The EGNOS Service Provider

Monthly Performance Report
March 2021

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Table of Content

EXECUTIVE SUMMARY **4**

1 EGNOS SIS AVAILABILITY **5**

2 OPEN SERVICE (OS) **7**

2.1 OPEN SERVICE HORIZONTAL AND VERTICAL ACCURACY 7

2.2 EGNOS OPEN SERVICE AVAILABILITY 9

3 SAFETY-OF-LIFE SERVICE (SOL) **10**

3.1 EGNOS NON PRECISION APPROACH (NPA) 10

3.1.1 EGNOS NPA Availability *10*

3.1.2 EGNOS NPA Continuity *11*

3.1.3 EGNOS NPA Integrity Events *12*

3.1.4 EGNOS NPA Accuracy *13*

3.2 EGNOS APPROACH WITH VERTICAL GUIDANCE (APV-I) 15

3.2.1 EGNOS APV-I Availability *15*

3.2.2 EGNOS APV-I Continuity Risk *16*

3.2.3 EGNOS APV-I Integrity *17*

3.2.4 EGNOS APV-I Accuracy *19*

3.2.5 EGNOS APV-I Performance at airports *21*

3.3 EGNOS LOCALIZER PERFORMANCE WITH VERTICAL GUIDANCE TO A DECISION ALTITUDE OF 200FT (LPV-200) 22

3.3.1 EGNOS LPV-200 Availability *22*

3.3.2 EGNOS LPV-200 Continuity Risk *23*

3.3.3 EGNOS LPV-200 Integrity *24*

3.3.4 EGNOS LPV-200 Accuracy *26*

3.3.5 EGNOS LPV-200 Performance at airports *28*

4 EGNOS DATA ACCESS SERVICE (EDAS) **29**

5 EGNOS TIME SERVICE **30**

APPENDIX A RECEIVER MONITORING NETWORK **33**

APPENDIX B EGNOS APV-I PERFORMANCE AT AIRPORTS **35**

APPENDIX C EGNOS LPV-200 PERFORMANCE AT AIRPORTS **44**

APPENDIX D REFERENCE DOCUMENTS **50**

APPENDIX E LIST OF ACRONYMS **51**

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Table of Figures

Figure 1 – EGNOS SIS & PRN Availability for March 2021 5
Figure 2 – Trend of EGNOS SIS Availability per GEO 5
Figure 3 – EGNOS Open Service HNSE Histogram and Cumulative Probability 8
Figure 4 – EGNOS Open Service VNSE Histogram and Cumulative Probability 8
Figure 5 – EGNOS Open Service Availability at reference stations 9
Figure 6 – EGNOS NPA availability 10
Figure 7 – EGNOS NPA Continuity over the last 6 months 11
Figure 8 – EGNOS NPA Horizontal Safety Index of the month 12
Figure 9 – EGNOS NPA HNSE Histogram and Cumulative Probability 14
Figure 10 – EGNOS APV-I Availability 15
Figure 11 – EGNOS APV-I availability compliance trend 15
Figure 12 – EGNOS APV-I Continuity 16
Figure 13 – EGNOS APV-I Horizontal Safety Index of the month 17
Figure 14 – EGNOS APV-I Vertical Safety Index of the month 18
Figure 15 – EGNOS APV-I HNSE Histogram and Cumulative Probability 20
Figure 16 – EGNOS APV-I VNSE Histogram and Cumulative Probability 20
Figure 17 – EGNOS APV-I Availability at airports 21
Figure 18 – EGNOS APV-I outages 21
Figure 19 – EGNOS LPV-200 Availability 22
Figure 20 – EGNOS LPV-200 availability compliance trend 22
Figure 21 – EGNOS LPV-200 Continuity 23
Figure 22 – EGNOS LPV-200 Horizontal Safety Index of the month 24
Figure 23 – EGNOS LPV-200 Vertical Safety Index of the month 25
Figure 24 – EGNOS LPV-200 HNSE Histogram and Cumulative Probability 27
Figure 25 – EGNOS LPV-200 VNSE Histogram and Cumulative Probability 27
Figure 26 – EGNOS LPV-200 Availability at airports 28
Figure 27 – EGNOS LPV-200 outages 28
Figure 28 – EGNOS Time Service availability 30
Figure 29 – ENT-GPS offset evolution 31
Figure 30 – EGNOS RIMS sites used in this report 33

Table of Tables

Table 1 – EGNOS SIS Availability (%) on EGNOS GEO satellites 6
Table 2 – EGNOS Open Service accuracy (95%) 7
Table 3 – EGNOS NPA Horizontal Accuracy (95%) and percentage of time in NPA mode 13
Table 4 – EGNOS APV-I Accuracy (95%) and percentage of time in APV-I mode at reference stations 19
Table 5 – EGNOS LPV-200 Accuracy (95%) and percentage of time in LPV-200 mode at reference stations 26
Table 6 – Performance of EDAS Services 29
Table 7 – List of sites where performances are reported 34
Table 8 – Monthly APV-I Availability at airports with published procedures using EGNOS 43
Table 9 – Monthly LPV-200 Availability at airports with published procedures using EGNOS 49

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EXECUTIVE SUMMARY

This report presents the EGNOS services performance during March 2021. The report contains global results for the reported period, including maps and tables with the performance observed at different locations in Europe using GEO-combined values for EGNOS operational GEOs. A list of the stations analysed in this report, including their location, can be found in Appendix A. Additional and more detailed information about EGNOS performance can be found at the EGNOS User Support website (https://egnos-user-support.essp-sas.eu).

Safety of Life Service (SoL)

The percentage[1] of SoL SDD service area [RD-2] covered by APV-I and LPV200 Availability (99%) performance was 97.98% for APV-I (section 3.2.1) and 94.66% for LPV200 (section 3.3.1). The achieved coverage for continuity ($5x10^{-4}$/15s) was 98.69% for APV-I (section 3.2.2) and 96.06% for LPV200 (section 3.3.2).

The performance at all airports with approach operations based on the APV-I or LPV200 service levels (Appendix B and Appendix C) presented availability and continuity values in line with their respective commitments as defined in the SoL SDD [RD-2].

The Horizontal and Vertical Safety Indexes remained below 0.37 for both APV-I (section 3.2.3) and LPV200 (section 3.3.3) service levels for all the analyzed sites, which represents a good integrity margin.

NPA Availability above 99% (section 3.1.1) was delivered in the 99.73% of the NPA service area (limited by the boundaries defined by MT27).

Open Service

The monitored stations presented an Open Service Availability higher than 99% for this month, being most of them equal or close to 100% (section 2.2).

The horizontal and vertical accuracy results for all the sites remained below 1.6 meters (95%) and 2.3 meters (95%) respectively, which represents a very good level of accuracy (section 2.1).

EDAS Service

In terms of availability and latency, the observed performance for all the EDAS services fulfilled the targets (section 4) [RD-3].

EGNOS Time Service

The information is presented for the combination of both operational GEOs. As it can be observed, the EGNOS Time Service availability was 100% or very close to 100% almost all days of the month, except for 23rd March (94.76%).

The offset between the EGNOS Network Time and the GPS time remained below 15 nanoseconds over the three previous months: December 2020 to February 2021 (section 5).

[1] The coverage percentages presented represent the ratio of area after applying the mapping projection, there may be a difference compared to the actual geographical area.

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1 EGNOS SIS AVAILABILITY

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

In addition to the individual SIS availability for PRN123 and PRN136, the following values are also reported:

- percentage of time in the month during which at least one geostationary satellite broadcasts EGNOS messages (PRN123 or PRN136);
- percentage of time in the month during which both operational geostationary satellites broadcast EGNOS messages.

EGNOS SIS monitoring for March 2021, reports the following reception percentage of an SBAS message:

- SIS – PRN123 or PRN136: **100%**
- SIS – PRN123 and PRN136: **99.75%**
- PRN123 Availability: **99.77%**
- PRN136 Availability: **99.98%**

The following figure presents the availability of the signal in both EGNOS GEO satellites (PRN123 and PRN136). Red lines correspond to unavailability periods:

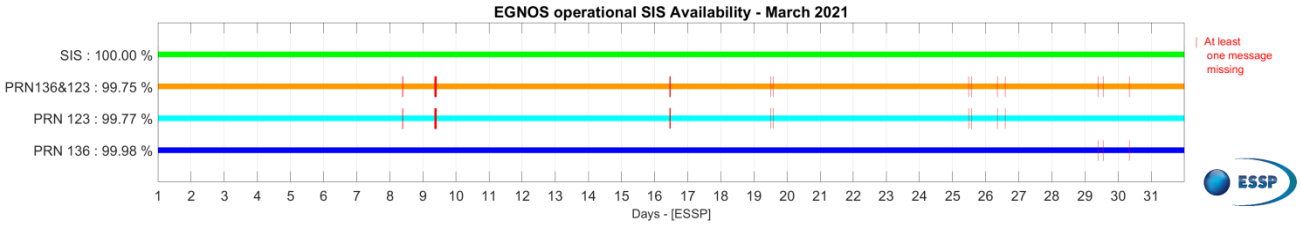

Figure 1 – EGNOS SIS & PRN Availability for March 2021

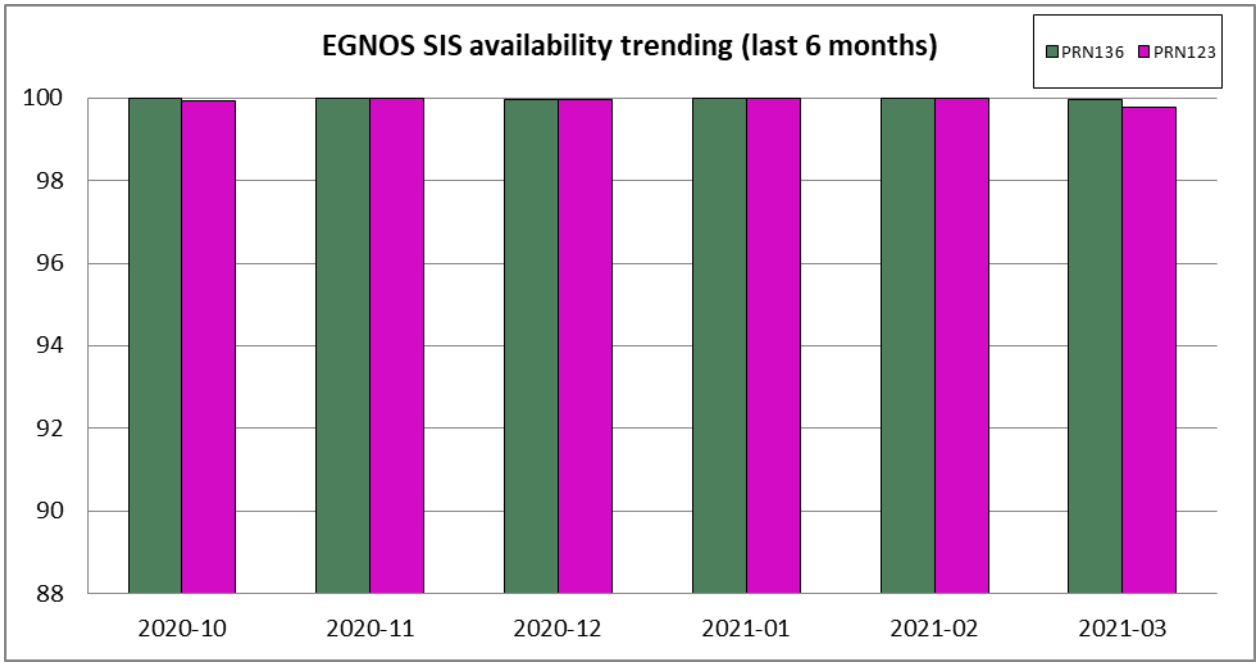

Figure 2 – Trend of EGNOS SIS Availability per GEO

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Availability (%)	2020-10	2020-11	2020-12	2021-01	2021-02	2021-03
PRN123	99.92	100	99.98	99.99	100	99.77
PRN136	99.99	100	99.97	99.99	99.99	99.98
At least one EGNOS GEO satellite	100	100	100	100	100	100

Table 1 – EGNOS SIS Availability (%) on EGNOS GEO satellites

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2 OPEN SERVICE (OS)

2.1 Open Service Horizontal and Vertical Accuracy

Accuracy is a measure of the position error, which is the difference between the estimated navigation position and the actual position.

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

The next table provides the values of accuracy (95%) in meters measured for this month. See Appendix A for further details of the stations where OS Accuracy is reported.

Station	HNSE 95% (m)	VNSE 95% (m)
Agadir	1.1	1.3
Aalborg	0.7	1.4
Alexandria	1.0	1.4
Athens	0.7	1.2
Berlin	0.8	1.2
Canarias	1.5	1.4
Cork	0.9	1.3
Catania	0.7	1.0
Djerba	0.9	1.0
Egilsstadir	0.7	1.7
Glasgow	1.0	1.3
Golbasi	0.8	1.2
Gavle	0.7	1.5
Haifa	1.0	1.6
Jan Mayen	1.1	2.2
Kirkenes	0.9	1.6
Lappeenranta	0.7	1.4
La Palma	1.2	1.5
Lisboa	1.1	1.4
Madeira	0.8	1.2
Malaga	0.9	0.9
Palma de Mallorca	0.7	0.9
Reykjavik	1.0	1.9
Roma	0.7	1.1
S. Compostela	0.9	1.0
Sofía	1.2	1.7
Swanwick	1.1	1.6
Toulouse	0.8	1.1
Trondheim	0.7	1.5
Tromsoe	1.0	2.2
Warsaw	0.8	1.4
Zurich	0.8	1.2

Table 2 – EGNOS Open Service accuracy (95%)

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The next 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 current month.

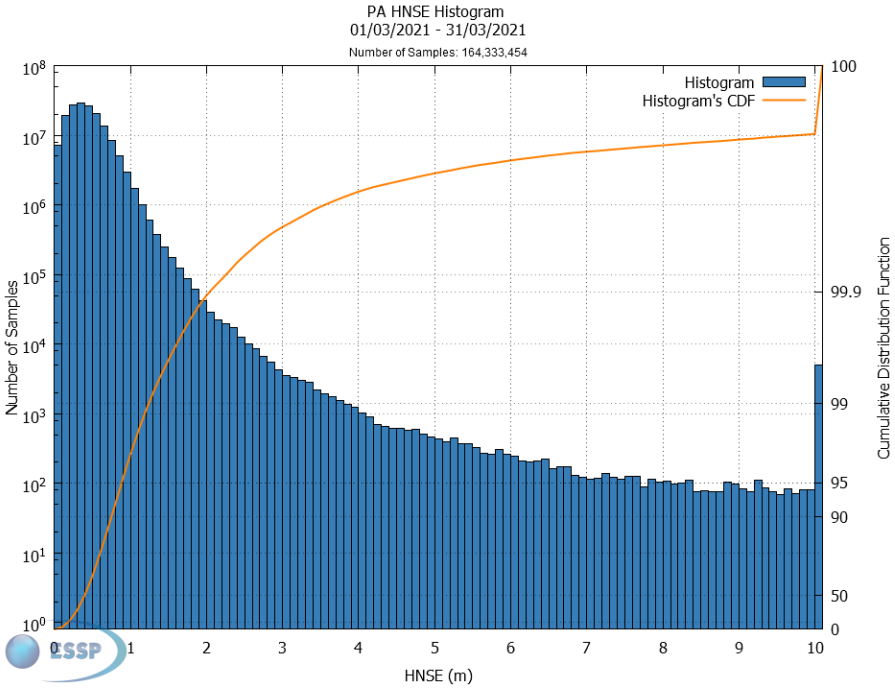

Figure 3 – EGNOS Open Service HNSE Histogram and Cumulative Probability

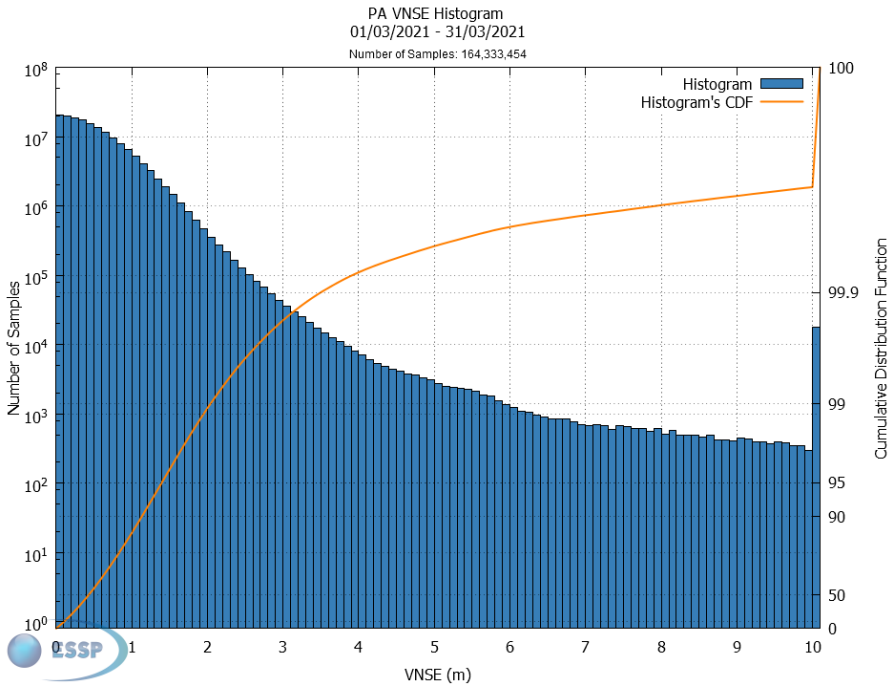

Figure 4 – EGNOS Open Service VNSE Histogram and Cumulative Probability

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2.2 EGNOS Open Service Availability

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

The following figures present the Open Service Availability measured in the monitoring stations for the reported month (RIMS sites with OS Availability lower than 99%, if any, are shown in red). See Appendix A for further details of the stations where OS Accuracy is reported.

