European Satellite Services Provider

ESSP

Service Provision Yearly Report (April 2012-March 2013)

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1 THE WORD OF THE ESSP PRESIDENT

It is with pleasure and with pride that I address to you this President's word in, what is now already, our fourth Yearly Service Provision Report.

The past 12 months (April 2012 – March 2013) of EGNOS Service Provision have again demonstrated ESSP excellent service performance. The continued trend of implementation of EGNOS Approach procedures by Air Navigation Service Providers confirms the need in Europe of the EGNOS service and its availability. Additional Air Navigation Service Providers have signed the EGNOS Working Agreement with ESSP, the first essential step on the way towards implementation of EGNOS Approach procedures. The number of registered users of the EDAS service confirms the eagerness of Europe to develop "added value services", based on the EGNOS data. Outside of aviation, in diverse application domains, there is a growing interest and need for both the Signal in Space service (Open Service as well as Safety of Life service) and the EDAS service, supported by the declaration of new added value services in April 2013. ESSP's User Support activities are being developed accordingly. The Yearly EGNOS Service Provision Workshop of 2013 is structured with the aim of supporting this multi-domain user portfolio.

Throughout this report, the reader will learn all the details on the Service Performance achieved for the Open Service, the Safety of Life Service and for the EDAS service. The report also addresses the essential activities, which result in high performance service: System Operation and Maintenance, System Evolution, Certification Coordination, Safety, Security and Quality Management.

In addition to all the challenges that those activities regularly present to all actors involved (ESSP and its shareholders, EC and ESA EGNOS Program Offices, GSA, EGNOS stakeholders), ESSP had to manage, during the past year, the transition of the ANSP certification and EGNOS Navigation Service Oversight towards the European Aviation Safety Agency. I may say this was managed to the satisfaction of all involved stakeholders, also with the active support of the European National Supervisory Committee (ENSAC), chaired by the French DSAC. Hence, it is the appropriate place and moment to express my thanks to all the members of the aforementioned ENSAC team for their constructive, though critical and demanding attitude during the past years. I have also been pleased to see the same dedication from the EASA team in charge of the EGNOS oversight activities.

This past year, our Staff have continued to perform very professionally and have focused on Customer and User value creation. In addition, the ESSP subcontractors maintained excellence in their services. Both, therefore, earn my sincere thanks!

I invite all Customers/Users to read this report and to join us at the Yearly EGNOS Service Provision Workshop of 2013. I insist that you should not hesitate to provide us with your feedback on this report, and even more importantly, on the service you experience. The EGNOS Service is there for the benefit of the European citizens and we at ESSP will ensure the continued satisfaction of the Users.

Thank you,

Dirk Werquin

President of ESSP SAS

2 EXECUTIVE SUMMARY

The current document covers the yearly period from April 1st 2012 to March 31st 2013.

2.1 EGNOS Service Performances

During this yearly period, the EGNOS service performances measured have been good, reaching the values committed in the Open Service and Safety of Life SDD (see http://www.essp-sas.eu/service_definition_documents). The excellent coverage observed in some regions beyond the commitment area is a consequence of the changes introduced with the deployment of releases 2.3.1p (February 2012) and 2.3.1i (August 2012), including ionosphere monitoring improvements, additional satellites, additional RIMS, etc.

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

- *Signal In Space (SIS) Availability:*

  Over the past year, the availability of an SBAS message reached the following[1]:

  - PRN120 (EGNOS OP): 99.71%
  - PRN126 (EGNOS OP): 99.87%
  - EGNOS OP (at least one SIS): 99.99%

- *Open Service (OS):*

  The Horizontal and Vertical Accuracy: The 95th percentile of the cumulative data (all stations for the whole period) provide very good results, i.e. around 1.3 meters for the horizontal error, and 2.3 meters for the vertical error, although the requirement is 3 meters for horizontal accuracy and 4 meters for vertical accuracy.

  The Open Service Availability: The value for OS Availability (percentage of time in the month in which HNSE<3m and VNSE<4m) was, on average, above 99% for all stations.

- *Safety of Life (SoL)- Non Precision Approach (NPA)*:

  The NPA Availability: the coverage was 100% of the service area defined in SoL SDD.

  The NPA Integrity: No integrity event has been identified for NPA for any of the monitored sites.

  The NPA Continuity: the NPA continuity risk results in the continental areas of Europe present values between $5x10^{-3}$/h and $5x10^{-4}$/h.

- *Safety of Life (SoL)- APproach with Vertical Guidance (APV-I):*
  - APV-I Availability: the requirement was met over 100% of the Service area.
  - The APV-I Integrity: No APV-I MI was reported.
  - The APV-I Continuity:
    - Requirement at 5.10^{-04}/15seconds was met over 99.77% of the Service area.

[1] These figures are obtained excluding the 3-day outage occurred on 23/06/2012 at 14:51:51.

- Requirement at 1.10^{-04}/15seconds was met over 100% of the Service area.
- Requirement at 1.10^{-03}/15seconds was met over 98.79% of the Service area.

The main causes for the performance degradations were:

- Ionospheric monitoring: As for the previous year, ionospheric issues related to the increase in solar activity (linked to the solar cycle #24) have been the main cause of underperformances.
- SIS outage: The 3-day SIS outage occurred from June 23rd to June 26th 2012 has been the second cause of anomalies. This failure was triggered by a corrupted ephemeris of PRN27 and has been corrected in ESR2.3.1i, deployed in August 2012.
- GPS monitoring: different issues relative to loss of monitoring of some GPS satellites have posed a problem in some areas, especially when combined with other factors. The inclusion of additional satellites in the EGNOS mask has mitigated its impact.

Regarding EDAS, the average availability and service downtime of the different EDAS services have been:

- SL0: 99.83% availability, 3131 sec. service downtime.
- SL1: 99.85% availability, 2240 sec. service downtime.
- SL2[2]: 99.88% availability, 2983 sec. service downtime.

2.2 EGNOS Service Provider Highlights

Service Provision and Development

Concerning the EGNOS adoption in aviation, ESSP continued its specific dissemination and awareness campaign related to the EGNOS Working Agreement (EWA). As a result of this process, ESSP has signed 6 new EWAs (over a total of 10) with Austrocontrol (Austria), NATS (UK), ENAV (Italy), AENA (Spain), PANSA (Poland), Exeter and Devon (UK). The activities performed by ESSP, various Air Navigation Service Providers and the EGNOS stakeholders such as Eurocontrol, EASA, National Supervisory Authorities, GSA and the European Commission have generated a steady increase of implemented EGNOS based approach procedures in different countries and airports: 57 LPV procedures in 36 airports and 71 APV-Baro in 38 German airports (approved to be flown with EGNOS vertical guidance by the German NSA).

The NOTAM proposals service has grown in terms of both countries subscribed and active airports. At the end of March 2013, ESSP was providing EGNOS NOTAM proposals to 5 countries, 71 airports and for a total of 121 EGNOS based approach procedures. Several evolutions of the NOTAM tool are under implementation and will allow the current service reaction time to be reduced.

Another dimension of the EGNOS Service which has also gained importance in the past year is the EGNOS Data Access Service, or better known as the EDAS service. In the past year, the EDAS service saw an increase of users (more than 100 users). Evolution plans were implemented in

[2] Service Level 2 is available since July 26th 2012.

2012/2013 to increase the capacity and service levels of the present EDAS service. On July 26th 2012, the EC declared EDAS officially available to EU users. This important milestone was accompanied by the declaration of the EDAS Service Definition Document v1.0 Most of the EDAS users today are "added value service" providers in other areas than aviation.

This extended use of EGNOS services is a confirmation of the positive interactions with stakeholders experienced over the past months, and more particularly during important events/exhibitions, where ESSP was present to further promote the EGNOS Service jointly with the EC and GSA and through the intensive Service Development activities to consolidate our relationships with those stakeholders

The User Support activities have been maintained and improved via the EGNOS Helpdesk that, since mid 2012, has been contactable 24/7, both by telephone link and via the EGNOS User Support website where EGNOS real time performances and additional reports are available to the user community.

The User Consultation Process was completed for EGNOS SoL and EDAS services and planned for the Open Service by mid-2013. The results of these surveys (currently under analysis) and consultations will be communicated at a later stage by ESSP.

Last but not least, following the deployment of the new EGNOS system releases ESR2.3.1p and ESR2.3.1i, a new version of the EGNOS Open Service SDD (v2.0) including the main performance improvements in terms of the commitment area was published. For the SoL service, an update SDD is also planned for June 2013 and, in addition, will include important improvements in terms of APV-I service area.

Regarding communication and promotion activities, ESSP has continued developing and improving the set of communication tools which inform about EGNOS services and the company itself.

System Evolutions

In the area of system evolutions, ESSP's main achievements over the reported period are:

- The successful deployment of ESR2.3.1i resulting in significant improvements to EGNOS performance with regards to ionosphere monitoring.
- The construction of two new RIMS sites –Agadir (AGA) and Abu Simbel (ABS)– has concluded. These sites will be integrated in the operational system as part of ESRv2.3.2.
- New RIMS site is under construction in Haifa.

Over the past year, ESSP also continued providing support (in line with the agreed funding capabilities) to the System Specification and the follow-up of the consortia activities in the scope of the EGNOS V3 project managed by ESA.

Certification

The handover of the French NSA's supervision of the ESSP as Air Navigation Service Provider to EASA took place at the beginning of November 2012. Oversight activities are now managed by EASA.

3 SERVICE PERFORMANCES

3.1 EGNOS SIS Availability

EGNOS SIS Availability is defined as the percentage of time in the month during which at least one geostationary satellite broadcasts EGNOS messages.

3.1.1 SIS Availability Trending

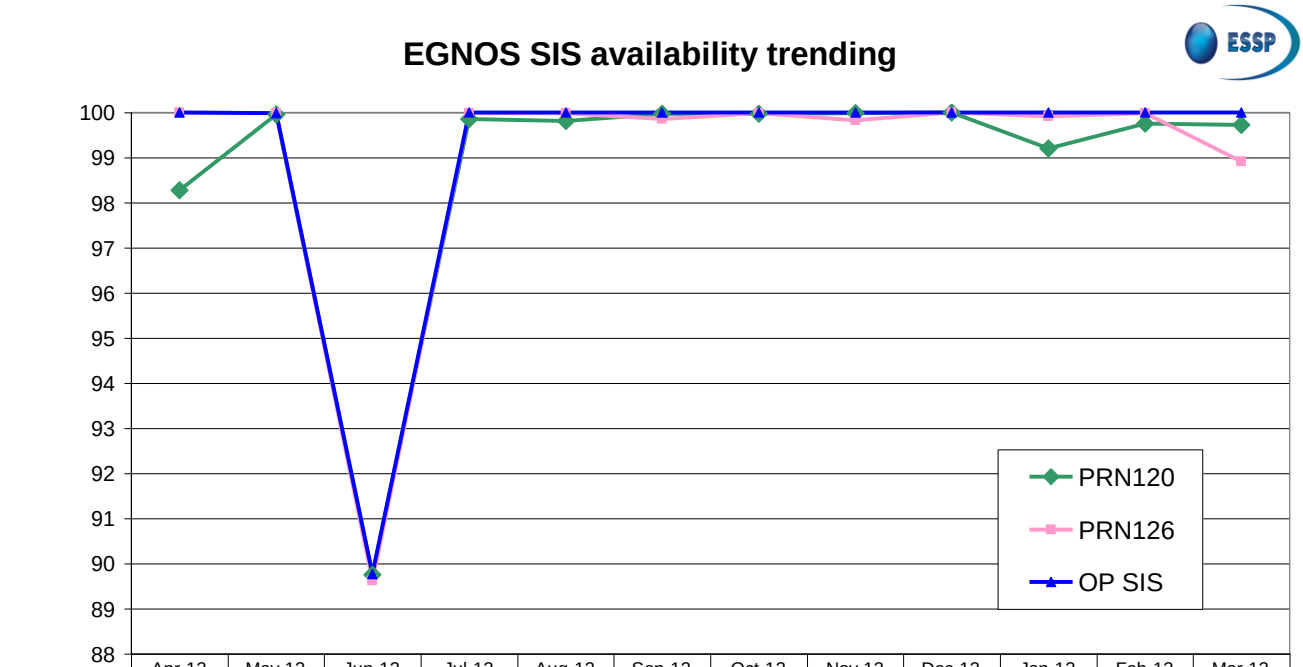
This section presents the yearly performance of the SIS availability. It provides the yearly average performances for the SIS Operational mode (OP) per PRN. It also provides the yearly trend based on the monthly data.

Performances of the PRN124 used for the SIS TEST mode are not provided in this report.

Remark: in March 2013, PRN126 and PRN124 were swapped between EGNOS Operational mode and TEST mode partitions (due to the Inmarsat 4F2 Band C antenna replacement maintenance). PRN126 stopped broadcasting in SoL mode on 26/03/2013 at around 10:00 UTC and started broadcasting in TEST mode on 26/03/2013 at 14:24 UTC. PRN124 started broadcasting in SoL mode on 22/03/2013 at around 14:00 UTC. In this section, for the month of March 2013, the figures provided for PRN126 correspond in fact to the following combination: PRN126 from 01/03/2013 to 25/03/2013 and PRN124 from 26/03/2013 to 31/03/2013.

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

- *PRN120 (EGNOS OP): 98.87%*
- *PRN126 (EGNOS OP): 99.02%*
- *EGNOS OP (at least one SIS): 99.16%*



	Apr-12	May-12	Jun-12	Jul-12	Aug-12	Sep-12	Oct-12	Nov-12	Dec-12	Jan-13	Feb-13	Mar-13
PRN120	98,27	99,96	89,76	99,86	99,81	99,97	99,97	99,99	100	99,21	99,75	99,73
PRN126	100	99,99	89,62	99,99	99,98	99,85	99,99	99,83	100	99,91	99,99	98,91
OP SIS	100	99,99	89,77	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 on the number of SIS outages (also called interruptions) per PRN. From a system point of view, a distinction is made between short interruptions (below 4 minutes) due to NLES switches and longer interruptions due to system issues or maintenance/deployment activities

Due to the GEO swap performed in March 2013 for testing new antennae for INM4F2, the 3 EGNOS GEO (PRN120, PRN124 and PRN126) have been used to broadcast EGNOS_OP signal for at least a subset of the reported period.

The following figures show the number of short and long PRN interruptions over the period.

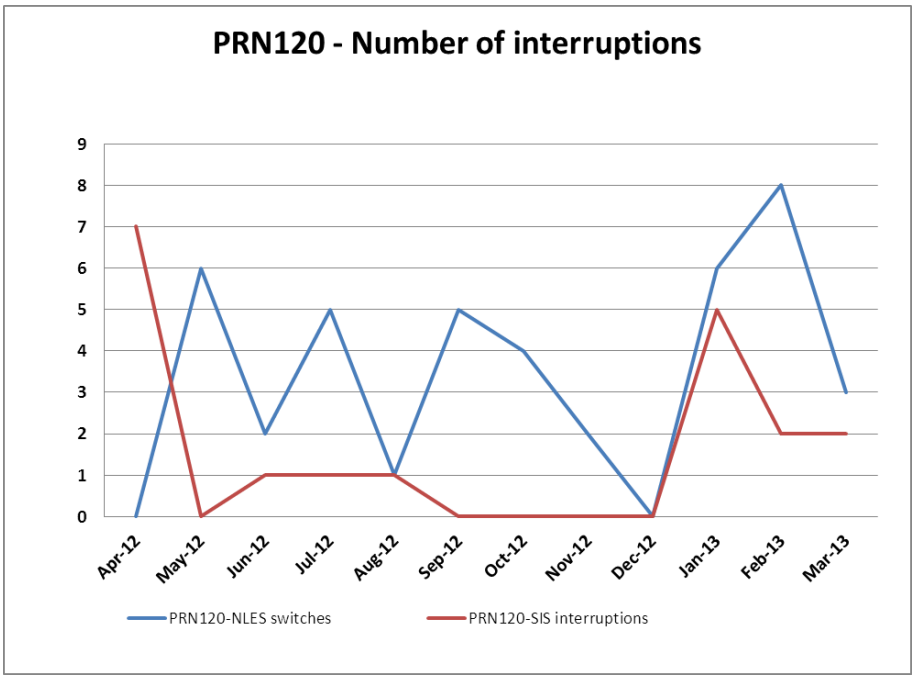


Figure 2: Number of SIS interruptions on PRN120

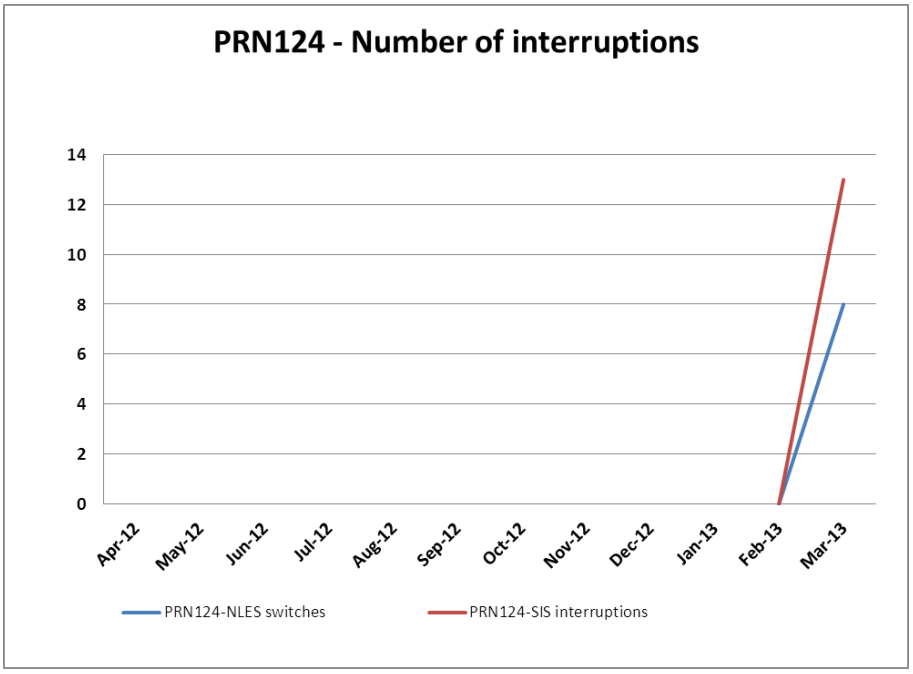


Figure 3: Number of SIS interruptions on PRN 124

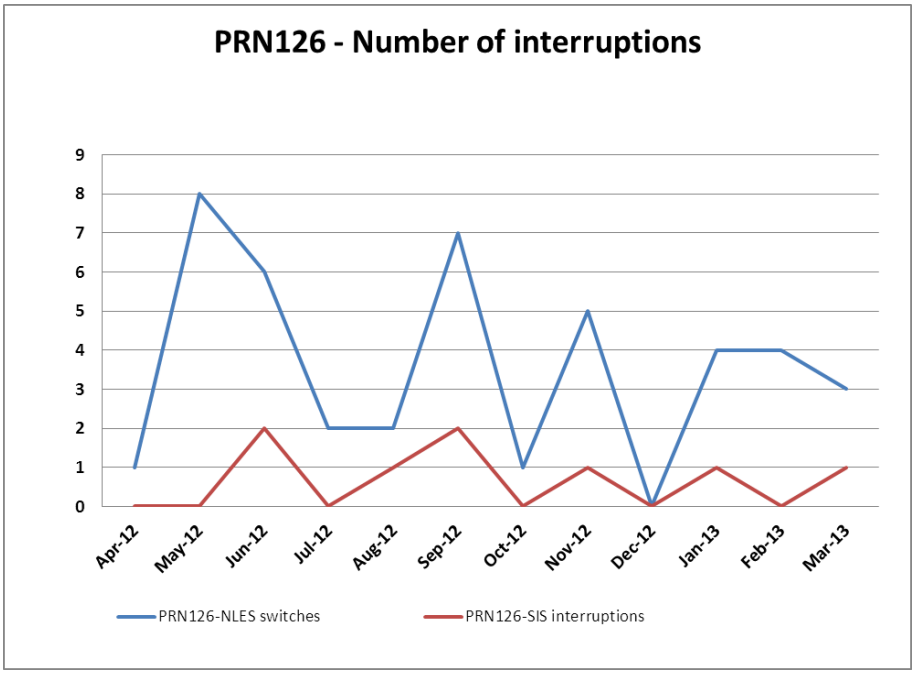


Figure 4: Number of SIS interruptions on PRN126

3.2 Open Service (OS)

3.2.1 RIMS Monitoring Network

The map below shows the location of the deployed RIMS:

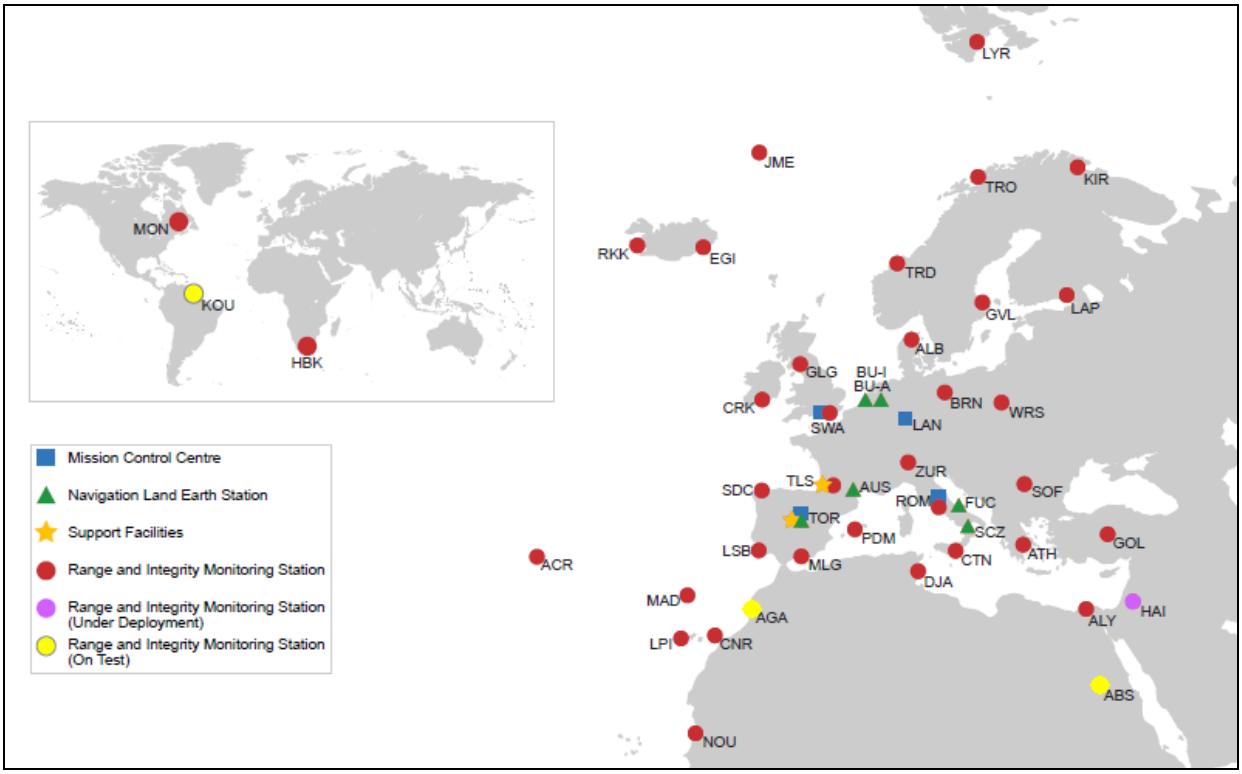


Figure 3: RIMS Locations

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 a subset of RIMS belonging to EGNOS system.

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

Table 1: List of RIMS sites where performances are reported.

3.2.2 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.*

Accuracy is a measure of the position error, which is the difference between the estimated position and the actual position. Accuracy is measured at the RIMS sites listed in Table 1.

