The EGNOS Service Provider

Monthly Performance Report
July 2019

ESSP

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EXECUTIVE SUMMARY

This report presents the EGNOS services performance during July 2019. 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 PRN123 – PRN136. 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 map is 95.86% for APV-I and 96.22% for LPV200. The achieved coverage for continuity ($5x10^{-4}$/15s) is 96.42% for APV-I and 93.92% for LPV200.

The APV-I and LPV200 performance at all airports with approach operations based on the APV-I or LPV200 service levels presented an availability above 99% and a continuity risk lower than $5 \cdot 10^{-4}$/15s, except Kirkenes, Mehamn (Norway) and Kuusamo (Finland) airports, both for the APV-I availability and continuity performance, Ivalo and Joensuu airports (Finland) for the APV-I continuity performance and Luga (Malta) airport for LPV200 continuity performance.

The Horizontal and Vertical Safety Indexes remained below 0.42 for both APV-I and LPV200 service levels for all the analyzed sites, what represents a good integrity margin.

NPA Availability above 99% is delivered in the whole 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 (and most of them equal or close to 100%).

The horizontal and vertical accuracy results for all the sites remained below 1.5 meters (95%) and 2.6 meters (95%) respectively, which represents a very good level of accuracy.

EDAS Service

In terms of availability, the observed performance for all the EDAS services has fulfilled the targets [RD-3].

Regarding the EDAS Services latency, the observed delays (for the real-time services) were also better than the committed performance [RD-3].

EGNOS Time Service

The EGNOS Time Service was available during more than 99% of the time for each day during July 2019.

The offset between the EGNOS Network Time and the GPS time remained below 15 nanoseconds over the three previous months (April to June 2019).

[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.

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 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 operational geostationary satellites broadcast EGNOS messages.

EGNOS SIS monitoring for July 2019, reports the following reception percentage of an SBAS message:

- PRN123 Availability: **100%**
- PRN136 Availability: **99.99%**
- SIS – PRN136 or PRN123: **100%**
- SIS – PRN136 and PRN123: **99.99%**

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

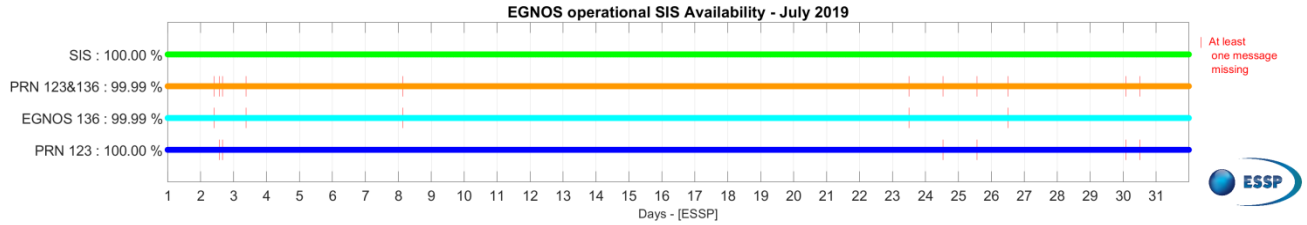

Figure 1 – EGNOS SIS & PRN Availability for July 2019.

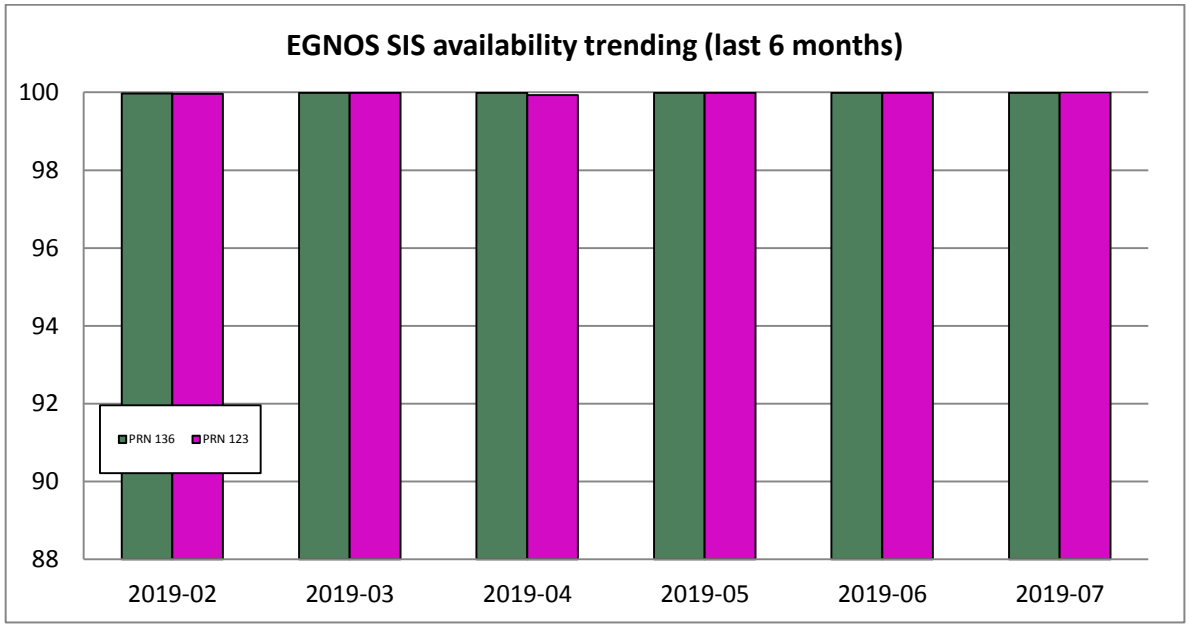

Figure 2 – Trend of EGNOS SIS Availability per GEO.

Availability (%)	2019-02	2019-03	2019-04	2019-05	2019-06	2019-07
PRN 123	99.96	99.99	99.93	99.99	99.99	100
PRN 136	99.97	99.99	99.99	99.99	99.99	99.99
At least one EGNOS GEO satellite	100	100	100	100	100	100

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

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	0.9	1.4
Aalborg	0.6	1.4
Alexandria	1.2	2.2
Athens	0.7	1.4
Berlin	0.7	1.1
Canarias	0.9	1.5
Cork	0.8	1.2
Catania	0.8	1.3
Djerba	0.9	1.3
Egilsstadir	0.7	1.8
Glasgow	0.8	1.4
Golbasi	0.9	1.5
Gavle	0.6	1.6
Haifa	1.4	2.4
Jan Mayen	1.1	2.5
Kirkenes	0.8	2.0
Lappeenranta	0.7	1.6
La Palma	0.9	1.6
Lisboa	0.9	1.3
Madeira	0.8	1.2
Malaga	0.8	1.2
Palma de Mallorca	0.7	1.0
Reykjavik	0.9	1.9
Roma	0.7	1.1
S. Compostela	0.8	1.0
Sofía	1.1	2.0
Swanwick	1.0	1.5
Toulouse	0.8	1.2
Trondheim	0.6	1.5
Tromsoe	0.9	2.3

Station	HNSE 95% (m)	VNSE 95% (m)
Warsaw	0.8	1.4
Zurich	0.8	1.2

Table 2 – EGNOS Open Service accuracy (95%)

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.

