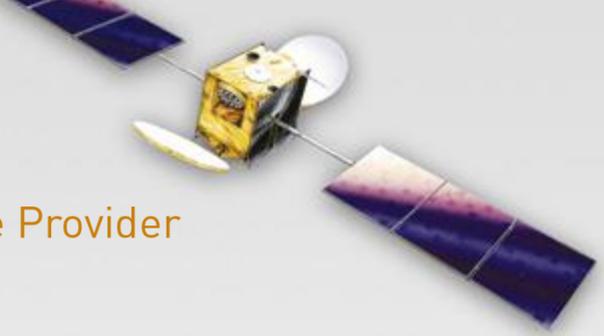


The **EGNOS** Service Provider



# Service Provision Yearly Report (April 2017 - March 2018)

EGNOS Service Provision



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## 1 A WORD FROM THE ESSP CEO

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EGNOS performance observed in the last annual period (April 2017- March 2018) remained at high levels, with no safety or security incidents to be highlighted during the period.

EGNOS was upgraded by mid-June 2017 thanks to a new system version. The EGNOS station located in Nouakchott was successfully moved to a brand-new location.

On the service provision side, the number of EGNOS-based published procedures was increased by 94. Among them, it is to be highlighted that 72 were LPV-200 based approach procedures and the first 5 RNP 0.3 routes based on EGNOS became operational in Switzerland, a clear indication of the growing interest on EGNOS for rotorcraft operations. At the end of March 2018, most European countries have published EGNOS based operations and above 30% of the instrumental runway ends in Europe had an EGNOS based approach procedure. In line with this increase in procedures, 7 new EGNOS Working Agreements (EWAs) were signed, reaching 59 at the end of March 2018 (covering 23 EU member states). Apart from the increasing adoption of EGNOS in aviation, significant progress was made again this year on the definition of the framework for the use of EGNOS in new market segments; in particular, the publication of the IALA guidelines “G1129: The retransmission of SBAS corrections using MF-radio beacon and AIS” has been definitively a great step towards the use of EGNOS for maritime navigation together with a specific roadmap, defined with the GSA, to start preparing a safety-of-life service for maritime users.

EGNOS multimodal adoption actions were successfully conducted jointly with the GSA in aviation and other application domains. Last year, a significant number of actions in *maritime* and *agriculture and surveying* were implemented, representing a major increase in the effort devoted to the uptake of EGNOS in these market segments with respect to past years.

The 2017 edition of the EGNOS Annual Workshop was held in Athens, bringing together again this year nearly 170 participants from almost 30 nationalities.

Users expressed an 81% satisfaction through the annual survey that is jointly performed by GSA and ESSP. Additionally, the revamp of the EGNOS user support website was performed successfully and the EGNOS APP was released to users in March 2018.

I would like to thank the ESSP teams, partners and subcontractors for their continuous commitment and contribution to this performance, and to our customer, the GSA, for the trust they place in us.



**Thierry Racaud**  
CEO, ESSP SAS



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## 2 EXECUTIVE SUMMARY

This document covers the period from 1 April 2017 to 31 March 2018.

### 2.1 EGNOS Service Performance

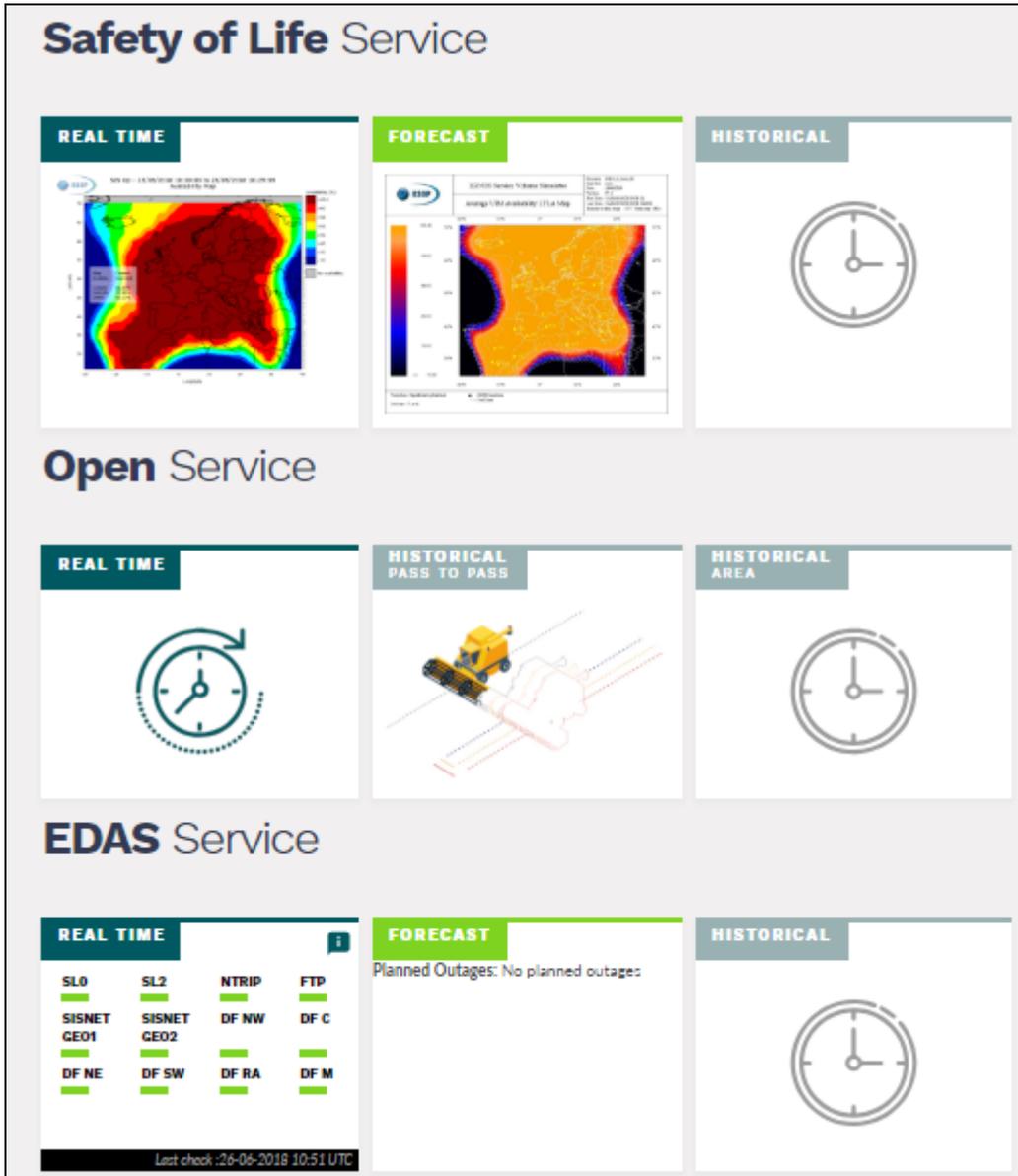
EGNOS service performance was excellent, providing consistent values with those committed in the Open Service, Safety-of-Life and EDAS [Service Definition Documents](#).

EGNOS Safety-of-Life (SoL) Service – Non-Precision Approach (NPA)		
NPA Availability	100% coverage of the 99.9% NPA Service Area ( <a href="#">EGNOS SoL SDD</a> )	
NPA Integrity	No integrity event for any of the monitoring sites	
NPA Continuity	Values below $5 \cdot 10^{-4}$ /h in continental Europe	
EGNOS Safety-of-Life (SoL) Service – Approach with Vertical Guidance (APV-I)		
APV-I Availability	99.33% coverage of the 99% APV-I Service Area ( <a href="#">EGNOS SoL SDD</a> )	
APV-I Integrity	No APV-I integrity event	
APV-I Continuity	99.89% coverage of the $5 \cdot 10^{-4}$ APV-I Service Area ( <a href="#">EGNOS SoL SDD</a> )	
EGNOS Safety-of-Life (SoL) Service – LPV-200		
LPV-200 Availability	99.97% coverage of the 99% LPV-200 Service Area ( <a href="#">EGNOS SoL SDD</a> )	
LPV-200 Integrity	No LPV-200 integrity event	
LPV-200 Continuity	99.66% coverage of the $5 \cdot 10^{-4}$ LPV-200 Service Area ( <a href="#">EGNOS SoL SDD</a> )	
LPV-200 Accuracy Tails	No events happened during the period	
EGNOS Open Service (OS)		
Horizontal Accuracy	0.9 metres (95 <sup>th</sup> percentile of the cumulative data for all stations)	
Vertical Accuracy	1.6 metres (95 <sup>th</sup> percentile of the cumulative data for all stations)	
Open Service Availability	Above 99% for all locations	
EGNOS Data Access Service (EDAS)		
EDAS Service	Availability (%)	Latency (ms)
Service Level 0	99.88%	648.62 ms
Service Level 2	99.87%	652.11 ms
Ntrip	99.85%	651.52 ms
SISNeT	99.79%	82.62 ms
Data Filtering	99.88%	476.49 ms
FTP	99.89%	N/A
Signal-In-Space (SIS) Availability		
PRN120	99.893%	
PRN123	99.994%	
EGNOS OP (at least one SIS)	100%	

Table 1: EGNOS service performance during the April 2017 – March 2018 period

The main causes for the observed lesser performance were:

- EGNOS OS and SoL services:
  - **Ionosphere monitoring:** EGNOS reaction to high ionospheric activity (e.g. important solar eruption that occurred on 6 September 2017) is one of the main causes for underperformance (around 56% of the daily underperformance events) impacting mainly the North and West of the Service Area. In general, the impact of this kind of events is limited to some specific areas and short periods of time without having a significant impact on the monthly performance.
  - **GPS monitoring:** Problems related to the monitoring (e.g. non monitored satellites due to the lack of visibility from EGNOS reference stations, satellites set to 'Don't use'/Not Monitored) of one or more GPS satellites are the second cause for underperformance. This loss of monitoring of some satellites has been especially significant in terms of performance impact during periods with degraded ionosphere monitoring conditions (e.g. on 6 September 2017, the abovementioned solar eruption that impacted the ionosphere monitoring provoked the simultaneous loss of monitoring of multiples satellites). As for the case of ionosphere monitoring issues, the impact of this kind of events is limited both geographically and from a duration point of view.
  - **RIMS and reference stations and telecommunication network related events:** Although some outages were observed over the year, most of them had a minor impact on the service performance. One of the most relevant cases took place on 16 June 2017, when the data from some of the EGNOS stations in North of Europe was not available for a couple of minutes. Such situation caused a short duration degradation of the EGNOS performance over that region. Actions are ongoing at the EGNOS programme level to maximise the resiliency of the EGNOS network.
  - **Data quality/RIMS anomaly:** The existence of local issues in the RIMS receivers (e.g. unhealthy data) has impacted EGNOS services performance on specific days in the areas near the affected station (e.g. Alexandria mainly in April, July, September and November 2017 and March 2018, Lappeenranta in January and March 2018) on specific dates. A HW replacement normally allowed recovering the nominal situation.
  - **NANU:** Four GPS maintenance events caused performance degradations over some border areas.
  - **Other isolated system anomalies:** one relevant event took place in January 2018, when a complete loss of service of a few minutes was observed on both operational GEOs. The EGNOS programme is working to maximise the system robustness and correct all identified anomalies as soon as possible.
- EDAS:
  - Very stable services with monthly performance consistently exceeding the committed values.
  - The only notable EDAS services' outage took place on 20 November 2017, caused by a cut affecting the local telecom provider network. The redundancy plan has been improved since then through more diversification.

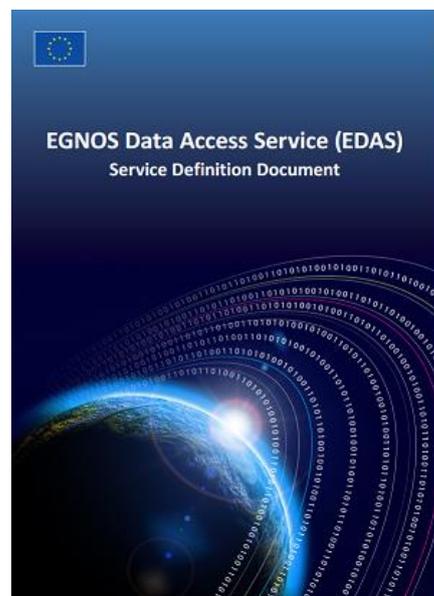
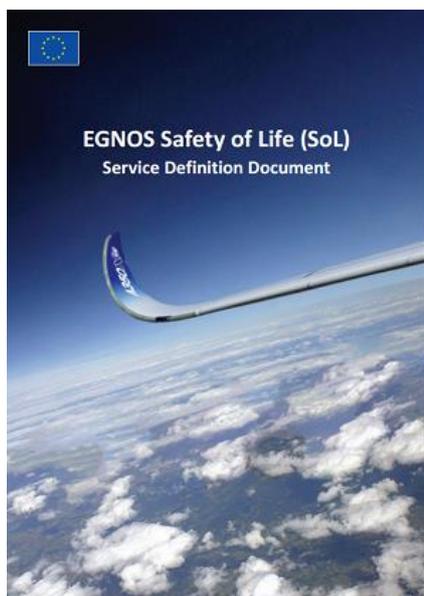


EGNOS services status dashboard ([EGNOS User Support Website](#))

## 2.2 Service Provision and Development

- **Service Evolution:**

- **Service Definition Documents (SDD):** a new version of the OS SDD (v2.3) was published on 3 October 2017 and presented during the EGNOS Annual Workshop held in Athens. The main elements of this new OS SDD version can be found in section 4.1.1.



### [EGNOS Service Definition Documents](#)

- **Service Notices:** the EGNOS Services' SDD contents were complemented by the publication of three Service Notices. The main information on these Service Notices can be found in section 4.1.1.
  - **EGNOS Service Implementation Roadmap:** The EGNOS Service Roadmaps were updated to v3.5 in June 2017 and presented during the EGNOS Annual Workshop held in Athens.
- **EGNOS Annual Workshop:**
    - The 2017 EGNOS Annual Workshop was held in Athens on 3-4 October 2017 with some 170 participants over the two days of the event. Attendees were highly satisfied according to the survey that was implemented, which provided an excellent satisfaction score of 85%, exactly the same as last year.
    - The 2018 EGNOS Annual Workshop will be integrated into the EU Space Week organised by GSA in Marseille from 3 to 6 December 2018 (<https://www.euspaceweek.eu/>).
  - **EGNOS User Satisfaction surveys:**
    - The EGNOS User Satisfaction Survey was launched in October 2017 to cover the 2017 calendar year. The survey used a specific online platform where 177 answers were received from a pool of approximately 6,700 consulted users.

- A total of 136 EGNOS users and 41 non-EGNOS users replied to the survey. The main results of this survey were included in the [EGNOS Bulletin Q1 2018](#). The results show an excellent level of user satisfaction with respect to EGNOS service, with an overall score of 80.83%, in line with the value obtained in 2016.
- **User Service Implementation:**
  - EGNOS Multimodal Adoption (EMA) Action Plan:
    - The market segments where more effort has been devoted are aviation and maritime, followed by agriculture & mapping and rail.
    - ESSP has continued to engage aerodromes to publish EGNOS-based procedures and operators to get equipped and certified. More than 145 LPV procedures were published and over 83 aircrafts were certified or achieved operational approval. Another 28 new aircraft/rotorcraft units were engaged, so in the near future they will retrofit, start with the certification process or request SBAS options in the avionics for new unit orders.
    - In the maritime domain, 2017 represented the continuation of activities launched to analyse a safety-of-life service for maritime users based on a roadmap defined with GSA, as well as those linked to the use of EGNOS V2 SiS or EDAS as a positioning source for Aids to Navigation (IALA DGNSS stations and AIS stations).
    - In agriculture and mapping, the contacts network has been notably increased, and custom information for those market segments has been prepared and disseminated. ESSP has approached users offering a “proof of concept” or demo, enabling users to confirm how EGNOS could solve their positioning needs with the suitable equipment.
    - In the rail market segment, continuous support for SoL and non-SoL applications has been provided to GSA. Support has been provided to GSA for analysing different means to use EGNOS (EDAS in particular) in the railway domain and for the revision of CWA-16390 standard.



*Steering system installed on a tractor*

- **User Support:**

- The EGNOS User Support website was completely revamped improving accessibility and the user experience, with a complete reorganisation of contents by market segment and including a new documentation library and other new visualisations and improvements.



The screenshot shows the EGNOS User Support website homepage. At the top, there is a navigation bar with links: EUROPEAN GNSS, EGNOS SYSTEM, SERVICES, NEWS & EVENTS, DOCUMENTS, and RESOURCES & TOOLS. Below this is a header area with the EGNOS User Support logo, the text "Find the support you need!", and a grid of icons representing different market segments (ROAD, AIR, SEA, RAIL, etc.). A hand cursor is pointing at the ROAD icon.

The main content area features a large banner with the text "MEET THE BRAND NEW EGNOS USER SUPPORT WEBSITE Is here!". Below this, there are several callouts highlighting new features:

- Redistributed Navigation panel**: Relevant information per market segment at a glance. Accompanied by an image of a satellite.
- New Library**: Filter by document type, market segment and more. Accompanied by an icon of an open book.
- Easy access EGNOS Helpdesk**: New floating icon available on every page. Accompanied by a headset icon.
- Restyled Look & feel**: Accompanied by a screenshot of the website interface on a monitor.
- Handy Dashboard**: Accompanied by a QR code.

At the bottom of the page, there are logos for the European Commission, ESSP (with the tagline "We certify you're there."), and GSA.

The [EGNOS User Support Website](http://egnos-user-support.essp-sas.eu) was fully renewed in 2018

### 3 SERVICE PERFORMANCE

#### 3.1 EGNOS SIS Availability

Definition
<b>Individual GEO availability:</b> Percentage of time when each geostationary satellite broadcasts a valid EGNOS SIS. A valid SIS is defined as a Signal-In-Space compliant with ICAO SARPS and RTCA MOPS.
<b>Grouped GEO Availability:</b> Percentage of time when at least one geostationary satellite in the EGNOS operational configuration (EGNOS-OP) broadcasts a valid EGNOS SIS. A valid SIS is defined as a Signal-In-Space compliant with ICAO SARPS and RTCA MOPS.

This section presents the annual performance of the SIS availability. It provides the yearly average performance for each GEO PRN in operational mode namely PRN120 and PRN123 and for the operational SIS (at least one SIS is available).

From April 2017 to March 2018, the average (per month) EGNOS message availability was:

- OP1: PRN120: 99.893%
- OP2: PRN 123: 99.994%
- EGNOS OP (at least one SIS): 100%

Monthly results are given by the following:

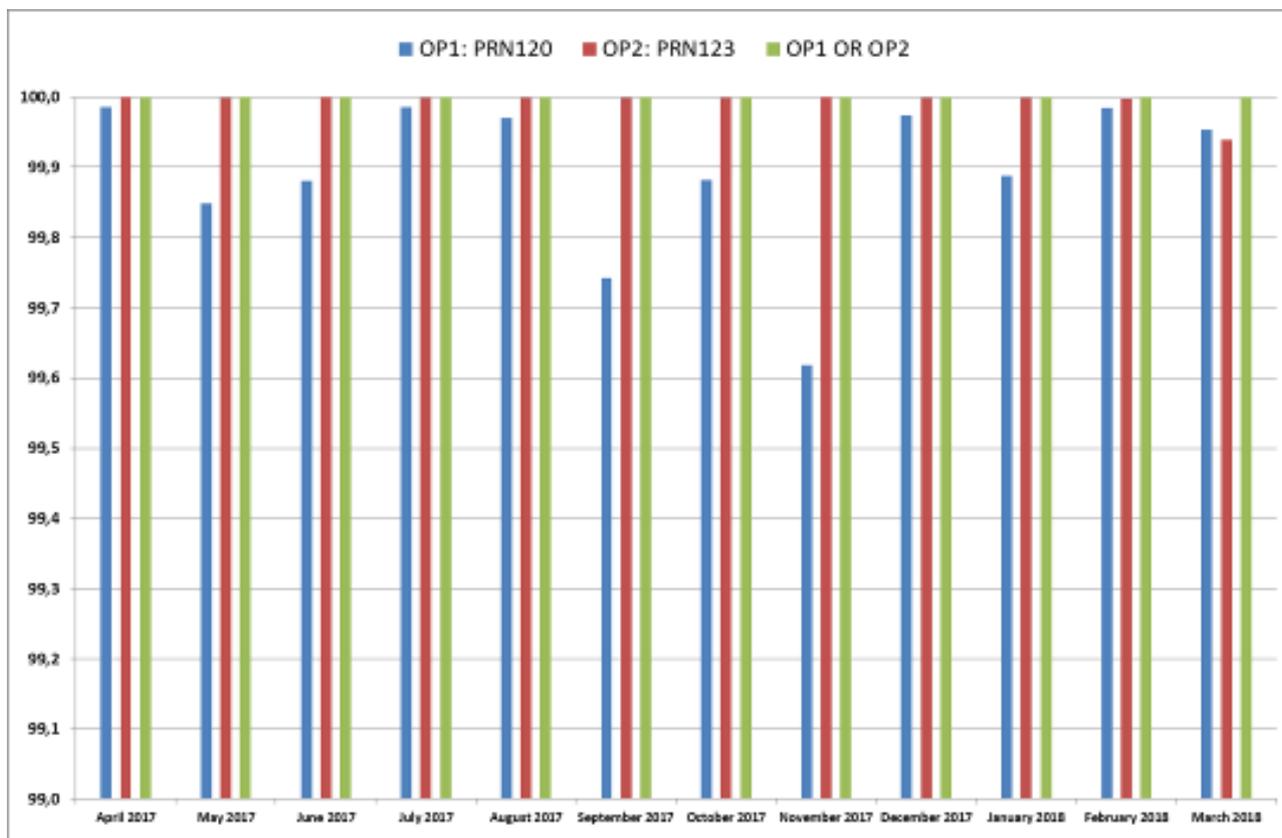


Figure 1: EGNOS SIS OP availability trend April 2017 to March 2018 (%)

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

Month	OP1: PRN 120	OP2: PRN 123	OP1 OR OP2
April 2017	99,986	100,000	100,000
May 2017	99,848	100,000	100,000
June 2017	99,880	100,000	100,000
July 2017	99,986	99,999	100,000
August 2017	99,970	100,000	100,000
September 2017	99,742	100,000	100,000
October 2017	99,882	100,000	100,000
November 2017	99,618	100,000	100,000
December 2017	99,974	100,000	100,000
January 2018	99,888	99,999	100,000
February 2018	99,985	99,998	100,000
March 2018	99,954	99,939	100,000
Average	99,893	99,994	100,000

Table 2: EGNOS SIS OP monthly availability from April 2017 to March 2018 (%)

### 3.2 SoL Service - Non-Precision Approach (NPA)

The following figures depict the minimum performance for the Non-Precision Approach (NPA) availability and continuity that can be expected from EGNOS, as defined in the [EGNOS SoL Service Definition Document](#). These values correspond to the expected average performance measured by a fault-free receiver using all GPS satellites in view over a period of one month, using all the operational EGNOS GEOs:

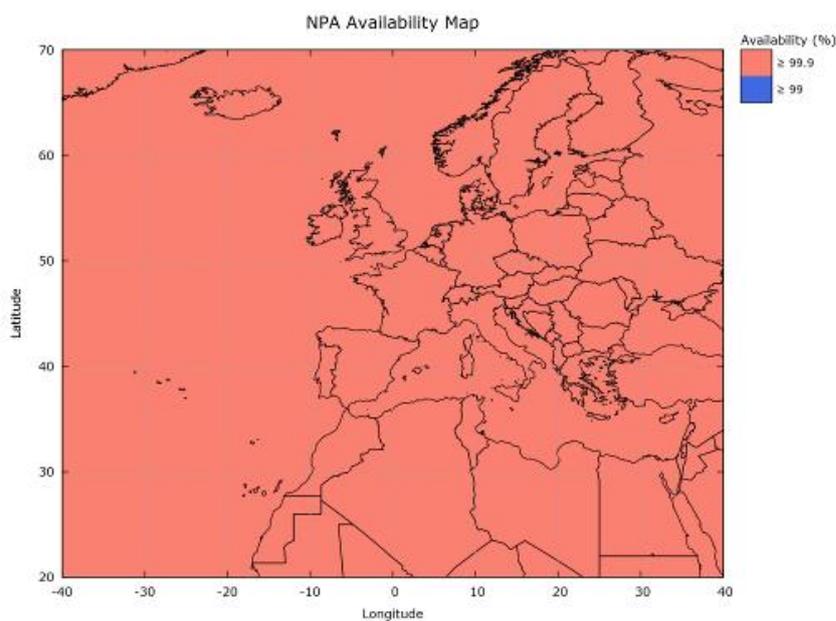


Figure 2: NPA Availability map- Expected minimum performance

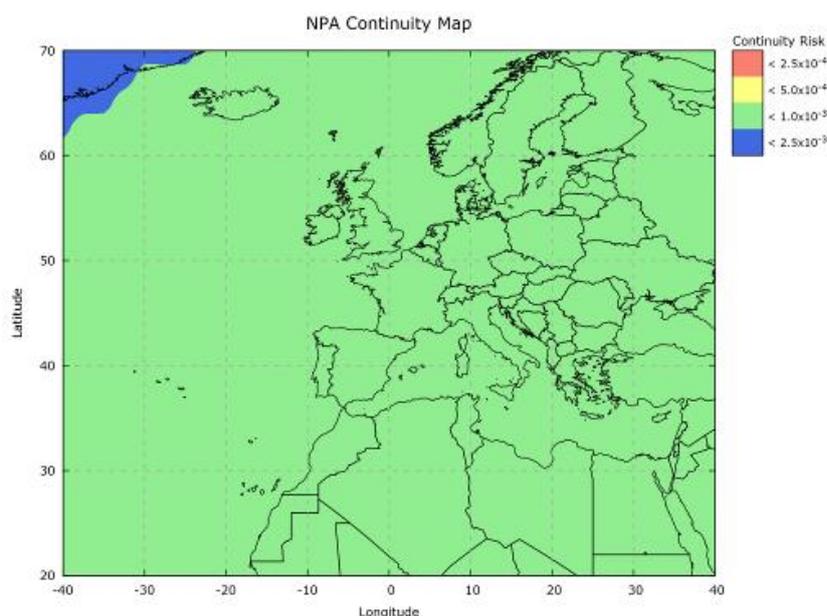


Figure 3: NPA Continuity map - Expected minimum performance

Achieved NPA performance during the reporting period is reported below. Additionally, NPA performance is reported through the EGNOS Monthly Performance reports, available on the [EGNOS User Support website](#).

### 3.2.1 NPA availability

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

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

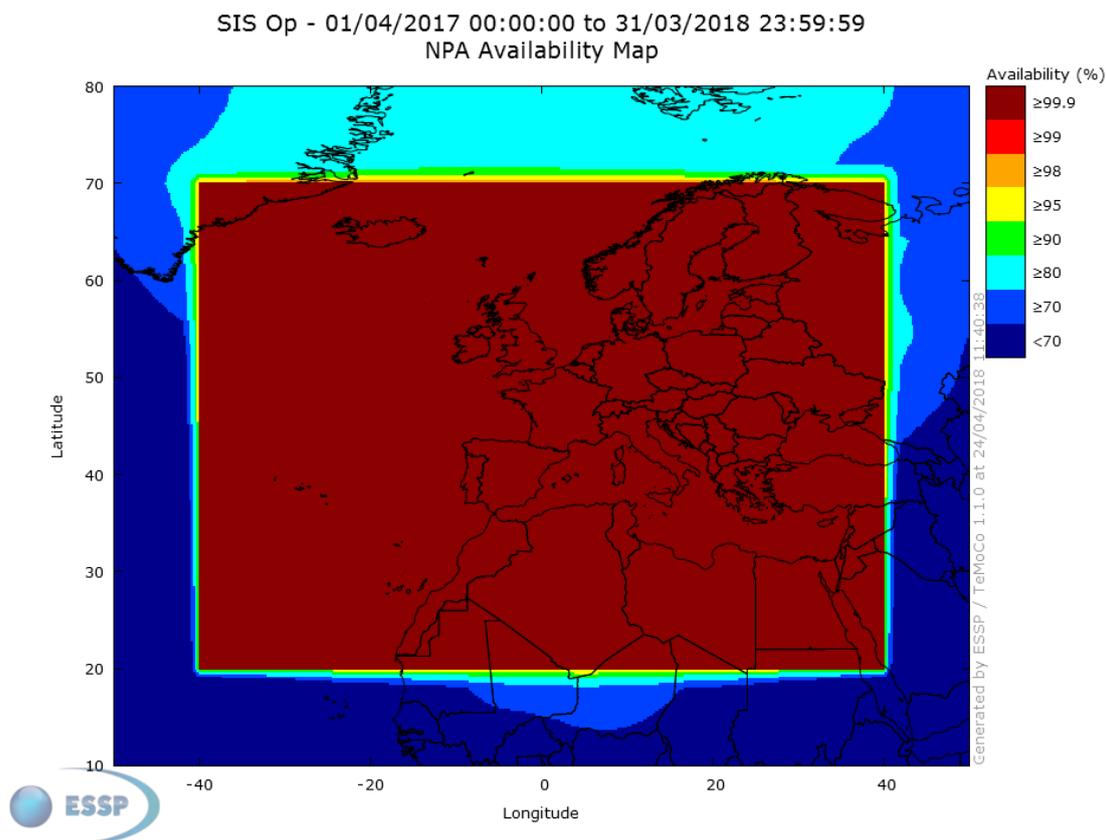


Figure 4: NPA Availability from 01/04/17 to 31/03/18

The NPA availability performance has been excellent during the reporting period, being greater than 99.9% over the entire NPA Service Area<sup>1</sup>.

<sup>1</sup> NPA Service Area is the 99% NPA availability area depicted in Figure 2 coming from the [EGNOS Safety of Life SDD](#). It corresponds to the MT27 area.

### 3.2.2 NPA availability - Achievement vs Target

The combination of the 99% NPA Availability map and the NPA Service Area<sup>1</sup> is shown in Figure 5. It should be noted that, thanks to the excellent NPA service performance, the same result would have been obtained taking the 99.9% availability target as the reference.

