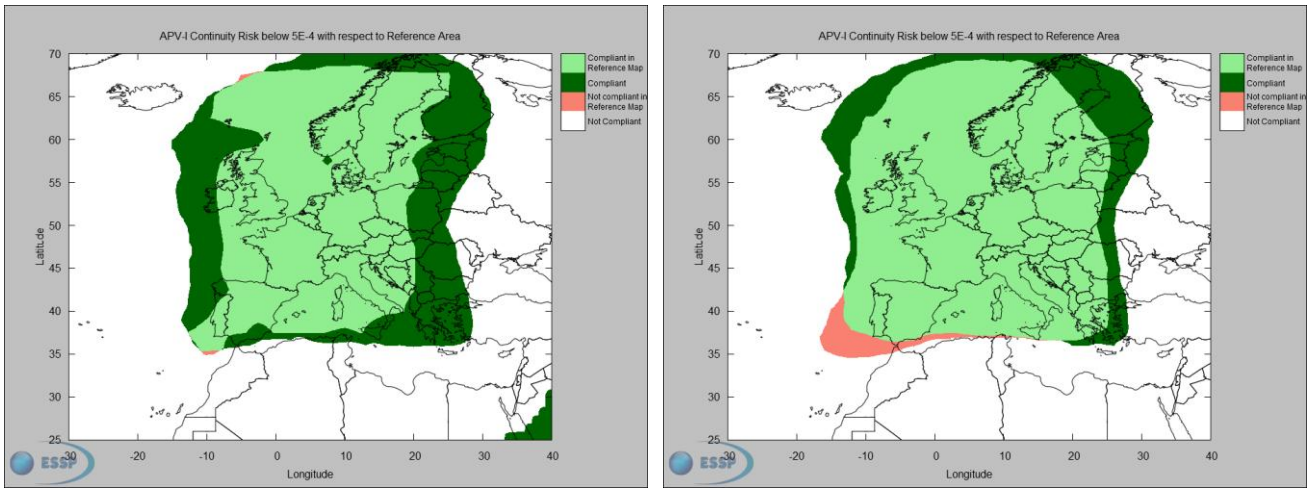


Figure 21: APV-I Continuity Risk map with respect to the reference map – 01/04/13 - 30/06/13 (SDD v1.0) (left) & 01/07/13 - 31/03/14 (SDD v2.0) (right)

If the whole period is referred to the current SDD (v2.0), the result is:

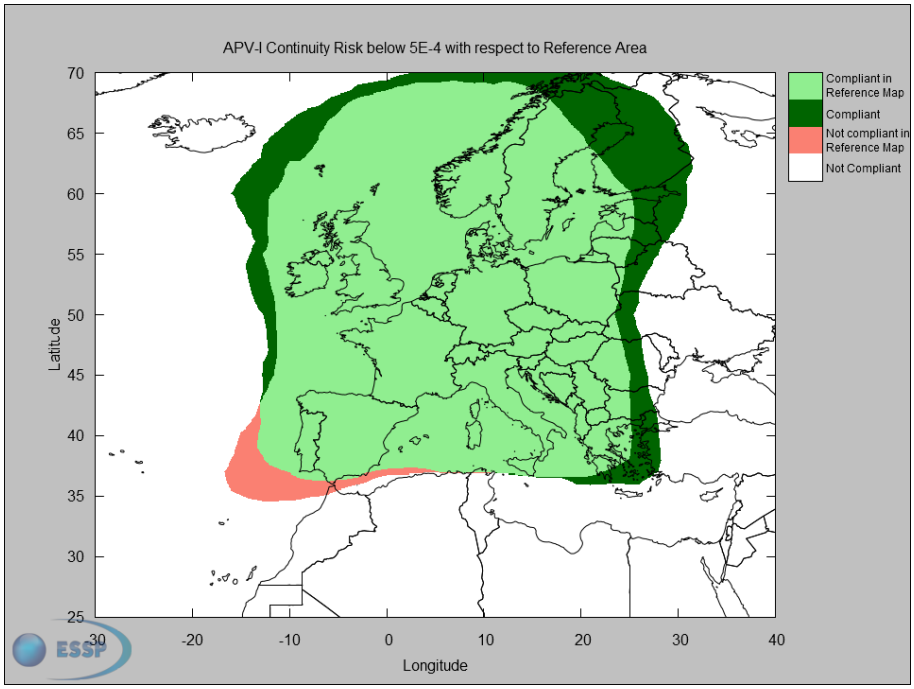


Figure 22: APV-I Continuity Risk (5E-04) map with respect to the reference map (SDD v2.0) - 01/04/13 to 31/03/14

Based on the SDD v2.0 map used as the reference, the percentage of points that were compliant with the reference area ($5x10^{-4}$/15sec) is **96.10%**.

For information, the differences with respect to the Reference Map for the area corresponding to a continuity risk of 10^{-3} and 10^{-4} are also included. For both levels, as with the $5x10^{-4}$ example, the results obtained are quite good (97.37% for a continuity risk of 10^{-3} and 90.05% for a continuity risk of 10^{-4}).

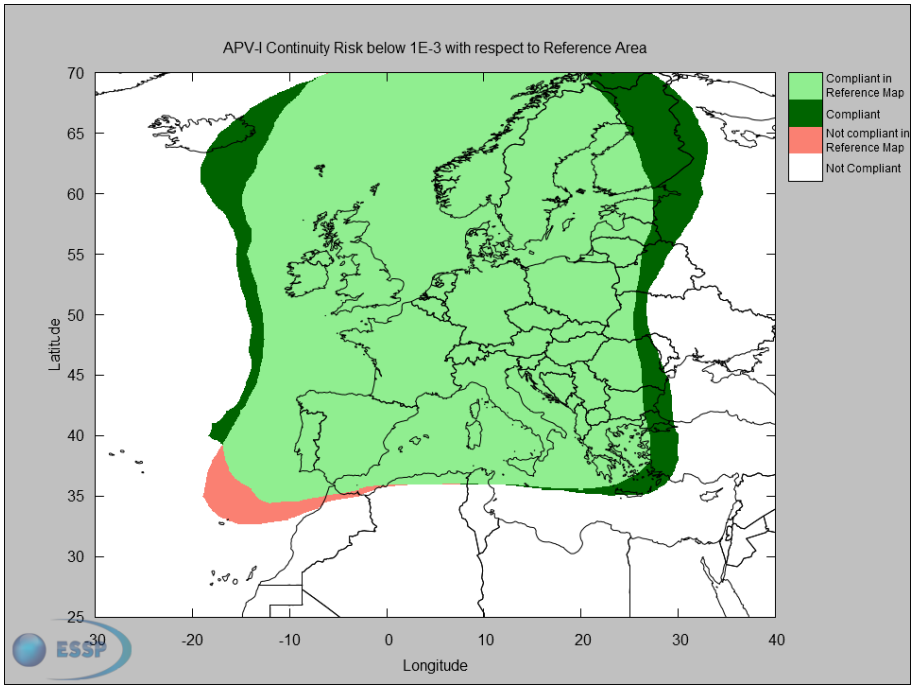


Figure 23: APV-I Continuity with respect to Reference Map (SDD v2.0) – 10^{-3} area - 01/04/13 to 31/03/14

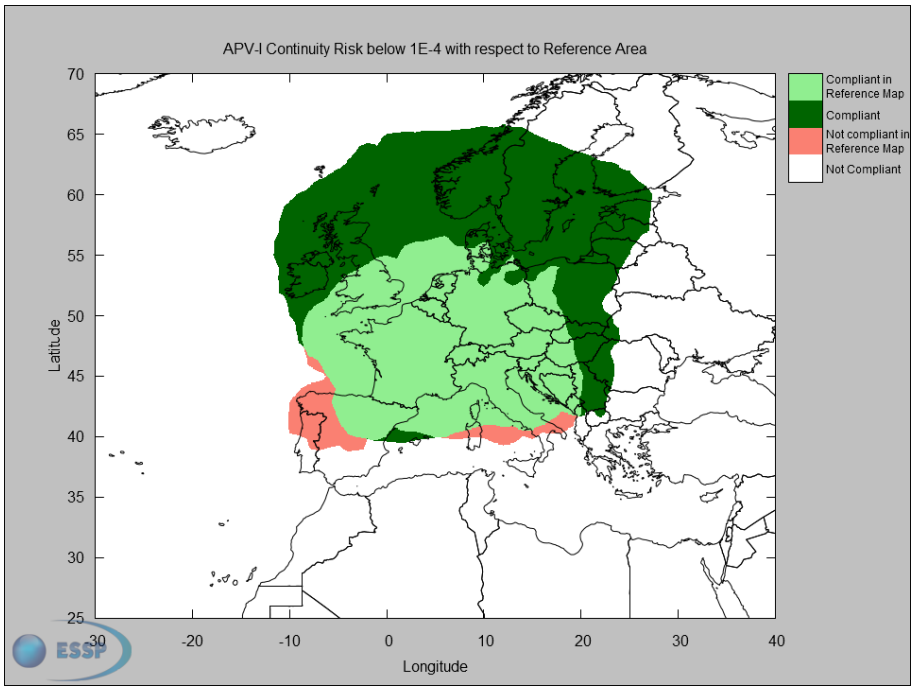


Figure 24: APV-I Continuity with respect to Reference Map (SDD v2.0) – 10^{-4} area - 01/04/13 to 31/03/14

3.4 Open Service (OS)

3.4.1 RIMS monitoring network

The map below shows the location of the deployed RIMS:

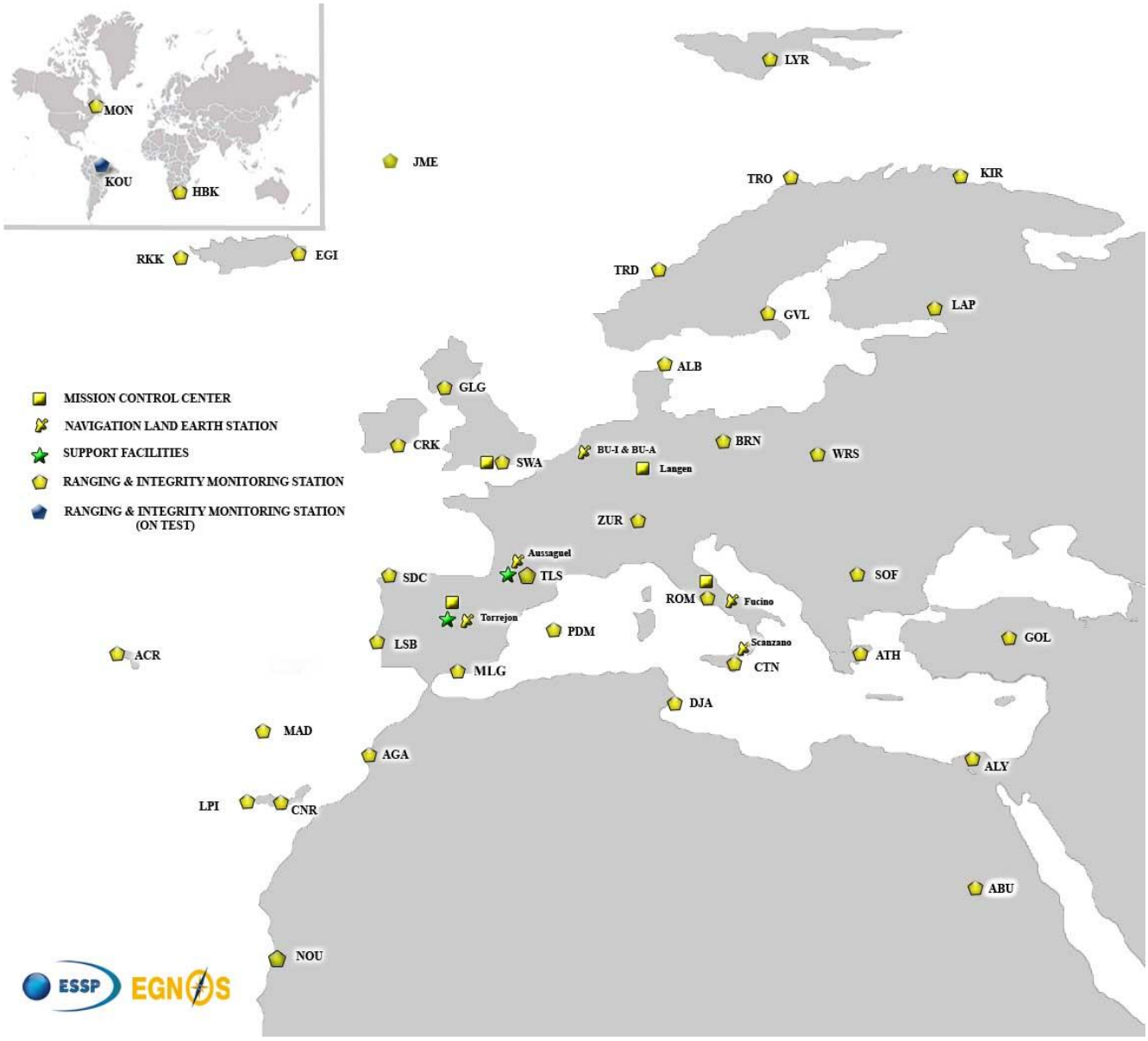


Figure 25: RIMS locations

The reference zone for the provision of the Open Service is detailed in OS SDD (see http://www.essp-sas.eu/service_definition_documents).

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

ID	Location name	Country	ID	Location name	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

Table 3: List of RIMS sites where performance is 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 table below provides the accuracy (95%) values in metres measured for the reporting period.

Station	HNSE 95% (metres)	VNSE 95% (metres)
Aalborg	0.7	1.4
Berlin	0.8	1.2
Catania	1.0	1.4
Cork	1.0	1.3
Warsaw	0.9	1.5
Djerba	1.6	2.0
Egilsstadir	1.1	2.0
Glasgow	0.9	1.4
Lisbon	1.4	1.9
Swanwick	1.2	1.6
Madeira	1.7	2.1
Málaga	1.3	1.4
Kirkenes	1.3	2.4
Palma de Mallorca	0.9	1.2
Reykjavik	1.3	2.3
Roma	0.9	1.2
Lappeenranta	0.9	1.8

Station	HNSE 95% (metres)	VNSE 95% (metres)
S. de Compostela	1.2	1.3
Sofia	1.3	2.3
Gävle	0.8	1.7
Toulouse	0.9	1.1
Trondheim	0.8	1.6
Tromsoe	1.3	2.4
Zürich	0.9	1.2
Jan Mayen	1.6	2.6
Athens	1.0	1.5

Table 4: EGNOS Open Service accuracy (95%)

The horizontal accuracy results for all stations remained below 1.7 metres (95%), and the vertical accuracy below 2.6 metres (95%), which represents a very good level of accuracy.

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

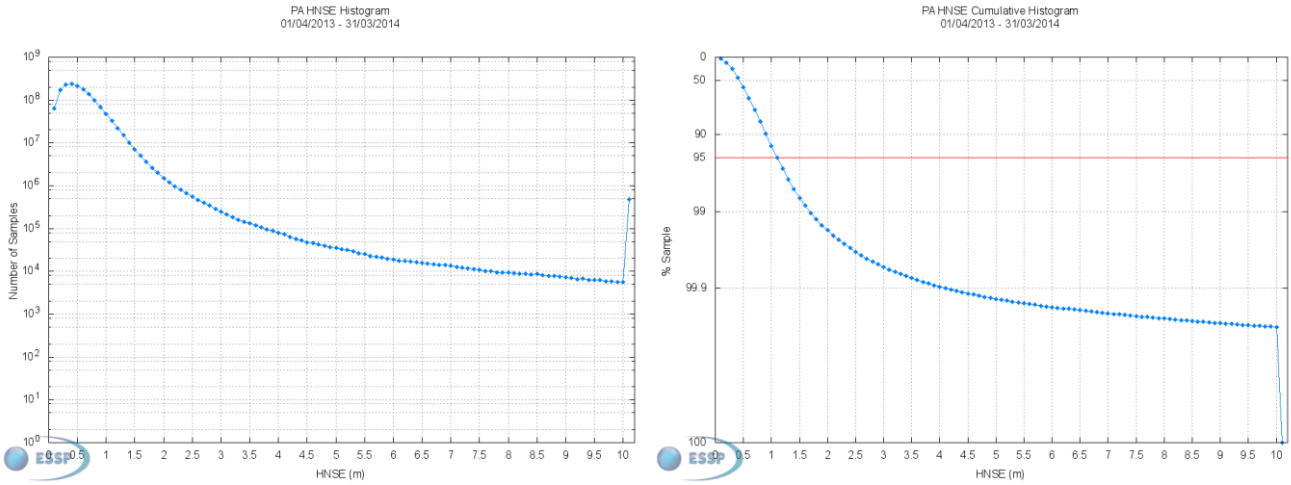


Figure 26: EGNOS Open Service HNSE Histogram and Cumulative Probability

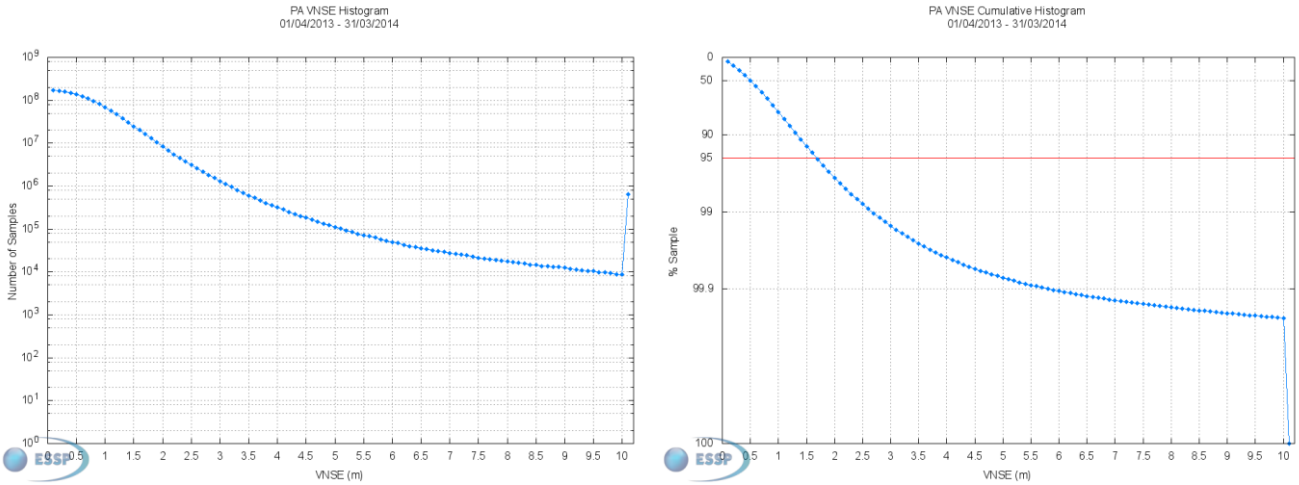


Figure 27: EGNOS Open Service VNSE Histogram and Cumulative Probability

As it can be observed, the cumulative results confirm the good values observed in the stations. The 95th percentile is below 1.1 metres in the horizontal domain and below 1.7 metres in the vertical domain.

Table 5 and Table 6 below provide the monthly maximum of the daily values for Horizontal and Vertical Accuracy while using an EGNOS message broadcast by PRN120 and PRN126 respectively.