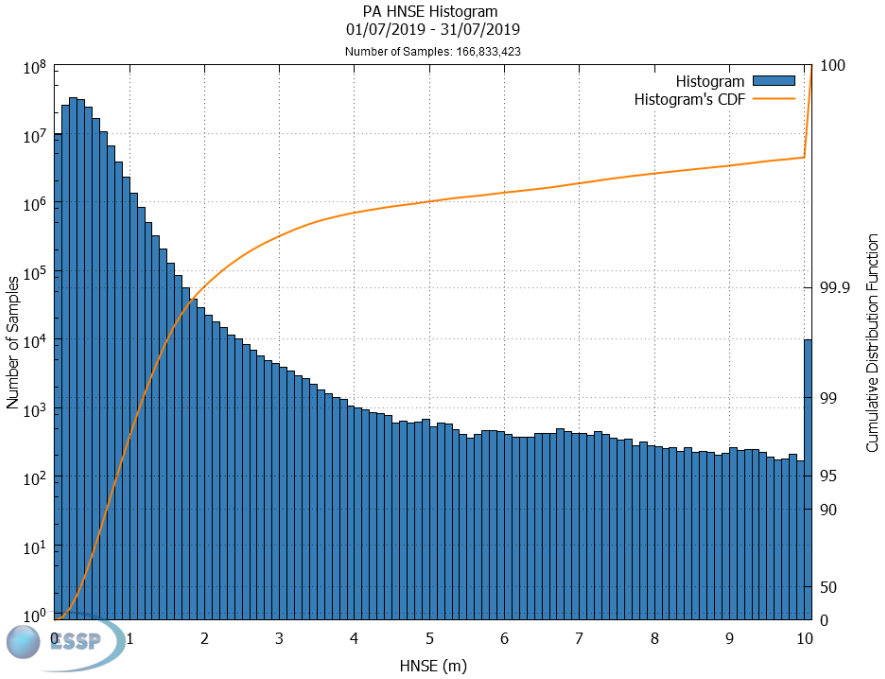

Figure 3 – EGNOS Open Service HNSE Histogram and Cumulative Probability

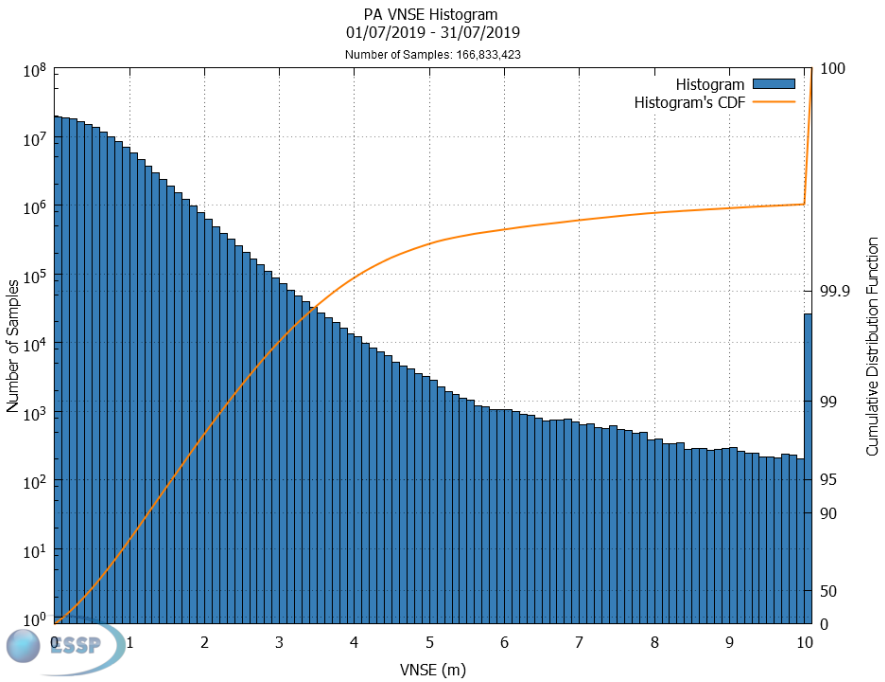

Figure 4 – EGNOS Open Service VNSE Histogram and Cumulative Probability

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.

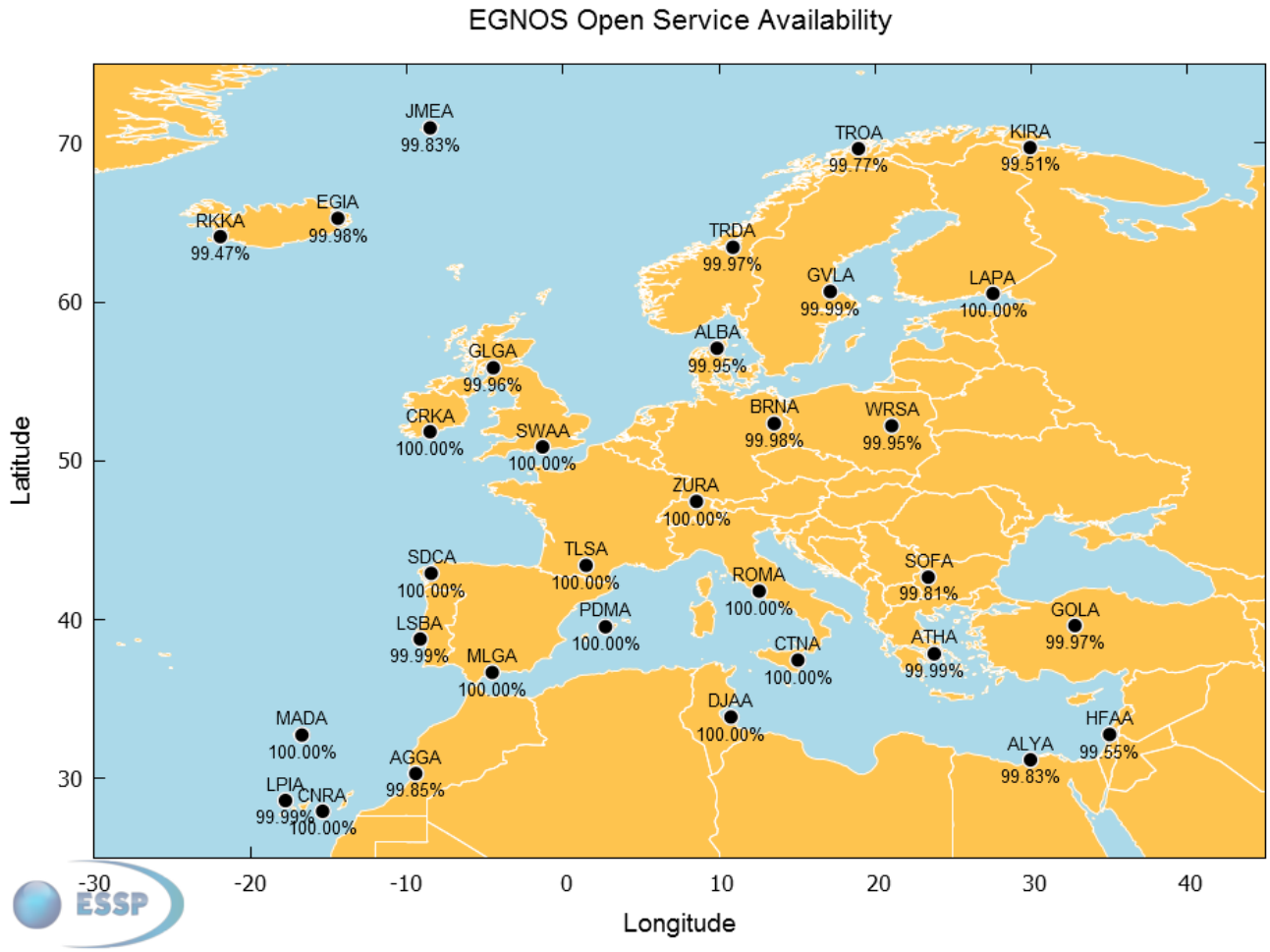

Figure 5 – EGNOS Open Service Availability at reference stations

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.

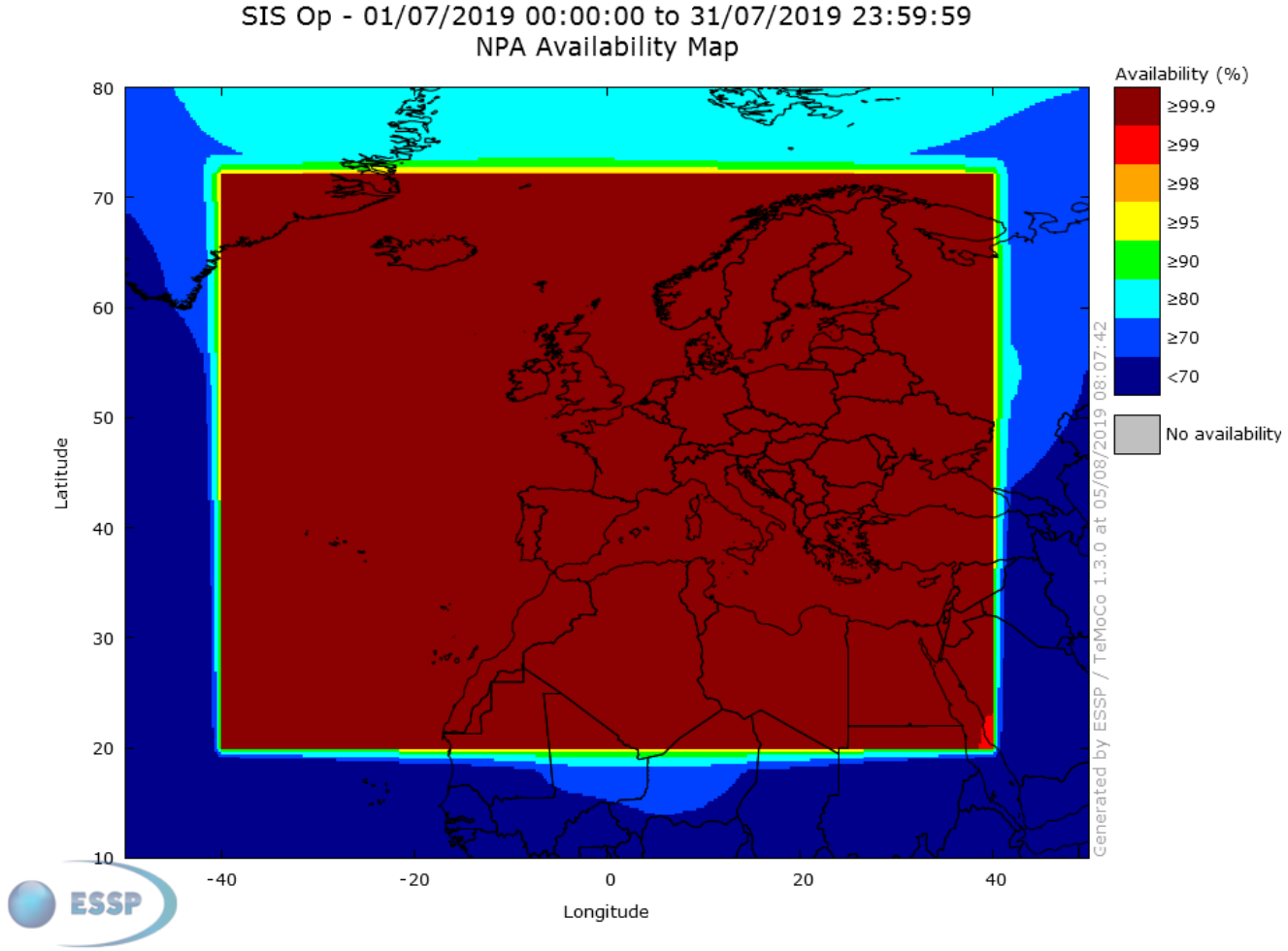

Figure 6 – EGNOS NPA availability

The evolution of the compliance area for a 30 days period with respect to NPA availability compliance area at 99% level as defined in the SoL SDD ([RD-2]) during the last 3 months is presented here:

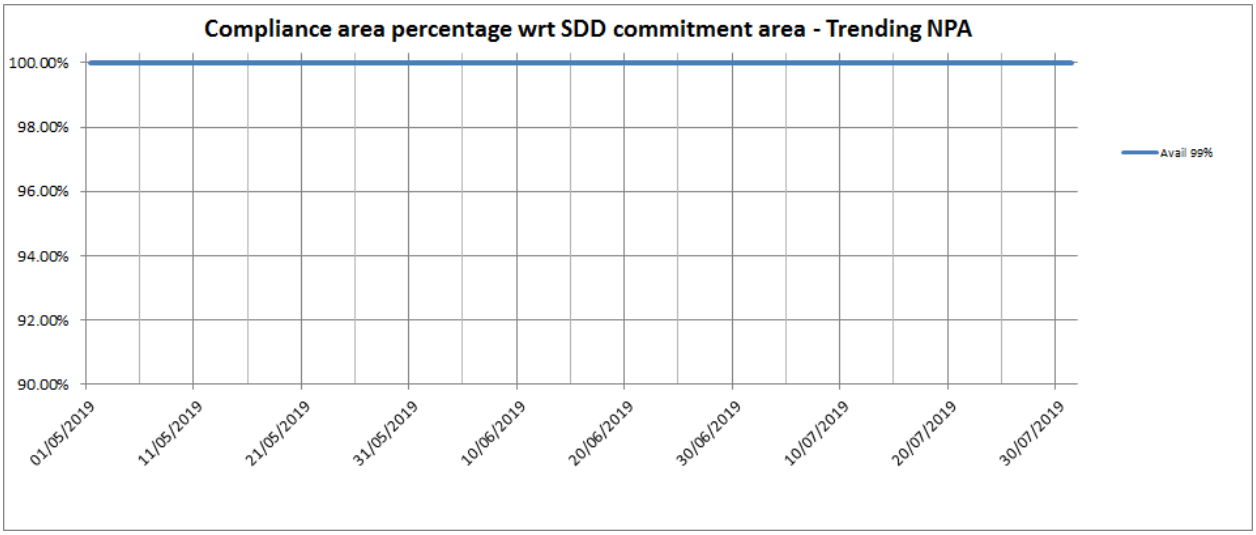

Figure 7 – EGNOS NPA availability compliance trend

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.

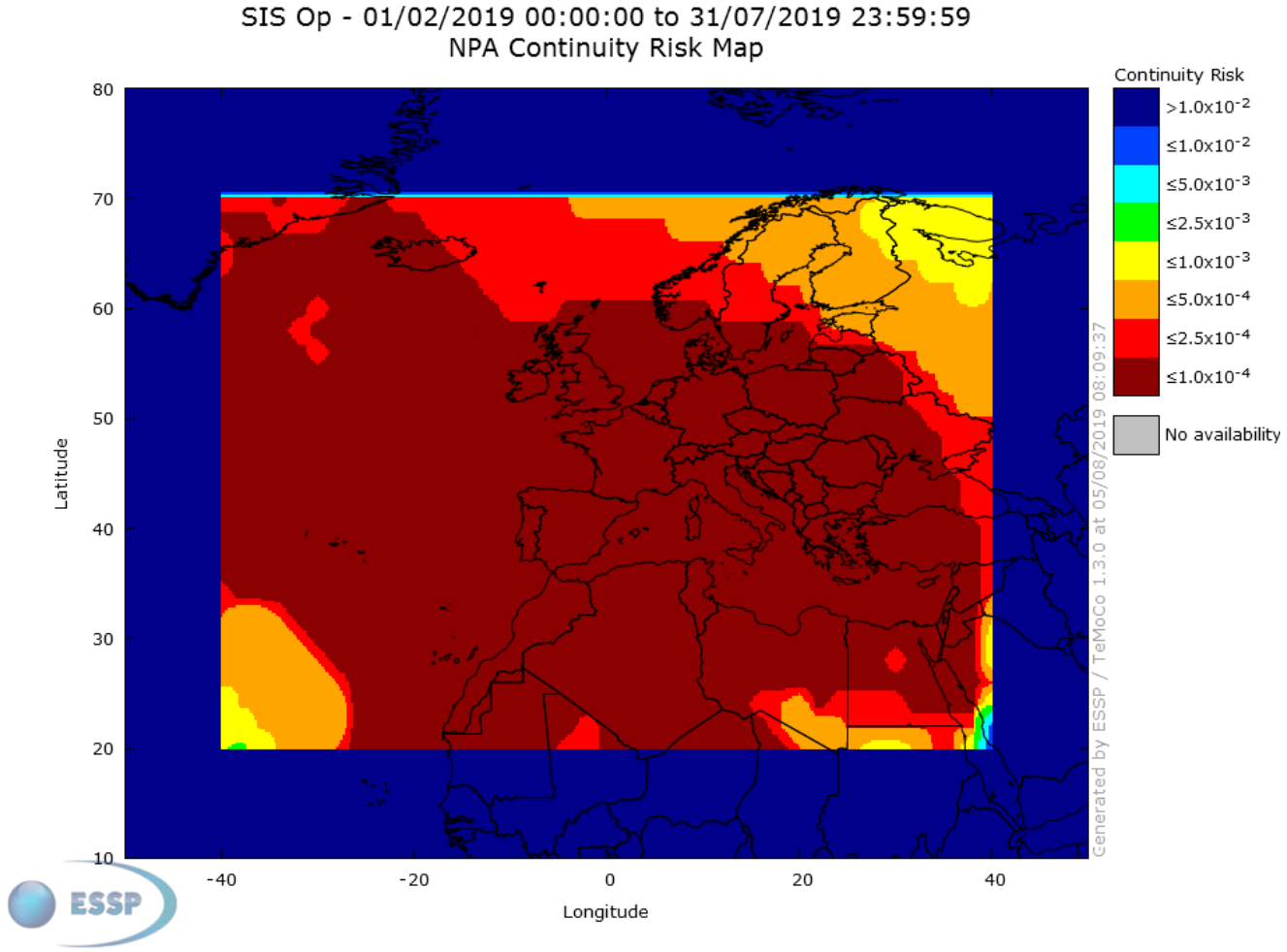

Figure 8 – EGNOS NPA Continuity over the last 6 months

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 histograms show the distribution of HSI (Horizontal Safety Index), which is computed at the different EGNOS stations for each second over the current month. These histograms take into account the epochs in which the NPA service is available (Protection Level < NPA Alarm Limit).