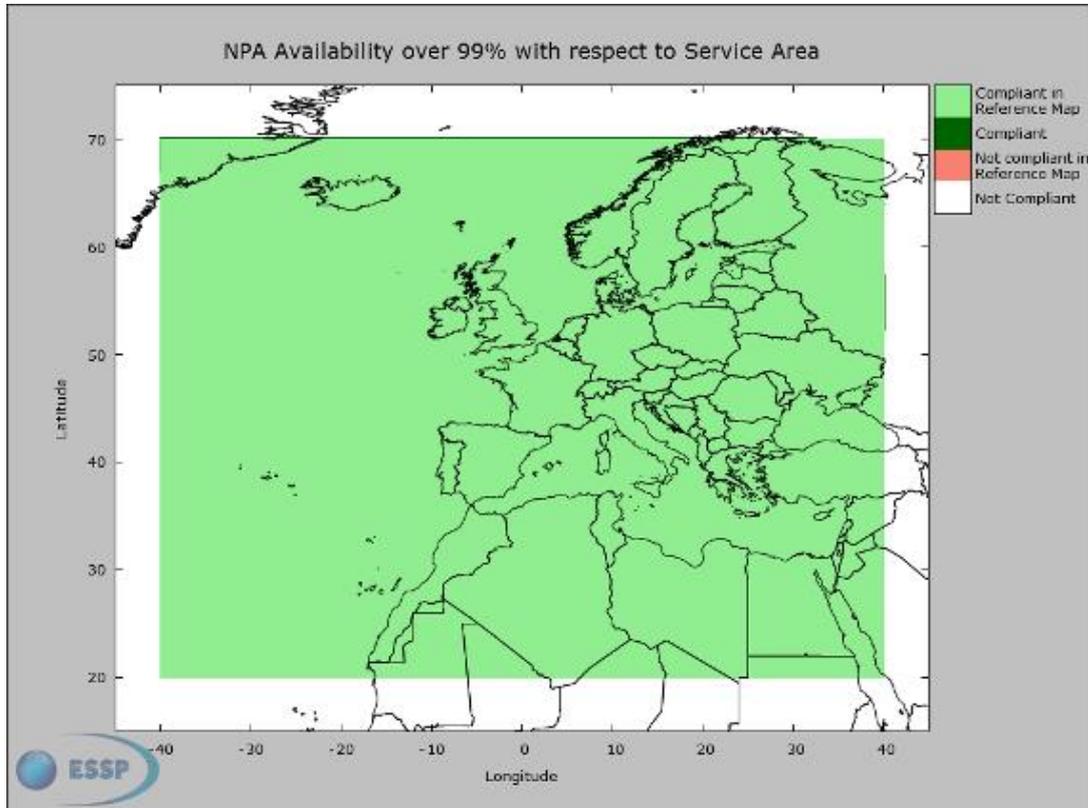


Figure 5: NPA Availability map with respect to the Service Area – 01/04/17 - 31/03/18

In the picture, the legend is read as follows:

- **Compliant in Reference Map:** This is the part of the NPA Service Area<sup>1</sup> where NPA availability was above 99%.
- **Compliant:** This is the zone out of the NPA Service Area<sup>1</sup> where NPA availability was also above 99% (extension of coverage with respect to the commitment).
- **Not compliant in Reference Map:** This is the part of the NPA Service Area<sup>1</sup> where NPA availability was lower than 99%.
- **Not compliant (white):** This is any zone out of the NPA Service Area<sup>1</sup>.

As shown in the previous figure, NPA availability was greater than 99% over the entire MT27 area for the reporting period.

Considering the applicable [Service Definition Document](#) map used as the reference, the percentage of points which were compliant with the commitment is **100%**. Note that the comparison with respect to the SDD SoL commitment map is included for information. The commitment map is a monthly reference, while the reported period is one year and, therefore, this comparison must be interpreted with care.

### 3.2.3 NPA availability - 99% daily compliance

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

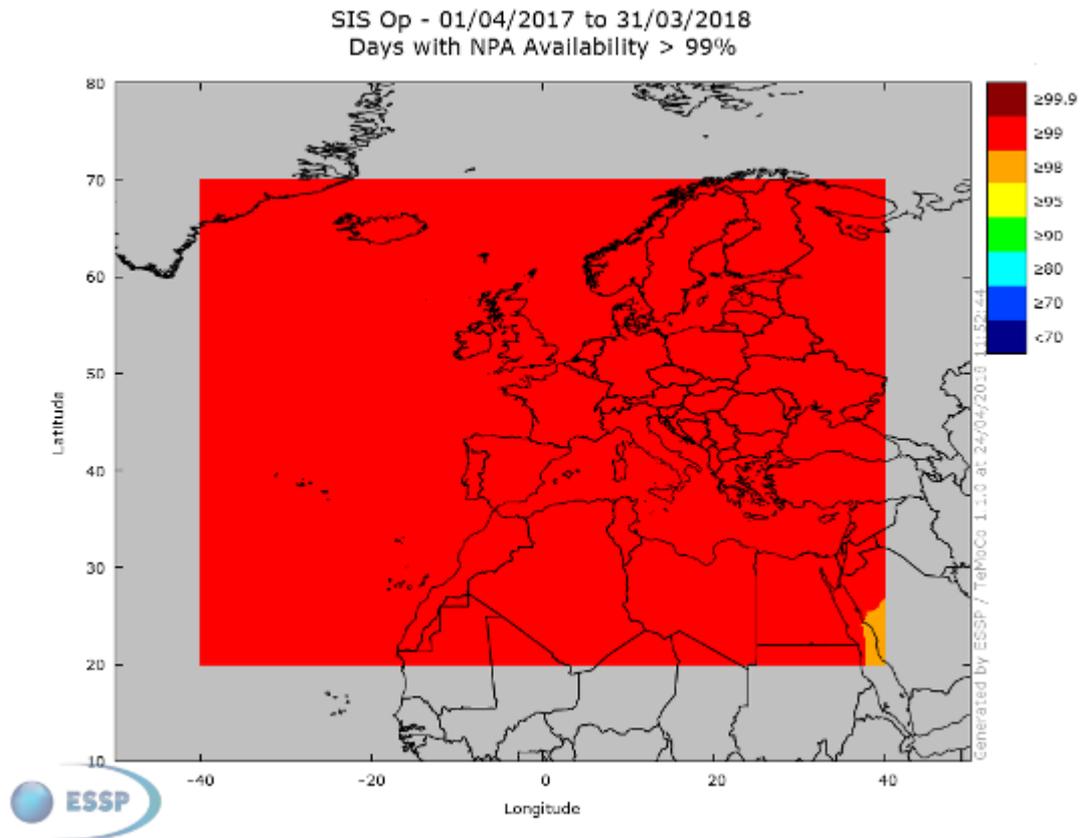


Figure 6: NPA Availability – Percentage of days with availability over 99% - 01/04/17 to 31/03/18<sup>2</sup>

As shown, the NPA daily Availability was higher than 99% for more than 99% of the days in the whole MT27 region, with the exception of a small area in the south-eastern corner in which an NPA daily availability above 99% was provided more than 98% of the days.

<sup>2</sup> The grey colour is used to identify regions where no days with an NPA availability greater than 99% has been observed. This situation is observed in all regions outside the target EGNOS service area (defined by the boundaries of MT27).

### 3.2.4 NPA Integrity

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

None of the RIMS stations inside the Service Area has been impacted by integrity events in the position domain during the analysed period.

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

Table 3 shows the maximum HSI at each RIMS inside the NPA Service Area (see Figure 2).

Station	HSI	Station	HSI
Aalborg	0.19	La Palma	0.35
Abu Simbel	0.26	Lappeenranta	0.18
Agadir	0.31	Lisbon	0.28
Alexandria	0.27	Madeira	0.30
Athens	0.19	Malaga	0.26
Azores	0.31	Palma de Mallorca	0.22
Berlin	0.19	Reykjavik	0.44
Canary Islands	0.39	Roma	0.20
Catania	0.22	S. de Compostela	0.29
Cork	0.25	Sofia	0.27
Djerba	0.22	Swanwick	0.29
Egilsstadir	0.24	Toulouse	0.23
Gävle	0.20	Tromsø	0.29
Glasgow	0.21	Trondheim	0.29
Golbasi	0.28	Warsaw	0.21
Kirkenes	0.29	Zürich	0.23

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

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

NPA HSI Histogram  
01/04/2017 - 31/03/2018

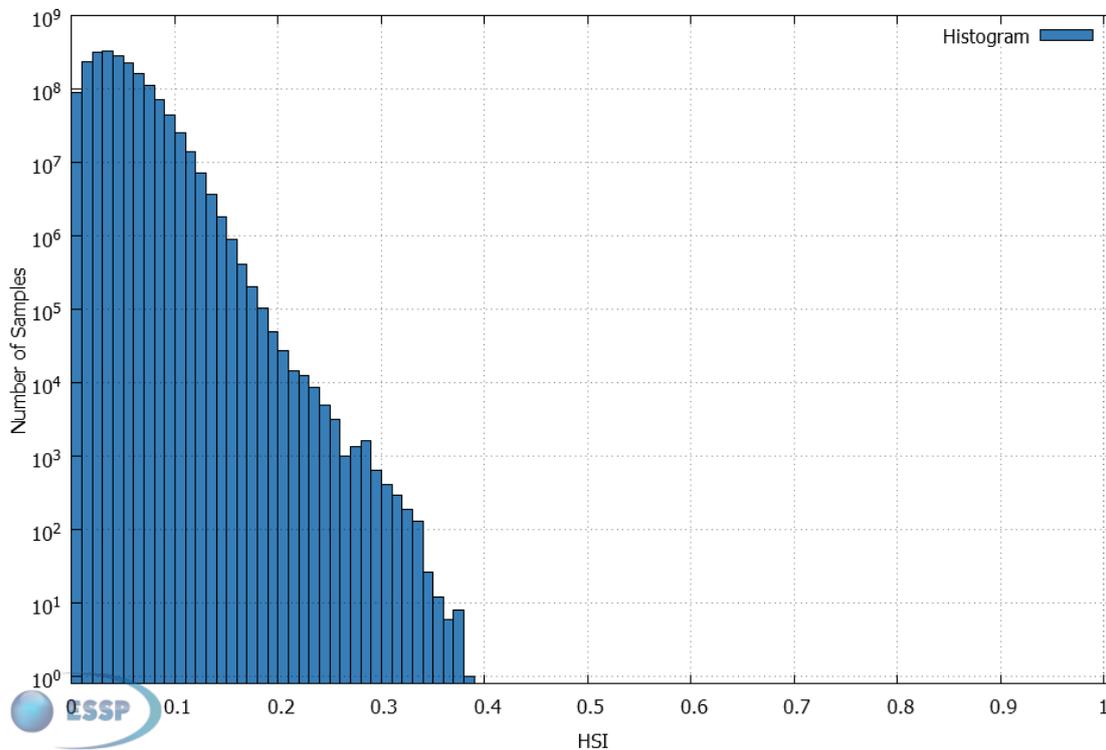


Figure 7: NPA Horizontal Safety Index<sup>3</sup>

Figure 7 shows that the horizontal safety index for NPA remained below 0.4 for all stations, which represents a very good safety margin.

<sup>3</sup> Note that for the computation of the different histograms presented in this document, some periods may have been removed, corresponding to stations presenting bad quality of data related to the local environment. Data removed from histograms correspond to data from RIMS in which any OR affecting data quality has been observed or presence of cycle slips affecting performance is detected or other data quality issues have been traced as the cause of daily degradations.

### 3.2.5 NPA Continuity

**EGNOS NPA Continuity** is computed by dividing the total number of single continuity events, using a time-sliding window of 1 hour, by the number of samples with valid and available NPA navigation solution. A single continuity event occurs if the system is available at the start of the operation and, in at least one second within the following time-sliding window of 1 hour, the system becomes unavailable.

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

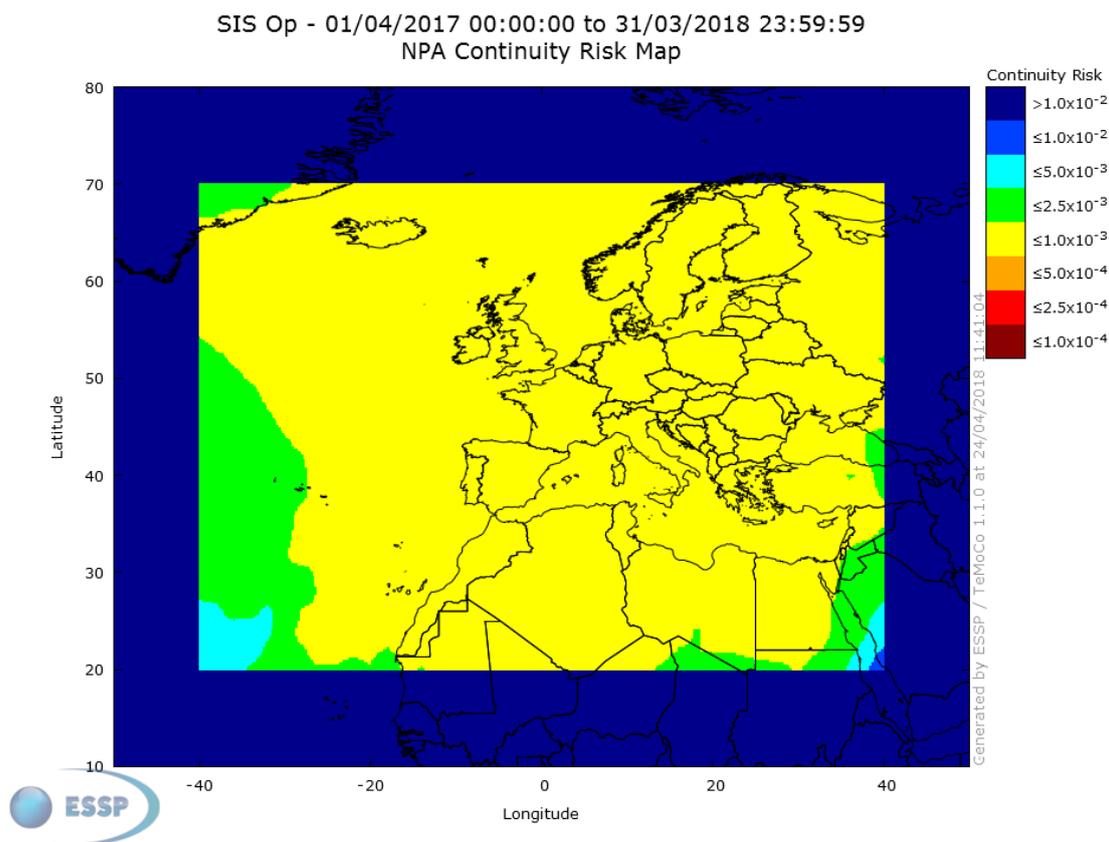


Figure 8: NPA Continuity Risk from 01/04/17 to 31/03/18

As shown in the previous figure, most of the MT27 Service Area presents a continuity risk lower than  $1 \cdot 10^{-3}$ , with the exception of the corners where the performance achieved is slightly worse, mainly due to the lower number of monitored satellites from those regions.

### 3.3 SoL Service - AApproach with Vertical guidance (APV-I)

The following figures depict the minimum performance that can be expected from EGNOS for Approach with Vertical guidance (APV-I) availability and continuity, as defined in the [EGNOS SoL Service Definition Document](#). These values correspond to the expected minimum performance measured by a fault-free receiver using all satellites in view, when averaged over a period of one month, using all the operational EGNOS GEOs.

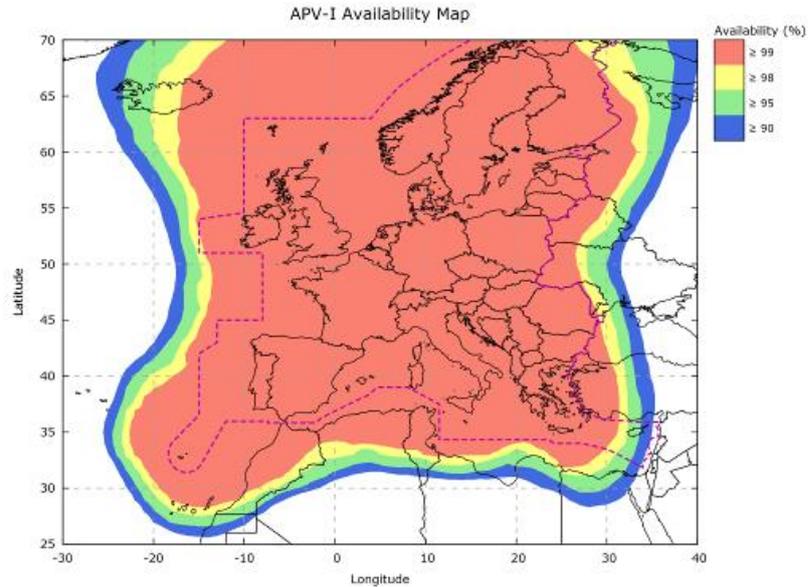


Figure 9: APV-I Availability map - Expected minimum performance

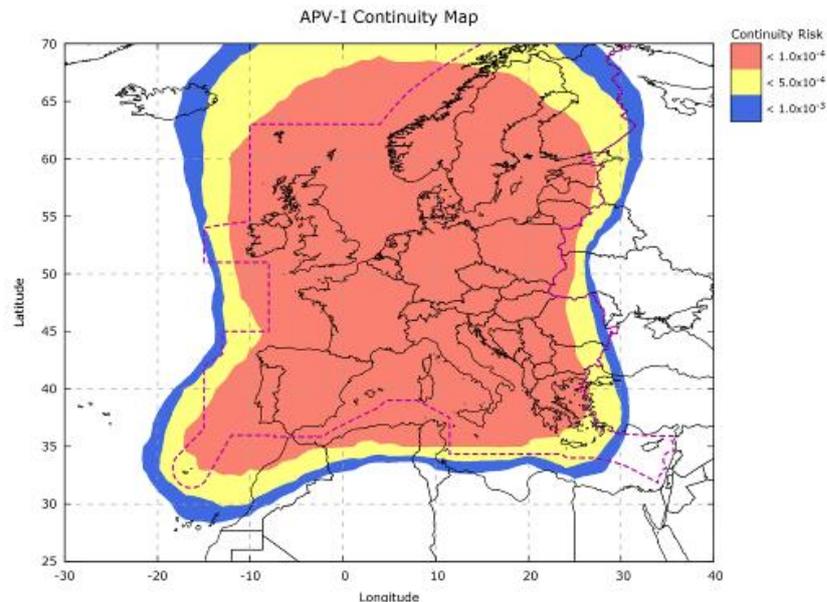


Figure 10: APV-I Continuity map - Expected minimum performance

Achieved APV-I performance during the reporting period is reported below. Additionally, APV-I performance is reported through the EGNOS Monthly Performance reports, available on the [EGNOS User Support website](#).

### 3.3.1 APV-I availability

**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 period.

The following figure provides, for the combination of the operational GEOs, the GEO APV-I availability for the reported period:

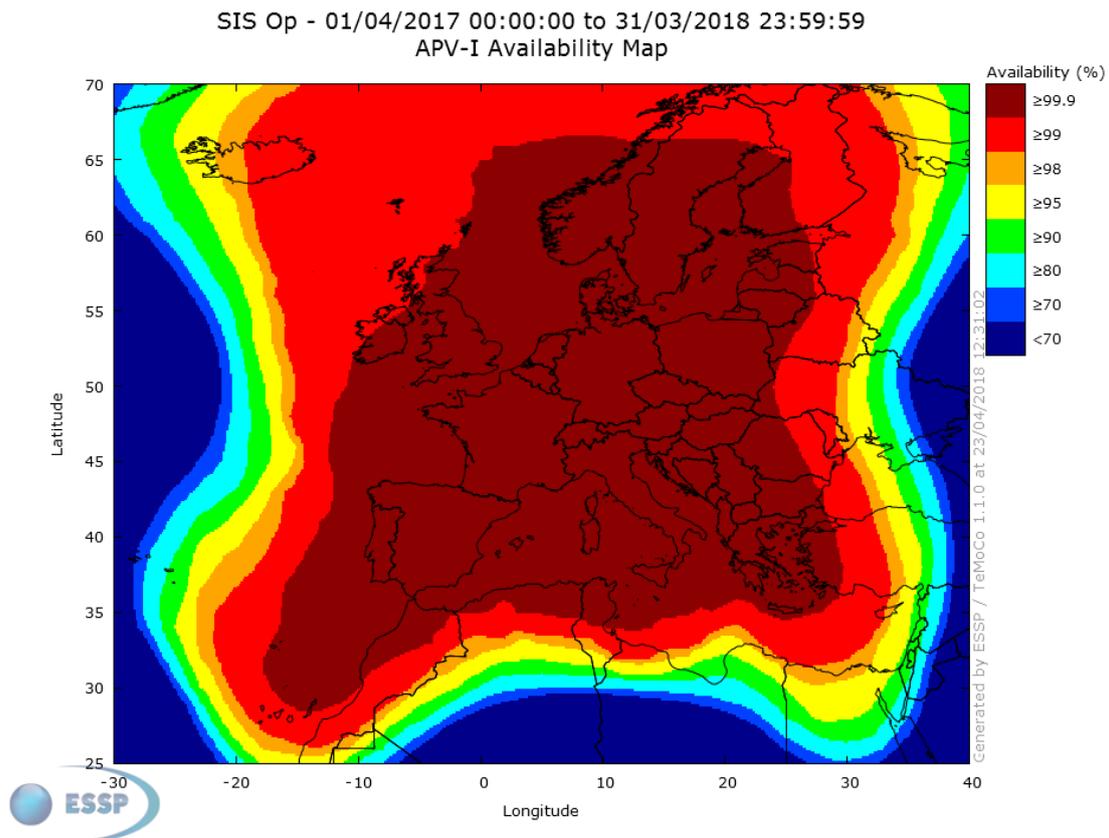


Figure 11: APV-I Availability from 01/04/17 to 31/03/18

The APV-I availability performance has been excellent during the reporting period, being greater than 99% over the entire 99% APV-I Service Area<sup>4</sup> with only minor deviations observed in the southwestern part.

<sup>4</sup> 99% APV-I Service Area is the 99% APV-I availability area depicted in Figure 9 coming from the [EGNOS Safety of Life SDD](#).

### 3.3.2 APV-I availability - Achievement vs Target

The combination of the 99% APV-I Availability map and the 99% APV-I Service Area<sup>4</sup> gives the following:

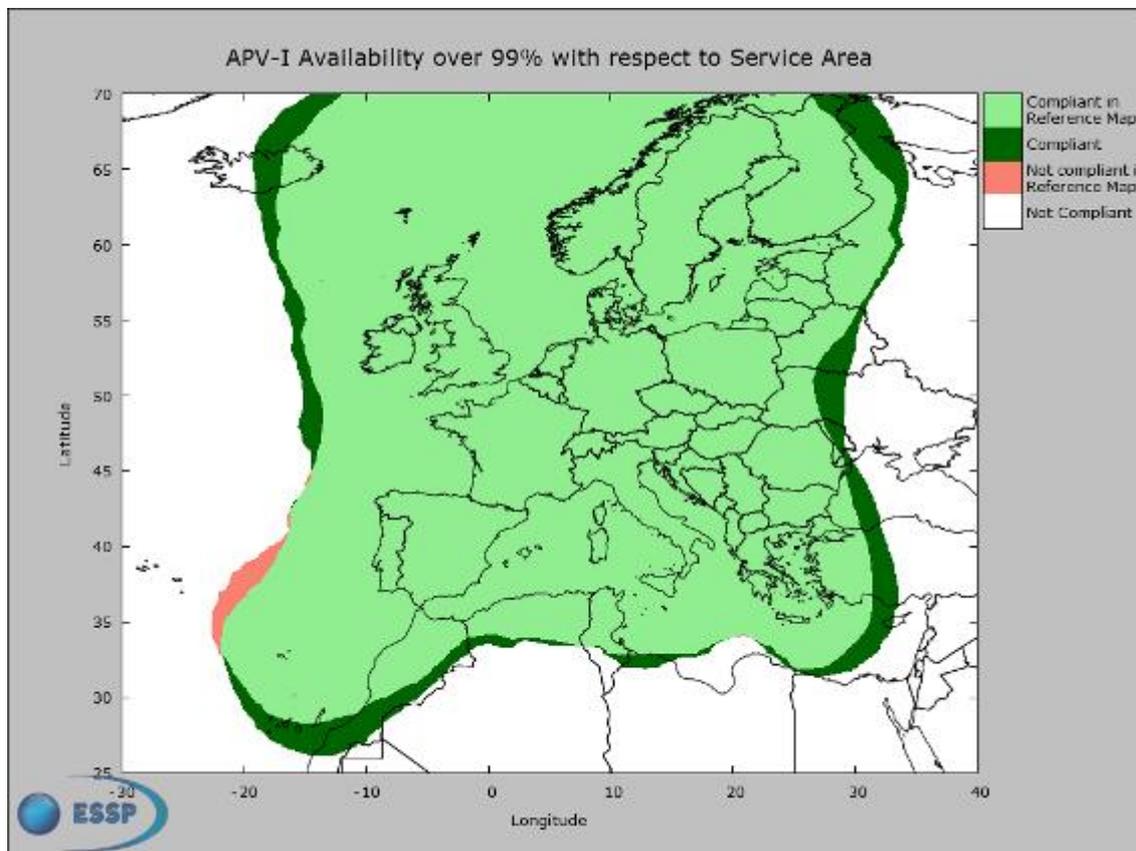


Figure 12: APV-I 99% Availability map with respect to the 99% APV-I Service Area<sup>4</sup> - 01/04/17 to 31/03/18

In the picture, the legend reads as follows:

- **Compliant in Reference Map:** This is the part of the 99% APV-I Service Area<sup>4</sup> where APV-I availability was above 99%.
- **Compliant:** This is the zone out of the 99% APV-I Service Area<sup>4</sup> where APV-I availability was also above 99% (extension of coverage with respect to the commitment).
- **Not compliant in Reference Map:** This is the part of the 99% APV-I Service Area<sup>4</sup> where APV-I availability was lower than 99%.
- **Not compliant (white):** This is any zone out of the 99% APV-I Service Area<sup>4</sup> where APV-I availability is lower than 99%.

The percentage of points that were compliant with the 99% APV-I Service Area<sup>4</sup> is **99.33%**. Just a small region in the Southwest presents underperformance.

Note that the comparison with respect to the SDD SoL commitment map is included for information. The commitment map is a monthly reference, while the reported period is one year and, therefore, this comparison must be interpreted with care.

### 3.3.3 APV-I availability - 99% daily compliance

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

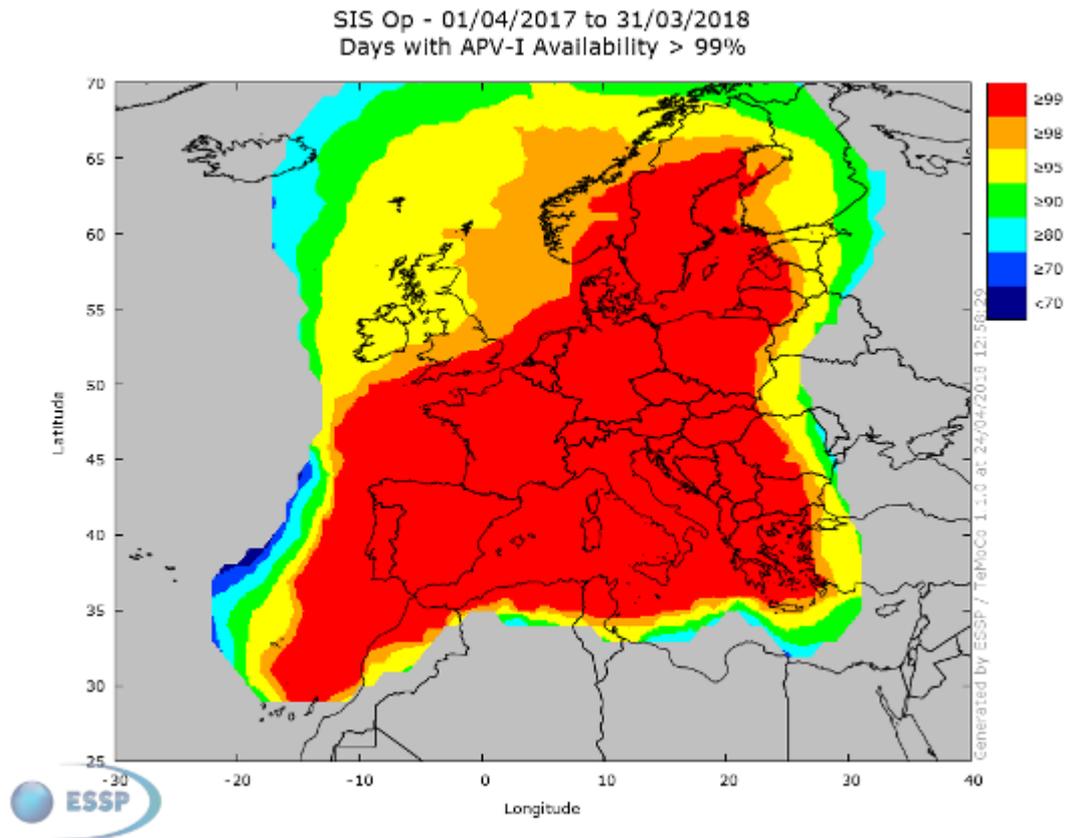


Figure 13: APV-I Availability – Percentage of days with availability over 99% - 01/04/17 to 31/03/18<sup>5</sup>

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

- 99% of the days in the 49.64% of the 99% APV-I Service Area.
- 95% of the days in the 82.90% of the 99% APV-I Service Area.

<sup>5</sup> The grey colour is used to identify regions where the daily APV-I availability has always been below 99%.

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

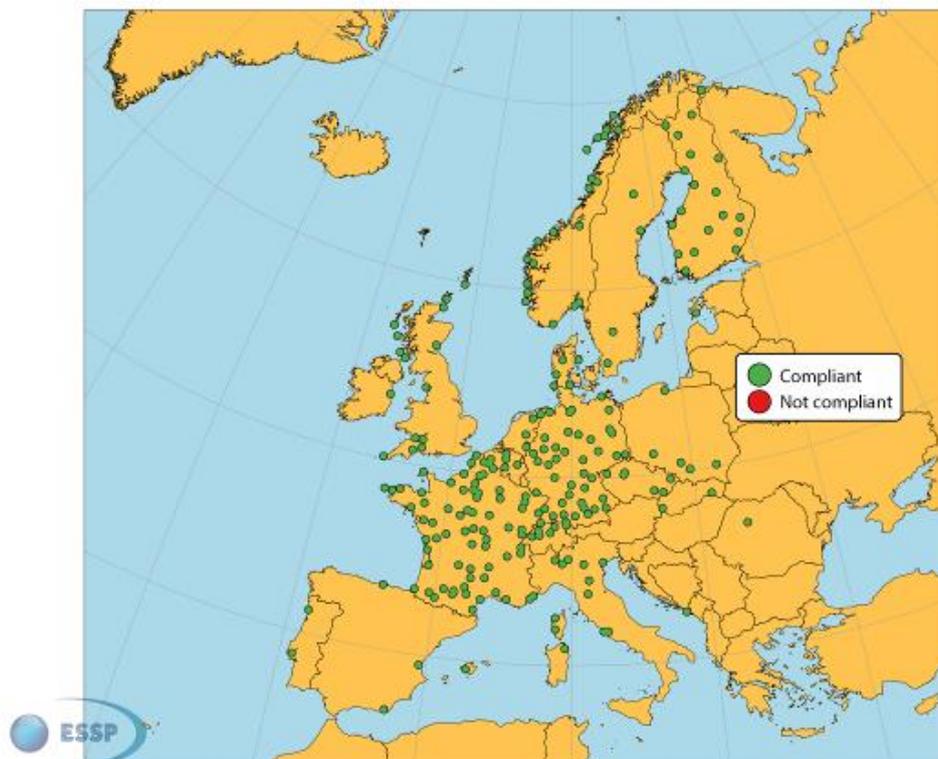


Figure 14: APV-I Availability compliance at airports with published EGNOS-based operations

Moreover, the monthly APV-I service availability was greater than 99% during the whole reporting period at all airports with EGNOS-based operations, with the exception of:

- 5 Northern Norwegian airports (ENAN, ENEV, ENKR, ENSH and ENSK) in September 2017.
- 2 Finnish airports (EFJO and EFSA) in March 2018.
- Kirkenes (ENKR) airport in December 2017 (APV-I availability was below 99% - 98.98% - but over the SDD commitment for that area - 98% -).

For additional information, please refer to the corresponding [Monthly Performance Reports](#).