Table 2 and Table 3 provide the monthly values over the reported period for Horizontal and Vertical Accuracy while using EGNOS message broadcast by PRN120 and PRN126[3] respectively.

Accuracy (95%) PRN 120		apr-12	may12	jun-12	jul-12	aug-12	sep-12	oct-12	nov-12	dec-12	jan-13	feb-13	mar13	Mean
ALB	HPE	0,6	0,6	0,6	0,6	0,6	0,7	0,8	0,8	0,8	0,7	0,7	0,7	0,7
	VPE	1,3	1,2	1,1	1,1	1,2	1,2	1,3	1,3	1,2	1,3	1,3	1,4	1,2
BRN	HPE	0,7	0,7	0,7	0,7	0,7	0,8	0,8	0,8	0,8	0,9	0,8	0,8	0,8
	VPE	1,2	1,2	1,2	1,2	1,2	1,1	1,4	1,4	1,1	1,1	1,1	1,1	1,2
CTN	HPE	1	1,1	1	1	0,9	1,1	1	1	1	0,8	0,8	0,9	1
	VPE	1,3	1,5	1,5	1,5	1,5	1,3	1,5	1,5	1,5	1,4	1,4	1,4	1,4
CRK	HPE	0,8	0,9	0,9	0,8	0,8	0,8	0,8	0,9	1	1	0,9	0,9	0,9
	VPE	1,1	1,2	1	1,1	1,1	1,1	1,2	1,2	1,1	1,3	1,4	1,3	1,2

[3] The results presented correspond to PRN126 except from 26/03/2013 to 31/03/2013, which correspond to PRN124.

Accuracy (95%) PRN 120		apr-12	may12	jun-12	jul-12	aug-12	sep-12	oct-12	nov-12	dec-12	jan-13	feb-13	mar13	Mean
WRS	HPE	0,8	0,8	0,8	0,8	0,8	0,9	0,9	0,8	0,9	0,9	0,9	0,9	0,9
	VPE	1,4	1,5	1,4	1,4	1,3	1,2	1,6	1,6	1,3	1,3	1,3	1,3	1,4
GLG	HPE	0,7	0,8	0,8	0,7	0,7	0,8	0,9	1	1	0,9	0,9	0,8	0,8
	VPE	1,2	1,3	1,1	1,1	1,2	1,3	1,3	1,3	1,2	1,3	1,4	1,4	1,3
LSB	HPE	1,2	1,2	1,1	1,1	1	1,2	1,1	1,2	1,1	1,2	1,2	1,3	1,1
	VPE	1,6	1,6	1,6	1,6	1,6	1,8	1,9	1,7	1,4	1,5	1,4	1,6	1,6
SWA	HPE	1	1	1	1	1	1,1	1	1,1	1,1	1,1	1,1	1,1	1,1
	VPE	1,4	1,4	1,4	1,4	1,5	1,5	1,5	1,5	1,4	1,5	1,5	1,6	1,5
MAD	HPE	1,7	1,3	1,2	1,1	1,1	1,3	1,8	1,6	1,1	1,3	1,3	1,4	1,3
	VPE	2	1,8	1,7	1,5	1,5	1,8	2,1	2,1	1,8	1,8	1,6	1,7	1,8
MLG	HPE	1	1,1	1,1	1	0,9	1	1,1	1	0,9	1	1	1,1	1
	VPE	1,2	1,4	1,3	1,3	1,3	1,3	1,5	1,3	1,1	1,1	1,1	1,2	1,3
PDM	HPE	0,8	0,8	0,8	0,8	0,7	0,8	0,8	0,8	0,8	0,6	0,7	0,8	0,8
	VPE	1	1,1	1,1	1	1	1	1,2	1,2	1	1	0,9	1	1
ROM	HPE	0,8	0,9	0,8	0,8	0,8	0,8	0,8	0,8	0,7	0,7	0,7	0,8	0,8
	VPE	1,2	1,3	1,3	1,2	1,2	1,2	1,2	1,2	1,3	1,2	1,2	1,2	1,2
SDC	HPE	0,9	1	1	1	0,9	0,9	1	1	1	1	0,9	1,1	1
	VPE	1	1,1	1,1	1,1	1,2	1,3	1,3	1,3	1,1	1,1	1,1	1,1	1,2
GVL	HPE	0,7	0,8	0,7	0,7	0,7	0,7	0,8	0,9	0,8	0,8	0,7	0,7	0,8
	VPE	1,5	1,5	1,3	1,4	1,4	1,4	1,5	1,6	1,5	1,5	1,6	1,6	1,5
TLS	HPE	0,8	0,8	0,8	0,8	0,8	0,7	0,8	0,8	0,8	0,8	0,7	0,8	0,8
	VPE	1	1,1	1	1,1	1	1,1	1,2	1,1	1	1	1	1	1,1
TRD	HPE	0,8	0,8	0,7	0,7	0,7	0,8	0,9	1	0,8	0,8	0,7	0,8	0,8
	VPE	1,4	1,4	1,3	1,3	1,3	1,4	1,6	1,7	1,5	1,6	1,6	1,6	1,5
TRO	HPE	1,1	1,1	1,1	1,1	1	1,2	1,4	1,4	1	1,2	1,1	1,2	1,2
	VPE	2,2	2,2	2,1	2,1	2,1	2,3	2,5	2,6	2,3	2,3	2,3	2,4	2,3
ZUR	HPE	0,7	0,8	0,8	0,8	0,8	0,8	0,8	0,8	0,9	0,9	0,8	0,8	0,8
	VPE	1,1	1,1	1,1	1,1	1	1,1	1,2	1,3	1,1	1,1	1	1,2	1,1

Table 2: Horizontal/Vertical Accuracy at RIMS-A sites for PRN120 (in meters).

Accuracy (95%) PRN 126		apr-12	may12	jun-12	jul-12	aug-12	sep-12	oct-12	nov-12	dec-12	jan-13	feb-13	mar13	Mean
ALB	HPE	0,6	0,6	0,6	0,6	0,6	0,7	0,8	0,8	0,8	0,7	0,7	0,7	0,7
	VPE	1,3	1,2	1,1	1,1	1,2	1,2	1,3	1,3	1,1	1,3	1,3	1,3	1,2
BRN	HPE	0,7	0,7	0,7	0,7	0,7	0,8	0,8	0,8	0,8	0,9	0,8	0,8	0,8
	VPE	1,2	1,2	1,2	1,2	1,2	1,1	1,4	1,4	1,1	1,1	1,1	1,1	1,2
CTN	HPE	1	1,1	1	1	0,9	1,1	1	1	1	0,7	0,8	0,9	1
	VPE	1,3	1,5	1,5	1,5	1,5	1,4	1,5	1,5	1,5	1,4	1,4	1,4	1,5
CRK	HPE	0,8	0,9	0,9	0,8	0,8	0,8	0,9	0,9	1	1	0,9	0,9	0,9
	VPE	1,1	1,2	1	1,1	1,1	1,1	1,2	1,2	1,1	1,3	1,4	1,3	1,2
WRS	HPE	0,8	0,8	0,8	0,8	0,8	0,9	0,9	0,8	0,9	0,9	0,9	0,9	0,9
	VPE	1,4	1,5	1,4	1,4	1,3	1,2	1,6	1,6	1,3	1,3	1,3	1,3	1,4
GLG	HPE	0,7	0,8	0,8	0,7	0,7	0,8	0,9	1	1	0,9	0,9	0,8	0,8
	VPE	1,2	1,3	1,1	1,1	1,2	1,3	1,3	1,3	1,2	1,3	1,4	1,4	1,3
LSB	HPE	1,2	1,2	1,1	1,1	1	1,2	1,1	1,2	1,1	1,2	1,2	1,3	1,1
	VPE	1,6	1,6	1,5	1,6	1,6	1,8	1,9	1,7	1,4	1,5	1,4	1,6	1,6
SWA	HPE	1	1	1	1	1	1,1	1,1	1,1	1,1	1,1	1,1	1,1	1,1
	VPE	1,4	1,4	1,4	1,4	1,5	1,5	1,5	1,5	1,4	1,5	1,5	1,6	1,5
MAD	HPE	1,7	1,3	1,2	1,1	1,1	1,3	1,8	1,6	1,1	1,3	1,3	1,4	1,3
	VPE	2	1,8	1,7	1,5	1,5	1,8	2,1	2,2	1,8	1,8	1,6	1,7	1,8
MLG	HPE	1	1,1	1,1	1	0,9	1	1,1	1	0,9	1	1	1,1	1
	VPE	1,2	1,4	1,3	1,3	1,3	1,3	1,5	1,3	1,1	1,1	1,1	1,2	1,3
PDM	HPE	0,8	0,8	0,8	0,8	0,7	0,8	0,8	0,8	0,8	0,6	0,7	0,8	0,8
	VPE	1	1,1	1,1	1	1	1	1,2	1,2	1	1	0,9	1	1
ROM	HPE	0,8	0,9	0,8	0,8	0,8	0,8	0,8	0,8	0,7	0,7	0,7	0,8	0,8
	VPE	1,2	1,3	1,3	1,2	1,2	1,2	1,3	1,2	1,3	1,2	1,2	1,2	1,2
SDC	HPE	0,9	1	1	1	0,9	0,9	1	1	1	1	0,9	1,1	1
	VPE	1	1,1	1,1	1,1	1,2	1,3	1,3	1,3	1,1	1,1	1,1	1,1	1,2
GVL	HPE	0,7	0,8	0,7	0,7	0,7	0,7	0,8	0,9	0,8	0,8	0,7	0,7	0,8
	VPE	1,5	1,5	1,3	1,4	1,4	1,4	1,6	1,6	1,5	1,5	1,6	1,6	1,5
TLS	HPE	0,8	0,8	0,8	0,8	0,8	0,7	0,8	0,8	0,8	0,8	0,7	0,8	0,8
	VPE	1	1,1	1	1,1	1	1,1	1,2	1,1	1	1	1	1	1,1
TRD	HPE	0,8	0,8	0,7	0,7	0,7	0,8	0,9	1	0,8	0,8	0,7	0,8	0,8
	VPE	1,4	1,4	1,3	1,3	1,3	1,4	1,6	1,7	1,5	1,6	1,6	1,6	1,5

Accuracy (95%) PRN 126		apr-12	may12	jun-12	jul-12	aug-12	sep-12	oct-12	nov-12	dec-12	jan-13	feb-13	mar13	Mean
TRO	HPE	1,1	1,1	1,1	1,1	1	1,2	1,4	1,4	1	1,2	1,1	1,2	1,2
	VPE	2,2	2,2	2,1	2,1	2,1	2,3	2,6	2,6	2,3	2,3	2,3	2,4	2,3
ZUR	HPE	0,7	0,8	0,8	0,8	0,8	0,8	0,8	0,8	0,9	0,9	0,8	0,8	0,8
	VPE	1,1	1,1	1,1	1,1	1	1,1	1,2	1,3	1,1	1,1	1	1,2	1,1

Table 3: Horizontal/Vertical Accuracy at RIMS-A sites for PRN126 (in meters).

The horizontal accuracy results for all stations remained below 1.3 meters (95%), and the vertical accuracy below 2.3 meters (95%), which represents a very good level of accuracy.

This information can be complemented with the histogram of HNSE and VNSE for all those sites listed in Table 1 during the full period reported. Note that the results for the two GEOs have been included in the same plot, what offers a representative figure of what users may have experienced.

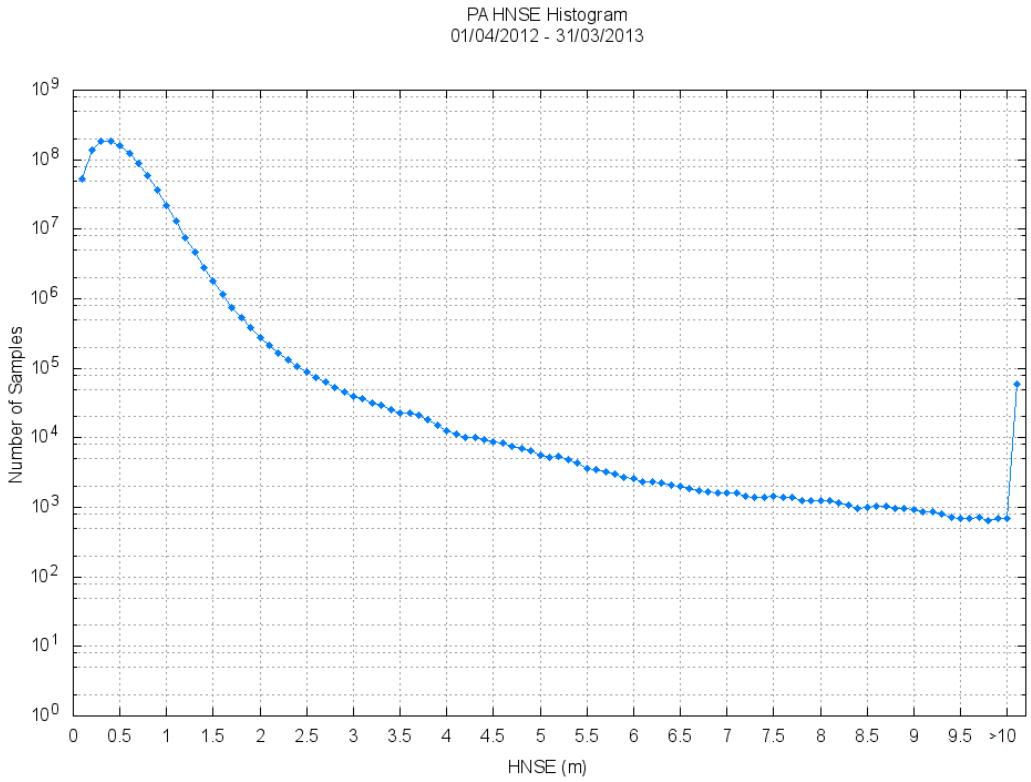


Figure 4: HNSE Histogram

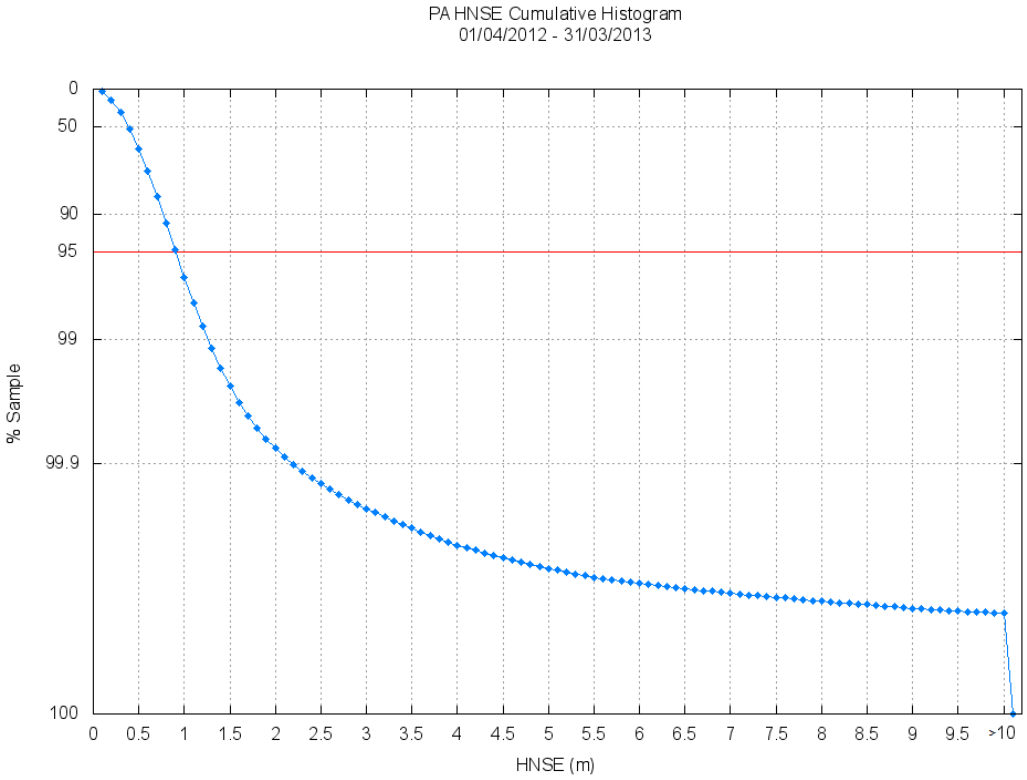


Figure 5: HNSE Cumulative Probability

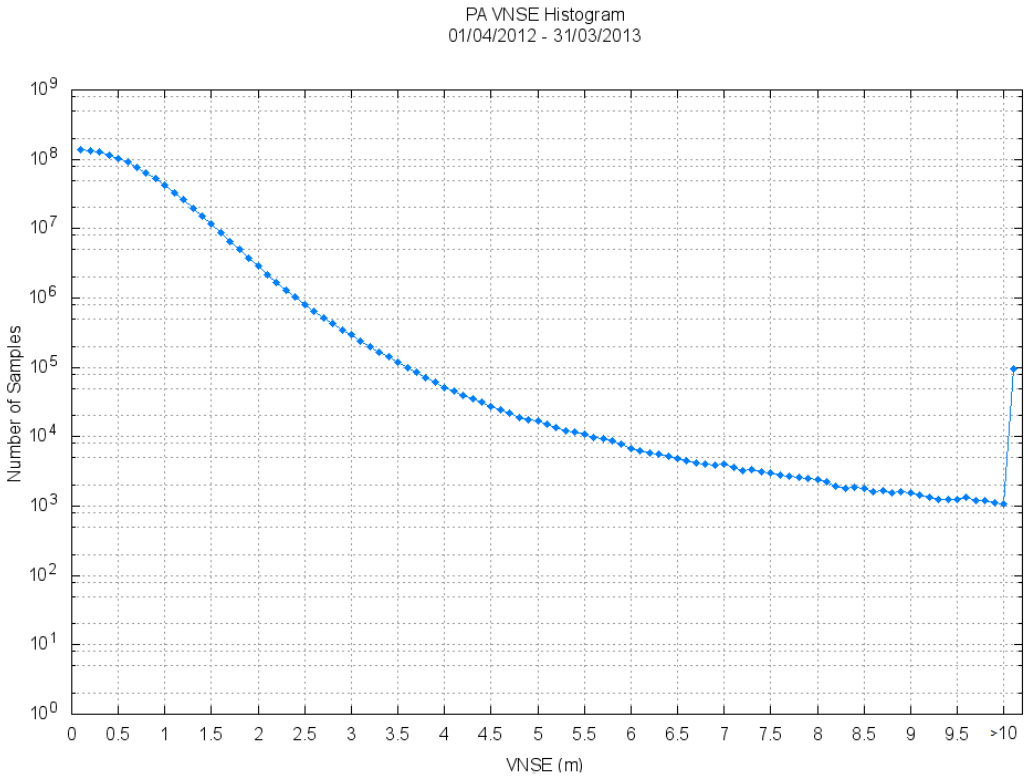


Figure 6: VNSE Histogram

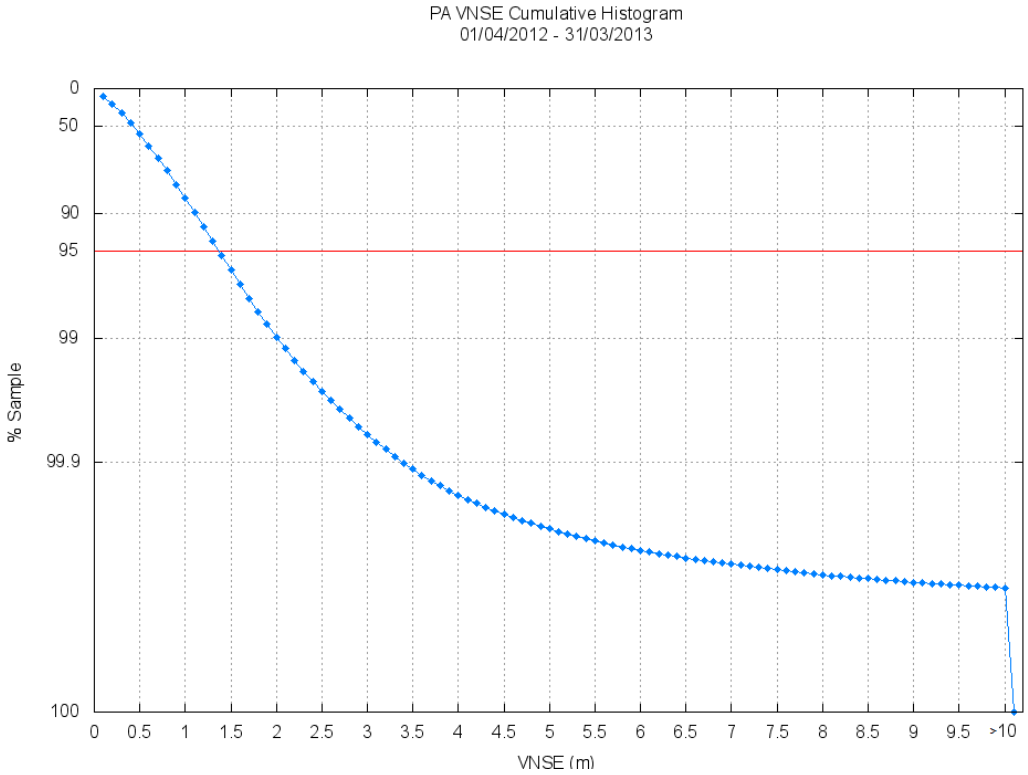


Figure 7: VNSE Cumulative Probability

As can be observed, the cumulative results confirm the good values observed in the stations. The 95th percentile is below 1 meter in the horizontal domain and below 1.5 meters in the vertical one. In fact, 99.9% of the samples lie below 2.5/3.5 meters in the horizontal/vertical domain.

3.2.3 Open Service Availability

EGNOS OS Availability performance *is defined in the present 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 meters for horizontal error and 4 meters for vertical error) over the total number of samples with valid PA navigation solution.*

The following tables provide the values measured using PRN120 and PRN126[4] respectively[5].

PRN 120	apr-12	may12	jun-12	jul-12	aug-12	sep-12	oct-12	nov-12	dec-12	jan-13	feb-13	mar13	Mean
MLG	99,79%	99,93%	99,97%	100%	99,97%	99,97%	99,87%	99,96%	99,99%	99,99%	99,98%	99,95%	99,95%
SDC	99,98%	99,98%	99,98%	100%	99,97%	99,97%	99,99%	100%	99,99%	99,99%	99,97%	99,99%	99,98%
PDM	99,86%	99,97%	99,93%	100%	99,98%	99,98%	99,87%	99,98%	100%	100%	99,97%	100%	99,96%
LSB	99,88%	99,72%	99,95%	100%	99,97%	99,97%	99,98%	99,91%	99,96%	99,96%	99,99%	99,93%	99,93%
TRD	99,99%	100%	99,99%	100%	100%	100%	99,95%	99,71%	99,92%	99,92%	100%	99,92%	99,95%
CRK	100%	99,99%	99,99%	100%	100%	100%	100%	99,97%	99,99%	99,99%	99,99%	100%	99,99%
ZUR	100%	100%	100%	100%	99,98%	99,98%	99,99%	99,99%	100%	100%	99,99%	100%	99,99%
BRN	100%	100%	100%	100%	99,99%	99,99%	99,99%	99,97%	99,97%	99,97%	99,98%	100%	99,99%
TLS	100%	100%	100%	100%	99,97%	99,97%	99,91%	100%	100%	100%	100%	100%	99,99%
TRO	99,77%	99,85%	99,76%	99,80%	99,93%	99,93%	99,17%	98,68%	99,82%	99,82%	99,86%	99,33%	99,64%
SWA	100%	100%	100%	99,98%	99,99%	99,99%	100%	99,98%	99,94%	99,94%	99,99%	100%	99,98%
ROM	99,98%	99,98%	99,90%	99,99%	99,99%	99,99%	99,97%	99,98%	99,99%	99,99%	99,96%	100%	99,97%
ALB	100%	100%	100%	100%	100%	100%	100%	99,97%	99,92%	99,92%	99,99%	100%	99,98%
GLG	100%	100%	100%	100%	100%	100%	100%	99,97%	99,98%	99,98%	99,99%	100%	99,99%
GVL	100%	99,99%	100%	100%	100%	100%	100%	99,84%	99,87%	99,87%	99,97%	99,99%	99,96%
WRS	99,99%	99,99%	99,99%	99,99%	100%	100%	99,96%	99,93%	99,99%	99,99%	99,98%	99,99%	99,98%
CTN	99,81%	99,97%	100%	99,99%	99,99%	99,99%	99,93%	99,96%	100%	100%	99,98%	100%	99,97%
MAD	97,54%	99,29%	99,98%	99,98%	99,91%	99,91%	98,57%	99,20%	99,91%	99,86%	99,78%	99,25%	99,43%

Table 4: OS Availability at RIMS-A sites for PRN120

PRN 126	apr-12	may12	jun-12	jul-12	aug-12	sep-12	oct-12	nov-12	dec-12	jan-13	feb-13	mar13	Mean
MLG	99,78%	99,93%	99,99%	100%	99,97%	99,97%	99,89%	99,96%	99,98%	99,98%	99,99%	99,96%	99,95%
SDC	99,98%	99,97%	99,98%	100%	99,97%	99,97%	99,99%	100%	99,99%	99,99%	99,96%	99,99%	99,98%
PDM	99,87%	99,97%	99,95%	100%	99,98%	99,98%	99,87%	99,98%	100%	100%	99,97%	100%	99,96%
LSB	99,88%	99,73%	99,95%	100%	99,97%	99,97%	99,97%	99,90%	99,97%	99,97%	99,99%	99,93%	99,94%
TRD	99,99%	100%	99,99%	100%	100%	100%	99,95%	99,73%	99,91%	99,91%	99,98%	99,92%	99,95%

[4] The results presented correspond to PRN126 except from 26/03/2013 to 31/03/2013, which correspond to PRN124.