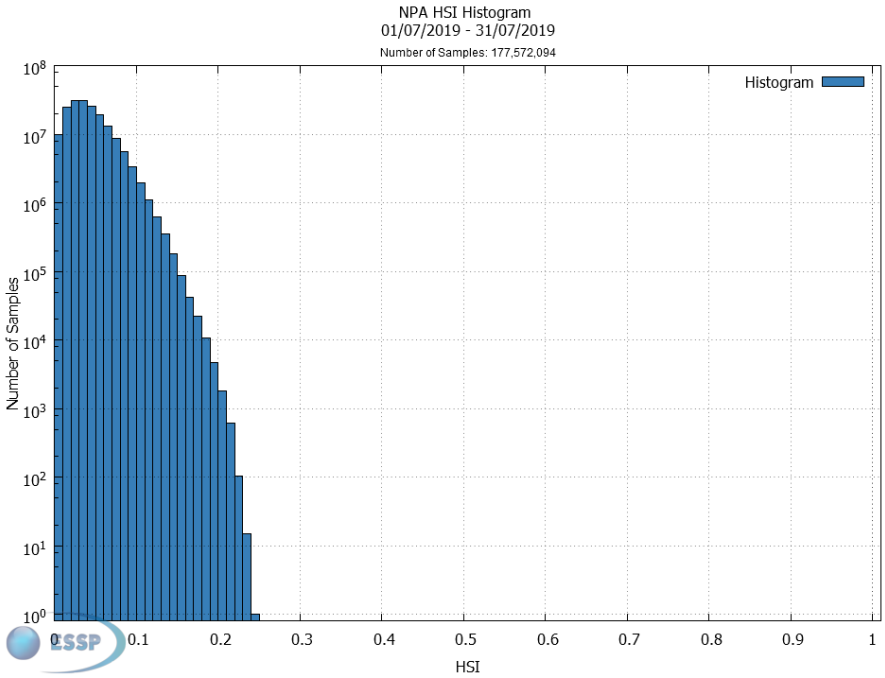

Figure 9 – EGNOS NPA Horizontal Safety Index of the month

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	1.7	99.99%
Azores	1.3	99.99%
Agadir	0.9	99.99%
Aalborg	0.6	99.99%
Alexandria	1.2	99.99%
Athens	0.7	99.99%
Berlin	0.7	99.99%
Canary Islands	0.9	99.99%
Cork	0.8	99.99%
Catania	0.8	99.99%
Djerba	0.9	99.99%
Egilsstadir	0.7	99.99%
Glasgow	0.8	99.99%
Golbasi	0.9	99.99%
Gavle	0.6	99.99%
Haifa	1.4	99.99%
Jan Mayen	1.1	99.99%
Kirkenes	0.8	99.99%
Lappeenranta	0.7	99.99%
La Palma	0.9	99.99%
Lisbon	0.9	99.99%
Madeira	0.8	99.99%
Málaga	0.8	99.99%
Palma de Mallorca	0.7	99.99%
Reykjavik	0.8	99.99%
Roma	0.7	99.99%
S. de Compostela	0.8	99.99%
Sofia	1.1	99.99%
Swanwick	1.0	99.99%
Toulouse	0.8	99.99%
Trondheim	0.6	99.99%
Tromsoe	0.9	99.99%
Warsaw	0.8	99.99%
Zürich	0.8	99.99%

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

The following figures show 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.

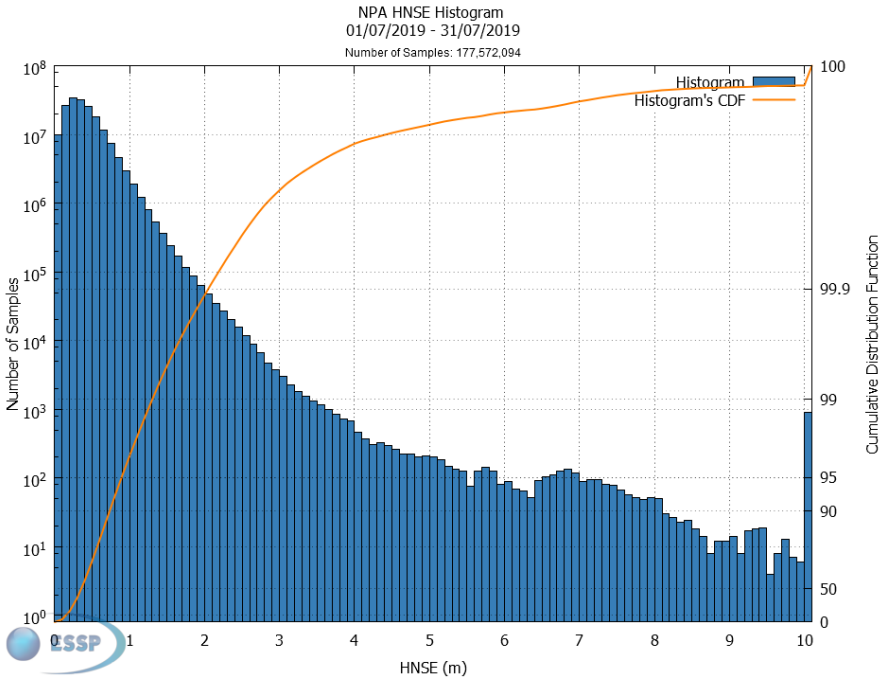

Figure 10 – EGNOS NPA HNSE Histogram and Cumulative Probability

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.

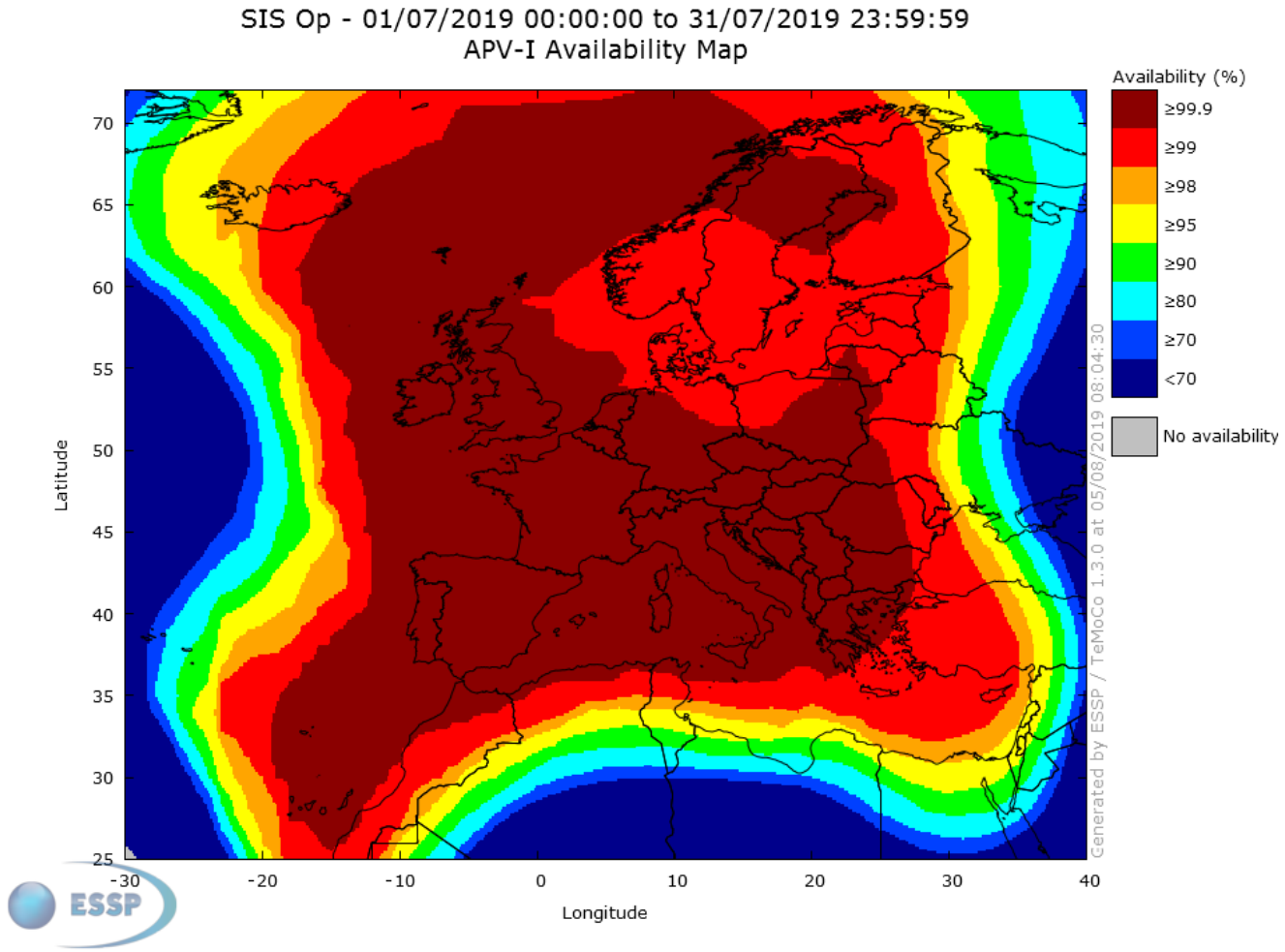

Figure 11 – EGNOS APV-I Availability

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.

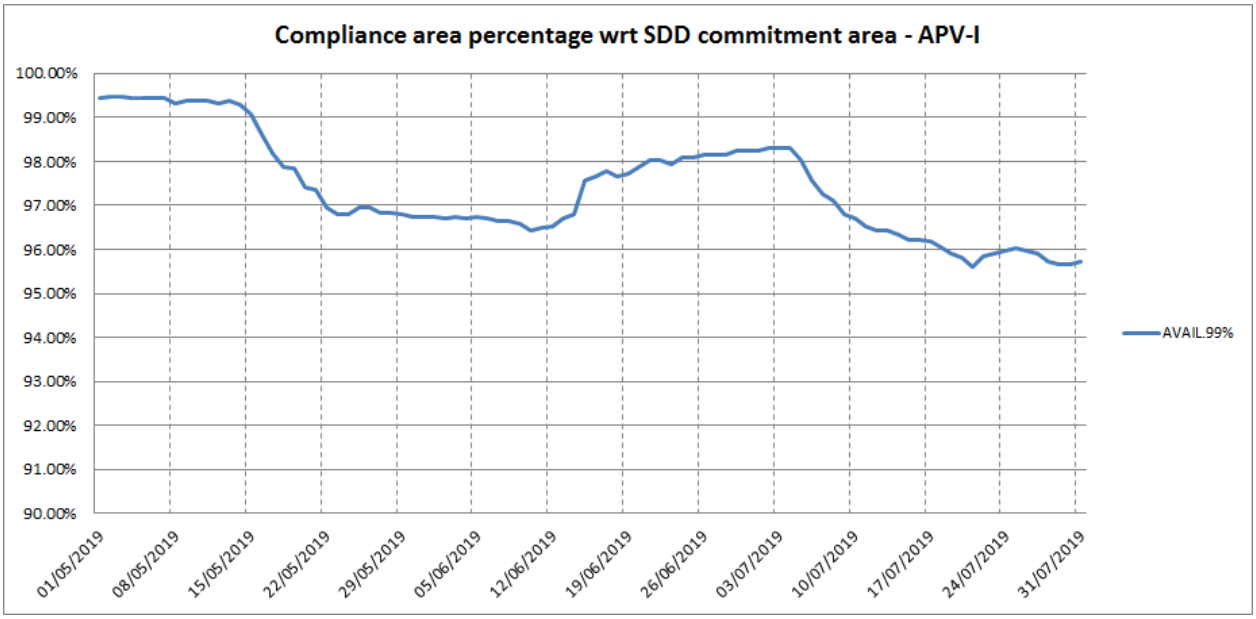

Figure 12 – EGNOS APV-I availability compliance trend

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.