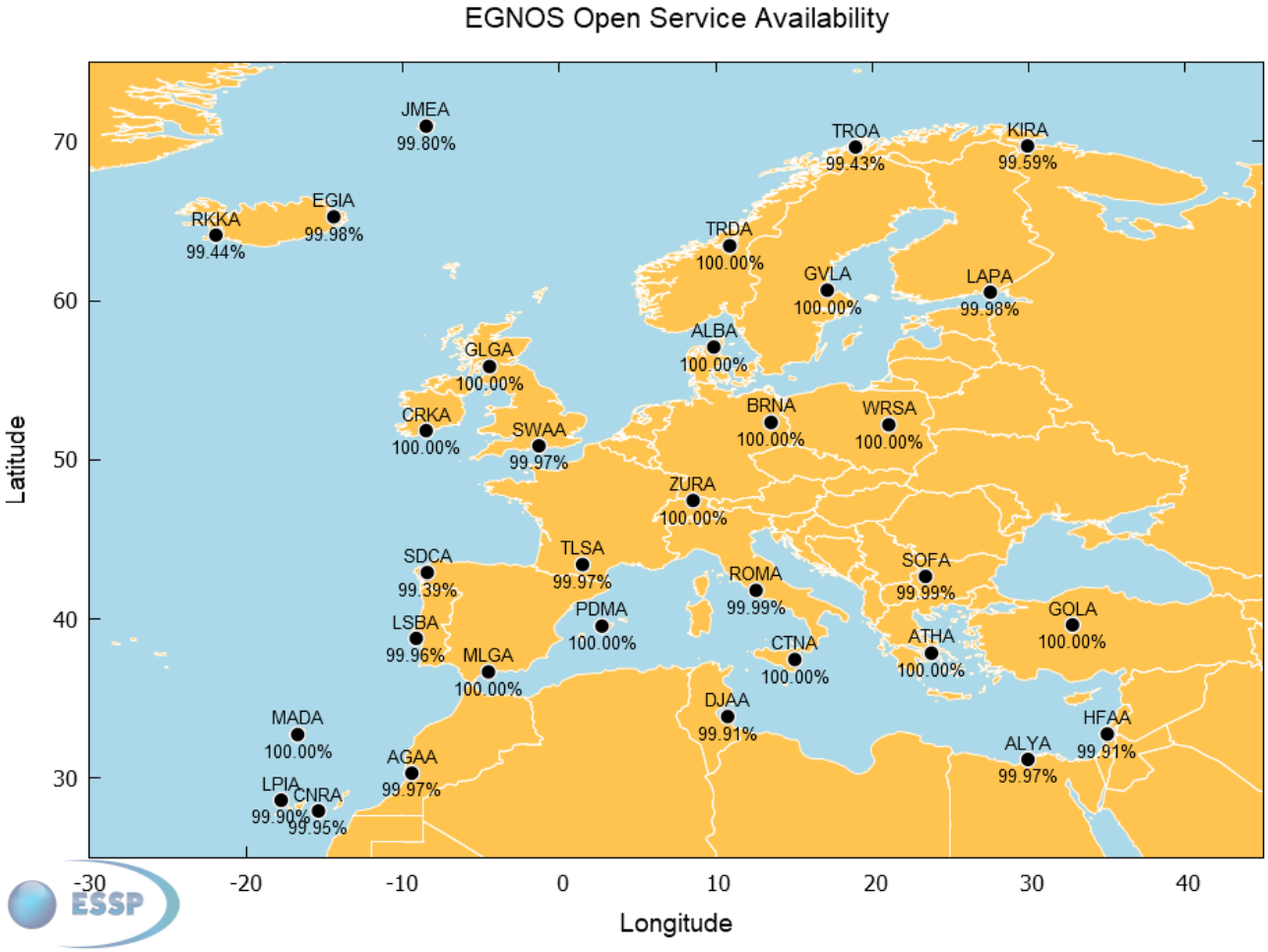

Figure 5 – EGNOS Open Service Availability at reference stations

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3 SAFETY-OF-LIFE SERVICE (SOL)

3.1 EGNOS Non Precision Approach (NPA)

3.1.1 EGNOS NPA Availability

EGNOS NPA Availability *is defined as the percentage of samples in which the Horizontal Protection Level is below Alert Limit for NPA (HPL below 556m) over the total period. This value corresponds to the performance obtained under fault-free conditions using all satellites in view.*

The following figure presents EGNOS NPA Availability over the current month. It must be noted that NPA Availability considering RAIM is not taken into account in this report.

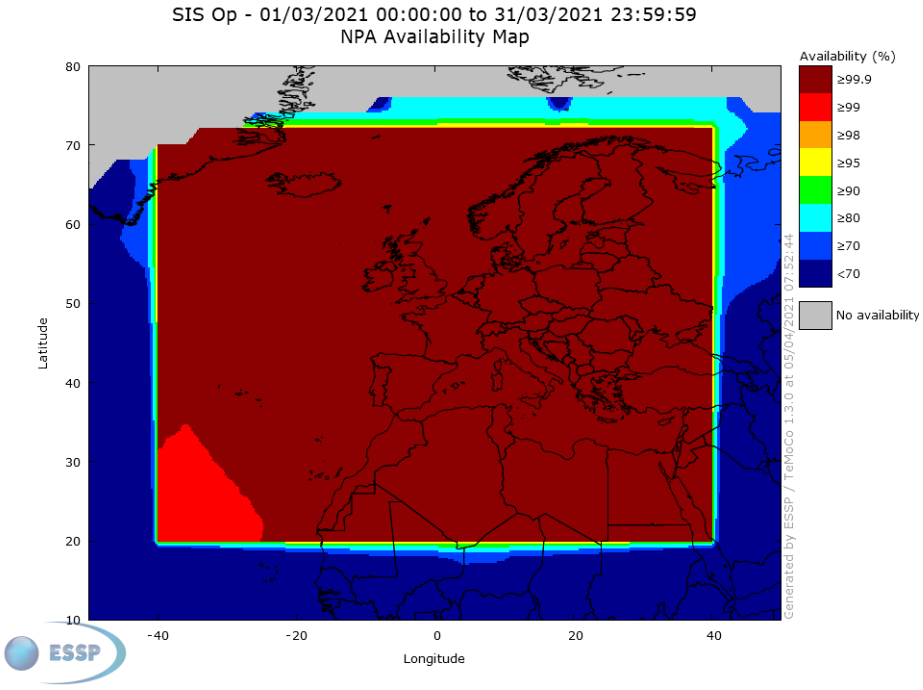

Figure 6 – EGNOS NPA availability

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3.1.2 EGNOS NPA Continuity

EGNOS NPA Continuity *is reported as the result of dividing the total number of single continuity events using a time-sliding window of 1 hour by the number 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 inside the following time-sliding window of 1 hour the system becomes not available. This value corresponds to the performance obtained under fault-free conditions using all satellites in view.*

The following picture presents the EGNOS NPA Continuity Risk measured for the last 6 months (in order to observe the minimum NPA Continuity performance committed in the SoL SDD -1×10^{-3}/hour-, at least 6 months of data need to be evaluated due to the discrete nature of discontinuity events). It must be noted that NPA continuity is computed in this report using only the EGNOS NPA solution and not considering the GPS RAIM solution when the EGNOS one is not available.

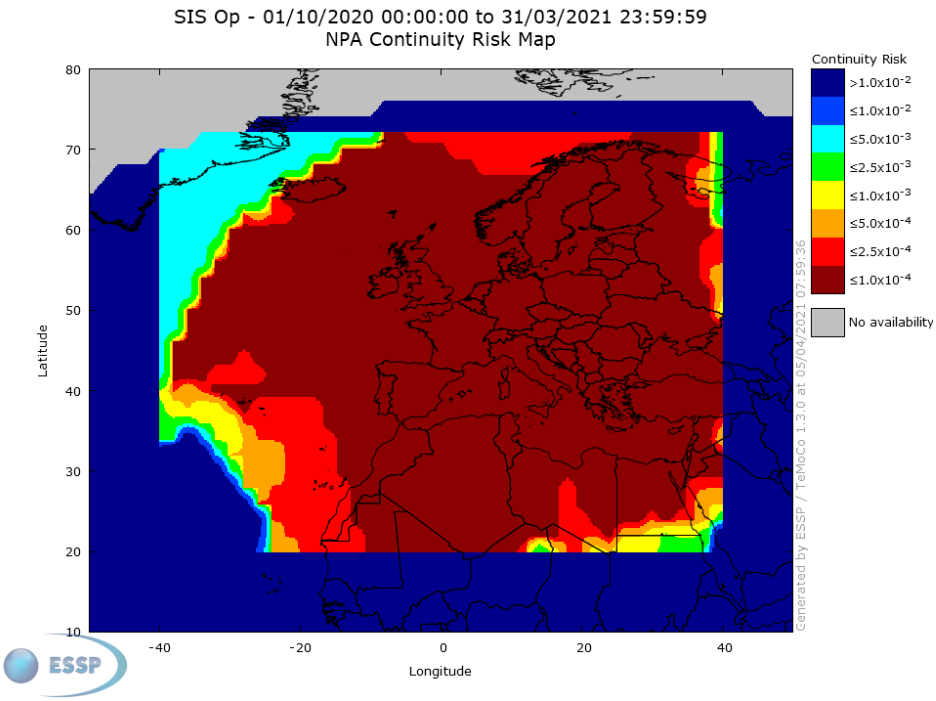

Figure 7 – EGNOS NPA Continuity over the last 6 months

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3.1.3 EGNOS NPA Integrity Events

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

No integrity event was detected.

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

The next histogram shows the distribution of HSI (Horizontal Safety Index), which is computed at the different EGNOS stations for each second over the current month. This histogram takes into account the epochs in which the NPA service is available (Protection Level < NPA Alarm Limit).

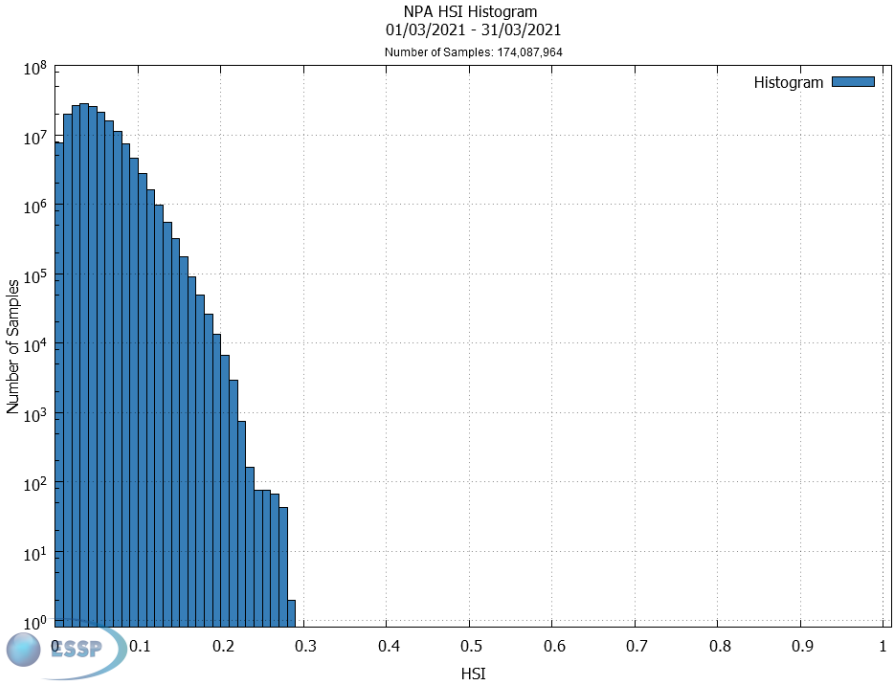

Figure 8 – EGNOS NPA Horizontal Safety Index of the month

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3.1.4 EGNOS NPA Accuracy

EGNOS NPA Accuracy *is reported as the 95th percentile of the Horizontal Navigation System Error (HNSE) over the month, at the monitored sites when the NPA service is available (HPL below 556 m).*

This table shows the NPA Accuracy values in meters. See Appendix A for further details of the stations where NPA accuracy is reported.

Station	HNSE 95% (meters)	% of samples in NPA mode
Abu Simbel	3.4	100.00%
Azores	1.9	100.00%
Agadir	1.1	100.00%
Aalborg	0.7	100.00%
Alexandria	1.0	100.00%
Athens	0.7	100.00%
Berlin	0.8	100.00%
Canary Islands	1.5	100.00%
Cork	0.9	100.00%
Catania	0.7	100.00%
Djerba	0.9	100.00%
Egilsstadir	0.7	100.00%
Glasgow	1.0	100.00%
Golbasi	0.8	100.00%
Gavle	0.7	100.00%
Haifa	1.0	100.00%
Jan Mayen	1.1	100.00%
Kirkenes	0.9	100.00%
Lappeenranta	0.7	100.00%
La Palma	1.2	100.00%
Lisbon	1.1	100.00%
Madeira	0.8	100.00%
Málaga	0.9	100.00%
Palma de Mallorca	0.7	100.00%
Reykjavik	0.9	100.00%
Roma	0.7	100.00%
S. de Compostela	0.9	100.00%
Sofia	1.2	100.00%
Swanwick	1.1	100.00%
Toulouse	0.8	100.00%
Trondheim	0.6	100.00%
Tromsoe	1.0	100.00%
Warsaw	0.8	100.00%
Zürich	0.8	100.00%

Table 3 – EGNOS NPA Horizontal Accuracy (95%) and percentage of time in NPA mode

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The following figure shows the histogram and cumulative probability function of HNSE (Horizontal Navigation System Error), which are computed at RIMS sites for each second over the current month.

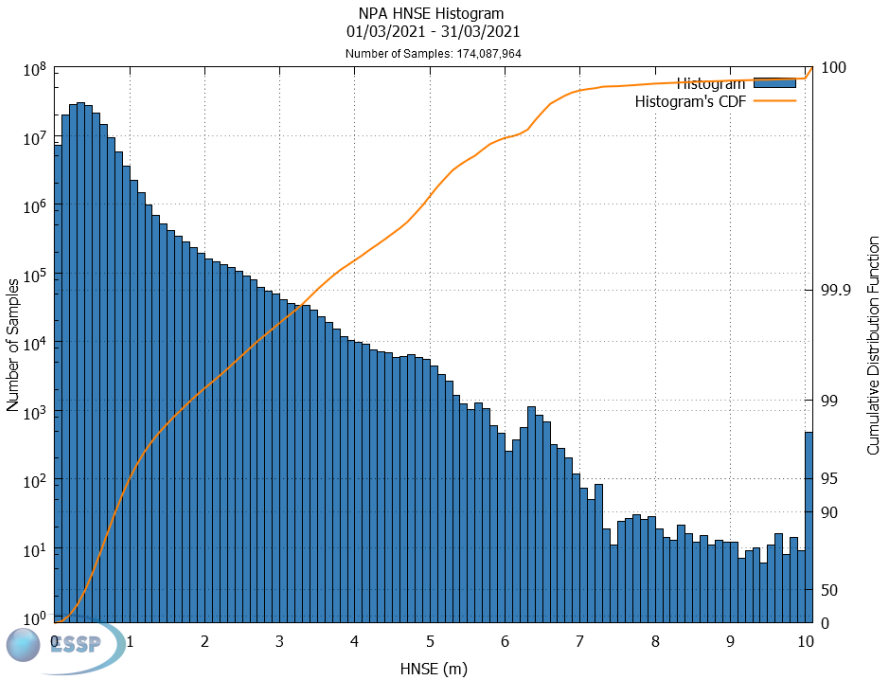

Figure 9 – EGNOS NPA HNSE Histogram and Cumulative Probability

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3.2 EGNOS Approach with Vertical guidance (APV-I)

3.2.1 EGNOS APV-I Availability

EGNOS APV-I Availability *is defined as the percentage of epochs in a month in which the Protection Level are below Alert Limits for this APV-I service (HPL<40m and VPL<50m) over the total period. This value corresponds to the performance obtained under fault-free conditions using all satellites in view.*

The following picture presents the EGNOS APV-I Availability over the current month using GEO-combined maps for the operational EGNOS GEOs.

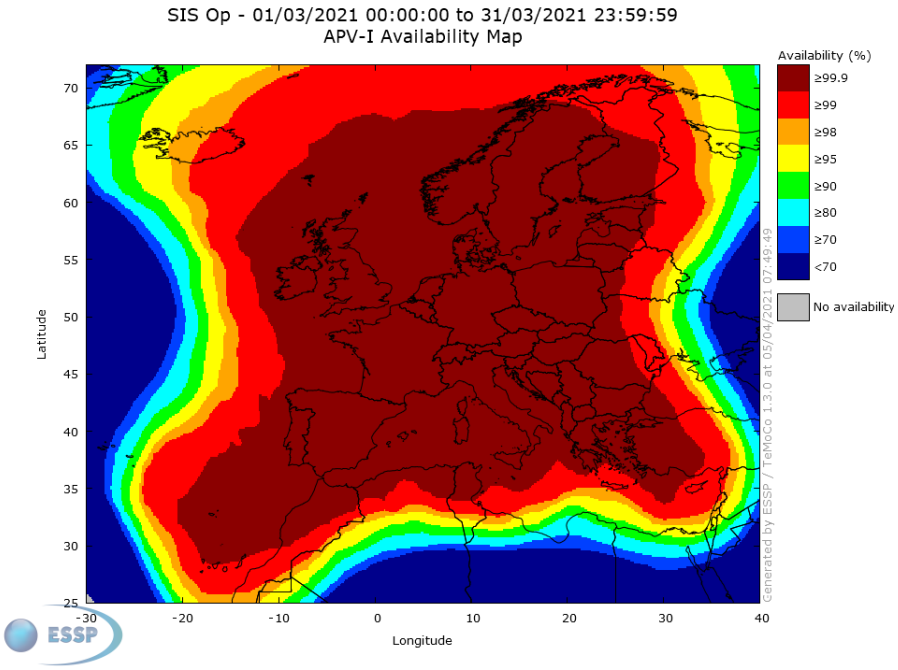

Figure 10 – EGNOS APV-I Availability

Below, the evolution of the monthly APV-I availability (99%) compliance area (30 days sliding window) is presented. The percentage is computed with respect to the commitment area at 99% level as defined in the SoL SDD ([RD-2]). The information is presented for the last 3 months.