[5] The loss of OS Availability caused by the SIS outages from 23/06/2012 to 26/06/2012 is not included in these values.

PRN 126	apr-12	may12	jun-12	jul-12	aug-12	sep-12	oct-12	nov-12	dec-12	jan-13	feb-13	mar13	Mean
CRK	100%	99,99%	100%	100%	99,98%	99,98%	100%	99,97%	99,99%	99,99%	99,99%	100%	99,99%
ZUR	100%	100%	100%	100%	99,97%	99,97%	99,99%	100%	100%	100%	99,99%	100%	99,99%
BRN	100%	99,99%	100%	100%	100%	100%	100%	99,97%	99,94%	99,94%	99,98%	100%	99,98%
TLS	100%	100%	100%	100%	99,97%	99,97%	99,93%	100%	100%	100%	100%	100%	99,99%
TRO	99,77%	99,84%	99,77%	99,79%	99,92%	99,92%	99,12%	98,76%	99,79%	99,79%	99,86%	99,29%	99,63%
SWA	100%	100%	100%	99,98%	99,99%	99,99%	99,99%	99,98%	99,91%	99,91%	99,99%	99,99%	99,98%
ROM	99,97%	99,97%	99,89%	99,99%	99,99%	99,99%	99,97%	99,98%	99,99%	99,99%	99,96%	99,99%	99,97%
ALB	100%	100%	100%	100%	100%	100%	100%	99,97%	99,91%	99,91%	99,98%	99,99%	99,98%
GLG	100%	100%	100%	100%	99,99%	99,99%	99,99%	99,98%	99,94%	99,94%	99,99%	99,99%	99,98%
GVL	100%	99,99%	100%	100%	100%	100%	100%	99,83%	99,92%	99,92%	99,98%	99,99%	99,97%
WRS	99,99%	99,96%	99,99%	100%	100%	100%	99,96%	99,94%	99,99%	99,99%	99,98%	99,99%	99,98%
CTN	99,81%	99,96%	100%	100%	99,99%	99,99%	99,94%	99,97%	100%	100%	99,98%	100%	99,97%
MAD	97,52%	99,30%	100%	99,99%	99,90%	99,90%	98,57%	99,17%	99,91%	99,87%	99,81%	99,25%	99,43%

Table 5: 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 in the figure:

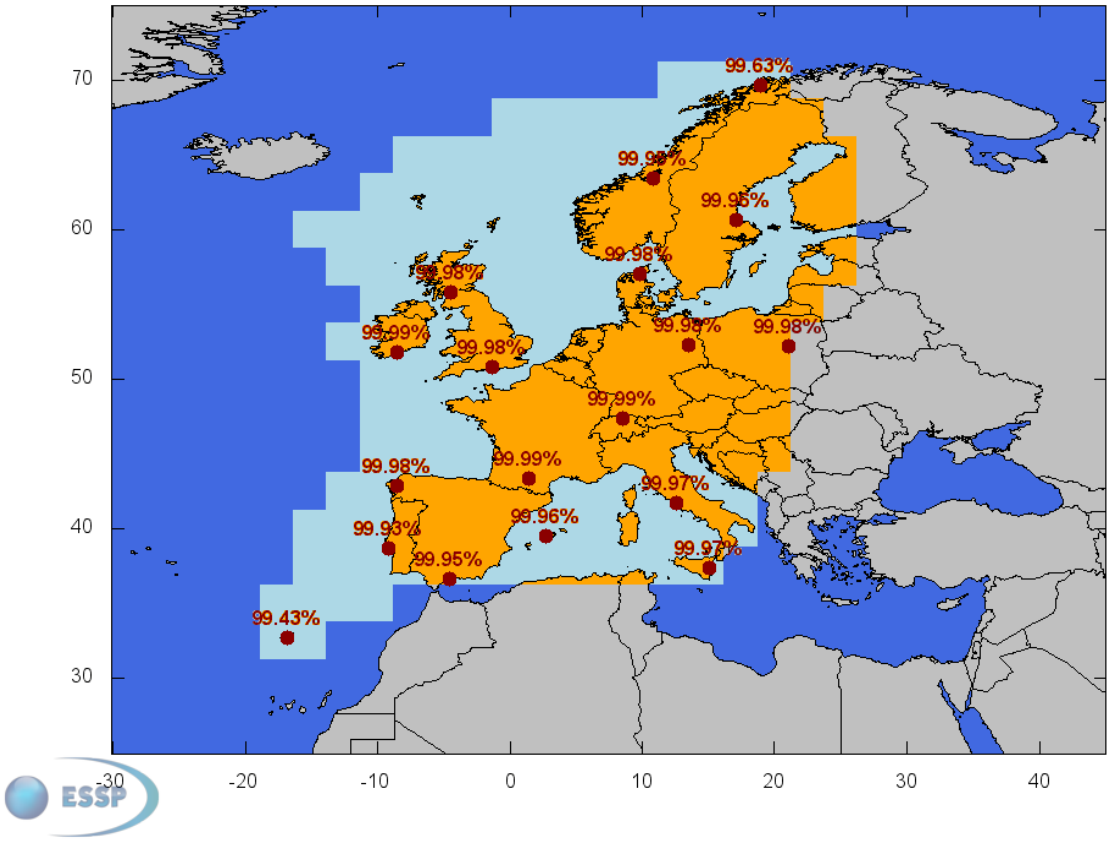


Figure 8: OS average availability for the RIMS stations

3.3 SoL Service - Non Precision Approach (NPA)

The receiver network used to report NPA performances corresponds to a subset of RIMS belonging to EGNOS system.

Id	Location name	Country	Id	Location name	Country
ACR	RIMS Azores	Portugal	LPI	RIMS La Palma	Spain
ALB	RIMS Aalborg	Denmark	LSB	RIMS Lisbon	Portugal
ALY	RIMS Alexandria	Egypt	MAD	RIMS Madeira	Portugal
ATH	RIMS Athens	Greece	MLG	RIMS Málaga	Spain
BRN	RIMS Berlin	Germany	PDM	RIMS Palma de Mallorca	Spain
CNR	RIMS Canary Isl.	Spain	RKK	RIMS Reykjavik	Iceland
CRK	RIMS Cork	Ireland	ROM	RIMS Roma	Italy
CTN	RIMS Catania	Italy	SDC	RIMS S. de Compostela	Spain
DJA	RIMS Djerba	Tunisia	SOF	RIMS Sofia	Bulgaria
EGI	RIMS Egilsstadir	Iceland	SWA	RIMS Swanwick	United Kingdom
GLG	RIMS Glasgow	United Kingdom	TLS	RIMS Toulouse	France
GOL	RIMS Golbasi	Turkey	TRD	RIMS Trondheim	Norway
GVL	RIMS Gävle	Sweden	TRO	RIMS Tromsoe	Norway
KIR	RIMS Kirkeness	Norway	WRS	RIMS Warsaw	Poland
LAP	RIMS Lappeenranta	Finland	ZUR	RIMS Zürich	Switzerland

Table 6: List of RIMS sites where NPA performances are reported.

3.3.1 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 figures provide NPA availability for the reported period[6], for combined GEO:

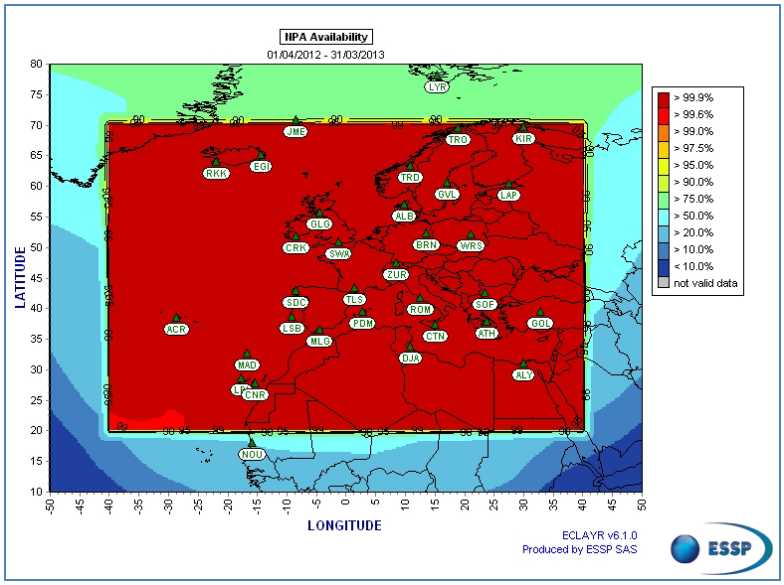


Figure 9: NPA Availability. Period from 01/04/12 to 31/03/13

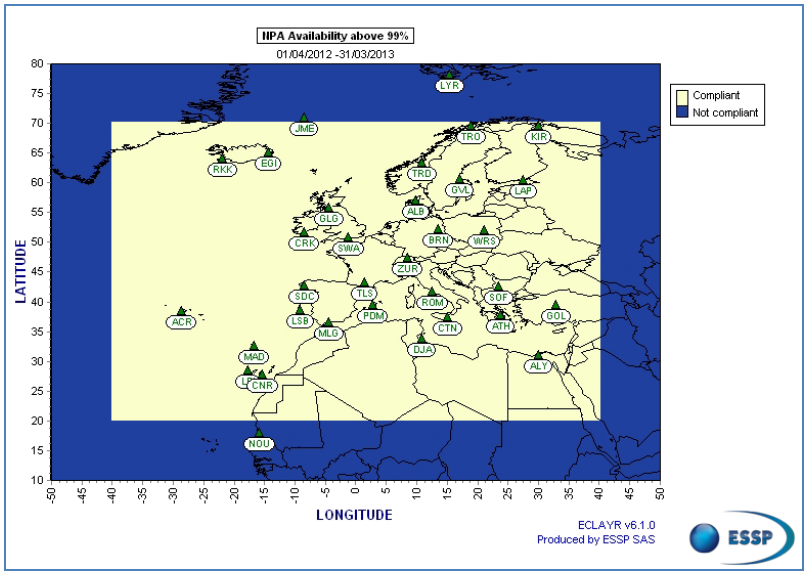


Figure 10: NPA Availability compliance area. Period from 01/04/12 to 31/03/13.

[6] The loss of NPA Availability caused by the SIS outages from 23/06/2012 to 26/06/2012 is not included in these results.

3.3.2 NPA Availability – Achievement Against Target

The following figure provides the map of the service area used as reference. It corresponds to the NPA commitment as included in the SoL Service Definition document in force during that period of time (see http://www.essp-sas.eu/service_definition_documents).

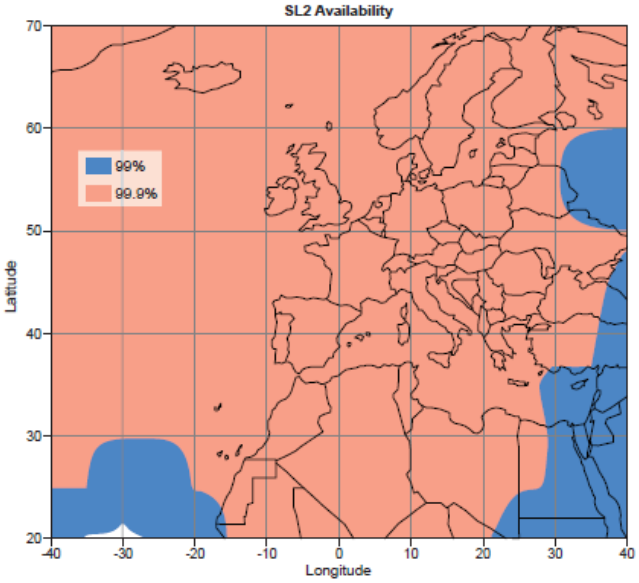


Figure 11: Reference map for NPA Availability

The next figure shows the level of compliance compared to the 99% reference area:

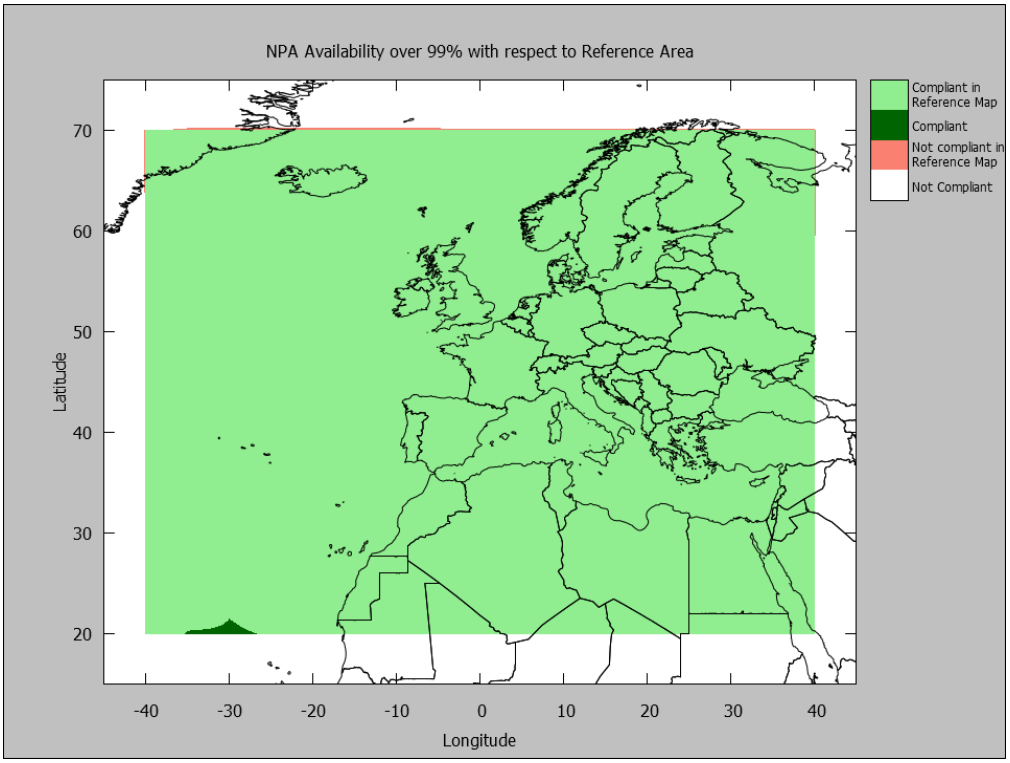


Figure 12: NPA 99% availability compliance area vs. reference area. Period from 01/04/12 to 31/03/13

The previous figure shows that the reference map is achieved in the whole reference area. As can be observed, the limits of the compliance area correspond with the boundaries identified in Message Type 27 (Lat: [20, 70], Lon [-40, 40]).

3.3.3 NPA Availability – Best Performance Measured (over a day)

In the EGNOS service area, as defined by Message Type 27 (Lat: [20, 70], Lon [-40, 40]), the NPA availability has been above 99% for 355 days. August 10th 2012 has been taken as an example.

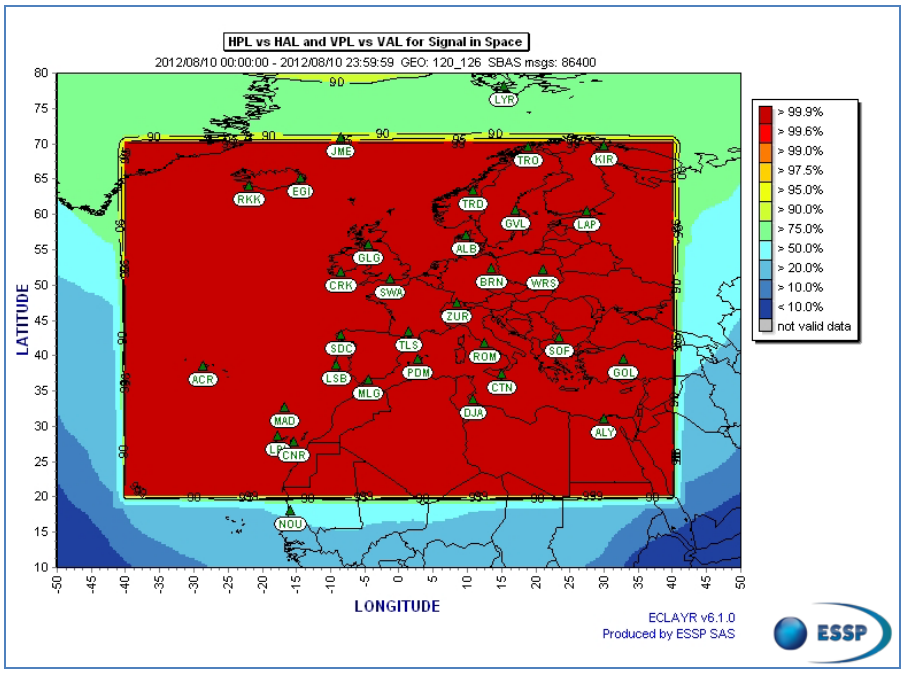


Figure 13: One of the best days for NPA Availability

3.3.4 NPA Availability – Worst Performance Measured (over a day)

Apart from the period spanning June 23rd to 26th 2012, when no SIS was broadcasted by EGNOS, the worst day of NPA availability was the June 17th 2012. On this day, NPA Availability was degraded over the whole ECAC area due to the fact that nearly all GPS satellites were set to DU/NM for 25 minutes, causing a total loss of the SoL service. The NPA availability percentage of compliance during this day was 0%.

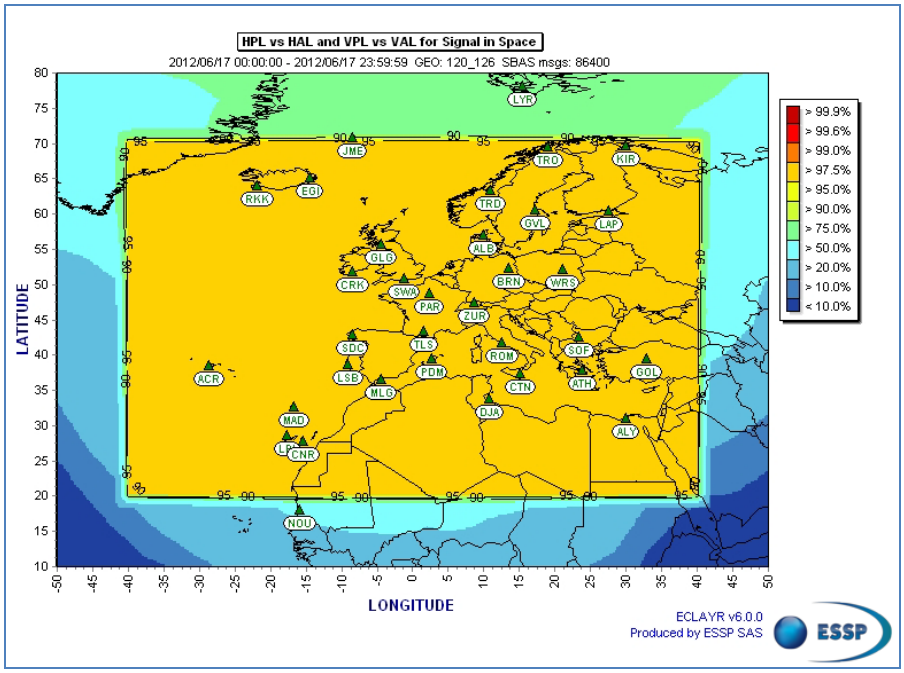


Figure 14: Worst NPA Availability day in the period

3.3.5 NPA Integrity

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

No integrity event has been identified for NPA for any of the monitored sites.

3.3.6 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 following figure provides NPA continuity for the reported period, for combined GEOs:

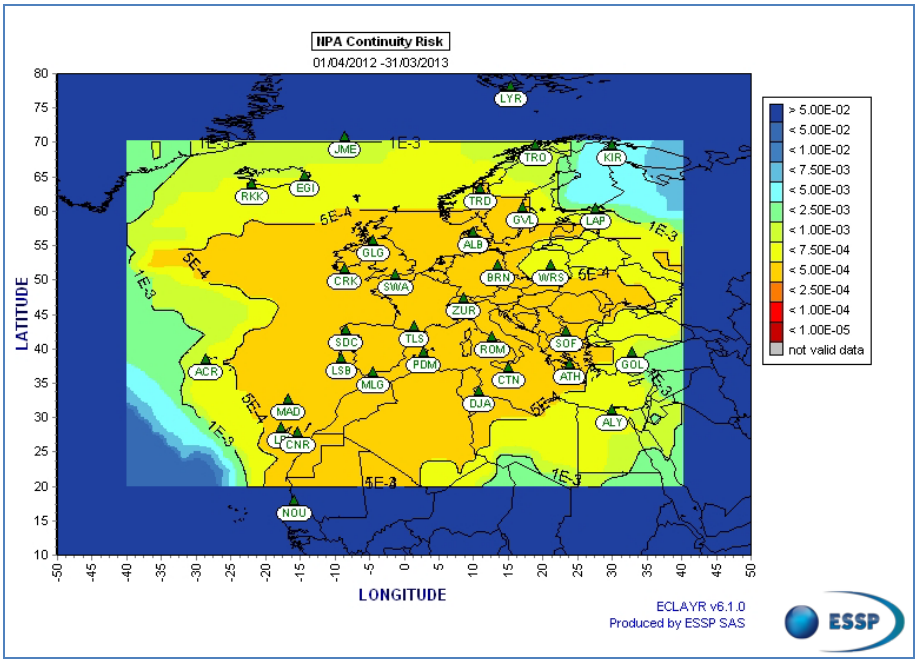


Figure 15: NPA Continuity. Period from 01/04/12 to 31/03/13

3.4 SoL Service - APproach with Vertical guidance (APV-I)

3.4.1 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) is below Alert Limits for this APV-I service (HAL: 40m; VAL: 50m) over the total number of SBAS messages in the period.*

The next figure provides the APV-I Availability maps for the reported period. Note that loss of APV-I Availability caused by the SIS outages from June 23rd to 26th 2012 is not included in these results.