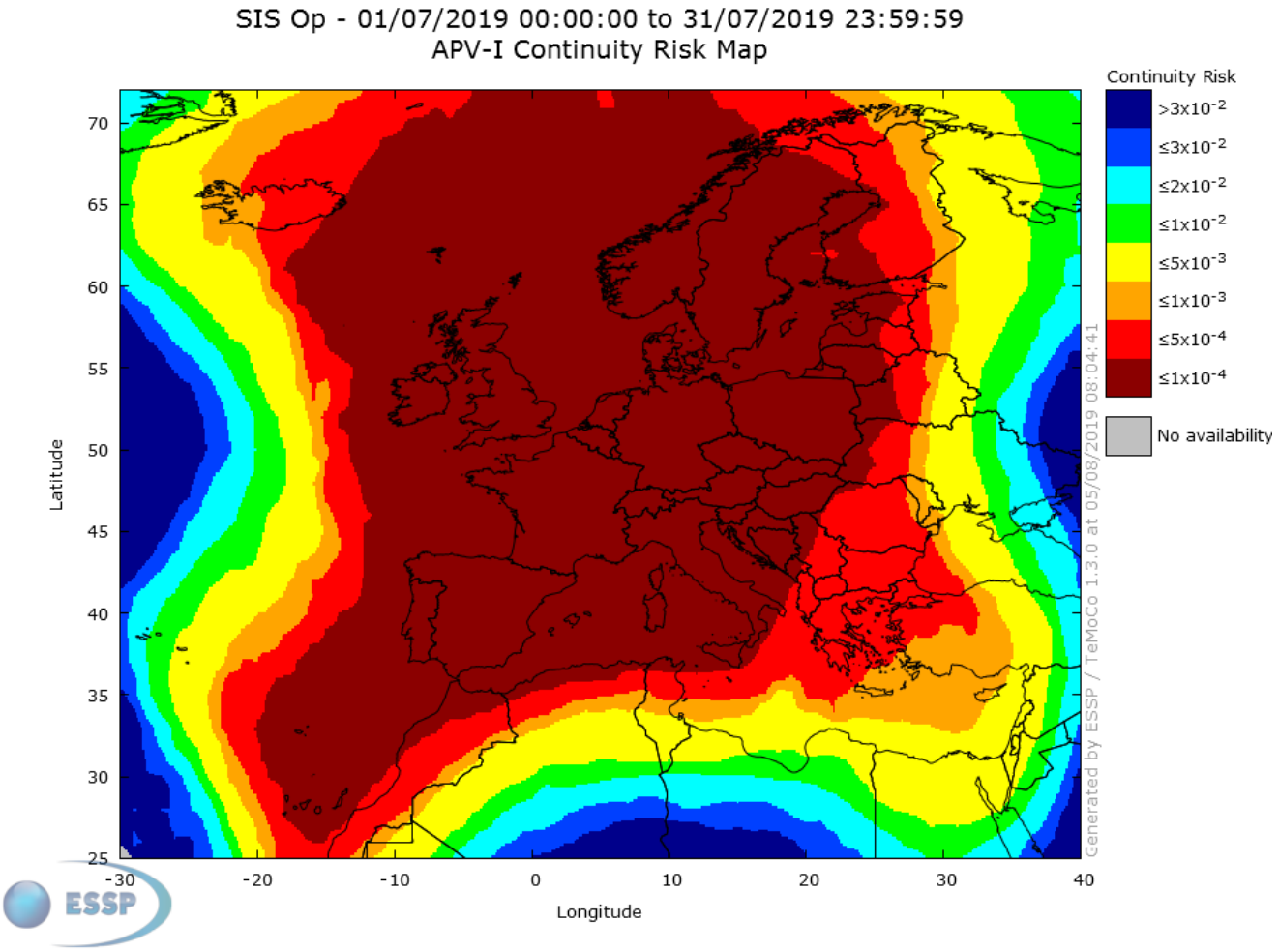

Figure 13 – EGNOS APV-I Continuity

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.

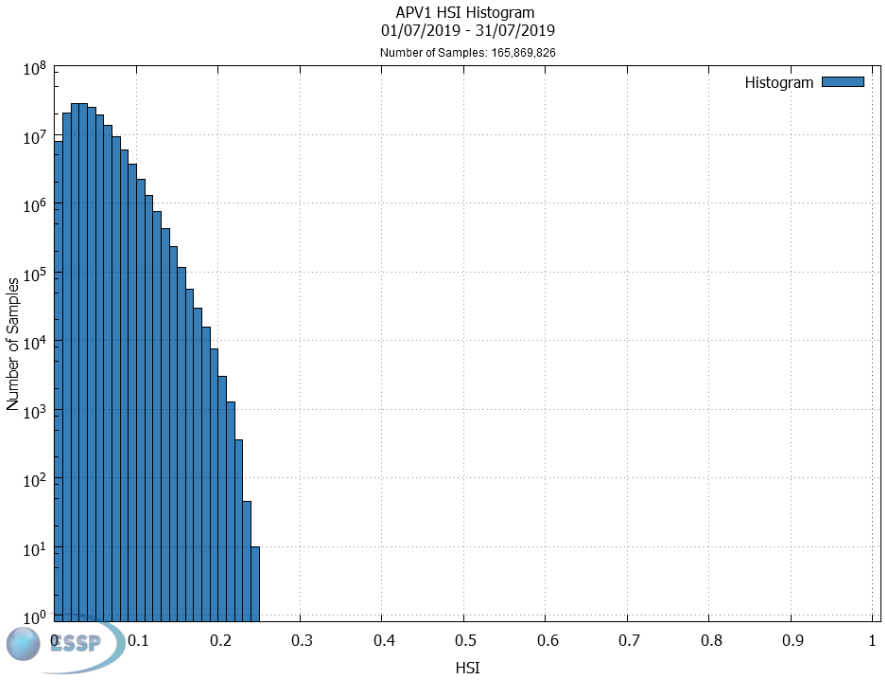

Figure 14 – EGNOS APV-I Horizontal Safety Index of the month

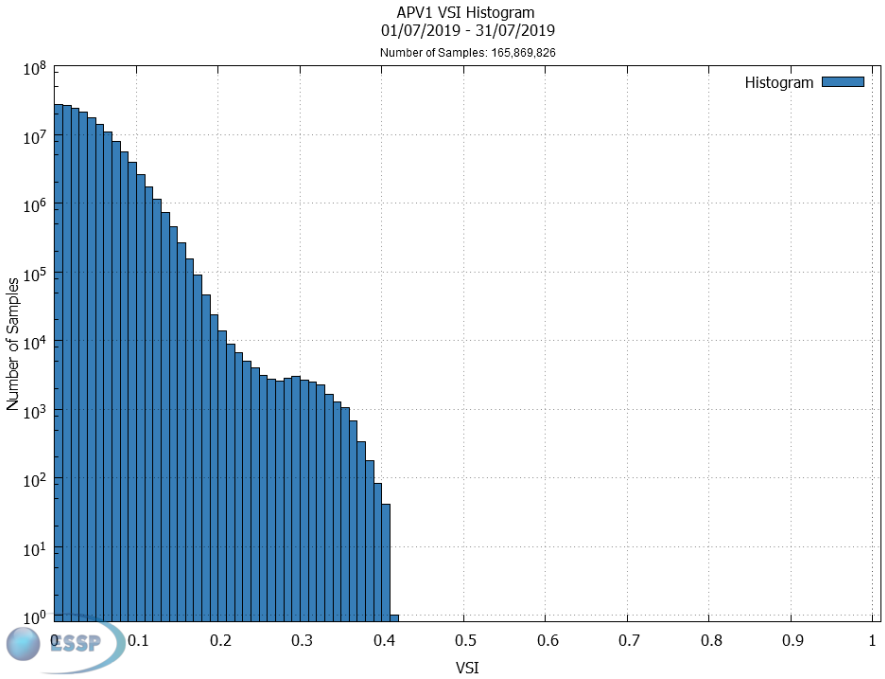

Figure 15 – EGNOS APV-I Vertical Safety Index of the month

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	0.9	1.4	99.81%
Aalborg	0.6	1.4	99.20%
Alexandria	1.2	2.2	98.42%
Athens	0.7	1.4	99.91%
Berlin	0.7	1.1	99.88%
Canary Islands	0.9	1.5	99.94%
Cork	0.8	1.2	99.99%
Catania	0.8	1.3	99.98%
Djerba	0.9	1.3	97.78%
Egilsstadir	0.7	1.8	99.91%
Glasgow	0.8	1.4	99.99%
Golbasi	0.9	1.5	99.50%
Gavle	0.6	1.6	99.87%
Haifa	1.4	2.3	97.69%
Jan Mayen	1.1	2.5	99.78%
Kirkenes	0.7	1.7	97.75%
Lappeenranta	0.7	1.6	99.62%
La Palma	0.9	1.6	99.93%
Lisbon	0.9	1.3	99.95%
Madeira	0.8	1.2	99.96%
Málaga	0.8	1.2	99.99%
Palma de Mallorca	0.7	1.0	99.97%
Reykjavik	0.8	1.8	98.54%
Roma	0.7	1.1	99.99%
S. de Compostela	0.8	1.0	99.97%
Sofia	1.1	2.0	99.95%
Swanwick	1.0	1.5	99.99%
Toulouse	0.8	1.2	99.99%
Trondheim	0.6	1.5	99.86%
Tromsoe	0.9	2.2	99.82%
Warsaw	0.8	1.4	99.91%
Zürich	0.8	1.2	99.97%

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

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.