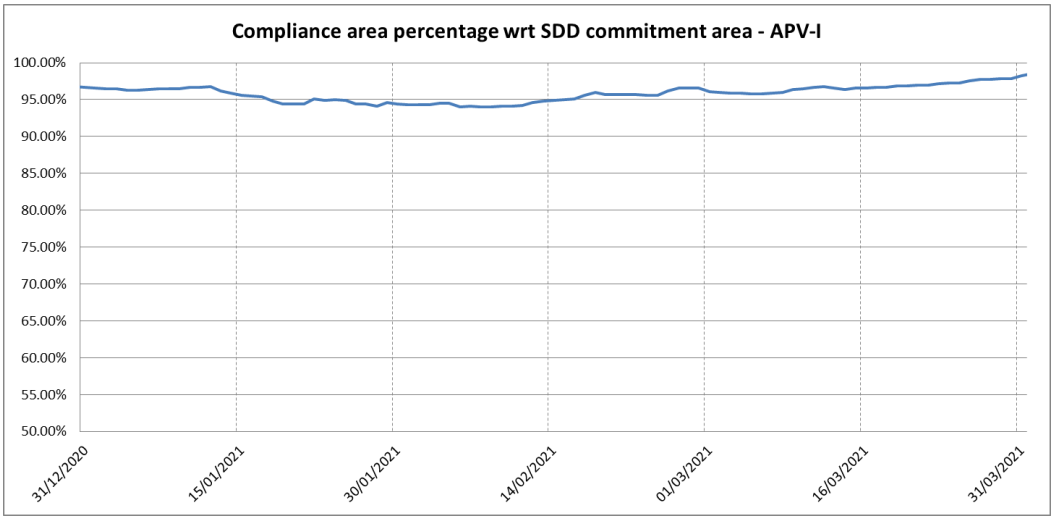

Figure 11 – EGNOS APV-I availability compliance trend

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3.2.2 EGNOS 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 event occurs if the system is available at the start of the operation and in at least one of the following 15 seconds the system becomes not available. This value corresponds to the performance obtained under fault-free conditions using all satellites in view.*

The following picture presents the EGNOS APV-I Continuity over the current month using GEO-combined maps for the operational EGNOS GEOs.

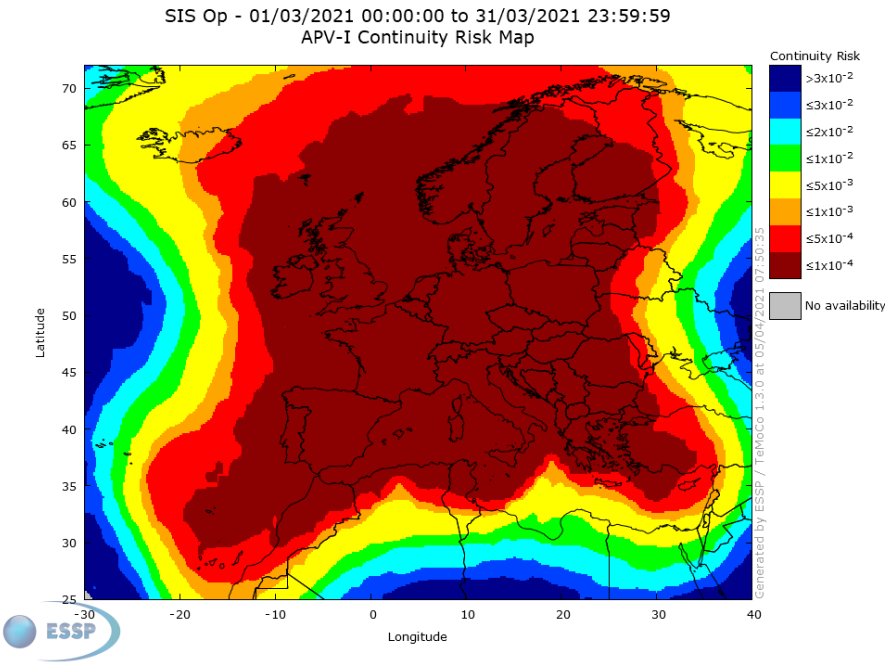

Figure 12 – EGNOS APV-I Continuity

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3.2.3 EGNOS APV-I Integrity

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

No integrity event was detected.

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

The next 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 over the current month. These histograms have considered that Protection Level is below APV-I Alarm Limit.

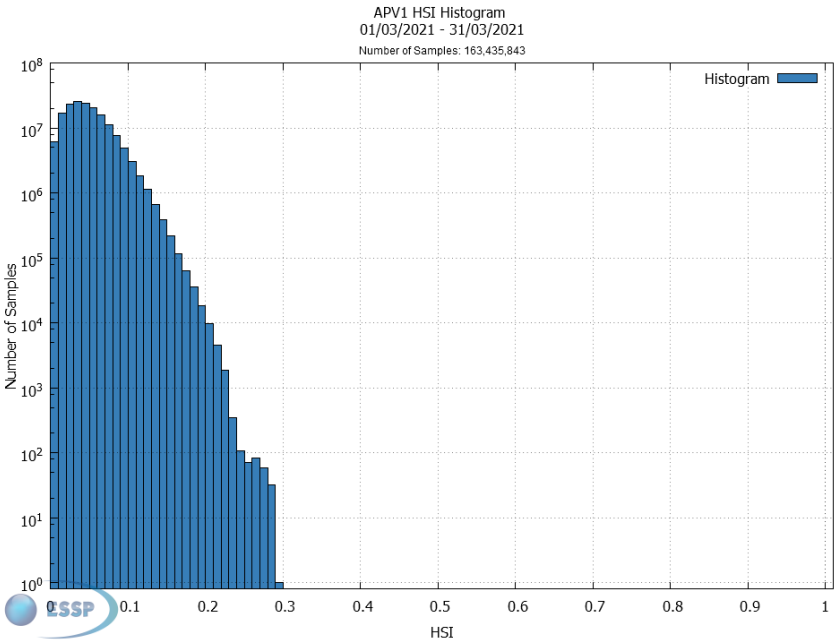

Figure 13 – EGNOS APV-I Horizontal Safety Index of the month

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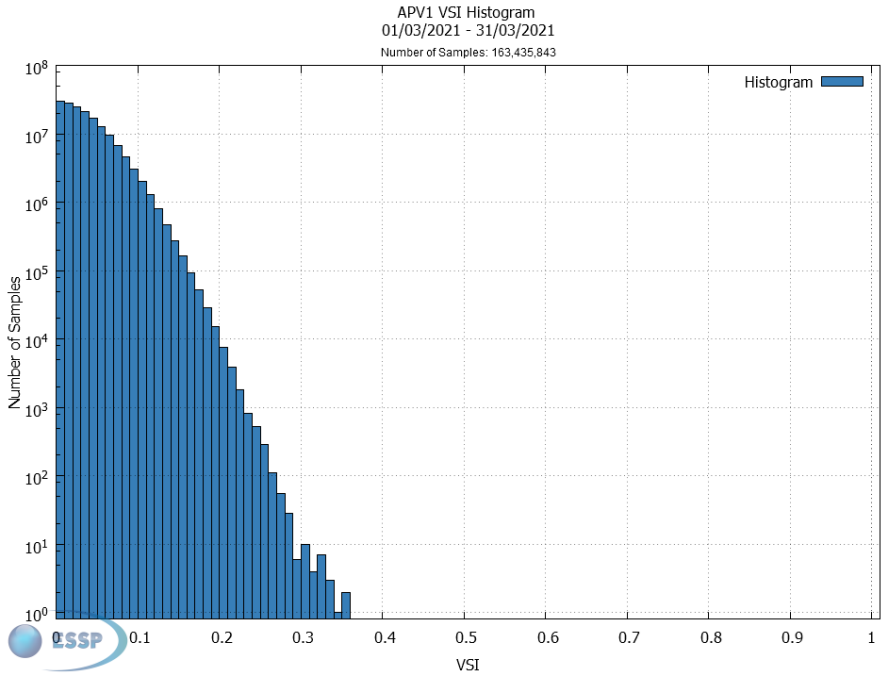

Figure 14 – EGNOS APV-I Vertical Safety Index of the month

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3.2.4 EGNOS APV-I Accuracy

EGNOS APV-I Accuracy *is reported as the 95th percentile of the Horizontal and Vertical Navigation System Error over the month, at the monitored sites when the APV-I service is available (HPL<40m and VPL<50m).*

The following table shows the monthly APV-I Accuracy values in meters per operational GEO combined satellite. See Appendix A for further details of the stations where APV-I Accuracy is reported.

Station	HNSE 95% (meters)	VNSE 95% (meters)	% of samples with APV-I service available
Agadir	1.1	1.3	100.00%
Aalborg	0.7	1.4	99.93%
Alexandria	1.0	1.3	96.01%
Athens	0.7	1.2	99.98%
Berlin	0.8	1.2	100.00%
Canary Islands	1.4	1.4	99.85%
Cork	0.9	1.3	100.00%
Catania	0.7	1.0	100.00%
Djerba	0.9	1.0	99.86%
Egilsstadir	0.7	1.7	99.59%
Glasgow	1.0	1.3	100.00%
Golbasi	0.8	1.2	99.90%
Gavle	0.7	1.5	99.99%
Haifa	1.0	1.6	98.62%
Jan Mayen	1.1	2.1	99.16%
Kirkenes	0.8	1.5	99.23%
Lappeenranta	0.7	1.4	99.94%
La Palma	1.2	1.5	99.93%
Lisbon	1.1	1.4	100.00%
Madeira	0.8	1.2	100.00%
Málaga	0.9	0.9	100.00%
Palma de Mallorca	0.7	0.9	100.00%
Reykjavik	0.9	1.7	97.98%
Roma	0.7	1.1	100.00%
S. de Compostela	0.9	1.0	99.97%
Sofia	1.2	1.7	99.97%
Swanwick	1.1	1.6	100.00%
Toulouse	0.8	1.1	100.00%
Trondheim	0.7	1.5	100.00%
Tromsoe	1.0	2.1	99.88%
Warsaw	0.8	1.4	99.99%
Zürich	0.8	1.2	100.00%

Table 4 – EGNOS APV-I Accuracy (95%) and percentage of time in APV-I mode at reference stations

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The next figures show the histogram and cumulative distribution function of HNSE (Horizontal Navigation System Error) and VNSE (Vertical Navigation System Error), which are computed at RIMS sites for each second over the current month.

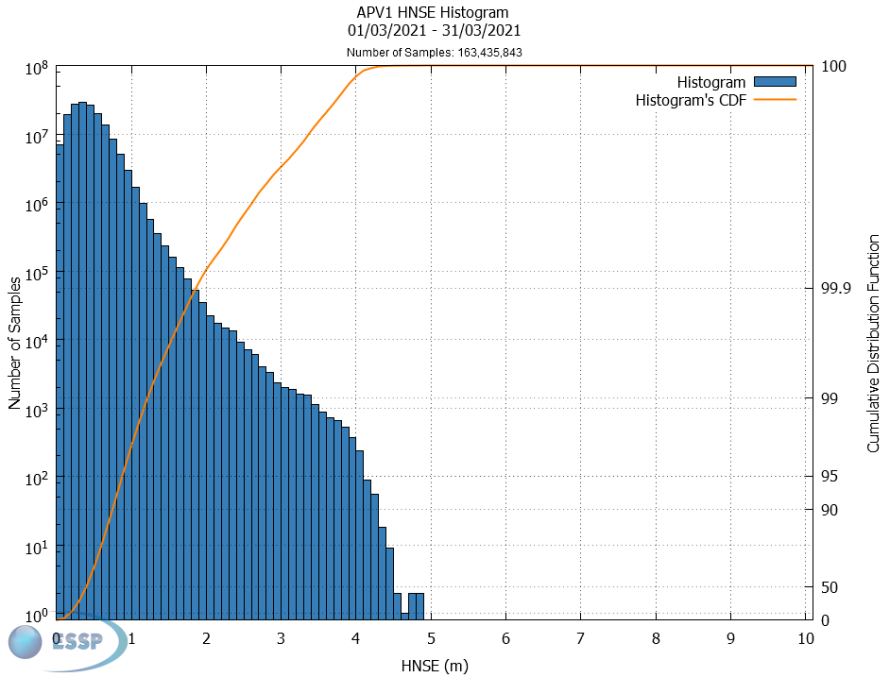

Figure 15 – EGNOS APV-I HNSE Histogram and Cumulative Probability

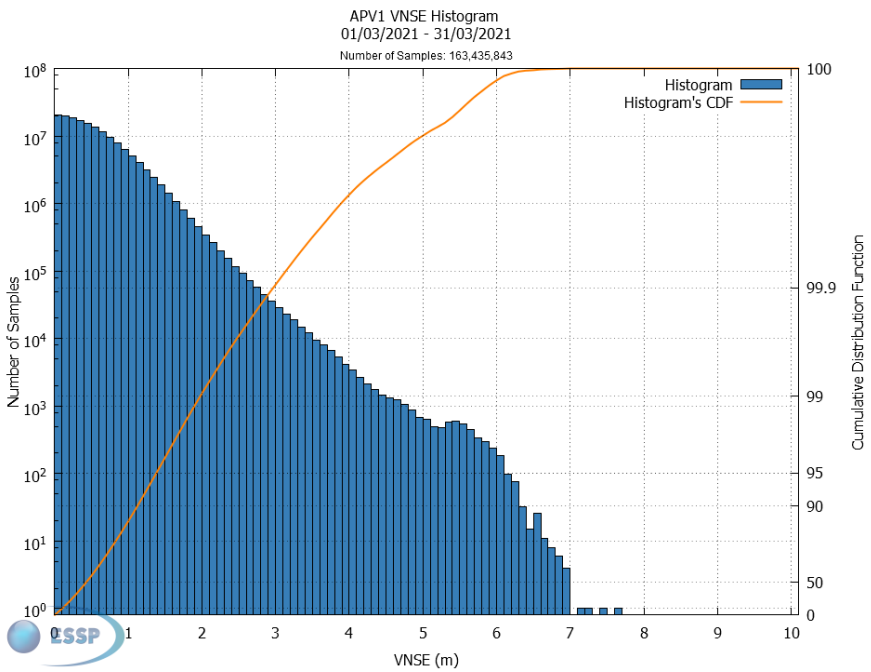

Figure 16 – EGNOS APV-I VNSE Histogram and Cumulative Probability

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3.2.5 EGNOS APV-I Performance at airports

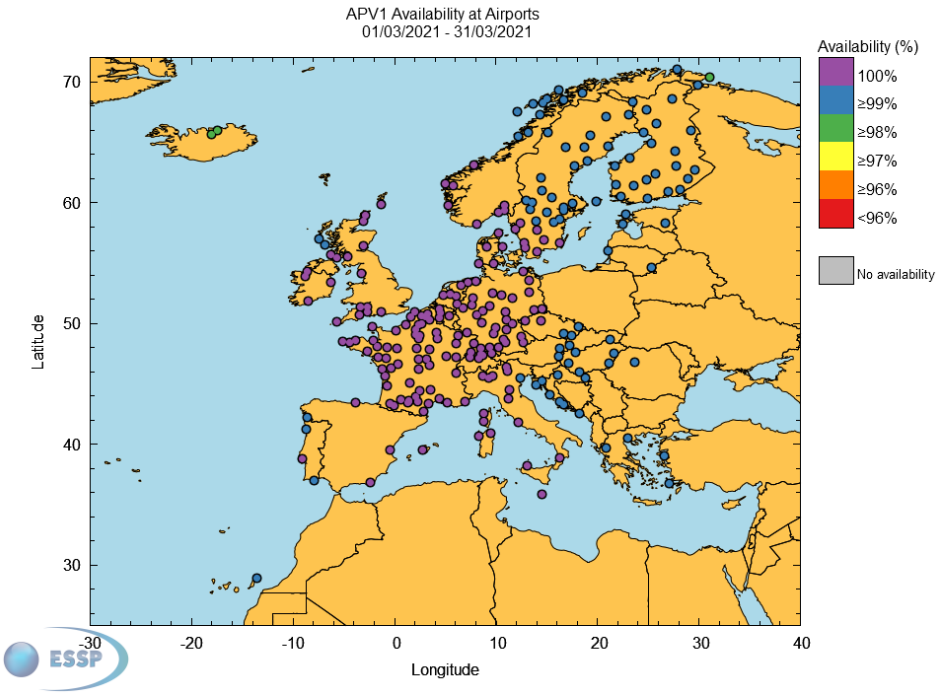

Figure 17 – EGNOS APV-I Availability at airports

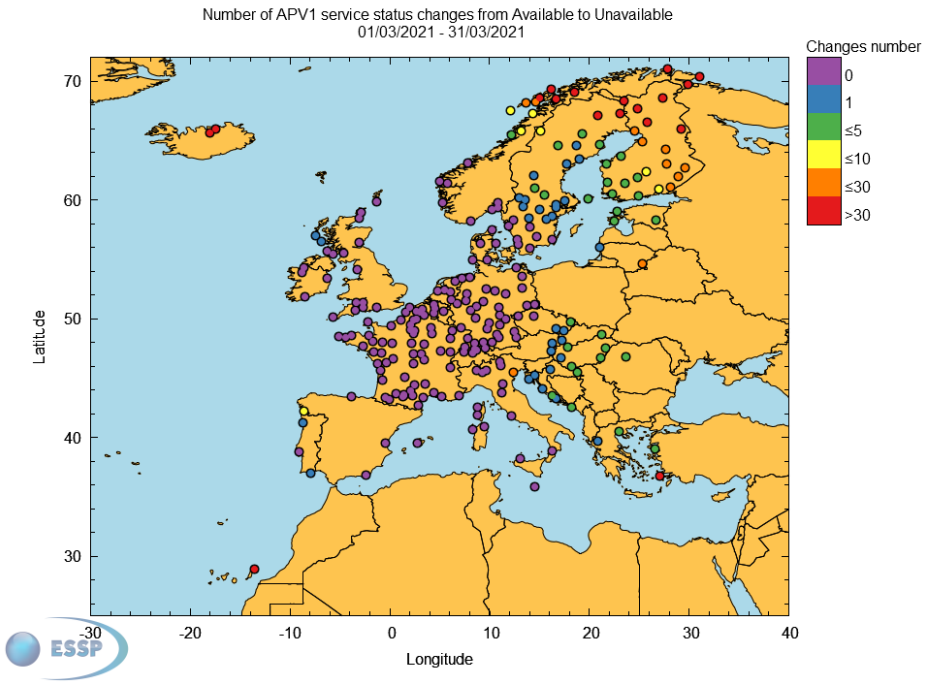

Figure 18 – EGNOS APV-I outages

See Appendix B for details of the APV-I Availability and Continuity at airports with published procedures using EGNOS.

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3.3 EGNOS Localizer Performance with Vertical Guidance to a decision altitude of 200ft (LPV-200)

3.3.1 EGNOS LPV-200 Availability

EGNOS LPV-200 Availability *is defined as the percentage of epochs in a month in which the Protection Level are below Alert Limits for this LPV-200 service (HPL<40m and VPL<35m) over the total period. This value corresponds to the performance obtained under fault-free conditions using all satellites in view.*

The following picture presents the EGNOS LPV-200 Availability over the current month using GEO-combined maps for the operational EGNOS GEOs.