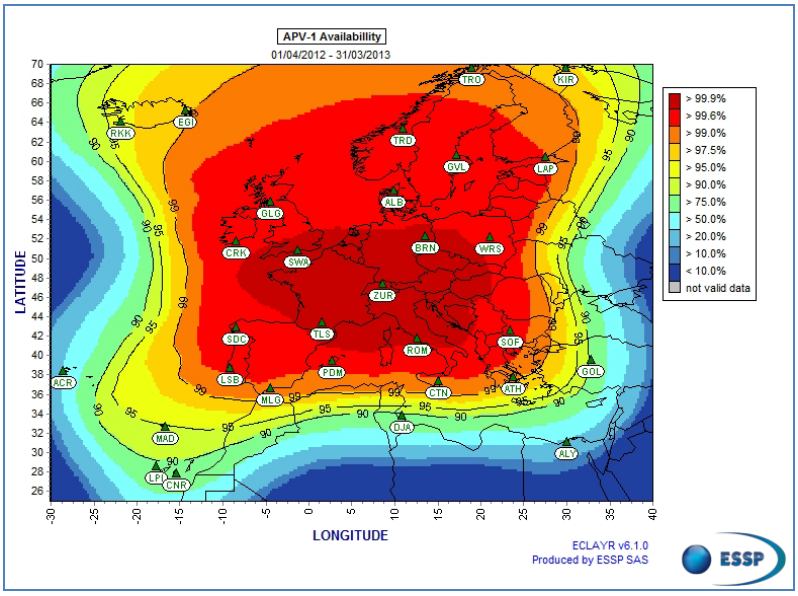


Figure 16: APV-I yearly Availability on combined GEOs (PRN 120&126[7]). Period from 01/04/12 to 31/03/13

[7] The results presented for EGNOS OP2 correspond to PRN126 except from 26/03/2013 to 31/03/2013, which correspond to PRN124

The following figure provides the yearly APV-I 99% availability map.

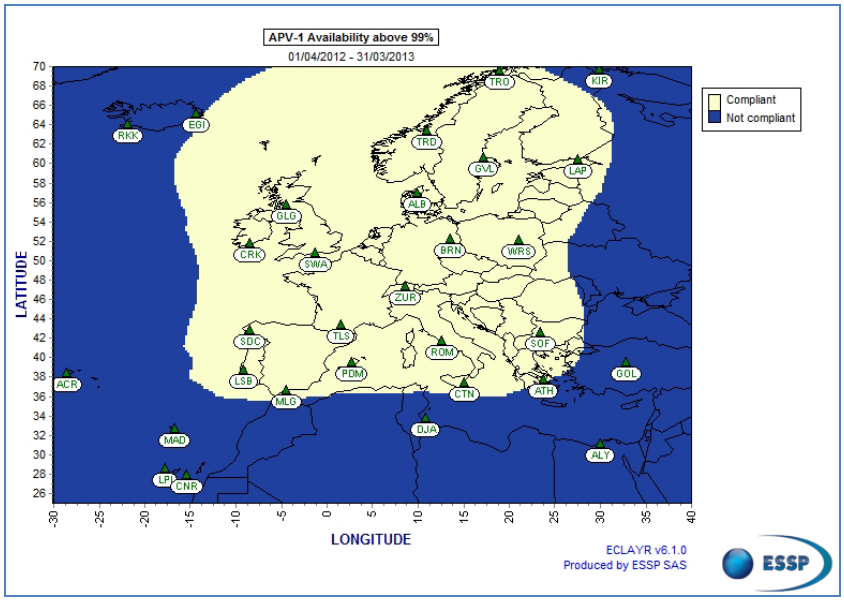


Figure 17: APV-I yearly 99% availability compliance area. Period from 01/04/12 to 31/03/13

The next figure provides, for informative purposes, the equivalent map corresponding to the full period, including the SIS outages that occurred from June 23rd to 26th 2012.

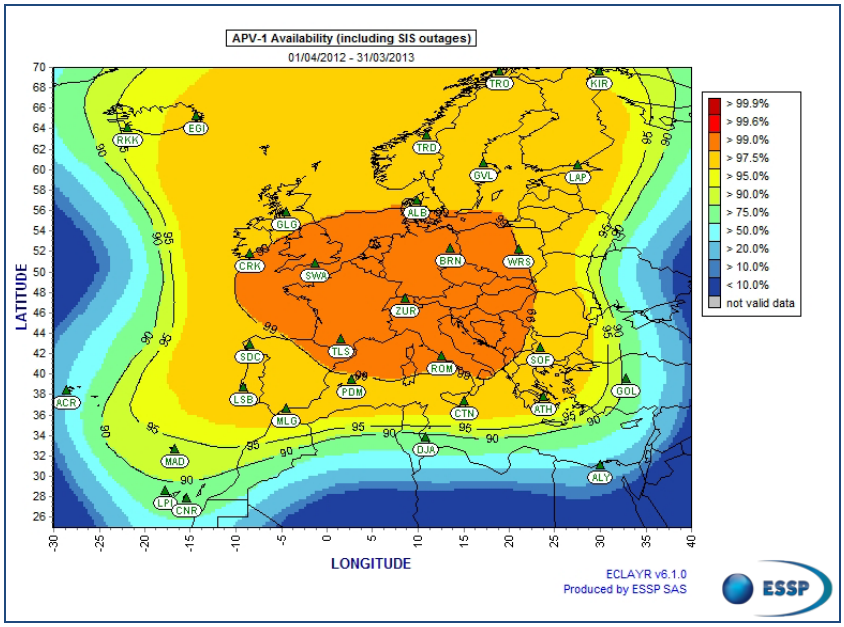


Figure 18: APV-I yearly Availability on combined GEOs (PRN 120&126[8]) – including SIS outage from June 23rd to June 26th 2012

As can be observed, the absence of EGNOS SIS during this 3-day period represents a drop in the yearly APV-I availability results equivalent to a loss of 0.82%. Only those areas in the centre of

[8] The results presented for EGNOS OP2 correspond to PRN126 except from 26/03/2013 to 31/03/2013, which correspond to PRN124

Europe which present a value of APV-I availability close to 100% during the rest of the year, are able to maintain the 99% level when the full period is considered.

3.4.2 APV-I Availability – Achievement Against Target

The following figure provides the map of the service area used as reference. It corresponds to the APV-I commitment as included in the SoL Service Definition document (see http://www.essp-sas.eu/service_definition_documents).

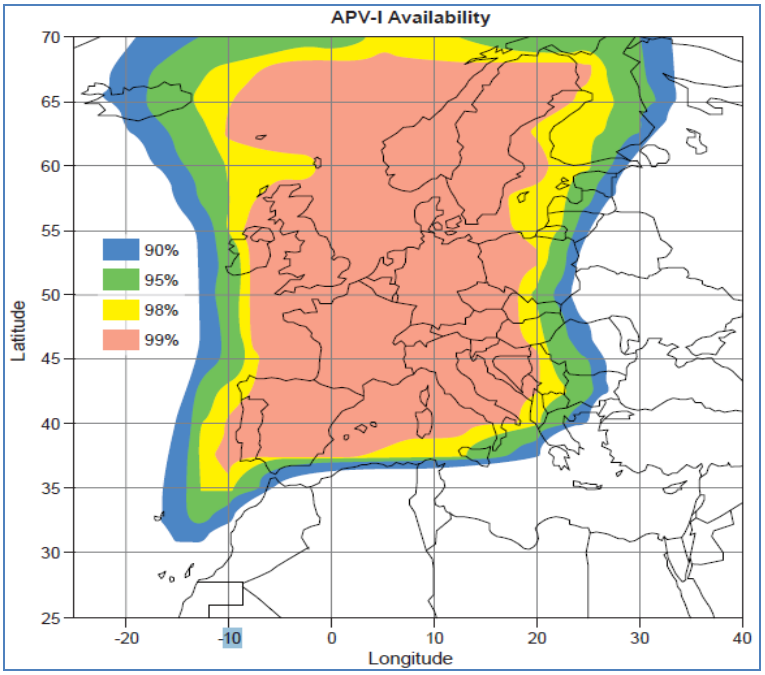


Figure 19: Reference map for APV-I Availability

The next figure shows the level of compliance compared to the reference area:

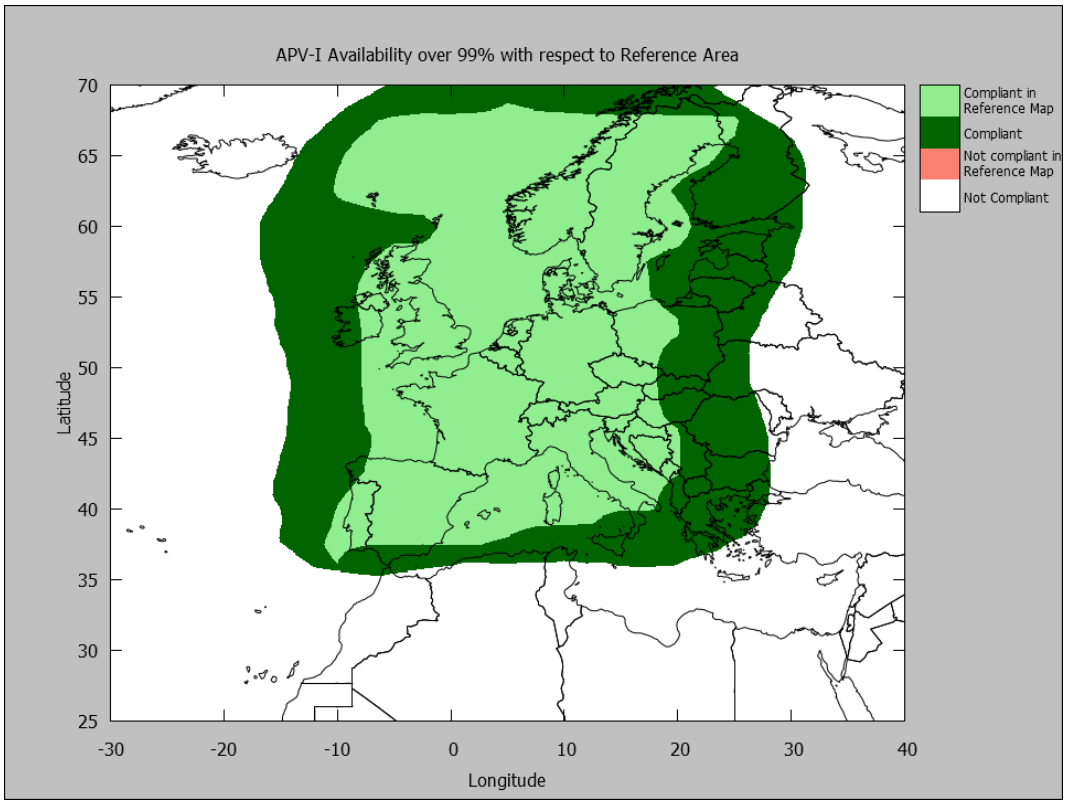


Figure 20: APV-I yearly 99% availability compliance area vs. reference area. Period from 01/04/12 to 31/03/13

The previous figure shows that the reference map is achieved in the whole reference area. The excellent coverage observed in some regions outside of the commitment area must also be noted, which is a consequence of the changes introduced with the deployment of releases 2.3.1p and 2.3.1i (ionosphere monitoring improvement, additional satellites, additional RIMS, etc.)

The following figure provides the percentage of the reference map for which the APV-I availability 99% figure was achieved for each day of the reported period.

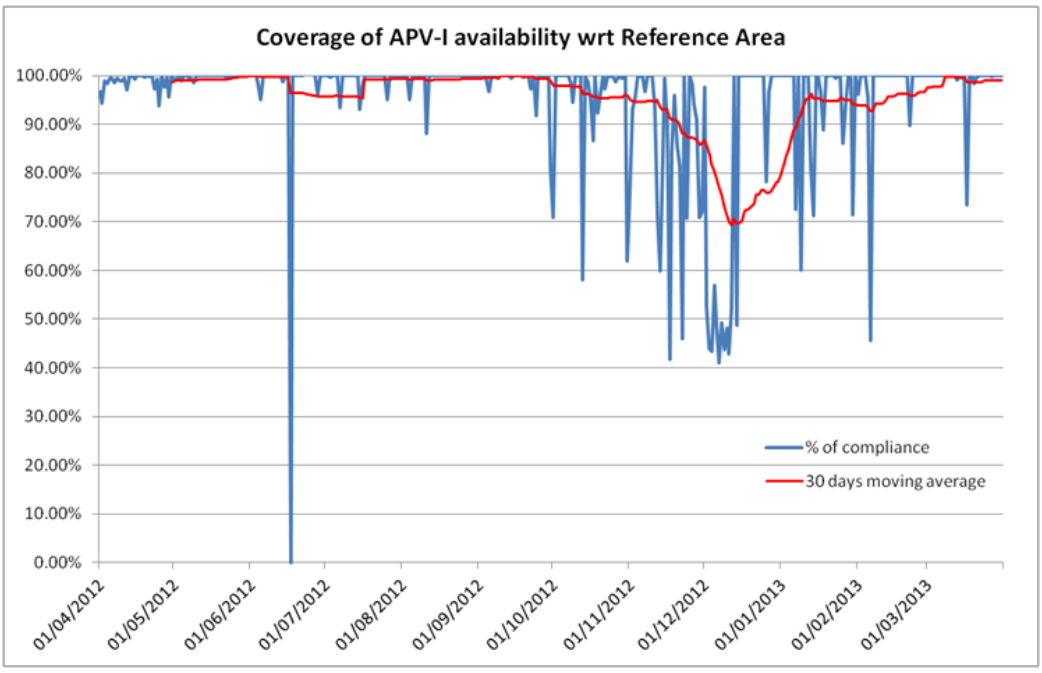


Figure 21: Daily coverage of the 99% APV-I Availability Reference Area over the year

It can be observed that the percentage of compliance is very good during the first 6 months, but after October, it presents higher instability, particularly in the period from November to mid-December.

Note that the 3-day period from June 23rd to 26th 2012 without SIS is not represented in the plot. Removing this period, the date with the lowest compliance area for APV-I Availability is June 17th 2012. On this date, nearly all GPS satellites were set to DU for a few seconds starting at around 00:15. These DU flags were followed by high UDREi and finally by the setting to NM of most SV. This event resulted in a total loss of APV1 service for more than 25 minutes.

3.4.3 APV-I Availability – Best Performance Measured (over a day)

For 303 days (more than 83% of the days), the area in the reference map which reached the target 99% APV-I availability was above 95%. In fact, for 223 days (61% of the days) the percentage of compliance was 100%.

In terms of the 99% availability area, the best day of the period was August 10th 2012:

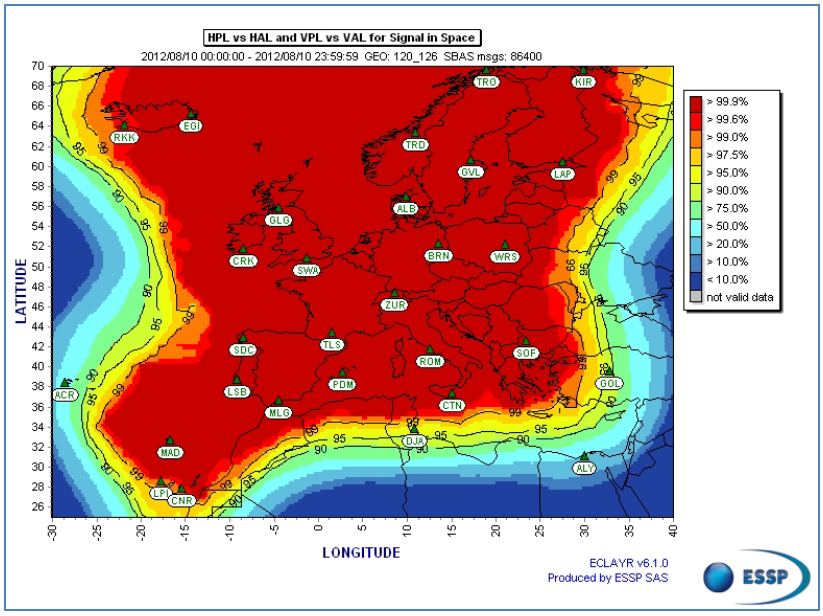


Figure 22: Best day for APV-I Availability.

3.4.4 APV-I Availability – Worst Performance Measured (over a day)

The worst day for APV-I Availability (if we exclude the 3 days without SIS from June 23rd to 26th 2012) was June 17th 2012, in which nearly all GPS satellites were set to DU for more than 25 minutes. On that day, the whole reference area (Figure 19) had APV-I availability below 99%.

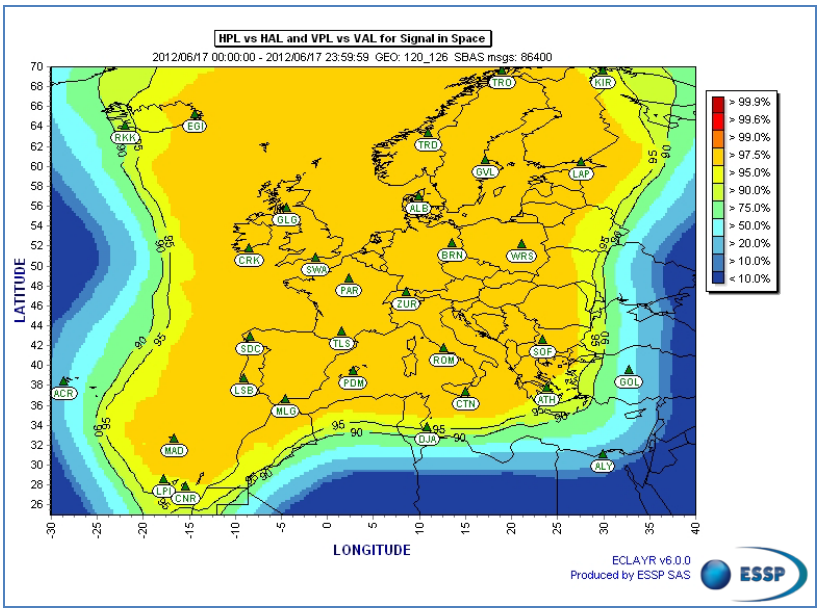


Figure 23: Worst day for APV-I Availability.

3.4.5 APV-I Integrity Events

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

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 the ratio xPE/xPL is over 1; it indicates that a Misleading Information situation has occurred.*

No integrity event has been identified for any receiver of the monitoring network.

The next figures provide the histogram for HSI (Horizontal Safety Index) and VSI (Vertical Safety Index) corresponding to the RIMS sites located inside the APV-I commitment area.

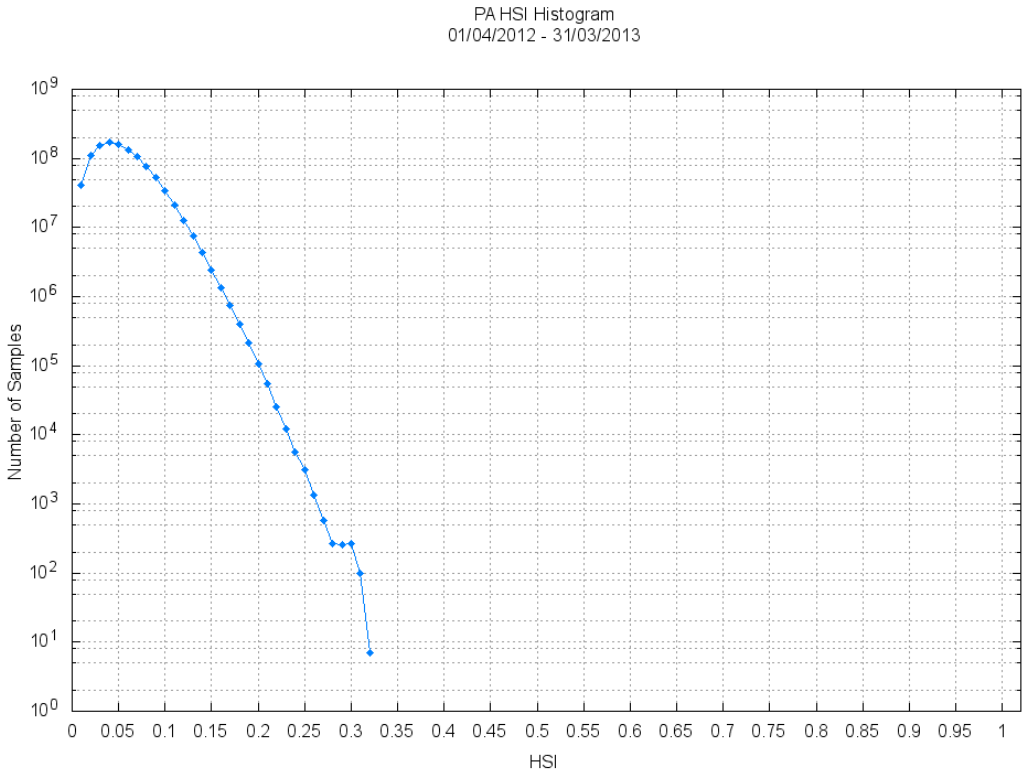


Figure 24: Horizontal safety index Histogram.

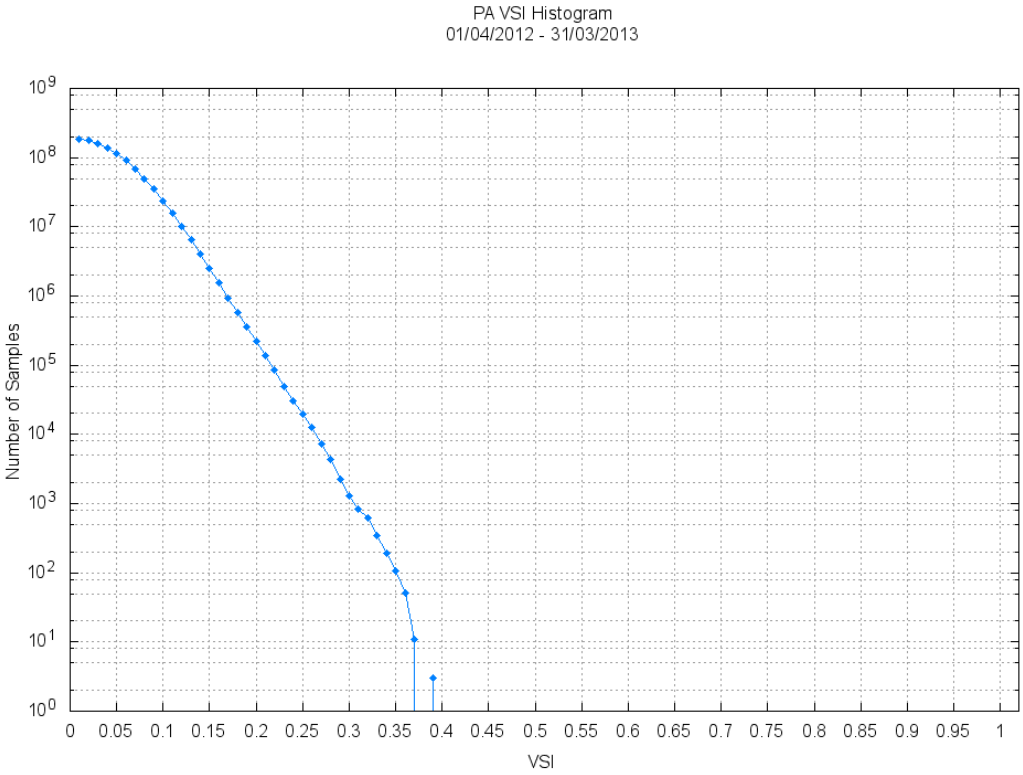


Figure 25: Vertical Safety Index Histogram.

The horizontal and vertical safety indexes remain below 0.4 for all the stations throughout the whole year, which represent a very good integrity margin.

On June 17th 2012, ESSP was notified of the occurrence of an integrity event at the IGS station in Matera, located in the south of Italy. The analysis done by CNES and ESSP have shown, however, that this problem does not represent a real integrity issue, and seems to have been caused by the abnormal reaction of one specific type of (uncertified) receiver, after the upload of the incorrect ephemeris of PRN19.