PRN 120		04/13	05/13	06/13	07/13	08/13	09/13	10/13	11/13	12/13	01/14	02/14	03/14	Average
MLG	HPE	1.22	1.44	1.46	1.45	1.19	1.94	1.45	1.43	1.25	1.34	2.82	2.17	1.60
	VPE	1.36	1.49	1.76	1.32	1.25	1.55	1.81	1.93	2.05	1.63	3.01	2.08	1.77
SDC	HPE	1.11	1.44	1.35	1.36	1.16	1.24	1.33	1.34	1.33	1.42	1.61	1.69	1.37
	VPE	1.35	1.73	1.57	1.77	2.00	1.54	1.64	1.49	1.47	1.37	1.75	1.67	1.61
PDM	HPE	0.98	1.32	1.28	1.08	1.19	1.09	1.11		1.00	4.27	2.64	2.54	1.68
	VPE	1.70	1.63	1.39	1.23	1.36	1.41	1.48		1.30	6.90	3.88	3.26	2.32
LSB	HPE	1.40	1.56	1.39	1.67	1.32	1.42	1.54	1.65	1.55	1.69	2.57	1.93	1.64
	VPE	1.74	2.16	2.25	1.86	2.22	2.07	2.49	2.27	2.12	2.04	2.83	2.28	2.19
TRD	HPE	1.00	1.04	1.14	0.88	0.88	0.95	1.21	1.55	1.16	1.05	2.19	1.37	1.20
	VPE	2.06	2.00	2.04	1.87	1.90	1.97	2.39	2.94	2.15	2.24	2.76	2.58	2.24
CRK	HPE	1.26	1.19	1.39	1.03	1.04	1.00	1.11	1.36	1.14	1.17	1.57	1.63	1.24
	VPE	1.72	1.46	1.53	1.62	1.29	1.48	1.49	1.56	1.86	1.56	1.79	1.96	1.61
ZUR	HPE	1.05	1.01	1.09	1.06	1.02	0.88	1.46	1.03	1.10	1.04	1.14	1.15	1.09
	VPE	1.32	1.45	1.36	1.19	1.17	1.05	1.49	1.47	1.29	1.36	1.64	1.66	1.37
BRN	HPE	1.20	1.01	1.02	0.93	0.86	0.92	1.08	1.00	0.99	0.93	1.26	1.06	1.02
	VPE	1.74	1.56	1.51	1.34	1.24	1.29	1.48	1.59	1.81	1.50	1.82	1.72	1.55
TLS	HPE	0.93	1.30	1.11	0.98	0.99	0.93	1.30	1.14	0.95	1.01	1.39	1.29	1.11
	VPE	1.36	1.31	1.31	1.23	1.34	1.11	1.53	1.47	1.19	1.54	1.72	1.34	1.37
TRO	HPE	1.48	1.68	1.78	1.40	1.30	1.52	2.19	2.62	2.39	1.69	2.61	2.31	1.91
	VPE	3.23	2.85	3.08	2.72	2.72	2.62	3.43	4.18	3.93	2.91	3.94	4.32	3.33
SWA	HPE	1.57	1.41	1.41	1.40	1.18	1.12	1.24	1.36	1.29	1.32	1.47	1.59	1.36
	VPE	2.10	1.87	1.73	1.66	1.99	1.62	1.75	1.90	1.90	1.91	2.30	2.60	1.94
ROM	HPE	1.04	1.25	1.46	1.02	1.00	1.14	1.03	0.99	0.87	0.86	1.06	1.29	1.08
	VPE	1.35	1.54	1.51	1.24	1.35	1.33	1.76	1.45	1.41	1.45	1.64	1.54	1.46
ALB	HPE	0.93	0.89	0.88	0.77	0.75	0.79	1.03	1.23	0.89	0.88	1.78	1.19	1.00
	VPE	2.32	1.98	2.01	1.79	1.64	1.41	1.40	2.07	2.16	1.52	2.24	2.73	1.94
GLG	HPE	1.16	1.03	1.04	1.01	0.99	0.98	1.15	1.36	1.10	1.01	1.84	1.17	1.15
	VPE	2.09	1.93	1.51	1.93	1.82	1.51	1.57	1.98	2.06	1.57	1.85	2.45	1.86
GVL	HPE	0.81	1.08	1.01	0.83	0.82	0.79	1.49	2.04	1.51	0.91	1.89	1.67	1.24
	VPE	2.03	2.00	2.10	1.96	1.81	1.63	1.83	2.29	2.23	2.10	2.52	3.74	2.19
WRS	HPE	1.51	1.02	1.18	1.05	1.07	0.98	1.17	1.08	1.09	0.98	1.36	1.23	1.14
	VPE	1.94	1.98	1.91	1.62	1.85	1.36	1.84	1.87	2.05	1.70	1.83	2.19	1.85
CTN	HPE	1.11	1.31	1.34	1.09	1.13	1.55	1.56	1.48	1.01	0.94	1.17	1.49	1.27
	VPE	1.76	1.71	1.71	1.59	1.42	1.73	1.75	1.82	1.70	1.60	1.76	2.14	1.72
MAD	HPE	2.21	2.08	2.19	1.85	2.19	3.80	3.40	3.48	1.97	2.82	4.70	4.60	2.94
	VPE	2.94	2.27	4.63	2.14	2.43	3.65	3.01	3.49	3.00	3.62	6.17	4.16	3.46
ATH	HPE	1.04	1.31	1.29	1.12	1.13	1.15	1.14	1.08	1.06	1.00	1.20	1.41	1.16
	VPE	2.06	1.94	2.10	1.85	1.78	1.77	2.05	1.67	1.80	1.64	2.04	1.90	1.88
DJA	HPE	1.92	1.78	1.95	1.43				3.02	1.48	1.60	2.75	3.46	2.15
	VPE	2.25	2.42	2.27	1.87				2.50	1.74	1.73	2.23	2.78	2.20
SOF	HPE	1.44	1.46	1.58	1.89	1.52	1.45	1.57	1.56	1.33	1.61	1.35	1.64	1.53
	VPE	2.49	2.76	2.88	2.51	2.64	2.34	2.88	3.22	2.70	2.74	2.90	2.59	2.72
LAP	HPE	1.08	1.27	1.18	0.90	0.99	1.02	1.70	1.46	1.91	1.01	2.36	2.28	1.43
	VPE	2.09	2.18	2.40	2.38	1.78	1.81	1.98	2.57	2.35	2.29	2.70	3.52	2.34
KIR	HPE	1.78	2.58	1.86	1.31	1.43	1.45	3.40	2.63	3.38	1.98	3.85	2.59	2.35
	VPE	3.33	2.98	3.19	2.81	3.09	3.17	3.89	4.17	4.04	3.83	4.04	4.72	3.61
JME	HPE	1.76	2.54			1.69	1.56	2.36	2.33	2.29	1.54	2.80	3.01	1.82
	VPE	3.57	3.60			2.89	2.54	3.91	4.45	3.18	3.25	4.11	4.45	3.00
EGI	HPE	1.28	1.47	1.47	1.19	0.99	1.44	1.78	2.43	2.08	1.21	2.41	2.14	1.66
	VPE	2.66	2.83	2.70	2.57	2.41	2.25	3.43	3.53	2.72	2.79	4.75	3.45	3.01
RKK	HPE	1.68	1.93	2.18	2.07	1.62	1.52	2.06	2.71	2.03	1.62	2.99	2.29	2.06
	VPE	2.77	3.29	3.17	2.92	2.57	2.55	3.67	4.04	3.28	3.20	5.47	3.85	3.40
LPI	HPE	4.34	3.66	3.52	3.51	2.83	4.43	6.01	6.15	4.15	4.74	7.13	7.28	4.81
	VPE	5.16	3.42	4.98	4.06	3.01	4.48	5.25	5.94	4.64	4.29	6.85	7.31	4.95
CNR	HPE	4.73	3.71	3.29	2.39	3.45	4.54	5.97	7.26	4.40	4.24	8.86	8.15	5.08
	VPE	5.31	3.52	7.67	2.93	3.83	4.45	5.84	6.36	4.37	5.46	12.74	6.72	5.77

Table 5: Monthly Horizontal/Vertical Accuracy at RIMS-A sites for PRN120 (in metres).

PRN 126		04/13	05/13	06/13	07/13	08/13	09/13	10/13	11/13	12/13	01/14	02/14	03/14	Average
MLG	HPE	1.45	1.47	1.42	1.45	1.18	1.98	1.45	1.43	1.26	1.34	2.90	2.18	1.63
	VPE	1.44	1.45	1.65	1.29	1.25	1.50	1.79	1.92	2.00	1.56	2.98	2.12	1.75
SDC	HPE	1.15	1.42	1.27	1.36	1.14	1.22	1.32	1.33	1.29	1.41	1.61	1.70	1.35
	VPE	1.25	1.73	1.56	1.82	2.00	1.54	1.65	1.50	1.51	1.36	1.76	1.66	1.61
PDM	HPE	1.13	1.32	1.22	1.09	1.22	1.08	1.11		1.00	3.71	2.65	2.54	1.64
	VPE	1.94	1.58	1.33	1.25	1.34	1.39	1.45		1.32	6.18	3.71	3.57	2.28
LSB	HPE	1.50	1.56	1.39	1.66	1.34	1.40	1.53	1.64	1.52	1.68	2.54	1.95	1.64
	VPE	1.74	2.16	2.25	1.81	2.21	2.07	2.44	2.26	2.01	2.07	2.81	2.29	2.18
TRD	HPE	0.96	1.05	1.14	0.88	0.93	0.90	1.22	1.52	1.19	1.04	2.17	1.36	1.20
	VPE	2.02	2.03	2.06	1.82	1.79	1.95	2.43	2.95	2.08	2.24	2.72	2.60	2.22
CRK	HPE	1.30	1.19	1.36	1.02	1.01	1.00	1.11	1.36	1.13	1.17	1.59	1.63	1.24
	VPE	1.77	1.46	1.55	1.61	1.31	1.45	1.51	1.56	1.95	1.54	1.77	1.97	1.62
ZUR	HPE	1.03	1.00	1.09	1.07	1.04	0.88	1.46	1.03	1.10	1.04	1.13	1.15	1.09
	VPE	1.44	1.46	1.36	1.21	1.17	1.05	1.49	1.49	1.33	1.35	1.64	1.66	1.39
BRN	HPE	1.18	1.02	0.98	0.92	0.86	0.96	1.09	1.00	0.95	0.93	1.27	1.07	1.02
	VPE	1.70	1.56	1.51	1.33	1.28	1.29	1.47	1.61	1.80	1.49	1.82	1.73	1.55
TLS	HPE	0.92	1.31	1.07	1.04	1.01	0.94	1.29	1.14	0.94	1.00	1.40	1.29	1.11
	VPE	1.64	1.31	1.28	1.22	1.36	1.12	1.55	1.46	1.22	1.50	1.71	1.35	1.39
TRO	HPE	1.52	1.72	2.06	1.39	1.32	1.53	2.36	2.59	2.51	1.70	2.70	2.29	1.97
	VPE	3.29	2.90	3.15	2.76	2.74	2.66	3.49	4.04	3.91	2.90	3.85	4.34	3.34
SWA	HPE	1.64	1.40	1.44	1.39	1.21	1.13	1.25	1.36	1.28	1.32	1.47	1.59	1.37
	VPE	2.24	1.87	1.72	1.62	1.99	1.61	1.76	1.90	1.90	1.90	2.27	2.62	1.95
ROM	HPE	1.23	1.24	1.44	1.00	1.03	1.16	0.99	0.97	0.85	0.86	1.07	1.28	1.09
	VPE	1.34	1.56	1.36	1.24	1.35	1.33	1.78	1.45	1.47	1.44	1.65	1.54	1.46
ALB	HPE	0.89	0.89	0.82	0.76	0.74	0.79	1.03	1.23	0.89	0.88	1.77	1.18	0.99
	VPE	2.41	1.96	1.98	1.81	1.64	1.41	1.41	2.09	2.13	1.53	2.22	2.75	1.95
GLG	HPE	1.16	1.04	1.04	1.02	0.99	0.97	1.14	1.39	1.06	1.02	1.79	1.17	1.15
	VPE	2.20	1.95	1.49	1.92	1.84	1.49	1.56	2.01	2.07	1.57	2.03	2.46	1.88
GVL	HPE	0.82	1.08	1.05	0.85	0.88	0.78	1.47	2.02	1.43	0.92	1.78	1.70	1.23
	VPE	2.03	2.00	2.10	1.94	1.82	1.62	1.82	2.23	2.09	2.12	2.50	3.74	2.17
WRS	HPE	1.52	1.03	1.16	1.05	1.08	0.99	1.16	1.08	1.09	0.98	1.34	1.23	1.14
	VPE	1.95	2.00	1.93	1.64	1.76	1.36	1.85	1.87	2.05	1.72	1.83	2.19	1.85
CTN	HPE	1.28	1.31	1.33	1.09	1.19	1.53	1.55	1.48	1.00	0.98	1.21	1.48	1.29
	VPE	1.73	1.72	1.72	1.57	1.43	1.73	1.76	1.80	1.70	1.64	1.77	2.03	1.72
MAD	HPE	2.32	2.11	2.14	1.85	2.19	3.71	3.54	3.50	2.02	2.57	4.31	4.54	2.90
	VPE	3.95	2.28	4.80	2.16	2.54	3.72	2.70	3.36	2.93	3.47	6.08	4.38	3.53
ATH	HPE	1.09	1.31	1.24	1.16	1.13	1.17	1.12	1.08	1.12	0.99	1.19	1.39	1.17
	VPE	1.98	1.92	2.05	1.84	1.79	1.87	2.05	1.69	1.90	1.64	2.00	1.92	1.89
DJA	HPE	1.77	1.78	1.97	1.41				3.03	1.43	1.58	2.76	3.63	2.15
	VPE	2.19	2.38	2.20	1.80				2.35	1.70	1.73	2.26	2.82	2.16
SOF	HPE	1.53	1.46	1.59	1.84	1.52	1.46	1.54	1.57	1.31	1.62	1.34	1.64	1.54
	VPE	2.57	2.79	2.90	2.52	2.56	2.33	2.85	3.24	2.72	2.74	2.95	2.58	2.73
LAP	HPE	1.06	1.26	1.18	0.90	1.03	1.01	1.66	1.45	1.85	1.02	2.33	2.26	1.42
	VPE	2.19	2.21	2.38	2.40	1.79	1.80	1.91	2.57	2.37	2.28	2.72	3.42	2.34
KIR	HPE	1.91	2.59	1.92	1.29	1.46	1.44	3.70	2.72	3.17	1.98	3.99	2.59	2.40
	VPE	3.29	2.93	3.25	2.74	3.09	3.12	4.03	4.32	4.16	3.85	4.10	4.61	3.62
JME	HPE	1.88	2.46			1.72	1.63	2.61	2.45	2.23	1.50	2.76	2.82	1.84
	VPE	3.88	3.52			2.98	2.49	3.83	4.48	3.18	3.29	4.36	4.47	3.04
EGI	HPE	1.31	1.45	1.37	1.17	0.99	1.44	1.86	2.37	1.96	1.22	2.50	2.16	1.65
	VPE	2.70	2.83	2.62	2.57	2.42	2.28	3.39	3.59	2.85	2.81	4.70	3.44	3.02
RKK	HPE	1.71	2.07	2.19	1.90	1.51	1.54	2.07	2.58	1.98	1.60	3.29	2.27	2.06
	VPE	2.79	3.35	3.10	2.84	2.73	2.56	3.59	4.19	3.32	3.23	5.26	3.79	3.40
LPI	HPE	5.20	3.61	3.30	4.06	2.89	4.37	5.97	5.91	4.16	4.69	6.70	7.21	4.84
	VPE	5.93	3.48	4.90	3.96	3.00	4.61	4.85	5.74	4.61	4.13	6.22	7.43	4.91
CNR	HPE	5.71	3.67	2.77	2.40	3.32	4.00	6.14	7.15	4.29	4.21	8.50	7.77	4.99
	VPE	5.47	3.47	6.68	2.93	3.86	4.41	6.02	6.49	4.51	5.57	12.98	7.42	5.82

Table 6: 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 a valid PA navigation solution.*

Following tables provide the values measured using PRN120 and PRN126 respectively.

PRN 120	11/14	12/14	01/14	02/14	03/14	04/14	11/14	12/14	01/14	02/14	03/14	04/14	Average
MLGA	99.82%	99.93%	99.95%	99.94%	99.84%	99.91%	99.89%	99.97%	99.97%	99.98%	99.40%	99.03%	99.80%
SDCA	99.98%	99.83%	99.96%	99.82%	99.88%	99.99%	99.90%	99.97%	100.00%	99.99%	99.90%	99.90%	99.93%
PDMA	99.99%	99.91%	99.86%	99.97%	99.97%	99.92%	99.98%		100.00%	99.43%	98.51%	99.21%	99.70%
LSBA	99.50%	99.08%	99.48%	99.53%	99.40%	99.84%	99.63%	99.78%	99.94%	99.92%	99.16%	98.97%	99.52%
TRDA	99.99%	100.00%	99.99%	100.00%	100.00%	99.97%	99.94%	99.85%	99.97%	100.00%	99.68%	99.90%	99.94%
CRKA	99.99%	100.00%	99.99%	99.99%	100.00%	100.00%	99.98%	99.99%	99.99%	100.00%	99.99%	100.00%	99.99%
ZURA	100.00%	100.00%	100.00%	100.00%	99.99%	99.99%	100.00%	100.00%	100.00%	99.99%	99.99%	99.99%	100.00%
BRNA	100.00%	99.99%	100.00%	100.00%	99.98%	99.99%	99.98%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
TLSA	100.00%	100.00%	99.99%	100.00%	100.00%	99.99%	99.99%	100.00%	100.00%	99.99%	99.99%	100.00%	100.00%
TROA	99.84%	99.66%	99.56%	99.70%	99.52%	99.56%	95.96%	99.10%	99.37%	99.62%	98.11%	97.71%	98.98%
SWAA	99.97%	99.99%	100.00%	99.99%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	99.95%	99.99%
ROMA	99.96%	99.99%	99.94%	99.99%	99.94%	99.87%	99.96%	99.93%	99.99%	99.98%	99.99%	99.99%	99.96%
ALBA	100.00%	99.99%	99.99%	99.99%	100.00%	99.99%	99.98%	99.98%	99.99%	100.00%	99.96%	99.99%	99.99%
GLGA	99.98%	100.00%	100.00%	99.99%	99.99%	99.99%	99.97%	99.97%	99.98%	100.00%	99.92%	99.99%	99.98%
GVLA	99.99%	99.99%	100.00%	100.00%	99.98%	99.96%	99.92%	99.93%	99.92%	99.97%	99.86%	99.81%	99.94%
WRSA	99.99%	99.98%	99.99%	99.98%	99.99%	99.99%	99.96%	99.96%	100.00%	100.00%	100.00%	100.00%	99.99%
CTNA	99.90%	99.85%	99.92%	99.97%	99.88%	99.65%	99.83%	99.84%	99.95%	99.93%	99.86%	99.65%	99.85%
MADA	98.71%	99.35%	99.38%	99.55%	99.51%	99.00%	98.25%	98.81%	99.29%	98.99%	96.68%	96.06%	98.63%
KIRA	99.62%	99.53%	99.44%	99.59%	99.34%	99.41%	98.60%	98.51%	99.07%	99.07%	97.21%	97.00%	98.87%
LAPA	99.99%	99.93%	99.97%	99.98%	99.99%	99.93%	99.86%	99.93%	99.95%	99.99%	99.74%	99.80%	99.92%
ATHA	99.95%	99.94%	99.96%	99.97%	99.92%	99.85%	99.91%	99.93%	99.93%	99.96%	99.89%	99.94%	99.93%
DJAA	99.61%	99.48%	99.52%	99.92%				99.20%	99.80%	99.87%	99.38%	98.51%	99.48%
SOFA	99.84%	99.84%	99.86%	99.88%	99.89%	99.83%	99.84%	99.58%	99.74%	99.65%	99.86%	99.92%	99.81%
JMEA	99.40%	97.46%			99.55%	99.64%	98.58%	98.59%	99.67%	99.55%	97.29%	97.11%	98.68%
EGIA	99.87%	99.71%	99.71%	99.84%	99.91%	99.97%	99.55%	99.48%	99.78%	99.84%	98.41%	98.97%	99.59%
RKKA	99.33%	99.05%	98.70%	98.94%	99.08%	99.50%	98.92%	99.01%	99.44%	99.53%	97.67%	98.33%	98.96%
LPIA	95.19%	98.10%	98.32%	98.95%	98.71%	95.07%	90.11%	90.08%	95.38%	95.77%	89.12%	84.70%	94.13%
CNRA	93.37%	97.64%	98.27%	98.65%	97.81%	94.03%	87.78%	87.92%	93.35%	94.08%	85.70%	80.28%	92.41%