*EGNOS improves safety and efficiency of aircraft operations*

### 3.3.4 APV-I Integrity events

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

No integrity events were detected.

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

Table 4 shows the maximum HSI and VSI at each RIMS inside of the APV-I Service Area (see Figure 9). Moreover, Stanford plots are available on the [EGNOS User Support Website](#).

Station	HSI	VSI	Station	HSI	VSI
Agadir	0.30	0.24	La Palma	0.36	0.23
Aalborg	0.19	0.25	Lisbon	0.28	0.23
Alexandria	0.24	0.25	Madeira	0.29	0.25
Athens	0.19	0.22	Malaga	0.27	0.23
Berlin	0.19	0.26	Palma de Mallorca	0.23	0.30
Canary Islands	0.40	0.23	Reykjavik	0.46	0.63
Catania	0.22	0.24	Roma	0.20	0.23
Cork	0.25	0.23	S. de Compostela	0.30	0.20
Djerba	0.19	0.22	Sofia	0.26	0.37
Egilsstadir	0.24	0.30	Swanwick	0.30	0.32
Gävle	0.21	0.29	Toulouse	0.24	0.22
Glasgow	0.21	0.26	Tromsoe	0.29	0.33
Golbasi	0.19	0.23	Trondheim	0.29	0.25
Kirkenes	0.30	0.31	Warsaw	0.21	0.25
Lappeenranta	0.19	0.25	Zürich	0.23	0.26

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

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

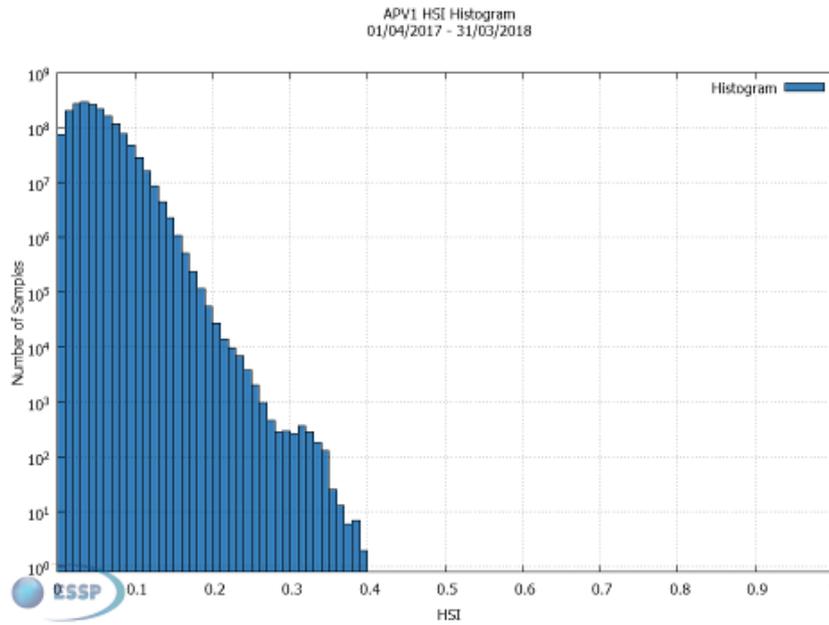


Figure 15: EGNOS APV-I Horizontal Safety Index<sup>6</sup>

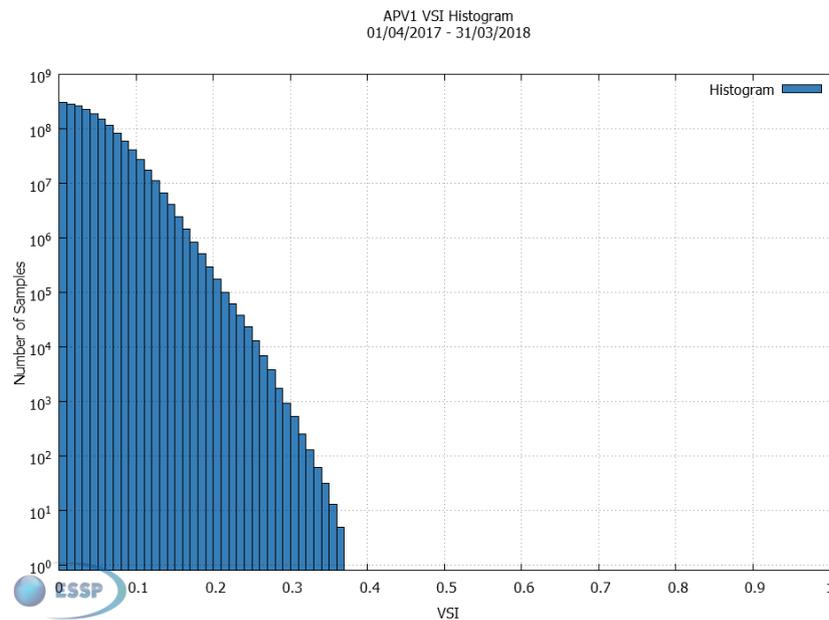


Figure 16: EGNOS APV-I Vertical Safety Index<sup>6</sup>

Figure 15 and Figure 16 show that the horizontal and vertical safety index for APV-I remained below 0.4 for all stations, which represents a very good safety margin.

<sup>6</sup> Note that for the computation of the different histograms presented in this document, some periods may have been removed, corresponding to stations presenting bad quality of data related to the local environment. Data removed from histograms correspond to data from RIMS in which any OR affecting data quality has been observed or presence of cycle slips affecting performance is detected or other data quality issues have been traced as the cause of daily degradations.

### 3.3.5 APV-I Continuity risk

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

The figure below provides the GEO combined APV-I continuity risk for the reported period:

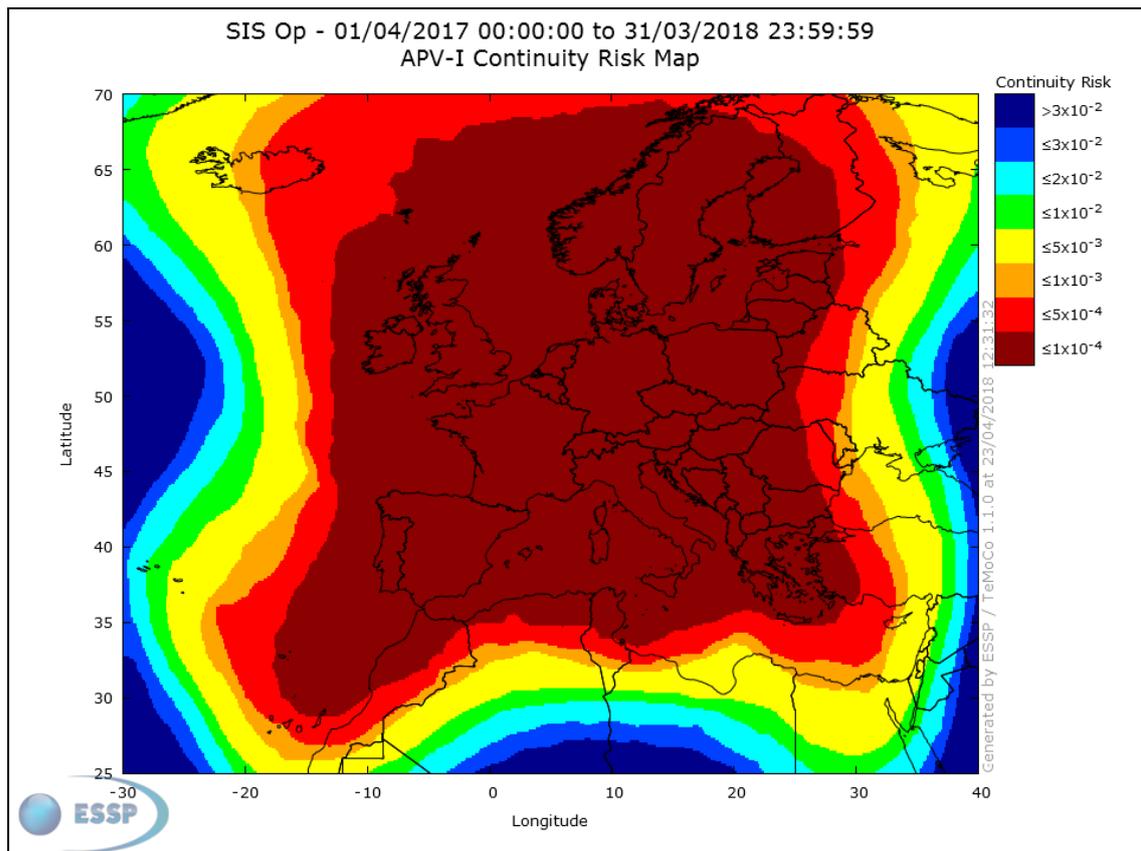


Figure 17: APV-I Continuity Risk from 01/04/17 to 31/03/18

The APV-I continuity performance has been excellent during the reporting period, being lower than  $5 \cdot 10^{-4}$  over the entire  $5 \cdot 10^{-4}$  APV-I Service Area<sup>7</sup> with only minor deviations observed in the Southwest and Southeast.

<sup>7</sup>  $5 \cdot 10^{-4}$  APV-I Service Area is the  $5 \cdot 10^{-4}$  APV-I continuity risk area depicted in Figure 10 coming from the [EGNOS Safety of Life SDD](#).

### 3.3.6 APV-I Continuity - Achievement vs Target

The combination of the  $5 \cdot 10^{-4}$  APV-I Continuity Risk map and the  $5 \cdot 10^{-4}$  APV-I Service Area<sup>7</sup> gives the following:

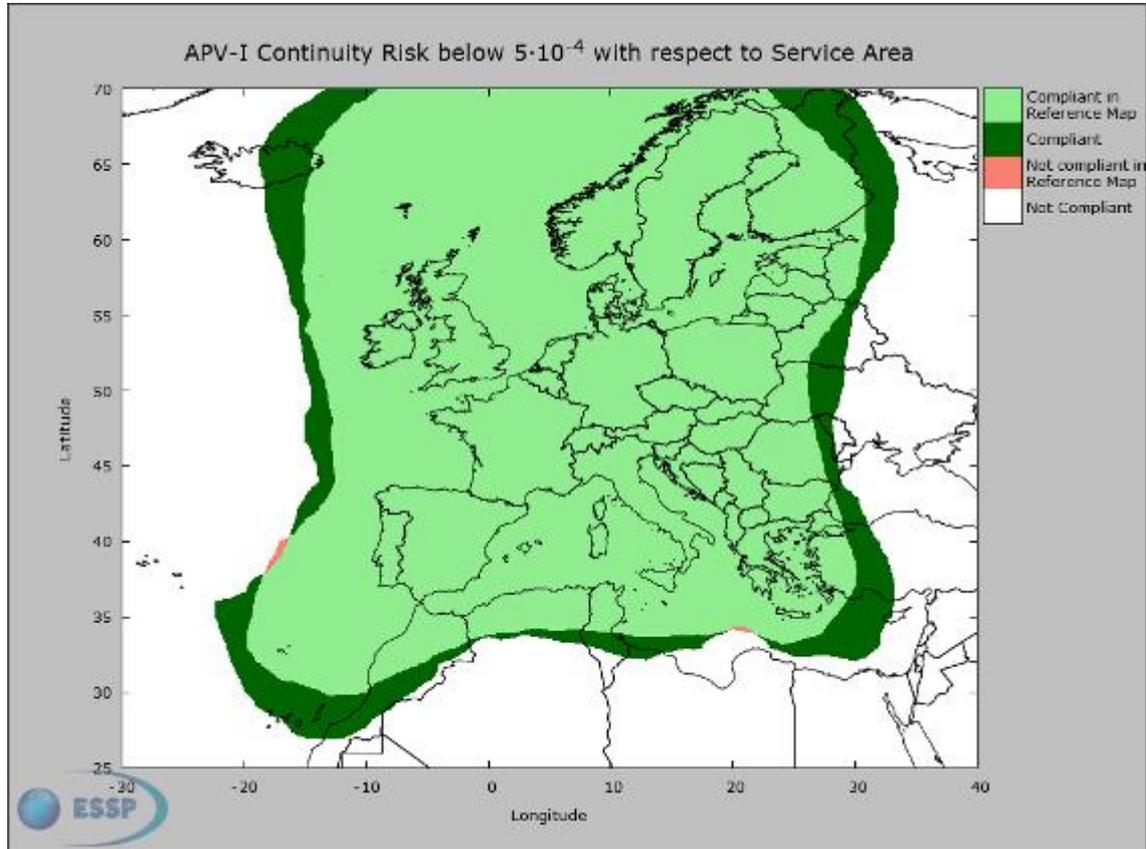


Figure 18: APV-I Continuity Risk ( $5 \cdot 10^{-4}$ ) map with respect to the  $5 \cdot 10^{-4}$  APV-I Service Area<sup>7</sup> - 01/04/17 to 31/03/18

In the picture, the legend reads as follows:

- **Compliant in Reference Map:** This is the part of the  $5 \cdot 10^{-4}$  APV-I Service Area<sup>7</sup> where APV-I continuity was above  $5 \cdot 10^{-4}$ .
- **Compliant:** This is the zone out of the  $5 \cdot 10^{-4}$  APV-I Service Area<sup>7</sup> where APV-I continuity was also above  $5 \cdot 10^{-4}$  (extension of coverage with respect to the commitment).
- **Not compliant in Reference Map:** This is the part of the  $5 \cdot 10^{-4}$  APV-I Service Area<sup>7</sup> where APV-I continuity was lower than  $5 \cdot 10^{-4}$ .
- **Not compliant (white):** This is any zone out of the  $5 \cdot 10^{-4}$  APV-I Service Area where APV-I continuity is lower than  $5 \cdot 10^{-4}$ .

Considering the SDD v3.1 map used as the reference, the percentage of points which were compliant with the  $5 \cdot 10^{-4}$  APV-I Service Area ( $5 \cdot 10^{-4}/15\text{sec}$ ) is **99.89%**. Note that the comparison with respect to SDD SoL commitment map is included for information. The commitment map is a monthly reference while the reported period is one year and, therefore, this comparison must be interpreted with care.

For information, the differences with respect to the Service Area for the area corresponding to a continuity risk of  $10^{-3}$  and  $10^{-4}$  are included below. For both levels, the results obtained, as in the  $5 \cdot 10^{-4}$  case, are excellent (99.98% for continuity risk of  $10^{-3}$  and 99.41% for continuity risk of  $10^{-4}$ ).

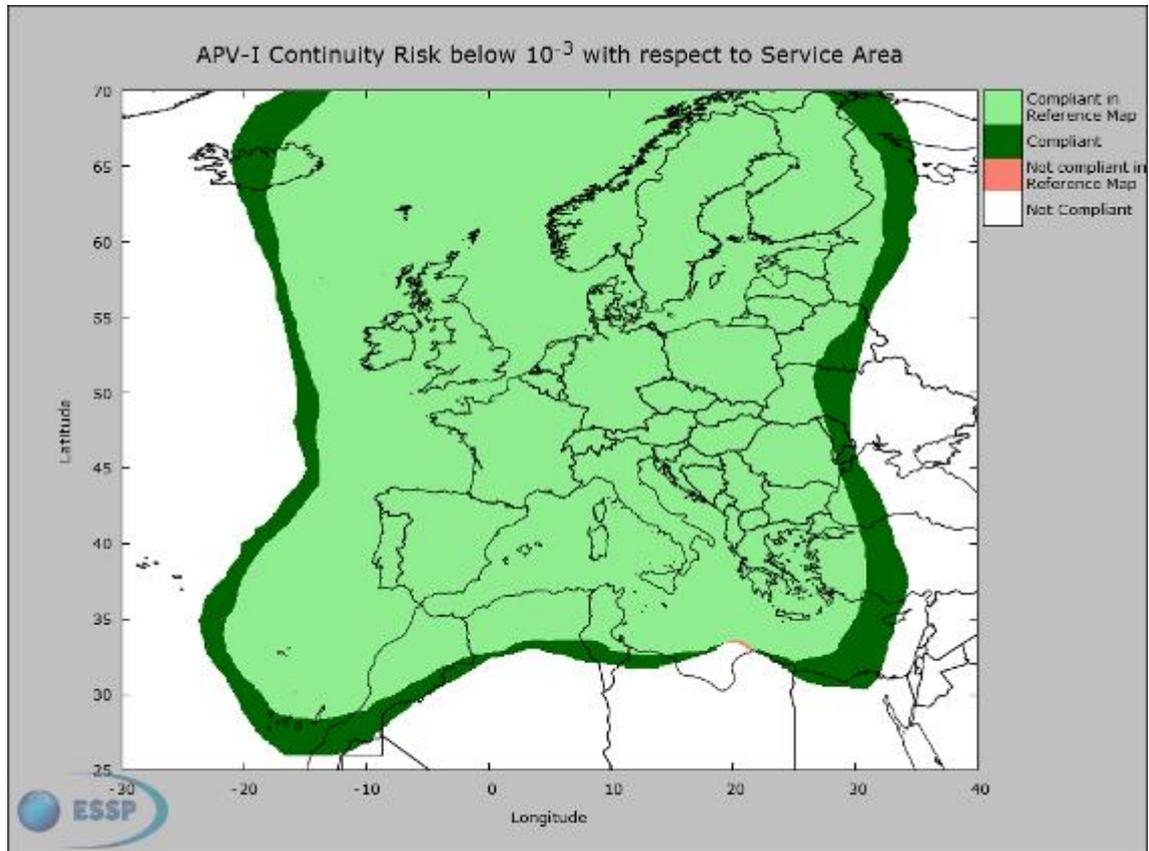


Figure 19: APV-I Continuity Risk ( $1 \cdot 10^{-3}$ ) map with respect to the Service Area - 01/04/17 to 31/03/18

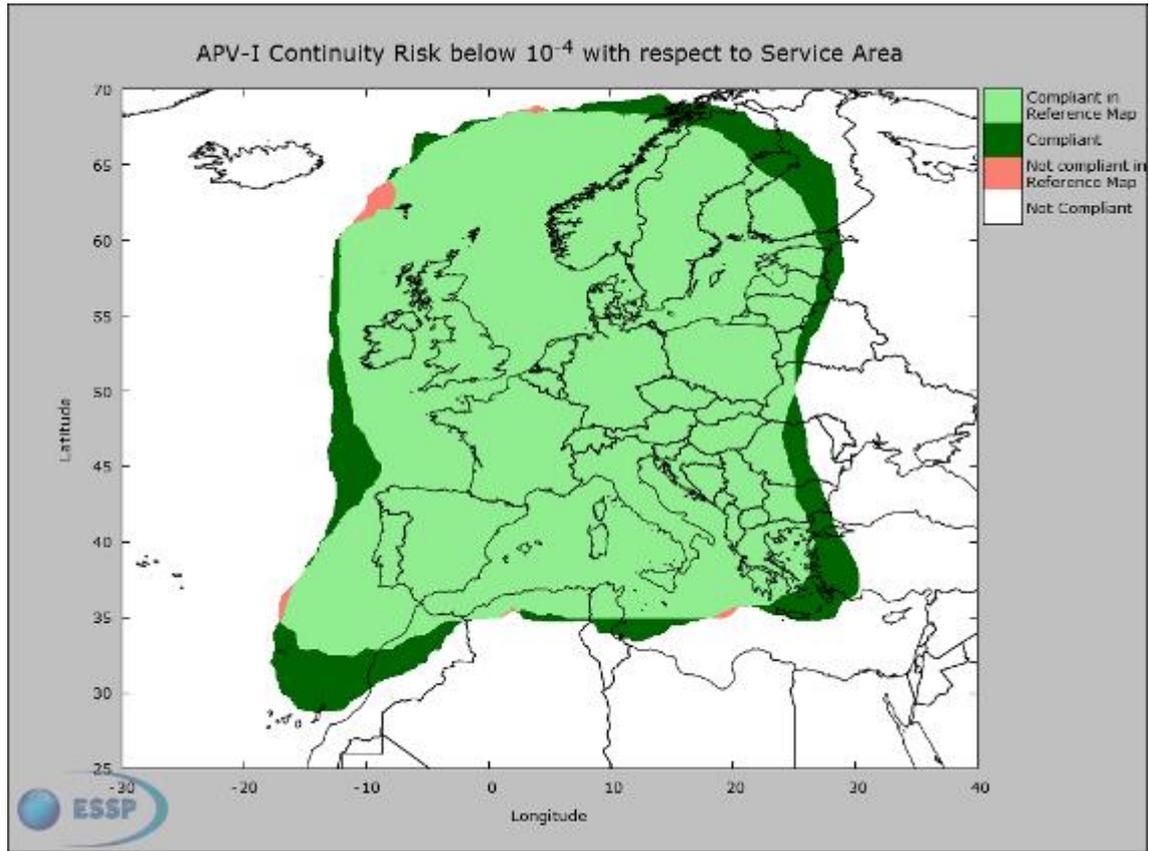


Figure 20: APV-I Continuity Risk ( $1 \cdot 10^{-4}$ ) map with respect to the Service Area - 01/04/17 to 31/03/18

In the pictures, the legend reads as explained for Figure 18 but applying the corresponding commitment level ( $1 \cdot 10^{-3}$  or  $1 \cdot 10^{-4}$ ).

### 3.4 SoL Service - EGNOS Localizer Performance with Vertical guidance to a decision altitude of 200 FT (LPV-200)

The following figures depict the minimum performance that can be expected from EGNOS for LPV-200 availability and continuity, as defined in the [EGNOS SoL Service Definition Document](#).

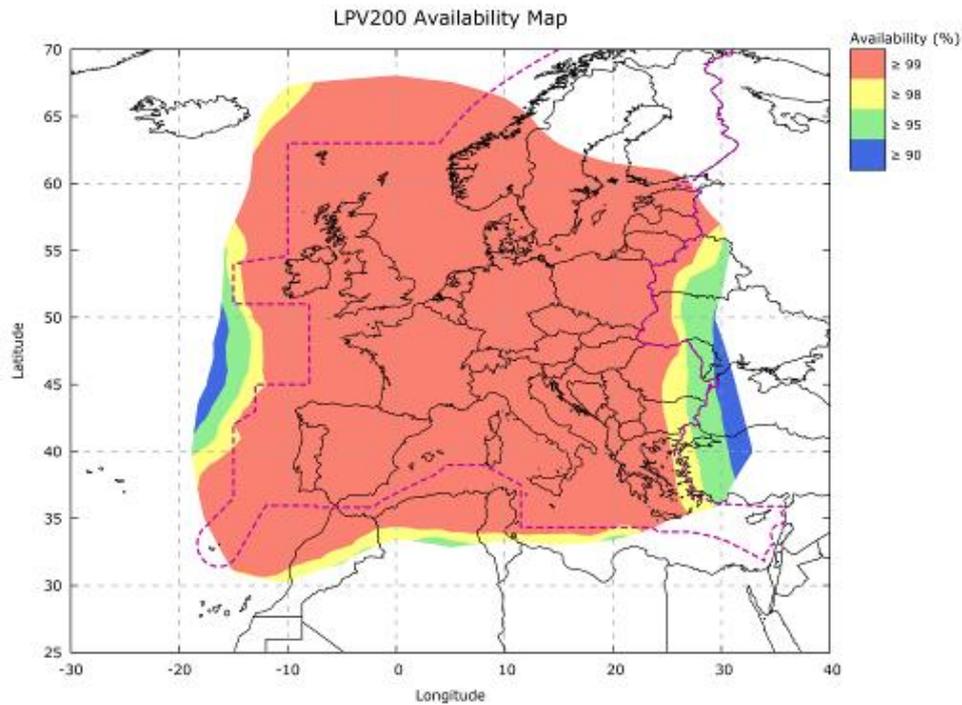


Figure 21: LPV-200 Availability map - Expected minimum performance

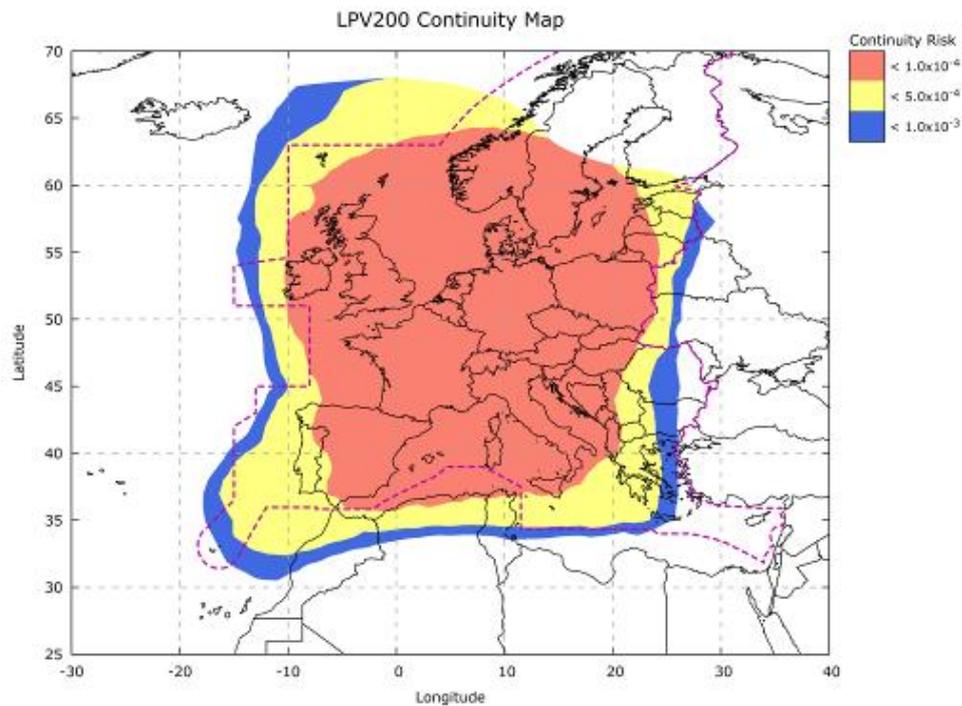


Figure 22: LPV-200 Continuity map - Expected minimum performance

These values correspond to the expected average performance measured by a fault-free receiver using all GPS satellites in view over a period of one month, using all the operational EGNOS GEOs.

Achieved LPV-200 performance during the reporting period is reported below. Additionally, LPV-200 performance is reported through the EGNOS Monthly Performance reports, available on the [EGNOS User Support website](#).

### 3.4.1 LPV-200 availability

*EGNOS LPV-200 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 LPV-200 service (HAL: 40m; VAL: 35m) over the total period.*

The following figure provides, for the combination of the operational GEOs, the LPV-200 availability for the period from April 2017 to March 2018:

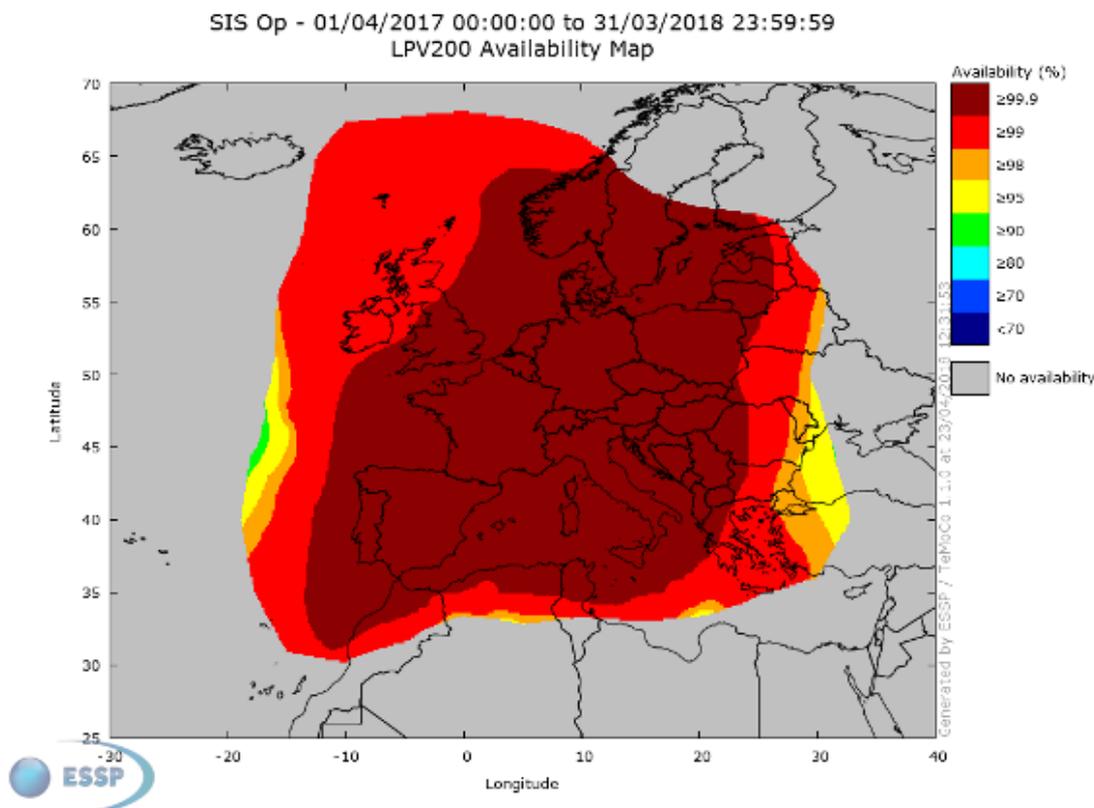


Figure 23: LPV-200 Availability from 01/04/17 to 31/03/18<sup>8</sup>

LPV-200 availability performance over the Service Area has been excellent during the reporting period: greater than 99% over the entire LPV-200 99% Service Area<sup>9</sup> except for a small region in the southwest.

<sup>8</sup> The grey colour is used to identify regions outside the LPV-200 Service area as defined in the [EGNOS Safety of Life SDD](#).

<sup>9</sup> 99% LPV-200 Service Area is the 99% LPV-200 availability area depicted in Figure 21 coming from the [EGNOS Safety of Life SDD](#).