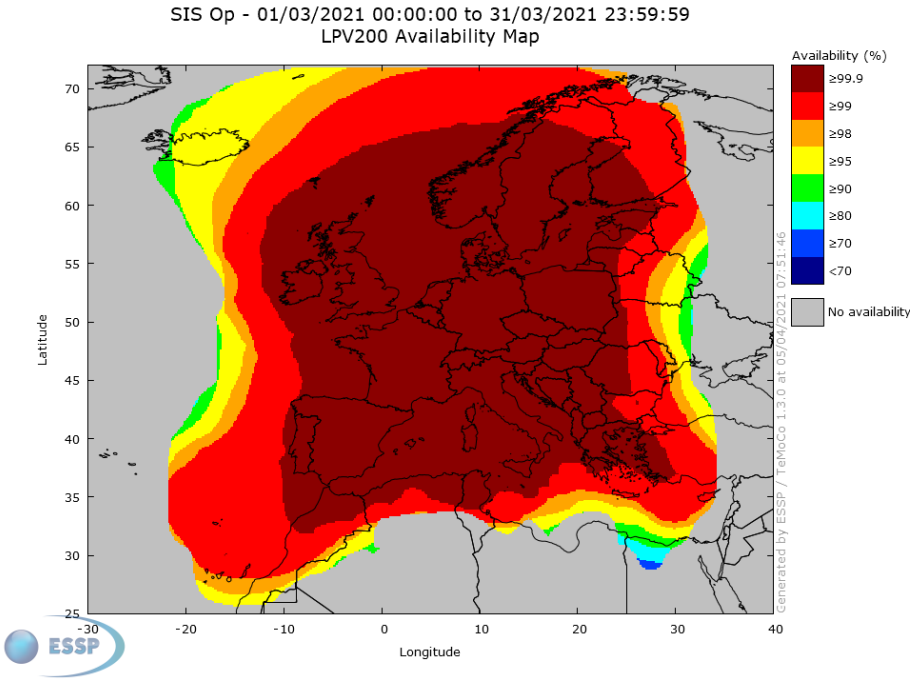

Figure 19 – EGNOS LPV-200 Availability

Below, the evolution of the monthly LPV-200 availability (99%) compliance area (30 days sliding window) is presented. The percentage is computed with respect to the commitment area at 99% level as defined in the SoL SDD ([RD-2]). The information is presented for the last 3 months.

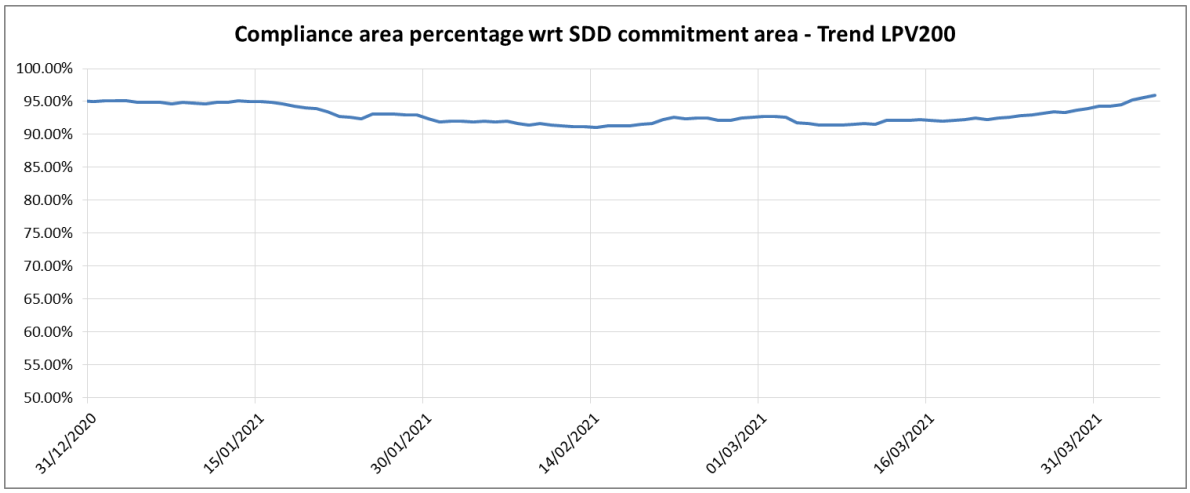

Figure 20 – EGNOS LPV-200 availability compliance trend

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3.3.2 EGNOS 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 in at least one of the following 15 seconds the system becomes not available. This value corresponds to the performance obtained under fault-free conditions using all satellites in view.*

The following picture presents the EGNOS LPV-200 Continuity over the current month using GEO-combined maps for the operational EGNOS GEOs.

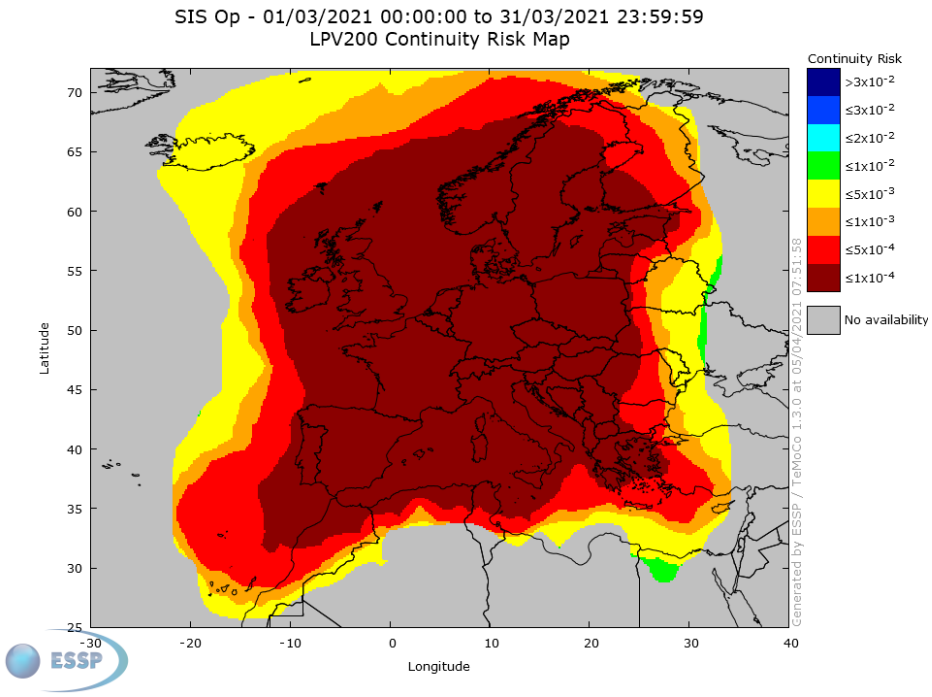

Figure 21 – EGNOS LPV-200 Continuity[2]

[2] The lack of additional performance levels in grey areas is due to the non-compliance in this region with the accuracy requirements imposed to LPV-200 service level. For more details please refer to section 6.3.3.1 of the EGNOS Safety of Life SDD [RD-2].

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3.3.3 EGNOS LPV-200 Integrity

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

No integrity event was detected.

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

The next 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 over the current month. These histograms have considered that Protection Level is below LPV-200 Alarm Limit.

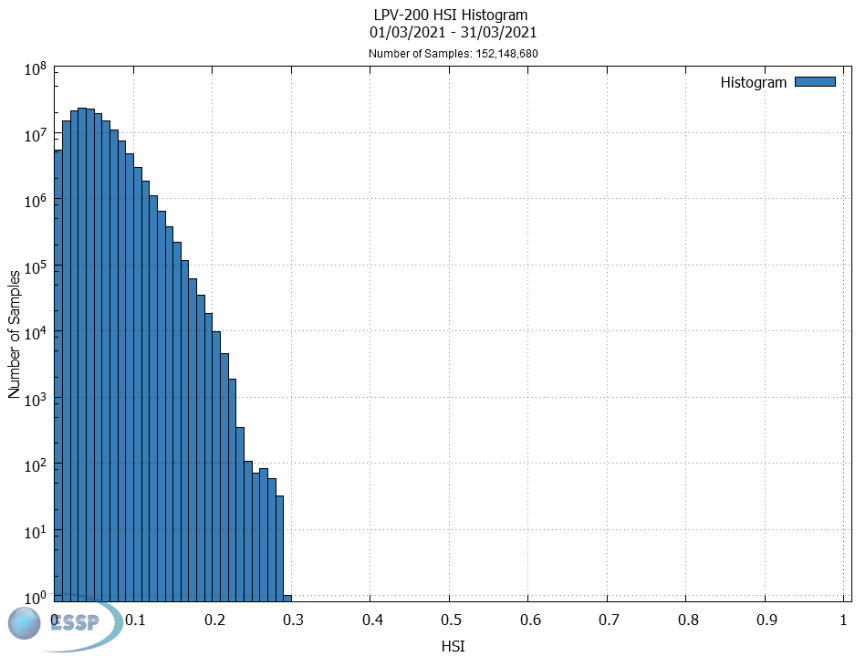

Figure 22 – EGNOS LPV-200 Horizontal Safety Index of the month

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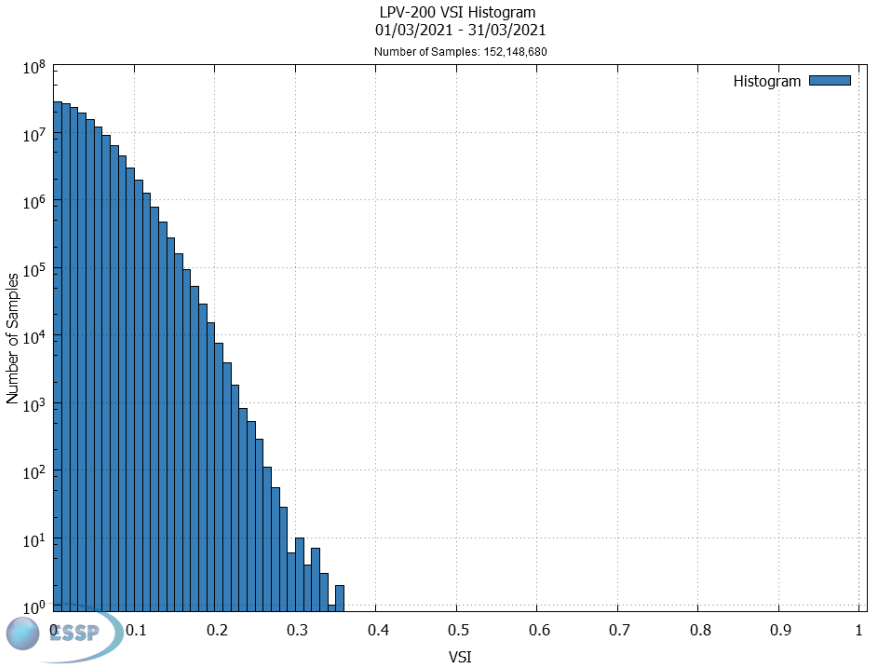

Figure 23 – EGNOS LPV-200 Vertical Safety Index of the month

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3.3.4 EGNOS LPV-200 Accuracy

EGNOS LPV-200 Accuracy *is reported as the 95th percentile of the Horizontal and Vertical Navigation System Error over the month, at the monitored sites when the LPV-200 service is available (HPL<40m and VPL<35m).*

The following table shows the monthly LPV-200 Accuracy values in meters per operational GEO combined satellite. See Appendix A for further details of the stations where LPV-200 Accuracy are reported.

Station	HNSE 95% (meters)	VNSE 95% (meters)	% of samples with LPV-200 service available
Agadir	1.0	1.3	100.00%
Aalborg	0.7	1.4	99.68%
Alexandria	1.0	1.3	93.82%
Athens	0.7	1.2	99.95%
Berlin	0.8	1.2	100.00%
Canary Islands	1.4	1.4	98.94%
Cork	0.9	1.3	99.98%
Catania	0.7	1.0	99.95%
Djerba	0.9	1.0	99.83%
Egilsstadir	0.7	1.7	97.75%
Glasgow	1.0	1.3	99.99%
Golbasi	0.8	1.2	99.17%
Gavle	0.7	1.5	99.99%
Jan Mayen	1.1	2.1	97.41%
Lappeenranta	0.7	1.4	99.93%
La Palma	1.1	1.5	99.04%
Lisboa	1.1	1.4	99.93%
Madeira	0.8	1.2	99.75%
Málaga	0.9	0.9	99.99%
Palma de Mallorca	0.7	0.9	100.00%
Reykjavik	0.9	1.6	94.69%
Roma	0.7	1.1	99.98%
S. de Compostela	0.9	1.0	99.92%
Sofia	1.2	1.7	99.94%
Swanwick	1.1	1.6	99.99%
Toulouse	0.8	1.1	100.00%
Trondheim	0.6	1.5	100.00%
Tromsoe	1.0	2.1	99.74%
Warsaw	0.8	1.4	99.99%
Zürich	0.8	1.2	100.00%

Table 5 – EGNOS LPV-200 Accuracy (95%) and percentage of time in LPV-200 mode at reference stations

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The next figures show the histogram and cumulative distribution function of HNSE (Horizontal Navigation System Error) and VNSE (Vertical Navigation System Error), which are computed at RIMS sites for each second over the current month.

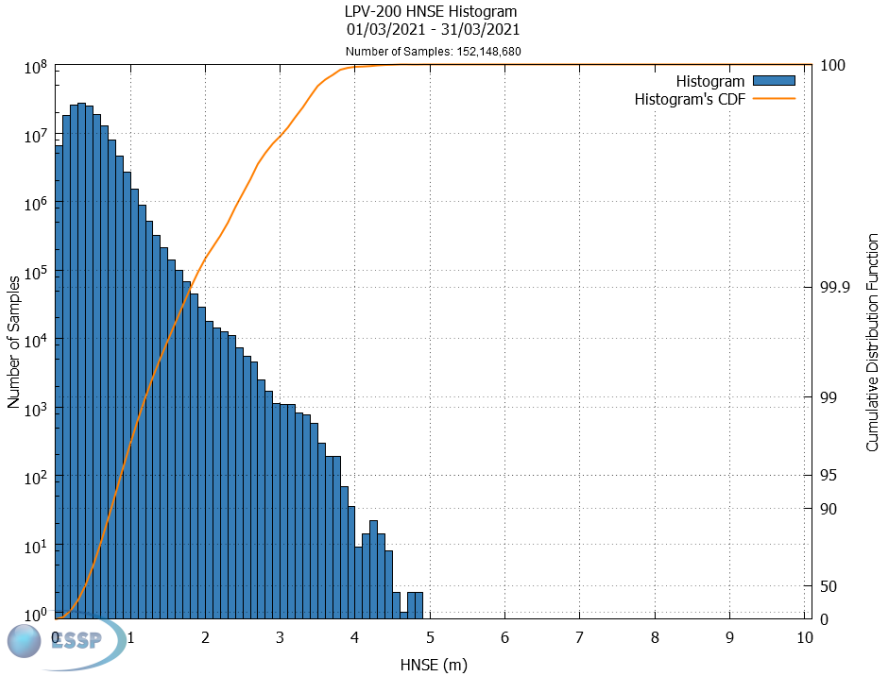

Figure 24 – EGNOS LPV-200 HNSE Histogram and Cumulative Probability

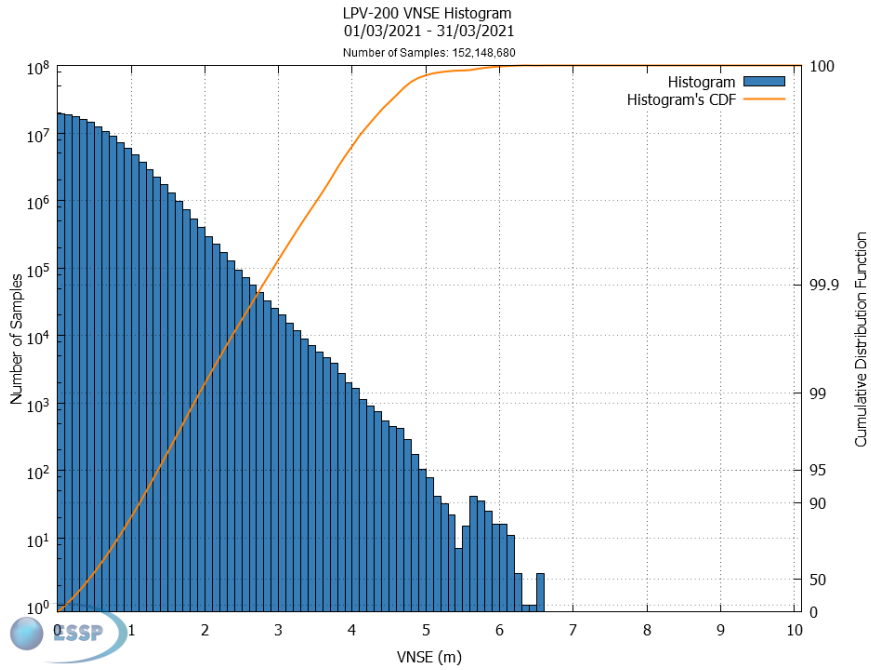

Figure 25 – EGNOS LPV-200 VNSE Histogram and Cumulative Probability

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3.3.5 EGNOS LPV-200 Performance at airports

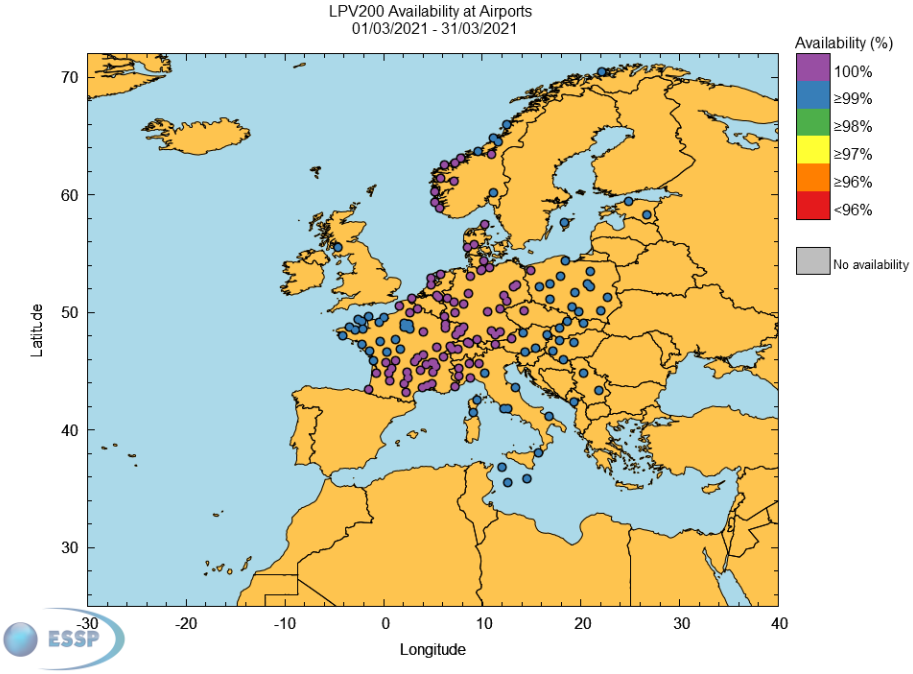

Figure 26 – EGNOS LPV-200 Availability at airports

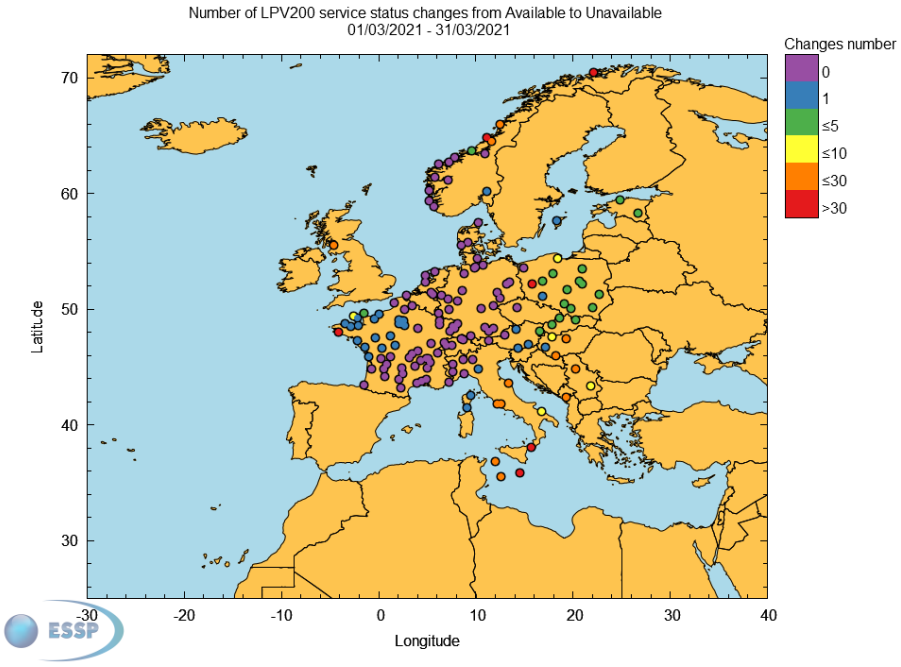

Figure 27 – EGNOS LPV-200 outages

See Appendix C for details of the LPV-200 Availability and Continuity at airports with published procedures using EGNOS.