Table 7: OS Availability at RIMS-A sites for PRN120

PRN 126	11/14	12/14	01/14	02/14	03/14	04/14	11/14	12/14	01/14	02/14	03/14	04/14	Average
MLGA	99.82%	99.94%	99.97%	99.94%	99.87%	99.91%	99.90%	99.97%	99.98%	99.98%	99.43%	99.05%	99.81%
SDCA	99.97%	99.83%	99.96%	99.81%	99.91%	99.99%	99.91%	99.98%	100.00%	100.00%	99.89%	99.90%	99.93%
PDMA	99.97%	99.91%	99.87%	99.97%	99.96%	99.94%	99.98%		100.00%	99.45%	98.48%	99.21%	99.70%
LSBA	99.65%	99.04%	99.49%	99.51%	99.43%	99.82%	99.62%	99.78%	99.94%	99.94%	99.17%	98.97%	99.53%
TRDA	100.00%	100.00%	100.00%	100.00%	100.00%	99.97%	99.94%	99.86%	99.98%	99.99%	99.70%	99.90%	99.95%
CRKA	99.97%	100.00%	99.99%	99.99%	99.99%	100.00%	99.98%	99.99%	99.98%	100.00%	99.99%	100.00%	99.99%
ZURA	100.00%	100.00%	100.00%	100.00%	100.00%	99.99%	100.00%	99.99%	100.00%	100.00%	100.00%	99.99%	100.00%
BRNA	100.00%	100.00%	100.00%	100.00%	99.99%	100.00%	99.99%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
TLSA	100.00%	100.00%	99.99%	100.00%	100.00%	100.00%	99.99%	100.00%	100.00%	100.00%	99.98%	100.00%	100.00%
TROA	99.84%	99.68%	99.53%	99.72%	99.52%	99.55%	95.95%	99.15%	99.42%	99.61%	98.16%	97.71%	98.99%
SWAA	99.95%	99.99%	99.99%	100.00%	100.00%	100.00%	100.00%	100.00%	99.99%	100.00%	100.00%	99.95%	99.99%
ROMA	99.98%	99.99%	99.94%	99.99%	99.95%	99.87%	99.96%	99.94%	99.98%	99.98%	100.00%	99.99%	99.96%
ALBA	100.00%	100.00%	100.00%	99.99%	100.00%	99.99%	99.99%	99.99%	99.99%	100.00%	99.96%	99.99%	99.99%
GLGA	99.96%	100.00%	100.00%	99.99%	99.99%	100.00%	99.98%	99.96%	99.98%	100.00%	99.92%	99.99%	99.98%
GVLA	100.00%	100.00%	100.00%	100.00%	99.99%	99.96%	99.93%	99.93%	99.94%	99.97%	99.87%	99.81%	99.95%
WRSA	99.99%	99.98%	100.00%	99.99%	99.99%	99.99%	99.95%	99.96%	100.00%	100.00%	100.00%	99.99%	99.99%
CTNA	99.90%	99.86%	99.90%	99.98%	99.89%	99.68%	99.83%	99.84%	99.96%	99.93%	99.86%	99.63%	99.86%
MADA	99.16%	99.30%	99.37%	99.52%	99.50%	99.00%	98.28%	98.76%	99.31%	98.98%	96.91%	95.88%	98.66%
KIRA	99.68%	99.52%	99.41%	99.64%	99.33%	99.39%	98.50%	98.46%	99.13%	99.04%	97.11%	96.97%	98.85%
LAPA	99.99%	99.95%	99.98%	99.98%	99.99%	99.94%	99.86%	99.94%	99.95%	99.99%	99.74%	99.82%	99.93%
ATHA	99.95%	99.93%	99.96%	99.96%	99.91%	99.85%	99.92%	99.93%	99.95%	99.97%	99.92%	99.93%	99.93%
DJAA	99.65%	99.51%	99.52%	99.90%				99.26%	99.81%	99.88%	99.36%	98.60%	99.50%
SOFA	99.86%	99.82%	99.86%	99.89%	99.89%	99.85%	99.86%	99.62%	99.72%	99.66%	99.85%	99.91%	99.82%
JMEA	99.22%	97.47%			99.54%	99.61%	98.48%	98.57%	99.69%	99.52%	97.24%	97.11%	98.65%
EGIA	99.86%	99.71%	99.75%	99.84%	99.90%	99.98%	99.54%	99.49%	99.83%	99.85%	98.35%	99.00%	99.59%
RKKA	99.38%	98.95%	98.75%	98.94%	99.11%	99.49%	98.90%	98.93%	99.45%	99.53%	97.70%	98.32%	98.95%
LPIA	95.56%	98.09%	98.38%	98.92%	98.67%	95.32%	89.88%	90.08%	95.38%	95.76%	89.19%	84.70%	94.16%
CNRA	93.53%	97.64%	98.34%	98.68%	97.81%	94.41%	87.57%	87.72%	93.38%	94.05%	85.90%	80.38%	92.45%

Table 8: OS Availability at RIMS-A sites for PRN126

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

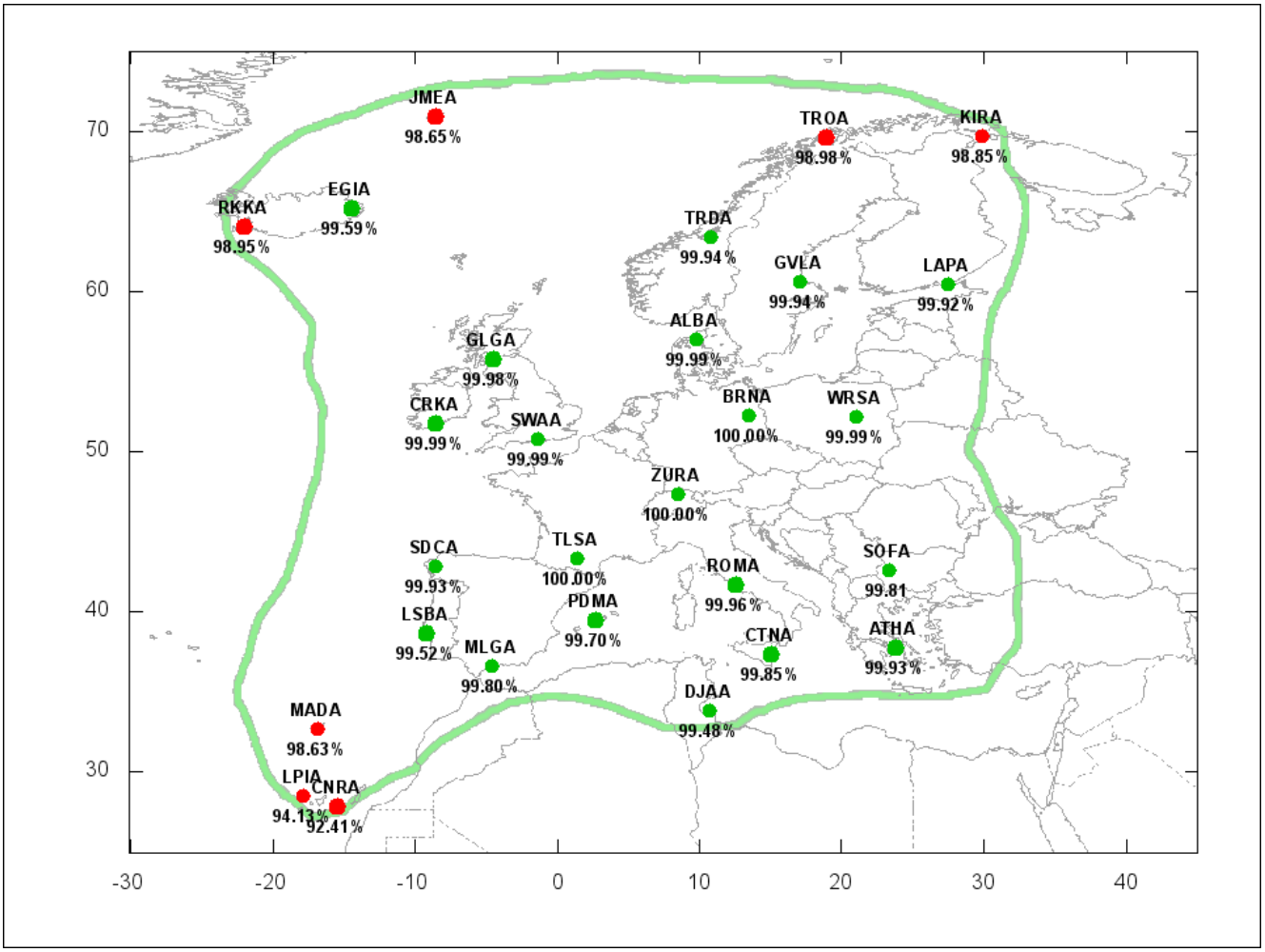
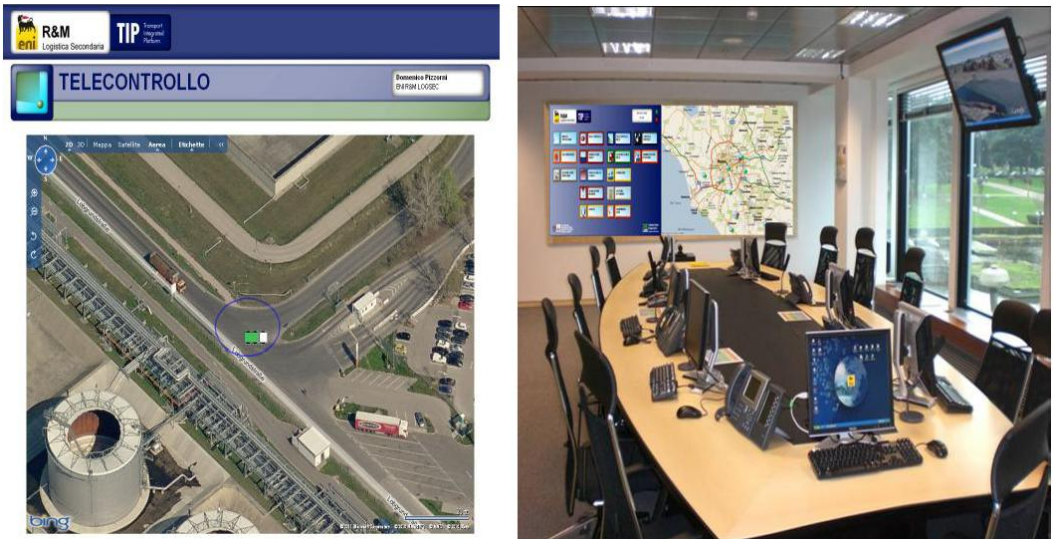


Figure 28: OS average availability for the RIMS stations

3.5 EGNOS Data Access Service (EDAS)



EDAS for tracking of dangerous goods (courtesy: Telespazio)

3.5.1 EDAS Performance

The EDAS (EGNOS Data Access Service) is the ground-based access (via the Internet) to EGNOS data in real-time, and in a historical archive that collects all the data generated by the EGNOS infrastructure, making use of EGNOS ground stations mainly distributed across Europe and North Africa.

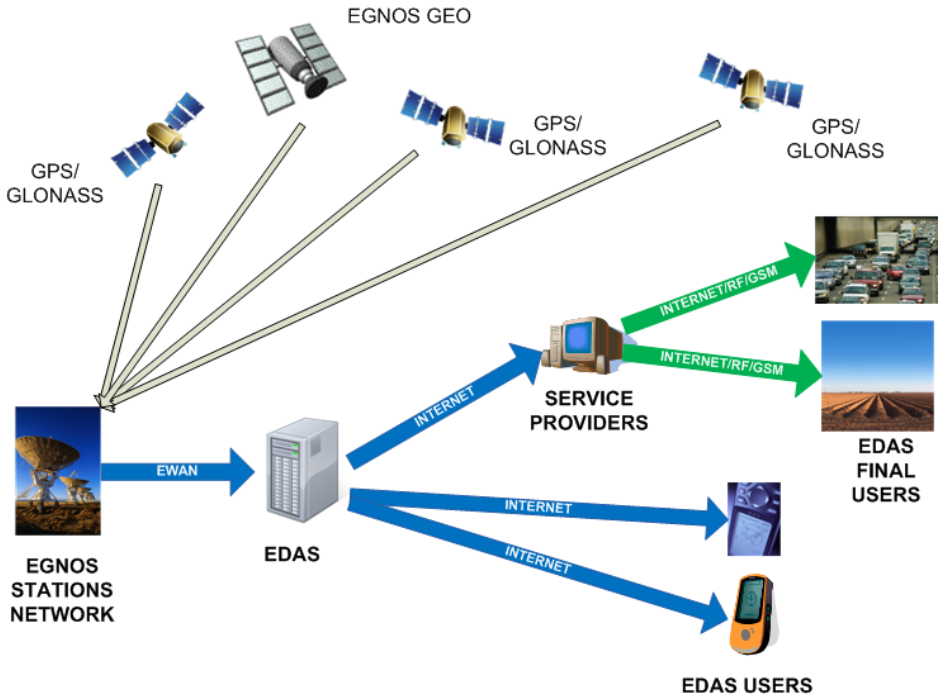


Figure 29: EDAS high-level architecture

EDAS, like all the other EGNOS Services, has its own EDAS SDD (see http://www.essp-sas.eu/service_definition_documents). Among other content, the EDAS SDD defines the committed

performance levels for EDAS (levels 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 leaves 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 EDAS services' minimum availability and maximum latency:

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

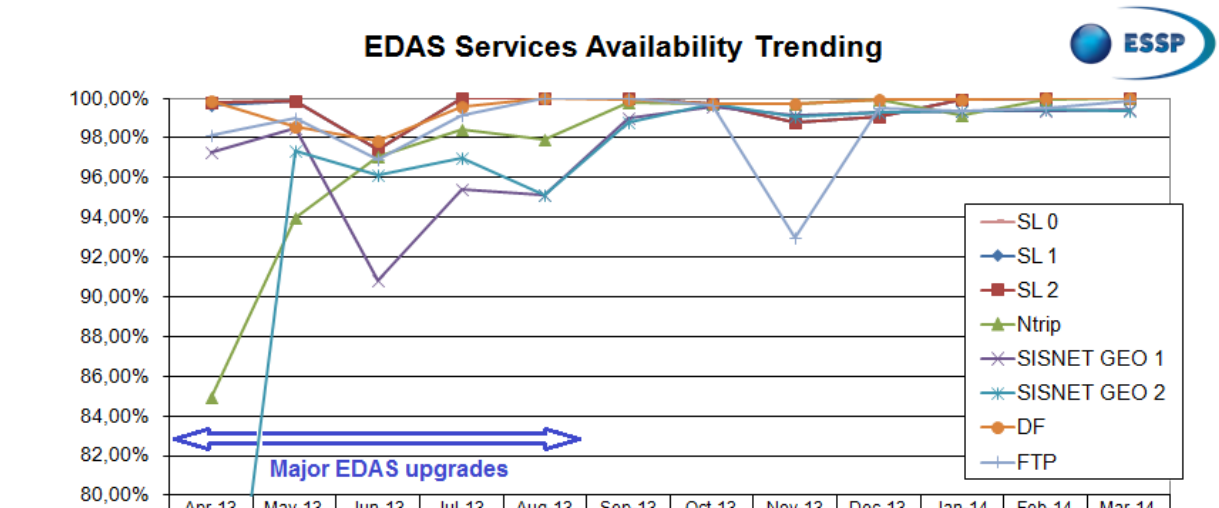
Table 9: EDAS services minimum availability

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 10: EDAS services maximum latency for EDAS Services

EDAS performance is reported through the EGNOS Monthly Performance reports, available on the ESSP website (http://www.essp-sas.eu/monthly_performance_reports).

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



	Apr-13	May-13	Jun-13	Jul-13	Aug-13	Sep-13	Oct-13	Nov-13	Dec-13	Jan-14	Feb-14	Mar-14
SL 0	99,78%	99,87%	97,39%	100,00%	99,99%	99,99%	99,72%	98,79%	99,04%	99,95%	99,99%	100,00%
SL 1	99,65%	99,87%	97,41%	100,00%	99,99%	99,99%	99,70%	98,82%	99,08%	99,95%	99,99%	100,00%
SL 2	99,79%	99,87%	97,42%	100,00%	99,99%	99,99%	99,72%	98,80%	99,10%	99,95%	99,99%	100,00%
Ntrip	84,91%	94,00%	97,08%	98,46%	97,95%	99,81%	99,71%	99,73%	99,94%	99,13%	99,96%	99,99%
SISNET GEO 1	97,25%	98,49%	90,84%	95,44%	95,14%	99,02%	99,59%	99,16%	99,30%	99,36%	99,38%	99,45%
SISNET GEO 2	63,99%	97,36%	96,12%	96,96%	95,12%	98,78%	99,71%	99,10%	99,30%	99,33%	99,41%	99,38%
DF	99,85%	98,59%	97,86%	99,56%	99,98%	99,93%	99,72%	99,71%	99,97%	99,93%	99,97%	99,97%
FTP	98,11%	98,99%	96,94%	99,13%	100,00%	100,00%	99,65%	92,97%	99,54%	99,35%	99,49%	99,85%

Table 11: EDAS Services Availability (April 2013-March 2014)

As seen above, after a few months when performance was not in line with the target, EDAS availability has been excellent since the end of summer 2013 (the only exception being the low FTP service availability in November 2013 due to some isolated delays which impacted the data processing function). The instability period from April to August 2013 was mainly due to the major EDAS upgrade that took place in order to extend the EDAS service portfolio (by declaring the availability of Ntrip, SISNeT, Data Filtering and FTP services).