### 3.4.2 LPV-200 availability - Achievement vs Target

The combination of the 99% LPV-200 Availability map and the 99% LPV-200 Service Area<sup>10</sup> gives the following:

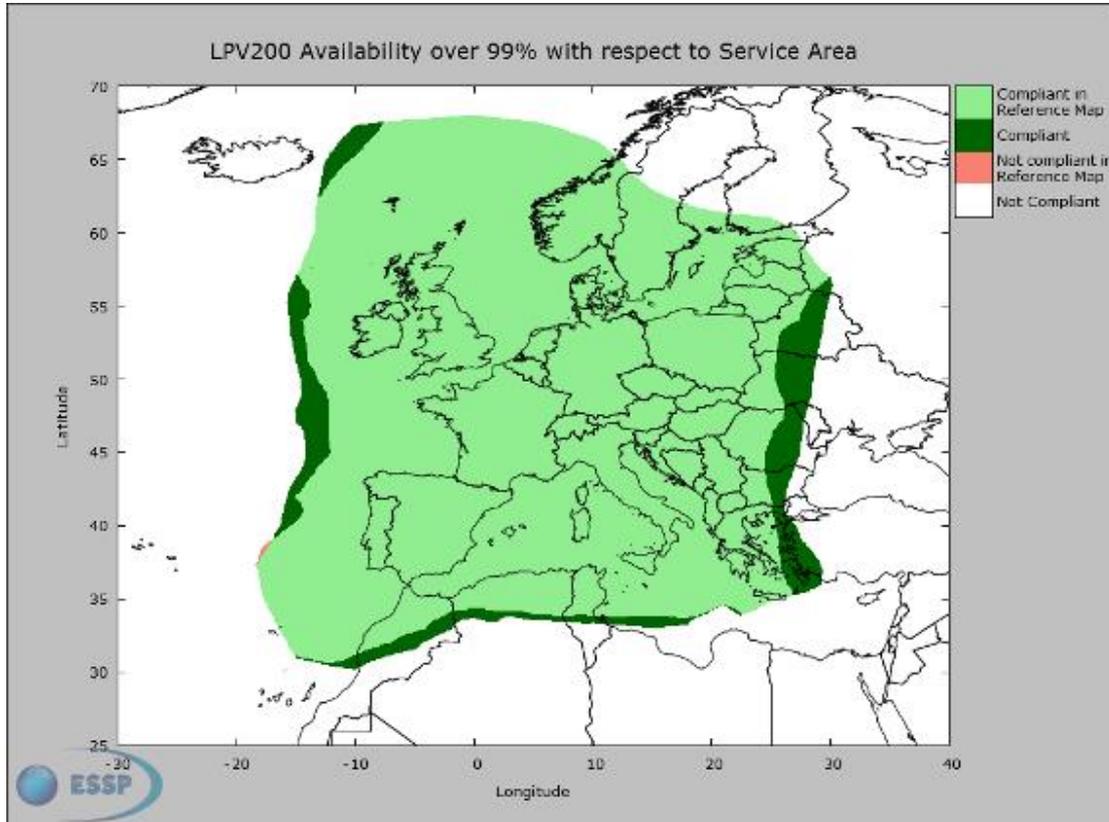


Figure 24: LPV-200 Availability map with respect to the Service Area - 01/04/17 to 31/03/18

In the picture, the legend reads as follows:

- **Compliant in Reference Map:** This is the part of the 99% LPV-200 Service Area<sup>10</sup> where LPV-200 availability was above 99%.
- **Compliant:** This is the zone out of the 99% LPV-200 Service Area<sup>10</sup> where LPV-200 availability was also above 99% (extension of coverage with respect to the commitment).
- **Not compliant in Reference Map:** This is the part of the 99% LPV-200 Service Area<sup>10</sup> where LPV-200 availability was lower than 99%.
- **Not compliant (white):** This is any zone out of the 99% LPV-200 Service Area<sup>10</sup> where LPV-200 availability is lower than 99%.

Considering the applicable [Service Definition Document \(SDD\)](#) map as reference, the percentage of points which were compliant with the 99% LPV-200 Service Area<sup>10</sup> is **99.97%**. As for APV-I, only a small region in the Southwest deviates from the SDD commitment.

<sup>10</sup> 99% LPV-200 Service Area is the 99% LPV-200 availability area depicted in Figure 21 coming from the [EGNOS Safety of Life SDD](#).

Note that the comparison with respect to the SDD SoL commitment map is included for information. The commitment map is a monthly reference while the reported period is one year and, therefore, this comparison must be interpreted with care.

### 3.4.3 LPV-200 availability - 99% daily compliance

The percentage of days over the reported period in which the daily LPV-200 availability was over 99% is shown in the figure below.

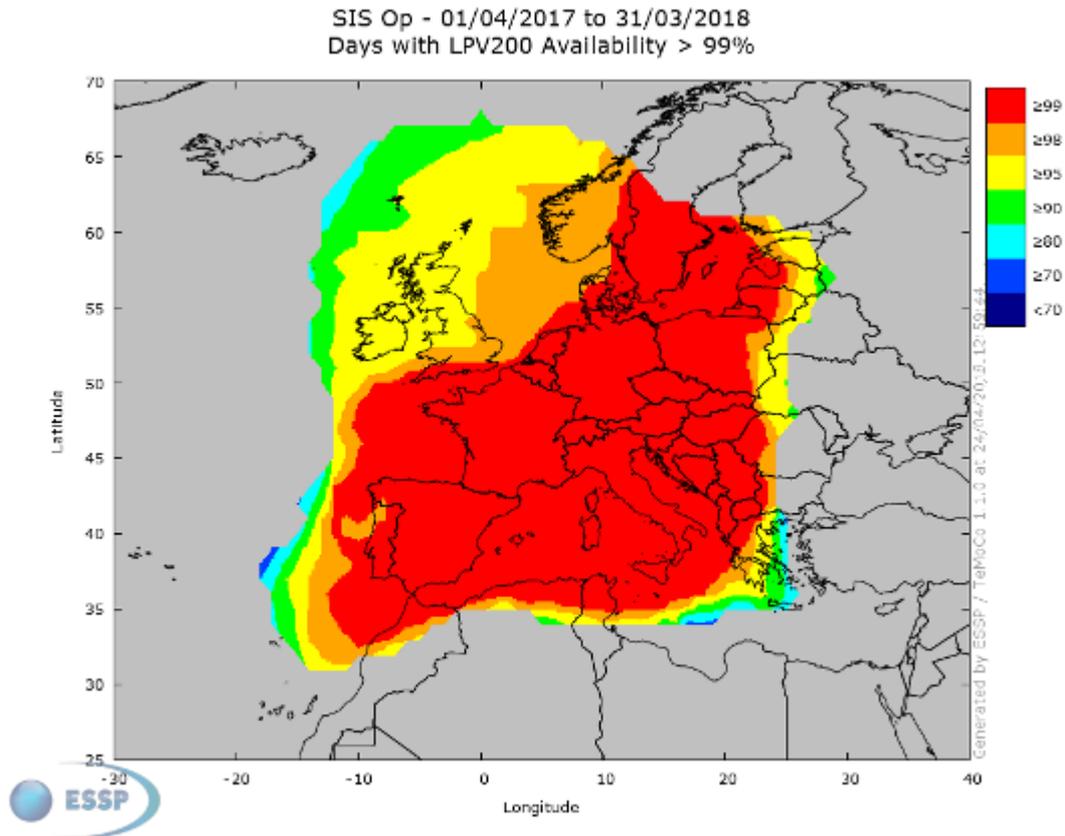


Figure 25: LPV-200 Availability – Percentage of days with availability over 99% - 01/04/17 to 31/03/18<sup>11</sup>

From the previous figure, it can be obtained that the LPV-200 Availability was higher than 99%:

- 99% of the days in the 54.33% of the 99% LPV-200 Service Area.
- 95% of the days in the 89.55% of the 99% LPV-200 Service Area.

<sup>11</sup> The grey colour is used to identify regions where the daily LPV-200 availability has always been below 99% (to be noted that all the grey area is outside the LPV-200 Service area as defined in the [EGNOS Safety of Life SDD](#)).

The figure below shows the LPV-200 availability compliance with respect to the target at the airports with published EGNOS-based operations:

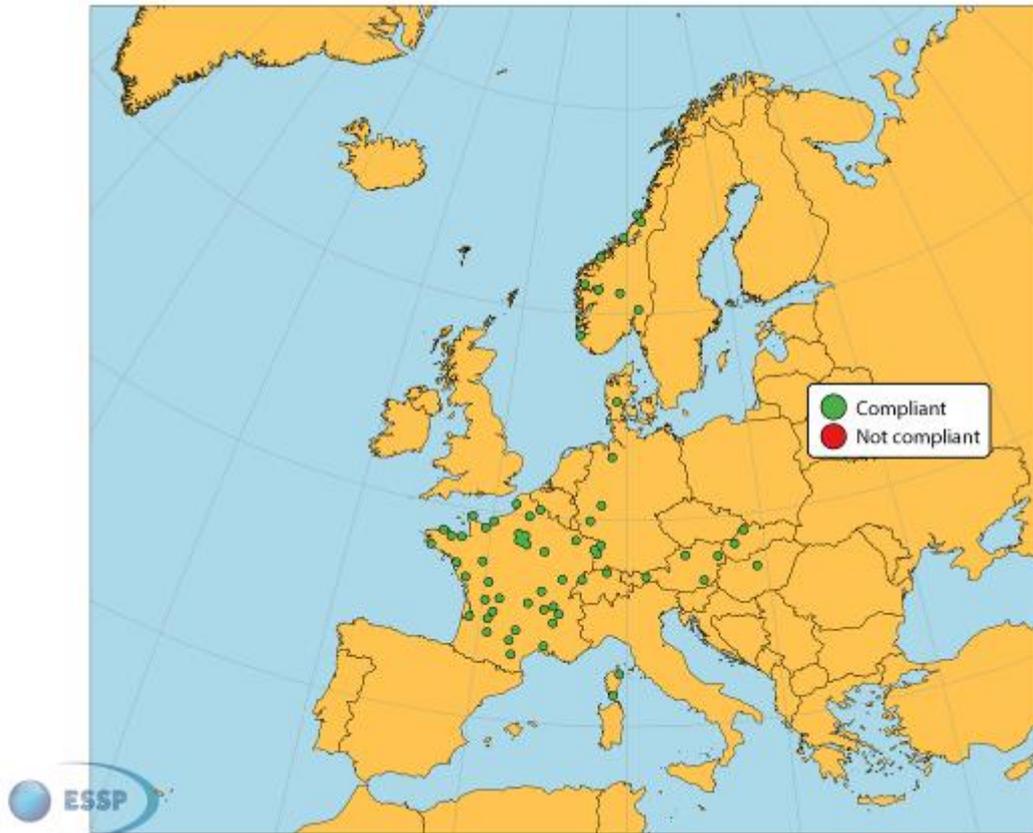


Figure 26: LPV-200 Availability compliance at airports with published EGNOS-based operations

Moreover, the monthly LPV-200 service availability was higher than 99% during the whole reporting period at all airports with EGNOS-based operations.



*Airbus350 flying a RNAV GNSS (LPV-200 based) approach*

### 3.4.4 LPV-200 Integrity events

*EGNOS LPV-200 Integrity Event is defined as an event in which the Navigation System Error is greater than or equal to the corresponding Protection Level for LPV-200.*

No integrity events were detected.

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

Table 5 shows the maximum HSI and VSI at each RIMS inside of the LPV-200 Service Area (see Figure 21). Moreover, Stanford plots are available on the [EGNOS User Support website](#).

Station	HSI	VSI
Aalborg	0.19	0.25
Athens	0.19	0.22
Berlin	0.19	0.26
Catania	0.22	0.24
Cork	0.25	0.23
Djerba	0.19	0.22
Gävle	0.21	0.29
Glasgow	0.21	0.26
Lisbon	0.28	0.23
Malaga	0.27	0.23
Palma de Mallorca	0.23	0.30
Roma	0.20	0.23
S. de Compostela	0.30	0.20
Sofia	0.26	0.36
Swanwick	0.30	0.32
Toulouse	0.24	0.22
Trondheim	0.29	0.25
Warsaw	0.21	0.25
Zürich	0.23	0.26

Table 5: EGNOS LPV-200 Safety Index (maximum) at reference stations

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

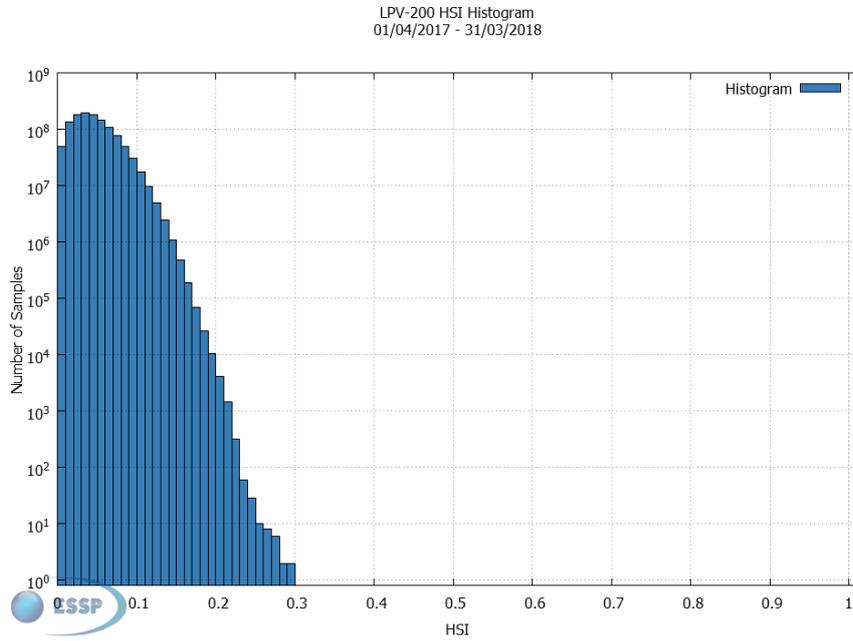


Figure 27: EGNOS LPV-200 Horizontal Safety Index

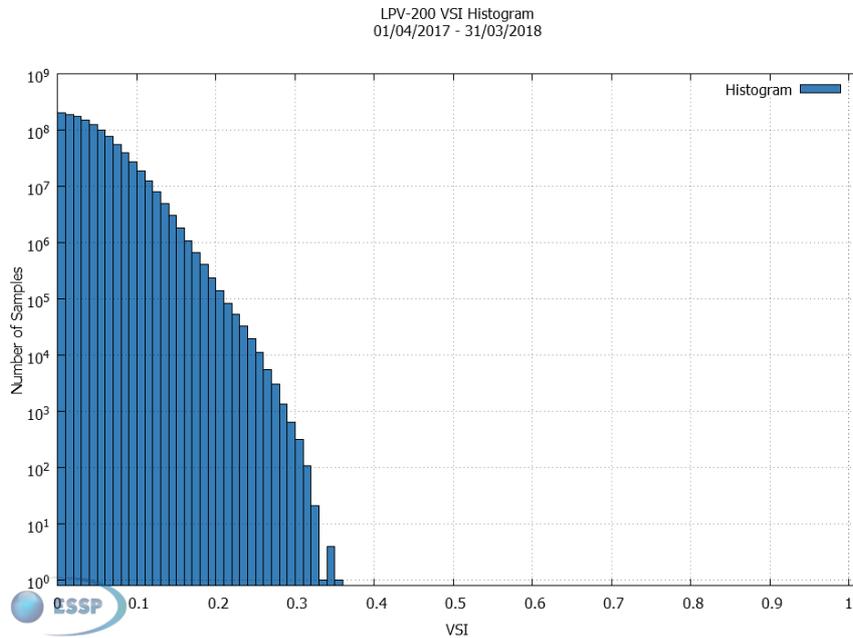


Figure 28: EGNOS LPV-200 Vertical Safety Index

Figure 27 and Figure 28 show that the horizontal and vertical safety index for LPV-200 remained below 0.3 and 0.4 respectively for all stations, which represents a very good safety margin.

### 3.4.5 LPV-200 Continuity risk

*EGNOS LPV-200 Continuity Risk is defined as the result of dividing the total number of single continuity events, using a time-sliding window of 15 seconds, by the number of samples with valid and available LPV-200 navigation solution. A single continuity event occurs if the system is available at the start of the operation and becomes unavailable in at least one of the following 15 seconds.*

The following figure provides the GEO combined LPV-200 continuity risk for the reported period:

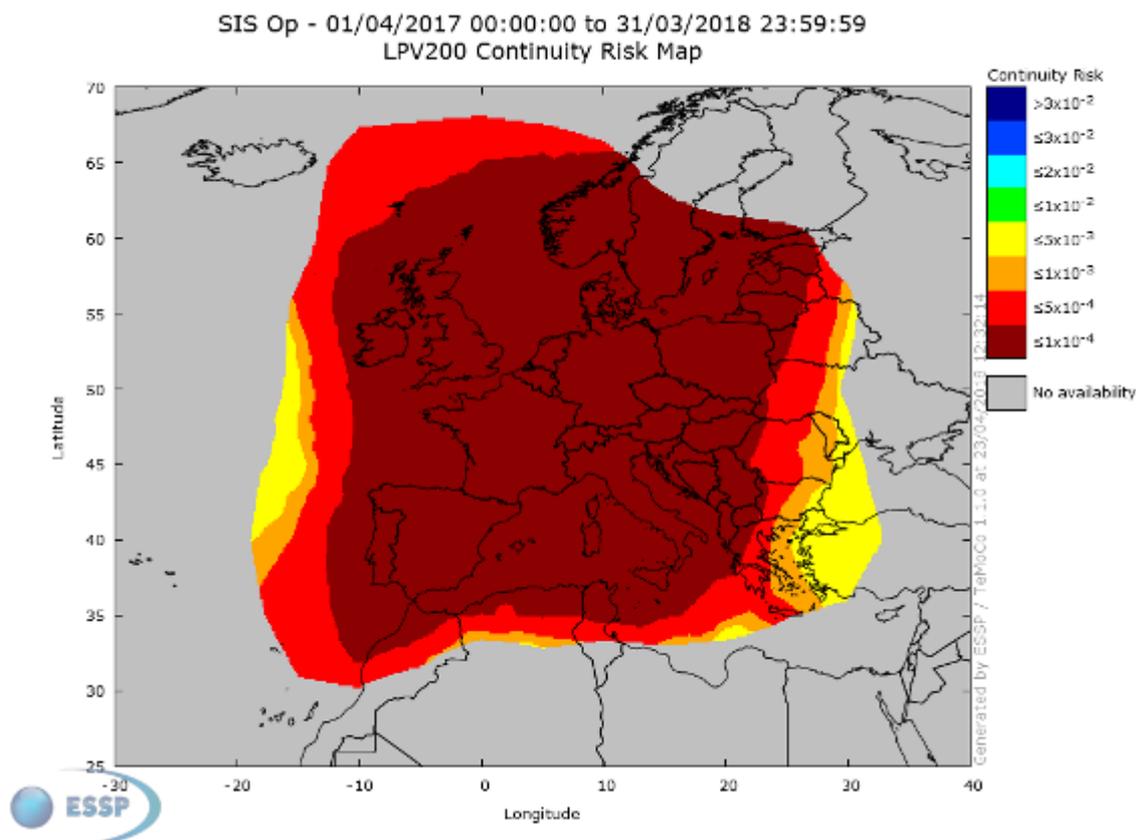


Figure 29: LPV-200 Continuity Risk from 01/04/17 to 31/03/18<sup>12</sup>

The LPV200 continuity performance has been excellent during the reporting period, being lower than  $5 \cdot 10^{-4}$  over the entire LPV200  $5 \cdot 10^{-4}$  Service Area<sup>13</sup> with only minor deviations observed in the southeastern part.

<sup>12</sup> The grey colour is used to identify regions outside the LPV-200 Service area as defined in the [EGNOS Safety of Life SDD](#).

<sup>13</sup>  $5 \cdot 10^{-4}$  LPV200 Service Area is the  $5 \cdot 10^{-4}$  LPV200 continuity risk area depicted in Figure 22 coming from the [EGNOS Safety of Life SDD](#).

### 3.4.6 LPV-200 Continuity - Achievement vs Target

The combination of the  $5 \cdot 10^{-4}$  LPV-200 Continuity Risk map and the Service Area<sup>14</sup> gives the following:

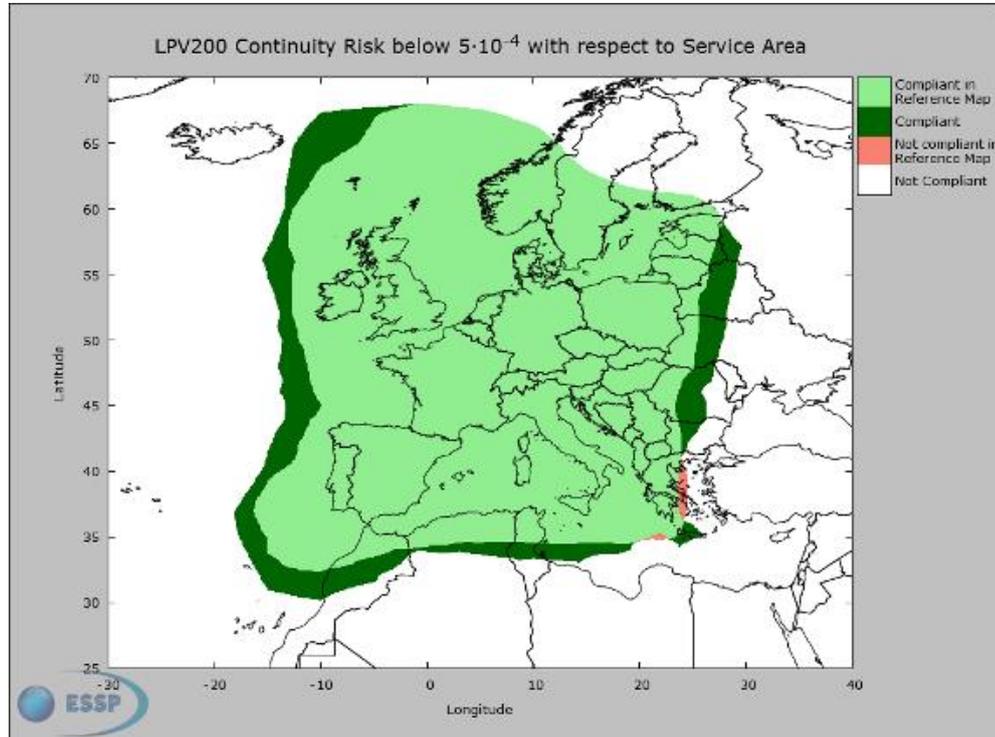


Figure 30: LPV-200 Continuity Risk ( $5 \cdot 10^{-4}$ ) map with respect to the  $5 \cdot 10^{-4}$  LPV-200 Service Area - 01/04/17 to 31/03/18

In the picture, the legend reads as follows:

- **Compliant in Reference Map:** This is the part of the  $5 \cdot 10^{-4}$  LPV-200 Service Area<sup>14</sup> where LPV-200 continuity was above  $5 \cdot 10^{-4}$ .
- **Compliant:** This is the zone out of the  $5 \cdot 10^{-4}$  LPV-200 Service Area<sup>14</sup> where LPV-200 continuity was also above  $5 \cdot 10^{-4}$  (extension of coverage with respect to the commitment).
- **Not compliant in Reference Map:** This is the part of the  $5 \cdot 10^{-4}$  LPV-200 Service Area<sup>14</sup> where LPV-200 continuity was lower than  $5 \cdot 10^{-4}$ .
- **Not compliant (white):** This is any other zone out of the  $5 \cdot 10^{-4}$  LPV-200 Service Area<sup>14</sup> where LPV-200 continuity is lower than  $5 \cdot 10^{-4}$ .

Considering the SDD v3.1 map used as the reference, the percentage of points which were compliant with the  $5 \cdot 10^{-4}$  LPV-200 Service Area ( $5 \cdot 10^{-4}/15\text{sec}$ ) is **99.66%**. Note that the comparison with respect to SDD SoL commitment map is included for information. The commitment map is a monthly reference while the reported period is one year and, therefore, this comparison must be interpreted with care.

<sup>14</sup>  $5 \cdot 10^{-4}$  LPV-200 Service Area is the  $5 \cdot 10^{-4}$  LPV-200 continuity risk area depicted in Figure 22 coming from the [EGNOS Safety-of-Life SDD](#).

For information, the differences with respect to the Service Area for the area corresponding to a continuity risk of  $10^{-3}$  and  $10^{-4}$  are included below. For both levels, the results obtained, as in the  $5 \cdot 10^{-4}$  case, are quite good (99.86% for continuity risk of  $10^{-3}$  and 99.97% for continuity risk of  $10^{-4}$ ).

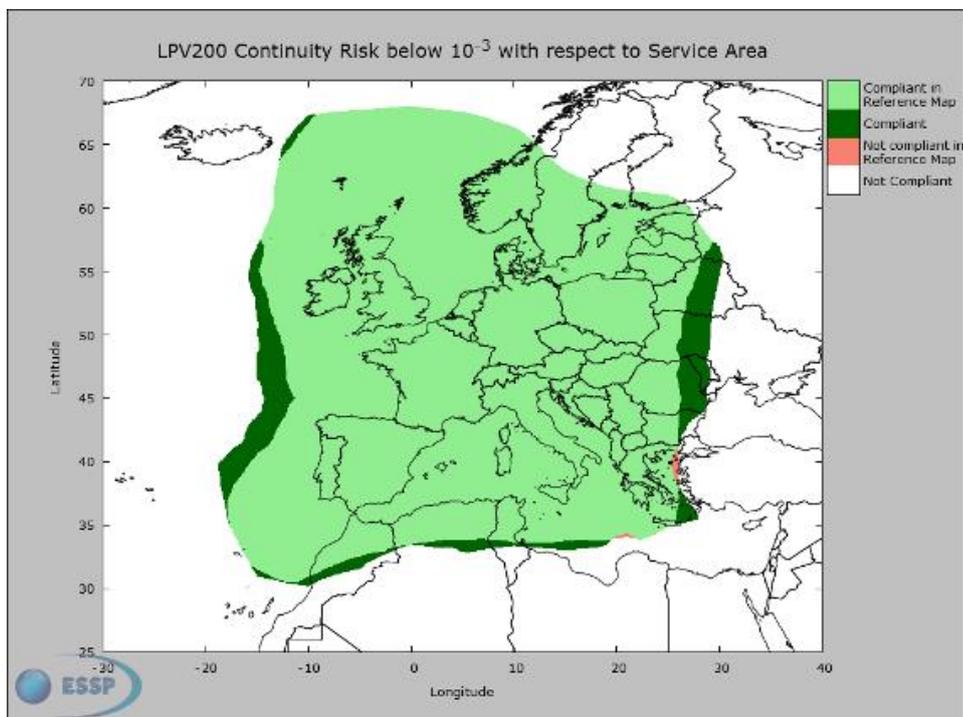


Figure 31: LPV-200 Continuity Risk ( $1 \cdot 10^{-3}$ ) map with respect to the Service Area - 01/04/17 to 31/03/18

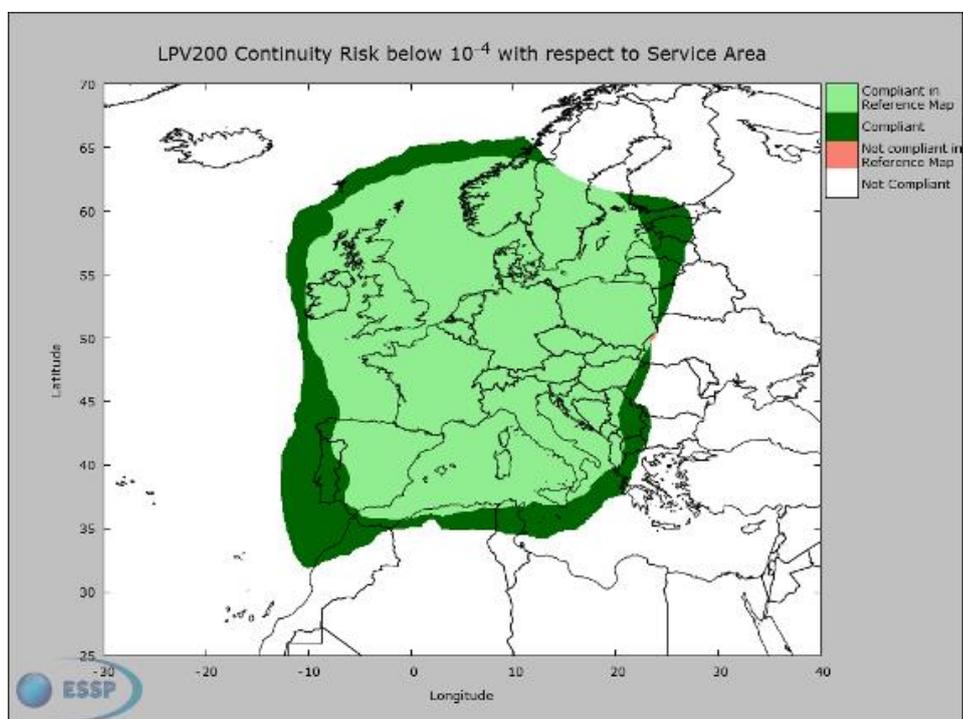


Figure 32: LPV-200 Continuity Risk ( $1 \cdot 10^{-4}$ ) map with respect to the Service Area - 01/04/17 to 31/03/18

In the picture, the legend reads as explained for Figure 30 but applying the corresponding commitment level ( $1 \cdot 10^{-3}$  or  $1 \cdot 10^{-4}$ ).

### 3.4.7 EGNOS LPV-200 vertical accuracy

When compared to APV-I, LPV-200 is based on more stringent performance requirements, such as a Vertical Navigation System Error (VNSE) of 4 m (95%) and a Vertical Alert Limit (VAL) of 35 m. In addition, specific requirements are defined regarding the probability that the VNSE exceeds 10 m in nominal system operation conditions, set to  $10^{-7}$ /per approach, or 15 m in degraded system operation conditions, defined as  $10^{-5}$ /per approach.

Whenever the instantaneous VNSE exceeds 10 m, in nominal conditions, or 15 m under degraded scenarios, an Accuracy Major Event (AME) occurs.

The following figures show the histogram and cumulative distribution function of VNSE, which are computed at the RIMS stations inside the LPV-200 Service Area for each second over the whole period.

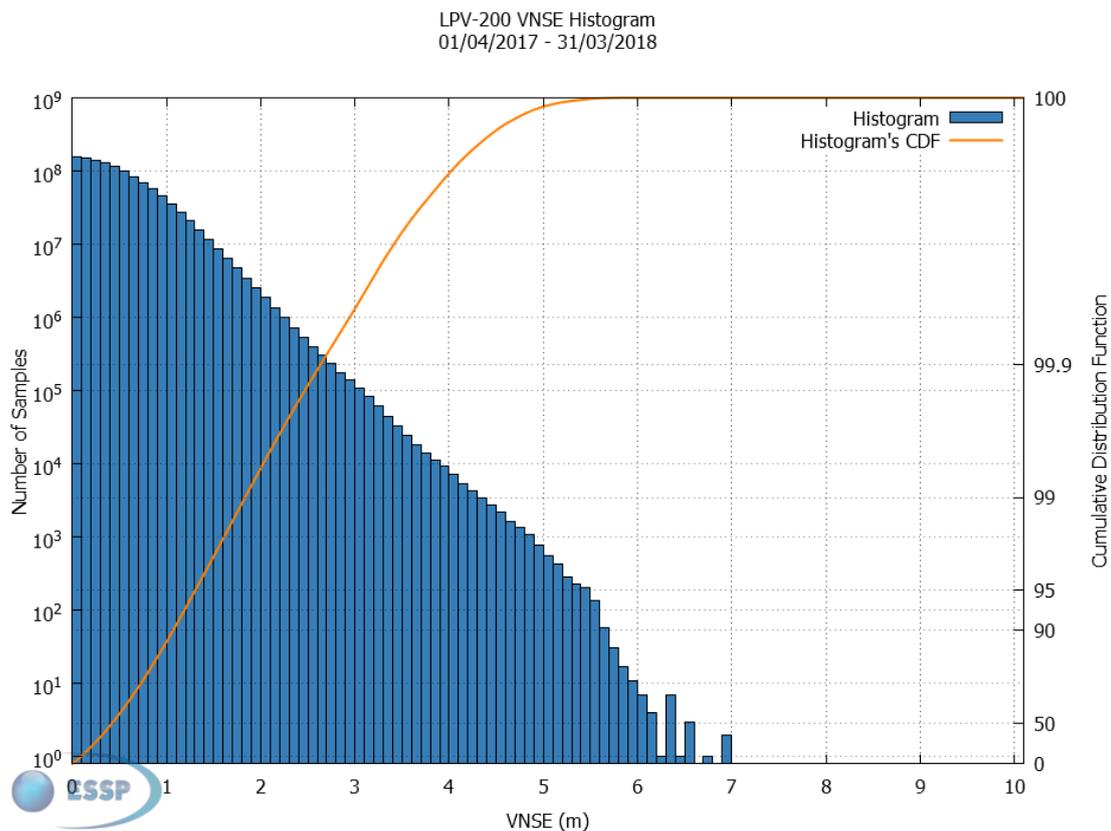


Figure 33: EGNOS LPV-200 Vertical Accuracy Histogram and Cumulative Probability

As shown, the cumulated results confirm that the vertical accuracy remained below 10 metres during the period analysed. In other words, no AME took place during the period analysed. The 95<sup>th</sup> percentile is below 1.4 metres. The worst accuracy measured in any of the stations is lower than 7 metres.