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4 EGNOS DATA ACCESS SERVICE (EDAS)

EDAS (EGNOS Data Access Service) offers internet-based access to EGNOS data [RD-3]. It is the single point of access for the data collected and generated by the EGNOS infrastructure composed of ground stations distributed over Europe and North Africa.

The main data provided by EDAS are:

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

These data are provided through different EDAS Services in different formats in order to meet different set of applications and needs. For a description of the EDAS services, please refer to the EDAS SDD [RD-3].

Additional information on the EDAS services is available at the EDAS specific section of the EGNOS User Support website (https://egnos-user-support.essp-sas.eu), including the EDAS services status in real-time.

Below, the performance of EDAS Services (please refer to the EDAS SDD [RD-3] for definition details) corresponding to March 2021 is presented:

- Availability: Percentage of time during which the service provides the data according to the specifications.
- Latency: Average of the percentile 95% latencies monitored for every 5 minutes period within the month.

EDAS Service		Availability	Latency (ms)
Service Level 0	-	100.00%	726.81
Service Level 2	-	100.00%	727.29
Ntrip Service	-	100.00%	732.19
SISNeT Service	GEO Operational 1	99.73%	64.48
	GEO Operational 2	99.96%	64.74
Data Filtering Service	RIMS A	100.00%	619.39
	Central	100.00%	487.57
	MEDA	100.00%	497.55
	North-East	100.00%	201.06
	North-West	100.00%	485.94
	South-West	100.00%	604.42
FTP Service	-	100.00%	N/A

Table 6 – Performance of EDAS Services

It is noted that SISNeT performance was impacted by the SIS availability events affecting PRN 123 and PRN 136. For further information, please refer to section 1.

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5 EGNOS TIME SERVICE

The EGNOS Time Service supports timing application by providing specific corrections that allow the tracing of EGNOS Network Time (ENT) to the physical realisation of the Coordinated Universal Time by Observatoire de Paris, UTC (OP).

The **EGNOS Time Service availability**[3] is computed as the percentage of time per day in which it is possible to obtain the time solution referred to UTC scale by applying a valid offset between the EGNOS Network Time (ENT) and the UTC scale, provided through the EGNOS Message Type 12.

The information is presented for the combination of both operational GEOs. As it can be observed, the EGNOS Time Service availability was 100% or very close to 100% almost all days of the month except for 23rd March (94.76%).

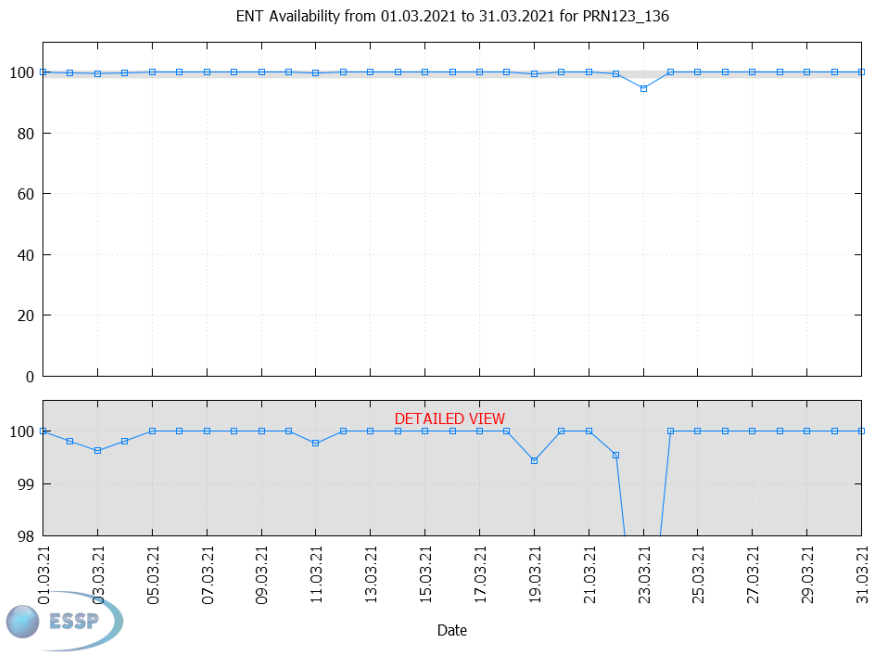

Figure 28 – EGNOS Time Service availability

[3] EGNOS Time Service availability is computed taking into account that it is not possible to obtain the time solution if the navigation solution cannot be computed. Therefore, if a SiS outage longer than 3 seconds happens the MT12 data will be set as invalid in order to simulate the unavailability of the receiver to compute the PVT solution and no Time Service will be available until a new valid MT12 is received. In order to take into account the user capability of switching from one operational GEO to the other in case of SiS outage, the EGNOS Time Service availability is computed over the combination of both GEOs.

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The EGNOS Network Time is computed assuring its alignment with the GPS timescale, due to this requirement it must be satisfied that the offset between both timescales is below 50ns. The next figure shows the relative consistency of both ENT and GPS timescales from December 2020 to February 2021. It can be observed that the offset between them remains below 15 nanoseconds.

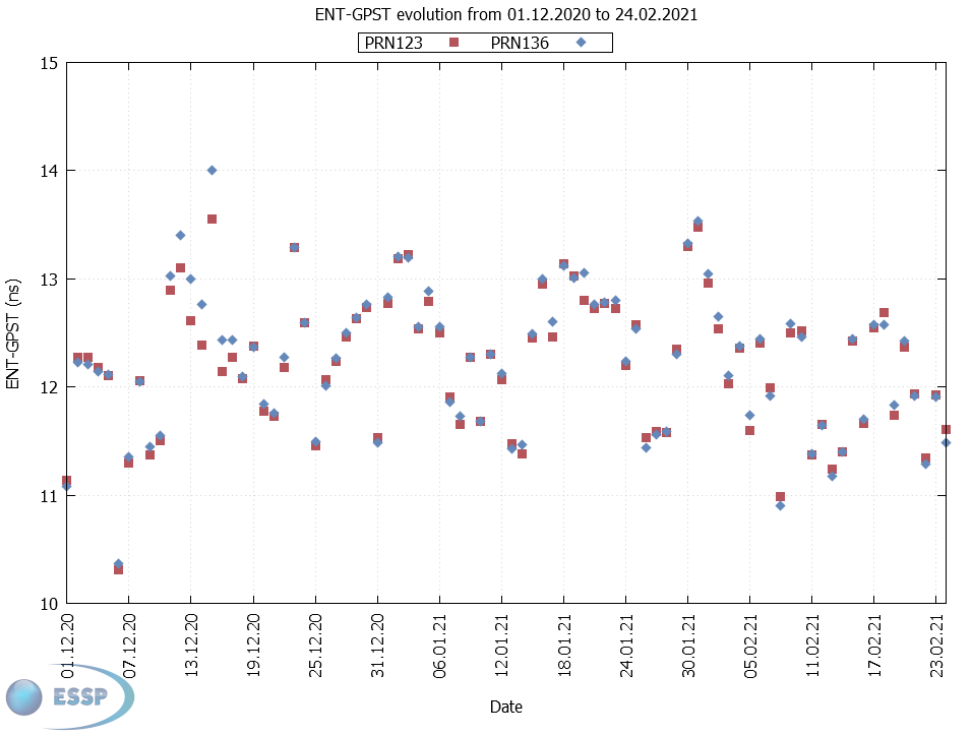

Figure 29 – ENT-GPS offset evolution

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FOR MORE INFORMATION

To get more information about EGNOS performance:

Please visit the EGNOS User Support website:

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

or

Contact the EGNOS helpdesk:

egnos-helpdesk@essp-sas.eu

+34 911 236 555

Or

Download the EGNOS app from the App Store or Google Play

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APPENDIX A RECEIVER MONITORING NETWORK

The receiver network used to report EGNOS performances in this document is based on the EGNOS monitoring stations (RIMS).

Next map shows the location of this receiver monitoring network, used in this report to present the EGNOS performances:

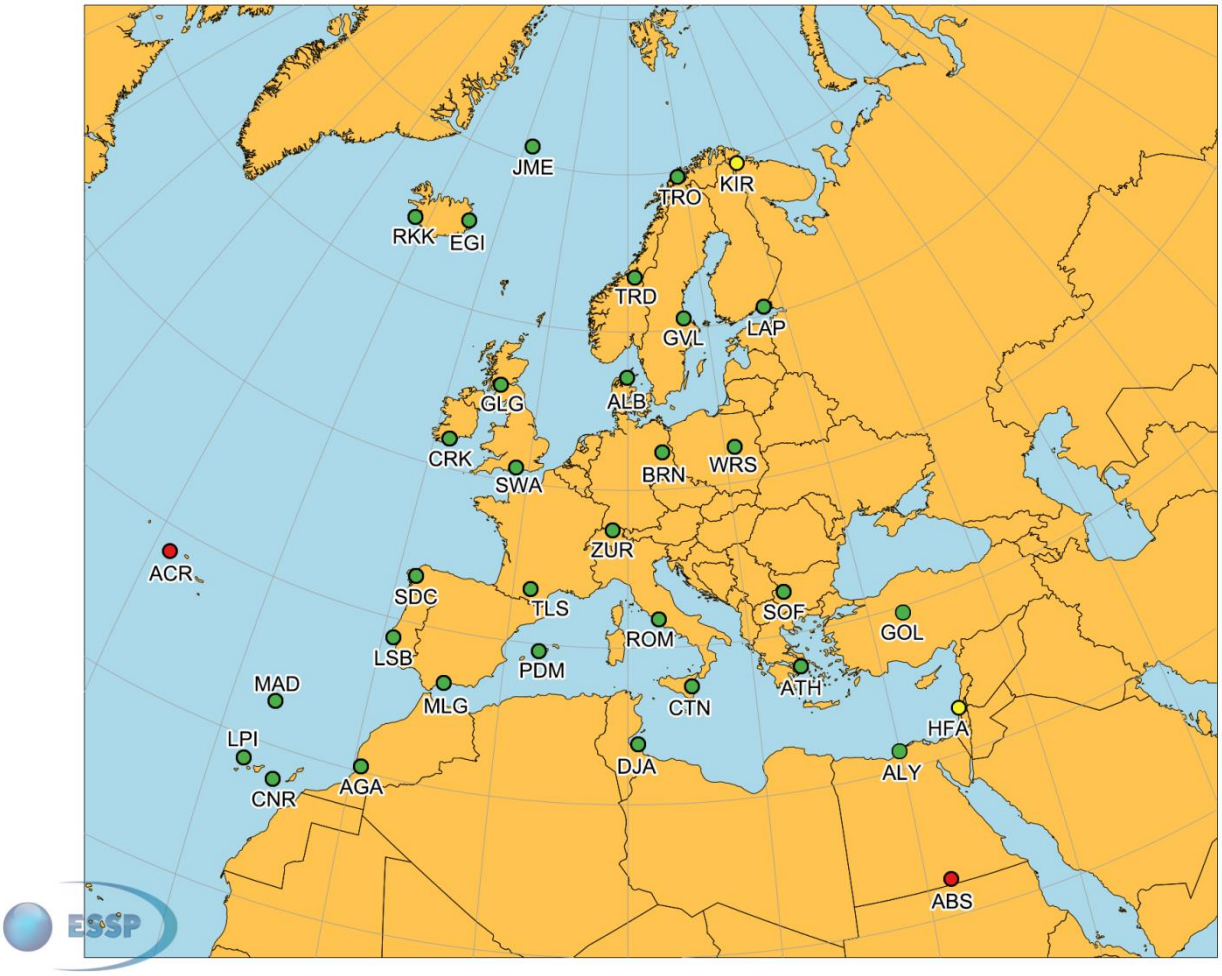

Figure 30 – EGNOS RIMS sites used in this report

The stations in green colour are used to report LPV-200.

The stations in green and yellow colour are used to report APV-I.

The stations in green and yellow are used to report Open Service results.

Performances corresponding to NPA include all the stations (green, yellow and red colours).

Next table shows the name and location of each one, also represents which service is used in each of them.

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Id	Location name	Country	APV-I	LPV-200	OS	NPA
ABS	RIMS Abu Simbel	Egypt				X
ACR	RIMS Azores	Portugal				X
ALB	RIMS Aalborg	Denmark	X	X	X	X
AGA	RIMS Agadir	Morocco	X	X	X	X
ALY	RIMS Alexandria	Egypt	X	X	X	X
ATH	RIMS Athens	Greece	X	X	X	X
BRN	RIMS Berlin	Germany	X	X	X	X
CNR	RIMS Canary Isl.	Spain	X	X	X	X
CRK	RIMS Cork	Ireland	X	X	X	X
CTN	RIMS Catania	Italy	X	X	X	X
DJA	RIMS Djerba	Tunisia	X	X	X	X
EGI	RIMS Egilsstadir	Iceland	X	X	X	X
GLG	RIMS Glasgow	United Kingdom	X	X	X	X
GOL	RIMS Golbasi	Turkey	X	X	X	X
GVL	RIMS Gävle	Sweden	X	X	X	X
HFA	RIMS Haifa	Israel	X		X	X
JME	RIMS Jan Mayen	Norway	X	X	X	X
KIR	RIMS Kirkenes	Norway	X		X	X
LAP	RIMS Lappeenranta	Finland	X	X	X	X
LPI	RIMS La Palma	Spain	X	X	X	X
LSB	RIMS Lisbon	Portugal	X	X	X	X
MAD	RIMS Madeira	Portugal	X	X	X	X
MLG	RIMS Málaga	Spain	X	X	X	X
PDM	RIMS Palma de Mallorca	Spain	X	X	X	X
RKK	RIMS Reykjavik	Iceland	X	X	X	X
ROM	RIMS Roma	Italy	X	X	X	X
SDC	RIMS S. de Compostela	Spain	X	X	X	X
SOF	RIMS Sofia	Bulgaria	X	X	X	X
SWA	RIMS Swanwick	United Kingdom	X	X	X	X
TLS	RIMS Toulouse	France	X	X	X	X
TRD	RIMS Trondheim	Norway	X	X	X	X
TRO	RIMS Tromsoe	Norway	X	X	X	X
WRS	RIMS Warsaw	Poland	X	X	X	X
ZUR	RIMS Zürich	Switzerland	X	X	X	X

Table 7 – List of sites where performances are reported

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 linked to local environment.

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APPENDIX B EGNOS APV-I PERFORMANCE AT AIRPORTS

The table reports APV-I Availability and Continuity at airports with published procedures using EGNOS. These values correspond to the performance obtained under fault-free conditions using all satellites in view:

Airports	Country	Monthly APV-I Availability	Monthly APV-I Continuity Risk	Outages[1]	Publication date of first APV-I procedure	APV-I Availability since procedure publication	APV-I Continuity Risk since procedure publication
BIAR / Akureyri	Iceland	98.90%	9.00E-04	539	21/05/2020	98.55%	9.01E-04
BIHU / Husavik	Iceland	98.94%	8.86E-04	621	29/03/2019	99.01%	6.61E-04
DT71/ Cles Helipad	Italy	100.00%	0.00E+00	0	30/01/2020	99.99%	4.08E-06
EBAW / Antwerpen / Deurne	Belgium	100.00%	0.00E+00	0	10/12/2015	99.98%	8.69E-06
EBBR / Brussels-National	Belgium	100.00%	0.00E+00	0	02/03/2017	99.98%	8.13E-06
EBCI / Charleroi / Brussels South	Belgium	100.00%	0.00E+00	0	31/03/2016	99.98%	6.63E-06
EBKT / Kortrijk/Wevelgem	Belgium	100.00%	0.00E+00	0	09/11/2017	99.99%	6.68E-06
EBLG / Liège	Belgium	100.00%	0.00E+00	0	13/10/2016	99.98%	8.92E-06
EDAB / Bautzen	Germany	100.00%	0.00E+00	0	27/04/2017	99.93%	1.60E-05
EDBH / Barth	Germany	100.00%	0.00E+00	0	03/06/2010	99.92%	1.72E-05
EDBM / Magdeburg/City	Germany	100.00%	0.00E+00	0	13/12/2012	99.93%	1.60E-05
EDBN / Neubrandenburg	Germany	100.00%	0.00E+00	0	02/04/2015	99.98%	1.24E-05
EDDC / Dresden	Germany	100.00%	0.00E+00	0	15/12/2011	99.93%	1.49E-05
EDDE / Erfurt-Weimar	Germany	100.00%	0.00E+00	0	15/12/2011	99.94%	1.28E-05
EDDF / Frankfurt Main	Germany	100.00%	0.00E+00	0	15/12/2011	99.94%	1.25E-05
EDDG / Münster/Osnabrück	Germany	100.00%	0.00E+00	0	15/12/2011	99.93%	1.48E-05
EDDL / Düsseldorf	Germany	100.00%	0.00E+00	0	15/12/2011	99.93%	1.25E-05
EDDN / Nürnberg	Germany	100.00%	0.00E+00	0	15/12/2011	99.94%	1.23E-05
EDDR / Saarbrücken	Germany	100.00%	0.00E+00	0	01/03/2018	99.99%	6.18E-06
EDDT / Berlin-Tegel	Germany	100.00%	0.00E+00	0	15/12/2011	99.93%	1.72E-05
EDDV / Hannover	Germany	100.00%	0.00E+00	0	15/12/2011	99.93%	1.57E-05
EDFQ / Allendorf/Eder	Germany	100.00%	0.00E+00	0	21/08/2014	99.93%	1.29E-05
EDGS / Siegerland	Germany	100.00%	0.00E+00	0	12/10/2017	99.99%	7.99E-06
EDJA / Memmingen	Germany	100.00%	0.00E+00	0	15/12/2011	99.93%	1.59E-05
EDLV / Niederrhein	Germany	100.00%	0.00E+00	0	23/06/2016	99.98%	7.76E-06
EDLW / Dortmund	Germany	100.00%	0.00E+00	0	12/12/2013	99.93%	1.37E-05

[1] *Outages* refer to events when the APV-I service changes its status from Available to Unavailable for the reported month.