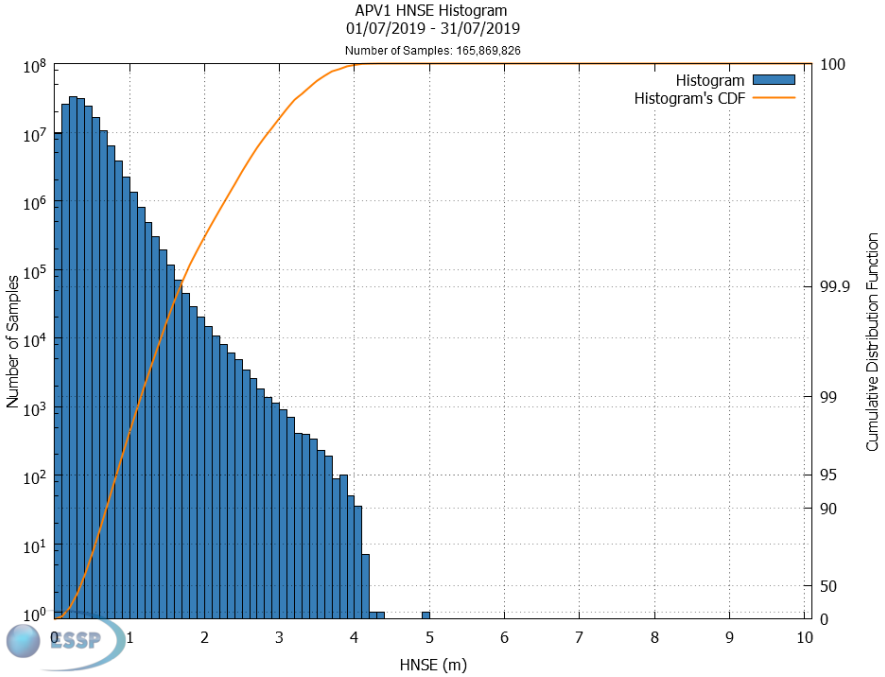

Figure 16 – EGNOS APV-I HNSE Histogram and Cumulative Probability

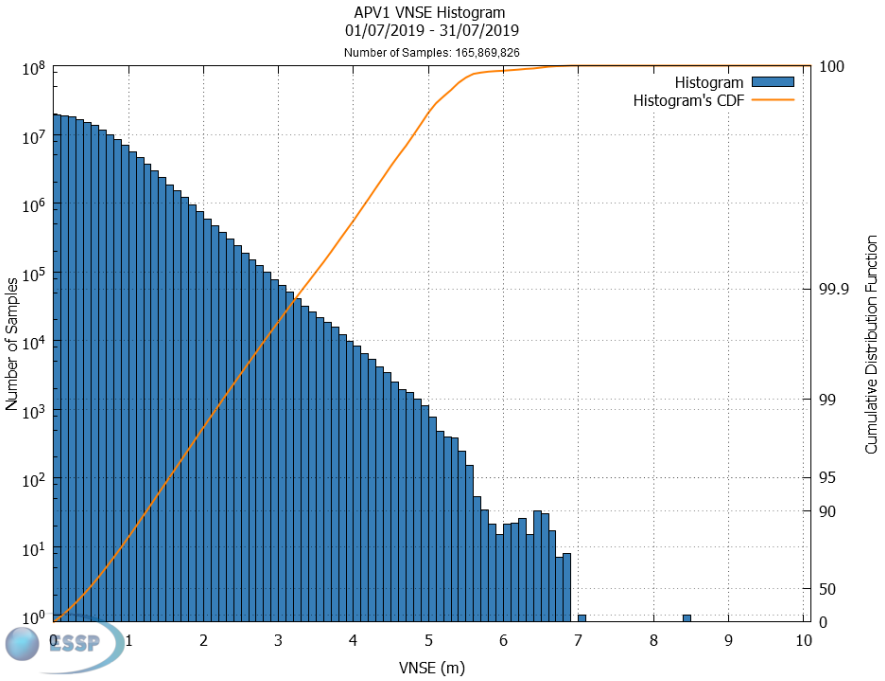

Figure 17 – EGNOS APV-I VNSE Histogram and Cumulative Probability

3.2.5 EGNOS APV-I Performance at airports

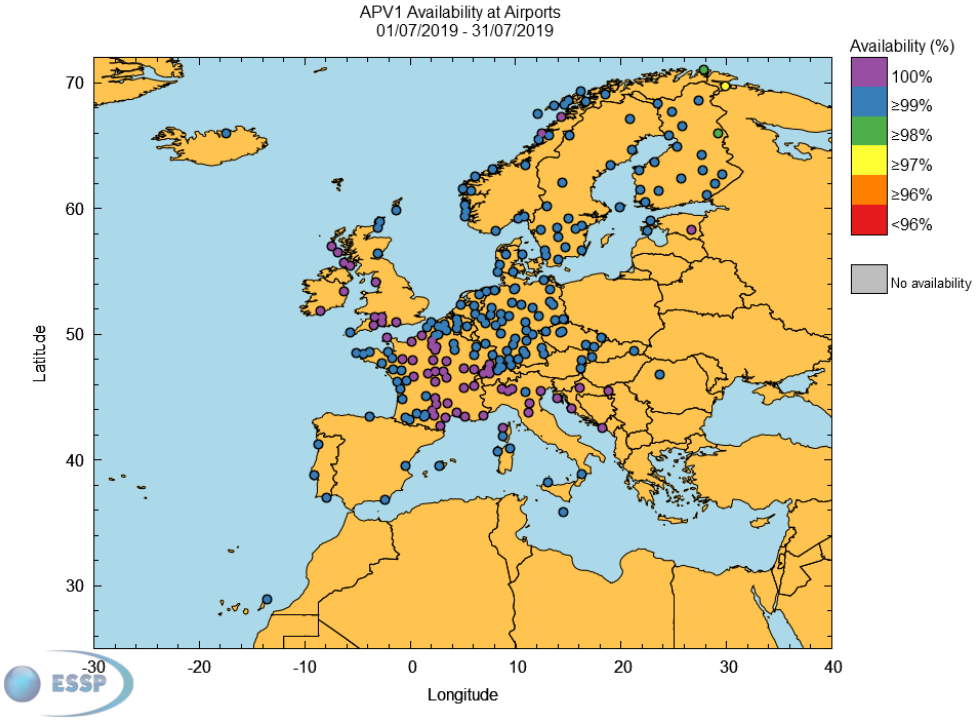

Figure 18 – EGNOS APV-I Availability at airports

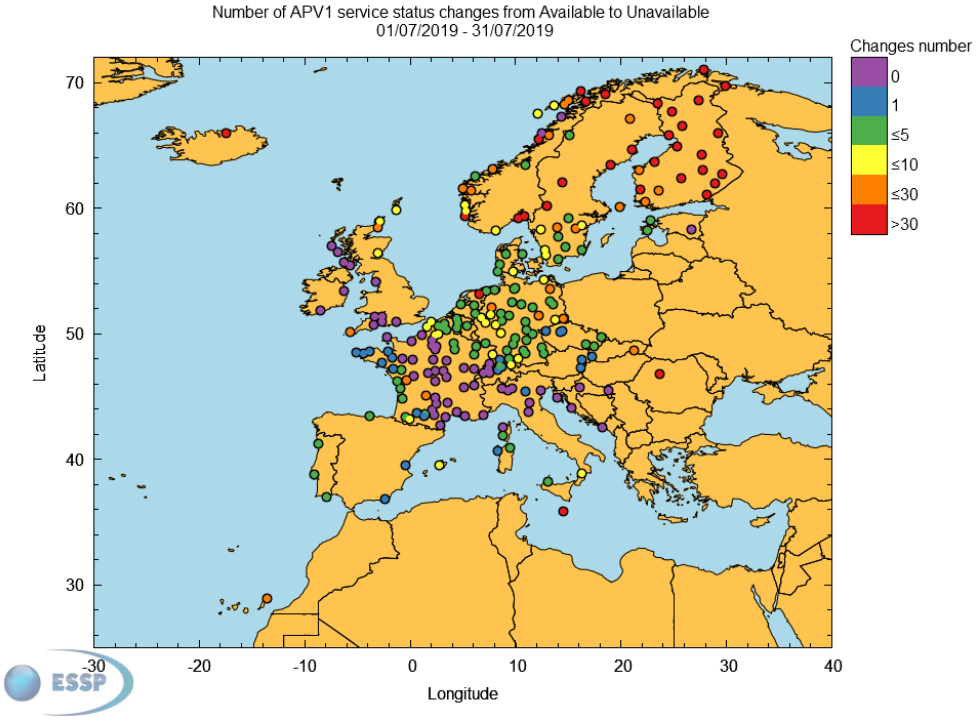

Figure 19 – EGNOS APV-I outages

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

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.