### 3.4.8 EGNOS LPV-200 accuracy extrapolated at $10^{-7}/150$ s

This section presents the results of extrapolating the accuracy results for every station to  $10^{-7}/150$  s. This extrapolation allows the characterisation of the accuracy distribution tails by means of a Gaussian extrapolation applied to the vertical navigation error<sup>15</sup>.

The following results present the values obtained from 1 January 2017 to 31 December 2017, using values obtained from both operational GEOs. For this period, all the RIMS within the [LPV-200 Service Area](#) present extrapolated accuracy values within the requirement:  $Pr(VNSE > 10 \text{ m}) < 10^{-7}/150$  s.

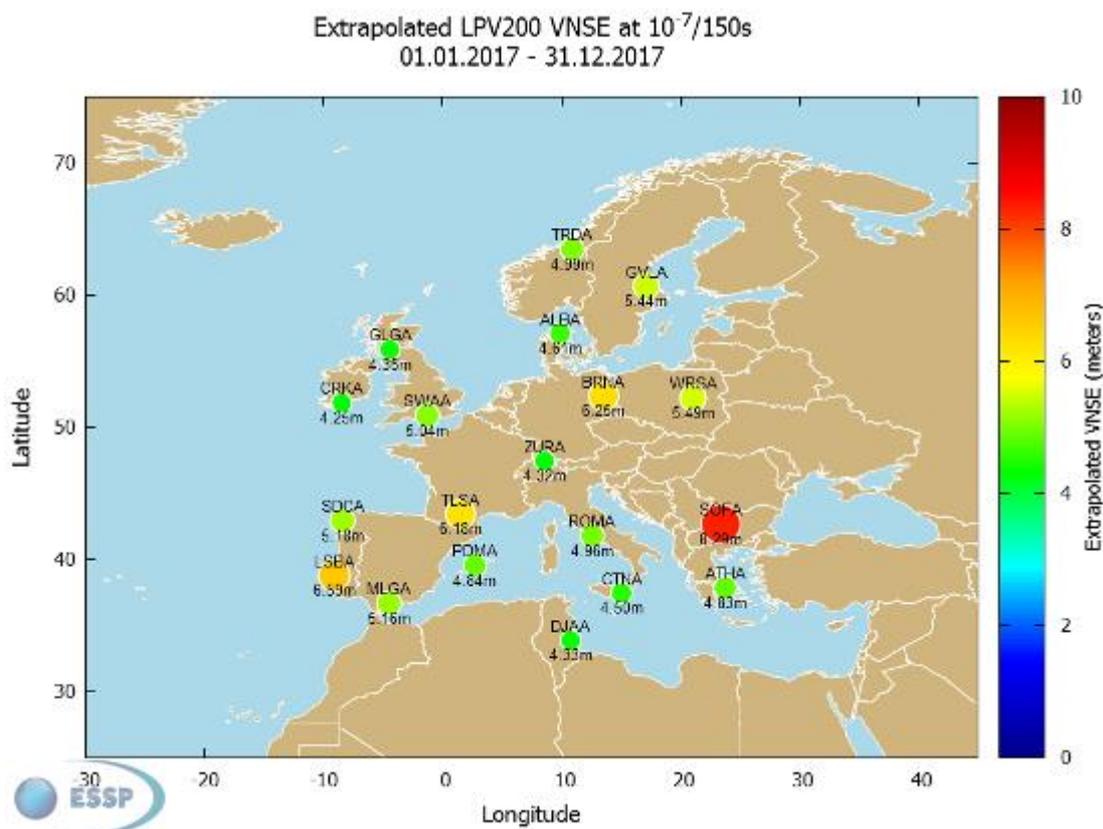


Figure 34: Extrapolated VNSE at  $10^{-7}/150$  s in the RIMS within the LPV-200 commitment

The highest value is 8.29 m, obtained for RIMS Sofia, which is still comfortably fulfilling the requirement.

<sup>15</sup> Using the accumulated VNSE distribution, an overbounding Gaussian distribution is computed ( $\sigma_{bound}$ ), which makes it possible to obtain the  $VNSE_{bound}$  extrapolated to the required probability of  $10^{-7}/150$  s. For additional details about the method used, please refer to “SBAS CAT-I available in Europe: LPV-200 commitment area and performance results” [ESSP SAS, ENC GNSS 2016].

### 3.5 Open Service (OS)

The EGNOS OS has been qualified by defining the minimum compliance area where 99% of the time the user is able to calculate their position and accuracy performance is better than 3 metres horizontally and 4 metres vertically. The minimum compliance area can be seen in the following figure:

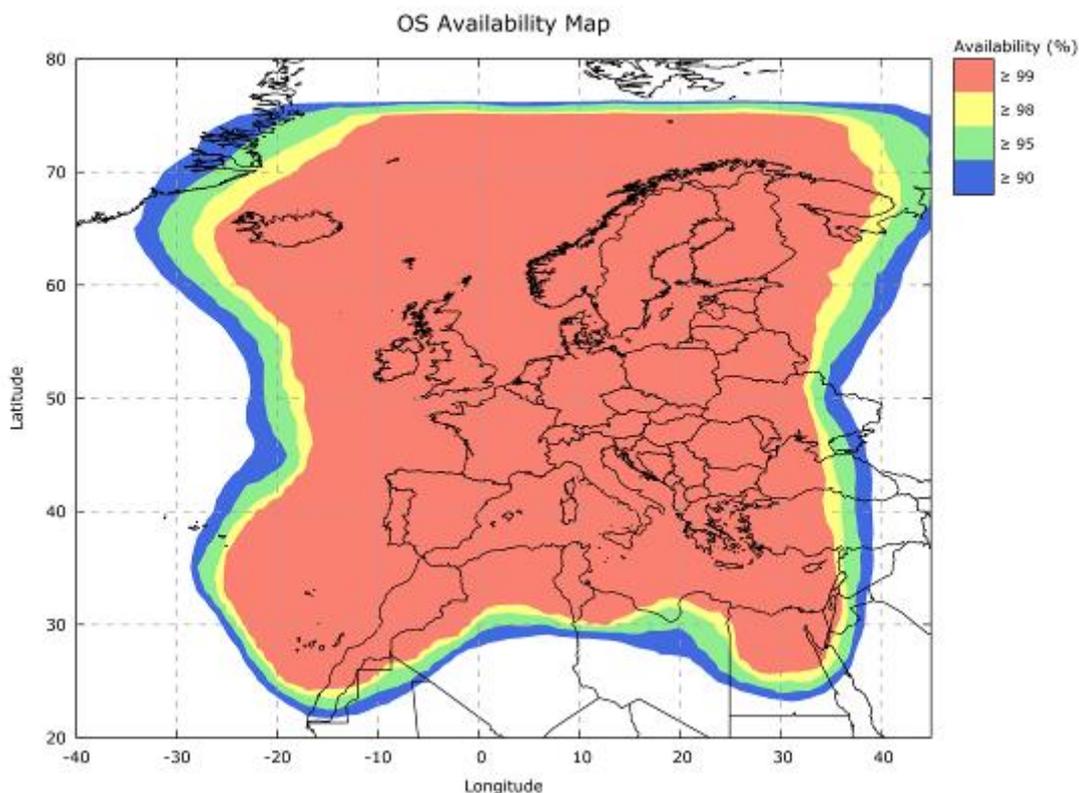


Figure 35: EGNOS OS compliance area

Further details can be found in the [EGNOS OS Service Definition](#). Additionally, OS performance is reported through the EGNOS Monthly Performance reports, available on the [EGNOS User Support website](#).

### 3.5.1 RIMS monitoring network

The following map shows the location of the deployed RIMS:



Figure 36: RIMS locations<sup>16</sup>

The receiver network used to report Open Service corresponds to the subset of RIMS which are inside the [EGNOS OS SDD](#) commitment map.

<sup>16</sup> Source: [EGNOS SDDs](#) (OS, SoL, EDAS).

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

Table 6: List of RIMS sites where performance are reported



*The interest towards EGNOS OS is growing in the UAV–Unmanned Aerial Vehicle- user community*

### 3.5.2 Horizontal and Vertical Accuracy

***EGNOS OS Horizontal (resp Vertical) Accuracy is reported as the 95<sup>th</sup> percentile of the Horizontal (resp Vertical) Navigation System Error (HNSE/VNSE) over the period, at the monitored sites when applying EGNOS messages.***

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

Station	HNSE 95% (metres)	VNSE 95% (metres)	Station	HNSE 95% (metres)	VNSE 95% (metres)
Aalborg	0.80	1.40	La Palma	1.00	1.60
Agadir	1.00	1.40	Lisbon	0.90	1.30
Alexandria	1.20	1.60	Madeira	0.80	1.20
Athens	0.70	1.20	Malaga	0.80	1.10
Berlin	0.80	1.20	Palma de Mallorca	0.60	1.00
Canary Islands	1.10	1.60	Reykjavik	0.90	1.90
Cork	0.80	1.30	Roma	0.70	1.10
Catania	0.70	1.20	S. de Compostela	0.80	1.10
Djerba	0.80	1.20	Sofia	1.00	2.20
Egilsstaðir	0.70	1.70	Swanwick	1.00	1.60
Glasgow	0.90	1.40	Toulouse	0.70	1.10
Golbasi	0.90	1.50	Trondheim	0.70	1.60
Gävle	0.70	1.60	Tromsø	0.90	2.10
Jan Mayen	1.20	2.50	Warsaw	0.80	1.40
Kirkenes	0.80	1.90	Zürich	0.80	1.30
Lappeenranta	0.80	1.60			

Table 7: EGNOS Open Service accuracy (95%)

The horizontal accuracy results for all the stations remained below 1.3 metre (95%), and the vertical accuracy below 2.6 metres (95%), which represents a very good level of accuracy.

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

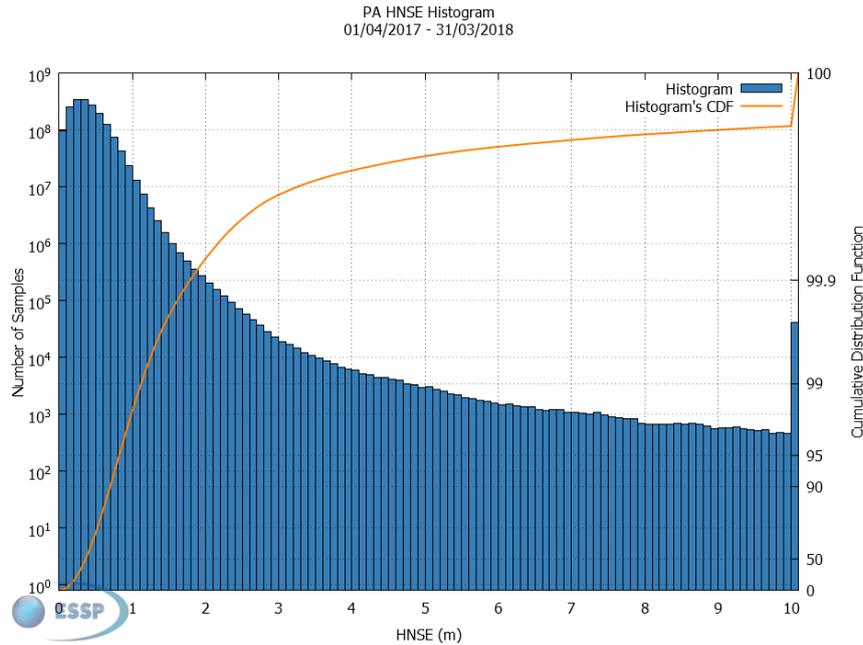


Figure 37: EGNOS Open Service HNSE Histogram and Cumulative Probability<sup>17</sup>

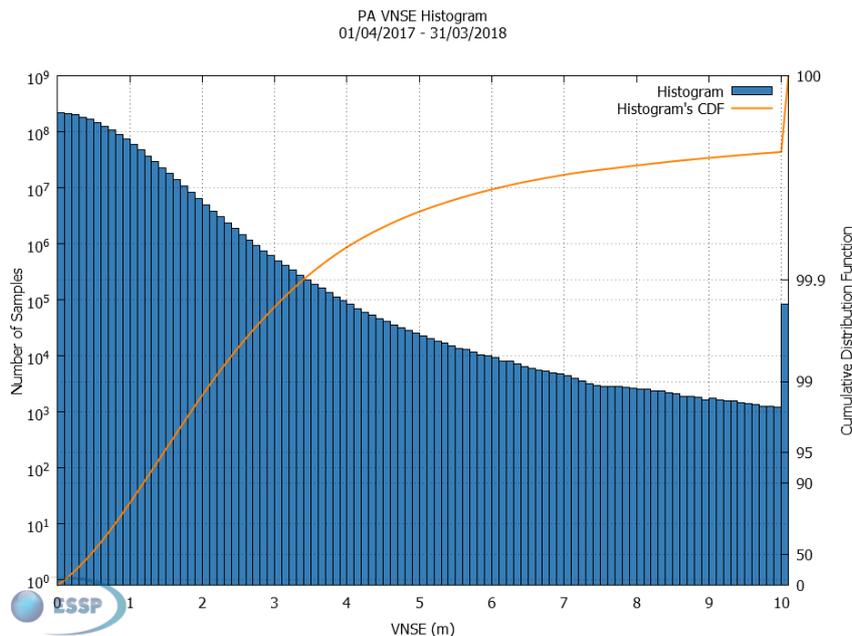


Figure 38: EGNOS Open Service VNSE Histogram and Cumulative Probability<sup>17</sup>

As shown, the cumulated results confirm the good values observed in all the stations. The 95<sup>th</sup> percentile of the observed accuracy performance is below 0.9 metres in the horizontal domain and below 1.6 metres in the vertical one.

Table 8 and Table 9 provide the monthly maximum of the daily values for Horizontal and Vertical Accuracy (95%) while using EGNOS message broadcast by PRN 120 and PRN 123, respectively.

<sup>17</sup> Note that for the computation of the different histograms presented in this document, some periods may have been removed, corresponding to stations presenting bad quality of data related to the local environment. Data removed from histograms correspond to data from RIMS in which any OR affecting data quality has been observed or presence of cycle slips affecting performance is detected or other data quality issues have been traced as cause of daily degradations.

PRN 120		04/17	05/17	06/17	07/17	08/17	09/17	10/17	11/17	12/17	01/18	02/18	03/18	Average
AGA	HPE								2.29	2.01	1.50	2.05	1.37	1.84
	VPE								1.90	1.55	1.57	2.05	1.90	1.79
ALB	HPE	0.74	0.63	0.63	0.67	0.70	0.77	0.86	1.08	1.03	0.99	1.01	0.83	0.83
	VPE	1.83	1.87	1.63	1.70	1.55	1.81	1.66	1.60	1.86	1.60	1.82	1.89	1.74
ALY	HPE								1.28	1.27	1.26	2.01	1.51	1.47
	VPE								2.24	1.83	1.69	1.88	1.79	1.89
ATH	HPE	0.94	0.87	0.84	0.80	0.77	0.91	0.74	0.72	0.76	0.81	0.88	0.88	0.83
	VPE	1.40	1.62	1.46	1.50	1.49	1.56	1.37	1.43	1.42	1.35	1.31	1.46	1.45
BRN	HPE	0.90	0.77	0.71	0.80	0.76	0.75	0.86	0.95	0.99	1.01	1.02	0.97	0.87
	VPE	1.76	1.47	1.41	1.51	1.51	1.54	1.37	1.27	1.43	1.43	1.46	1.84	1.50
CNR	HPE	1.58	1.10	1.00	1.31	1.68	1.95	2.46				1.89	1.72	1.63
	VPE	1.70	1.73	1.95	2.24	1.97	1.86	1.97				1.86	1.82	1.90
CRK	HPE	0.87	0.71	0.69	0.77	0.81	0.72	0.95	1.04	1.07	1.08	1.11	1.03	0.90
	VPE	1.72	1.60	1.57	1.47	1.62	1.49	1.50	1.35	1.67	1.64	1.62	1.59	1.57
CTN	HPE	3.30	0.94	0.82	0.93	0.72	0.82	0.68	0.72	0.75	0.71	0.83	0.79	1.00
	VPE	5.67	1.54	1.42	1.47	1.45	1.53	1.40	1.41	1.48	1.41	1.47	1.30	1.80
DJA	HPE	0.93	0.95	0.89	0.98	1.01	0.92	0.80	0.81	0.95	0.87	1.08	0.88	0.92
	VPE	1.48	1.66	1.73	1.62	1.67	1.31	1.50	1.70	1.38	1.51	1.31	1.17	1.50
EGI	HPE	0.91	1.12	0.69	0.78	0.79	1.10	0.87	0.96	0.82	0.74	0.76	0.86	0.87
	VPE	2.15	2.38	1.84	1.99	1.88	2.60	2.24	2.14	1.82	2.01	2.32	2.26	2.14
GLG	HPE	0.84	0.75	0.68	0.79	0.86	0.80	1.01	1.04	1.13	1.12	1.21	1.03	0.94
	VPE	2.00	1.90	1.80	1.61	1.73	1.71	1.58	1.56	2.03	1.75	1.81	1.67	1.76
GOL	HPE	1.19	1.29	1.10	1.06	0.92	2.34	1.08	0.99	0.88	0.95	1.02	1.02	1.15
	VPE	1.97	1.92	1.77	1.84	1.62	2.76	1.79	1.92	1.50	1.49	1.63	1.73	1.83
GVL	HPE	0.69	0.74	0.62	0.72	0.65	1.09	0.76	0.83	0.90	0.96	0.94	0.71	0.80
	VPE	1.92	2.31	1.85	1.82	1.84	2.04	1.89	2.06	1.77	1.78	2.01	2.04	1.94
JME	HPE	1.49	1.73	1.24	1.48	1.37	1.52	1.37	1.40	1.47	1.42	1.26	1.36	1.43
	VPE	3.20	3.39	2.65	2.75	2.87	3.28	3.04	3.25	3.07	2.86	3.27	3.42	3.09
KIR	HPE	1.08	1.35	0.75	0.95	0.98	2.06	1.03	1.11	1.07	0.98	0.99	1.01	1.11
	VPE	2.18	2.41	2.14	2.28	2.61	3.52	3.11	2.86	2.62	2.41	2.62	2.70	2.62
LAP	HPE	0.76	0.81	0.72	0.68	0.73	1.13	0.79	0.92	0.89	0.99	0.95	0.91	0.86
	VPE	1.87	2.19	1.64	1.87	1.87	2.12	1.95	2.35	1.67	1.85	1.91	2.05	1.95
LPI	HPE	1.58	1.06	1.00	1.40	1.62	1.83	2.09	2.35	1.55	1.98	1.76	1.70	1.66
	VPE	2.44	1.75	2.06	1.93	1.84	1.91	1.81	1.79	2.09	1.92	1.95	1.97	1.96
LSB	HPE	1.02	0.99	1.02	1.14	0.92	1.03	0.91	0.94	0.84	0.87	0.97	0.93	0.97
	VPE	1.22	1.22	1.27	1.43	1.49	1.67	1.60	1.59	1.53	1.49	1.61	1.72	1.49
MAD	HPE	0.90	0.95	0.98	1.00	0.88	0.92	1.00	0.83	0.83	0.93	0.92	0.93	0.92
	VPE	1.40	1.34	1.37	1.68	1.54	1.55	1.64	1.56	1.35	1.56	1.59	1.69	1.52
MLG	HPE	0.80	0.87	0.89	0.98	0.87	0.97	0.80	0.82	0.72	0.75	0.87	0.81	0.85
	VPE	1.24	1.23	1.20	1.45	1.45	1.54	1.57	1.59	1.37	1.33	1.24	1.28	1.37
PDM	HPE	0.66	0.73	0.66	0.77	0.65	0.78	0.67	0.67	0.66	0.60	0.68	0.67	0.68
	VPE	1.06	1.19	1.10	1.22	1.16	1.12	1.41	1.30	0.99	1.24	1.19	1.29	1.19
RKK	HPE	1.10	1.35	0.94	1.06	0.99	1.44	1.34	1.32	1.12	1.23	1.13	1.21	1.19
	VPE	2.42	3.19	2.15	2.30	2.22	3.18	3.01	2.57	2.07	2.31	2.63	2.48	2.54
ROM	HPE	0.80	0.82	0.72	0.72	0.66	0.80	0.68	0.70	0.71	0.70	0.81	0.78	0.74
	VPE	1.43	1.22	1.14	1.24	1.25	1.31	1.27	1.25	1.18	1.26	1.35	1.45	1.28
SDC	HPE	0.95	0.87	0.88	0.86	0.94	0.92	0.82	0.87	0.87	0.91	0.98	1.05	0.91
	VPE	1.25	1.07	1.27	1.19	1.37	1.28	1.30	1.14	1.16	1.19	1.34	1.45	1.25
SOF	HPE	1.19	1.40	1.09	1.40	1.28	1.17	1.02	1.15	1.08	1.08	1.22	1.16	1.19
	VPE	2.46	2.70	2.50	2.56	2.55	2.44	2.40	2.16	2.10	2.31	2.53	2.76	2.46
SWA	HPE	1.06	0.94	0.91	0.96	1.10	1.01	1.17	1.26	1.19	1.23	1.25	1.12	1.10
	VPE	2.01	1.75	1.67	1.92	1.84	1.77	1.76	1.56	1.88	1.94	1.84	1.91	1.82
TLS	HPE	0.79	0.75	0.72	0.76	0.77	0.78	0.77	0.84	0.78	0.77	0.81	0.82	0.78
	VPE	1.28	1.37	1.41	1.35	1.45	1.21	1.37	1.10	1.20	1.51	1.50	1.46	1.35
TRD	HPE	0.76	0.77	0.62	0.69	0.73	1.04	0.72	0.85	0.83	0.81	0.85	0.77	0.79
	VPE	1.85	2.03	1.99	1.56	1.81	2.13	1.99	1.89	1.82	1.94	2.11	2.06	1.93
TRO	HPE	1.11	1.47	0.99	0.99	1.06	1.57	1.16	1.23	1.05	0.99	1.14	1.07	1.15
	VPE	2.27	2.85	2.31	2.52	2.33	2.97	2.55	2.98	2.63	2.41	2.78	2.82	2.62
WRS	HPE	0.91	0.81	0.83	0.83	0.83	0.88	0.91	0.97	1.03	1.04	1.05	1.02	0.93
	VPE	1.80	1.62	1.44	1.57	1.67	1.73	1.55	1.51	1.49	1.51	1.66	1.97	1.63
ZUR	HPE	0.97	0.90	0.84	0.91	0.80	0.81	0.81	0.89	0.84	0.90	0.98	0.95	0.88
	VPE	1.68	1.55	1.34	1.42	1.59	1.40	1.61	1.12	1.28	1.47	1.72	1.56	1.48

Table 8: Monthly Horizontal/Vertical Accuracy at RIMS-A sites for PRN120 (in metres)<sup>18 19</sup>

<sup>18</sup> RIMS AGA and RIMS ALY were included within the new OS SDD commitment published in October 2017, so no performance information before that date is reported.

<sup>19</sup> Data from RIMS CNR from November 2107 to January 2018 is not presented because works at airport implied an interruption of the RIMS during that period.

PRN 123		04/17	05/17	06/17	07/17	08/17	09/17	10/17	11/17	12/17	01/18	02/18	03/18	Average
AGA	HPE								2.28	2.02	1.48	2.02	1.41	1.84
	VPE								1.90	1.53	1.56	2.10	1.87	1.79
ALB	HPE	0.76	0.63	0.62	0.67	0.73	0.77	0.86	1.08	1.01	1.00	1.01	0.82	0.83
	VPE	1.84	1.88	1.62	1.69	1.58	1.82	1.64	1.59	1.83	1.59	1.82	1.91	1.73
ALY	HPE								1.28	1.26	1.26	1.99	1.51	1.46
	VPE								2.23	1.87	1.68	1.87	1.80	1.89
ATH	HPE	0.93	0.86	0.83	0.78	0.77	0.90	0.73	0.72	0.76	0.79	0.88	0.87	0.82
	VPE	1.42	1.61	1.45	1.49	1.45	1.56	1.41	1.42	1.40	1.34	1.32	1.44	1.44
BRN	HPE	0.89	0.77	0.71	0.79	0.76	0.76	0.85	0.95	0.99	1.00	1.02	0.96	0.87
	VPE	1.75	1.45	1.41	1.50	1.49	1.55	1.36	1.26	1.44	1.43	1.46	1.84	1.50
CNR	HPE	1.57	1.05	1.05	1.31	1.65	2.02	2.46				1.87	1.73	1.63
	VPE	1.63	1.74	2.02	2.27	1.98	1.83	2.03				1.88	1.78	1.91
CRK	HPE	0.86	0.70	0.69	0.78	0.83	0.73	0.96	1.05	1.05	1.07	1.12	1.04	0.91
	VPE	1.72	1.62	1.59	1.46	1.59	1.46	1.52	1.36	1.71	1.63	1.64	1.57	1.57
CTN	HPE	3.22	0.94	0.80	0.92	0.72	0.81	0.68	0.73	0.75	0.71	0.83	0.80	0.99
	VPE	5.67	1.57	1.42	1.45	1.41	1.52	1.39	1.41	1.50	1.39	1.46	1.32	1.79
DJA	HPE	0.93	0.95	0.91	0.97	1.02	0.91	0.78	0.82	0.93	0.88	1.08	0.88	0.92
	VPE	1.54	1.67	1.70	1.65	1.66	1.31	1.50	1.71	1.40	1.50	1.30	1.19	1.51
EGI	HPE	0.93	1.12	0.69	0.77	0.80	1.08	0.85	0.97	0.80	0.74	0.76	0.85	0.86
	VPE	2.14	2.38	1.78	2.03	1.88	2.64	2.30	2.11	1.85	2.00	2.30	2.32	2.14
GLG	HPE	0.84	0.75	0.69	0.78	0.88	0.79	1.01	1.04	1.14	1.11	1.22	1.02	0.94
	VPE	1.99	1.90	1.83	1.61	1.74	1.74	1.58	1.57	2.02	1.78	1.82	1.69	1.77
GOL	HPE	1.16	1.29	1.08	1.06	0.95	2.29	1.07	0.99	0.89	0.94	1.03	1.03	1.15
	VPE	1.96	1.94	1.72	1.85	1.68	2.74	1.80	1.91	1.53	1.50	1.60	1.71	1.83
GVL	HPE	0.70	0.74	0.63	0.70	0.65	1.08	0.76	0.83	0.89	0.97	0.93	0.71	0.80
	VPE	1.90	2.32	1.81	1.76	1.89	2.05	1.89	2.06	1.74	1.78	2.01	2.05	1.94
JME	HPE	1.50	1.71	1.24	1.52	1.37	1.67	1.35	1.42	1.51	1.44	1.26	1.39	1.45
	VPE	3.20	3.30	2.66	2.72	2.84	3.28	2.98	3.26	3.10	2.90	3.25	3.49	3.08
KIR	HPE	1.08	1.57	0.74	0.93	0.97	2.19	1.04	1.13	1.09	0.98	1.00	1.01	1.14
	VPE	2.14	2.53	2.08	2.26	2.59	3.71	3.04	2.79	2.50	2.41	2.61	2.69	2.61
LAP	HPE	0.73	0.81	0.72	0.66	0.73	1.13	0.79	0.91	0.90	1.00	0.95	0.92	0.85
	VPE	1.86	2.16	1.62	1.79	1.91	2.11	1.94	2.39	1.69	1.86	1.92	2.12	1.95
LPI	HPE	1.64	1.04	1.02	1.40	1.55	1.81	2.02	2.34	1.55	2.03	1.73	1.68	1.65
	VPE	2.37	1.74	2.01	1.94	1.79	1.89	1.80	1.82	2.00	1.93	1.97	1.97	1.94
LSB	HPE	1.03	0.98	1.03	1.13	0.93	1.02	0.91	0.94	0.83	0.87	0.96	0.99	0.97
	VPE	1.18	1.22	1.28	1.41	1.48	1.64	1.58	1.60	1.52	1.52	1.60	1.71	1.48
MAD	HPE	0.91	0.96	0.98	1.02	0.84	0.90	0.97	0.84	0.80	0.93	0.92	0.92	0.92
	VPE	1.36	1.32	1.42	1.68	1.52	1.53	1.64	1.55	1.30	1.54	1.59	1.73	1.52
MLG	HPE	0.81	0.88	0.89	0.97	0.85	0.95	0.81	0.81	0.72	0.75	0.87	0.81	0.84
	VPE	1.24	1.24	1.23	1.48	1.47	1.57	1.55	1.60	1.39	1.29	1.23	1.30	1.38
PDM	HPE	0.65	0.73	0.67	0.76	0.64	0.76	0.68	0.67	0.66	0.61	0.68	0.67	0.68
	VPE	1.07	1.18	1.11	1.22	1.20	1.13	1.39	1.30	1.01	1.19	1.18	1.28	1.19
RKK	HPE	1.11	1.40	0.94	1.06	0.97	1.47	1.35	1.32	1.12	1.20	1.17	1.25	1.20
	VPE	2.25	3.17	2.07	2.36	2.22	3.15	3.14	2.58	2.24	2.30	2.76	2.60	2.57
ROM	HPE	0.78	0.80	0.72	0.73	0.67	0.80	0.67	0.70	0.72	0.70	0.80	0.77	0.74
	VPE	1.44	1.24	1.14	1.23	1.27	1.31	1.28	1.24	1.19	1.23	1.36	1.44	1.28
SDC	HPE	0.96	0.87	0.89	0.85	0.96	0.92	0.83	0.87	0.86	0.92	0.98	1.05	0.91
	VPE	1.25	1.08	1.25	1.17	1.35	1.27	1.27	1.16	1.16	1.20	1.33	1.43	1.24
SOF	HPE	1.20	1.35	1.08	1.37	1.27	1.17	1.02	1.15	1.08	1.09	1.21	1.14	1.18
	VPE	2.45	2.62	2.46	2.50	2.51	2.43	2.37	2.14	2.14	2.25	2.53	2.71	2.43
SWA	HPE	1.06	0.94	0.93	0.96	1.10	1.01	1.18	1.26	1.18	1.24	1.25	1.13	1.10
	VPE	2.02	1.79	1.67	1.91	1.85	1.76	1.75	1.56	1.88	1.94	1.84	1.90	1.82
TLS	HPE	0.79	0.76	0.73	0.75	0.76	0.79	0.77	0.85	0.78	0.79	0.81	0.84	0.79
	VPE	1.27	1.35	1.41	1.33	1.42	1.18	1.36	1.10	1.14	1.54	1.49	1.48	1.34
TRD	HPE	0.75	0.77	0.61	0.68	0.73	1.05	0.73	0.85	0.83	0.82	0.85	0.81	0.79
	VPE	1.84	2.11	1.98	1.52	1.76	2.13	1.98	1.88	1.81	1.94	2.12	2.06	1.93
TRO	HPE	1.11	1.45	0.99	1.00	1.06	1.60	1.15	1.22	1.06	0.99	1.16	1.06	1.15
	VPE	2.34	2.79	2.29	2.52	2.40	2.83	2.58	2.99	2.64	2.39	2.77	2.78	2.61
WRS	HPE	0.90	0.81	0.83	0.84	0.82	0.88	0.91	0.97	1.03	1.02	1.05	0.99	0.92
	VPE	1.80	1.61	1.43	1.53	1.68	1.72	1.53	1.50	1.50	1.51	1.66	1.95	1.62
ZUR	HPE	0.97	0.90	0.84	0.91	0.79	0.81	0.81	0.89	0.84	0.92	0.98	0.94	0.88
	VPE	1.65	1.51	1.34	1.45	1.61	1.40	1.60	1.13	1.30	1.47	1.72	1.57	1.48

Table 9: Monthly Horizontal/Vertical Accuracy at RIMS-A sites for PRN123 (in metres)<sup>20 21</sup>

<sup>20</sup> RIMS AGA and RIMS ALY were included within the new OS SDD commitment published in October 2017, so no performance information is reported before that date.