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Airports	Country	Monthly APV-I Availability	Monthly APV-I Continuity Risk	Outages[1]	Publication date of first APV-I procedure	APV-I Availability since procedure publication	APV-I Continuity Risk since procedure publication
EDMA / Augsburg	Germany	100.00%	0.00E+00	0	15/12/2011	99.93%	1.54E-05
EDME / Eggenfelden	Germany	100.00%	0.00E+00	0	11/12/2014	99.93%	1.64E-05
EDMS / Straubing	Germany	100.00%	0.00E+00	0	11/12/2014	99.93%	1.41E-05
EDPR / Donauwörth	Germany	100.00%	0.00E+00	0	08/12/2016	99.99%	6.74E-06
EDQC / Coburg-Brandensteinsebene	Germany	100.00%	0.00E+00	0	11/12/2014	99.94%	1.17E-05
EDQD / Bayreuth	Germany	100.00%	0.00E+00	0	15/12/2011	99.94%	1.23E-05
EDQG / Giebelstadt	Germany	100.00%	0.00E+00	0	14/02/2012	99.94%	1.21E-05
EDTD / Donaueschingen-Villingen	Germany	100.00%	0.00E+00	0	11/12/2014	99.93%	1.54E-05
EDTL / Lahr	Germany	100.00%	0.00E+00	0	23/06/2016	99.99%	8.71E-06
EDTM / Mengen-Hohentengen	Germany	100.00%	0.00E+00	0	11/12/2014	99.93%	1.64E-05
EDTY / Schwäbisch-Hall	Germany	100.00%	0.00E+00	0	13/12/2012	99.94%	1.39E-05
EDVE / Braunschweig-Wolfsburg	Germany	100.00%	0.00E+00	0	18/10/2012	99.93%	1.61E-05
EDVK / Kassel-Calden	Germany	100.00%	0.00E+00	0	04/04/2013	99.97%	1.00E-05
EDWE / Emden	Germany	100.00%	0.00E+00	0	30/05/2013	99.98%	1.13E-05
EDWI / Wilhelmshaven JadeWeserAirport	Germany	100.00%	0.00E+00	0	15/12/2011	99.92%	1.57E-05
EDXW / Sylt	Germany	100.00%	0.00E+00	0	10/12/2015	99.98%	1.37E-05
EEKA / KÄRDLA	Estonia	99.98%	1.68E-05	3	31/01/2019	99.97%	2.31E-05
EEKE / Kuressaare	Estonia	99.98%	1.68E-05	3	02/03/2017	99.97%	2.08E-05
EETU / Tartu	Estonia	99.93%	2.80E-05	5	18/07/2019	99.93%	4.87E-05
EFET / Enontekiö	Finland	99.87%	1.63E-04	95	07/12/2017	99.81%	1.81E-04
EFHA / Halli	Finland	99.98%	1.68E-05	4	03/12/2020	99.94%	4.89E-05
EFHK / Helsinki-Vantaa	Finland	99.98%	1.68E-05	4	27/02/2020	99.94%	6.03E-05
EFIV / Ivalo	Finland	99.74%	1.97E-04	88	07/12/2017	99.45%	4.75E-04
EFJO / Joensuu	Finland	99.90%	8.04E-05	16	12/12/2013	99.72%	1.75E-04
EFJY / Jyväskylä	Finland	99.98%	2.80E-05	6	07/12/2017	99.91%	6.93E-05
EFKE / Kemi-Tornio	Finland	99.94%	9.00E-05	24	07/12/2017	99.90%	1.24E-04
EFKI / Kajaani	Finland	99.94%	6.39E-05	18	07/12/2017	99.82%	1.52E-04
EFKK / Kokkola-Pietarsaari	Finland	99.99%	1.12E-05	2	07/12/2017	99.95%	5.15E-05
EFKS / Kuusamo	Finland	99.85%	1.64E-04	79	07/12/2017	99.47%	4.13E-04
EFKT / Kittilä	Finland	99.87%	1.65E-04	85	07/12/2017	99.78%	2.01E-04
EFKU / Kuopio	Finland	99.96%	4.93E-05	13	07/12/2017	99.84%	1.12E-04

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EFLP / Lappeenranta	Finland	99.93%	5.31E-05	12	07/12/2017	99.85%	9.81E-05
EFMA / MARIEHAMN	Finland	99.98%	1.68E-05	3	29/03/2019	99.97%	1.26E-05
EFOU / Oulu	Finland	99.97%	5.00E-05	19	07/12/2017	99.91%	9.45E-05
EFPO / Pori	Finland	99.98%	1.68E-05	3	07/12/2017	99.96%	2.58E-05
EFRO / Rovaniemi	Finland	99.87%	1.50E-04	68	07/12/2017	99.80%	2.08E-04
EFSA / Savonlinna	Finland	99.91%	7.29E-05	13	07/12/2017	99.79%	1.31E-04
EFTP / Tampere-Pirkkala	Finland	99.98%	1.68E-05	3	07/12/2017	99.95%	4.00E-05
EFTU / Turku	Finland	99.98%	1.68E-05	3	07/12/2017	99.97%	2.09E-05
EFUT / Utti	Finland	99.97%	3.92E-05	7	28/01/2021	99.96%	3.80E-05
EFVA / Vaasa	Finland	99.99%	1.12E-05	2	07/12/2017	99.97%	3.61E-05
EGEC / Campbeltown	United Kingdom	100.00%	0.00E+00	0	23/06/2016	99.93%	3.91E-05
EGFF / Cardiff	United Kingdom	100.00%	0.00E+00	0	13/10/2016	99.97%	1.94E-05
EGGD / Bristol	United Kingdom	100.00%	0.00E+00	0	21/08/2014	99.97%	1.50E-05
EGHC / Lands End	United Kingdom	100.00%	0.00E+00	0	27/04/2017	99.98%	1.42E-05
EGHG / Yeovil	United Kingdom	100.00%	0.00E+00	0	09/06/2017	99.98%	1.31E-05
EGHI / Southampton	United Kingdom	100.00%	0.00E+00	0	11/10/2018	99.98%	8.10E-06
EGJA / Alderney	Guernsey	100.00%	0.00E+00	0	07/12/2011	99.93%	1.38E-05
EGNL / Barrow/Walney Island	United Kingdom	100.00%	0.00E+00	0	23/06/2016	99.95%	3.17E-05
EGPA / Kirkwall	United Kingdom	100.00%	0.00E+00	0	21/07/2016	99.91%	4.39E-05
EGPB / Sumburgh	United Kingdom	100.00%	0.00E+00	0	11/10/2018	99.92%	4.66E-05
EGPC / Wick	United Kingdom	100.00%	0.00E+00	0	23/06/2016	99.91%	4.50E-05
EGPI / Islay	United Kingdom	100.00%	0.00E+00	0	18/08/2016	99.93%	4.02E-05
EGPK / Prestwick	United Kingdom	100.00%	0.00E+00	0	30/01/2020	99.94%	4.18E-05
EGPN / Dundee	United Kingdom	100.00%	0.00E+00	0	30/03/2017	99.93%	3.28E-05
EGPR / Barra	United Kingdom	99.99%	5.60E-06	1	18/08/2016	99.91%	4.58E-05
EGPU / Tiree	United Kingdom	99.99%	5.60E-06	1	04/02/2016	99.92%	4.28E-05
EGTE / Exeter	United Kingdom	100.00%	0.00E+00	0	21/08/2014	99.98%	1.20E-05
EHAM / Amsterdam	Netherlands	100.00%	0.00E+00	0	13/11/2014	99.98%	1.17E-05
EHGG / Eelde	Netherlands	100.00%	0.00E+00	0	13/11/2014	99.98%	1.17E-05

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EHLE / Lelystad	Netherlands	100.00%	0.00E+00	0	05/12/2019	99.99%	8.45E-06
EHTE / Teuge	Netherlands	100.00%	0.00E+00	0	13/11/2014	99.98%	9.79E-06
EICK / Cork Airport	Ireland	100.00%	0.00E+00	0	16/08/2018	99.94%	4.04E-05
EIDW / Dublin	Ireland	100.00%	0.00E+00	0	25/05/2017	99.95%	3.64E-05
EIKN / Ireland West Airport	Ireland	100.00%	0.00E+00	0	25/03/2021	100.00%	0.00E+00
EISG / Sligo	Ireland	100.00%	0.00E+00	0	25/03/2021	100.00%	0.00E+00
EKAH / Aarhus	Denmark	100.00%	0.00E+00	0	05/03/2015	99.98%	1.36E-05
EKKA / Karup	Denmark	100.00%	0.00E+00	0	02/04/2015	99.98%	1.37E-05
EKSB / Sønderborg	Denmark	100.00%	0.00E+00	0	18/08/2016	99.98%	1.33E-05
EKSN / Sindal	Denmark	100.00%	0.00E+00	0	18/06/2020	99.98%	1.67E-05
ENAN / Andøya/Andenes	Norway	99.89%	1.13E-04	64	02/04/2015	99.82%	1.20E-04
ENBL / Førde/Bringeland	Norway	100.00%	0.00E+00	0	28/05/2015	99.96%	2.35E-05
ENBN / Brønnøysund/Brønnøy	Norway	99.99%	1.76E-05	5	08/12/2016	99.95%	4.33E-05
ENBO / Bodo	Norway	99.96%	2.76E-05	10	06/12/2018	99.89%	9.86E-05
ENCN / Kristiansand/Kjevik	Norway	100.00%	0.00E+00	0	03/03/2016	99.97%	1.68E-05
ENDU / Bardufoss	Norway	99.90%	1.40E-04	74	26/04/2018	99.84%	1.47E-04
ENEV / Harstad/Narvik/Evenes	Norway	99.91%	1.02E-04	42	30/03/2017	99.85%	1.14E-04
ENFL / Florø	Norway	100.00%	0.00E+00	0	02/04/2015	99.96%	2.55E-05
ENKB / Kristiansund/Kvernberget	Norway	100.00%	0.00E+00	0	26/05/2016	99.96%	2.36E-05
ENKR / Kirkenes/Hoybuktmoen	Norway	99.24%	5.59E-04	207	27/04/2017	98.69%	8.29E-04
ENLK / Leknes	Norway	99.94%	6.24E-05	17	02/02/2017	99.87%	9.33E-05
ENMH / Mehamn	Norway	99.18%	6.54E-04	305	29/03/2019	98.52%	9.70E-04
ENMS / Mosjøen/Kjærstad	Norway	99.96%	2.99E-05	8	30/03/2017	99.94%	5.09E-05
ENRS / Røst	Norway	99.92%	2.35E-05	8	06/03/2014	99.85%	9.47E-05
ENRY / Moss/Rygge	Norway	100.00%	0.00E+00	0	10/12/2015	99.97%	1.74E-05
ENSH / Svolvær/Helle	Norway	99.92%	7.55E-05	22	08/12/2016	99.86%	9.57E-05
ENSK / Stokmarknes/Skagen	Norway	99.91%	1.05E-04	51	08/12/2016	99.85%	1.07E-04
ENSO / Stord/Sørstokken	Norway	100.00%	0.00E+00	0	03/03/2016	99.96%	2.11E-05
ENSS / Vardø/Svartnes	Norway	98.86%	7.33E-04	292	03/12/2020	97.97%	1.18E-03
ENTO / Sandefjord/Torp	Norway	100.00%	0.00E+00	0	20/08/2015	99.97%	1.71E-05

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ENTX / Oslo Helikopterplass Taraldrud	Norway	100.00%	0.00E+00	0	25/03/2021	100.00%	0.00E+00
ESCM / Uppsala	Sweden	99.99%	5.60E-06	1	21/05/2020	99.98%	1.23E-05
ESGJ / Jönköping	Sweden	100.00%	0.00E+00	0	09/11/2017	99.98%	1.26E-05
ESGP / Säve	Sweden	100.00%	0.00E+00	0	05/11/2020	99.97%	2.76E-05
ESGR / Skövde	Sweden	99.99%	5.60E-06	1	31/05/2018	99.98%	1.18E-05
ESGT / Trollhättan-Vänersborgs flygplats	Sweden	100.00%	0.00E+00	0	29/03/2018	99.97%	1.23E-05
ESKM / Mora / Silijan	Sweden	99.99%	1.12E-05	2	30/01/2020	99.99%	1.16E-05
ESMK / Kristianstad	Sweden	100.00%	0.00E+00	0	06/12/2018	99.98%	1.08E-05
ESMQ / Kalmar Öland Airport	Sweden	100.00%	0.00E+00	0	29/03/2019	99.97%	1.05E-05
ESMT / Halmstad	Sweden	100.00%	0.00E+00	0	08/11/2018	99.98%	9.61E-06
ESMX / Växjö Kronoberg	Sweden	100.00%	0.00E+00	0	25/04/2019	99.97%	1.18E-05
ESND / Sveg	Sweden	99.99%	5.60E-06	1	31/01/2019	99.97%	1.53E-05
ESNG / Lapland Airport	Sweden	99.91%	8.93E-05	31	20/06/2019	99.88%	1.34E-04
ESNK / Kramfors-Sollefteå	Sweden	99.99%	5.60E-06	1	13/08/2020	99.98%	1.74E-05
ESNL / Lycksele Airport	Sweden	99.99%	5.60E-06	1	15/08/2019	99.96%	4.56E-05
ESNO / Örnsköldsvik	Sweden	99.99%	5.60E-06	1	07/12/2017	99.97%	2.64E-05
ESNS /Skellefteå Airport	Sweden	99.99%	1.68E-05	3	29/03/2019	99.95%	5.92E-05
ESNV /Vilhelmina	Sweden	100.00%	1.19E-05	3	27/02/2020	99.95%	5.39E-05
ESNX / Arvidsjaur	Sweden	99.98%	1.79E-05	5	05/12/2019	99.92%	8.67E-05
ESOE / Örebro Airport	Sweden	99.99%	5.60E-06	1	16/08/2018	99.97%	1.08E-05
ESOH /Hagfors	Sweden	99.99%	5.60E-06	1	30/01/2020	99.99%	9.27E-06
ESOK / Karlstad	Sweden	99.99%	5.60E-06	1	05/11/2020	99.97%	3.07E-05
ESOW / Stockholm / Västerås	Sweden	99.99%	5.60E-06	1	30/01/2020	99.99%	9.29E-06
ESSD / Borlänge Dala	Sweden	99.99%	1.12E-05	2	05/11/2020	99.97%	2.50E-05
ESSL / Linköping/Saab	Sweden	99.99%	5.60E-06	1	31/01/2019	99.97%	9.83E-06
ESSP / Norrköping Kungsängen	Sweden	99.99%	5.60E-06	1	29/03/2018	99.98%	9.21E-06
ESST / Torsby	Sweden	99.99%	5.60E-06	1	23/05/2019	99.97%	1.44E-05
ESSU / Eskilstuna	Sweden	99.99%	5.60E-06	1	10/09/2020	99.98%	1.94E-05
ESTA / Ängelholm	Sweden	100.00%	0.00E+00	0	19/07/2018	99.98%	1.09E-05
ESUP / Pajala	Sweden	99.90%	1.20E-04	50	31/12/2020	99.89%	1.72E-04