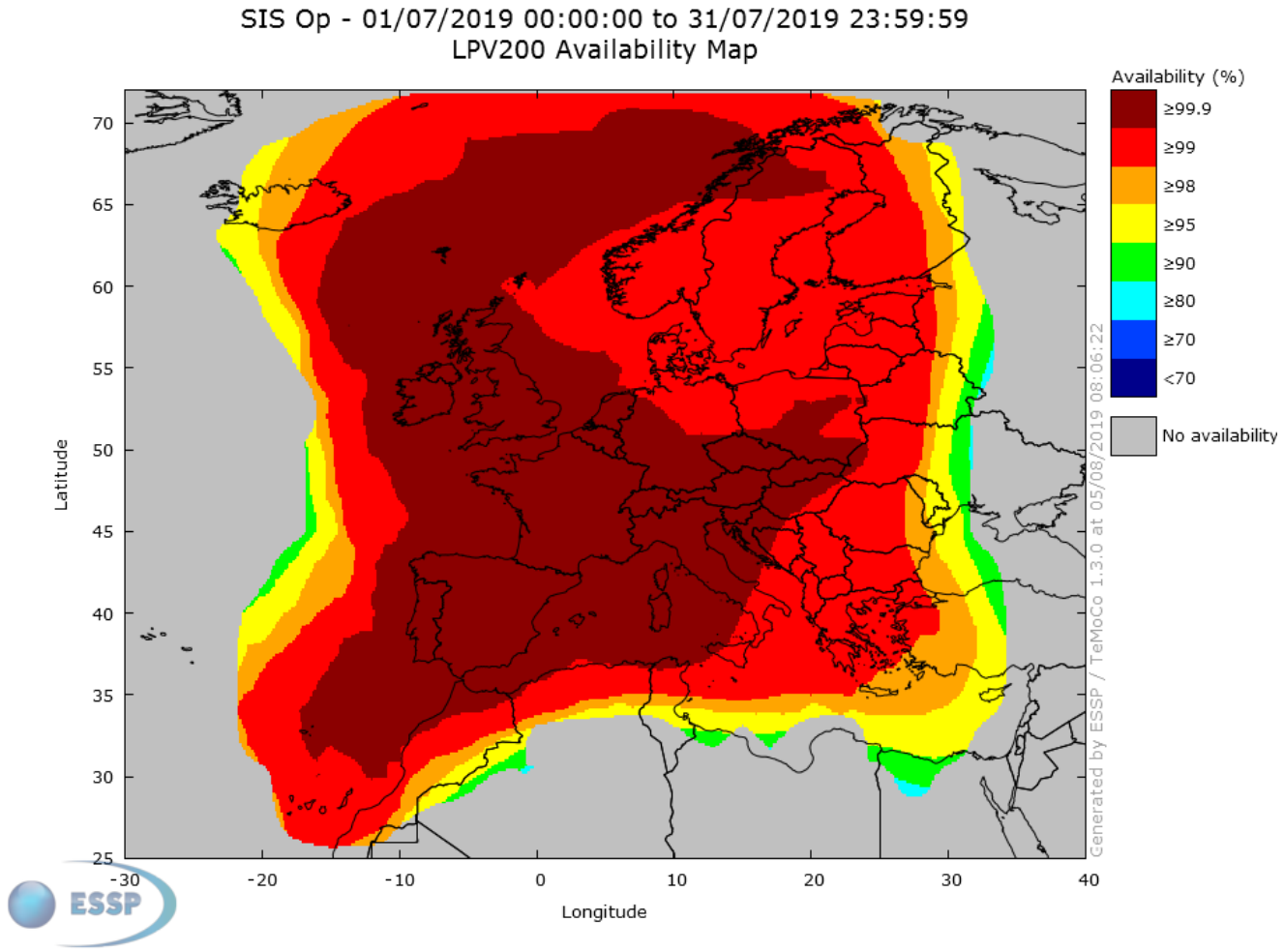

Figure 20 – EGNOS LPV-200 Availability

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.

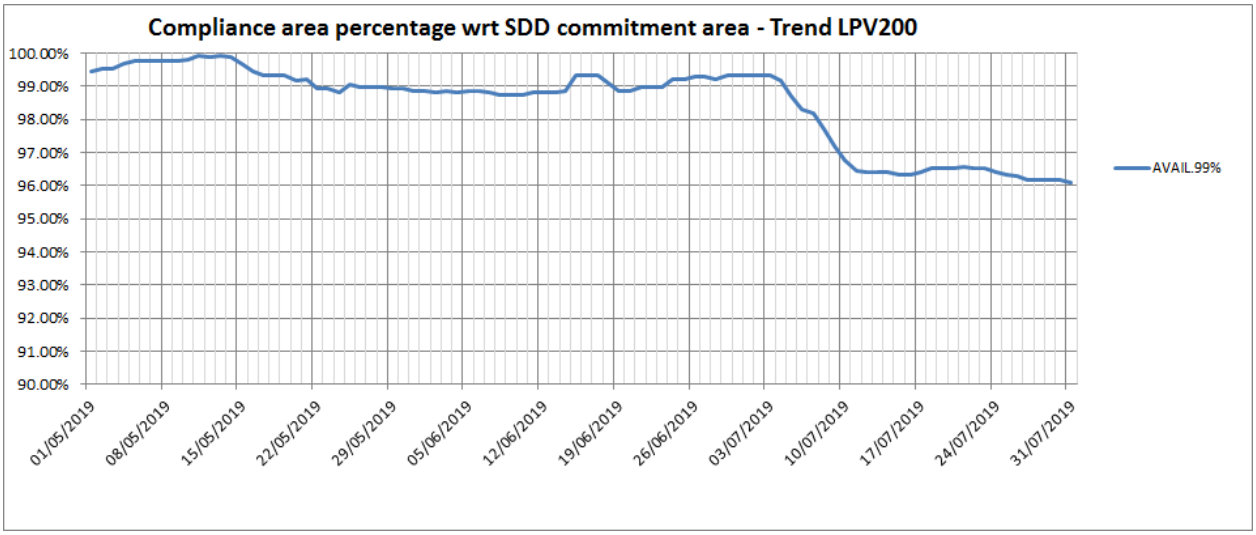

Figure 21 – EGNOS LPV-200 availability compliance trend

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.