<sup>21</sup> Data from RIMS CNR from November 2107 to January 2018 is not presented because works at airport implied an interruption of the RIMS during the period.

### 3.5.3 Open Service Availability

*EGNOS OS Availability performance is defined in this document as the percentage of time in the month when the instantaneous HNSE is lower than 3 metres and the instantaneous VNSE is lower than 4 metres over the total number of samples with valid PA navigation solution.*

The following tables provide the values measured using PRN 120 and PRN 123 respectively.

PRN120	04/17	05/17	06/17	07/17	08/17	09/17	10/17	11/17	12/17	01/18	02/18	03/18	Average
AGAA								99.89%	100.00%	99.99%	99.92%	99.97%	99.95%
ALBA	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
ALYA								99.99%	99.98%	99.97%	99.95%	99.98%	99.98%
ATHA	100.00%	100.00%	100.00%	100.00%	100.00%	99.99%	100.00%	100.00%	100.00%	99.99%	99.99%	100.00%	100.00%
BRNA	100.00%	100.00%	99.99%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	99.99%	99.98%	100.00%	100.00%
CNRA	99.95%	99.97%	99.99%	99.99%	99.90%	99.73%	99.83%				99.91%	99.88%	99.91%
CRKA	99.99%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	99.99%	100.00%	100.00%
CTNA	99.74%	100.00%	99.99%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	99.99%	99.98%	100.00%	99.97%
DJAA	100.00%	100.00%	99.99%	100.00%	100.00%	100.00%	99.99%	100.00%	99.98%	99.95%	99.98%	99.99%	99.99%
EGIA	99.96%	99.97%	100.00%	99.99%	99.96%	99.80%	99.95%	99.94%	99.99%	99.94%	99.93%	99.92%	99.95%
GLGA	99.99%	99.97%	100.00%	99.99%	100.00%	99.99%	99.98%	99.96%	100.00%	100.00%	100.00%	99.99%	99.99%
GOLA	99.98%	99.88%	100.00%	99.99%	99.98%	99.50%	99.99%	99.95%	99.99%	99.97%	99.95%	99.95%	99.93%
GVLA	100.00%	100.00%	100.00%	100.00%	100.00%	99.98%	99.99%	100.00%	100.00%	99.99%	100.00%	100.00%	100.00%
JMEA	99.70%	99.47%	99.86%	99.69%	99.69%	99.16%	99.63%	99.72%	99.60%	99.50%	99.27%	99.41%	99.56%
KIRA	99.63%	99.64%	99.77%	99.82%	99.79%	99.40%	99.78%	99.76%	99.73%	99.75%	99.41%	99.36%	99.65%
LAPA	99.99%	99.97%	100.00%	100.00%	100.00%	99.96%	99.99%	100.00%	100.00%	99.98%	99.99%	99.89%	99.98%
LPIA	99.91%	100.00%	99.95%	99.96%	99.86%	99.76%	99.78%	99.93%	99.84%	99.95%	99.80%	99.82%	99.88%
LSBA	99.99%	100.00%	99.99%	100.00%	100.00%	100.00%	99.96%	100.00%	100.00%	99.98%	100.00%	99.99%	99.99%
MADA	99.98%	100.00%	99.99%	99.99%	99.95%	99.77%	99.82%	99.87%	99.89%	99.98%	99.95%	99.98%	99.93%
MLGA	100.00%	99.99%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
PDMA	99.99%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
RKKA	99.69%	99.07%	99.44%	99.47%	99.43%	99.14%	99.27%	99.53%	99.33%	99.15%	99.26%	98.91%	99.31%
ROMA	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	99.99%	99.99%	100.00%	100.00%
SDCA	99.97%	99.99%	99.99%	99.99%	99.99%	100.00%	99.98%	100.00%	100.00%	100.00%	100.00%	100.00%	99.99%
SOFA	99.95%	99.78%	99.93%	99.76%	99.92%	99.89%	99.98%	99.99%	99.99%	99.96%	99.87%	99.81%	99.90%
SWAA	99.98%	100.00%	100.00%	99.99%	100.00%	100.00%	100.00%	99.98%	99.98%	100.00%	100.00%	100.00%	99.99%
TLSA	99.96%	100.00%	100.00%	100.00%	100.00%	100.00%	99.98%	100.00%	100.00%	100.00%	99.99%	100.00%	100.00%
TRDA	99.98%	100.00%	99.98%	99.99%	99.98%	99.96%	100.00%	100.00%	99.99%	99.99%	100.00%	99.99%	99.99%
TROA	99.91%	99.81%	99.96%	99.93%	99.89%	99.63%	99.91%	99.80%	99.80%	99.91%	99.83%	99.88%	99.85%
WRSA	100.00%	100.00%	100.00%	100.00%	100.00%	99.99%	100.00%	100.00%	100.00%	99.98%	99.99%	100.00%	100.00%
ZURA	100.00%	100.00%	99.99%	100.00%	100.00%	100.00%	99.99%	100.00%	100.00%	99.99%	99.99%	99.99%	100.00%

Table 10: OS Availability at RIMS-A sites for PRN120<sup>22 23</sup>

<sup>22</sup> RIMS AGA and RIMS ALY were included within the new OS SDD commitment published in October 2017, so no performance information is reported before that date.

<sup>23</sup> Data from RIMS CNR from November 2107 to January 2018 is not presented because works at airport implied an interruption of the RIMS during that period.



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PRN123	04/17	05/17	06/17	07/17	08/17	09/17	10/17	11/17	12/17	01/18	02/18	03/18	Average
AGAA								99.89%	100.00%	99.98%	99.91%	99.98%	99.95%
ALBA	99.99%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
ALYA								99.99%	99.99%	99.98%	99.95%	99.97%	99.98%
ATHA	100.00%	100.00%	100.00%	100.00%	99.99%	99.99%	99.99%	100.00%	100.00%	99.99%	99.99%	100.00%	100.00%
BRNA	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	99.99%	99.98%	100.00%	100.00%
CNRA	99.96%	99.97%	99.99%	99.99%	99.87%	99.72%	99.82%				99.91%	99.85%	99.90%
CRKA	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	99.98%	100.00%	100.00%
CTNA	99.75%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	99.98%	100.00%	99.98%
DJAA	100.00%	100.00%	99.99%	100.00%	100.00%	100.00%	100.00%	99.99%	99.97%	99.96%	99.98%	99.99%	99.99%
EGIA	99.98%	99.96%	100.00%	99.99%	99.96%	99.84%	99.95%	99.94%	99.98%	99.95%	99.93%	99.91%	99.95%
GLGA	99.99%	99.98%	100.00%	99.99%	99.99%	99.99%	99.99%	99.96%	100.00%	100.00%	100.00%	99.99%	99.99%
GOLA	100.00%	99.89%	100.00%	99.99%	99.98%	99.50%	99.99%	99.95%	99.98%	99.96%	99.95%	99.96%	99.93%
GVLA	100.00%	100.00%	100.00%	100.00%	100.00%	99.99%	99.99%	100.00%	99.99%	99.98%	100.00%	100.00%	100.00%
JMEA	99.68%	99.45%	99.88%	99.73%	99.71%	99.19%	99.64%	99.71%	99.60%	99.51%	99.28%	99.39%	99.57%
KIRA	99.60%	99.58%	99.74%	99.85%	99.75%	99.42%	99.79%	99.76%	99.66%	99.78%	99.41%	99.35%	99.64%
LAPA	99.98%	99.97%	100.00%	100.00%	100.00%	99.97%	99.99%	100.00%	100.00%	99.99%	99.99%	99.89%	99.98%
LPIA	99.90%	100.00%	99.96%	99.97%	99.81%	99.78%	99.77%	99.93%	99.83%	99.92%	99.79%	99.80%	99.87%
LSBA	100.00%	100.00%	99.99%	100.00%	100.00%	100.00%	99.96%	100.00%	100.00%	99.98%	100.00%	100.00%	99.99%
MADA	99.99%	100.00%	99.99%	100.00%	99.92%	99.78%	99.82%	99.87%	99.88%	99.97%	99.95%	99.96%	99.93%
MLGA	100.00%	99.99%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
PDMA	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
RKKA	99.68%	99.12%	99.39%	99.46%	99.39%	99.16%	99.22%	99.51%	99.36%	99.10%	99.26%	98.92%	99.30%
ROMA	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	99.99%	100.00%	100.00%
SDCA	99.96%	99.99%	99.99%	99.99%	99.99%	100.00%	99.99%	100.00%	100.00%	100.00%	100.00%	100.00%	99.99%
SOFA	99.94%	99.78%	99.94%	99.76%	99.92%	99.90%	99.98%	99.99%	100.00%	99.97%	99.88%	99.80%	99.91%
SWAA	99.98%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	99.99%	99.97%	100.00%	100.00%	100.00%	99.99%
TLSA	99.97%	100.00%	100.00%	100.00%	100.00%	100.00%	99.99%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
TRDA	100.00%	100.00%	99.99%	99.99%	99.98%	99.96%	100.00%	100.00%	100.00%	99.99%	100.00%	100.00%	99.99%
TROA	99.92%	99.83%	99.95%	99.91%	99.89%	99.65%	99.91%	99.79%	99.82%	99.90%	99.83%	99.90%	99.86%
WRSA	100.00%	100.00%	100.00%	100.00%	100.00%	99.99%	100.00%	100.00%	100.00%	99.98%	99.99%	100.00%	100.00%
ZURA	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	99.99%	99.99%	100.00%	100.00%

Table 11: OS Availability at RIMS-A sites for PRN123<sup>24 25</sup>

The monthly Open Service availability performance in all RIMS stations was over 99% with the exception of Reykjavik RIMS site in March 2018. During that month the occasional loss of monitoring of some GPS satellites and the high geomagnetic activity observed on some days, degraded the performance at this station.

<sup>24</sup> RIMS AGA and RIMS ALY were included within the new OS SDD commitment published in October 2017, so no performance information is reported before that date.

<sup>25</sup> Data from RIMS CNR from November 2107 to January 2018 is not presented because because works at airport implied an interruption of the RIMS during that period.

The map below shows, for each location, the OS availability value during the year. The worst value between PRN 120 and PRN 123 is shown:

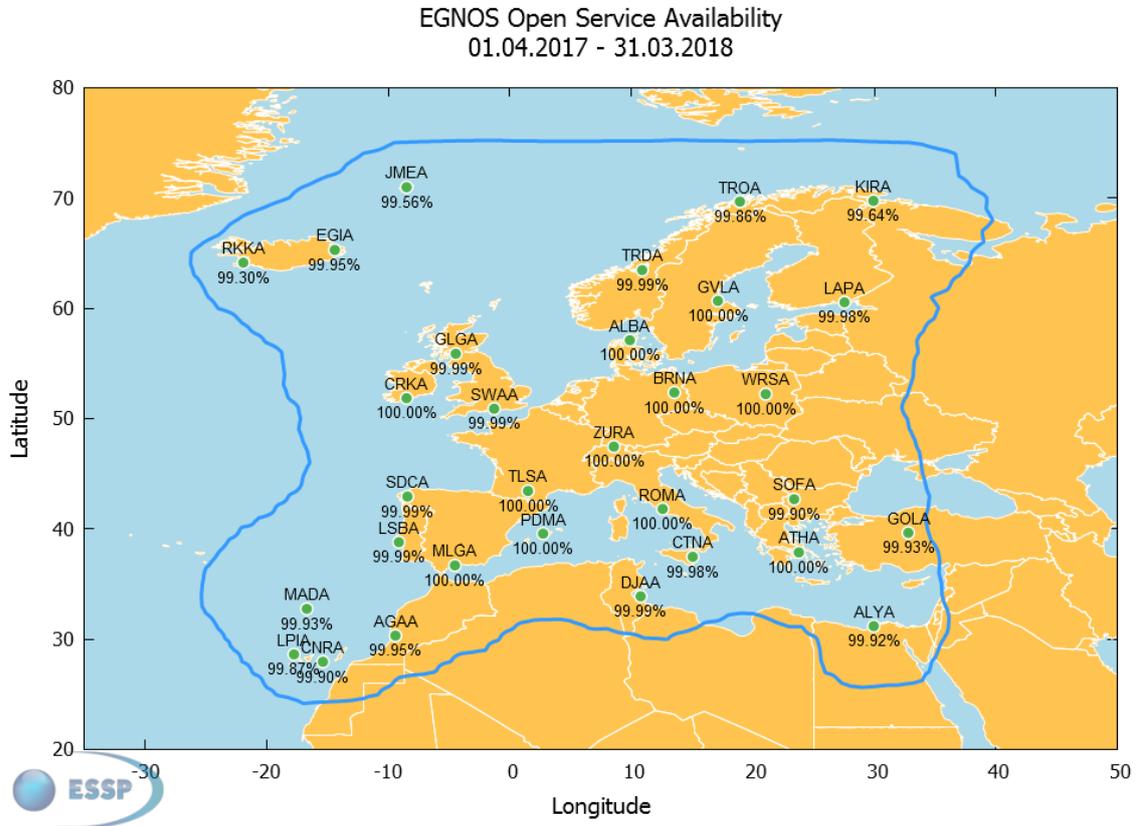


Figure 39: OS availability for the RIMS stations

As shown in the previous figure, Open Service Availability performance has been greater than 99% at all stations.

### 3.6 EGNOS Data Access Service (EDAS)

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

EDAS, as all the other EGNOS Services, has its own [EDAS SDD \(Service Definition Document\)](#). Among other content, the EDAS SDD defines the committed performance for EDAS (what should always be met in a nominal situation) in terms of availability and latency:

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

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

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

Table 12: EDAS services minimum availability

SL0	SL2	SISNeT	FTP	Ntrip	Data Filtering	
					SL0	SL2
1.3 seconds	1.450 seconds	1.150 seconds	N/A	1.75 seconds	1.6 seconds	1.75 seconds

Table 13: Maximum latency for EDAS Services

EDAS performance is reported through the EGNOS Monthly Performance reports, available on the [EGNOS User Support website](#).

The availability achieved during the last annual period is shown in Figure 40.

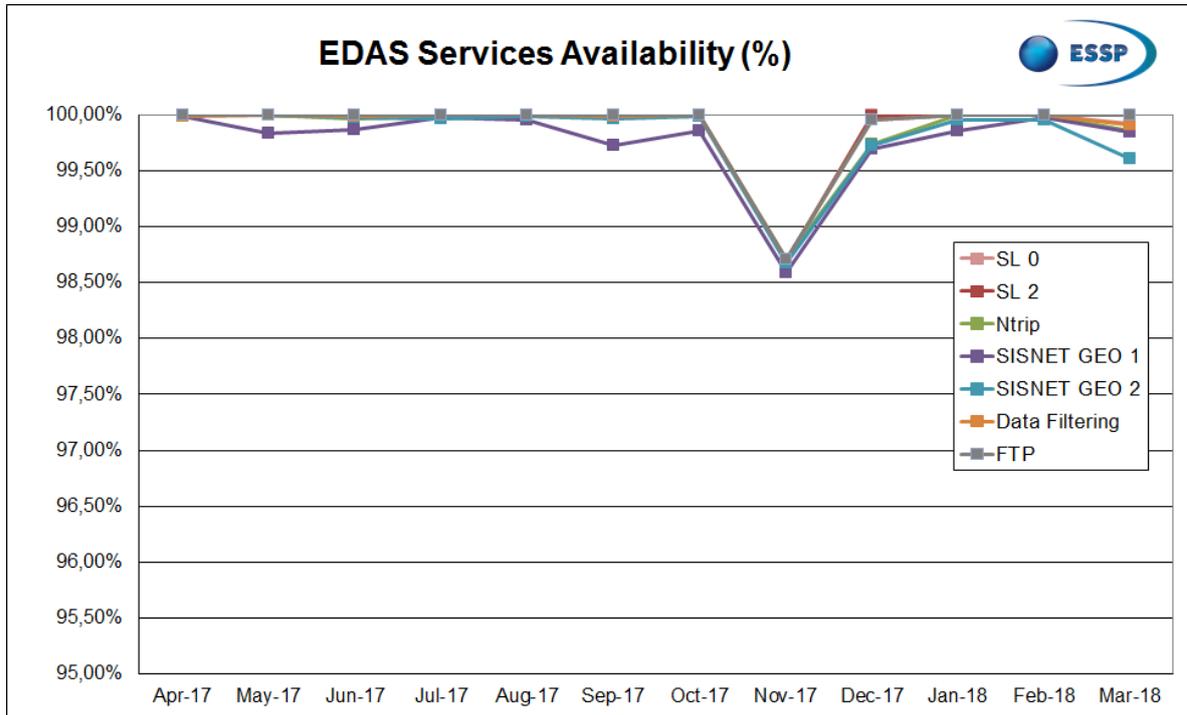


Figure 40: EDAS Services Availability (April 2017-March 2018)

As shown above, EDAS availability has been consistently above 99.5% for all services over the entire reporting period, except in November 2017. During that month, the lower EDAS services availability, although still above the committed performance according to [EDAS SDD \(Service Definition Document\)](#), was caused by an unplanned telecommunications service outage (damaged telecommunications infrastructure) which required civil works from the local service provider to restore the service.

The latency during the last annual period for real-time services (not applicable for the FTP) is shown below, computed as the average of the 95<sup>th</sup> percentile latencies monitored for every 5-minute period during the month.

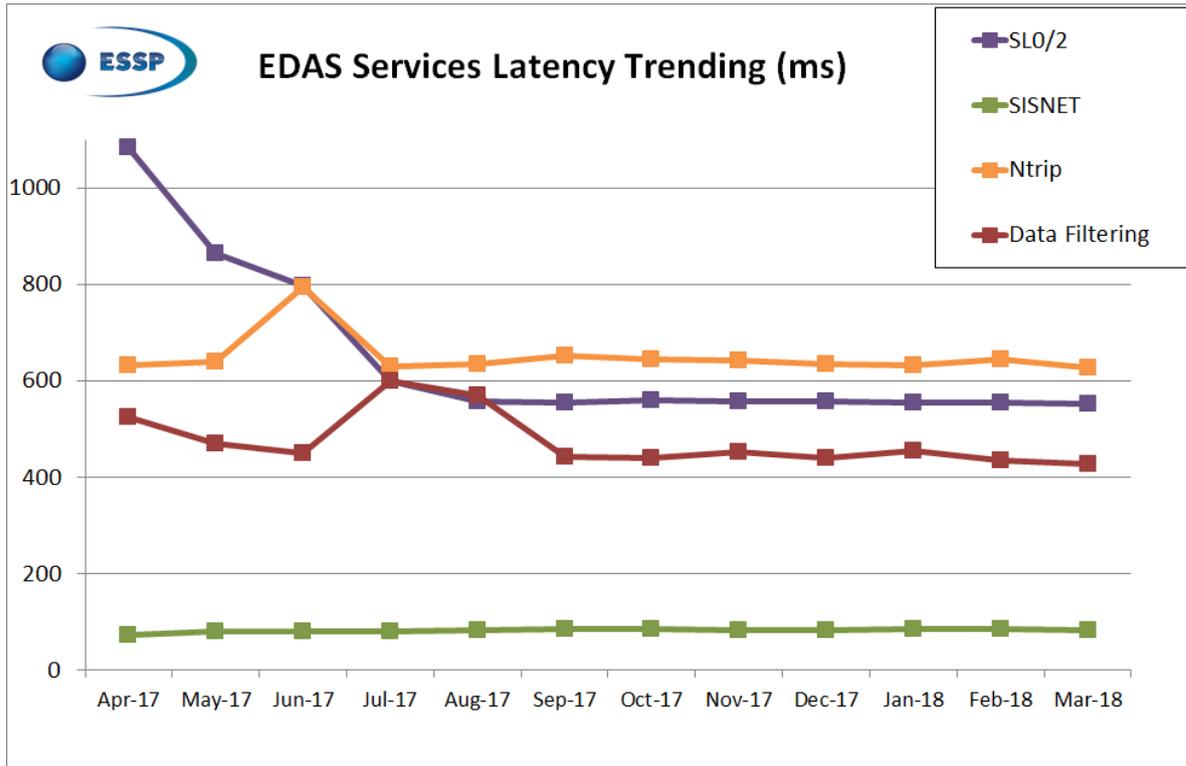


Figure 41: EDAS Services Latency (April 2017-March 2018)

As shown above, EDAS services latency has been consistently below the target delays for all the services over the entire reporting period. Moreover, all real-time services have been provided regularly with delays below the 1-second threshold (with the sole exception of SLO/SL2 in April 2017).

## 4 EGNOS SERVICES PROVISION

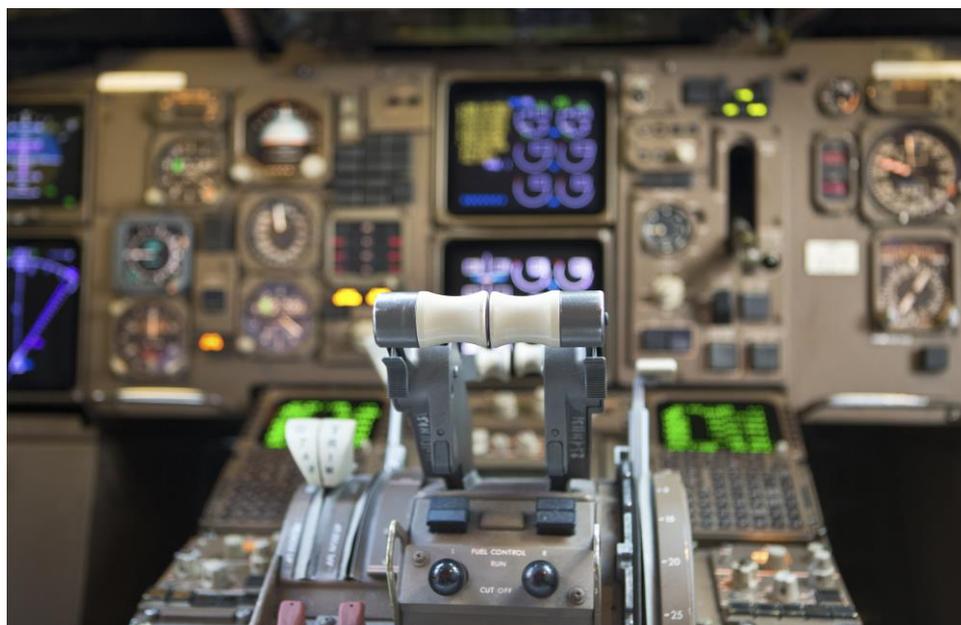
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### 4.1 SoL Aviation Service Status

All the available EGNOS Safety-of-Life Service Levels enable aircraft approaches from NPA to those operationally equivalent to ILS CAT I. APV-I and LPV-200 Service Levels provide lateral and angular vertical guidance without the need for visual contact with the ground until a Decision Height (DH) of down to 250 ft. and 200 ft. respectively above the runway. In particular EGNOS LPV-200-based approaches guarantee the advantages provided by an ILS CAT I approach with the airspace design flexibility of a PBN approach.

The EGNOS SoL Service remained quite stable and robust during the reported period, not suffering degradations leading to contingency situations (according to the definition in place as per EGNOS Working Agreement). The EGNOS Working Agreement (EWA) lays the operational and legal foundations formalising the working procedures, technical baseline and required interfaces between ESSP and the SES Certified Air Navigation Service Provider (ANSP) or other organisations entitled by the corresponding competent authority willing to use the EGNOS Safety-of-Life Service as a navigation aid. This Agreement is the necessary step before the publication of SBAS-based operations, being even mandatory for ANSPs.

The [SoL Service Definition Document \(SDD 3.1\)](#) has been in force since 26 September 2016.



*EGNOS-equipped cockpit of a commercial plane*

#### 4.1.1 Service Definition Documents and Service Notices over the period

EGNOS Service Definition Documents (SDD) describe the characteristics and conditions of access to each EGNOS service (OS, SoL and EDAS).

A new version of the OS SDD (v2.3) was published on 3 October 2017 and presented during the EGNOS Annual Workshop held in Athens. The main changes in this new version of the OS SDD were:

- Updated information on EGNOS system.
- Updated performance figures observed.
- New Appendix devoted to relevant definitions.
- New commitment map increasing EGNOS Open Service coverage:

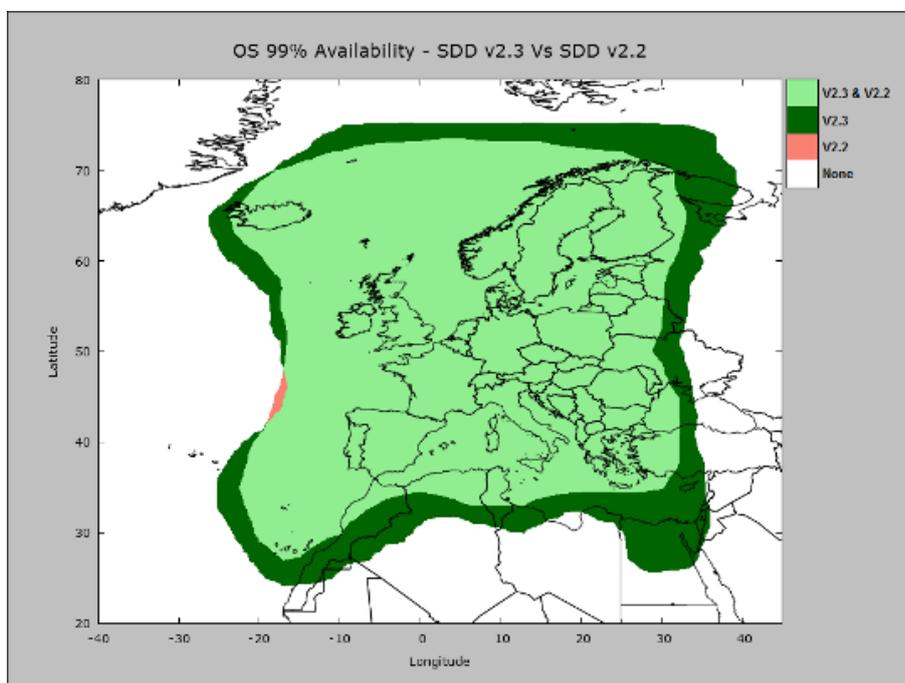


Figure 42: Extension of the availability commitment in OS SDD v2.3 with respect to OS SDD v2.2 (dark green)

As amendments to EGNOS SDDs, ESSP generates Service Notices whenever there is any complementary information to be provided to users that could affect any SDD content. Hence, an EGNOS Service Notice is a temporary amendment to the applicable version of the EGNOS Service Definition Documents.

During the period reported here, ESSP published/updated 3 Service Notices and 3 Service Notices have been changed to “Expired” status:

Number	Subject	Version	Date of Publication	Status	Target Users
17	EDAS FTP RINEX navigation files	1.1	19/03/2018	In Force	EDAS
17	EDAS FTP RINEX navigation files	1.0	12/02/2018	Expired due to new update	EDAS
16	Leap Second Introduction	1.0	21/11/2016	Expired on 22/12/17	All Users
15	EGNOS Space Segment Update	1.3	22/12/2017	In Force	All Users
15	EGNOS Space Segment Update	1.2	14/03/2017	Expired due to new update	All Users
14	EGNOS System Release 2.4.1.M entry in operations	1.1	26/09/2016	Expired on 22/12/17	All Users

Figure 43: Service Notices published/update during this period

The current status of the Service Notices is available on the [EGNOS User Support website](#).

## 4.2 User Consultations and Improvement Actions

### 4.2.1 EGNOS User Satisfaction Process 2017

Each year, an overall EGNOS User Satisfaction Process is performed jointly by GSA and ESSP on the three EGNOS Services (SoL, OS and EDAS) to get valuable feedback about EGNOS use and ESSP performance and to identify improvement areas and define recommendations on the EGNOS services.

This process considers the feedback received via different means and interfaces like the EGNOS Annual Workshop, the EGNOS User Support activities and the participation of ESSP in multimodal forums, GNSS implementation projects, working groups or relevant events, but being the main input the customised satisfaction survey that is widely distributed to the main users and stakeholders of each EGNOS Service.

The EGNOS user satisfaction process in the 2017 period has provided very valuable information and recommendations.

The EGNOS User Satisfaction Survey was launched in October 2017 to cover 2017 calendar year. The survey was open from 3 October 2017 to 18 December 2017 using a special online platform, and 177 answers were received from a pool of approximately 6,700 consulted users.

The outputs of this survey were included in the [EGNOS Bulletin Q1 2018](#). They will also be published on the [EGNOS User Support Website](#).