3.4.6 APV-I Continuity Risk – Yearly Performances

EGNOS APV-I Continuity Risk *is defined as the result of dividing the total number of single continuity breaks using a time-sliding window of 15 seconds by the number of samples with valid and available PA navigation solution.* A *single continuity break occurs if the system is available at one epoch and becomes not available during the following 15 seconds.*

APV-I continuity between April 1st 2012 and March 31st 2013 is reported as the number of single continuity events in a time-sliding window of 15 seconds over the total number of available samples in the period. The result is presented as the probability per 15 seconds of occurrence of one discontinuity event.

The following figures provide the APV-I continuity maps for combined GEOs.

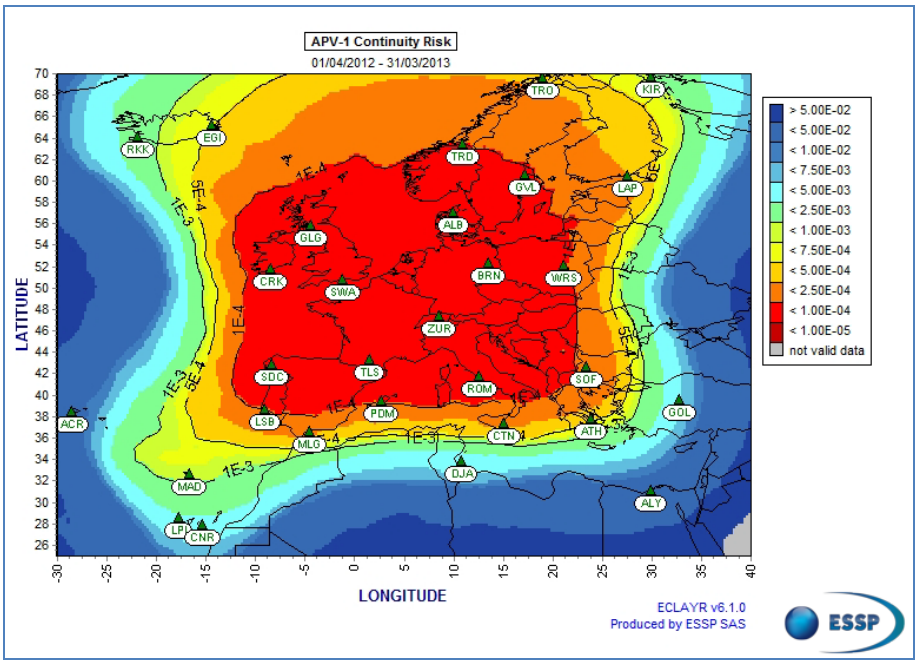


Figure 26: APV-I yearly continuity. Period from 01/04/12 to 31/03/13

The following figure provides the yearly APV-I $5x10^{-4}$/15sec Continuity compliance map.

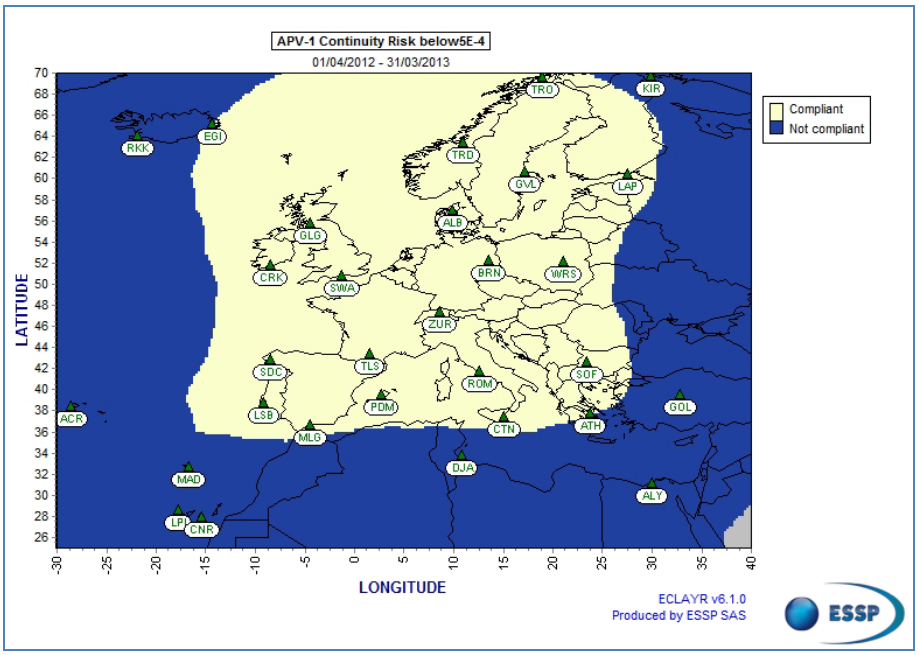


Figure 27: APV-I yearly continuity compliance area. Period from 01/04/12 to 31/03/13

3.4.7 APV-I Continuity – Achievement Against Target

The following figure provides the map of the service area used as reference. It corresponds to the APV-I commitment as included in the SoL Service Definition document.

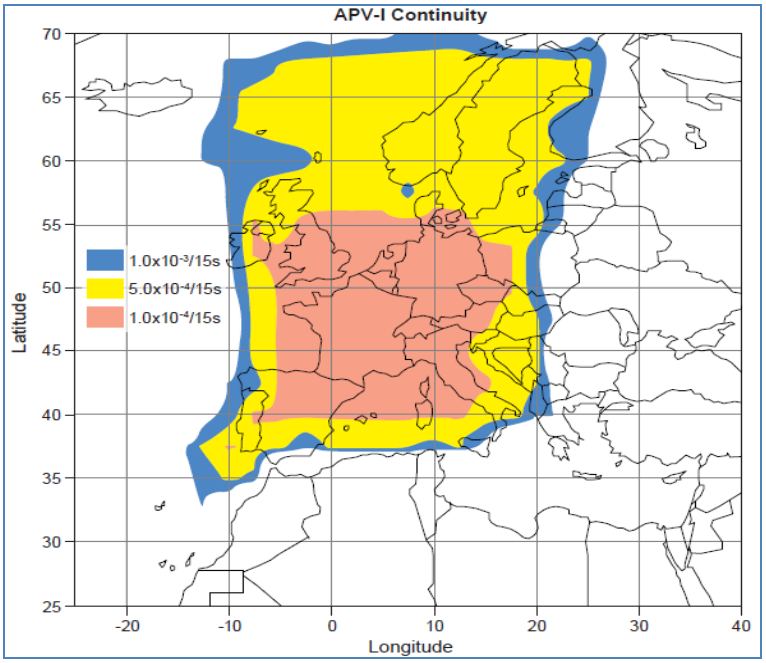


Figure 28: Reference map for APV-I Continuity

The next figure shows the level of compliance compared to the $5x10^{-4}$/15s reference area:

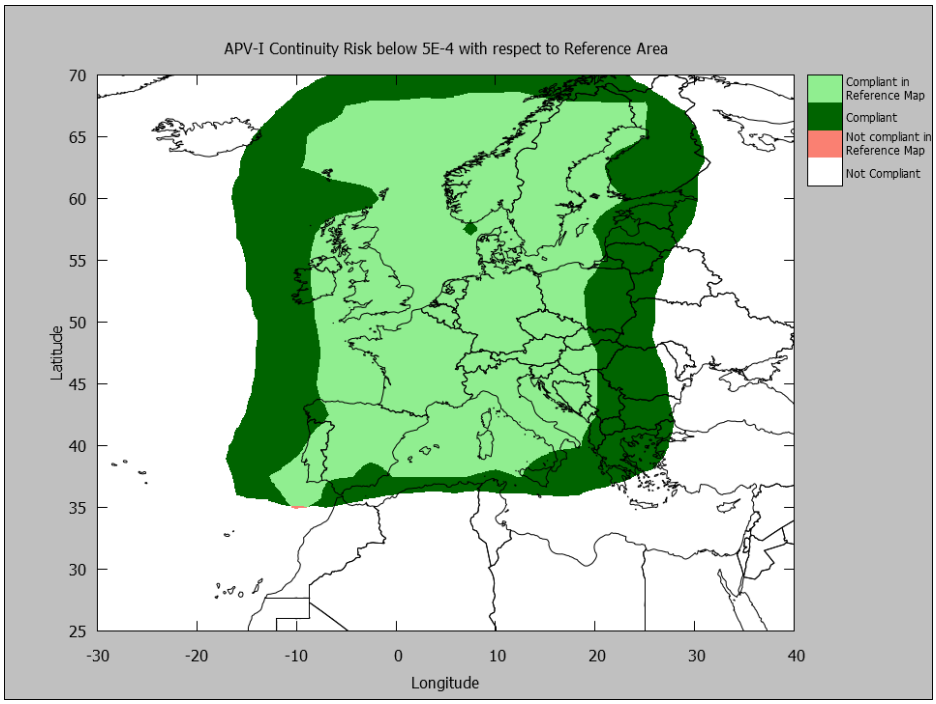


Figure 29: APV-I yearly continuity risk compliance area (5E-4) vs. reference area. Period from 01/04/12 to 31/03/13

The coverage of the reference map has been of **99.77%.**

It is also presented the equivalent figure corresponding to the other two levels of continuity risk, $1x10^{-4}$/15s and $1x10^{-3}$/15s.

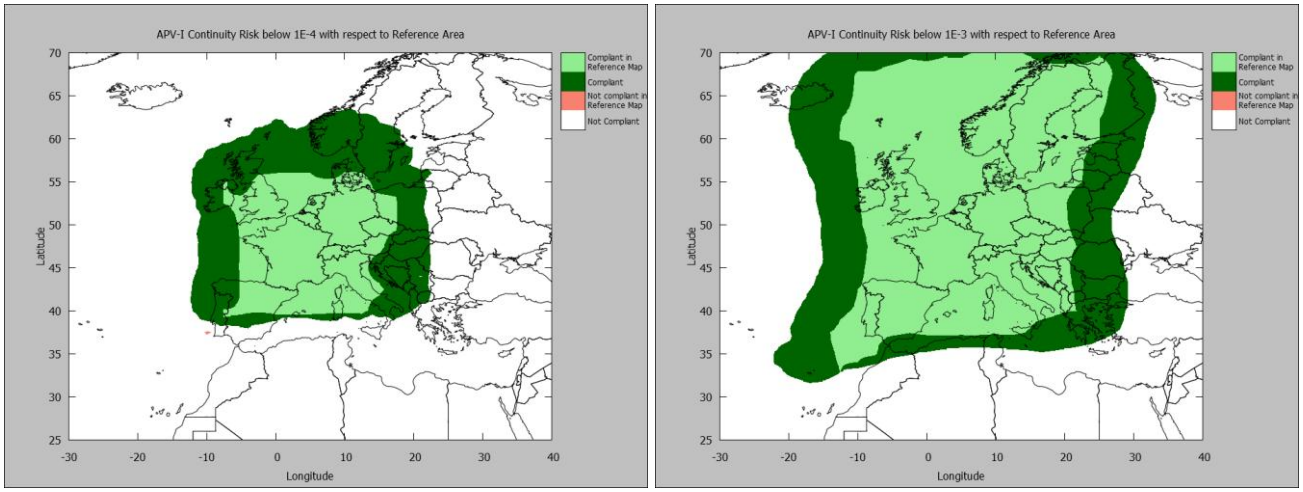


Figure 30: APV-I yearly continuity risk compliance area (1E-4 and 1E-3) vs. reference area. Period from 01/04/12 to 31/03/13

As for APV-I Availability, the commitment area has been almost fully covered for the different levels of continuity. In this case, it can be observed that some zones out of the commitment area also have good performances. As in the case of APV-I availability, this is a direct consequence of the changes introduced with the deployment of releases 2.3.1p and 2.3.1i.

The following figure provides the percentage of the reference map for which the APV-I continuity (level $5x10^{-4}$/15s) target was achieved for each day of the reported period.

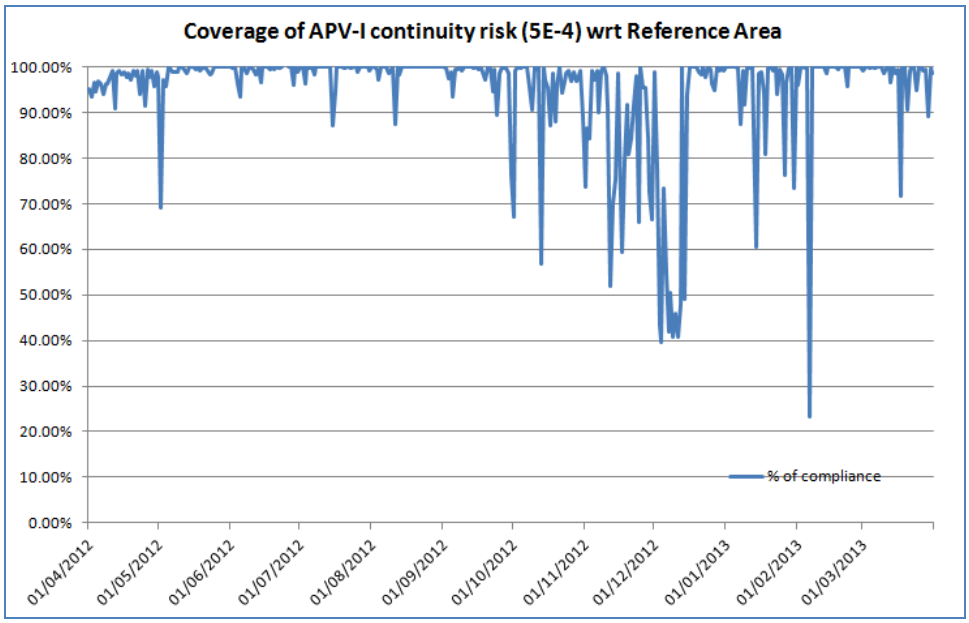


Figure 31: Daily coverage of the APV-I Continuity Risk (5E-4) Reference Area over the year

The date with the lowest compliance area is February 6th 2013, when the percentage of compliance was only 23.2%.

For 294 days (more than 80% of the days), the area inside the reference map which reached the value $5x10^{-4}$ was greater than 95%. For 216 days (59% of the days), the percentage of compliance was above 99%.

3.4.8 APV-I Continuity - Best Performance Measured (over a day)

There have been 118 days during which more than 99% of the Reference Map reached a continuity value of $5x10^{-4}$/15sec. The best of the whole period was August 10th 2012. On this day, the whole of ECAC landmasses presented a continuity risk below 10^{-5}/15 seconds.

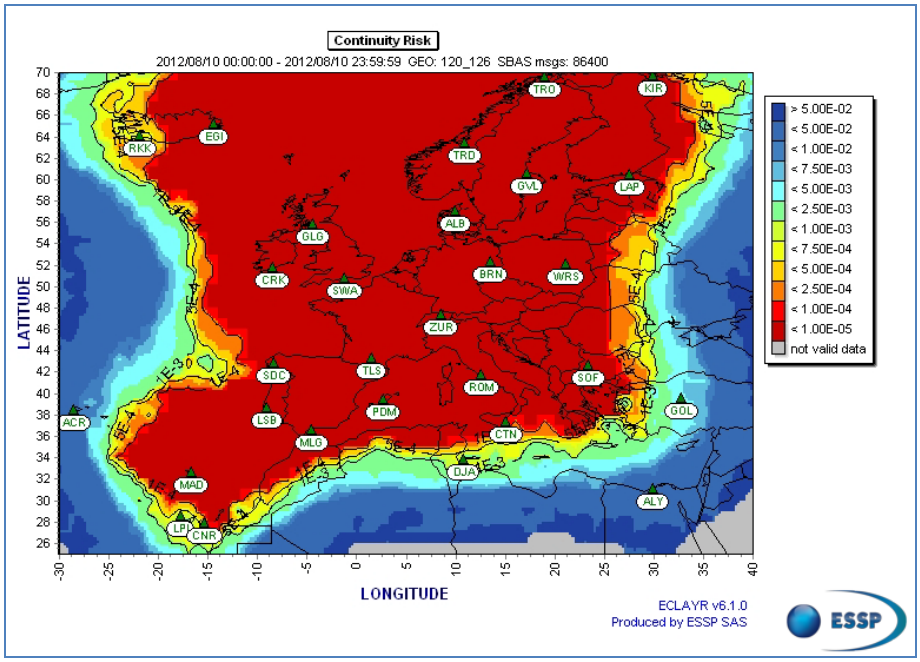


Figure 32: Best day for APV-I Continuity.

3.4.9 APV-I Continuity – Worst Performance Measured (over a day)

The worst day in terms of APV-I continuity was February 6th 2013, when the percentage of compliance only reached 23.2%. On this day, different problems combined (short duration GPS monitoring and network issues) and produced degraded values of continuity.

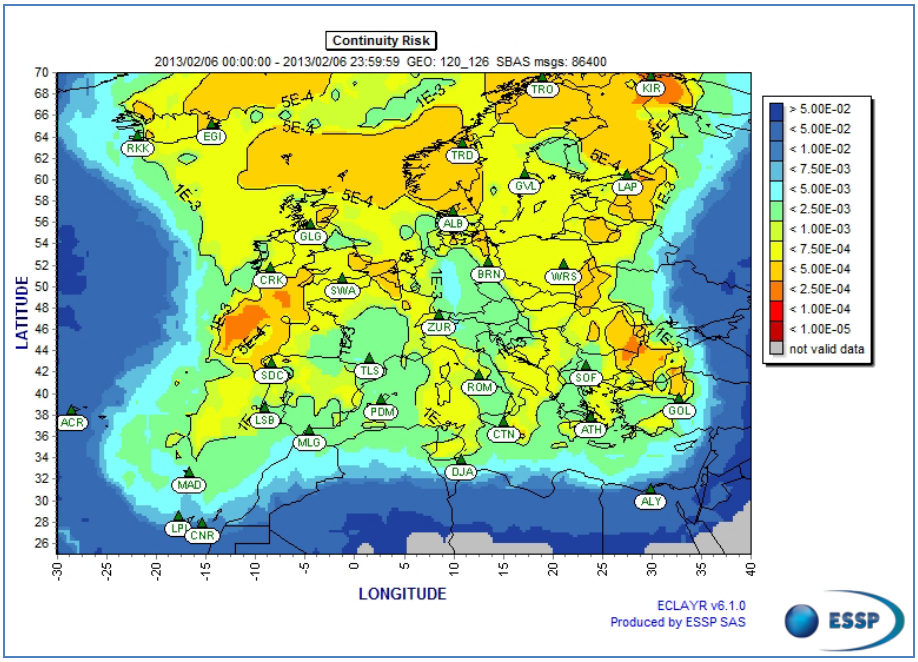


Figure 33: Worst day for APV-I Continuity.

3.4.10 Main Conclusions

The APV-I 99% requirement has been met in 100% of the SoL SDD service area. In the case of the APV-I continuity risk (5x10-4/15s), the level of compliance represents 99.77% of the service area. In both cases, the excellent coverage observed in some regions out of the commitment area must be highlighted, which is a consequence of the changes introduced with the deployment of the releases 2.3.1p and 2.3.1i (ionosphere monitoring improvement, additional satellites, additional RIMS, etc).

This is confirmed by the analysis of the daily underperformances detected during the whole period, which shows that the area in the reference map which reached the target for APV-I availability and Continuity was above 95% for more than 80% of the days..

The analysis of the daily results allows reaching some conclusions regarding the main causes for the underperformances observed on a daily basis. The main reasons for such deviations are:

- **Ionospheric Monitoring:** As for the previous year, the problems related to ionosphere monitoring have been the main cause of underperformances. Most of these problems present a relation with the increase of the solar activity, linked to the solar cycle #24, the effects of which started to become visible on EGNOS in 2011.
- **SIS outage:** The second cause of anomalies of APV-I availability corresponds to the 3-day SIS outage occurring on June 23rd 2012 at 14:51:51. This failure was triggered by a corrupted

ephemeris of PRN27 provided by one of the monitoring stations. The effect of this outage in the availability (SIS, NPA, APV-I or OS) results represents a drop of about 10% in the monthly percentage and 0.82% in the yearly value. This problem is corrected in the version ESR2.3.1i, deployed in August 2012.

- **GPS Monitoring:** The problems related to the monitoring of one or more GPS satellites represent the third cause of the underperformances of APV-I availability and the second for APV-I continuity, contributing to degrade the performances in some areas. This loss of monitoring of some satellites has been especially significant when combined with degraded ionosphere monitoring conditions. The inclusion of additional satellites in the EGNOS mask (PRN24 in January 2013), has mitigated the impact of this kind of problem.

3.5 EGNOS Data Access Service (EDAS)

EDAS (EGNOS Data Access Service) allows users to plug into the EGNOS ground infrastructure to receive the data collected, generated and delivered by the EGNOS system, which is composed of ground stations distributed across Europe and North Africa.

The main data provided by EDAS are:

- Raw GPS and EGNOS GEO observations and navigation data collected by the entire network of Ranging and Integrity Monitoring Stations (RIMS) and Navigation Land Earth Stations (NLES).
- EGNOS augmentation messages, normally received by users via the EGNOS Geostationary satellites.

In addition, EDAS provides the Antenna Phase Centre Coordinates, which is a list of the geographical coordinates of all RIMS stations.

EGNOS data is provided through the Internet in real-time and in different formats, depending on the Service Level selected:

- Service Level 0 in Abstract Syntax Notation One (ASN.1)
- Service Level 1 in RTCM 3.0[9].
- Service Level 2 in RTCM 3.1[9].

Below, the EDAS availability figures and downtimes during the reported period are provided:

[9] See www.rtcm.org

	EDAS Service Operational Availability			EDAS Service Operational Downtime		
	SL0	**SL1**	**SL2**[10]	**SL0**	**SL1**	**SL2**
April 2012	100%	100%	-	0 secs	0 secs	-
May 2012	100%	100%	-	0 secs	0 secs	-
June 2012	99.50%	99.31%	-	0 secs	0 secs	-
July 2012	99.85%	99.85%	-	4015 secs	4015 secs	-
August 2012	>99.99%	>99.99%	>99.99%	24 secs	26 secs	26 secs
September 2012	>99.99%	>99.99%	>99.99%	0 secs	0 secs	0 secs
October 2012	99.99%	99.99%	99.99%	301 secs	305 secs	308 secs
November 2012	99.97%	99.97%	99.92%	885 secs	855 secs	2103secs
December 2012	99.48%	99.46%	99.53%	12738 secs	13231 secs	11551 secs
January 2013	100.00%	99.99%	99.99%	94 secs	332 secs	309 secs
February 2013	99.21%	99.68%	99.62%	19208 secs	7789 secs	9289 secs
March 2013	99.99%	99.99%	99.99%	309 secs	323 secs	275 secs
Mean	**99,83%**	**99,85%**	**99,88%**	**3131 secs**	**2240 secs**	**2983 secs**

Table 7: EDAS availability and downtime figures.

[10] Service Level 2 has been available since July 26th 2012 and, in consequence, availability figures have been provided since August 2012. Users of SL1 are invited to migrate to SL2.

4 SERVICE PROVISION AND DEVELOPMENT

4.1 Open Service Status

The EGNOS Open Service (OS) was declared available by the European Commission to European citizens on October 1st, 2009, officially enabling EGNOS capable devices available over Europe to get benefits from this service. An initial version of the OS SDD (v1.1) was initially published reflecting the conditions of access to the service and the minimum performance achievable by OS enabled equipment.