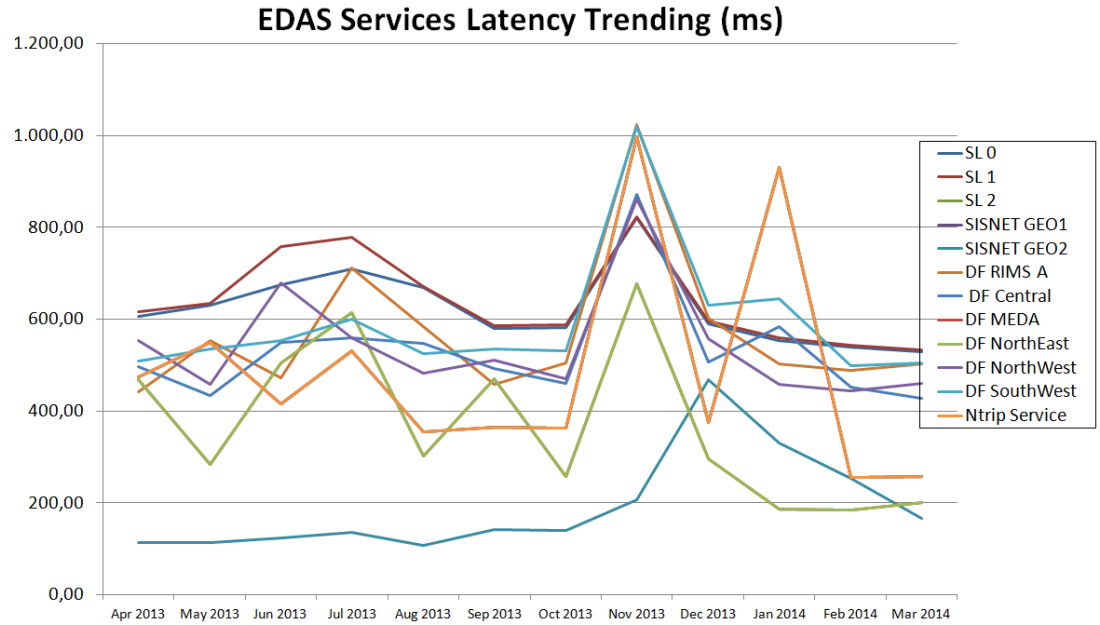


Figure 30: EDAS Services Latency (April 2013-March 2014)

As can be seen above, EDAS services latency has been consistently below the target delays (see Table 10) for all the services throughout the entire reporting period.

4 EGNOS SERVICES PROVISION

4.1 SoL Aviation Service Status

4.1.1 ESSP participation/support to key aviation supporting cells

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

Event	Dates
Joint ICAO PBN TF – RAISG Meeting #1	11-13/09/2013
Joint ICAO PBN TF – RAISG Meeting #2	12-14/03/2014
EUROCONTROL NSG Meeting #18	24-26/09/2013
EUROCONTROL NSG Meeting #19	01-03/04/2014
EGNOS Service Provision Workshop 2013	03-04/07/2013
French APV Working Group	26/09/2013, 03/04/2014
Ukraine ATM IOP Workshop	25-26/11/2013
SHERPA Service Provision Workshop (Prague)	02/07/2013
SHERPA Final User Forum (Dubrovnik)	16-17/10/2013
ACCEPTA Portugal (Lisbon) National Workshop	02/04/2013
MEDUSA LPV Implementation Workshop (Madrid)	10/10/2013
Specific meetings/teleconferences held with: LFV (Sweden), EANS (Estonia), NAV (Portugal), Avinor (Norway), Naviair (Denmark), Crocontrol (Croatia), Romatsa (Romania) and LPS (Slovakia)	2013-2014

Table 12: Key aviation supporting cells with ESSP participation

4.1.2 EGNOS Working Agreement (EWA) Status

4.1.2.1 *EWA dissemination & awareness activities*

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

An important indicator of EWA approach consolidation is its inclusion in the guidance material for the implementation of RNP APCH Operations (issued by Eurocontrol in support to ICAO) published by ICAO as **EUR Doc 025 - EUR RNP APCH Guidance Material, First Edition, December 2012** and in the European GNSS NOTAM Concept (issued by Eurocontrol).

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.

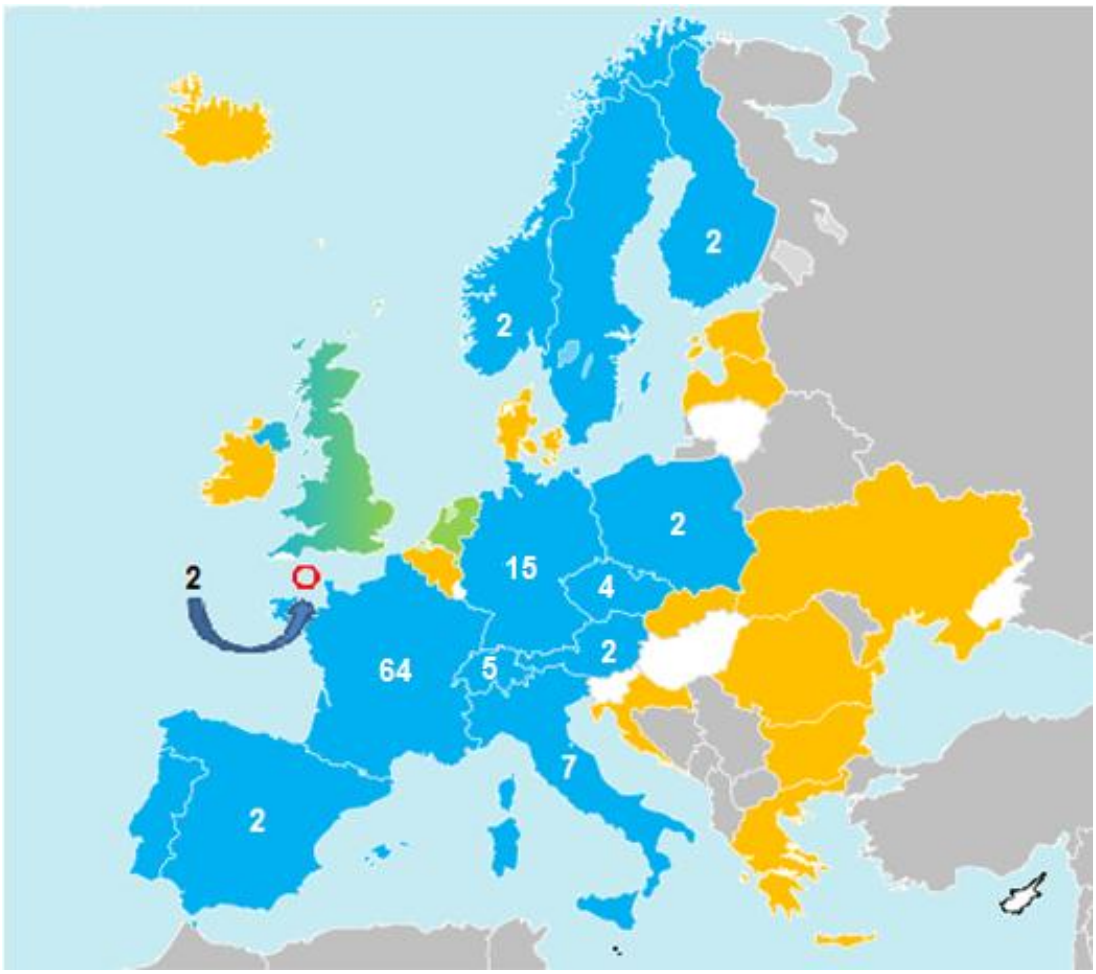
4.1.2.2 *EWA negotiations and signature status*

During the reporting period, 9 new EWAs were signed, of a total of 19 EWAs in place:

EGNOS Working Agreement (EWA)	Signature date
ANS CR (Czech Rep)	12/06/2013
HIAL (UK)	11/09/2013
NAV (Portugal)	09/10/2013
Finavia (Finland)	19/11/2013
Avinor (Norway)	04/12/2013
LFV (Sweden)	12/12/2013
London Southend Airport (UK)	09/01/2014
Marshall Aerospace (Cambridge airport – UK)	04/03/2014
Kent Airport (Manston Airport – UK)	06/03/2014

Table 13: EWAs signed during April 2013 – March 2014 period

The following figure provides the status of the EWA negotiations with European ANSPs (EU and non-EU). The colour code below 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
	No feedback

Figure 31: EGNOS Working Agreement status

4.1.3 EGNOS Procedures Implementation

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 signed up (following the signature of an EGNOS Working Agreement between ESSP and the corresponding ANSP) and operational airports. By end of March 2014 (AIRAC cycle 1402 – 6th March), nineteen ANSPs had signed up to the EGNOS NOTAM Proposals Provision (see Figure 31).

The full list of airports with at least one EGNOS-based approach procedure, including the type and number of procedures available per airport, can be found on ESSP's website (www.essp-sas.eu). This list is regularly updated by the ESSP. A summary of the airports signed up and procedures published in each country is detailed in the following figure:

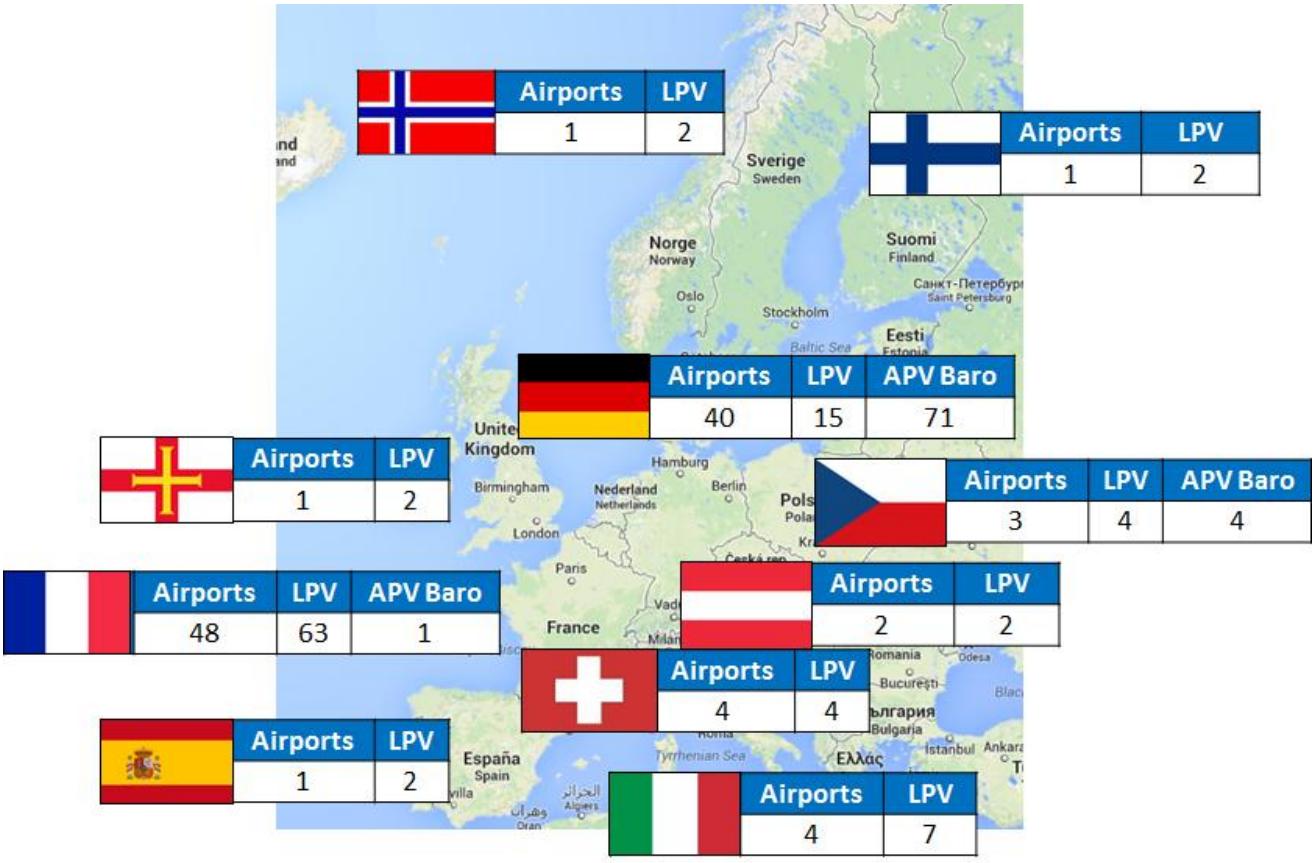


Figure 32: Airports signed up and procedures published in each country.

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

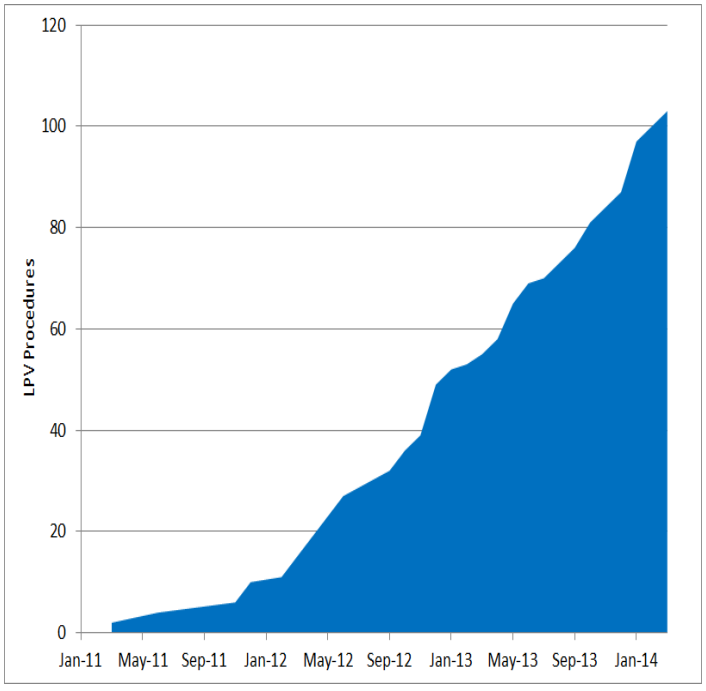


Figure 33: EGNOS-based procedures – publication status

To sum up, at the time of writing (April 3rd 2014), ESSP was providing EGNOS NOTAM proposals to 10 countries and 77 airports, for a total of 107 EGNOS-based approach procedures.

Introducing an airport to the EGNOS NOTAM Proposals Provision (following publication of the corresponding EGNOS-based approach procedure at the airport) is quite straightforward and is done upon request from the interested ANSP. The ANSP requests activation of a certain airport to ESSP 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

NOTAM stands for NOTice to AirMen. NOTAMs contain any important information that could affect the safe flight of an aircraft or information that is required by the pilot to conduct safe operations. NOTAMs cover a wide variety of aspects, including navaids availability but also runways and even meteorological conditions. A NOTAM must be initiated and issued promptly whenever the information to be distributed is of a temporary nature and of short duration, or when operationally significant permanent changes or temporary changes of long duration are made at short notice, except for extensive text and/or graphics.

Before a flight, pilots request a printout of any NOTAMs that are relevant to the route, destinations and alternatives for the flight. A NOTAM service is essential in order to approve a flight procedure.

The need for a NOTAM service when implementing SBAS-based approach procedures is stated by the ICAO SARPs:

"Before publishing procedures based on SBAS signals, a State is expected to provide a status monitoring and NOTAM system. To determine the effect of a system element failure on service, a mathematical service volume model is to be used. […]. The system element status data (current and forecast) required for the model could be obtained via a bilateral arrangement with the SBAS service provider, or via connection to a real time "broadcast" of the data if the SBAS service provider chooses to provide data this way."

The ICAO SARPs also lay down the applicable recommendations for this kind of service, in terms of notification timeliness:

"For scheduled events, notification should be given to the NOTAM authority at least 72 hours prior to the event. For unscheduled events, notification to the NOTAM authority should be given within 15 minutes. Notification should be given for events of 15 minutes, or longer, duration."

As stated above, the State publishing SBAS-based approach procedures is ultimately responsible for the provision of a NOTAM service. Hence, the ICAO recommendations are not directly applicable to ESSP (which acts as data originator in the EGNOS NOTAM generation chain), but to the ANSPs having published EGNOS-based approach procedures and to which ESSP is providing EGNOS NOTAM proposals, in line with the EGNOS Working Agreement. Nevertheless, ESSP, with the full support of the European GNSS Agency (GSA), is committed to improving the current EGNOS NOTAM Proposals Provision in order to better support EGNOS-based approach procedures implementation and the aviation user community in Europe.

In order to do this, ESSP is actively working to improve the current service with the following high-level objectives:

- Bring the EGNOS NOTAM Proposals Provision to a fully ICAO-compliant level.
- Minimise the number of false and missed NOTAMs.
- Maximise users' satisfaction.

A stepwise approach was outlined to allow the EGNOS NOTAM Proposals Provision to enable compliance with the applicable ICAO recommendation regarding notification of unscheduled events (15 minutes delay) in the medium term. In terms of evolution strategy, an incremental approach has been proposed, defining intermediate objectives and service levels as shown in Figure 1.

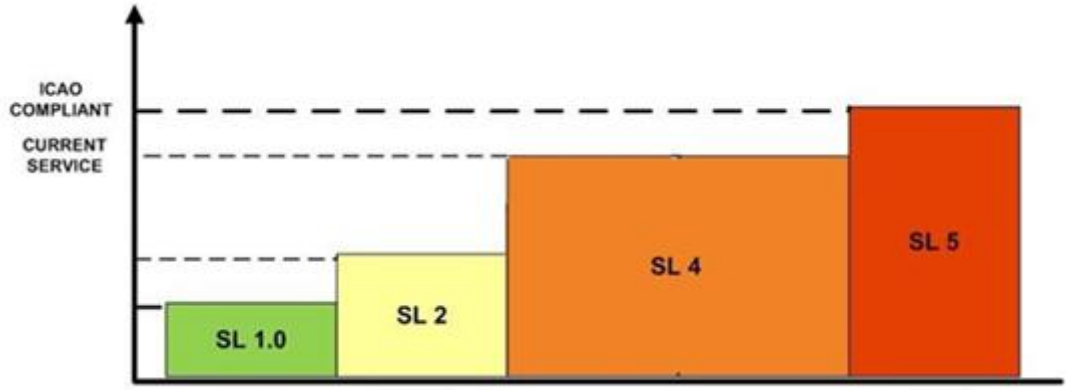


Figure 34: NOTAM Proposals Service Evolution Roadmap

As detailed in the following table, the main difference between the service levels defined is the reaction time for unscheduled activities, from 16 hours for SL1 to 10 minutes for SL5.

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

Table 14: NOTAM Proposals Service Levels – Reaction Times

As mentioned previously, the EGNOS NOTAM Proposals Provision has been operational since 2nd March 2011. Initially, the NOTAM Proposals provision was provided as per the SL1.0 operations concept, where NOTAM proposals resulting from GNSS (GPS and GEO) planned outages were delivered a minimum of 72 hours in advance, whereas unplanned outages were notified within a maximum of 16 hours, every day of the week (7/7).

As a result of the entry into service of Service Level 2 on 26th June 2013, the reaction time for unscheduled events was reduced to 2 hours during working days and working hours (5D/business hours).

Since January 2014, the NOTAM Proposals service has been provided as per Service Level 4, extending to H24 the reduction in reaction time (to 2 hours).