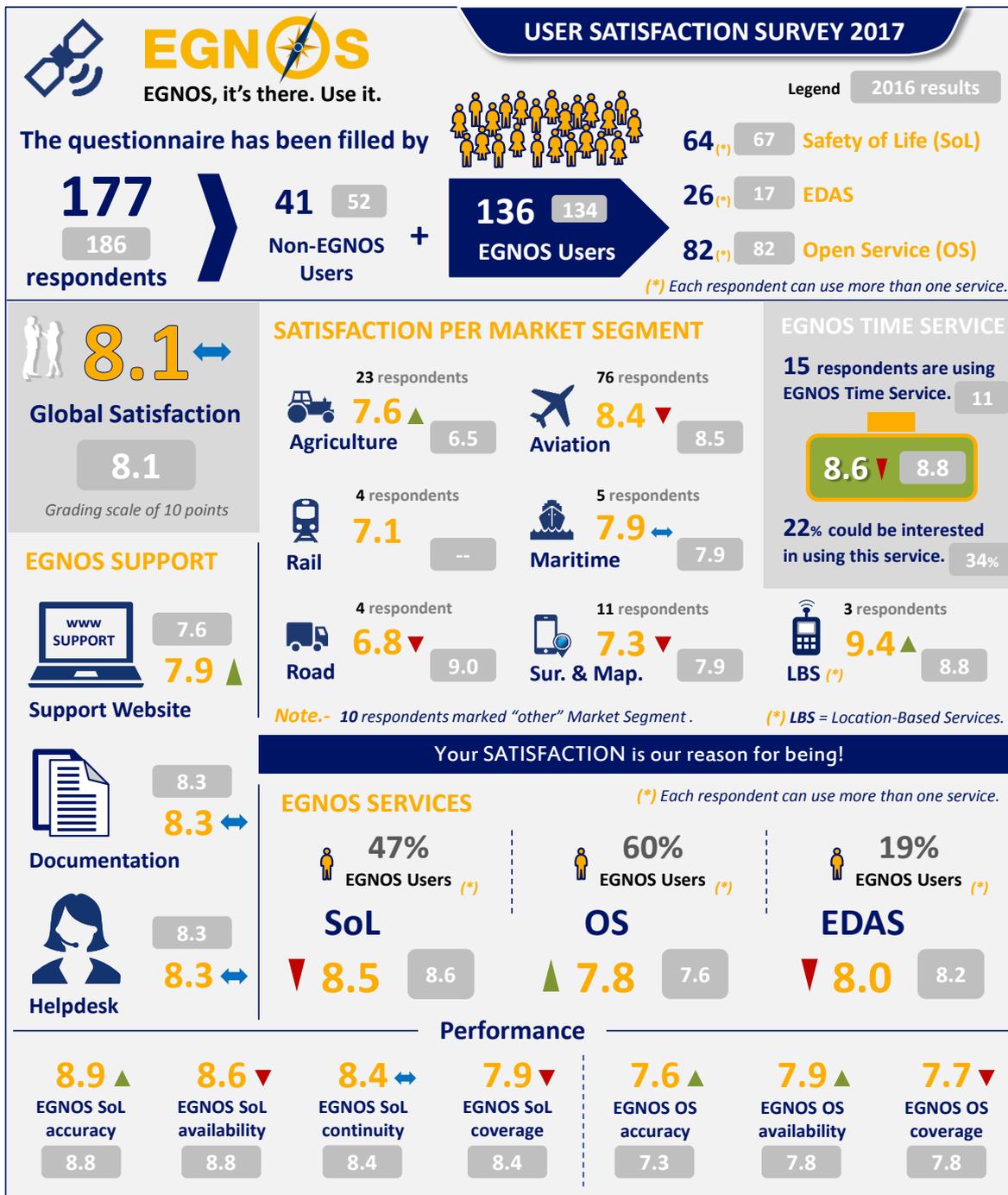


Figure 44: Summary of results from the User Satisfaction Survey

Main conclusions on EGNOS User Satisfaction (Evolution 2016 -2017):

EGNOS users show the same level of satisfaction as was obtained in 2016 (8.1 in both years). This represents the consolidation of the very good level of satisfaction with respect to EGNOS. In particular, note the increase achieved for Agriculture (from 6.5 in 2016 to 7.6 in 2017).

- **EGNOS SERVICES:** The EGNOS SoL and EDAS services maintained a high level of satisfaction (8 or above) with similar scores in the last two years although a slight decrease in the user satisfaction was obtained for 2017. On the other hand, the EGNOS OS user satisfaction increased from 7.6 to 7.8.

- **EGNOS USER SUPPORT:** the use of the EGNOS User Support Website has grown compared to 2016. Nevertheless, it has decreased for EGNOS Documentation and EGNOS Helpdesk. The user satisfaction level is higher in 2017 than it was in 2016 for the website (7.9 versus 7.6) and has been maintained overall for the EGNOS Helpdesk and for EGNOS Documentation (both 8.3). Among the EGNOS Documentation elements, the Notification Service has increased its level of satisfaction (8.4 versus 8.0), the same level of satisfaction for Monthly Performance Reports (8.5) and decreased level for Service Definition Documents (SDD) (8.4 in 2017 versus 8.5 in 2016) and Service Roadmaps (7.7 in 2017 versus 8.3 in 2016).

Taking into account the above information, it seems important to concentrate the satisfaction plan efforts on maintaining the good global results while aiming for an improvement on the satisfaction of EGNOS Safety-of-Life users. After that, the efforts should be focused on increasing the EGNOS User Support Website satisfaction level over 8.0 points and to recover the satisfaction level for those parameters decreasing their scores (in particular for Service Implementation Roadmaps and EDAS).

### 4.3 Service Implementation Roadmaps

The EGNOS Services' Roadmaps provide a high-level overview of the EGNOS Services current status and their expected evolution in a 3-year timeframe linked to the subsequent EGNOS System Release deployments and information/interfaces improvements/changes. These roadmaps are mainly focused on 4 different service aspects: Service Area / Data availability, Service Level, Service Robustness and User Interfaces.

The three EGNOS Services' Roadmaps were updated to v3.5 in June 2017 and presented during the EGNOS Annual Workshop held in Athens. The current applicable version can be found at:

1. [EGNOS Open Service Roadmap](#)
2. [EGNOS Safety of Life Service Roadmap](#)
3. [EGNOS Data Access Service \(EDAS\) Roadmap](#)

Improvements were made to the SIR contents and presentation in these three documents mainly with the inclusion of a new list of acronyms.



Figure 45: EGNOS Services' Roadmaps – extract of the SoL service roadmap

#### 4.4 2017 EGNOS Multimodal Adoption Plan

The EGNOS Multimodal Adoption Plan, as during the last four years, has proven to be a useful means of enhancing EGNOS adoption in aviation, maritime, agriculture & mapping and rail market segments. Aviation, maritime and agriculture and surveying are the markets where the most effort and activities are taking place according to GSA-established priorities.

ESSP and GSA have continued to engage aerodromes to publish EGNOS-based procedures and operators to get equipped and certified. Relevant stakeholders have also been identified during this period: aircraft lessors, as they represent a significant percentage of EU aircraft owners. Additionally, ESSP performed 22 traffic assessments and 9 Cost Benefit Analyses to support airlines, OEMs and airports decision making process towards the adoption of EGNOS.

During the period reported in this document, more than 145 LPV procedures have been published (34 of them are “upgrades”) and more than 80 aircraft have been certified or achieved operational approval.

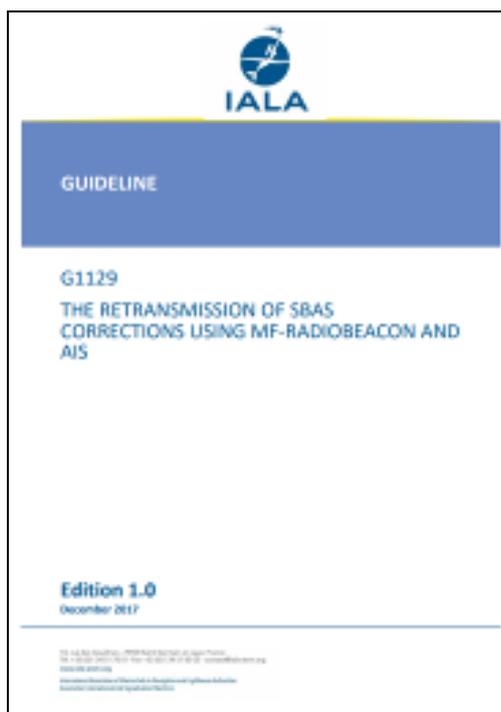
Another 28 new aircraft/rotorcraft units have been engaged so that in the near future they will retrofit, start with the certification process or request SBAS options in the avionics for new unit orders. ESSP has proven to be a key facilitator in promoting, explaining and connecting potential partners within ANSPs, Avionics Manufacturers, Operators and Aircraft Manufacturers.

The flight simulator (each year with new procedures available to fly, some not even published yet) has proven to be a useful tool to demonstrate to aviation users the benefits EGNOS can bring.



*Attendee trying the LPV simulator at the World ATM congress in Madrid*

With regard to the maritime domain, 2017 has represented the continuation of the activities launched to analyse a Maritime Service in EGNOS V2, as well as those linked to the use of EGNOS V2 SiS or EDAS as a positioning source for Aids to Navigation (IALA DGNSS stations and AIS stations). The publication of the IALA guidelines, called “G1129: The retransmission of SBAS corrections using MF-radio beacon and AIS” has been a great success achieved during 2017. Even a number of EU AtoN authorities have confirmed that the Cost Analysis performed by ESSP, demonstrating both the technical feasibility and the savings for the infrastructure maintenance if EGNOS V2 SiS and/or EDAS is used as a positioning source for Aids to Navigation.



*IALA guidelines G1129 on “The retransmission of SBAS corrections using MF-radio beacon and AIS”*

In agriculture and mapping, the contacts network has increased significantly. In this period, ESSP has approached users offering a “proof of concept” or demo, meaning that a user can now see how EGNOS could solve their positioning needs with the suitable equipment (tablets, handheld devices, GNSS-GIS integrated devices, etc.). This approach has proven successful in engaging users. Further contacts have been launched with Member State Agencies in charge of CAP payment, as they are entities for which EGNOS accuracy fits their positioning needs. ESSP has also continued preparing customised information for those market segments prepared and provided both at specific workshops held at events and made available through the EGNOS User Support Website.

## 4.5 Communication and EGNOS Promotion Activities

### 4.5.1 2017 EGNOS Annual Workshop

The 2017 EGNOS Annual Workshop, organised by the GSA and the ESSP, was in Athens, Greece, on 3 and 4 October 2017. Over 170 international participants from 29 different countries joined the event. Information about the EGNOS services status, applications and success stories from partners currently

using EGNOS in real life applications were shared with the attendees. The diverse audience included authorities, service providers, international SBAS providers, application developers, manufacturers and end users.

During the 2017 edition of the EGNOS Workshop, participants had the possibility to fly an LPV approach with a Garmin G-1000 simulator and evaluate the EDAS demo. Additionally, key experts from different application domains made their first appearance at the EGNOS Workshop. For example, KARI reported on their plans for KASS system development, Swiss Airlines, easyJet and CANSO provided their view on the EGNOS benefits for their operations and the Superseries52 explained the importance of EGNOS for high-performance regattas.

The satisfaction of attendees at the 2017 EGNOS Annual Workshop reached an overall score of 8.5, according to the survey conducted by ESSP using the PAPI methodology<sup>26</sup> through a self-completion questionnaire.



Left to right: Carlo Des Dorides (GSA), Philippe Chappuis (skyguide), Thierry Racaud (ESSP)



Ekaterini Kavvada (EC) – “EU Space Policy” presentation



2017 EGNOS Workshop - Garmin G-1000 LPV simulator



2017 EGNOS Workshop - Award to the first LPV-200 approach in Europe (DSNA)

Figure 46: 2017 EGNOS Annual Workshop– Athens, Greece

<sup>26</sup> Paper and pencil interviewing.

The **first day** was devoted to explaining the latest updates in EGNOS services & programme together with an overview of the status of the implementation of EGNOS in aviation and an international session in which other SBAS programmes reported on their latest updates.

The **second day** was devoted to EGNOS in maritime and land applications. The EDAS service for added value applications was also a main theme of the day.

Further details on the EGNOS Workshop and the contents of all presentations are available at the [EGNOS User Support Website](#):

- The [EGNOS Bulletin for Q3 2017](#) provides an extensive summary of the event contents.
- The 2017 EGNOS Annual Workshop presentations can be [downloaded](#).



Figure 47: EGNOS Bulletin Q3 2017 (Pages 2-3)

## 5 MAIN ACTIVITIES PLANNED FOR THE YEAR AHEAD

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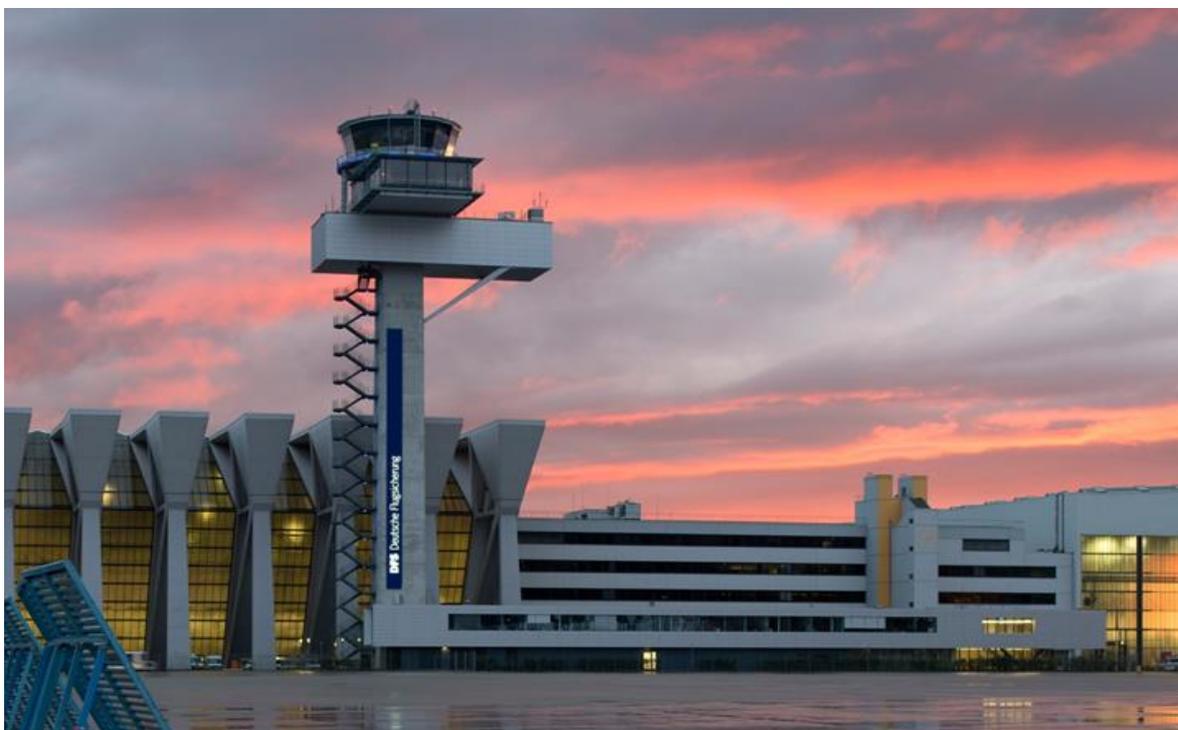
### 5.1 Service Provision and Development

#### 5.1.1 EGNOS Working Agreement Implementation in Aviation

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

The EWA content is expected to evolve and to be improved to cover any user needs and applicable EU regulation. The main activities planned with regard to the EWA are:

- EWA improvement activities: addressing the improvement of Collaborative Decision Making, GNSS Data recording service arrangements and reinforcing communication with all types of users under the EGNOS Working Agreement.
- Support to the GSA in the establishment of EGNOS Working Agreements (EWAs) with non-EU countries (non-SES countries such as the Balkans) beyond the EU-28 Member States, and progress on the related discussions.
- Finalisation/confirmation of the Aerodrome Operator EWA concept tailoring for the CAP1122 provisions applicable in UK facilitating the implementation of EGNOS-based procedures in scenarios where non-SES certified ANSPs operate, supporting the application of National Regulations.



*EGNOS increases efficiency and safety of air traffic control*

### 5.1.2 Evolution of EGNOS Service-related documents

#### **EGNOS Service Definition Documents (SDD)**

Three Service Definition Documents are planned for publication over the next annual period:

- A new version of the SoL SDD will be published in September 2018, increasing the LPV200 Service Area (in particular in the North) and providing additional information of interest to support new EGNOS user cases in aviation.
- A new version of the EDAS SDD is expected to be published to align SDD contents with the in-force Service Notices by the end of 2018.
- A new version of the SoL SDD is expected to be published in Q1 2019, with a new commitment area reflecting MT27 extension to 72° north.

#### **Service Implementation Roadmaps**

The three EGNOS Service Roadmaps will be updated twice over the next annual period to inform the EGNOS user community on the latest news.

The main items to be addressed by the next versions of the Service Roadmaps are:

- Publication of the SoL SDD with extension of the LPV200 Service Area.
- Publication of the SoL SDD including the MT27 extension to 72°N.
- GEO Swap in the satellite constellation so that the ASTRA SES-5B (PRN136) will replace INMARSAT 3F2 (PRN120).
- New EGNOS release deployment will bring increased robustness.

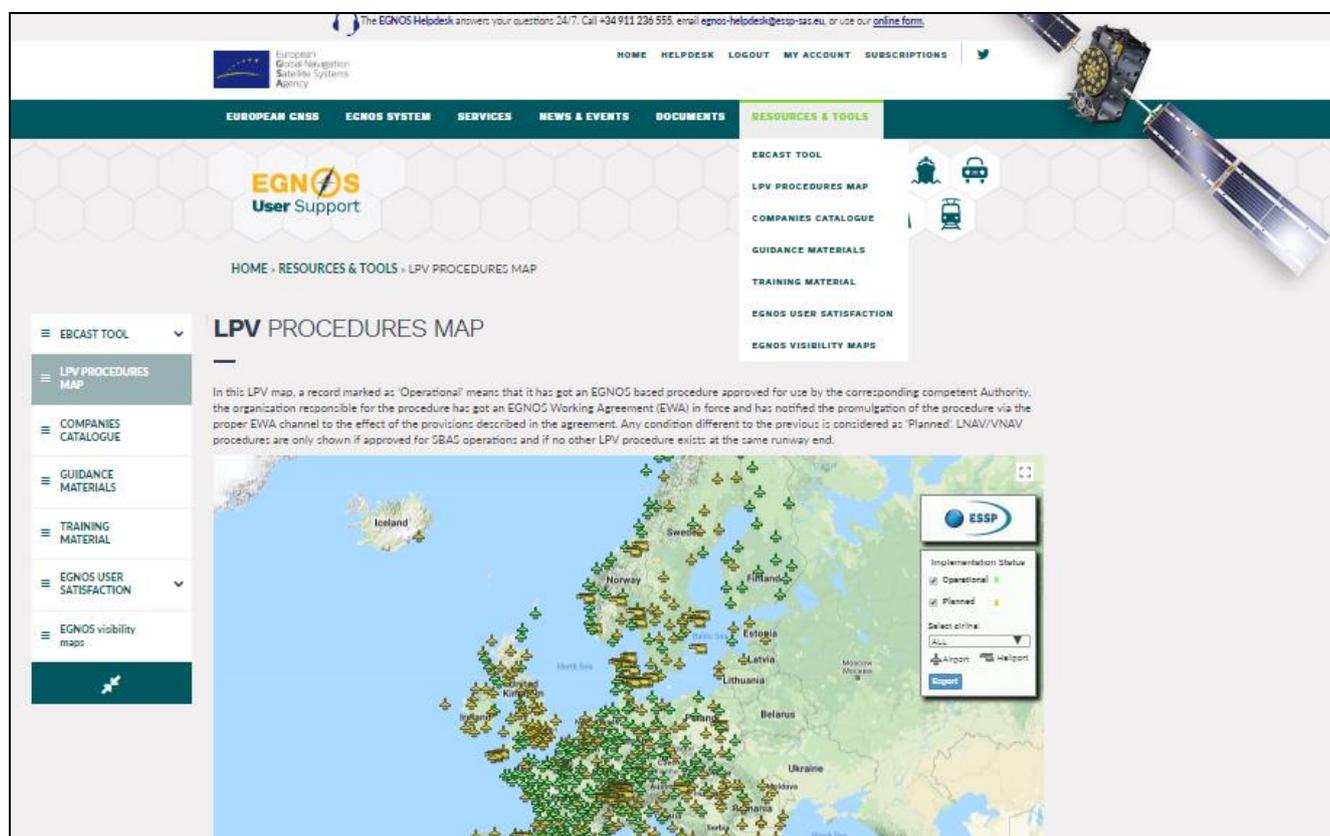
### 5.1.3 User Services Evolution

The EGNOS User Support website is continuously evolving to better support the adoption of EGNOS and the needs of the different user communities.

The main priorities for the next period are:

- **Website Performance and Robustness:** To maintain the excellent level of availability and robustness of the website, placing special emphasis on security management.
- **Website Accessibility:** To continue improving accessibility to the different content in order to facilitate website usage.
- **EGNOS Performance Notifications/Alerts:** To include additional notification types to cover the different EGNOS Services. For example, the alerts related to the EDAS service outages (planned and unplanned) were implemented in the previous period for internal use and will be made available to all EDAS users. Additional improvements are also planned for formatting and texts of the notification/alerts sent to users.
- **EGNOS Communications Subscriptions:** A specific functionality will be implemented on the website allowing subscription/un-subscription to the different EGNOS communications and official publications (EGNOS Service Definition Documents, EGNOS Service Notices, EGNOS Service Implementation Roadmaps, EGNOS Monthly Performance Reports, EGNOS Public Service Provision Yearly Reports, EGNOS Bulletins...).

- EGNOS Adoption: To implement additional functionalities supporting the adoption of EGNOS, as well as to maintain and improve the existing ones.



Resources and tools for EGNOS users ([EGNOS User Support Website](#))

- Innovative visualisations: Different new visualisations will be designed to simplify information leveraging and to support advanced analyses. For example, a map showing the potential EDAS DGNSS corrections tentative coverage area will be implemented on this regard.
- Customised EGNOS adoption material: To continue populating the website with adoption and promotion material specific to different market segments.

#### 5.1.4 2018 EGNOS Multimodal Adoption Action Plan

The EGNOS Multimodal Adoption (EMA) plan establishes, on an annual basis, the different activities to be put in place to leverage the use of EGNOS by all different market segments. These are agreed between the GSA and the ESSP at the beginning of the year and their progress is reviewed on a regular basis. The activities developed during 2018 are distributed into four different market segments: aviation (where the bulk of the effort is placed), maritime, agriculture & surveying and rail (where less effort is devoted).

Regarding aviation, the activities to be executed during 2018 are:

- **Engagement of aerodromes and operators** by supporting/guiding ANSPs in the signature of EWAs, offering Traffic Assessments and CBAs, providing ANSPs with performance and

NOTAM assessments and providing support to GSA in aviation events (WATM, AeroFriedrichshafen, EBACE, Helitech, ERAA, etc.).

- **Monitoring the EGNOS implementation status** both in terms of published EGNOS-based procedures and equipped/approved aircrafts/rotorcrafts, following new STC (Supplemental Type Certificates) solutions and promoting them within PART 145 entities, analysing FSTD (Flight Simulation Training Devices) capabilities and analysing the aircraft lessors fleets.
- **Looking at the future** analysing potential new applications, such as ADS-B.



*EGNOS stand at the World ATM Congress (Madrid)*

Regarding maritime, the main activities to be undertaken during 2018 are:

- Activities aimed at enabling the **use of EGNOS via IALA beacons or AIS stations** offering a trade-off architecture analysis and a Cost Benefit Analysis for maritime and inland waterways authorities for the transmission of EGNOS corrections via IALA beacons and AIS stations and supporting GSA in the IALA eNAv and RIS-VTT committee-related activities.
- Activities pursuing the analysis of an **EGNOS Maritime Safety Service (EGNOS V2 1046)** by progressing in the definition of the service provision scheme in the working group established within EMRF, performing a study for a preliminary maritime Service Definition Document and supporting GSA in the development of guidelines for Receivers manufacturers for a SBAS service based on IMO. Res. 1046.
- General **EGNOS promotion activities** by studying the SBAS compatible devices, launching co-marketing activities with manufacturers and supporting GSA in relevant events such as METS.



*EGNOS presentation at 19<sup>th</sup> IALA Conference 2018*

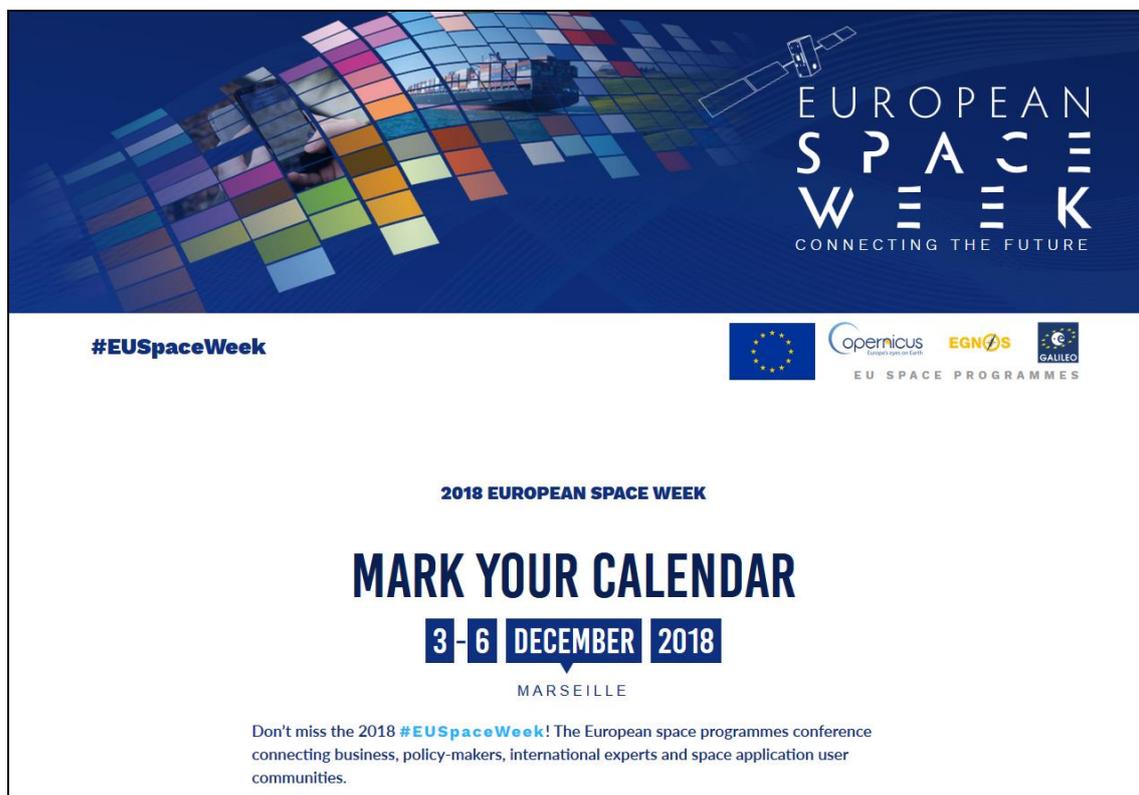
In agriculture & mapping, the main activities to be undertaken in 2018 are oriented to get a better understanding of the role of EGNOS in drones providing services for agriculture, to support GSA in the promotion of EGNOS within the CAP (Common Agricultural Policy) inspection and for municipalities and to generate relevant awareness material (guides on how to configure equipment, papers, presentations, etc.).

Finally, in relation to rail, the main activities to be executed during 2018 are mainly in support to GSA for the development of EGNOS safety and non-safety relevant applications.

## 5.1.5 EGNOS Promotion plan

### 5.1.5.1 2018 EGNOS Annual Workshop

The 2018 edition of the EGNOS Annual Workshop will take place as part of the [EU Space Week](#) in Marseille, France, from 3 to 6 December 2018.



The poster features a top section with a colorful grid of squares and a satellite in the upper right. The text 'EUROPEAN SPACE WEEK' is written in large, white, spaced-out letters, with 'CONNECTING THE FUTURE' below it. The middle section is white and contains the hashtag '#EUSpaceWeek', the European Union flag, and logos for Copernicus, EGNOS, and Galileo. The main text reads '2018 EUROPEAN SPACE WEEK', 'MARK YOUR CALENDAR', '3-6 DECEMBER 2018', and 'MARSEILLE'. A short paragraph at the bottom encourages attendance at the conference.

**#EUSpaceWeek**

EUROPEAN  
SPACE  
WEEK  
CONNECTING THE FUTURE

2018 EUROPEAN SPACE WEEK

**MARK YOUR CALENDAR**

**3-6 DECEMBER 2018**

MARSEILLE

Don't miss the 2018 #EUSpaceWeek! The European space programmes conference connecting business, policy-makers, international experts and space application user communities.

### *2018 European Space Week*

## APPENDIX A LIST OF EGNOS-BASED PROCEDURES

The information shown in this annex corresponds to the situation at AIRAC Cycle 1804. For an up to date list of the published EGNOS based procedures, please refer to the [EGNOS User Support Website](#).