On March 27th, 2013, a new version of the EGNOS Open Service SDD (v2.0) was published (http://www.essp-sas.eu/service_definition_documents) including the main performance improvements derived from the EGNOS System Releases deployed since October 2009 and bringing significant performance improvements in terms of commitment area as depicted in the following figure:

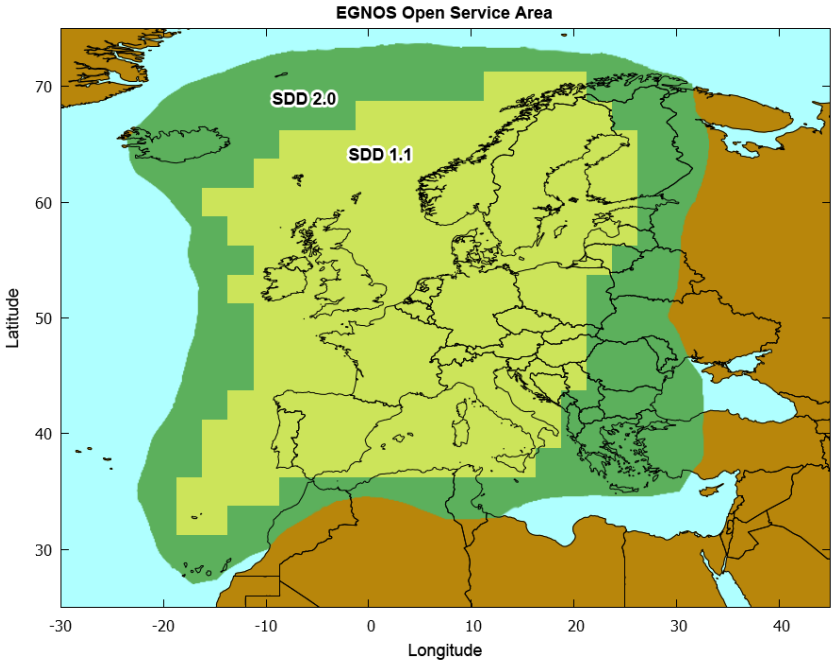


Figure 34: EGNOS OS Compliance area in EGNOS SDD V2.0 with respect to V1.1

The OS Compliance Area is defined as the minimum area where the user is able to calculate its position with an accuracy below a defined threshold for 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 that arrived at the EGNOS Helpdesk over the reported period.

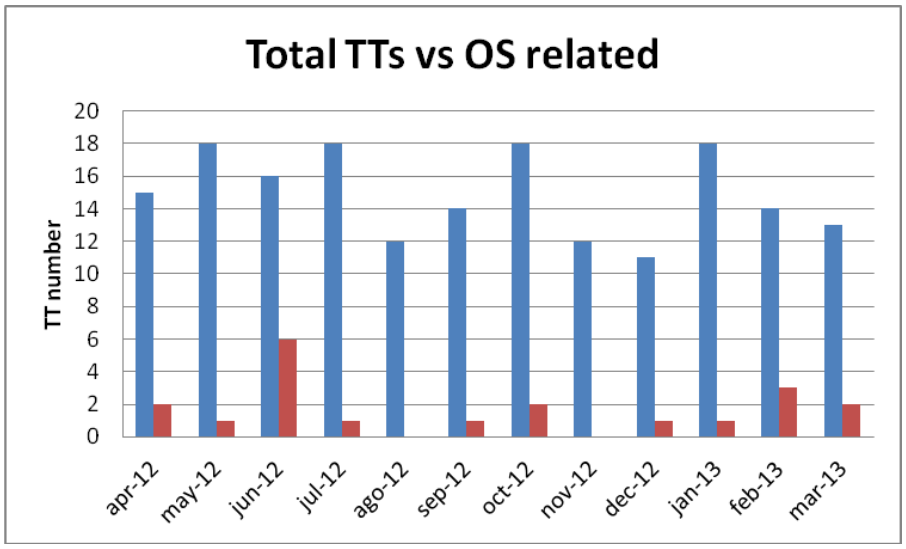


Figure 35: OS related tickets (in red) vs. total tickets (in blue) which arrived at the EGNOS Helpdesk.

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

- ESSP is participating in the Intelligent Transport Systems (ITS) and Location-Based Systems (LBS) User Forums created in the frame of the SUNRISE project for identification of requirements and priorities of these market segments in relation to GNSS.
- ESSP is also attending and contributing to different multimodal events like Agritechnica, Munich Satellite Summit or European Space Solutions. See Section 4.7.2 for more details.
- ESSP is organising the EGNOS Service Provision Workshop 2013 as the key EGNOS event gathering users and stakeholders from the different EGNOS Services and from different application domains.
- ESSP is also in close contact with OS receiver manufacturers.
- ESSP is obtaining valuable feedback from OS user communities via the corresponding Customer/User Satisfaction process as described in section 4.4.

4.2 SoL Service Status

4.2.1 EGNOS Working Agreement (EWA) Status

4.2.1.1 *EWA Dissemination & Awareness Activities*

ESSP continued its specific dissemination and awareness campaign related to the EWA, presenting/informing on the harmonized approach established in the various international meetings.

The EWA proposed approach is consolidated at European level, being accepted and supported by the European ANSPs, NSAs and GNSS stakeholders (Eurocontrol, ICAO, CANSO, etc.).

A relevant evidence of the EWA approach consolidation is its inclusion in the guidance material for the implementation of RNP APCH Operations (issued by Eurocontrol in support to ICAO) finally

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 even at international level) have shown interest in either discussing or being informed about the EWA which is identified as key with regards to EGNOS implementation in civil aviation.

4.2.1.2 *EWA Negotiations / Signature Status*

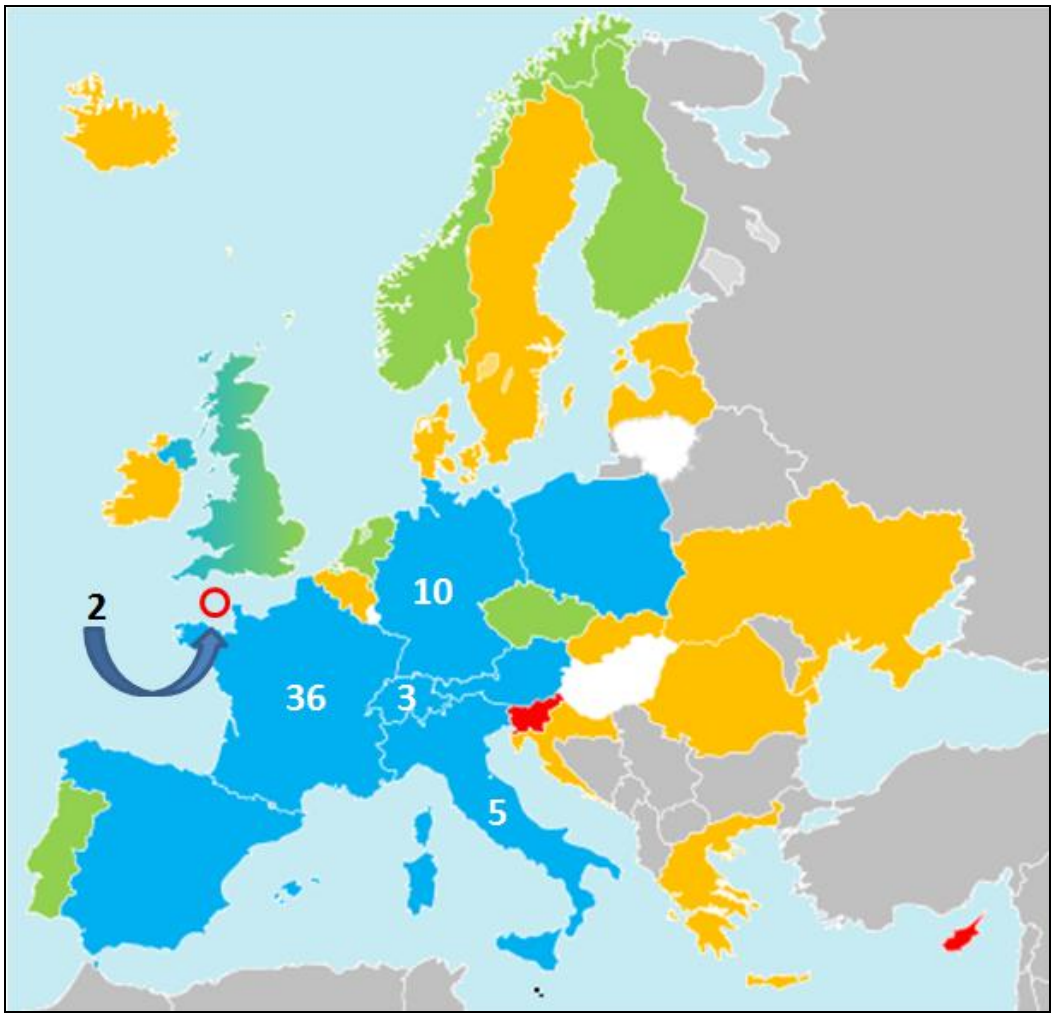
During the reported period, 6 new EWAs were signed.

Table 8 shows a history of the signed EWAs. Those in white background are the EWAs signed during the reported period (April 1st 2012 – May 31st 2013), and those in grey background are those EWAs that were previously signed:

STATE (ANSP contacted)	EU / NON EU	EWA SIGNED
FRANCE (DSNA)	EU	08/03/2011
SWITZERLAND (SKYGUIDE)	NON EU	14/11/2011
GUERNSEY (CAA)	NON EU	17/11/2011
GERMANY (DFS)	EU	09/12/2011
ITALY (ENAV)	EU	16/05/2012
AUSTRIA (Austrocontrol)	EU	14/06/2012
UK (NATS)	EU	14/06/2012
SPAIN (AENA)	EU	20/12/2012
POLAND (PANSA)	EU	28/02/2013
UK (Exeter& Devon Airport - EDAL)	EU	26/03/2013

Table 8: EWAs signed

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



	Rejection to discuss / EWA not needed
	Initiated Discussions
	Advanced Discussions
	EWA signed
3	Number of published LPV procedures
	No feedback

Figure 36: EGNOS Working Agreement Status

4.2.2 EGNOS Procedures Implementation

ESSP has been coordinating with Eurocontrol and GSA to assess how to monitor the GNSS based operations implementation in Europe (published procedures), with the aim to draw some conclusions on the potential for EGNOS implementation, expected users in the short term, etc. apart from monitoring the current national plans for EGNOS implementation.

Since Eurocontrol is monitoring the whole RNAV implementation in Europe (they are developing an RNAV approach implementation map tool which is about to be presented), they will lead this task in close coordination with ESSP. Additionally, ESSP will keep an updated "EGNOS based published procedures" map and list, available on its website.

Concerning the EGNOS-based procedures publication during the period being reported here, and following the corresponding EWAs signed, 48 new LPVs were published which, together with the EGNOS based approach procedures published before April 1st 2012, provide the overall figures given below.

Country	Airports	LPV Procedures[11]	APV baro Procedures (EGNOS enabled)
France	29[12]	36 (+31)	0
Switzerland	3	3 (+1)	0
Guernsey	1	2 (+0)	0
Germany	38	11 (+11)	71
Italy	3	5 (+5)	0
Total	74 (36 with LPV)	57 (+48)	71

Table 9: EGNOS procedures already published as of April 4th 2013.

Section 6 (Annex A: Full list of EGNOS-Based Approach procedures) shows detailed information regarding all the aforementioned EGNOS based approach procedures.

4.2.3 NOTAM Proposals Service Status

Since March 2nd, 2011 (EGNOS SoL Service Declaration date), ESSP is providing the EGNOS NOTAM proposals service to any airport having an EGNOS-based approach procedures published. This publication can only be possible once an EGNOS Working Agreement between the ESSP and the ANSP providing Air Traffic Services is signed. The agreement includes the EGNOS NOTAM proposals services as one of the main enablers for the EGNOS based approach procedures implementation.

The EGNOS NOTAM proposals service predicts EGNOS-based approach unavailability taking into account scheduled and unscheduled outages/failures of GPS and EGNOS system assets. These predictions, based on the current and expected GPS and EGNOS system status, are performed using the Euronotam Tool (developed by GMV AD for EUROCONTROL within the GISE project). Once an unavailability of the EGNOS SoL service is predicted, the Euronotam Tool generates airport-specific EGNOS NOTAM proposals in ICAO format, which are then delivered via AFTN to the concerned NOF (either directly or through the European AIS Database –EAD-). The current service provides EGNOS NOTAM proposals 72 hours in advance for scheduled events (in line with ICAO SARPS recommendation) whereas the EGNOS NOTAM proposals caused by unscheduled events are delivered within a maximum of 16 hours (according to ICAO SARPS recommendation, unscheduled

[11] The numbers between brackets indicate the increase in LPV procedures that have been published in the reported period (April 1st 2012 – March 31st 2013):

[12] 2 military airports with 3 LPVs published. No NOTAM proposals are sent to these military airports.

events should be notified within 15 minutes). ESSP is working to improve the EGNOS NOTAM proposals service with the aim of enabling the national AIS providers to fully meet the applicable ICAO recommendations. These efforts will be translated into a significant reduction of the service reaction time to unscheduled events in the coming months.

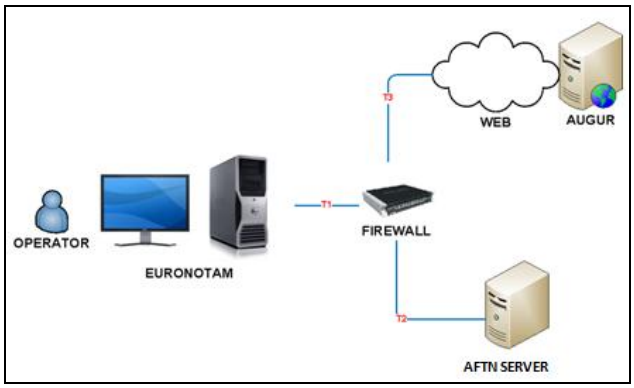


Figure 37: NOTAM Proposals Service HW architecture[13]

During the reported period, 183 NOTAM proposals were issued informing of EGNOS APV-I service unavailability:

- 51 EGNOS NOTAM proposals (one per active airport) were issued in June 2012 to inform of the EGNOS Service Outage that took place on the 23/06/2012 due to an abnormal behaviour of one Ranging and Integrity Monitoring Station (RIMS) combined with the fact that the Central Processing Facilities (CPF) were not able to reconcile the inconsistent data generated by that RIMS. For further details on this event, please refer to Service Notice # 5 at www.essp-sas.eu.
- 54 EGNOS NOTAM proposals (one per active airport) were issued on the June 27th 2012 to inform of a potential EGNOS Service unavailability following the introduction of a leap second on the 01/07/2012 at 00:00h (UTC) to align the Universal Time Coordinated (UTC) reference with the Mean Solar Time.
- As explained in Service Notice #4 (available at www.essp-sas.eu), although the current process to manage the introduction of a new leap second might have implied a potential EGNOS service unavailability for a period of 72 hours, no such service interruption was actually necessary and therefore no impact on the EGNOS service provision resulted from the leap second introduction process. Hence, ESSP issued 54 cancel EGNOS NOTAM proposals on the 01/07/2012 shortly after the leap second introduction (one per active airport) to cancel the notifications issued on June 27th 2012.
- 12 EGNOS NOTAM proposals were sent to the French NOTAM Office affecting the active airports in the South-western part of France on the October 13th 2012, following a failure on the EGNOS network which affected the EGNOS Services performance in the Southwest part of the EGNOS service area for a short period of time. Later that day, 12 cancellation EGNOS NOTAM proposals were sent to inform the recovery of the performances.

[13] AUGUR (web service by Eurocontrol) is currently not used.

The NOTAM proposals service has grown both in terms of countries subscribed and active airports. At the end of March 2013, ESSP was providing EGNOS NOTAM proposals to 5 countries, 71 airports and for a total of 121 EGNOS based approach procedures.

4.3 EDAS Service Status

4.3.1 EDAS Service Declaration

Since April 2010, the EGNOS Data Access System (EDAS) service is being fully provided by ESSP, as the EGNOS Services Provider, in an initial operational phase following the successful handover of the service from the GSA and the transfer of ownership of the system from GSA to the European Commission (EC).

On July 26th 2012, the EC declared EDAS officially available to EU users in a press conference in Brussels. This important milestone was accompanied by the declaration of the EDAS Service Definition Document v1.0 (see http://www.essp-sas.eu/service_definition_documents), which presented the characteristics of the EDAS Service Levels (SL 0, 1 and 2), including a detailed description of all the necessary information for users to get access to the service and benefit from it. This document also detailed the EDAS service performance commitments available to registered users in terms of both availability and latency.

During the aforementioned press conference, the EC Vice-President Antonio Tajani, explained that: "*This third EGNOS service once again proves the European Commission's commitment to delivering improved services to the EU's businesses and citizens. So much of our day-to-day private and business lives are dependent on satellite navigation technology. With EDAS, we have a reliable performance level which can, in turn, support the creation of new and innovative products and thus help to overcome the current economic crisis*."

4.3.2 EDAS Evolutions

From 2009, EDAS covered Service Levels 0 and 1, which provided EDAS data in real-time through two different formats: ASN.1 for Service Level 0 and RTCM 3.0 for Service Level 1.

On July 26th, 2012, the EDAS Service Declaration came together with the following service enhancements:

- A new version of EDAS was put in operation (EDAS v2.0), providing a new Service Level 2 (SL2) that encodes RTCM 3.1 messages. Please note that as SL2 is an evolution of SL1, this Service Level 1 will not be available for newly requested accounts. SL1 users are recommended to switch to SL2.
- A new version of the EDAS Client Software (client application enabling connecting to EDAS SL 0, 1 and 2) that included new functionalities and enhanced graphical interface was provided to EDAS users.

On April 10th, 2013, the European Commission officially declared available a full set of new EDAS services, which are:

- **EDAS FTP Service**: historical data from EGNOS and EDAS can be downloaded in a variety of standard formats and data rates.

- **EDAS SiSNeT Service**: EGNOS messages are provided in real-time using the SISNeT protocol as defined by ESA.
- **EDAS Ntrip service**: GNSS data (RTCM format) coming from the EGNOS network and disseminated in real-time in line with the Ntrip protocol.
- **EDAS Data Filtering Service**: possibility of accessing a subset of the Service Level 0 or Level 2 data (set of predefined groups of stations available) at different data rates.

Consequently, an updated version 2.0 of EDAS Service Definition Document (see http://www.essp-sas.eu/service_definition_documents) was published in line with the aforementioned upgrades, describing the characteristics and performances of these new EDAS Services.

4.3.3 EDAS Usage

The number of registered users has been continuously increasing, reaching a total of 106 at the end of March 2013. At the beginning of the reported period (beginning of April 2012) the total number of EDAS users was 94, hence the number of EDAS users has increased by 13% in the last 12 months.

It should be highlighted that the use of EDAS is not only linked to the aerospace sector. EDAS provides the opportunity for service providers to deliver EGNOS data to users who cannot always view EGNOS satellites (such as in urban canyons) or to support a variety of other value added services, applications and research programs. The area of activity of the registered EDAS users covers different application domains, as depicted in the figure below:

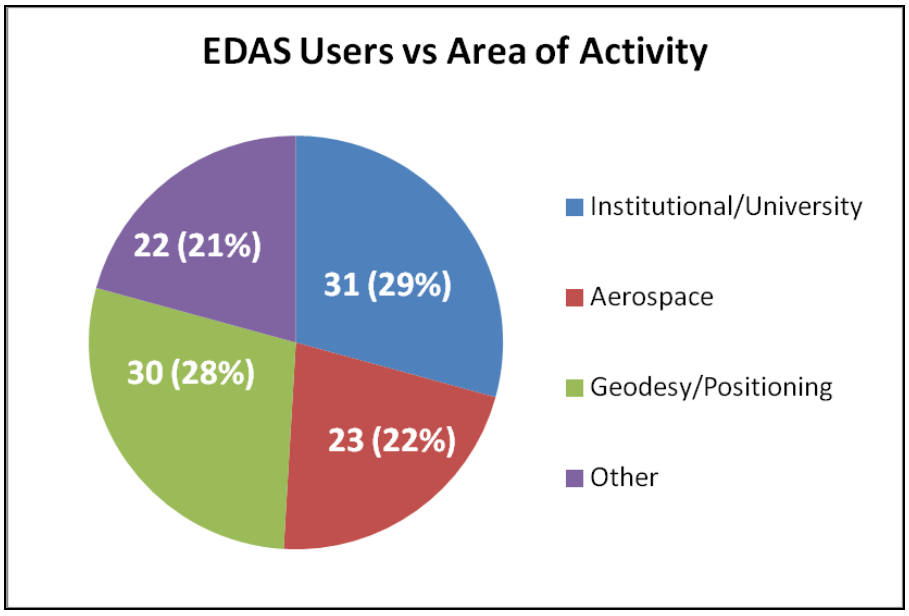


Figure 38: EDAS Users and Area of Activity

An important measure of the popularity and use of EDAS Services is the important weight of the EDAS related requests received at the EGNOS Helpdesk (45% overall during the reported period):

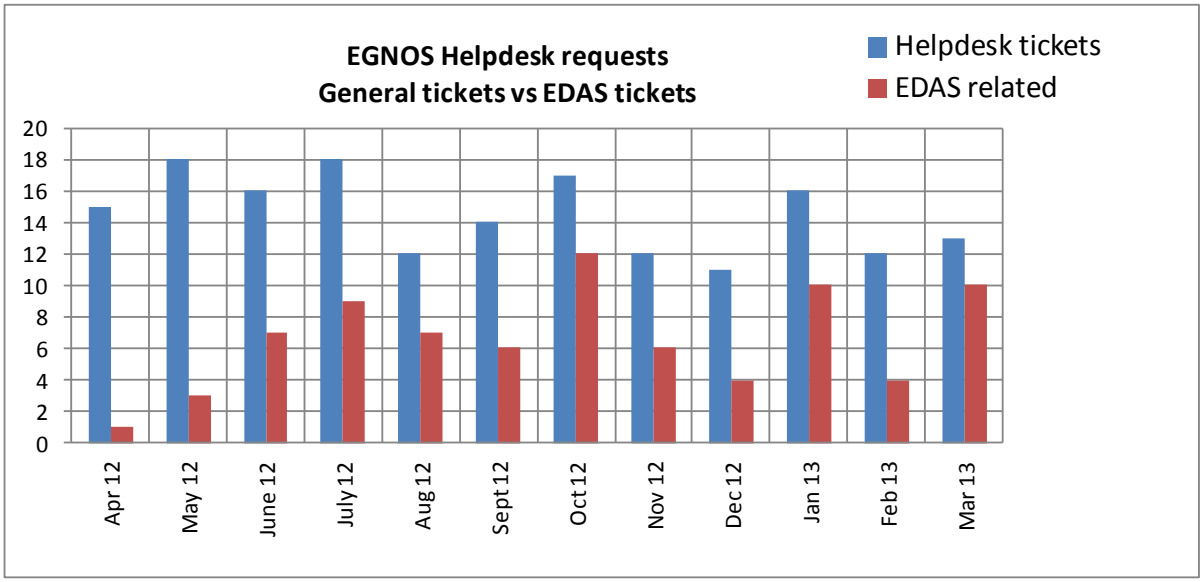


Figure 39: EDAS Related Requests in the EGNOS Helpdesk

4.4 User Consultation Process

The User Consultation Process aims at setting the appropriate channels to interact with the EGNOS Services users in order to establish a method to provide them with information and obtain their valuable feedback on ESSP and EGNOS Services performance in regard to the corresponding Service Provision. The final objective is to understand the user's perspective in order to define corrective and improvement actions on ESSP activities as EGNOS Services Provider.

In the reported period, ESSP launched a specific user consultation process for two of the three EGNOS Services (the EGNOS Open Service User Satisfaction questionnaire was launched in June 2013), using customized questionnaires that were distributed to the main stakeholders of each EGNOS Service market:

- **EGNOS Open Service**: Firstly launched in June 2013 to cover the 2012 calendar year.
- **EGNOS Data Access Service**: Firstly launched in December 2012 to cover the 2012 calendar year.
- **EGNOS SoL Service**: Second survey launched in February 2013 to cover the 2012 calendar year. The results of this process will be also incorporated to ESSP's annual report.

4.5 User Helpdesk

4.5.1 EGNOS Helpdesk

Between April 1st, 2012 and March the 31st, 2013, the EGNOS Helpdesk, operated by ESSP SAS, has managed 174 user requests.