With regards to the EGNOS NOTAM Proposals Provision operation, the impact of EGNOS and GPS system planned maintenance activities on user performance is predicted every week (covering a week-long period). These weekly predictions that account for the impact of the planned GNSS assets status are updated daily, based on the real-time monitoring of the GNSS (EGNOS and GPS) system assets. Changes in the status of these assets are detected and assessed in near-real time (a delay of just a few minutes). If an impact is identified (EGNOS APV-I service is expected not to be available at a certain time and location), EGNOS NOTAM proposals are generated and distributed

Hence it is clear that the current EGNOS NOTAM Proposals Provision, although compliant with the ICAO recommendation for scheduled events, is not compliant with the recommendation for unscheduled events. Despite this situation, it is important to highlight that reaction time from unscheduled events has been reduced (since the beginning of the service) by a factor of 8 (from 16 hours to 2 hours).

The progressive implementation of the NOTAM Service Roadmap has of course not only improved the delay in notifying unscheduled events, but has also contributed to achieving the other objectives (minimising the number of false and missed NOTAMs and maximising user satisfaction) driving this improvement plan.

In order to identify the improvement brought by the new infrastructure, historic data achieved with the former Service Level 1 operations baseline (based on 3 daily checks on GNSS inputs) have been taken as reference. Figure 35 shows the comparison, in terms of GNSS events lasting longer than 15 minutes (status changes) considered, and the associated predictions between the different Service Levels (SL1, SL2 and SL4), based on the use of the real-time GNSS status information.

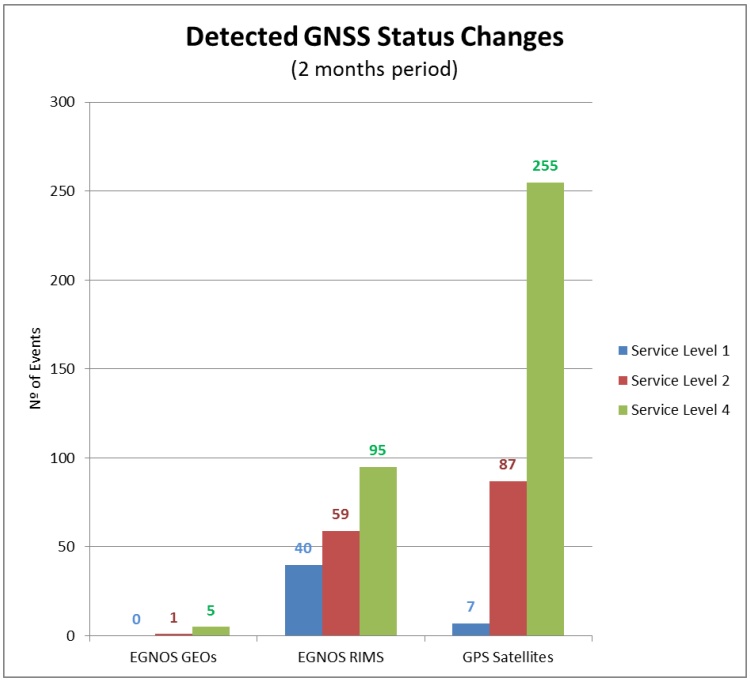


Figure 35: Detected GNSS Status Changes

Hence, it can be seen that connection to the real-time GNSS status has already boosted the detection capabilities of the EGNOS NOTAM Proposals Service.

```
(Q) LFBB/QGAAU/I/NBO/A/000/999/4322N00025W005
A) LFBP
B) 1105050202
C) 1105050359
E) 0002/11 NOTAMPN
EGNOS IS NOT AVAILABLE FOR LPV)
```

EGNOS NOTAM Proposal sent for Pau Pyrénées airport on May 2011.

4.1.5 Service Notices & Contingencies over the period

1. Service Notices: Generated whenever there is any complementary information to be provided to users that could affect any SDD content. During the period reported here, ESSP published/updated 5 new Service Notices (from #6 to #10) – highlighted inside the green box in the figure below – which are available at ESSP website (http://www.essp-sas.eu/service_notices).

Service Notices

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

Figure 36: Service Notices section of the ESSP website

Next steps: There is a new SN under definition SN#10 relating to "EGNOS GEO PRN 124 Decommissioning and Space Segment Update", planned to be published in June 2014.

2. Service Contingencies Managed over the period:
   - EGNOS performances degradation (N and NE of Service Area) as in SN#6: All notifications sent as established in ESSP-MAN-5033_03-01
   - Tests on 02/09/2013 on EGNOS Inmarsat 3F2 (PRN120) – EGNOS in mono GEO configuration (SDCM tests): All EWA signatories with LPV procedures in place were informed through dedicated communications on the 27/08/2013
   - EGNOS performances degradation (N and SW of Service Area) as in SN#10: All notifications sent as established in ESSP-MAN-5033_03-01

4.2 Open Service Status

The European Commission officially declared the EGNOS Open Service (OS) available to European citizens on 1st October 2009, officially enabling EGNOS-capable devices available across Europe to benefit from this service.

The conditions of access to the service and the minimum performance achievable by OS-enabled equipment are described in the Open Service SDD v2.0 published on 27th March 2013 (http://www.essp-sas.eu/service_definition_documents).

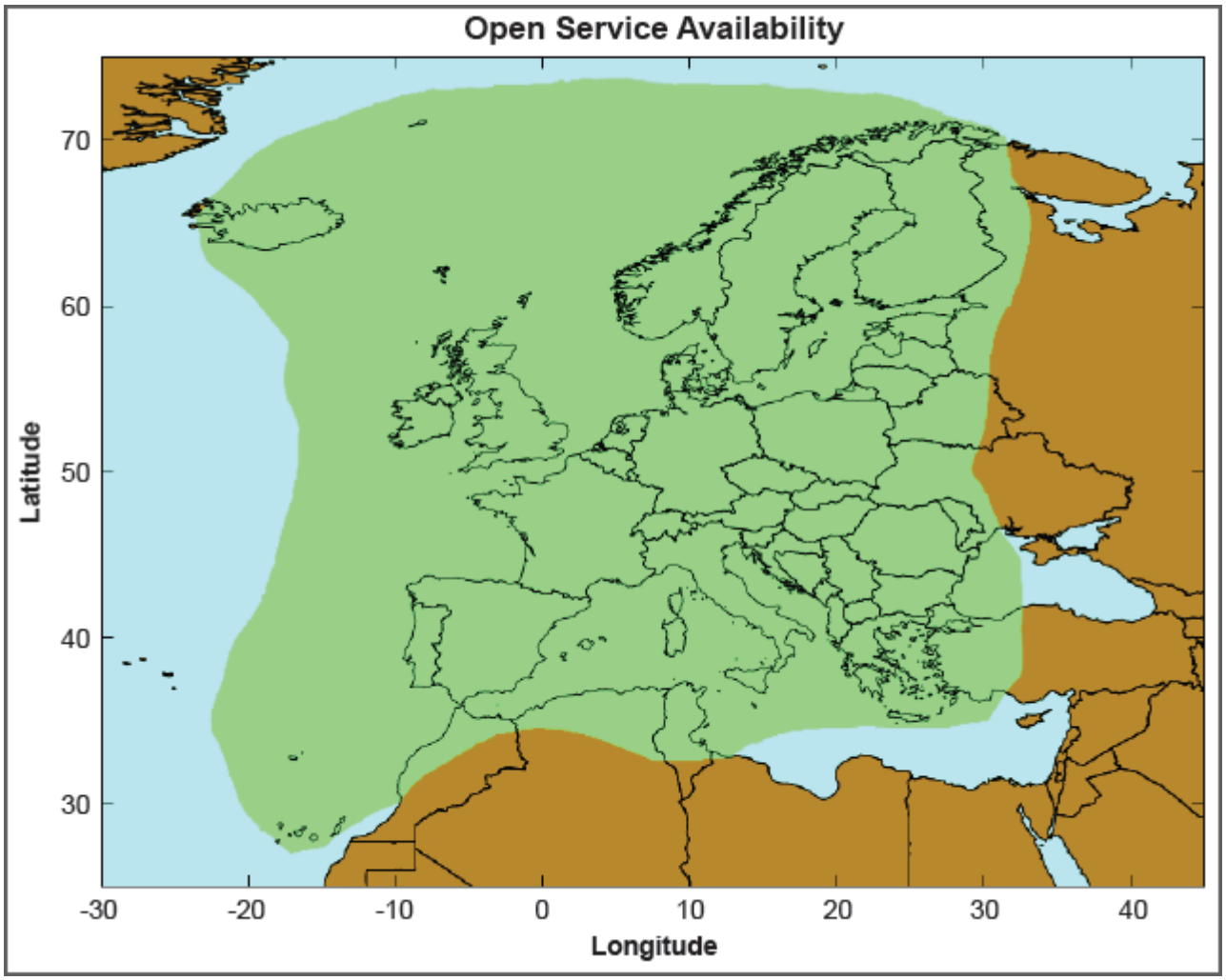
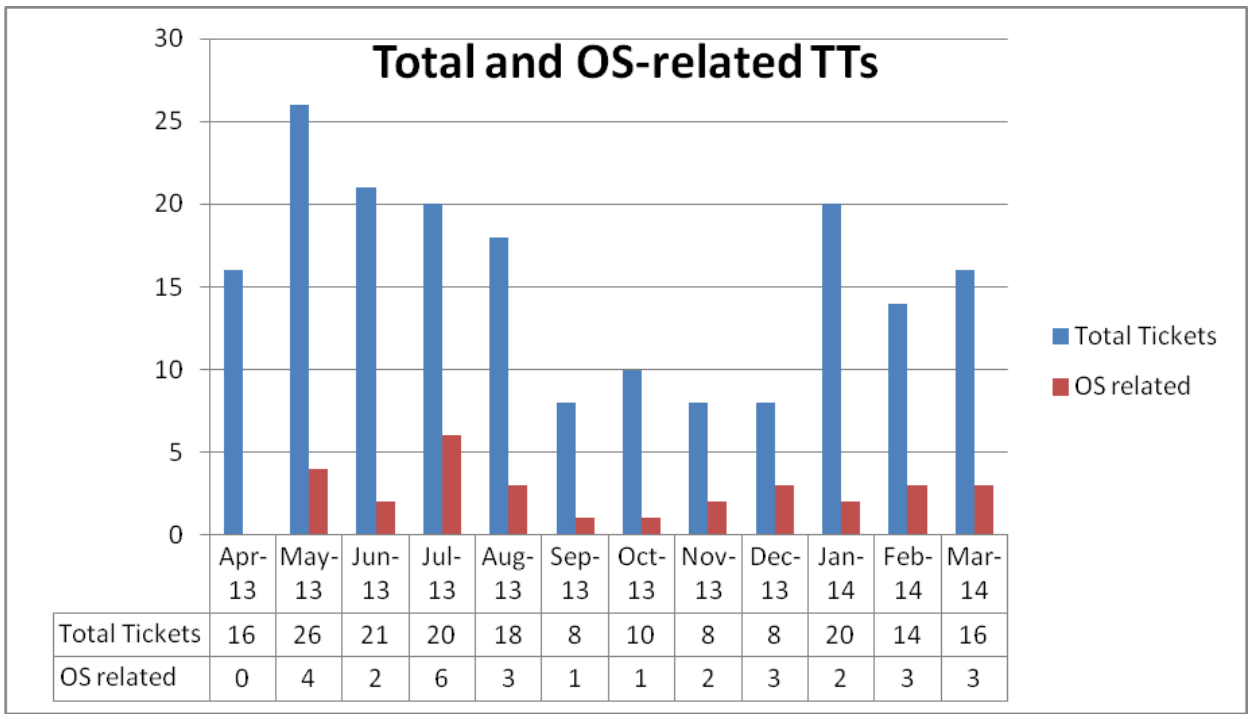


Figure 37: EGNOS OS Compliance area in EGNOS OS SDD V2.2

The OS Compliance Area is defined as the minimum area where the user is able to calculate their position with accuracy below a defined threshold, 99% of the time.

ESSP is actively supporting Open Service users' communities via the EGNOS Helpdesk and EGNOS User Support website. The following figure shows the relative number of OS-related questions arriving at the EGNOS helpdesk over the reporting period.



	Apr-13	May-13	Jun-13	Jul-13	Aug-13	Sep-13	Oct-13	Nov-13	Dec-13	Jan-14	Feb-14	Mar-14
Total Tickets	16	26	21	20	18	8	10	8	8	20	14	16
OS related	0	4	2	6	3	1	1	2	3	2	3	3

Figure 38: Number of total questions and OS-related TTs arrived at the Helpdesk

According to EGNOS Helpdesk requests[5], the Open Service user distribution per area of activity is shown in Figure 39:

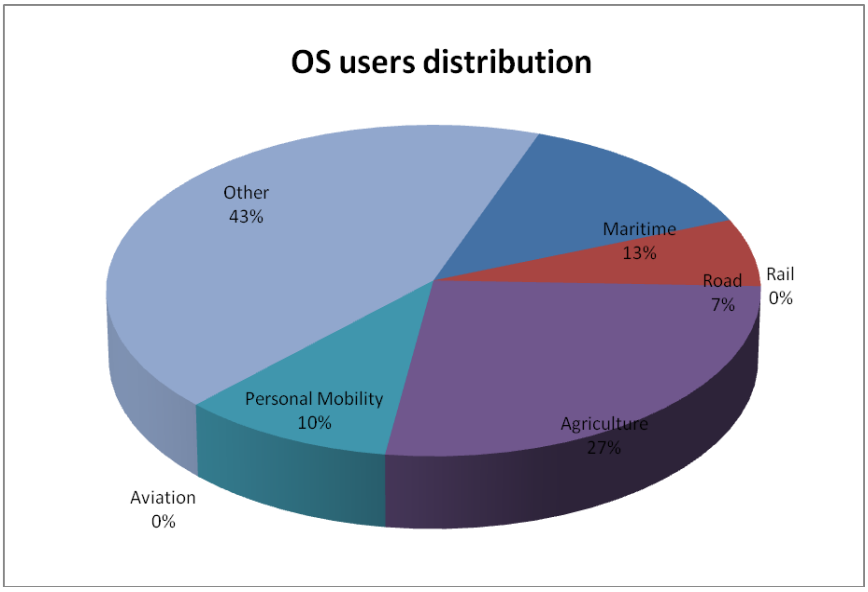


Figure 39: Open Service user distribution according to EGNOS Helpdesk information

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

[5] Since Open Service users do not need to be registered, ESSP is not able to know the exact distribution of these users with respect to their area of activity, as is the case for EDAS users. An estimate based on EGNOS Helpdesk requests has therefore been calculated, taking into account that this approximation gives a partial view of Open Service usage distribution.

- Participating in the Intelligent Transport Systems (ITS) and Location-Based Systems (LBS) User Forums created as part of the SUNRISE project for identification of requirements and priorities of these market segments in relation to GNSS.
- Contributing 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).
- Attending and contributing to multimodal events such as CAPIGI, Infrarail, e-Navigation Underway, Munich Satellite Summit and European Space Solutions. See Section 4.8.2 for more details.
- Organising the EGNOS Service Provision Workshop (Section 4.8.1) as the key EGNOS event bringing together users and stakeholders from the different EGNOS Services (including OS) and from different application domains.
- Being in close contact with OS receiver manufacturers as part of the SBAS Receiver Platform.
- Gathering all valuable feedback from OS user communities via the corresponding Customer/User Satisfaction process, as described section 4.4.

EGNOS equipped tractor in Spain

4.3 EDAS Service Status

4.3.1 EDAS Evolutions

The European Commission officially declared an initial set of EDAS services available to EU users in July 2012. In April 2013, a new set of value-added services was subsequently officially declared available, to extend the initial EDAS portfolio and enable EDAS support to new application domains. Currently, the services provided by EDAS are as follows (please refer to the EDAS Service Definition Document –EDAS SDD- for a detailed description, http://www.essp-sas.eu/service_definition_documents):

- Main Data Streams: GNSS data is provided through Internet in real-time in ASN.1 format (Service Level 0) and RTCM 3.1 format (SL2).
- Data Filtering: Filtering capabilities to allow GNSS data to be received from only certain subsets of RIMS stations when connecting to EDAS Service Level 0 and/or 2.
- SISNET Service: EGNOS messages provided in real time using the SISNeT protocol defined by ESA.
- FTP Service: Historical GNSS data available through an FTP site.
- Ntrip service: GNSS measurements and corrections in real time using Ntrip protocol.

The following table summarises the types of data that can be retrieved via the different EDAS services. For further details on the formats and protocols, users are kindly advised to consult the EDAS Service Definition Document – EDAS SDD – (http://www.essp-sas.eu/service_definition_documents).

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 15: EDAS data sheet

EGNOS data coming from the EDAS Services can be used for the development of applications based on GNSS streams, or for the provision of value- added services based on EDAS. EDAS services are currently used for tracking dangerous 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, irrespective of GEO visibility conditions, improve accuracy with

respect to GPS only (see table below) and even calculate EGNOS protection levels in order to set the bounds of the navigation position error.

		Max	Mean
GPS	**HPE/VPE**	2.81/3.66	0.85/0.98
SISNeT	**HPE/VPE**	1.92/2.45	0.32/0.42
DGPS	**HPE/VPE**	0.77/1.57	0.16/0.27
RTK	**HPE/VPE**	0.13/0.34	0.03/0.14

Table 16: Horizontal Position Error (HPE) and Vertical Position Error (VPE) in metres, measured at a station located at Berlin (Germany) on 19/07/2013.

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://www.essp-sas.eu/monthly_performance_reports to check EDAS monthly performance, or to section 3.5.1 of the present document for an overview of the last yearly period).

In 2014, two important improvements have already been implemented:

- Improved support to EDAS users through the EGNOS Helpdesk (egnos-helpdesk@essp-sas.eu, +34 911 236 555). In the event of suspected EDAS failure or outage, EDAS users may contact the EGNOS Helpdesk and receive confirmation on the actual EDAS status in one hour (24/7).
- Improved availability of the EDAS access line: two lines in high availability configuration have been deployed to provide redundancy in the data link connecting EDAS to the external world.

In the second half of 2014, a modernisation of the EDAS system, involving the replacement of the EDAS V1 legacy components, will be performed to secure the EDAS performance and quality of service in the medium term.