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ESUT / Hemavan Tärnaby Airport AB	Sweden	99.96%	2.50E-05	8	11/10/2018	99.93%	5.83E-05
EYPA / Palanga	Lithuania	99.97%	2.48E-05	1	25/03/2021	99.97%	2.48E-05
EYVI / Vilnius	Lithuania	99.92%	6.76E-05	29	16/07/2020	99.93%	5.03E-05
GCRR / Lanzarote AD	Spain	99.92%	1.60E-04	168	23/05/2019	99.94%	7.14E-05
LDDU / Dubrovnik	Croatia	99.99%	5.60E-06	2	10/12/2015	99.98%	2.10E-05
LDOS / Osijek/Klisa	Croatia	99.99%	5.60E-06	1	29/03/2018	99.99%	8.61E-06
LDPL / Pula	Croatia	99.98%	1.12E-05	2	26/04/2018	99.98%	2.14E-05
LDRI / Rijeka	Croatia	99.99%	5.60E-06	1	10/10/2019	99.99%	4.66E-06
LDSB / Brac	Croatia	99.99%	5.60E-06	1	05/12/2019	99.99%	9.93E-06
LDSP / Split/Kastela	Croatia	99.99%	1.19E-05	3	10/10/2019	99.99%	7.88E-06
LDZA / Zagreb/Pleso	Croatia	99.99%	5.60E-06	1	29/03/2018	99.98%	9.35E-06
LDZD / Zadar	Croatia	99.99%	5.60E-06	1	11/10/2018	99.99%	8.27E-06
LEAM / Almería	Spain	100.00%	0.00E+00	0	02/02/2017	99.99%	1.08E-05
LEPA / Palma de Mallorca	Spain	100.00%	0.00E+00	0	01/03/2018	99.99%	6.66E-06
LEVC / Valencia	Spain	100.00%	0.00E+00	0	01/02/2018	99.99%	9.30E-06
LEVX / Vigo	Spain	99.98%	2.46E-05	7	05/12/2019	99.96%	3.72E-05
LEXJ / Santander	Spain	100.00%	0.00E+00	0	17/10/2013	99.95%	3.38E-05
LFAB / Dieppe Saint Aubin	France	100.00%	0.00E+00	0	02/03/2017	99.98%	6.46E-06
LFAC / Calais	France	100.00%	0.00E+00	0	20/09/2012	99.96%	1.36E-05
LFAQ / Albert Bray	France	100.00%	0.00E+00	0	15/11/2012	99.96%	1.12E-05
LFAT / Le Touquet Paris Plage	France	100.00%	0.00E+00	0	04/02/2016	99.98%	7.89E-06
LFAV / Valenciennes Denain	France	100.00%	0.00E+00	0	19/09/2013	99.98%	8.91E-06
LFAY / Amiens Glisy	France	100.00%	0.00E+00	0	27/06/2013	99.96%	9.92E-06
LFBD / Bordeaux Merignac	France	100.00%	0.00E+00	0	08/03/2012	99.92%	1.62E-05
LFBF / Toulouse Francazal	France	100.00%	0.00E+00	0	23/06/2016	99.99%	6.44E-06
LFBH / La Rochelle	France	100.00%	0.00E+00	0	20/09/2012	99.96%	1.47E-05
LFBI / Poitiers Biard	France	100.00%	0.00E+00	0	12/11/2015	99.98%	7.02E-06
LFBK / Montluçon Gueret	France	100.00%	0.00E+00	0	17/12/2013	99.98%	1.28E-05
LFBN / Niort Marais Poitevin	France	100.00%	0.00E+00	0	02/03/2017	99.98%	7.72E-06
LFBO / Toulouse Blagnac	France	100.00%	0.00E+00	0	03/05/2012	99.93%	1.54E-05

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LFBP / Pau-Pyrénées	France	100.00%	0.00E+00	0	17/03/2011	99.92%	2.07E-05
LFBR / Muret Lherm	France	100.00%	0.00E+00	0	15/10/2015	99.99%	7.16E-06
LFBT / Tarbes Lourdes Pyrénées	France	100.00%	0.00E+00	0	28/05/2015	99.99%	7.63E-06
LFCI / Albi Le Sequestre	France	100.00%	0.00E+00	0	26/05/2016	99.99%	7.67E-06
LFCK / Castres Mazamet	France	100.00%	0.00E+00	0	22/08/2013	99.98%	1.46E-05
LFCR / Rodez Marcillac	France	100.00%	0.00E+00	0	31/05/2012	99.93%	1.60E-05
LFCY / Royan Médis	France	100.00%	0.00E+00	0	30/04/2015	99.98%	8.09E-06
LFDH / Auch Lamothe	France	100.00%	0.00E+00	0	28/05/2015	99.99%	7.29E-06
LFEC / Ouessant	France	100.00%	0.00E+00	0	11/12/2014	99.98%	1.21E-05
LFHY / Moulins Montbeugny	France	100.00%	0.00E+00	0	01/05/2014	99.99%	7.89E-06
LFJL / Metz Nancy Lorraine	France	100.00%	0.00E+00	0	04/04/2013	99.97%	1.29E-05
LFKC / Calvi Sainte Catherine	France	100.00%	0.00E+00	0	30/04/2015	99.99%	7.59E-06
LFKJ / Ajaccio Napoléon Bonaparte	France	100.00%	0.00E+00	0	23/06/2016	99.99%	6.65E-06
LFLA / Auxerre Branches	France	100.00%	0.00E+00	0	21/08/2014	99.99%	8.26E-06
LFLD / Bourges	France	100.00%	0.00E+00	0	18/08/2016	99.99%	6.23E-06
LFLP / Annecy Meythet	France	100.00%	0.00E+00	0	19/09/2013	99.98%	1.35E-05
LFMD / Cannes Mandelieu	France	100.00%	0.00E+00	0	05/02/2015	99.99%	8.83E-06
LFML / Marseille	France	100.00%	0.00E+00	0	08/01/2015	99.99%	7.76E-06
LFMP / Perpignan Rivesaltes	France	100.00%	0.00E+00	0	15/10/2015	99.99%	7.48E-06
LFMU / Béziers Vias	France	100.00%	0.00E+00	0	18/10/2012	99.96%	1.43E-05
LFNB / Mende	France	100.00%	0.00E+00	0	17/12/2013	99.98%	1.27E-05
LFOB / Beauvais	France	100.00%	0.00E+00	0	20/09/2012	99.96%	1.15E-05
LFOK / Chalons Vatry	France	100.00%	0.00E+00	0	02/02/2017	99.99%	6.98E-06
LFOU / Cholet le Pontreau	France	100.00%	0.00E+00	0	04/02/2016	99.98%	7.75E-06
LFOV / Laval Entrammes	France	100.00%	0.00E+00	0	26/04/2018	99.98%	7.77E-06
LFOZ / Orléans St. Denis De L'Hotel	France	100.00%	0.00E+00	0	28/06/2012	99.97%	1.24E-05
LFPB / Paris-Le Bourget	France	100.00%	0.00E+00	0	02/06/2011	99.93%	1.20E-05
LFPO / Paris Orly	France	100.00%	0.00E+00	0	30/05/2013	99.96%	1.13E-05
LFPT / Pontoise Cormeilles en Vexin	France	100.00%	0.00E+00	0	01/05/2014	99.98%	8.25E-06
LFQA / Reims Prunay	France	100.00%	0.00E+00	0	03/04/2014	99.98%	9.15E-06

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Airports	Country	Monthly APV-I Availability	Monthly APV-I Continuity Risk	Outages[1]	Publication date of first APV-I procedure	APV-I Availability since procedure publication	APV-I Continuity Risk since procedure publication
LFQG / Nevers Fouchambault	France	100.00%	0.00E+00	0	13/12/2012	99.97%	1.26E-05
LFQM / Besançon La Vèze	France	100.00%	0.00E+00	0	18/09/2014	99.99%	9.83E-06
LFQQ / Lille Lesquin	France	100.00%	0.00E+00	0	26/06/2014	99.98%	7.19E-06
LFQT / Merville	France	100.00%	0.00E+00	0	15/11/2012	99.96%	1.14E-05
LFRB / Brest Bretagne	France	100.00%	0.00E+00	0	03/05/2012	99.92%	1.76E-05
LFRD / Dinard	France	100.00%	0.00E+00	0	06/02/2014	99.98%	1.04E-05
LFRG / Deauville Saint Gatien	France	100.00%	0.00E+00	0	18/09/2014	99.98%	8.16E-06
LFRM / Le Mans	France	100.00%	0.00E+00	0	15/11/2012	99.96%	1.35E-05
LFRN / Rennes	France	100.00%	0.00E+00	0	30/05/2013	99.96%	1.34E-05
LFRS / Nantes	France	100.00%	0.00E+00	0	28/06/2012	99.96%	1.51E-05
LFRU / Morlaix Ploujean	France	100.00%	0.00E+00	0	13/10/2016	99.98%	9.37E-06
LFRV / Vannes Meucon	France	100.00%	0.00E+00	0	31/05/2012	99.92%	1.53E-05
LFSB / Bâle-Mulhouse	France	100.00%	0.00E+00	0	10/12/2015	99.99%	7.98E-06
LFSD / Dijon-Longvic	France	100.00%	0.00E+00	0	28/04/2016	99.99%	6.83E-06
LFSG / Epinal Mirecourt	France	100.00%	0.00E+00	0	30/05/2013	99.97%	1.36E-05
LFSL / Brive Souillac	France	100.00%	0.00E+00	0	22/08/2013	99.98%	1.43E-05
LFTW / Nîmes Garons	France	100.00%	0.00E+00	0	18/10/2012	99.96%	1.34E-05
LGIO / Ioannina	Greece	99.99%	5.60E-06	1	27/02/2020	99.97%	1.01E-04
LGKO / Kos	Greece	99.96%	6.46E-05	65	27/02/2020	99.85%	1.53E-04
LGMT / Mitilini	Greece	99.98%	5.60E-06	2	27/02/2020	99.95%	1.24E-04
LGTS / Thessaloniki	Greece	99.98%	5.60E-06	2	27/02/2020	99.96%	1.19E-04
LHBC / Békéscsaba Repülőtér	Hungary	99.98%	1.12E-05	3	28/01/2021	99.96%	7.26E-05
LHDC / Debrecen International Airport	Hungary	99.98%	1.12E-05	3	30/01/2020	99.98%	4.20E-05
LHPP / Pecs-Pogany Airport	Hungary	99.98%	1.12E-05	2	03/12/2020	99.98%	3.08E-05
LHPR / Győr-Pér	Hungary	99.99%	1.12E-05	3	25/02/2021	99.99%	9.92E-06
LHSM / Heviz-Balaton	Hungary	99.99%	2.48E-05	1	25/03/2021	99.99%	2.48E-05
LICA / Lamezia Terme	Italy	100.00%	0.00E+00	0	23/05/2018	99.98%	2.19E-05
LICJ / PALERMO/Punta Raisi	Italy	100.00%	0.00E+00	0	11/10/2018	99.98%	8.28E-06
LIDT / Trento/Mattarello	Italy	100.00%	0.00E+00	0	30/01/2020	99.99%	4.10E-06
LIEA / ALGHERO/Fertilia	Italy	100.00%	0.00E+00	0	11/10/2018	99.99%	6.35E-06
LIEO / Olbia/Costa Smeralda	Italy	100.00%	0.00E+00	0	12/11/2015	99.99%	7.99E-06

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Airports	Country	Monthly APV-I Availability	Monthly APV-I Continuity Risk	Outages[1]	Publication date of first APV-I procedure	APV-I Availability since procedure publication	APV-I Continuity Risk since procedure publication
LIMC / Milano/Malpensa	Italy	100.00%	0.00E+00	0	21/08/2014	99.99%	9.42E-06
LIME / Bergamo/Orio al Serio	Italy	100.00%	0.00E+00	0	20/07/2017	99.99%	7.93E-06
LIML / Milano/Linate	Italy	100.00%	0.00E+00	0	13/12/2012	99.96%	1.43E-05
LIPE / BOLOGNA / Borgo Panigale	Italy	100.00%	0.00E+00	0	03/01/2019	99.98%	1.25E-05
LIPZ / Venezia/Tessera	Italy	99.99%	9.33E-06	11	27/06/2013	99.96%	1.77E-05
LIRF / Roma-Fiumicino	Italy	100.00%	0.00E+00	0	23/05/2019	99.99%	3.33E-06
LIRQ / Firenze/Peretola	Italy	100.00%	0.00E+00	0	22/06/2017	99.99%	7.47E-06
LKKU / Kunovice	Czech Republic	99.99%	5.60E-06	1	01/12/2017	99.98%	1.14E-05
LKKV / Karlovy Vary	Czech Republic	100.00%	0.00E+00	0	13/11/2014	99.99%	8.58E-06
LKMT / Ostrava	Czech Republic	99.98%	1.16E-05	3	09/01/2014	99.98%	1.46E-05
LKTB / Brno	Czech Republic	99.99%	5.60E-06	1	09/01/2014	99.98%	1.37E-05
LKVO / Praha/Vodochody	Czech republic	100.00%	0.00E+00	0	25/06/2015	99.99%	9.31E-06
LMML / Luqa	Malta	100.00%	0.00E+00	0	11/10/2018	99.98%	3.94E-05
LOAV / Vöslau	Austria	99.99%	5.60E-06	1	28/02/2019	99.99%	4.97E-06
LODO / ÖAMTC/Oberwart	Austria	99.99%	5.60E-06	1	28/02/2019	99.99%	5.85E-06
LPFR / Faro	Portugal	99.99%	5.60E-06	1	18/07/2019	99.98%	3.11E-05
LPPR / Porto	Portugal	99.99%	5.60E-06	1	12/10/2017	99.97%	3.05E-05
LPPT / Lisboa	Portugal	100.00%	0.00E+00	0	28/05/2015	99.98%	2.05E-05
LRCL / Cluj - Napoca / Avram Iancu	Romania	99.98%	1.12E-05	3	10/11/2016	99.93%	7.35E-05
LSMD / Dübendorf	Switzerland	100.00%	0.00E+00	0	21/08/2014	99.99%	1.05E-05
LSME / Emmen	Switzerland	100.00%	0.00E+00	0	03/04/2014	99.99%	9.62E-06
LSZG / Grenchen	Switzerland	100.00%	0.00E+00	0	25/07/2013	99.97%	1.42E-05
LSZH / Zurich	Switzerland	100.00%	0.00E+00	0	06/12/2018	99.99%	3.87E-06
LSZR / St. Gallen-Altenrhein	Switzerland	100.00%	0.00E+00	0	17/11/2011	99.93%	1.49E-05
LZIB / Bratislava-Milan Rastislav Štefánik	Slovak Republic	99.99%	5.60E-06	1	05/02/2015	99.98%	1.81E-05
LZKZ / Košice	Slovak Republic	99.98%	1.12E-05	3	05/02/2015	99.96%	4.78E-05

Table 8 – Monthly APV-I Availability at airports with published procedures using EGNOS

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APPENDIX C EGNOS LPV-200 PERFORMANCE AT AIRPORTS

The table reports LPV-200 Availability and Continuity at airports with published procedures using EGNOS. These values correspond to the performance obtained under fault-free conditions using all satellites in view:

Airports	Country	Monthly LPV-200 Availability	Monthly LPV-200 Continuity Risk	Outages[1]	Publication date of first LPV-200 procedure	LPV-200 Availability since procedure publication	LPV-200 Continuity Risk since procedure publication
EBOS / Oostende-Brugge	Belgium	100.00%	0.00E+00	0	03/01/2019	99.97%	1.28E-05
EDAC / Leipzig/Altenburg	Germany	100.00%	0.00E+00	0	29/03/2019	99.96%	1.90E-05
EDAZ / Schoenhagen	Germany	100.00%	0.00E+00	0	11/10/2018	99.97%	1.93E-05
EDDB / Berlin Brandenburg	Germany	100.00%	0.00E+00	0	08/10/2020	99.98%	7.01E-06
EDDH / Hamburg	Germany	100.00%	0.00E+00	0	18/06/2020	99.98%	1.34E-05
EDDK / Koeln-Bonn	Germany	100.00%	0.00E+00	0	15/12/2011	99.98%	1.33E-05
EDDM / München	Germany	100.00%	0.00E+00	0	12/09/2019	99.98%	1.37E-05
EDDP / Leipzig/Halle	Germany	100.00%	0.00E+00	0	30/01/2020	99.96%	2.33E-05
EDDW / Bremen	Germany	100.00%	0.00E+00	0	30/03/2017	99.97%	1.68E-05
EDFH / Frankfurt Hahn	Germany	100.00%	0.00E+00	0	14/09/2017	99.98%	1.23E-05
EDGS / Siegerland	Germany	100.00%	0.00E+00	0	12/10/2017	99.98%	1.43E-05
EDHI / Hamburg/Finkenwerder	Germany	100.00%	0.00E+00	0	18/06/2020	99.98%	1.51E-05
EDHK / Kiel-Holtenau	Germany	100.00%	0.00E+00	0	18/06/2020	99.98%	1.23E-05
EDHL / Luebeck-Blankensee	Germany	100.00%	0.00E+00	0	18/06/2020	99.98%	1.06E-05
EDLN / Moenchengladbach	Germany	100.00%	0.00E+00	0	06/12/2018	99.97%	1.80E-05
EDLP / Paderborn/Lippstadt	Germany	100.00%	0.00E+00	0	10/10/2019	99.97%	1.37E-05
EDMA / Augsburg	Germany	100.00%	0.00E+00	0	11/10/2018	99.98%	1.34E-05
EDMO / Oberpfaffenhofen	Germany	100.00%	0.00E+00	0	23/05/2019	99.98%	1.30E-05
EDNY / Friedrichshafen	Germany	100.00%	0.00E+00	0	19/07/2018	99.98%	1.39E-05
EDQM / Hof-Plauen	Germany	100.00%	0.00E+00	0	21/06/2018	99.98%	1.49E-05
EDQT / Hassfurt-Schweinfurt	Germany	100.00%	0.00E+00	0	23/04/2020	99.98%	1.89E-05
EDSB / Karlsruhe/Baden-Baden	Germany	100.00%	0.00E+00	0	27/04/2017	99.98%	1.22E-05
EDTL / Lahr	Germany	100.00%	0.00E+00	0	27/04/2017	99.98%	1.26E-05
EETN / LENNART MERI TALLINN	Estonia	99.97%	1.68E-05	4	06/12/2018	99.93%	6.12E-05
EETU / Tartu	Estonia	99.92%	2.80E-05	5	18/07/2019	99.88%	1.07E-04

[1] *Outages* refer to events when the LPV-200 service changes its status from Available to Unavailable for the reported month.