The complexity of a typical request to the Helpdesk is steadily increasing. This implies that, for basic information, the general user resorts to consult the information already published both in the EGNOS User Support and on the corporate websites, while for more complex request they contact the EGNOS Helpdesk.

One particular user profile of the EGNOS Helpdesk is that of the EDAS user. The number of EDAS-related requests amount to about 45% of the total.

A significant increment in the EDAS registration requests has been noticed during the past months due to the great interest among the application developers created by the new EDAS services available during the first quarter of 2013.

Since July 26th 2012, a 24/7 telephone link with the EGNOS Helpdesk has been available to register general user requests and to provide urgent support to the EDAS user.

Figure 40 shows the number of Helpdesk requests from March 2012 to March 2013.

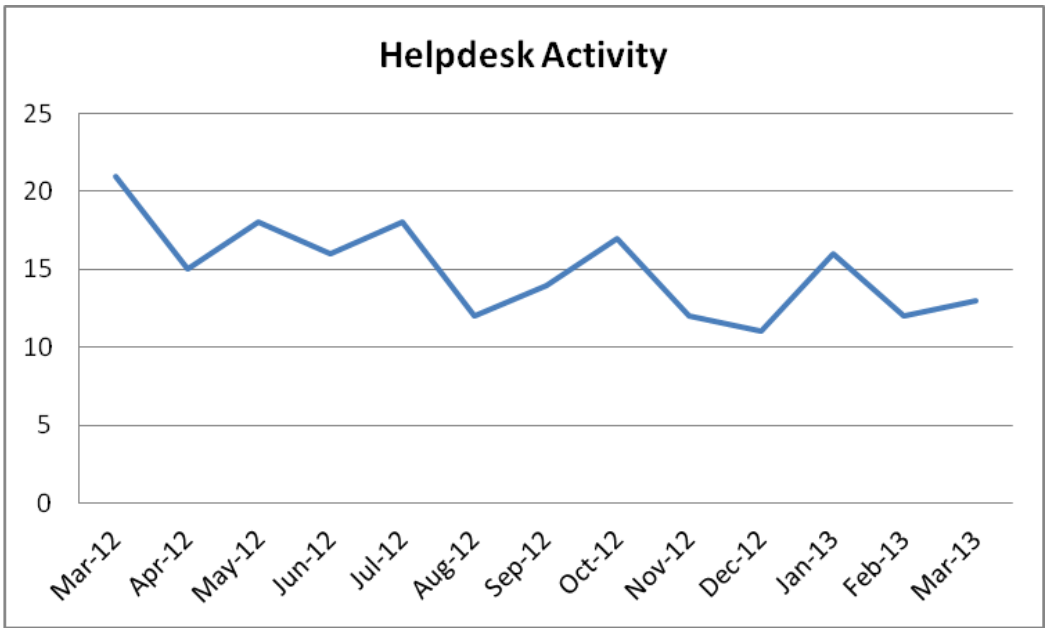


Figure 40: Helpdesk Activity Evolution

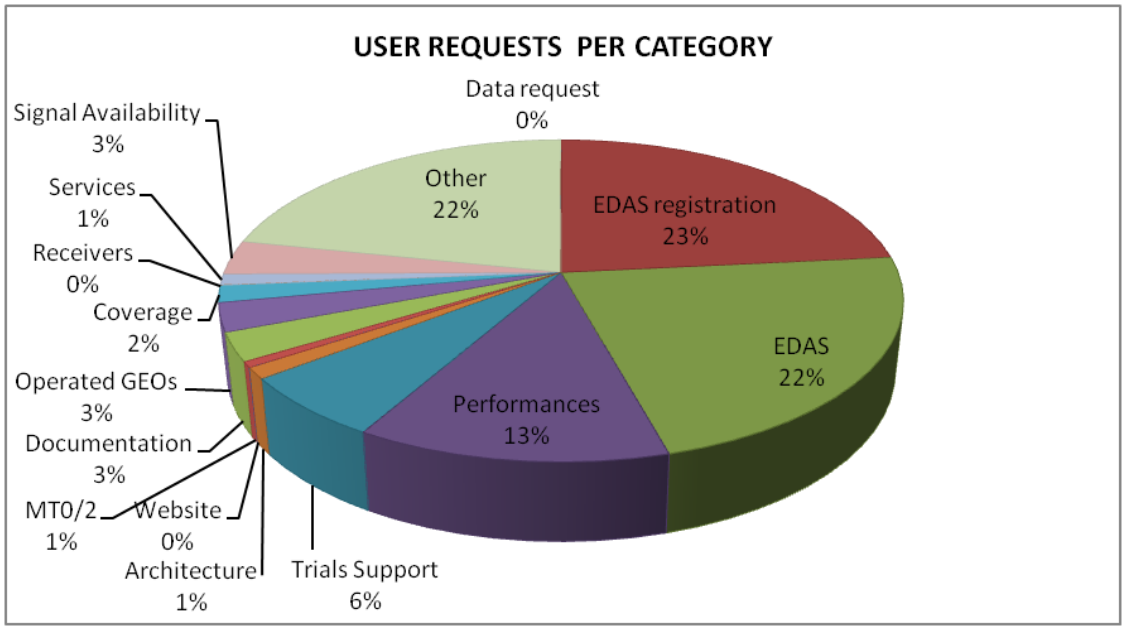


Figure 41: Helpdesk User Requests per Category

The EGNOS Helpdesk can be contacted either by mail (egnos-helpdesk@essp-sas.eu) or by phone (+34 911 236 555).

4.5.2 EGNOS User Support Website

The EGNOS User Support website has nearly one thousand registered users. The area of activity of website registered users is shown in the next figure. As can be seen, the main applications are Aviation and Agriculture use:

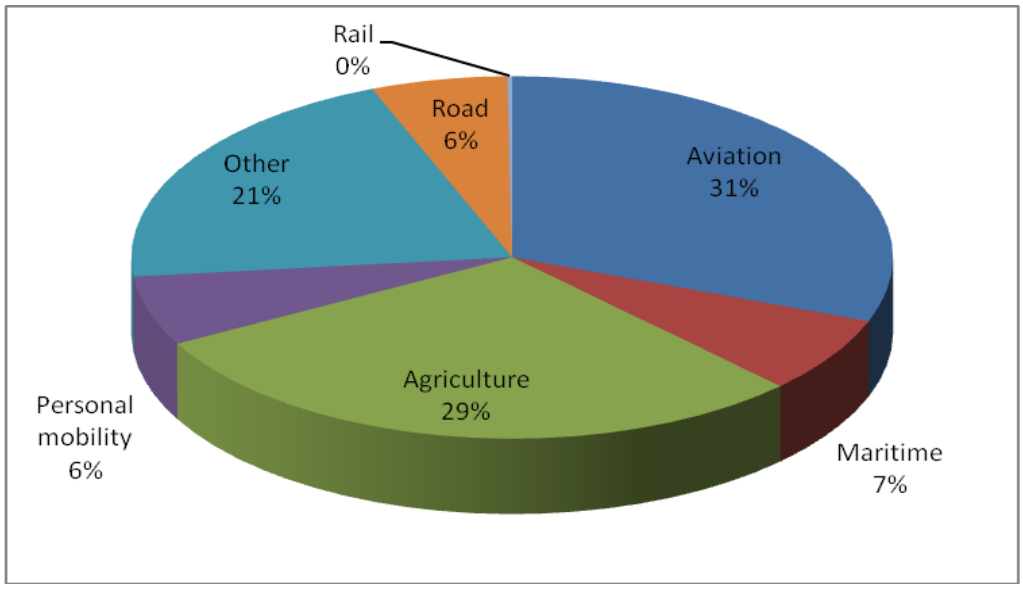


Figure 42: Area of activity of the EGNOS User Support website registered users

The website has been expanded with new contents for aviation users, like the real-time availability at the aerodromes where SBAS procedures are published and the evolution in the past 14 days of the APV-I availability coverage. New upgrades for the aviation and general sections of the website are planned for 2013, like the real-time presentation of NOTAMs affecting the published EGNOS-based procedures or comparison data between EGNOS/GPS and GPS alone positioning.

Future evolutions of the website will include:

- The real time status of the EDAS services available for EDAS registered users and organization of contents per EGNOS Service and/or domain of application.
- Improvement of the EGNOS performances' real-time information to users in order to provide GEO combined maps for APV-1 availability and continuity, real-time performances in specific locations (airports), with a "Google-like" view and a split between Operational and Test information.

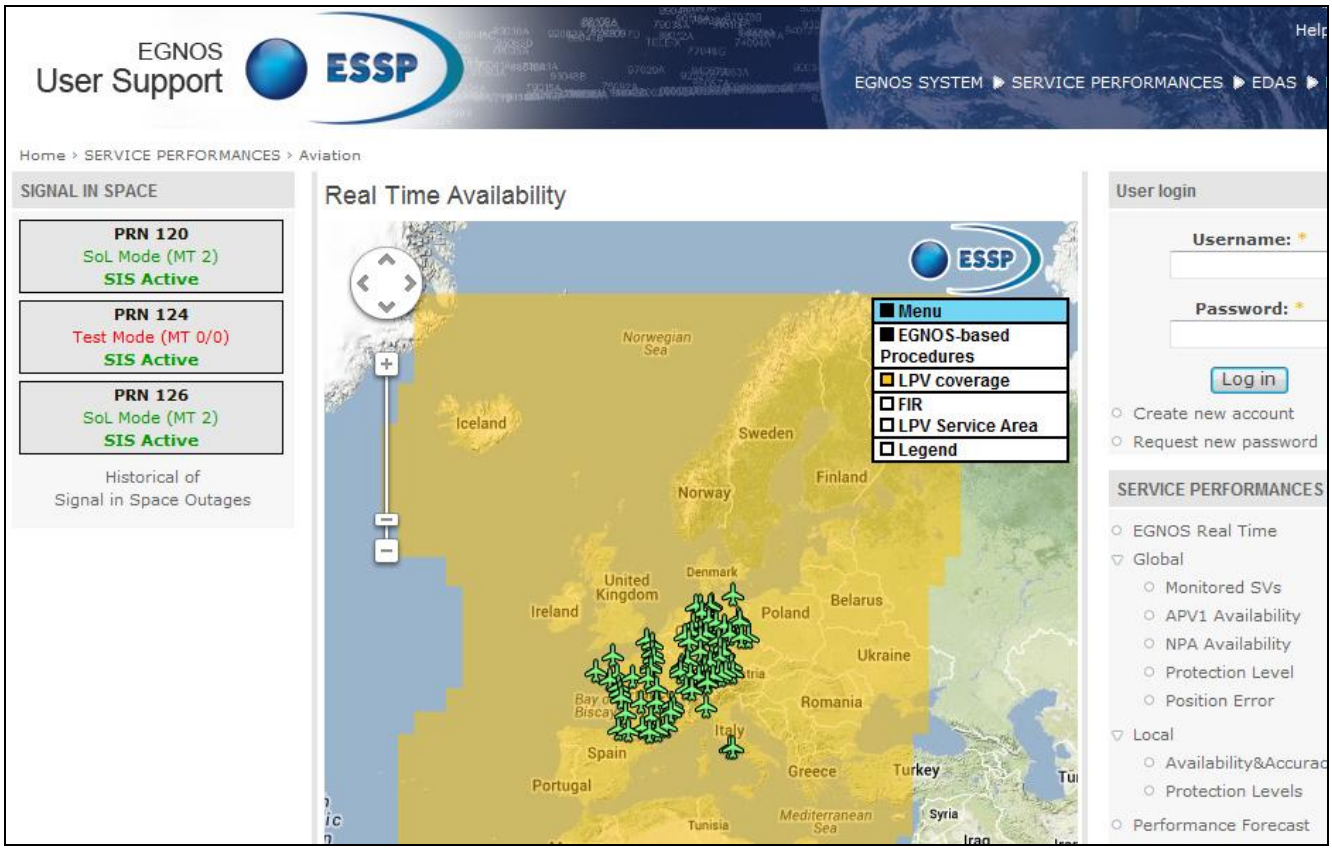


Figure 43: EGNOS User Support website – EGNOS APV-I Service Availability at airports with EGNOS based approach procedures published in real-time.

4.6 Interfaces with users

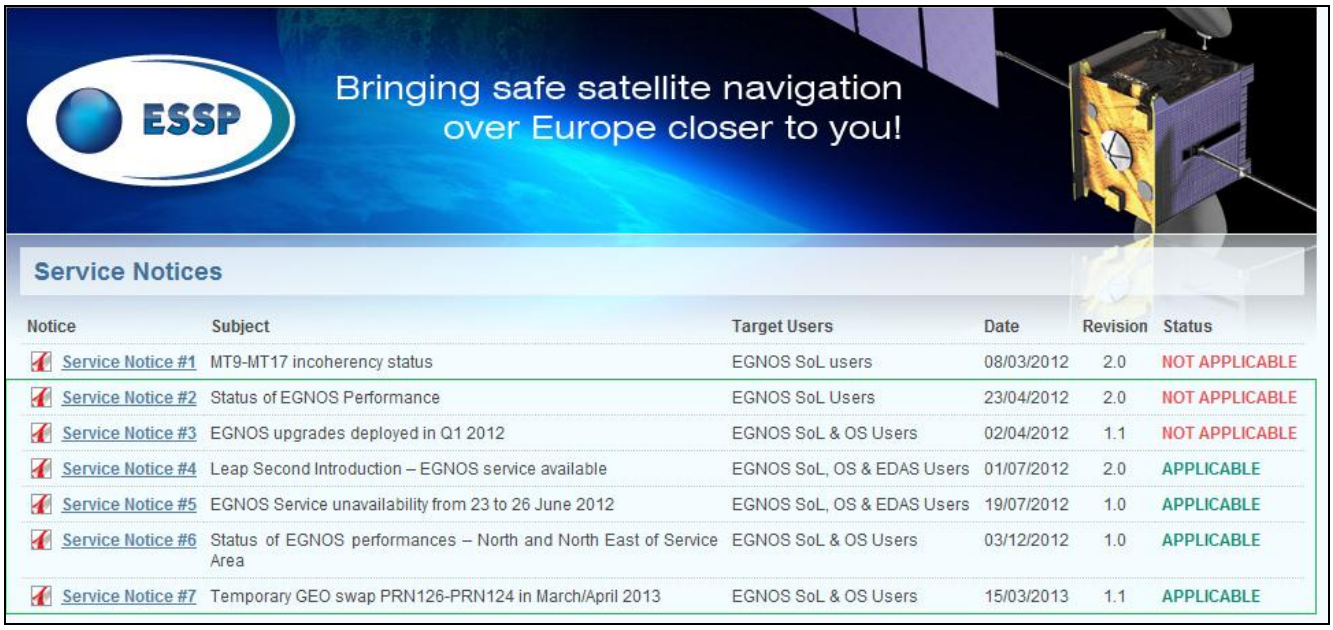
4.6.1 Generic Interfaces with Users

ESSP identifies 3 different categories of EGNOS users, linked to the three different EGNOS Services being provided:

- **EGNOS Open Service (OS):** intended to support non-safety critical applications within a unregulated framework as described in the OS SDD (see http://www.essp-sas.eu/service_definition_documents).
- **EGNOS Safety-of-Life (SoL) Service:** Navigation Service provided under SES. EGNOS SoL Users defined within SoL SDD (see http://www.essp-sas.eu/service_definition_documents):
    - Airspace Users (as defined by SES regulation) equipped with EGNOS certified receivers (TSOs/ETSOs C144, C145 or C146).
    - Certified Air Navigation Service Providers (ANSPs) having signed an EGNOS Working Agreement (EWA) with ESSP.
- **EGNOS Data Access Service (EDAS):** Registered users, regulatory needs and maturity depending on application type and domain. EDAS SDD last version published in April 2013 (see http://www.essp-sas.eu/service_definition_documents).

All interfaces established by ESSP for these users are described as follows:

1. **EGNOS Communication / Promotion / Awareness activities**: In line with ESSP Communication Plan, as described in section 4.7
2. **User Support activities:** As defined in section 4.5
3. **ESSP / EGNOS publications:**
    a. EGNOS Service Definition Documents (SDD) describing the characteristics and conditions of access to each EGNOS service (OS, SoL and EDAS).
        i. OS SDD: Applicable SDD was published by the EC on March 18th 2013 (see http://www.essp-sas.eu/service_definition_documents).
        ii. SoL SDD: Applicable SDD was published by the EC on March 2nd 2011 (see http://www.essp-sas.eu/service_definition_documents) in parallel to the SoL Service Declaration. New version of the SDD for ESR 2.3.1 is under preparation and will be published in June 2013.
        iii. EDAS SDD: The applicable EDAS SDD was published by the EC on April 10th 2013 (see http://www.essp-sas.eu/service_definition_documents).
    b. 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 6 Service Notices –highlighted inside a green rectangle in the figure below- which are available on the ESSP website (http://www.essp-sas.eu/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	APPLICABLE
Service Notice #5	EGNOS Service unavailability from 23 to 26 June 2012	EGNOS SoL, OS & EDAS Users	19/07/2012	1.0	APPLICABLE
Service Notice #6	Status of EGNOS performances – North and North East of Service Area	EGNOS SoL & OS Users	03/12/2012	1.0	APPLICABLE
Service Notice #7	Temporary GEO swap PRN126-PRN124 in March/April 2013	EGNOS SoL & OS Users	15/03/2013	1.1	APPLICABLE

Figure 44: Service Notices section of the ESSP website

c. EGNOS Monthly Performance Reports: available on the ESSP website (http://www.essp-sas.eu/monthly_performance_reports) since May 2011.

d. EGNOS Yearly Service Provision Reports: available on the ESSP website (http://www.essp-sas.eu/printed_documents).

e. EGNOS Services' Roadmaps: available since July 31st 2012 on the ESSP website (http://www.essp-sas.eu/printed_documents), providing a high-level overview of EGNOS services current status and their expected evolution linked to the consecutive EGNOS system release (ESR) deployment and information / interfaces' improvements described therein.

   i. ESSP-COM-7462_01-00_EGN_OS_ROADMAP, to be updated by mid-2013.

   ii. ESSP-COM-7463_01-00_EGN_SOL_ROADMAP, to be updated by mid-2013.

   iii. ESSP-COM-7464_01-00_EDAS_SERV_ROADMAP, to be updated by mid-2013.

f. ESSP Customer Satisfaction Surveys: channelling users' feedback on EGNOS Services, as described in section 4.4.

4.6.2 Interfaces with SoL Users

Due to the particular characteristics of the EGNOS SoL Service and the regulatory framework applying to aviation, ESSP has established specific interfaces for SoL Service Users:

1. **EGNOS Working Agreement (EWA) related interfaces**:
    a. EWA Generic Interface: Between focal points in either parties
    b. ESSP SAS SoL Service Commitment interface (EWA Annex I): Information / coordination link for contingencies/impacts on the committed performances in the SoL SDD.
        i. All Service Notices were distributed to the corresponding EWA PoCs.
        ii. EWA signing ANSPs were informed of the established approach for contingency communication to ANSPs (ESSP-MEMO-7562).
        iii. All contingency communications were sent in the period reported in line with the ESSP-MAN-5033_ESSP Contingency Communication Manual, triggered by the identified contingencies.
    c. Service Arrangements Interfaces (EWA Annex II):
        i. *Collaborative Decision Making (CDM):* Link to minimize potential impact in the EGNOS performance of ESSP planned activities.

            Two specific communications were sent in the framework of the CDM linked to the ESR 2.3.1 deployment and the introduction of the leap second.
        ii. *NOTAM proposals generation*: For the AIS provider to publish the corresponding NOTAMs concerning EGNOS based operations under its responsibility (as described in section 4.2.3).
        iii. *GNSS Data Recording*: If required for occurrences investigation.
2. **ESSP User Consultation Process:** channelling Civil Aviation Users' feedback on the EGNOS SoL Service through a yearly consultation. This process covers the specific Customer satisfaction survey for the SoL Service as described in section 4.4.
3. **ESSP support/advisory services to ANSPs**: In accordance with ESSP's mission/willingness to support the EGNOS adoption initiatives in all domains, with specific interest in civil aviation at this stage, ESSP has completed a series of actions adapted to the ANSPs' needs evolution and specific requests in the civil aviation domain.

    The definition of these actions has been based on bilateral interactions with the identified ANSPs/states fed by ESSP participation to the key civil aviation EGNOS implementation supporting cells (Eurocontrol RAISG and NSG, and ICAO PBN TF mainly) and the existing interfaces with ANSPs (EGNOS Helpdesk, EWA interfaces/contacts/discussions, ESSP participation in key implementation initiatives, etc.).
4. **ESSP EASA Safety Information Bulletins monitoring:** As relevant publications issued by EASA towards the civil aviation final users' community ESSP has monitored the publication of these documents with a twofold objective:

a. Detect all EGNOS related SIBs issued by EASA: To be able to inform users accordingly and to detect any inconsistency in the SIB contents or in the ESSP information available.

b. Offer ESSP support/cooperation to EASA in the process of the EGNOS related SIBs issuance: First successful experience with the EASA SIB No: 2012-21 published on 19/12/2012.

SIB Id	Date	Subject
EASA_SIB_2012-09_1	23/05/2012	Space weather
EASA_SIB_2012-10_1	23/05/2012	Cosmic rays in aircraft
EASA_SIB_2011-24R1	11/06/2012	MT9-MT17
EASA_SIB_SW-12-45_1	03/10/2012	Garmin model 400W/500W Series GPS-WAAS Navigation System
EASA_SIB_2012-21_1	19/12/2012	EGNOS availability in North and North East Europe

Table 10: EGNOS related SIBs issuance where ESSP supports/cooperates with EASA

4.7 Communication and EGNOS Promotion Activities

One aspect of the EGNOS Service Provision is the promotion of the service itself. ESSP has been supporting the EC and the GSA with their own promotion initiatives, also developing communication activities on its own in order to promote the use of EGNOS in different fields, mainly in the Aviation sector.

ESSP has developed several new tools to contact users and inform them of the different EGNOS services, the Service Provision and the company itself, such as the EGNOS Bulletins, and the ESSP Annual Report. Nevertheless, the main communication tool for ESSP is still the participation and attendance to various conferences, workshops and events related to the GNSS world and specific domains where the EGNOS services are being used (mainly aviation, but also rail, road, maritime and agriculture).

The scope of this action is:

- To provide accurate and updated information on the EGNOS system and services, promoting their user and applications development.
- To promote successful implementations and use of EGNOS services.

The ESSP participation in events is being carried out in three different ways:

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

4.7.1 EGNOS Service Provision Workshop 2012

ESSP is in charge of organizing an annual event to congregate EGNOS stakeholders (users, industry, institutions, regulators) in order to present EGNOS's latest performance and ESSP's main achievements.

The event configuration is adapted every year, but the core objectives remain the same: information, promotion, and networking.

The EGNOS Service Provision Workshop 2012 took place last June 14th-15th, 2012 at Madrid Barajas Airport premises. It was the perfect location to present the overall event, but it was especially suitable on the second day, which was mainly dedicated to the aviation sector: a practical view for pilots, airlines and operators willing to use EGNOS.

The first day of the event was more focused on general topics, such as EGNOS performances, system news and roadmaps. There was also a specific slot dedicated to EGNOS LPV implementation status within the European Service Area. Different ANSPs, such as DSNA (France) and Skyguide (Switzerland), shared their own experience in terms of EWA signature and EGNOS implementation in their national airports.

More than 120 people attended the two-day event, enriched with a technical visit to the Barajas Airport installations.

4.7.2 ESSP Event Participation April 2012 – March 2013

The next table shows the events in which ESSP had the chance to participate over the past months and that gave ESSP staff the opportunity to directly interact with EGNOS end users and stakeholders. Also, information about key targets, ESSP objectives and the type of participation for each of the previous mentioned events is provided.