Operational Aerodromes / Heliports /Routes												
Aerodrome/ Route	Name	Country	ICAO Code	APV-I Procedure	Activation APV-I procedure	APV Baro Procedure	Activation APV Baro Procedure	LPV-200 Procedure	Activation LPV-200 procedure	RNP 0.3 Procedure	Activation RNP 0.3 procedure	Total Procedures
Aerodrome	Antwerpen / Deurne	Belgium	EBAW	1	10/12/2015							1
Aerodrome	Brussels-National	Belgium	EBBR	3	02/03/2017							3
Aerodrome	Charleroi / Brussels South	Belgium	EBCI	2	31/03/2016							2
Aerodrome	Liège	Belgium	EBLG	2	13/10/2016							2
Aerodrome	Kortrijk/Wevelgem	Belgium	EBKT	1	09/11/2017							1
Aerodrome	Bautzen	Germany	EDAB	2	27/04/2017		15/12/2011					2
Aerodrome	Barth	Germany	EDBH			1	03/06/2010					1
Aerodrome	Magdeburg/City	Germany	EDBM	1	13/12/2012							1
Aerodrome	Neubrandenburg	Germany	EDBN	2	02/04/2015							2
Aerodrome	Berlin/Schönefeld	Germany	EDDB			2	04/06/2009					2
Aerodrome	Dresden	Germany	EDDC			2	15/12/2011					2
Aerodrome	Erfurt-Weimar	Germany	EDDE			2	15/12/2011					2
Aerodrome	Frankfurt Main	Germany	EDDF			4	15/12/2011					4
Aerodrome	Münster/Osnabrück	Germany	EDDG			2	15/12/2011					2
Aerodrome	Hamburg	Germany	EDDH			4	15/12/2011					4
Aerodrome	Köln/Bonn	Germany	EDDK			6	15/12/2011					6
Aerodrome	Düsseldorf	Germany	EDDL			4	15/12/2011					4
Aerodrome	München	Germany	EDDM			4	15/12/2011					4
Aerodrome	Nürnberg	Germany	EDDN			1	15/12/2011					1
Aerodrome	Leipzig/Halle	Germany	EDDP			4	15/12/2011					4
Aerodrome	Saarbrücken	Germany	EDDR	2	01/03/2018							2

Operational Aerodromes / Heliports /Routes												
Aerodrome/ Route	Name	Country	ICAO Code	APV-I Procedure	Activation APV-I procedure	APV Baro Procedure	Activation APV Baro Procedure	LPV-200 Procedure	Activation LPV-200 procedure	RNP 0.3 Procedure	Activation RNP 0.3 procedure	Total Procedures
Aerodrome	Stuttgart	Germany	EDDS			1	15/12/2011					1
Aerodrome	Berlin-Tegel	Germany	EDDT			4	15/12/2011					4
Aerodrome	Hannover	Germany	EDDV			4	15/12/2011					4
Aerodrome	Bremen	Germany	EDDW				15/12/2011	2	30/03/2017			2
Aerodrome	Frankfurt Hahn	Germany	EDFH		23/07/2015			2	14/09/2017			2
Aerodrome	Allendorf/Eder	Germany	EDFQ	1	21/08/2014							1
Aerodrome	Siegerland	Germany	EDGS	1	12/10/2017			1	12/10/2017			2
Aerodrome	Hamburg- Finkenwerder	Germany	EDHI	2	13/12/2012							2
Aerodrome	Memmingen	Germany	EDJA			2	15/12/2011					2
Aerodrome	Paderborn/Lippstadt	Germany	EDLP	2	13/12/2012							2
Aerodrome	Niederrhein	Germany	EDLV	1	23/06/2016							1
Aerodrome	Dortmund	Germany	EDLW	2	12/12/2013							2
Aerodrome	Augsburg	Germany	EDMA			2	15/12/2011					2
Aerodrome	Eggenfelden	Germany	EDME	1	11/12/2014							1
Aerodrome	Oberpfaffenhofen	Germany	EDMO	1	13/12/2012							1
Aerodrome	Straubing	Germany	EDMS	1	11/12/2014							1
Aerodrome	Friedrichshafen	Germany	EDNY			2	15/12/2011					2
Aerodrome	Donauwörth	Germany	EDPR	2	08/12/2016							2
Aerodrome	Coburg- Brandensteinsee	Germany	EDQC	1	11/12/2014							1
Aerodrome	Bayreuth	Germany	EDQD			1	15/12/2011					1
Aerodrome	Giebelstadt	Germany	EDQG			2	14/02/2012					2
Aerodrome	Karlsruhe/Baden- Baden	Germany	EDSB		17/09/2015			2	27/04/2017			2
Aerodrome	Donaueschingen- Villingen	Germany	EDTD	1	11/12/2014							1
Aerodrome	Lahr	Germany	EDTL	1	23/06/2016			1	27/04/2017			2

Operational Aerodromes / Heliports /Routes												
Aerodrome/ Route	Name	Country	ICAO Code	APV-I Procedure	Activation APV-I procedure	APV Baro Procedure	Activation APV Baro Procedure	LPV-200 Procedure	Activation LPV-200 procedure	RNP 0.3 Procedure	Activation RNP 0.3 procedure	Total Procedures
Aerodrome	Mengen- Hohentengen	Germany	EDTM	1	11/12/2014							1
Aerodrome	Schwäbisch-Hall	Germany	EDTY	2	13/12/2012							2
Aerodrome	Braunschweig- Wolfsburg	Germany	EDVE	2	18/10/2012							2
Aerodrome	Kassel-Calden	Germany	EDVK	2	04/04/2013							2
Aerodrome	Emden	Germany	EDWE	4	30/05/2013							4
Aerodrome	Wilhelmshaven JadeWeserAirport	Germany	EDWI			2	15/12/2011					2
Aerodrome	Sylt	Germany	EDXW	2	10/12/2015							2
Aerodrome	Kuressaare	Estonia	EEKE	2	02/03/2017							2
Aerodrome	Enontekiö	Finland	EFET			2	07/12/2017					2
Aerodrome	Ivalo	Finland	EFIV			2	07/12/2017					2
Aerodrome	Joensuu	Finland	EFJO	2	12/12/2013							2
Aerodrome	Jyväskylä	Finland	EFJY			2	07/12/2017					2
Aerodrome	Kemi-Tornio	Finland	EFKE			2	07/12/2017					2
Aerodrome	Kajaani	Finland	EFKI			2	07/12/2017					2
Aerodrome	Kokkola- Pietarsaari	Finland	EFKK			2	07/12/2017					2
Aerodrome	Kuusamo	Finland	EFKS			2	07/12/2017					2
Aerodrome	Kittilä	Finland	EFKT			2	07/12/2017					2
Aerodrome	Kuopio	Finland	EFKU			2	07/12/2017					2
Aerodrome	Lappeenranta	Finland	EFLP			2	07/12/2017					2
Aerodrome	Oulu	Finland	EFOU			2	07/12/2017					2
Aerodrome	Pori	Finland	EFPO			1	07/12/2017					1
Aerodrome	Rovaniemi	Finland	EFRO			2	07/12/2017					2
Aerodrome	Savonlinna	Finland	EFSA			2	07/12/2017					2
Aerodrome	Tampere-Pirkkala	Finland	EFTP			2	07/12/2017					2
Aerodrome	Turku	Finland	EFTU			2	07/12/2017					2

Operational Aerodromes / Heliports /Routes												
Aerodrome/ Route	Name	Country	ICAO Code	APV-I Procedure	Activation APV-I procedure	APV Baro Procedure	Activation APV Baro Procedure	LPV-200 Procedure	Activation LPV-200 procedure	RNP 0.3 Procedure	Activation RNP 0.3 procedure	Total Procedures
Aerodrome	Vaasa	Finland	EFVA			2	07/12/2017					2
Aerodrome	Campbeltown	United Kingdom	EGEC	2	23/06/2016							2
Aerodrome	Cardiff	United Kingdom	EGFF	2	13/10/2016							2
Aerodrome	Bristol	United Kingdom	EGGD	2	21/08/2014							2
Aerodrome	Lands End	United Kingdom	EGHC	4	27/04/2017							4
Aerodrome	Yeovil	United Kingdom	EGHG	2	09/06/2017							2
Aerodrome	Alderney	Guernsey	EGJA	2	07/12/2011							2
Aerodrome	Barrow/Walney Island	United Kingdom	EGNL	2	23/06/2016							2
Aerodrome	Kirkwall	United Kingdom	EGPA	2	21/07/2016							2
Aerodrome	Sumburgh	United Kingdom	EGPB	3	27/04/2017							3
Aerodrome	Wick	United Kingdom	EGPC	2	23/06/2016							2
Aerodrome	Islay	United Kingdom	EGPI	2	18/08/2016							2
Aerodrome	Dundee	United Kingdom	EGPN	2	30/03/2017							2
Aerodrome	Barra	United Kingdom	EGPR	2	18/08/2016							2
Aerodrome	Tiree	United Kingdom	EGPU	2	04/02/2016							2
Aerodrome	Exeter	United Kingdom	EGTE	2	21/08/2014							2
Aerodrome	Eelde	Netherlands	EHGG	2	13/11/2014							2
Aerodrome	Teuge	Netherlands	EHTE	1	13/11/2014							1
Aerodrome	Dublin	Ireland	EIDW	1	25/05/2017							1
Aerodrome	Aarhus	Denmark	EKAH	2	05/03/2015							2
Aerodrome	Billund	Denmark	EKBI					2	20/07/2017			2

Operational Aerodromes / Heliports /Routes												
Aerodrome/ Route	Name	Country	ICAO Code	APV-I Procedure	Activation APV-I procedure	APV Baro Procedure	Activation APV Baro Procedure	LPV-200 Procedure	Activation LPV-200 procedure	RNP 0.3 Procedure	Activation RNP 0.3 procedure	Total Procedures
Aerodrome	Esbjerg	Denmark	EKEB	2	15/10/2015							2
Aerodrome	Karup	Denmark	EKKA	2	02/04/2015							2
Aerodrome	Sønderborg	Denmark	EKSB	2	18/08/2016							2
Aerodrome	Ålesund/Vigra	Norway	ENAL	2	03/03/2016							2
Aerodrome	Andøya/Andenes	Norway	ENAN	2	02/04/2015							2
Aerodrome	Førde/Bringeland	Norway	ENBL	1	28/05/2015			1	27/04/2017			2
Aerodrome	Brønnøysund/Brønnøy	Norway	ENBN	1	08/12/2016							1
Aerodrome	Bergen/Flesland	Norway	ENBR			2	03/03/2016					2
Aerodrome	Kristiansand/Kjevik	Norway	ENCN			2	03/03/2016					2
Aerodrome	Harstad/Narvik/Evenes	Norway	ENEV	1	30/03/2017							1
Aerodrome	Fagernes	Norway	ENFG					1	14/09/2017			1
Aerodrome	Florø	Norway	ENFL	1	02/04/2015							1
Aerodrome	Gardermoen	Norway	ENGM					4	10/11/2016			4
Aerodrome	Haugesund/Karmøy	Norway	ENHD			2	03/03/2016					2
Aerodrome	Kristiansund/Kvernberget	Norway	ENKB	2	26/05/2016							2
Aerodrome	Kirkenes/Hoybuktnoan	Norway	ENKR	2	27/04/2017							2
Aerodrome	Leknes	Norway	ENLK	1	02/02/2017							1
Aerodrome	Molde/Årø	Norway	ENML					2	30/03/2017			2
Aerodrome	Mosjøen/Kjærstad	Norway	ENMS	1	30/03/2017							1
Aerodrome	Namsos	Norway	ENNM		02/04/2015			2	27/04/2017			2
Aerodrome	Ørland	Norway	ENOL				03/03/2016	2	12/10/2017			2
Aerodrome	Rørvik/Ryum	Norway	ENRM					2	02/02/2017			2
Aerodrome	Røst	Norway	ENRS	2	06/03/2014							2
Aerodrome	Moss/Rygge	Norway	ENRY	2	10/12/2015							2

Operational Aerodromes / Heliports / Routes												
Aerodrome/ Route	Name	Country	ICAO Code	APV-I Procedure	Activation APV-I procedure	APV Baro Procedure	Activation APV Baro Procedure	LPV-200 Procedure	Activation LPV-200 procedure	RNP 0.3 Procedure	Activation RNP 0.3 procedure	Total Procedures
Aerodrome	Sogndal/Haukasen	Norway	ENSG		17/08/2017			1	14/09/2017			1
Aerodrome	Svolvær/Helle	Norway	ENSH	1	08/12/2016							1
Aerodrome	Stokmarknes/Skagen	Norway	ENSK	1	08/12/2016							1
Aerodrome	Stord/Sørstokken	Norway	ENSO			2	03/03/2016					2
Aerodrome	Sandnessjøen/Stokka	Norway	ENST	2	23/07/2015							2
Aerodrome	Sandefjord/Torp	Norway	ENTO	2	20/08/2015							2
Aerodrome	Trondheim/Vårnes	Norway	ENVA			2	03/03/2016					2
Aerodrome	Stavanger/Sola	Norway	ENZV				03/03/2016	4	09/11/2017			4
Aerodrome	Gdańsk Lech Wałęsa	Poland	EPGD	2	28/05/2015							2
Aerodrome	Kraków - Balice	Poland	EPKK	2	18/08/2016							2
Aerodrome	Katowice	Poland	EPKT	2	03/04/2014							2
Aerodrome	Rzeszów - Jasionka	Poland	EPRZ	1	15/09/2016							1
Aerodrome	Wrocław/Strachowice	Poland	EPWR	2	13/10/2016							2
Aerodrome	Jönköping	Sweden	ESGJ	2	09/11/2017							2
Aerodrome	Trollhättan-Vänersborgs flygplats	Sweden	ESGT	2	29/03/2018							2
Aerodrome	Örnsköldsvik	Sweden	ESNO	1	07/12/2017							1
Aerodrome	Norrköping Kungsängen	Sweden	ESSP	2	29/03/2018							2
Aerodrome	Ljungbyhed	Sweden	ESTL	2	07/12/2017							2
Aerodrome	Storuman	Sweden	ESUD	1	11/12/2014							1
Aerodrome	Dubrovnik	Croatia	LDDU	1	10/12/2015							1
Aerodrome	Osijek/Klisa	Croatia	LDOS	1	29/03/2018							1
Aerodrome	Split/Kastela	Croatia	LDSP					1	29/03/2018			1
Aerodrome	Zagreb/Pleso	Croatia	LDZA	2	29/03/2018							2

Operational Aerodromes / Heliports /Routes												
Aerodrome/ Route	Name	Country	ICAO Code	APV-I Procedure	Activation APV-I procedure	APV Baro Procedure	Activation APV Baro Procedure	LPV-200 Procedure	Activation LPV-200 procedure	RNP 0.3 Procedure	Activation RNP 0.3 procedure	Total Procedures
Aerodrome	Almería	Spain	LEAM	2	02/02/2017							2
Aerodrome	Palma de Mallorca	Spain	LEPA	3	01/03/2018							3
Aerodrome	Valencia Airport	Spain	LEVC	2	01/02/2018							2
Aerodrome	Santander	Spain	LEXJ	2	17/10/2013							2
Aerodrome	Dieppe Saint Aubin	France	LFAB	1	02/03/2017							1
Aerodrome	Calais	France	LFAC	1	20/09/2012							1
Aerodrome	Albert Bray	France	LFAQ	1	15/11/2012			1	21/11/2017			2
Aerodrome	Le Touquet Paris Plage	France	LFAT	1	04/02/2016			1	21/11/2017			2
Aerodrome	Valenciennes Denain	France	LFAV	1	19/09/2013			1	21/11/2017			2
Aerodrome	Amiens Glisy	France	LFAY	1	27/06/2013							1
Aerodrome	Agen La Garenne	France	LFBA		06/03/2014			1	21/11/2017			1
Aerodrome	Bordeaux Merignac	France	LFBD	3	08/03/2012			1	21/11/2017			4
Aerodrome	Bergerac	France	LFBE		09/01/2014			2	21/11/2017			2
Aerodrome	Toulouse Franczal	France	LFBF	2	23/06/2016							2
Aerodrome	La Rochelle	France	LFBH	1	20/09/2012							1
Aerodrome	Poitiers Biard	France	LFBI	1	12/11/2015			1	21/11/2017			2
Aerodrome	Montluçon Gueret	France	LFBK	1	17/12/2013							1
Aerodrome	Limoges	France	LFBL		28/06/2012			2	21/11/2017			2
Aerodrome	Niort Marais Poitevin	France	LFBN	1	02/03/2017							1
Aerodrome	Toulouse Blagnac	France	LFBO	4	03/05/2012							4
Aerodrome	Pau-Pyrénées	France	LFBP	1	17/03/2011							1
Aerodrome	Muret Lherm	France	LFBR	1	15/10/2015							1
Aerodrome	Tarbes Lourdes Pyrénées	France	LFBT	1	28/05/2015							1
Aerodrome	Angoulême Brie Champniers	France	LFBU		03/04/2014			2	21/11/2017			2

Operational Aerodromes / Heliports /Routes												
Aerodrome/ Route	Name	Country	ICAO Code	APV-I Procedure	Activation APV-I procedure	APV Baro Procedure	Activation APV Baro Procedure	LPV-200 Procedure	Activation LPV-200 procedure	RNP 0.3 Procedure	Activation RNP 0.3 procedure	Total Procedures
Aerodrome	Périgueux Bassillac	France	LFBX		28/05/2015			1	25/05/2017			1
Aerodrome	Biarritz Bayonne Anglet	France	LFBZ	1	09/02/2012	1	01/01/2013					2
Aerodrome	Albi Le Sequestre	France	LFCI	1	26/05/2016			1	21/11/2017			2
Aerodrome	Castres Mazamet	France	LFCK	1	22/08/2013							1
Aerodrome	Rodez Marcillac	France	LFCR	1	31/05/2012			1	21/11/2017			2
Aerodrome	Royan Médis	France	LFCY	1	30/04/2015							1
Aerodrome	Auch Lamothe	France	LFDH	2	28/05/2015							2
Aerodrome	Ouessant	France	LFEC	2	11/12/2014							2
Aerodrome	Colmar Houssen	France	LFGA	2	02/05/2013							2
Aerodrome	Dole Tavaux	France	LFGJ		09/01/2014			1	21/11/2017			1
Aerodrome	Le Puy Loudes	France	LFHP	2	04/02/2016							2
Aerodrome	Moulins Montbeugny	France	LFHY	1	01/05/2014							1
Aerodrome	Metz Nancy Lorraine	France	LFJL	1	04/04/2013			1	21/11/2017			2
Aerodrome	Angers Marcé	France	LFJR		07/01/2016			1	21/11/2017			1
Aerodrome	Bastia Poretta	France	LFKB					1	07/12/2017			1
Aerodrome	Calvi Sainte Catherine	France	LFKC	2	30/04/2015							2
Aerodrome	Ajaccio Napoléon Bonaparte	France	LFKJ	1	23/06/2016							1
Aerodrome	Figari Sud Corse	France	LFKF					1	21/11/2017			1
Aerodrome	Auxerre Branches	France	LFLA	2	21/08/2014							2
Aerodrome	Clermont-Ferrand Auvergne	France	LFLC		05/05/2011			1	21/11/2017			1
Aerodrome	Bourges	France	LFLD	1	18/08/2016							1
Aerodrome	Lyon St Exupery	France	LFLI	4	07/02/2013							4
Aerodrome	Saint Yan	France	LFLN					2	02/03/2017			2
Aerodrome	Annecy Meythet	France	LFLP	2	19/09/2013							2

Operational Aerodromes / Heliports / Routes												
Aerodrome/ Route	Name	Country	ICAO Code	APV-I Procedure	Activation APV-I procedure	APV Baro Procedure	Activation APV Baro Procedure	LPV-200 Procedure	Activation LPV-200 procedure	RNP 0.3 Procedure	Activation RNP 0.3 procedure	Total Procedures
Aerodrome	Grenoble Isere	France	LFLS		07/03/2013			2	13/10/2016			2
Aerodrome	Valence	France	LFLU		13/12/2012			1	21/11/2017			1
Aerodrome	Vichy Charmeil	France	LFLV	1	05/02/2015							1
Aerodrome	Aurillac	France	LFLW	1	26/06/2014							1
Aerodrome	Chateauroux Deols	France	LFLX	1	06/02/2014							1
Aerodrome	Lyon Bron	France	LFLY					2	28/09/2016			2
Aerodrome	Cannes Mandelieu	France	LFMD	1	05/02/2015							1
Aerodrome	Saint Étienne Bouthéon	France	LFMH		24/07/2014			2	02/02/2017			2
Aerodrome	Carcassonne Salvaza	France	LFMK		03/05/2012			1	21/11/2017			1
Aerodrome	Marseille	France	LFML	4	08/01/2015	2	25/06/2015					6
Aerodrome	Nice Côte d'Azur	France	LFMN	2	25/06/2015							2
Aerodrome	Perpignan Rivesaltes	France	LFMP	1	15/10/2015							1
Aerodrome	Béziers Vias	France	LFMU	2	18/10/2012							2
Aerodrome	Mende	France	LFNB	1	17/12/2013							1
Aerodrome	Beauvais	France	LFOB	1	20/09/2012							1
Aerodrome	Évreux Fauville	France	LFOE	2	15/11/2012							2
Aerodrome	Le Havre Octeville	France	LFOH		10/12/2015			1	21/11/2017			1
Aerodrome	Orleans Bricy	France	LFOJ	2	18/09/2014							2
Aerodrome	Chalons Vatry	France	LFOK	2	02/02/2017							2
Aerodrome	Blois Le Breuil	France	LFOQ	1	15/09/2016							1
Aerodrome	Cholet le Pontreau	France	LFOU	2	04/02/2016							2
Aerodrome	Orléans St. Denis De L'Hotel	France	LFOZ	2	28/06/2012							2
Aerodrome	Paris-Le Bourget	France	LFPB	1	02/06/2011			1	21/11/2017			2
Aerodrome	Paris Charles de Gaulle	France	LFPG					4	28/04/2016			4

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Aerodrome/ Route	Name	Country	ICAO Code	APV-I Procedure	Activation APV-I procedure	APV Baro Procedure	Activation APV Baro Procedure	LPV-200 Procedure	Activation LPV-200 procedure	RNP 0.3 Procedure	Activation RNP 0.3 procedure	Total Procedures
Aerodrome	Melun Villaroche	France	LFPM		10/12/2015			2	21/11/2017			2
Aerodrome	Toussus Le Noble	France	LFPN					2	27/04/2017			2
Aerodrome	Paris Orly	France	LFPO	4	30/05/2013	1	30/04/2015	1	21/11/2017			6
Aerodrome	Pontoise Corneilles en Vexin	France	LFPT	1	01/05/2014			2	21/11/2017			3
Aerodrome	Reims Prunay	France	LFQA	1	03/04/2014							1
Aerodrome	Troyes Barberey	France	LFQB					2	18/08/2016			2
Aerodrome	Nevers Fouchambault	France	LFQG	1	13/12/2012							1
Aerodrome	Besançon La Vèze	France	LFQM	1	18/09/2014							1
Aerodrome	Lille Lesquin	France	LFQQ	3	26/06/2014							3
Aerodrome	Merville	France	LFQT	2	15/11/2012							2
Aerodrome	Brest Bretagne	France	LFRB	1	03/05/2012	1	01/01/2014					2
Aerodrome	Cherbourg Maupertus	France	LFRC					1	23/06/2016			1
Aerodrome	Dinard	France	LFRD	1	06/02/2014			1	21/11/2017			2
Aerodrome	Deauville Saint Gatien	France	LFRG	1	18/09/2014							1
Aerodrome	La Roche Sur Yon	France	LFRI		13/12/2012			1	10/11/2016			1
Aerodrome	Caen Carpiquet	France	LFRK		11/12/2014			1	21/11/2017			1
Aerodrome	Le Mans	France	LFRM	1	15/11/2012							1
Aerodrome	Rennes	France	LFRN	2	30/05/2013							2
Aerodrome	Lannion	France	LFRQ		07/01/2016			1	21/11/2017			1
Aerodrome	Quimper	France	LFRQ		09/01/2014			1	21/11/2017			1
Aerodrome	Nantes	France	LFRS	1	28/06/2012							1
Aerodrome	Saint Briec Armor	France	LFRS		10/12/2015			1	21/11/2017			1
Aerodrome	Morlaix Ploujean	France	LFRU	1	13/10/2016							1
Aerodrome	Vannes Meucon	France	LFRV	1	31/05/2012							1

Operational Aerodromes / Heliports /Routes												
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Aerodrome	Saint Nazaire Montoir	France	LFRZ		28/10/2014			1	21/11/2017			1
Aerodrome	Bâle-Mulhouse	France	LFSB	2	10/12/2015							2
Aerodrome	Dijon-Longvic	France	LFSB	1	28/04/2016							1
Aerodrome	Epinal Mirecourt	France	LFSG	1	30/05/2013							1
Aerodrome	Brive Souillac	France	LFSL	2	22/08/2013							2
Aerodrome	Nancy Essey	France	LFSN	1	02/05/2013							1
Aerodrome	Strasbourg Entzheim	France	LFST		10/12/2015			2	21/11/2017			2
Aerodrome	Nîmes Garons	France	LFTW	1	18/10/2012			1	21/11/2017			2
Aerodrome	Budapest Liszt Ferenc	Hungary	LHBP					4	15/09/2016			4
Aerodrome	Olbia/Costa Smeralda	Italy	LIEO	2	12/11/2015							2
Aerodrome	Milano/Malpensa	Italy	LIMC	2	21/08/2014							2
Aerodrome	Bergamo / Orio al Serio	Italy	LIME	1	20/07/2017							1
Aerodrome	Milano/Linate	Italy	LIML	2	13/12/2012							2
Aerodrome	Bologna Borgo Panigale	Italy	LIPE	1	18/11/2014							1
Aerodrome	Venezia/Tessera	Italy	LIPZ	3	27/06/2013							3
Aerodrome	Verona/Villafranca	Italy	LIPX	1	22/06/2017							1
Aerodrome	Roma/Ciampino	Italy	LIRA	1	10/01/2013							1
Aerodrome	Roma/Fiumicino	Italy	LIRF	6	10/01/2013							6
Aerodrome	Firenze/Peretola	Italy	LIRQ	1	22/06/2017							1
Aerodrome	Kunovice	Czech Republic	LKKU	1	01/12/2017							1
Aerodrome	Karlovy Vary	Czech Republic	LKKV	2	13/11/2014							2
Aerodrome	Ostrava	Czech Republic	LKMT	2	09/01/2014							2
Aerodrome	Praha	Czech	LKPR			4	09/01/2014					4

Operational Aerodromes / Heliports /Routes												
Aerodrome/ Route	Name	Country	ICAO Code	APV-I Procedure	Activation APV-I procedure	APV Baro Procedure	Activation APV Baro Procedure	LPV-200 Procedure	Activation LPV-200 procedure	RNP 0.3 Procedure	Activation RNP 0.3 procedure	Total Procedures
		Republic										
Aerodrome	Brno	Czech Republic	LKTB	2	09/01/2014							2
Aerodrome	Praha/Vodochody	Czech republic	LKVO	2	25/06/2015							2
Aerodrome	Graz	Austria	LOWG		09/01/2014			1	01/03/2018			1
Aerodrome	Innsbruck	Austria	LOWI					1	01/02/2018			1
Aerodrome	Linz	Austria	LOWL		09/01/2014			2	02/02/2017			2
Aerodrome	Wien - Schwechat	Austria	LOW W					3	02/02/2017			3
Aerodrome	Porto	Portugal	LPPR	1	12/10/2017							1
Aerodrome	Lisboa	Portugal	LPPT	2	28/05/2015							2
Aerodrome	Cluj - Napoca / Avram Iancu	Romania	LRCL	2	10/11/2016							2
Aerodrome	Les Eplatures	Switzerland	LSGC					2	26/05/2016			2
Aerodrome	Genève	Switzerland	LSGG	2	12/11/2015							2
Aerodrome	Bern-Insel Hospital	Switzerland	LSHI	1	23/07/2015							1
Aerodrome	Dübendorf	Switzerland	LSMD	2	21/08/2014							2
Aerodrome	Emmen	Switzerland	LSME	1	03/04/2014							1
Aerodrome	Payerne	Switzerland	LSMP	1	17/09/2015							1
Aerodrome	Berne-Belp	Switzerland	LSZB	1	07/03/2013							1
Aerodrome	Grenchen	Switzerland	LSZG	1	25/07/2013							1
Aerodrome	Zurich	Switzerland	LSZH					1	25/05/2017			1
Aerodrome	St. Gallen- Altenrhein	Switzerland	LSZR	1	17/11/2011							1
Aerodrome	Bratislava-Milan Rastislav Štefánik	Slovak Republic	LZIB	2	05/02/2015							2
Aerodrome	Košice	Slovak Republic	LZKZ	2	05/02/2015							2
Aerodrome	Piešťany	Slovak Republic	LZPP					1	02/02/2017			1

Operational Aerodromes / Heliports /Routes												
Aerodrome/ Route	Name	Country	ICAO Code	APV-I Procedure	Activation APV-I procedure	APV Baro Procedure	Activation APV Baro Procedure	LPV-200 Procedure	Activation LPV-200 procedure	RNP 0.3 Procedure	Activation RNP 0.3 procedure	Total Procedures
Aerodrome	POPRAD-Tatry	Slovak Republic	LZTT					2	29/03/2018			2
Aerodrome	Žilina	Slovak Republic	LZZI					1	25/05/2017			1
Route	Hel Low-Flight Route KY251	Switzerland	KY251							1	22/06/2017	1
Route	Hel Low-Flight Route KY252	Switzerland	KY252							1	22/06/2017	1
Route	Hel Low-Flight Route KY253	Switzerland	KY253							1	22/06/2017	1
Route	Hel Low-Flight Route KY256	Switzerland	KY256							1	22/06/2017	1
Route	Hel Low-Flight Route KY257	Switzerland	KY257							1	22/06/2017	1

Table 14: Full list of EGNOS-based Approach Procedures as of 26 April 2018 (AIRAC cycle 5)

**APPENDIX B****LIST OF ACRONYMS**

<b>Acronym</b>	<b>Definition</b>
ADS-B	Automatic Dependent Surveillance — Broadcast
AIRAC	Aeronautical Information Regulation And Control
AIS	Aeronautical Information System
AME	Accuracy Major Event
APP	APPLication
APV	Approach Procedure with Vertical Guidance
ATM	Air Traffic Management
CANSO	Aeronautical Information Regulation And Control
CAP	Correction Action Plan
CAP	Common Agricultural Policy
CAT	CATegory
CEO	Chief Executive Officer
CPF	Central Processing Facility
CWA	CEN Workshop Agreement
DGNSS	DGNSS Differential Global Navigation Satellite System
DH	Decision Height
DSNA	Direction des Services de la Navigation Aérienne (France)
EBACE	European Business Aviation Convention & Exhibition
EC	European Commission
EDAS	EGNOS Data Access Service
EFJO	Joensuu Airport
EFSA	Savonlinna Airport
EGNOS	European Geostationary Navigation Overlay Service
EMA	EGNOS Multimodal Adoption
EMRF	EMRF European Maritime Radionavigation Forum
ENAN	Andøya Airport
ENEV	Harstad/Narvik Airport
ENKR	Kirkenes Airport
ENSH	Svolvær Airport
ENSK	Stokmarknes Airport
ERAA	European Regions Airline Association
ESR	EGNOS System Release

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<b>Acronym</b>	<b>Definition</b>
ESSP	European Satellite Services Provider
EU	European Union
EWA	EGNOS Working Agreement
EWAN	EGNOS Wide Area Network
FSTD	Flight Simulation Training Devices
FT	FeeT
FTP	File Transfer Protocol
GEO	Geostationary Earth Orbit
GIS	GIS Geographic Information Services
GNSS	Global Navigation Satellite System
GPS	GPS Global Positioning System
GSA	European GNSS Agency
HAL	Horizontal Alarm Limit
HNSE	HNSE Horizontal Navigation System Error
HPL	Horizontal Protection Level
HSI	Horizontal Safety Index
IALA	IALA International Association of Lighthouse Authorities
ICAO	International Civil Aviation Organisation
ID	Identificator
ILS	Instrument Landing System
IMO	International Maritime Organisation
KARI	Korea Aerospace Research Institute
KASS	Korea Augmentation Satellite System
LPV	Lateral Precision with Vertical guidance
METS	Marine Equipment Trade Show
MF	Medium Frequency
MOPS	Minimum Operational Performance Standards
NANU	Notice Advisory to Navstar Users
NOTAM	Notice To Airmen
NPA	Non Precision Approach
NTRIP	Networked Transport of RTCM via Internet Protocol
OP	Operational
OR	Observation Report

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<b>Acronym</b>	<b>Definition</b>
OS	Open Service
PA	Precision Approach
PAPI	Paper-and-Pencil Interviewing
PBN	Performance Based Navigation
PRN	Pseudo-Random Number
RIMS	Ranging and Integrity Monitoring Station
RIMS AGA	RIMS Agadir
RIMS ALB	RIMS Aalborg
RIMS ALY	RIMS Alexandria
RIMS ATH	RIMS Athens
RIMS BRN	RIMS Berlin
RIMS CNR	RIMS Canary Island
RIMS CRK	RIMS Cork
RIMS CTN	RIMS Catania
RIMS DJA	RIMS Djerba
RIMS EGI	RIMS Egilsstadir
RIMS GLG	RIMS Glasgow
RIMS GOL	RIMS Golbasi
RIMS GVL	RIMS Gavle
RIMS JME	RIMS Jan Mayen
RIMS KIR	RIMS Kirkenes
RIMS LAP	RIMS Lappeenranta
RIMS LPI	RIMS La Palma Island
RIMS LSB	RIMS Lisbon
RIMS MAD	RIMS Madeira
RIMS MLG	RIMS Malaga
RIMS PDM	RIMS Palma de Mallorca
RIMS RKK	RIMS Reykjavik
RIMS ROM	RIMS Roma
RIMS SDC	RIMS Santiago de Compostela
RIMS SOF	RIMS Sofia
RIMS SWA	RIMS Swanwick
RIMS TLS	RIMS Toulouse

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<b>Acronym</b>	<b>Definition</b>
RIMS TRD	RIMS Trondheim
RIMS TRO	RIMS Tromsø
RIMS WRS	RIMS Warsaw
RIMS ZUR	RIMS Zurich
RIS	River Information Services
RNAV	RNAV Radio NAVigation
RNP	RNP Required Navigation Performance or Required Navigation Parameters
RTCA	Radio Technical Commission for Aeronautics
RTCM	Radio Technical Commission for Maritime
SARPS	Standards And Recommended Practices
SBAS	Satellite Based Augmentation System
SC	Special Committee
SDD	Service Declaration Document
SES	Single European Sky
SIR	Safety Incident Report
SIS	Signal In Space
SISNeT	Signal in Space through the Internet
SL0	EDAS Service Level 0
SL2	EDAS Service Level 2
STC	Supplemental Type Certificates
UAV	Unmanned Aerial Vehicle
UK	United Kingdom
VAL	Vertical Alert Limit
VNSE	VNSE Vertical Navigation System Error
VPL	Vertical Protection Level
VSI	Vertical Safety Index
VTT	Vessel Tracking and Tracing
WATM	World Air Traffic Management Congress
YSR	Yearly System Release



We certify you're there.

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