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Airports	Country	Monthly LPV-200 Availability	Monthly LPV-200 Continuity Risk	Outages[1]	Publication date of first LPV-200 procedure	LPV-200 Availability since procedure publication	LPV-200 Continuity Risk since procedure publication
EGJB / Guernsey	Estonia	99.98%	7.84E-06	7	10/10/2019	99.95%	1.66E-05
EGJJ / Jersey	United Kingdom	99.98%	5.60E-06	1	23/05/2019	99.96%	1.36E-05
EGPK / Prestwick	United Kingdom	99.99%	1.64E-05	18	16/07/2020	99.89%	8.38E-05
EHAM / Amsterdam	Netherlands	100.00%	0.00E+00	0	05/12/2019	99.97%	1.93E-05
EHBD / Weert/Budel	Netherlands	100.00%	0.00E+00	0	31/12/2020	99.99%	9.65E-06
EHEH / Eindhoven	Netherlands	100.00%	0.00E+00	0	28/01/2021	100.00%	2.76E-06
EHKD / Den Helder - De Kooy	Netherlands	100.00%	0.00E+00	0	28/01/2021	99.99%	1.10E-05
EHLW / Leeuwarden	Netherlands	100.00%	0.00E+00	0	28/01/2021	99.99%	8.27E-06
EKBI / Billund	Denmark	100.00%	0.00E+00	0	20/07/2017	99.97%	2.08E-05
EKEB / Esbjerg	Denmark	100.00%	0.00E+00	0	26/03/2020	99.97%	1.49E-05
EKSN / Sindal	Denmark	100.00%	0.00E+00	0	18/06/2020	99.97%	2.13E-05
ELLX / Luxembourg	Luxembourg	100.00%	0.00E+00	0	26/03/2020	99.97%	1.57E-05
ENAL / Ålesund/Vigra	Norway	100.00%	0.00E+00	0	07/11/2019	99.94%	4.79E-05
ENBL / Førde/Bringeland	Norway	100.00%	0.00E+00	0	27/04/2017	99.94%	3.72E-05
ENBR / Bergen/Flesland	Norway	100.00%	0.00E+00	0	28/02/2019	99.94%	3.73E-05
ENGM / Gardermoen	Norway	99.99%	5.60E-06	1	10/11/2016	99.96%	2.40E-05
ENHD / Haugesund/Karmøy	Norway	100.00%	0.00E+00	0	13/08/2020	99.94%	3.73E-05
ENHK / Hasvik	Norway	99.33%	8.63E-04	491	03/12/2020	99.23%	9.21E-04
ENKB / Kristiansund/Kvernberget	Norway	100.00%	0.00E+00	0	31/12/2020	99.91%	5.38E-05
ENML / Molde/Årø	Norway	100.00%	0.00E+00	0	30/03/2017	99.95%	3.66E-05
ENNM / Namsos	Norway	99.99%	4.59E-05	30	27/04/2017	99.94%	5.65E-05
ENOL / Ørland	Norway	100.00%	6.72E-06	2	12/10/2017	99.95%	4.76E-05
ENRM / Rørvik/Ryum	Norway	99.99%	5.04E-05	36	02/02/2017	99.94%	6.66E-05
ENSG / Sogndal/Haukasen	Norway	100.00%	0.00E+00	0	14/09/2017	99.95%	2.92E-05
ENST / Sandnessjøen/Stokka	Norway	99.94%	3.66E-05	12	30/01/2020	99.82%	1.58E-04
ENVA /Trondheim/Værnes	Norway	100.00%	0.00E+00	0	27/02/2020	99.95%	5.82E-05
ENZV / Stavanger/Sola	Norway	100.00%	0.00E+00	0	09/11/2017	99.95%	3.03E-05
EPBY / Bydgoszcz - Szwederowo	Poland	99.99%	1.68E-05	3	26/04/2018	99.97%	2.41E-05
EPGD / Gdańsk Lech Wałęsa	Poland	99.98%	1.98E-05	9	26/04/2018	99.96%	2.16E-05
EPKK / Kraków - Balice	Poland	99.98%	1.46E-05	5	26/04/2018	99.96%	4.91E-05

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Airports	Country	Monthly LPV-200 Availability	Monthly LPV-200 Continuity Risk	Outages[1]	Publication date of first LPV-200 procedure	LPV-200 Availability since procedure publication	LPV-200 Continuity Risk since procedure publication
EPKT / Katowice	Poland	99.98%	1.12E-05	2	26/04/2018	99.97%	3.41E-05
EPLB / Lublin	Poland	99.97%	2.24E-05	5	26/04/2018	99.90%	9.86E-05
EPLL / Łódź - Lublinek	Poland	99.99%	1.12E-05	2	21/06/2018	99.96%	3.15E-05
EPMO / Warszawa/Modlin	Poland	99.98%	2.24E-05	4	26/04/2018	99.96%	3.47E-05
EPPO / Poznan Lawica	Poland	99.99%	1.12E-05	2	18/07/2019	99.96%	2.34E-05
EPRZ / Rzeszów - Jasionka	Poland	99.98%	1.68E-05	4	26/04/2018	99.93%	9.16E-05
EPSC / Szczecin - Goleniów	Poland	100.00%	0.00E+00	0	26/04/2018	99.97%	1.85E-05
EPSY / Olsztyn - Mazury	Poland	99.99%	1.68E-05	3	26/04/2018	99.96%	3.10E-05
EPWA / Warszawa - F. Chopin	Poland	99.99%	2.24E-05	4	26/04/2018	99.96%	3.68E-05
EPWR / Wroclaw/Strachowice	Poland	99.99%	5.60E-06	1	26/04/2018	99.97%	1.89E-05
EPZG / Zielona Góra - Babimost	Poland	100.00%	1.83E-05	35	18/07/2019	99.97%	2.46E-05
ESSV / Visby	Sweden	99.97%	2.48E-05	1	25/03/2021	99.97%	2.48E-05
LFAQ / Albert Bray	France	100.00%	0.00E+00	0	21/11/2017	99.98%	1.16E-05
LFAT / Le Touquet Paris Plage	France	100.00%	0.00E+00	0	21/11/2017	99.98%	1.28E-05
LFAV / Valenciennes Denain	France	100.00%	0.00E+00	0	21/11/2017	99.98%	1.26E-05
LFBA / Agen La Garenne	France	100.00%	0.00E+00	0	21/11/2017	99.97%	1.67E-05
LFBD / Bordeaux Merignac	France	100.00%	0.00E+00	0	21/11/2017	99.97%	1.76E-05
LFBE / Bergerac	France	100.00%	0.00E+00	0	21/11/2017	99.97%	1.69E-05
LFBI / Poitiers Biard	France	99.99%	5.60E-06	1	21/11/2017	99.97%	1.54E-05
LFBL / Limoges	France	100.00%	0.00E+00	0	21/11/2017	99.98%	1.55E-05
LFBU / Angoulême Brie Champniers	France	100.00%	0.00E+00	0	21/11/2017	99.97%	1.60E-05
LFBX / Périgueux Bassillac	France	100.00%	0.00E+00	0	25/05/2017	99.98%	1.45E-05
LFBZ / Biarritz Bayonne Anglet	France	100.00%	0.00E+00	0	26/04/2018	99.97%	2.14E-05
LFCI / Albi Le Sequestre	France	100.00%	0.00E+00	0	21/11/2017	99.98%	1.76E-05
LFCR / Rodez Marcillac	France	100.00%	0.00E+00	0	21/11/2017	99.98%	1.74E-05
LFDN / Rochefort Charente Maritime	France	99.99%	5.60E-06	1	23/05/2018	99.97%	1.67E-05
LFGA / Colmar Houssen	France	100.00%	0.00E+00	0	21/06/2018	99.98%	1.48E-05
LFGJ / Dole Tavaux	France	100.00%	0.00E+00	0	21/11/2017	99.98%	1.43E-05
LFHP / Le Puy Loudes	France	100.00%	0.00E+00	0	28/02/2019	99.97%	1.66E-05
LFJL / Metz Nancy Lorraine	France	100.00%	0.00E+00	0	21/11/2017	99.98%	1.43E-05

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Airports	Country	Monthly LPV-200 Availability	Monthly LPV-200 Continuity Risk	Outages[1]	Publication date of first LPV-200 procedure	LPV-200 Availability since procedure publication	LPV-200 Continuity Risk since procedure publication
LFJR / Angers Marcé	France	99.99%	5.60E-06	1	21/11/2017	99.97%	1.45E-05
LFKB / Bastia Poretta	France	99.99%	5.60E-06	1	07/12/2017	99.98%	2.12E-05
LFKF / Figari Sud Corse	France	99.99%	5.60E-06	1	21/11/2017	99.97%	2.52E-05
LFLC / Clermont-Ferrand Auvergne	France	100.00%	0.00E+00	0	21/11/2017	99.98%	1.51E-05
LFLL / Lyon St Exupery	France	100.00%	0.00E+00	0	15/08/2019	99.97%	1.53E-05
LFLN / Saint Yan	France	100.00%	0.00E+00	0	02/03/2017	99.98%	1.29E-05
LFLS / Grenoble Isere	France	100.00%	0.00E+00	0	13/10/2016	99.98%	1.24E-05
LFLU / Valence	France	100.00%	0.00E+00	0	21/11/2017	99.98%	1.51E-05
LFLV / Vichy Charmeil	France	100.00%	0.00E+00	0	26/04/2018	99.98%	1.29E-05
LFLW / Aurillac	France	100.00%	0.00E+00	0	15/08/2019	99.97%	1.92E-05
LFLX / Chateauroux Deols	France	99.99%	5.60E-06	1	15/08/2019	99.97%	1.62E-05
LFLY / Lyon Bron	France	100.00%	0.00E+00	0	28/09/2016	99.98%	1.22E-05
LFMH / Saint Étienne Bouthéon	France	100.00%	0.00E+00	0	02/02/2017	99.98%	1.27E-05
LFMK / Carcassonne Salvaza	France	100.00%	0.00E+00	0	21/11/2017	99.97%	1.75E-05
LFMN / Nice Côte d'Azur	France	100.00%	0.00E+00	0	24/04/2019	99.98%	1.59E-05
LFMT / Montpellier Mediterranee	France	100.00%	0.00E+00	0	05/12/2019	99.97%	2.52E-05
LFMV / Avignon Caumont	France	100.00%	0.00E+00	0	21/06/2018	99.98%	1.45E-05
LFOH / Le Havre Octeville	France	99.99%	5.60E-06	1	21/11/2017	99.97%	1.13E-05
LFOQ / Blois le Breuil	France	99.99%	5.60E-06	1	24/04/2019	99.97%	1.34E-05
LFPB / Paris-Le Bourget	France	99.99%	5.60E-06	1	21/11/2017	99.98%	1.12E-05
LFPG / Paris Charles de Gaulle	France	99.99%	5.60E-06	1	28/04/2016	99.98%	8.94E-06
LFPM / Melun Villaroche	France	99.99%	5.60E-06	1	21/11/2017	99.98%	1.21E-05
LFPN / Toussus Le Noble	France	99.99%	5.60E-06	1	27/04/2017	99.98%	1.01E-05
LFPO / Paris Orly	France	99.99%	5.60E-06	1	21/11/2017	99.98%	1.15E-05
LFPT / Pontoise Cormeilles en Vexin	France	99.99%	5.60E-06	1	21/11/2017	99.98%	1.14E-05
LFQB / Troyes Barberey	France	100.00%	0.00E+00	0	18/08/2016	99.98%	9.70E-06
LFRC / Cherbourg Maupertus	France	99.98%	5.97E-06	2	23/06/2016	99.97%	1.02E-05
LFRD / Dinard	France	99.98%	5.60E-06	1	21/11/2017	99.97%	1.36E-05
LFRI / La Roche Sur Yon	France	99.99%	5.60E-06	1	10/11/2016	99.97%	1.42E-05
LFRK / Caen Carpiquet	France	99.99%	5.60E-06	1	21/11/2017	99.97%	1.17E-05

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Airports	Country	Monthly LPV-200 Availability	Monthly LPV-200 Continuity Risk	Outages[1]	Publication date of first LPV-200 procedure	LPV-200 Availability since procedure publication	LPV-200 Continuity Risk since procedure publication
LFRO / Lannion	France	99.98%	5.60E-06	1	21/11/2017	99.97%	1.58E-05
LFRQ / Quimper	France	99.95%	6.20E-05	53	21/11/2017	99.96%	2.33E-05
LFRT / Saint Brieuc Armor	France	99.98%	5.60E-06	1	21/11/2017	99.97%	1.54E-05
LFRZ / Saint Nazaire Montoir	France	99.99%	5.60E-06	1	03/12/2020	99.97%	1.60E-05
LFSN / Nancy Essey	France	100.00%	0.00E+00	0	26/04/2018	99.98%	1.42E-05
LFST / Strasbourg Entzheim	France	100.00%	0.00E+00	0	21/11/2017	99.98%	1.37E-05
LFTW / Nîmes Garons	France	100.00%	0.00E+00	0	21/11/2017	99.98%	1.55E-05
LHBP / Budapest Liszt Ferenc	Hungary	99.98%	3.77E-05	30	15/09/2016	99.95%	8.11E-05
LHPP / Pecs-Pogany Airport	Hungary	99.96%	3.74E-05	29	03/12/2020	99.89%	8.47E-05
LHPR / Győr-Pér	Hungary	99.98%	1.68E-05	9	25/02/2021	99.98%	1.49E-05
LHSM / Heviz-Balaton	Hungary	99.98%	2.48E-05	1	25/03/2021	99.98%	2.48E-05
LIBD / Bari / Palese	Italy	99.92%	6.45E-05	10	25/03/2021	99.92%	6.45E-05
LICD / Lampedusa	Italy	99.97%	3.17E-05	28	30/01/2020	99.87%	1.29E-04
LICG / Pantelleria	Italy	99.97%	3.17E-05	28	31/05/2018	99.93%	9.98E-05
LICR / Reggio Calabria	Italy	99.95%	4.78E-05	40	19/07/2018	99.92%	1.35E-04
LIMC / Milano/Malpensa	Italy	100.00%	0.00E+00	0	23/04/2020	99.97%	2.11E-05
LIME / Bergamo /Orio al Serio	Italy	100.00%	0.00E+00	0	08/10/2020	99.98%	4.50E-06
LIMF / Torino / Caselle	Italy	100.00%	0.00E+00	0	25/03/2021	100.00%	0.00E+00
LIMJ / Genova/Sestri	Italy	100.00%	0.00E+00	0	10/09/2020	99.98%	1.28E-05
LIMP / Parma	Italy	99.99%	5.60E-06	1	23/05/2018	99.98%	1.91E-05
LIMZ / CUNEO/Levaldigi	Italy	100.00%	0.00E+00	0	23/05/2018	99.98%	1.29E-05
LIPY / ANCONA / Falconara	Italy	99.98%	3.73E-05	29	03/01/2019	99.96%	6.80E-05
LIRA / Roma/Ciampino	Italy	99.98%	3.14E-05	28	21/05/2020	99.96%	5.05E-05
LIRF / Roma/Fiumicino	Italy	99.98%	2.84E-05	21	23/05/2019	99.97%	6.39E-05
LKPR / Prague	Czech Republic	100.00%	0.00E+00	0	05/12/2019	99.97%	2.17E-05
LMML / Luqa	Malta	99.96%	3.47E-05	35	11/10/2018	99.88%	1.60E-04
LOWG / Flughafen Graz	Austria	99.99%	5.60E-06	1	01/03/2018	99.96%	5.05E-05
LOWI / Innsbruck	Austria	100.00%	0.00E+00	0	01/02/2018	99.98%	1.84E-05
LOWK / Klagenfurt	Austria	99.99%	5.60E-06	1	11/10/2018	99.97%	3.68E-05
LOWL / Linz	Austria	99.99%	5.60E-06	1	02/02/2017	99.97%	2.29E-05
LOWS / Salzburg	Austria	100.00%	0.00E+00	0	23/04/2020	99.97%	2.00E-05

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Airports	Country	Monthly LPV-200 Availability	Monthly LPV-200 Continuity Risk	Outages[1]	Publication date of first LPV-200 procedure	LPV-200 Availability since procedure publication	LPV-200 Continuity Risk since procedure publication
LOWW / Wien - Schwechat	Austria	99.98%	1.12E-05	2	02/02/2017	99.97%	4.13E-05
LSGC / Les Eplatures	Switzerland	100.00%	0.00E+00	0	26/05/2016	99.98%	1.19E-05
LSGG / Genève	Switzerland	100.00%	0.00E+00	0	13/09/2018	99.98%	1.36E-05
LSMD / Dübendorf	Switzerland	100.00%	0.00E+00	0	30/01/2020	99.97%	2.03E-05
LSMP / Payerne	Switzerland	100.00%	0.00E+00	0	05/12/2019	99.97%	1.86E-05
LSZB / Bern-Belp	Switzerland	100.00%	0.00E+00	0	03/12/2020	99.99%	2.92E-06
LSZH / Zurich	Switzerland	100.00%	0.00E+00	0	25/05/2017	99.98%	1.28E-05
LYBE / Beograd/Nikola Tesla	Serbia	99.96%	2.28E-05	21	26/03/2020	99.88%	1.28E-04
LYNI / Niš/Konstantin Veliki	Serbia	99.96%	1.38E-05	9	26/03/2020	99.85%	1.62E-04
LYPG / Podgorica	Montenegro	99.95%	2.32E-05	16	26/03/2020	99.88%	1.26E-04
LZPP / Piešťany	Slovak Republic	99.98%	1.12E-05	3	02/02/2017	99.97%	4.48E-05
LZTT / POPRAD-Tatry	Slovak Republic	99.98%	1.12E-05	3	29/03/2018	99.94%	8.71E-05
LZZI / Žilina	Slovak Republic	99.98%	1.12E-05	3	25/05/2017	99.97%	4.35E-05

Table 9 – Monthly LPV-200 Availability at airports with published procedures using EGNOS

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APPENDIX D REFERENCE DOCUMENTS

[RD-1]	Open Service Definition Document, EGN-SDD-OS; v.02-03 (https://egnos-user-support.essp-sas.eu/new_egnos_ops/sites/default/files/documents/egnos_os_sdd_in_force.pdf)
[RD-2]	Safety Of Life Definition Document, EGN-SDD-SoL; v.03-03 (https://egnos-user-support.essp-sas.eu/new_egnos_ops/sites/default/files/documents/egnos_sol_sdd_in_force.pdf)
[RD-3]	EGNOS Data Access Service (EDAS) Service Definition Document, EGN-SDD-EDAS; v.02-02 (https://egnos-user-support.essp-sas.eu/new_egnos_ops/sites/default/files/documents/egnos_edas_sdd_in_force.pdf)

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APPENDIX E LIST OF ACRONYMS

Acronym	Definition
APV	Approach with Vertical Guidance
ASN	Abstract Syntax Notation
ECAC	European Civil Aviation Conference
EDAS	EGNOS Data Access Service
EGNOS	European Geostationary Navigation Overlay Service
ENT	EGNOS Network Time
ESSP	European Satellite Services Provider
FTP	File Transfer Protocol
GEO	Geostationary Satellite
GNSS	Global Navigation Satellite System
GPS	Global Positioning System
HAL	Horizontal Alarm Limit
HNSE	Horizontal Navigation System Error
HPE	Horizontal Position Error
HPL	Horizontal Protection Level
HSI	Horizontal Safety Index
LPV	Localizer Performance with vertical guidance
MI	Misleading Information
MT27	Message Type 27
NA	Not Applicable/ Not Available
NLES	Navigation Land Earth Station
NPA	Non-Precision Approach
NTRIP	Networked Transport of RTCM via Internet Protocol
OP	Operation
OPS	Operations
OS	Open Service
PA	Precision Approach
PL	Protection Level
PRN	Pseudo-Random Number
RAIM	Receiver Autonomous Integrity Monitoring
RD	Reference Document
RIMS	Ranging and Integrity Monitoring Station
RTCM	Radio Technical Commission for Maritime Services
SBAS	Satellite-Based Augmentation System
SDD	Service Definition Document
SIS	Signal-In-Space
SL0	Service Level 0
SL2	Service Level 2
SoL	Safety of Life
UTC	Universal Time Coordinated
VAL	Vertical Alarm Limit
VNSE	Vertical Navigation System Error
VPE	Vertical Position Error
VPL	Vertical Protection Level
VSI	Vertical Safety Index

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