Name of event	Date	Location	Description	Key Targets	ESSP Objective	Type of Participation
Workshop on EGNOS and Galileo for Marine and Maritime Applications	April 16-17, 2012	Venice	Nereus Workshop	GNSS developers in the maritime sector	To start interacting with the maritime sector in order to promote the use of EGNOS	Attending
Seminar on Satellite Navigation	May 8, 2012	Stockholm	Technical meeting on GNSS	Satellite Navigation community	To promote EGNOS in Scandinavia	Paper Presentation "EGNOS status, particularly at northern latitudes"
2012 European Business Aviation Convention & Exhibition	May 14-16, 2012	Geneva	Premier annual meeting place for the European Business aviation community.	European Business Aviation	To interact with key business aviation operators	Support given to GSA stand
EGNOS Yearly Service Provision Event	June 14-15, 2012	Madrid	ESSP YEARLY EGNOS SERVICE PROVISION WORKSHOP 2012			
Toulouse Space Show	June 25- 28, 2012	Toulouse	Meeting around European Space Industry	Space and Aviation Industry	To promote EGNOS and ESSP as the EGNOS Service Provider	ESSP-EGNOS stand
ION GNSS 2012	September 17-21, 2012	Nashville, USA	The world's largest technical meeting and showcase of GNSS technology, products and services	GNSS stakeholders (technical, political and industrial) from around the world	To update tech information and lobbying	Paper Presentation "The EGNOS NOTAM Proposals Service" + support to the EC stand
ESTEL Conference	October 2-5, 2012	Rome	Meeting on Space and Satellite Communications	Space Industry	To lobby and network with GNSS industry	Attending the Galileo Special Panel

Name of event	Date	Location	Description	Key Targets	ESSP Objective	Type of Participation
European Space Solutions	December 3-9, 2012	London	Meeting on Space + GNSS applications	GNSS app developers	To promote EGNOS services among GNSS app developers	Conference Participation + company Presentation + support to European Space Expo
CANSO ATM WORLD CONGRESS 2013	February 12-14, 2013	Madrid	First time CANSO organizes a Congress. Intends to substitute ATC in Amsterdam. Main discussion fora for European ANSPs.	ANSPs, Aviation stakeholders, Associations	To promote the EGNOS SoL Service among ANSPs and to distribute the information around the ATC entourage	ESSP - EGNOS stand and participation in Aviation Workshop. Award to AENA for EWA signature (media opp)
ATC GLOBAL 2013	March 12-14, 2013	Amsterdam	The annual ANSPs meeting. Lighter edition due to the CANSO event	ANSPs, Aviation stakeholders, Associations	To promote the EGNOS SoL Service among ANSPs and to distribute the information around the ATC entourage	ESSP-EGNOS Stand by ESSP

Table 11: Events with ESSP participation during reported period (April 2012 – March 2013)

5 MAIN ACTIVITIES PLANNED FOR THE YEAR AHEAD

5.1 EGNOS Working Agreement and Procedures Implementation

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

According to the status of the EWA discussions, FP7 implementation projects planning (SHERPA and ACCEPTA) and the States' LPV implementation plans, the EWAs with Finavia (Finland), LVNL (Netherlands), LPS (Slovakia) and some UK ANSPs (HIAL, Saint Mary's or 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. A total of more than 20 EWA´s are targeted before mid-2014.

Figure 45 shows the expected status of the procedures implementation at the end of the 2013-2014 period (those currently published plus those expected). Countries highlighted in blue are those where at least one LPV procedure is expected to be published (please note that, prior to that, an EWA would need to be signed between ESSP and the national ATS provider –for those which have not yet signed this agreement-).

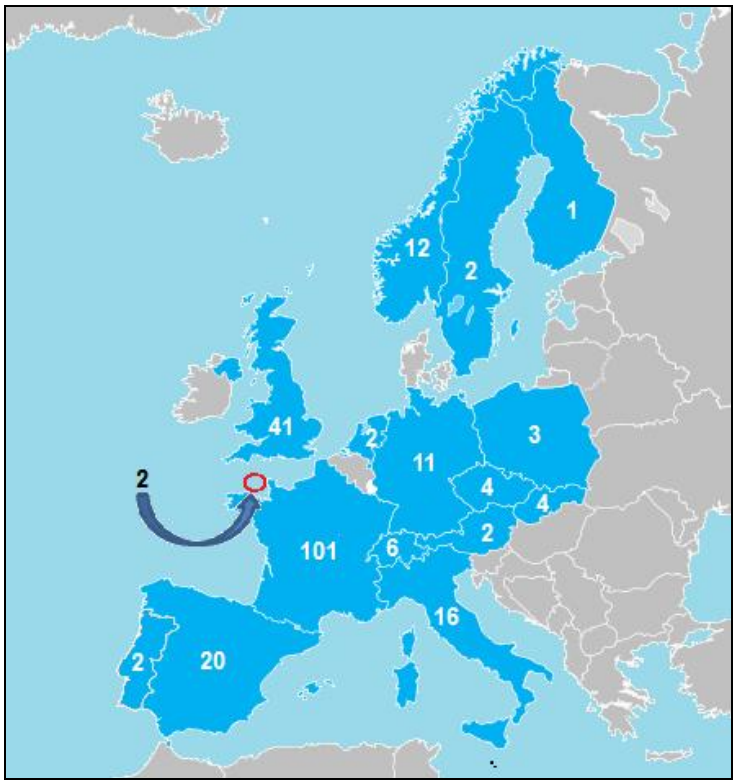


Figure 45: Expected procedures to be published during 2013-2014 period

The EWA contents are expected to remain stable with minor adaptations required from the evolutions of the EGNOS services or external constraints.

5.2 EGNOS SDDs Evolution

The EGNOS SoL SDD will be updated by June 2013 to account for the performance improvements of the EGNOS System Release (ESR) v2.3.1, also including the main outcomes of the consultation performed by the EC.

5.3 EGNOS Services Roadmap

The structure and contents included in the first release of these documents intend to be consolidated establishing a bi-annual update cycle ensuring that their contents are up to date and that they reflect the official message to be shared both by ESSP and by the EC in all fora. The next update is planned by mid 2013.

5.4 User Support Improvement

The activities aimed at improving the support provided to the EGNOS users are mainly focused on three objectives:

- Providing more information material tailored to each EGNOS service and/or to the specific application domains of the EGNOS user community in the form of:
  - New website contents.
  - Elaboration of interpretation material and guidance manuals.
- Improving the quality of the service provided through the EGNOS Helpdesk by:
  - Reducing the time to process the user requests.
  - Improving the phone support provided to EDAS users.
- Improving the real-time information provided in the EGNOS User Support Website thanks to the next planned evolutions:
  - Alert messages will be emitted from an ESSP address and/or should have at least an official address.
  - Use of RIMS data as receiver stations via EDAS.
  - Update SBAS information more frequently.
  - Change airplane colour based on NOTAM proposals existence (xml with NOTAM status will be made available in a future NOTAM update) and on status changes since the last update.
  - In airport alerts, change “System” by “APV-I Service”.
  - Airport maps will be updated every minute.
  - Indicate in the alerts that the time used is GPS time.
  - Include ESSP logo in the generated images.
  - Add a new image with the horizontal deviation for the local receivers.

5.5 Support to Multimodal Adoption

In line with the increasing demand for support received from diverse application domains (in addition to aviation) and in adherence with ESSP's mission/willingness to support all EGNOS users, ESSP is in the process of assessing the best approach to interact with different application domains, prioritizing our potential effort among all these domains.

In order to enable the development of multimodal applications, a high level of awareness is required. In addition, it is also important to participate in implementation/standardization projects (mainly FP7) which allow close contact with final users and relevant organizations in the field. For this reason, ESSP will reinforce its participation in events, workshops and working groups for multimodal domains and try to be actively involved in implementation projects.

With this purpose in mind, ESSP is willing to coordinate the scope of these activities/support with the aim to follow the EC/GSA leadership to find synergies and optimize the associated efforts for the year ahead.

5.6 EGNOS Communication Plan

5.6.1 EGNOS Service Provision Workshop 2013

The EGNOS Service Provision Workshop 2013 is taking place in Prague, July 3rd-4th 2013, at the GSA premises.

The two-day event agenda will include as in past editions an overall view on EGNOS performance, service status and roadmaps. The first day will be more focused on aviation stakeholders, while second day will be fully dedicated to the EDAS service as well as the use of EGNOS in multimodal sectors.

5.6.2 ESSP Planned Event Participation 2013

The events with performed or planned ESSP participation during the next reporting period in 2013 are the following:

Name of Event	**Type of Event**	**Date**
Regional ACI (Lyon)	Aviation	April 2013
European Navigation Conference (Vienna)	Satellite Navigation	April 2013
Aero Friedrichshafen	Aviation	April 2013
European Helicopter Show (Kralove)	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
ION GNSS (USA)	General GNSS	September 2013
ERA General Assembly (Salzburg)	Aviation	October 2013
Agritechnica (Hannover)	Agriculture	November 2013

Table 12: ESSP performed or planned event participation in the next reporting period in 2013

6 ANNEX A: FULL LIST OF EGNOS-BASED APPROACH PROCEDURES

The table below provides the full list of EGNOS based approach procedures published in Europe by the end of March 2013 (the APV Baro procedures included below are those for which the competent authority has approved the use of EGNOS for the vertical guidance).

Airport	ICAO Code	Country	Procedure(s)		Publication Date
			Type	Number	
Pau-Pyrénées	LFBP	France	LPV	1	17/03/2011
Clermont-Ferrand Auvergne	LFLC	France	LPV	1	05/05/2011
Paris-Le Bourget	LFPB	France	LPV	2	02/06/2011
Biarritz Bayonne Anglet	LFBZ	France	LPV	1	09/02/2012
Bordeaux Merignac	LFBD	France	LPV	2	08/03/2012
Brest Bretagne	LFRB	France	LPV	1	03/05/2012
Carcassonne Salvaza	LFMK	France	LPV	1	03/05/2012
Toulouse Blagnac	LFBO	France	LPV	4	03/05/2012
Vannes Meucon	LFRV	France	LPV	1	31/05/2012
Rodez Marcillac	LFCR	France	LPV	1	31/05/2012
Limoges	LFBL	France	LPV	1	28/06/2012
Orléans St. Denis De L´Hotel	LFOZ	France	LPV	2	28/06/2012
Nantes	LFRS	France	LPV	1	28/06/2012
Calais	LFAC	France	LPV	1	20/09/2012
Beauvais	LFOB	France	LPV	1	20/09/2012
La Rochelle	LFBH	France	LPV	1	20/09/2012
Nimes Garons	LFTW	France	LPV	1	18/10/2012
Beziers Vias	LFMU	France	LPV	1	18/10/2012
Albert Bray	LFAQ	France	LPV	1	15/11/2012
Le Mans	LFRM	France	LPV	1	15/11/2012
Merville	LFQT	France	LPV	1	15/11/2012
Nevers Fouchambault	LFQG	France	LPV	1	13/12/2012
Valence	LFLU	France	LPV	1	13/12/2012
La Roche Sur Yon	LFRI	France	LPV	1	13/12/2012
Lyon St Exupery	LFLL	France	LPV	1	07/02/2013

Airport	ICAO Code	Country	Procedure(s)		Publication Date
			Type	Number	
Grenoble Isere	LFLS	France	LPV	1	07/03/2013
Metz Nancy Lorraine	LFJL	France	LPV	1	04/04/2013
Evreux Fauville	LFOE	France	LPV	2	2012
Orleans Bricy	LFOJ	France	LPV	1	2012
St. Gallen-Altenrhein	LSZR	Switzerland	LPV	1	17/11/2011
Les Eplatures	LSGC	Switzerland	LPV	1	17/11/2011
Berne-Belp	LSZB	Switzerland	LPV	1	07/03/2013
Alderney	EGJA	Guernsey	LPV	2	07/12/2011
Milano/Linate	LIML	Italy	LPV	1	13/12/2012
Roma/Ciampino	LIRA	Italy	LPV	1	10/01/2013
Roma/Fiumicino	LIRF	Italy	LPV	3	10/01/2013
Braunschweig-Wolfsburg	EDVE	Germany	LPV	2	18/10/2012
Hamburg-Finkenwerder	EDHI	Germany	LPV	2	13/12/2012
Magdeburg/City	EDBM	Germany	LPV	1	13/12/2012
Oberpfaffenhofen	EDMO	Germany	LPV	1	13/12/2012
Paderborn/Lippstadt	EDLP	Germany	LPV	2	13/12/2012
Schwäbisch-Hall	EDTY	Germany	LPV	2	13/12/2012
Kassel-Calden	EDVK	Germany	LPV	1	04/04/2013
Allendorf/Eder	EDFQ	Germany	APV Baro	1	15/12/2011
Augsburg	EDMA	Germany	APV Baro	2	15/12/2011
Barth	EDBH	Germany	APV Baro	1	15/12/2011
Bautzen	EDAB	Germany	APV Baro	1	15/12/2011
Bayreuth	EDQD	Germany	APV Baro	1	15/12/2011
Berlin-Tegel	EDDT	Germany	APV Baro	4	15/12/2011
Berlin/Schönefeld	EDDB	Germany	APV Baro	4	15/12/2011
Bremen	EDDW	Germany	APV Baro	2	15/12/2011
Bremerhaven	EDWB	Germany	APV Baro	2	15/12/2011
Coburg-Brandensteinsebene	EDQC	Germany	APV Baro	1	15/12/2011
Donaueschingen-Villingen	EDTD	Germany	APV Baro	1	15/12/2011
Dortmund	EDLW	Germany	APV Baro	2	15/12/2011
Dresden	EDDC	Germany	APV Baro	2	15/12/2011

Airport	ICAO Code	Country	Procedure(s)		Publication Date
			Type	Number	
Düsseldorf	EDDL	Germany	APV Baro	4	15/12/2011
Eggenfelden	EDME	Germany	APV Baro	1	15/12/2011
Erfurt-Weimar	EDDE	Germany	APV Baro	2	15/12/2011
Frankfurt Main	EDDF	Germany	APV Baro	4	15/12/2011
Friedrichshafen	EDNY	Germany	APV Baro	2	15/12/2011
Giebelstadt	EDQG	Germany	APV Baro	2	14/02/2012
Hamburg	EDDH	Germany	APV Baro	4	15/12/2011
Hannover	EDDV	Germany	APV Baro	4	15/12/2011
Köln/Bonn	EDDK	Germany	APV Baro	6	15/12/2011
Leipzig/Halle	EDDP	Germany	APV Baro	4	15/12/2011
Memmingen	EDJA	Germany	APV Baro	2	15/12/2011
Mengen-Hohentengen	EDTM	Germany	APV Baro	1	15/12/2011
München	EDDM	Germany	APV Baro	4	15/12/2011
Münster/Osnabrück	EDDG	Germany	APV Baro	2	15/12/2011
Nürnberg	EDDN	Germany	APV Baro	1	15/12/2011
Saarbrücken	EDDR	Germany	APV Baro	2	15/12/2011
Straubing	EDMS	Germany	APV Baro	1	15/12/2011
Stuttgart	EDDS	Germany	APV Baro	1	15/12/2011
Wilhelmshaven JadeWeserAirport	EDWI	Germany	APV Baro	2	15/12/2011

Table 13: EGNOS-based approach procedures published

7 ANNEX B: APV-I PERFORMANCES AT AIRPORTS HAVING EGNOS-BASED PROCEDURES

The table below provides the global APV-I performances at airports with EGNOS based approach procedures published (on March 31st 2013). The results correspond to the APV-I availability and continuity results computed from the date in which the procedure was published.

Airports	Country	Status	APV-I Availability	APV-I Continuity Risk
EDAB / Bautzen	Germany	Operational	99.10%	4.48E-05
EDBH / Barth	Germany	Operational	99.03%	6.17E-05
EDBM / Magdeburg/City	Germany	Operational	99.09%	5.83E-05
EDDB / Berlin/Schönefeld	Germany	Operational	99.07%	6.48E-05
EDDC / Dresden	Germany	Operational	99.10%	4.48E-05
EDDE / Erfurt-Weimar	Germany	Operational	99.11%	3.85E-05
EDDF / Frankfurt Main	Germany	Operational	99.11%	3.39E-05
EDDG / Münster/Osnabrück	Germany	Operational	99.07%	5.09E-05
EDDH / Hamburg	Germany	Operational	99.03%	6.10E-05
EDDK / Köln/Bonn	Germany	Operational	99.10%	4.02E-05
EDDL / Düsseldorf	Germany	Operational	99.09%	4.24E-05
EDDM / München	Germany	Operational	99.11%	2.73E-05
EDDN / Nürnberg	Germany	Operational	99.12%	2.27E-05
EDDP / Leipzig/Halle	Germany	Operational	99.10%	4.61E-05
EDDR / Saarbrücken	Germany	Operational	99.13%	1.87E-05
EDDS / Stuttgart	Germany	Operational	99.12%	2.17E-05
EDDT / Berlin-Tegel	Germany	Operational	99.07%	6.69E-05
EDDV / Hannover	Germany	Operational	99.06%	5.09E-05
EDDW / Bremen	Germany	Operational	99.05%	5.94E-05
EDFQ / Allendorf/Eder	Germany	Operational	99.10%	4.04E-05
EDHI / Hamburg-Finkenwerder	Germany	Operational	99.04%	6.16E-05
EDJA / Memmingen	Germany	Operational	99.11%	2.63E-05
EDLP / Paderborn/Lippstadt	Germany	Operational	99.09%	5.15E-05
EDLW / Dortmund	Germany	Operational	99.09%	4.49E-05

Airports	Country	Status	APV-I Availability	APV-I Continuity Risk
EDMA / Augsburg	Germany	Operational	99.11%	2.67E-05
EDME / Eggenfelden	Germany	Operational	99.11%	2.67E-05
EDMO / Oberpfaffenhofen	Germany	Operational	99.11%	2.95E-05
EDMS / Straubing	Germany	Operational	99.11%	2.66E-05
EDNY / Friedrichshafen	Germany	Operational	99.11%	2.41E-05
EDQC / Coburg-Brandensteinsebene	Germany	Operational	99.11%	3.47E-05
EDQD / Bayreuth	Germany	Operational	99.11%	2.91E-05
EDQG / Giebelstadt	Germany	Operational	99.12%	2.19E-05
EDTD / Donaueschingen-Villingen	Germany	Operational	99.12%	2.09E-05
EDTM / Mengen-Hohentengen	Germany	Operational	99.12%	2.29E-05
EDTY / Schwäbisch-Hall	Germany	Operational	99.12%	2.13E-05
EDVE / Braunschweig-Wolfsburg	Germany	Operational	99.06%	5.20E-05
EDWB / Bremerhaven	Germany	Operational	99.04%	5.92E-05
EDWI / Wilhelmshaven Jade-Weser	Germany	Operational	99.04%	5.71E-05
EGJA / Alderney	Guernsey	Operational	99.12%	3.28E-05
LFAC / Calais	France	Operational	99.92%	6.28E-05
LFAQ / Albert Brey	France	Operational	99.96%	4.50E-05
LFBD / Bourdeaux Mérignac	France	Operational	99.11%	2.60E-05
LFBH / Beauvais	France	Operational	99.96%	2.16E-05
LFBL / Limoges	France	Operational	99.97%	2.16E-05
LFBO / Toulouse Blagnac	France	Operational	99.11%	2.66E-05
LFBP / Pau	France	Operational	99.09%	3.08E-05
LFBZ / Biarritz	France	Operational	99.07%	3.95E-05
LFCR / Rodez-Marcillac	France	Operational	99.06%	2.10E-05
LFLC / Clermont Ferrand	France	Operational	99.12%	1.74E-05
LFLL / Lyon St Exupery	France	Operational	100.00%	0.00E+00
LFLS / Grenoble Isere	France	Operational	100.00%	0.00E+00
LFLU / Valence	France	Operational	99.99%	1.21E-05
LFMK / Carcassonne Salvaza	France	Operational	99.11%	2.46E-05

Airports	Country	Status	APV-I Availability	APV-I Continuity Risk
LFMU / Beziers Vias	France	Operational	99.99%	1.91E-05
LFOB / La Rochelle	France	Operational	99.97%	2.87E-05
LFOZ / Orleans	France	Operational	99.98%	1.58E-05
LFPB / Le Bourget	France	Operational	99.13%	2.02E-05
LFQG / Nevers Fouchambault	France	Operational	99.99%	2.01E-05
LFQT / Merville	France	Operational	99.93%	6.86E-05
LFRB / Brest Bretagne	France	Operational	99.11%	3.84E-05
LFRI / La Roche Sur Yon	France	Operational	99.99%	1.41E-05
LFRM / Le Mans	France	Operational	99.99%	1.69E-05
LFRS / Nantes	France	Operational	99.97%	2.32E-05
LFRV / Vannes Meucon	France	Operational	99.05%	2.86E-05
LFTW / Nimes Garons	France	Operational	99.99%	1.35E-05
LIML / Milano/Linate	Italy	Operational	99.99%	5.63E-06
LIRA / Roma/Ciampino	Italy	Operational	99.99%	9.86E-06
LIRF / Roma/Fiumicino	Italy	Operational	99.99%	1.07E-05
LSGC / Les Eplatures	Switzerland	Operational	99.12%	2.04E-05
LSZB /Berne-Belp	Switzerland	Operational	100.00%	0.00E+00
LSZR / St.Gallen-Altenrhein	Switzerland	Operational	99.11%	2.42E-05

Table 14: APV-I performances at airports with LPV published procedures

8 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
AIS	Aeronautical Information Services
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
BU	Burum
CAA	Civil Aviation Authority
CANSO	Civil Air Navigation Services Organization
CDM	Collaborative Decision Making
CNES	Centre National d'Etudes Spatiales
CNR	Canary Islands
CPF	Central Processing Facility
CRK	Cork
CTN	Catania
DFS	Deutsche Flugsicherung

Acronym	Definition
DJA	Djerba
DSAC	Direction de la Sécurité de l'Aviation Civile
DSNA	Direction des Services de la Navigation Aérienne
DU	Do not Use
EAD	European AIS Database
EASA	European Aviation Safety Agency
EC	European Commission
ECAC	European Civil Aviation Conference
EDAL	Exeter and Devon Airport Limited
EDAS	EGNOS Data Access Service
EGI	Egilsstadir
EGNOS	European Geostationary Navigation Overlay Service
ENAV	Ente Nazionale Di Assistenza Al Volo
ENSAC	European National Supervisory Authority Committee
ESA	European Space Agency
ESR	EGNOS System Release
ESSP	European Satellite Services Provider
ETSO	European Technical Standard Order
EU	European Union
EWA	EGNOS Working Agreement
FP7	Seventh Framework Programme
FUC	Fucino
GEO	Geostationary Satellite
GISE	GNSS Information System for Europe
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

Acronym	Definition
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
HW	Hardware
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
MAD	Madeira
MLG	Malaga
MON	Moncton
N/A	Not Applicable/ Not Available
NANU	Notice Advisory to Navstar Users
NATS	National Air Traffic Services
NLES	Navigation Land Earth Station
NM	Not Monitored
NOF	NOTAM Offices
NOTAM	Notice to Airmen
NOU	Nouakchott

Acronym	Definition
NPA	Non-Precision Approach
NSA	National Supervisory Authority
NSG	Navigation Steering Group
OP	Operation
OS	Open Service
PA	Precision Approach
PANSA	Polish Air Navigation Services Agency
PBN	Performance Based Navigation
PDM	Palma De Mallorca
PoC	Point of Contact
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
SARPS	Standards And Recommended Practices
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
SIB	Safety Information Bulletin
SIS	Signal-In-Space
SISNeT	Signal-In-Space through the Internet
SL0	Service Level 0
SL1	Service Level 1
SL2	Service Level 2
SOF	Sofia

Acronym	Definition
SoL	Safety-Of-Life
SV	Space Vehicle
SWA	Swanwick
TF	Task Force
TLS	Toulouse
TOR	Torrejón
TRD	Trondheim
TRO	Tromsoe
TSO	Technical Standard Order
UDRE	User Differential Range Error
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
WAAS	Wide Area Augmentation System
WRS	Warsaw
ZUR	Zurich

END OF DOCUMENT