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

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

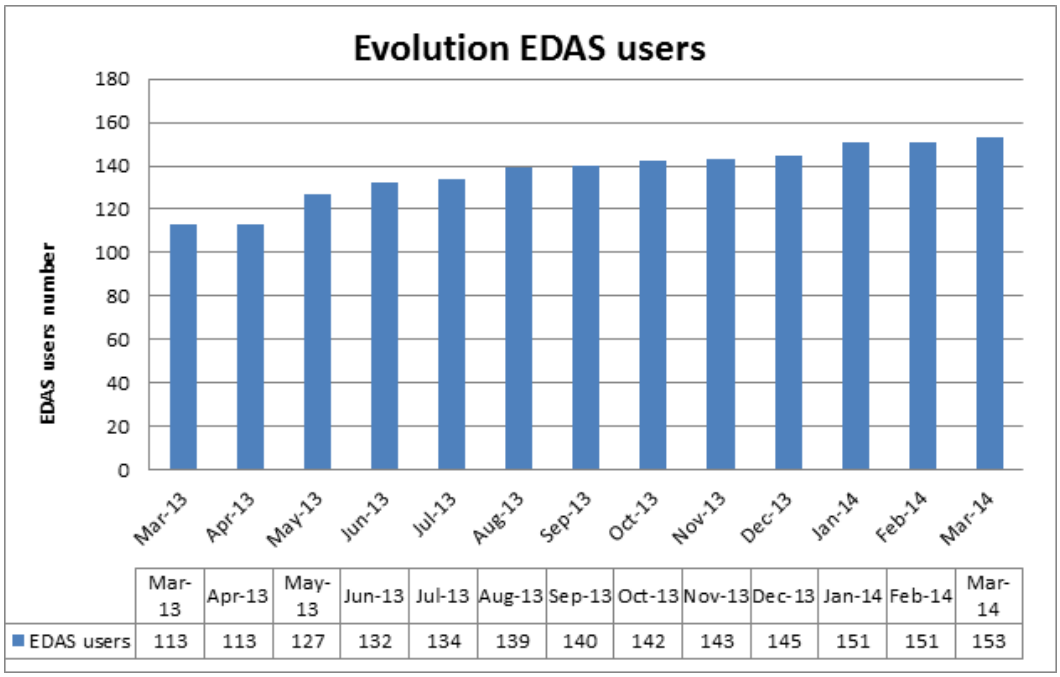
   http://egnos-user-support.essp-sas.eu

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 153 at the end of March 2014. At the start of the reporting period (beginning of April 2013), the total number of EDAS users was 113, hence the number of EDAS users has increased by 35% in the last 12 months.



	Mar-13	Apr-13	May-13	Jun-13	Jul-13	Aug-13	Sep-13	Oct-13	Nov-13	Dec-13	Jan-14	Feb-14	Mar-14
EDAS users	113	113	127	132	134	139	140	142	143	145	151	151	153

Figure 40: EDAS users' evolution

It should be highlighted that 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 different application domains, as illustrated in the figure below:

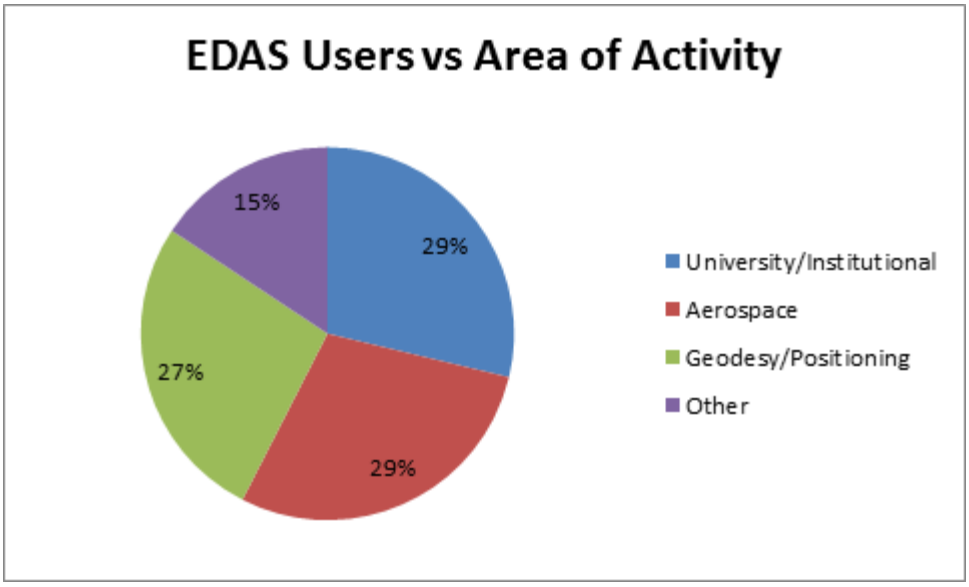


Figure 41: EDAS users and area of activity

An important measure of the popularity and use of EDAS Services is the relative weighting of EDAS-related requests received at the EGNOS Helpdesk (54% overall during the reporting period). Also, the fact that EDAS users are becoming more expert in the services, and that the kinds of EDAS-related requests that are now processed by ESSP are highly complex, is reflected in the number of iterations (question + answer) needed to close the EDAS requests. As illustrated below, the weighting of EDAS-related activities within the EGNOS Helpdesk when measured in terms of iterations with the user is even larger, accounting for roughly 70% of overall exchanges.

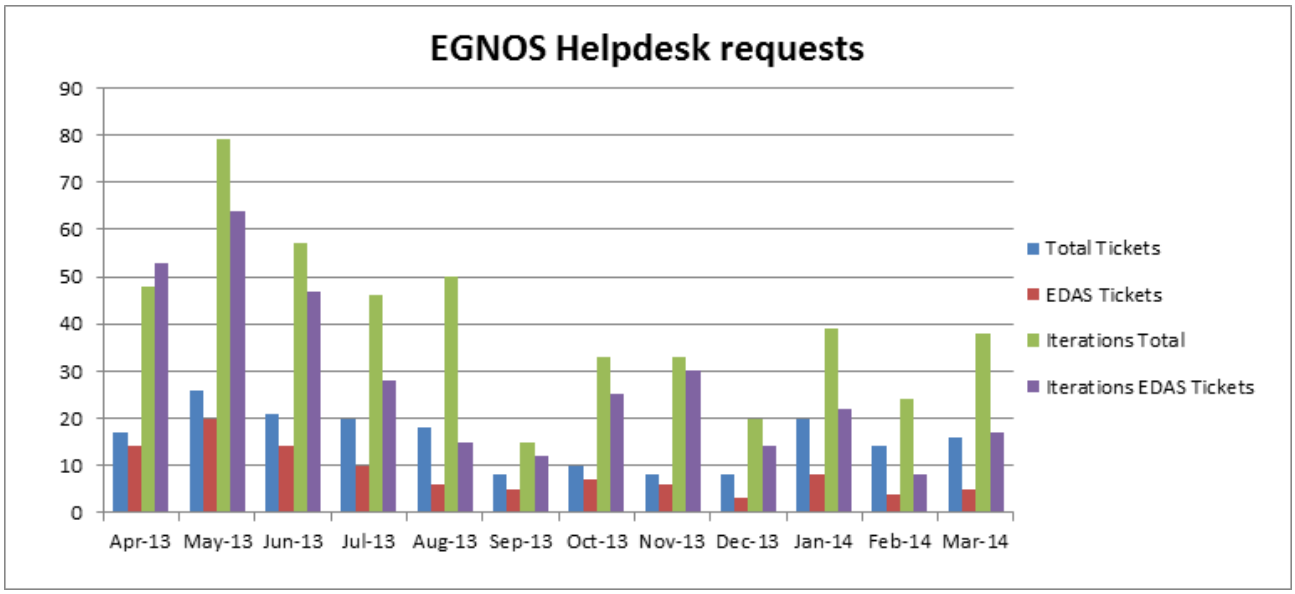


Figure 42: EDAS-related requests at the EGNOS Helpdesk

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 that is totally user-oriented.

The EGNOS User Support Improvement Process pursues EGNOS adoption and ensures that user satisfaction in all application domains will be closely monitored to identify key areas where major efforts are needed, driving the corresponding definition and implementation actions. The target is clear: continuous improvement towards meeting users' expectations and wide scale EGNOS adoption. The main methodology used is illustrated below:

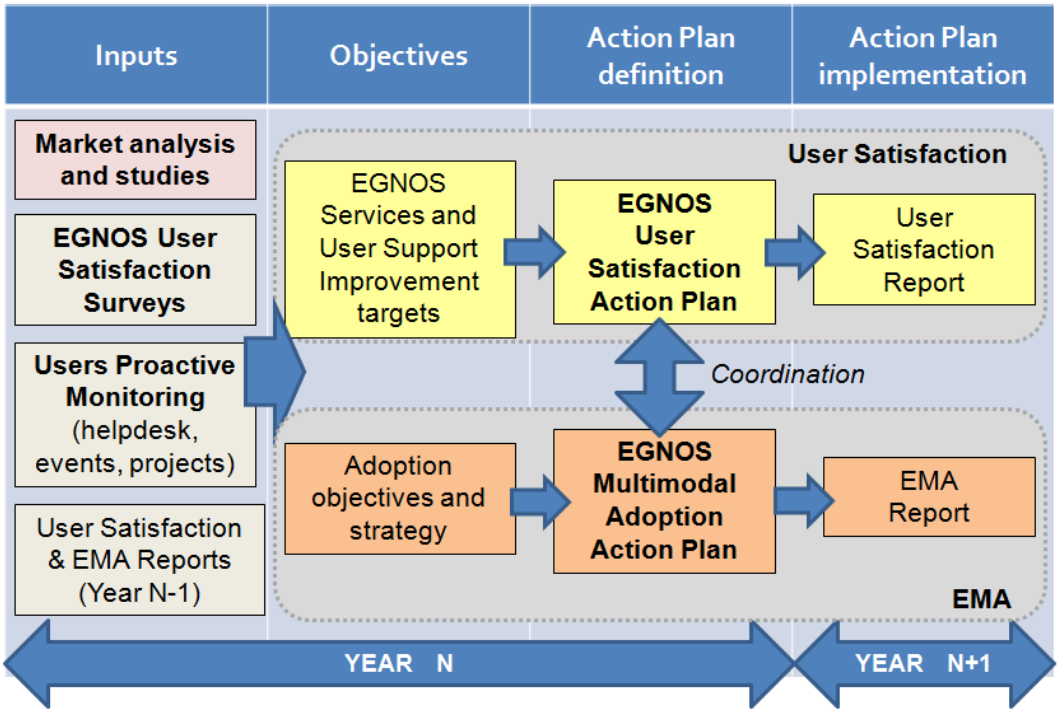


Figure 43: User Support Improvement Process

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 that have a contractual relationship with ESSP.

Each year, ESSP launches an overall EGNOS Users' Satisfaction Process covering the three EGNOS Services (SoL, OS and EDAS), gathering valuable feedback about EGNOS and ESSP performance in order to define improvement areas and recommendations on EGNOS and ESSP activities as EGNOS Services Provider.

This process considers the feedback received via different means and interfaces such as the EGNOS Service Provision Workshop, the EGNOS User Support activities and ESSP's participation in multimodal fora, GNSS implementation projects, working groups and relevant events. However, the main input is the customised satisfaction surveys per service type that are widely distributed to the main users and stakeholders of each EGNOS Service:

- **EGNOS Helpdesk**: The different user questions received during 2012 were processed and analysed in order to obtain relevant feedback.
- **EGNOS Service Provision Workshop 2013**: This took place on 2nd-3rd July 2013 in Prague (Czech Republic), with more than 150 people attending from a wide range of organisations involved in activities related to GNSS. Important feedback was obtained thanks to the interaction with attendees and the questions put forward during the event.
- **Relevant multimodal fora, working groups and events in different domains.**
- **EGNOS Service-specific questionnaire** distributed to the identified relevant users and stakeholders. The target for EGNOS service users was selected from the general population used to conduct the survey. The methodology applied to obtain qualitative and quantitative data

and to achieve general objectives was based on satisfaction, perception, fidelity plus strengths and weaknesses of the service. With the aim of increasing the response average and maintaining a low average abandon rate, a second distribution was carried out. To be able to target different users, individual questionnaires were created and distributed.

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 reports issued in 2013 (covering 2012) have provided very valuable information and recommendations that have been incorporated into the User Satisfaction Action Plan and EGNOS Multimodal Adoption (EMA) Action Plan currently being implemented.

In the reporting period, ESSP finalised the user satisfaction surveys for the three EGNOS Services and completed the corresponding user satisfaction reports, using customised questionnaires that were distributed to the main stakeholders and users of each EGNOS service market in all application domains. The main summary is shown in the following figure:

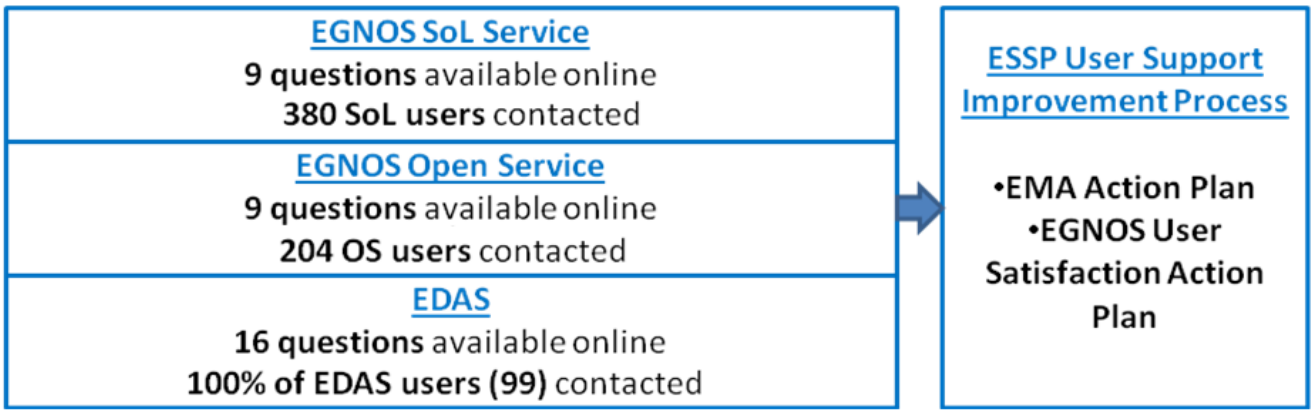


Figure 44: Summary of User Satisfaction Survey status

4.4.3 SoL Users Survey

The SoL user satisfaction survey (also known as user consultation survey) was launched for the second time on February 2013 to cover the 2012 calendar year. The survey was open from 08/02/2013 to 08/03/2013, using a specific online platform, and 102 answers were received from a survey population of 380 consulted users.

The SoL user satisfaction report was published on 11/09/2013 and the main outcomes were anticipated during the 2013 EGNOS Service Provision Workshop (2nd-3rd July 2013 in Prague).

The outputs of this survey were also included in the ESSP annual report published on ESSP's corporate website (www.essp-sas.eu).

The main recommendations derived from the corresponding report are summarised in the following table:

ID	Recommendation
SoL-R-1	Increase ESSP presence/support to multimodal domains to provide the required support and increase EGNOS awareness
SoL-R-2	Increase ESSP support/links with EGNOS SoL Service final users: More efforts appear to be needed in relation to these communities to achieve wide scale LPV implementation.
SoL-R-3	EGNOS Helpdesk and User Support features improvements: Although recognised as key assets of the EGNOS SoL Service, there is room for improvement identified by the users; improving the structure and providing additional content in particular. Further awareness is also needed with regards to the EGNOS Helpdesk.
SoL-R-4	EGNOS SoL SDD required improvements: To increase its usefulness and simplicity, including some information that users are missing. Moreover, its update cycle should be reduced significantly to align this document's contents with actual system behaviour.
SoL-R-5	Improve ESSP support to ANSPs in EGNOS-based operations implementation: Evident ANSP need for support and guidance to boost EGNOS-based operations implementation in coordination with existing funding programmes and implementation initiatives.
SoL-R-6	More efforts on guidelines/awareness material generation and dissemination: ESSP is requested to improve its support and links with general and business aviation communities, to provide guidelines or awareness material to trigger the necessary decisions. Additionally, simple and clear roadmaps showing the planned evolutions of the system, services and interfaces are required.

Table 17: Main recommendations from SoL user satisfaction report

4.4.4 OS Users Survey

The EGNOS OS user satisfaction survey was first launched in 2013 to cover the 2012. The survey was open from 07/06/2013 to 31/07/2013 using a specific online platform and 28 answers were received from a survey population of 204 consulted users.

The final analysis of the EGNOS Open Service satisfaction surveys and available inputs was finalised on 23/09/2013.

The main recommendations derived from the corresponding report are summarised in the following table:

ID	Recommendation
OS-R-1	Adequate awareness should be raised to disseminate EGNOS programmatic aspects and the role of the different actors involved. On the other hand, the required action should be taken to make EGNOS widely known across the different user communities and to promote the value of ESSP's activities. EGNOS is not very well known in other application domains (e.g. road, LBS, agriculture, maritime, rail) other than aviation.
OS-R-2	Increase ESSP's presence in the different mass-market segments to promote EGNOS, not only in aviation. In particular, ESSP should strengthen its participation in events, user fora, working groups and task forces where additional interaction with user communities is needed to achieve wide-scale EGNOS adoption. In particular, ESSP is requested to provide further support for the implementation of EGNOS-based applications.
OS-R-3	Awareness and promotion activities need to be tailored to the needs of the different application domains, using the appropriate communication channels. In addition, whenever possible, the target audience (e.g. layperson, novice, familiar, expert) must also be taken into account. In addition, ESSP is requested to enhance the content, quality and clarity of the information provided to users, as well as to extend the range of formats in which information is provided (e.g. videos, podcasts, social networks).
OS-R-4	The EGNOS Service Provision Workshop needs to be further promoted across the OS user community as an annual meeting point for interaction with users. Increased importance needs to be placed on the implementation and use of EGNOS in the different mass-market segments.
OS-R-5	The EGNOS OS SDD should be simplified to make the document more easily readable to users not very familiar with EGNOS. In addition, the OS SDD should be updated more frequently to reflect any modification or evolution in the system performance as soon as possible. The Service Notices should be published more rapidly after the situation triggering the publication occurred and the information should also be improved, since it is often deemed insufficient and confusing.
OS-R-6	EGNOS Helpdesk response time should be reduced, especially for requests dealing with urgent issues. Additional awareness is required concerning the EGNOS Helpdesk and the EGNOS User Support website, to allow users to better understand who is behind it, the available functionalities, how they can get support and the information available. The EGNOS User Support website contents should be improved to include additional information about the EGNOS system and the EGNOS programme, together with application-specific information. Efforts should be made to bring together all available EGNOS-related information into a single website, or at least so that information does overlap and can be easily found.

ID	Recommendation
OS-R-7	To extend the OS service area to cover northern latitudes in Europe and additional areas in North Africa. Other common requests have been to evolve the system in order to provide submetric accuracy and better availability. Some users have claimed that there is a lack of public information describing EGNOS services roadmap and evolutions.
OS-R-8	Specific efforts shall be made to improve the EGNOS system real-time alerting system. There is a general request to have information on the status of GEO and RIMS provided in real-time through the User Support website, and alerts sent when an important change occurs in the system. Some users also ask to reduce response times and define a "standard" format allowing alerts to be processed directly by machines.

Table 18: Main recommendations from the OS user satisfaction report

4.4.5 EDAS Users Survey

The EDAS user satisfaction survey was first launched in December 2012 to cover the 2012 calendar year. The survey was open from December 2012 to June 2013 in the EGNOS User Support Website and 8 responses were received from a survey population of 99 registered users (all users were consulted).

The EDAS user satisfaction report was published on 11/09/2013 and the main outcomes were anticipated during the EGNOS Service Provision Workshop 2013 (2-3 July 2013 in Prague).

The main recommendations derived from the corresponding report are summarised in the following table:

ID	Recommendation
EDAS-R-1	Increase EDAS promotion and awareness: EDAS Service information should be provided in additional fora. There should be marketing efforts to find potential future EDAS users and make interested audiences aware of EDAS Services.
EDAS-R-2	Clarification and communication of the EDAS pricing policy in the long term. (To be agreed with the EC).
EDAS-R-3	Give more weight to EDAS in the EGNOS Service provision workshop: EGNOS Service provision workshop could be also oriented to EDAS users, including an EDAS section.
EDAS-R-4	Upgrade the EGNOS user support website: Provide up-to-date information about future developments of EDAS/EGNOS and more EDAS-specific content.
EDAS-R-5	Improvement of EDAS outage notifications: Actual service outages notified by the EGNOS Helpdesk should be adjusted to the time frame specified in the notification.
EDAS-R-6	Provide Client Software with command-line interface: Client Software should include the possibility to run in graphical user interface and command-line interface.

ID	Recommendation
EDAS-R-7	Keep the EGNOS and EDAS services roadmap up to date and available to users: This interest of users in the upcoming EDAS and EGNOS should be taken into account by ESSP when re-assessing the means and content of the information provided.

Table 19: Main recommendations from the EDAS user satisfaction report

4.5 User Support

4.5.1 EGNOS Helpdesk

Between 1st April 2013 and 31st March 2014, the EGNOS Helpdesk operated by ESSP managed 185 user requests, which represented an increase of 15% with respect to the previous yearly reporting period, in which a total of 160 requests were managed.

The EGNOS Helpdesk is available 24/7 and accessible via e-mail (egnos-helpdesk@essp-sas.eu) and via telephone (+34 911 236 555). 11 requests were received via telephone on this number.

Of the total number of received questions, 6 were catalogued as urgent requests (the current status of the EDAS service or a technical failure of the EGNOS system), and all were resolved according to the committed response time (24 hours in 2013 and 1 hour in 2014). Standard questions (those considered non urgent) were committed to be answered within 6 working days in 2013 and 3 working days from 2014, and this response time was always respected for the 185 user requests received during the reporting period.

Note that in general the questions received at the EGNOS helpdesk followed the same trends shown for last period, with increasing complexity and generally requiring different iterations with the user. On average, the number of questions per month was 15.41, while the average number of iterations per month represented around 40.17, thus making an average of 2.6 iterations per user question.

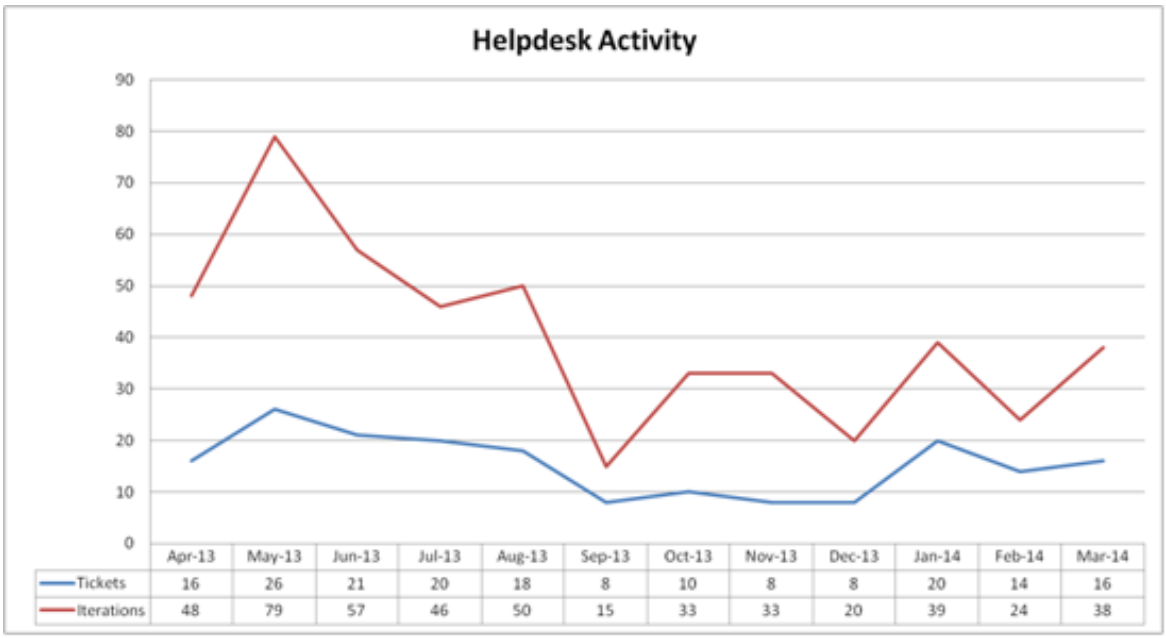


Figure 45: Helpdesk activity evolution

According the figure below, more than half of the questions are relating to the EDAS (EDAS technical questions represented 22%, while EDAS registration requests represented 32%). Compared with the previous reporting period, the percentage of EDAS technical questions remained similar (22%), but EDAS registration requests increased from 23% (41) to 32% (60).

By contrast, there was a reduction in percentage and absolute numbers in questions relating to performance (from 13% -22- to 9% -16-) and trials support (from 6% -11- to 4% -7-), while questions concerning documentation increased (from 3% -5- to 8% -14-). This clearly shows that EGNOS use is evolving towards actual use in applications.

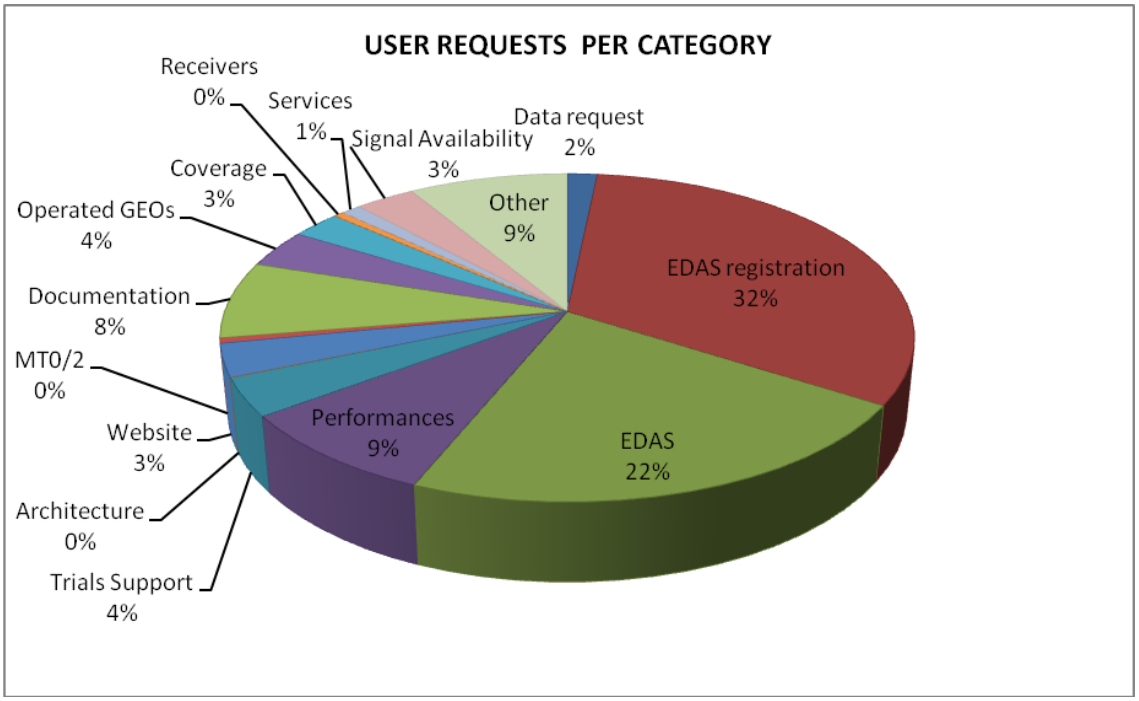


Figure 46: Helpdesk user requests per category

Meanwhile, most of the questions received during the reporting period were related to aviation (59%), followed by agriculture (6%), personal mobility questions (6%), road (4%), maritime (3%) and rail (1%). Other questions were generic and could not be classified in a specific domain of application.

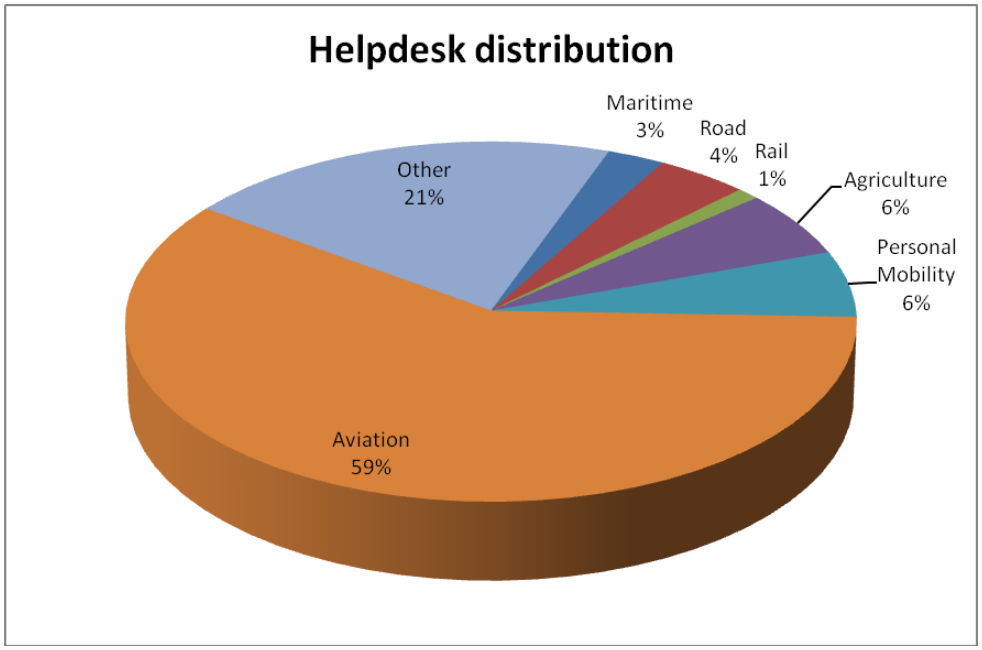


Figure 47: Helpdesk user requests per domain

A similar distribution can be found in the EDAS-related questions (including technical questions and registration requests). OS questions mainly originated from agriculture (27%), maritime (13%) and personal mobility (10%) users. All SoL questions were related to aviation, since this is the only domain where SoL applications have been developed so far.

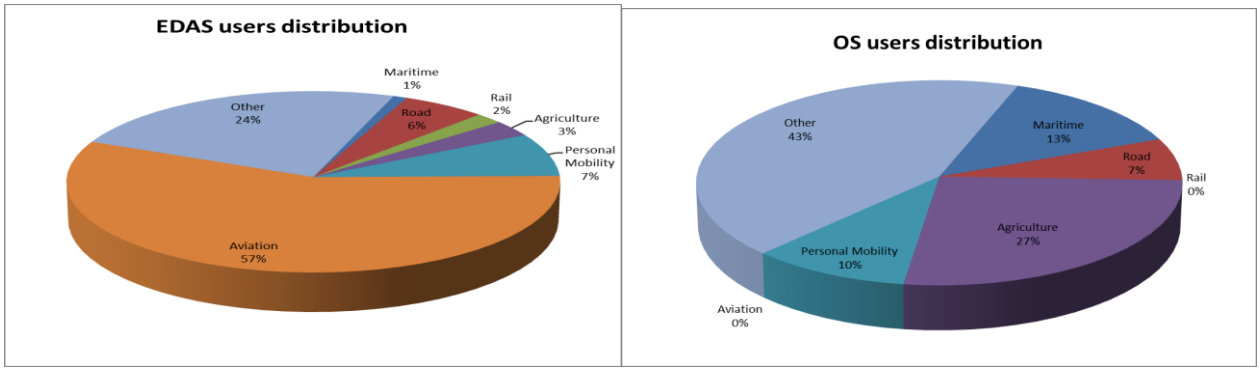


Figure 48: Helpdesk user requests per domain for EDAS and OS

4.5.2 EGNOS User Support Website

At the end of the reporting period, the EGNOS User Support website had 1,351 registered users. The different areas of activity of the website's registered users are shown in the figure below. As can be observed, the main application domains are aviation (31%) and agriculture (26%), followed, at some distance, by road (9%), maritime (7%) and personal mobility (7%). A significant number of users (20%) selected "other" domain during the registration process.

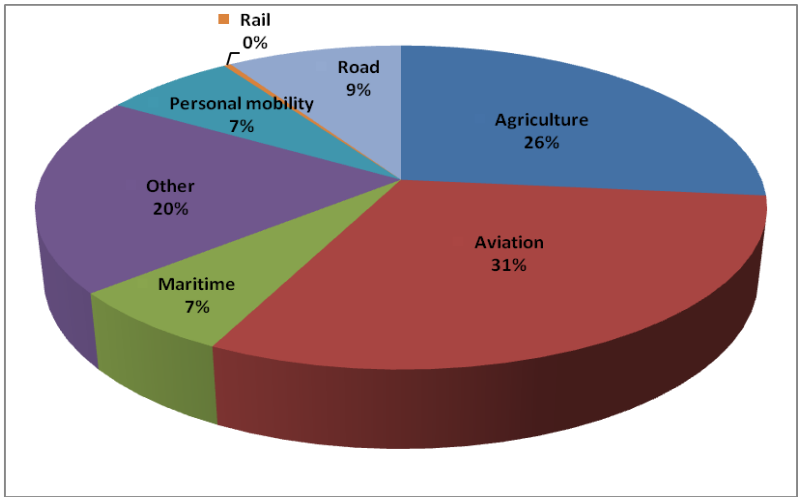


Figure 49: Area of activity of the EGNOS User Support website's registered users

The percentage of users per domain has not seen major changes since 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 (29% to 26%).

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

- EGNOS SoL Service (APV-I) degradations alerts via the EGNOS User Support website, to notify planned and unplanned service degradations (APV-I availability below a specific target) via e-mail to registered users. This new type of notification was added to the existing alerts that covering planned and unplanned Signal-In-Space (SIS) outages.
- New information in the real-time section of the website (the so-called UPCM tool). In particular, the following content was added:
    - EGNOS IGP monitoring map
    - Local Horizontal and Vertical Stanford Diagram
    - Local HPE, HPL and NSV vs. Time
    - Local VPE, VPL and NSV vs. Time
    - Local Horizontal Deviation from Reference
    - SDD Coverage Percentage in last 24 hours' availability
- GPS vs. GPS/EGNOS errors in the *>Service Performance>Local>GPS vs. GPS/EGNOS>* menu of the website, allowing comparison of position errors obtained at the selected RIMS for the selected period of GPS versus GPS+EGNOS, both in the vertical and horizontal axes for each available GEO.

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 ESR 2.3.1i and the relevant improvements made to the EDAS Service during 2013, ESSP updated the three EGNOS Services' SDDs as follows:
    i. EGNOS OS SDD (EGN – SDD OS, V2.0): Published on 11/03/2013
    ii. EGNOS SoL SDD (EGN-SDD SoL, V2.0): Published on 28/06/2013
    iii. EDAS SDD (EGN-SDD EDAS, V2.0): Published on 10/04/2013
2. Next steps: On-going activities for the SDDs update after ESR 2.3.2 deployment.

4.6.2 Service Implementation Roadmaps

1. EGNOS Service Roadmaps: available since 31st July 2012, providing a high-level overview of the EGNOS service's current status and its expected evolution linked to the consecutive EGNOS system release (ESR) deployment and information/interfaces improvements described therein. The three EGNOS Service Roadmaps were updated on 14/05/2013 to version 2.0:
    i. ESSP-COM-7462_02-00_EGN_OS_ROADMAP, to be updated by mid-2014.
    ii. ESSP-COM-7463_02-00_EGN_SOL_ROADMAP, to be updated by mid-2014.
    iii. ESSP-COM-7464_02-00_EDAS_SERV_ROADMAP, to be updated by mid-2014.
2. Next steps: The next update of these roadmaps is scheduled in December 2014

4.7 EGNOS Multimodal Adoption Plan 2014

Very schematically, there have been 3 main periods in EGNOS's lifetime:

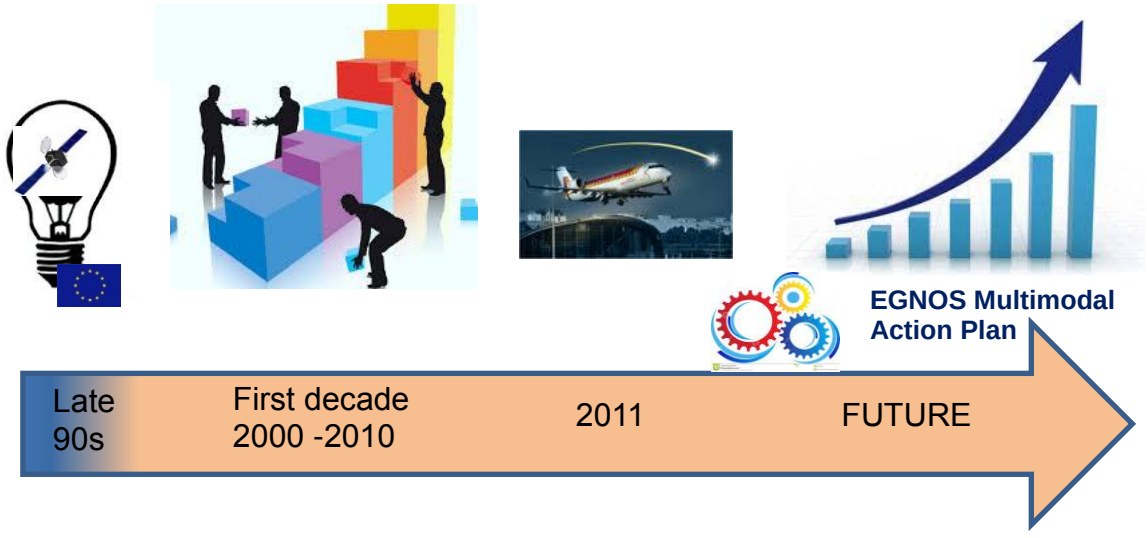


Figure 50: EGNOS schematic timeline.

- Late 90s: when Europe decided to launch its own global Navigation Systems venture. EGNOS was the first building block of this venture
- First decade of the 21st Century: it was during this time that the system was developed, and early EGNOS operation began.
- The historic moment was on 2nd March 2011, when the safety of life service was declared. This pivotal point enabled early service development in aviation (first EWA signed; first LPV in Pau (France); first commercial airline using it Aurigny).

Looking forward to the coming years, and asking what the natural path followed by EGNOS should be, there is undoubtedly an answer: **EGNOS has to be used as much as possible, as much as is feasible**.

It is at this point that the EGNOS Multimodal Adoption Plan, in close coordination with the GSA, plays its role, as part of the necessary machinery for making EGNOS usage a reality, not only in aviation but in other domains as well.

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

In rail and maritime, all activities are oriented towards a deeper understanding of those domains. Therefore, in subsequent steps the suitable actions are triggered to set EGNOS on the path to being used.

Finally, EGNOS promotion in surveying and agriculture entails keeping an eye on technology evolution and on new user needs in the domain.

	Aviation	Maritime	Rail	Surveying	Agriculture	TOTAL
ACTIONS	21	5	13	5	3	47

Figure 51: Actions in each domain to be carried out during 2014

4.8 Communication and EGNOS Promotion Activities

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.

Two main tools have been used during the 2013-14 period to publicise and promote EGNOS services:

- Quarterly publication of the EGNOS Bulletin (in May, August and November 2013, and February 2014) as the main platform for EGNOS news, service improvements, implementation

status etc., as well as for informing users about performance statuses and any other occurrence related to the service provision.

- Active participation in 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 where there are genuine expectations that they will be used in the near future (mainly in the aviation domain, but also rail, road, maritime and agriculture).

  ESSP participation in events is taking place in three different ways:

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

A third instrument for EGNOS communication and promotion is the organisation of a yearly EGNOS Service Provision Workshop (more details in the next section).

4.8.1 2013 EGNOS Service Provision Workshop

Every year, ESSP organises the annual meeting for EGNOS stakeholders to get together and learn about the latest news, projects and improvements 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 exchange information.

The event configuration changes every year, but the core objective remains the same: information, promotion, and networking.

The 2013 EGNOS Service Provision Workshop took place on 3rd and 4th July in Prague, hosted by the Czech Ministry of Transport. This impressive venue welcomed more than 170 EGNOS-involved actors from across Europe.

The first day was devoted to presenting the latest EGNOS performance, to explaining the different EGNOS service roadmaps and to focusing on EGNOS implementation in the field of aviation. ANSPs, ATCs, pilots, regulators and avionics manufacturers shared their real-life experiences of the EGNOS Safety-of-Life Service for aviation.

Day 2 was designed as an EDAS User Forum, with different companies presenting EDAS applications. The second part of the day was focused on EGNOS uses in fields other than aviation. The GSA presented the EGNOS market status and opportunities; followed by practical examples of EGNOS use in multimodal domains: maritime (Ariadna Project); rail (INECO and ANSALDO); transport and logistics (TELESPAZIO); precision agriculture (TOPCON); and road (THALES).

4.8.2 ESSP Event Participation April 2013 – March 2014

The table below shows the events in which ESSP had the opportunity to participate in recent months and which gave ESSP staff the opportunity to directly interact with EGNOS end users and stakeholders.

Name of Event	Type of Event	Date
European Navigation Conference (Vienna)	Satellite Navigation	April 2013
Aero Friedrichshafen	Aviation	April 2013
ACI Europe 6th Regional Airports' Conference and Exhibition (Lyon)	Aviation	April 2013
European Helicopter Show (Kralove)	Aviation	May 2013
EBACE (Geneva)	Aviation	May 2013
ITS Forum	Rail	June 2013
Le Bourget Air Show (Paris)	Aviation	June 2013
EGNOS Service Provision Workshop (Prague)	EGNOS stakeholders	July 2013
9th European Conference in Precision Agriculture	Agriculture	July 2013
Beacon Satellite Symposium (UK)	General GNSS	July 2013
ION GNSS (USA)	General GNSS	September 2013
ERA General Assembly (Salzburg)	Aviation	October 2013
ISPA 2013 (Berlin)	Aviation	October 2013
Agritechnica (Hannover)	Agriculture	November 2013
European Space Solutions 2013 (Munich)	General GNSS	November 2013
CANSO ATM WORLD Congress (Madrid)	Aviation	February 2014
Munich Satellite Summit	General GNSS	March 2014
SmartRail (Amsterdam)	Rail	March 2014

Table 20: Event participation in the April 2013 – March 2014 period

5 MAIN ACTIVITIES PLANNED FOR THE YEAR AHEAD

5.1 Service Provision and Development

ESSP will launch an ad-hoc LPV-200 coordination project aimed at establishing all the necessary actions to ensure the successful introduction of the LPV 200 service level within the EGNOS SoL Service and its successful unveiling to the users. After completing an initial LPV 200 impact assessment, ESSP will identify the necessary actions to be implemented and will manage their implementation in close coordination with all relevant stakeholders (the GSA, EASA, etc.).

5.2 EGNOS Working Agreement and Procedures 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 at the EC's prior request.

According to the status of the EWA discussions, the planning of GSA-funded projects (mainly the SHERPA and "first LPV" project) and the States' LPV implementation plans, the EWAs with Naviair (Denmark), LVNL (Netherlands), LPS (Slovakia), Romatsa (Romania), Jersey (non-EU) and some UK ANSPs (Wolverhampton, BAE Systems Marine Ltd and Land's End airport) could be advanced or signed in the year ahead. Additionally, discussions and ad-hoc support will be provided to any other ANSP interested in publishing EGNOS-based procedures in Europe. The target is more than 24 EWAs before mid-2015.

Figure 52 shows the expected status of the procedures' implementation at the end of the 2014-2015 period (those currently published plus expected publications). Countries highlighted in blue are those where at least one LPV procedure is expected to be published (please note that, prior to this, an EWA would need to be signed between ESSP and the national ATS provider – for those that have not yet signed this agreement-).

EGNOS enabled aircraft

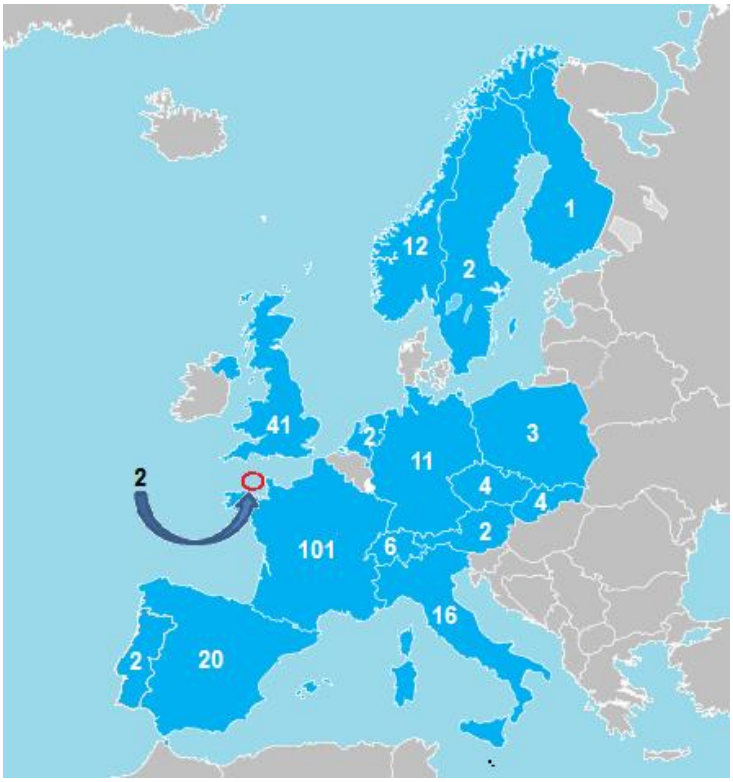


Figure 52: Procedures expected to be published during 2014-2015 period

The EWA contents are expected to evolve and to be improved in line with 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 backwards update to ensure the coherence of all agreements in place.
- Improvement of the Collaborative Decision Making and GNSS Data Recording provisions as required by users in the 2013 User Consultation process.
- Management of the incoming EWA negotiation requests, with a target of a minimum of 24 EWAs in place by the end of the next reporting period.

5.2.1 Evolutions of EGNOS Service-related documents

1- EGNOS Services Definition Documents (SDDs): The EGNOS Services' SDDs will be updated as follows (schedule in place on the date of issuing this document):

- **EGNOS SoL SDD**: Corresponding to ESR 2.3.2
  - Delivery to GSA: 03/10/2014

- **EGNOS OS SDD**: Corresponding to ESR 2.3.2
  - Delivery to GSA: 18/11/2014

- **EDAS SDD**: Document update:
  - Delivery to GSA: 7/8/2014

Additionally, in order to optimise the process for management of the three EGNOS SDDs, ESSP plans to define and improve the procedure involving the triggers for publication of the SDDs, their definition/issue process and their corresponding update (when required).

2- Service Notices: There is a new Service Notice: SN#11, "EGNOS GEO PRN 124 Decommissioning and Space Segment Update", which was published on June 9 2014.

Additionally, in order to optimise the process for the Service Notices management, ESSP plans to define a procedure depicting the triggers for SNs publication, their definition/issue process and their corresponding update or closure (non-applicability).

3- EGNOS Service Implementation Roadmaps: The structure and contents included in these documents, as agreed with the GSA during the Transition Phase, is intended to be consolidated, establishing a bi-annual update cycle (June-December). This will involve ensuring their content is up to date and reflects the official message to be shared by ESSP/GSA/EC in all fora.

5.2.2 EDAS Service Evolution

In the second half of 2014, there will be a modernisation of the EDAS system, consisting of replacing the EDAS V1 legacy components (EDS upgrade), to secure the EDAS performance and quality of service in the medium term. Activity was launched by late March 2014 and is planned to be completed after the summer.

Additionally, ESSP is working on an EDAS evolution plan to be submitted to the GSA in the second half of 2014.

5.2.3 EGNOS Helpdesk / User support website Evolution

Taking into account the user feedback received via the corresponding EGNOS services' user satisfaction surveys and any other information received via the existing interfaces with users (helpdesk responses and meetings with users), ESSP will prepare an EGNOS Helpdesk evolution roadmap

identifying the main areas for improvement and a tentative implementation plan. In addition, in order to increase the users' awareness of the EGNOS Helpdesk's existence, capabilities and how to access it, a specific EGNOS Helpdesk communication plan will be prepared and implemented. Both roadmaps/plans should be ready by Q3 2014.

With the aim of improving the EGNOS User Support website's robustness, usability, user experience, and of keeping website contents updated, ESSP is outlining an evolution plan in close coordination with the GSA, based on the feedback provided by EGNOS users. This covers different aspects:

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

In the short term, the main improvement under development is a specific section including real-time performance of the EDAS services. This functionality should be available in summer 2014.

5.2.4 User Support Improvement Process

Since the User Support Improvement Process addresses both adoption of and user satisfaction with the EDAS services, the main activities anticipated for the next reporting period, aside from implementation of the corresponding 2014 plans, are the preparation and agreement with the GSA by Q4 2014 of the EMA Action Plan 2015 (see Section 5.2.5) and of the 2015 User Satisfaction Action Plan.

The main inputs for preparation of the 2015 User Satisfaction Action Plan will be the outcomes of the EGNOS User Satisfaction surveys that will be launched during Q2 2014, with the corresponding complete analysis and associated report ready by Q3 2014.

5.2.5 EGNOS Multimodal Adoption Action Plan

To prepare the 2015 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 2015 EMA inputs by early Q3 2014, including the main objectives for 2015 and an initial high-level proposal for the 2015 EMA Action Plan;
- Based on these inputs, the GSA will prepare, by the end of Q3, or the beginning of Q4 2014, the GSA 2015 EMA plan including the main activities delegated to ESSP;
- ESSP's 2015 EMA Action Plan, further detailing the actions delegated by the GSA, will be ready and approved by the GSA by the end of Q4 2014.

5.2.6 EGNOS Promotion plan

On a yearly basis, ESSP prepares an EGNOS Promotion Plan focusing on different aspects.

- Attendance at and participation in user-focused exhibitions, conferences and workshops with promotion/marketing/adoption objectives, including but not limited to Participation in events agreed with GSA in the framework of the EGNOS Multimodal Adoption (EMA) Action Plan.
- GNSS and navigation generic events (ION GNSS, ENC GNSS…).
- The preparation of promotion and marketing material relating to EGNOS, addressing EGNOS users from different user communities, including but not limited to the material agreed with the GSA in the framework of the EGNOS Multimodal Adoption Plan (EMA).
- The creation of material for application-specific media publications, including but not limited to the material agreed with the GSA in the framework of the EGNOS Multimodal Adoption Plan (EMA).
- GNSS and navigation generic events (ION GNSS, ENC GNSS…).
- The preparation of the EGNOS bulletin every three months.
- The organisation of the EGNOS Service Provision Workshop every year.

The main events envisaged in 2014 are summarised in section 5.2.6.2.

5.2.6.1 *EGNOS Service Provision Workshop 2014*

The yearly meeting with EGNOS stakeholders will take place this year in Lisbon on 7th and 8th October. An ambitious Workshop Communication Plan has been designed to ensure widespread participation.

Figure 53: EGNOS Workshop “Save the Date” advertisement

5.2.6.2 *EGNOS Planned Event Participation in 2014*

The table below shows the events planned for 2014 (as of March).

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

Name of Event	Type of Event	Date
11th UIC ERTMS Conference (Istanbul)	Rail	April 2014
Aero Friedrichshafen	Aviation	April 2014
European Navigation Conference (Rotterdam)	General GNSS	April 2014
ACI Europe 7th Regional Airports' Conference and Exhibition (Madeira)	Aviation	May 2014
CAPIGI	Agriculture	May 2014
GEOSPATIAL World Forum	Mapping	May 2014
EBACE (Geneva)	Aviation	May 2014
IALA 2014 AISM (la Coruña)	Aviation	May 2014
European Space Solutions (Prague)	General GNSS	June 2014
RPAS 2014	UAV	June 2014
DLG Field Days	Agriculture	June 2014
Toulouse Space Show	General GNSS	July 2014
Farnborough Intl Air show	Aviation	July 2014
ION GNSS 2014	General GNSS	September 2014
INNOTRANS 2014 (Berlin)	Rail	September 2014
EGNOS Service Provision Workshop (Lisbon)	EGNOS stakeholders	October 2014
ERA General Assembly (Barcelona)	Aviation	October 2014
INTERGEO (Berlin)	Mapping	October 2014
METS	Maritime	November 2014

Table 21: EGNOS planned event participation in 2014

APPENDIX A FULL LIST OF EGNOS-BASED APPROACH PROCEDURES

The table below provides the full list of EGNOS-based procedures published by April 2014. For the most up-to-date information, please refer to the ESSP's website (www.essp-sas.eu).

Operational Airports							
Airport	Country	ICAO Code	LPV Procedure	Activation LPV procedure	APV Baro Procedure	Total Nbr Procedures (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	LFCR	1	31/05/2012	0	1	CIVIL
Limoges	France	LFBL	1	28/06/2012	0	1	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	LFLL	1	07/02/2013	0	1	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	1	02/05/2013	0	1	CIVIL
Nancy Essey	France	LFSN	1	02/05/2013	0	1	CIVIL
Paris Orly	France	LFPO	2	30/05/2013	0	2	CIVIL
Rennes	France	LFRN	2	30/05/2013	0	2	CIVIL
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

Operational Airports							
Airport	Country	ICAO Code	LPV Procedure	Activation LPV procedure	APV Baro Procedure	Total Nbr Procedures (LPV+ APV Baro)	Purpose
Annecy 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	2	CIVIL
Evreux Fauville	France	LFOE	2		0	2	MILITAR
Orleans Bricy	France	LFOJ	1		0	1	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
Alderney	Guernsey	EGJA	2	07/12/2011	0	2	CIVIL
Milano/Linate	Italy	LIML	1	13/12/2012	0	1	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	1	27/06/2013	0	1	CIVIL
Allendorf/Eder	Germany	EDFQ	0		1	1	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-Brandensteinsebene	Germany	EDQC	0		1	1	CIVIL
Donaueschingen-Villingen	Germany	EDTD	0		1	1	CIVIL
Dortmund	Germany	EDLW	0		2	2	CIVIL
Dresden	Germany	EDDC	0		2	2	CIVIL
Düsseldorf	Germany	EDDL	0		4	4	CIVIL
Eggenfelden	Germany	EDME	0		1	1	CIVIL

Operational Airports							
Airport	Country	ICAO Code	LPV Procedure	Activation LPV procedure	APV Baro Procedure	Total Nbr Procedures (LPV+ APV Baro)	Purpose
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	0		1	1	CIVIL
München	Germany	EDDM	0		4	4	CIVIL
Münster/Osnabrück	Germany	EDDG	0		2	2	CIVIL
Nürnberg	Germany	EDDN	0		1	1	CIVIL
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	0		1	1	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	2	15/10/2013	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
Rost	Norway	ENRS	2	06/03/2014	0	2	CIVIL
Katowice	Poland	EPKT	2	03/04/2014	2	2	CIVIL

Table 22: List of EGNOS procedures – April 2014

APPENDIX B LIST OF ACRONYMS

Acronym	Definition
ABS	Abu Simbel
ACCEPTA	Accelerating EGNOS adoption in Aviation
ACR	Azores
AENA	Aeropuertos Españoles y Navegación Aérea
AFTN	Aeronautical Fixed Telecommunication Network
AGA	Agadir
ALB	Aalborg
ALY	Alexandria
ANSP	Air Navigation Service Provider
APCH	Approach
APV	Approach with Vertical Guidance
ASN.1	Abstract Syntax Notation One
ATC	Air Traffic Control
ATH	Athens
ATM	Air Traffic Management
ATS	Air Traffic Service
AUS	Aussaguel
BRN	Berlin
CANSO	Civil Air Navigation Services Organization
CNR	Canary Islands
CRK	Cork
CTN	Catania
DJA	Djerba
EASA	European Aviation Safety Agency
EC	European Commission
EDAS	EGNOS Data Access Service
EGI	Egilsstadir
EGNOS	European Geostationary Navigation Overlay Service
EMA	EGNOS Multimodal Adoption
ESA	European Space Agency
ESR	EGNOS System Release

Acronym	Definition
ESSP	European Satellite Services Provider
EU	European Union
EWA	EGNOS Working Agreement
FUC	Fucino
GEO	Geostationary Satellite
GLG	Glasgow
GNSS	Global Navigation Satellite System
GOL	Gölbasi
GPS	Global Positioning System
GSA	European GNSS Agency
GVL	Gävle
HAI	Haifa
HAL	Horizontal Alert Limit
HBK	Hartebeeshoek
HIAL	Highlands and Islands Airports Limited
HNSE	Horizontal Navigation System Error
HPE	Horizontal Position Error
HPL	Horizontal Protection Level
HSI	Horizontal Safety Index
ICAO	International Civil Aviation Organization
ION	Institute Of Navigation
ITS	Intelligent Transport Systems
JME	Jan Mayen
KIR	Kirkeness
KOU	Kourou
LAN	Langen
LAP	Lappeenranta
LBS	Location-Based Systems
LPI	La Palma
LPS	Letové Prevádzkové Služby
LPV	Localizer Performance with Vertical guidance
LSB	Lisbon
LVNL	Luchtverkeersleiding Nederland

Acronym	Definition
MAD	Madeira
MLG	Malaga
MON	Moncton
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
PA	Precision Approach
PBN	Performance Based Navigation
PDM	Palma De Mallorca
PRN	Pseudo-Random Noise
RAISG	RNAV Approach Implementation Support Group
RIMS	Ranging and Integrity Monitoring Station
RKK	Reykjavík
RNAV	Area Navigation
RNP	Required Navigation Performance
ROM	Roma
RTCM	Radio Technical Commission for Maritime Services
SBAS	Satellite-Based Augmentation System
SCZ	Scanzano
SDC	Santiago De Compostela
SDD	Service Definition Document
SES	Single European Sky
SHERPA	Support ad-Hoc to Eastern Region Pre-operational Actions in GNSS
SIS	Signal-In-Space
SISNeT	Signal-In-Space through the Internet

Acronym	Definition
SL0	Service Level 0
SL1	Service Level 1
SL2	Service Level 2
SOF	Sofia
SoL	Safety-Of-Life
SWA	Swanwick
TF	Task Force
TLS	Toulouse
TOR	Torrejón
TRD	Trondheim
TRO	Tromsoe
UK	United Kingdom
UTC	Coordinated Universal Time
VAL	Vertical Alert Limit
VNSE	Vertical Navigation System Error
VPE	Vertical Position Error
VPL	Vertical Protection Level
VSI	Vertical Safety Index
WRS	Warsaw
ZUR	Zurich

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