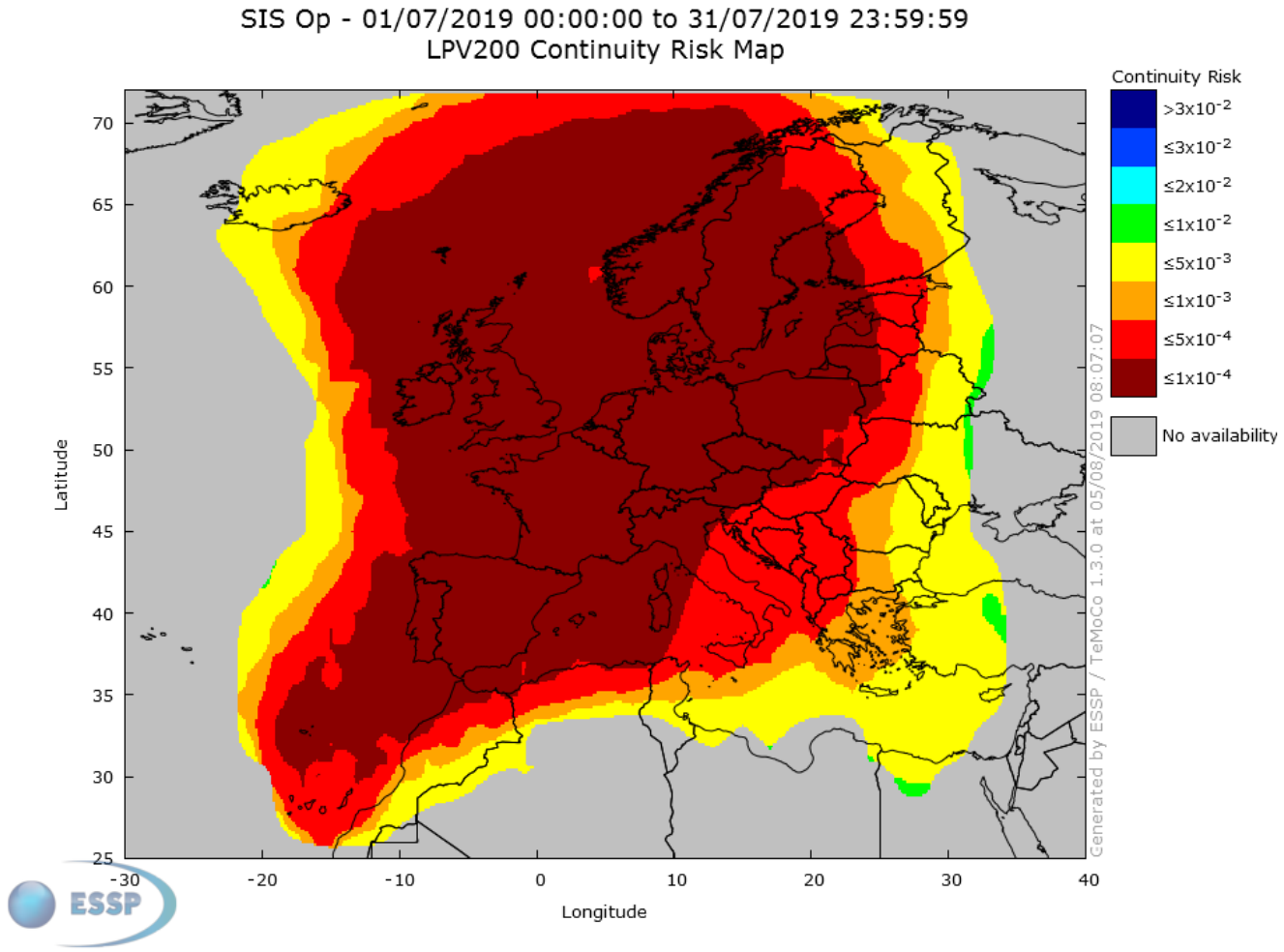

Figure 22 – EGNOS LPV-200 Continuity[2]

[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].

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.

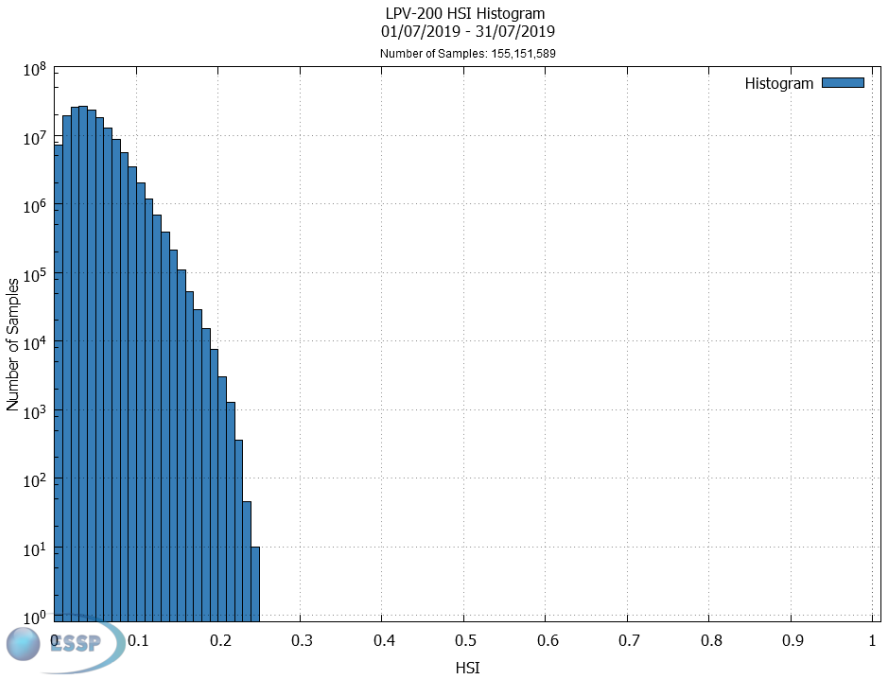

Figure 23 – EGNOS LPV-200 Horizontal Safety Index of the month

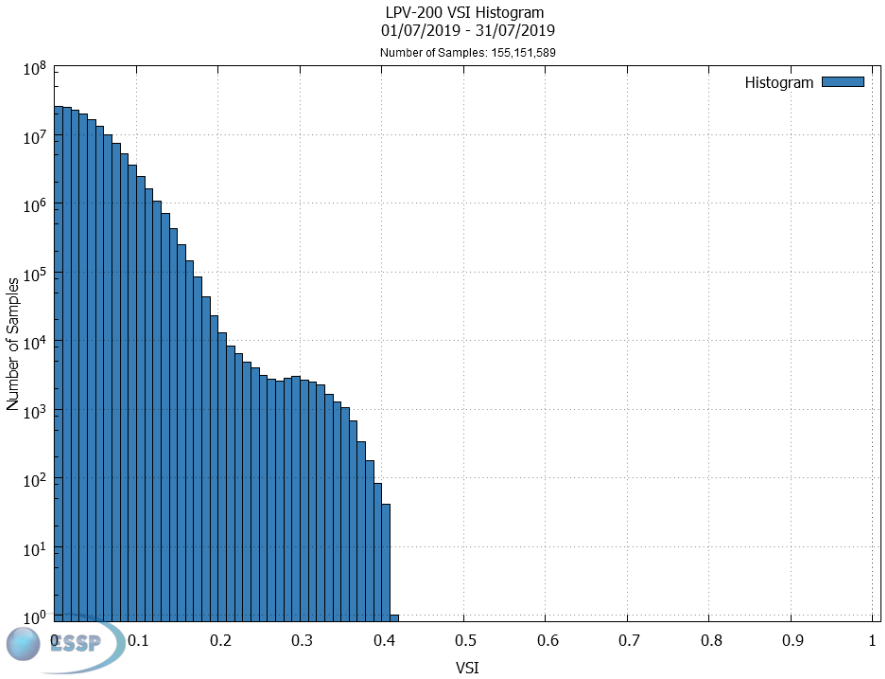

Figure 24 – EGNOS LPV-200 Vertical Safety Index of the month

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	0.9	1.4	99.81%
Aalborg	0.6	1.4	99.09%
Alexandria	1.2	2.2	95.01%
Athens	0.7	1.3	99.48%
Berlin	0.7	1.1	99.88%
Canary Islands	0.9	1.5	99.75%
Cork	0.8	1.2	99.99%
Catania	0.8	1.3	99.83%
Djerba	0.9	1.3	97.44%
Egilsstadir	0.7	1.8	99.80%
Glasgow	0.8	1.4	99.99%
Golbasi	0.9	1.5	96.72%
Gavle	0.6	1.6	99.85%
Jan Mayen	1.1	2.5	99.50%
Lappeenranta	0.7	1.6	99.31%
La Palma	0.9	1.6	99.79%
Lisboa	0.9	1.3	99.94%
Madeira	0.8	1.2	99.90%
Málaga	0.8	1.2	99.99%
Palma de Mallorca	0.7	1.0	99.97%
Reykjavik	0.8	1.7	97.38%
Roma	0.7	1.1	99.97%
S. de Compostela	0.8	1.0	99.94%
Sofia	1.1	2.0	99.68%
Swanwick	1.0	1.5	99.99%
Toulouse	0.8	1.2	99.99%
Trondheim	0.6	1.5	99.84%
Tromsoe	0.9	2.2	99.67%
Warsaw	0.8	1.4	99.91%
Zürich	0.8	1.2	99.97%

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

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.

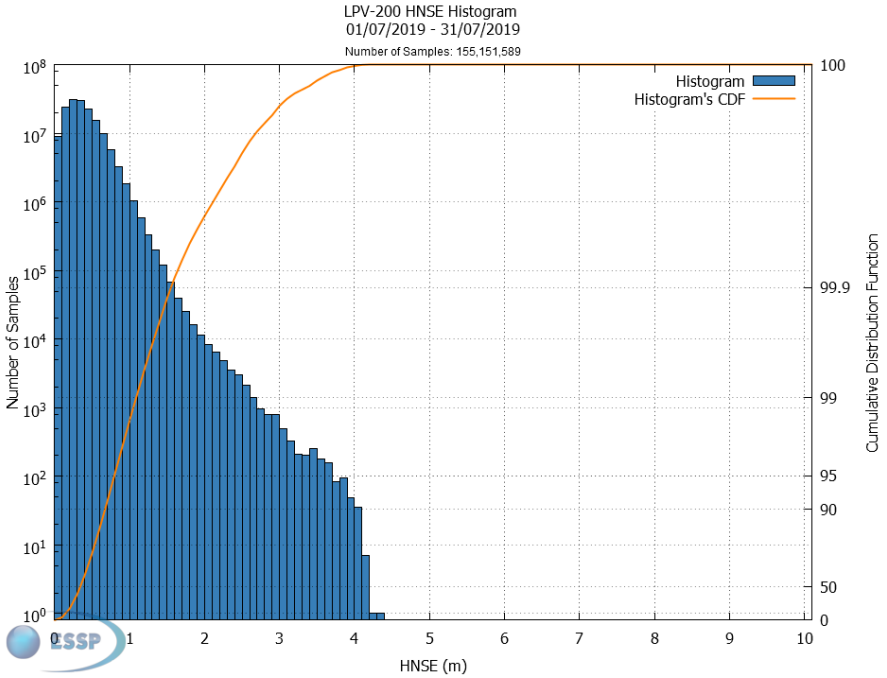

Figure 25 – EGNOS LPV-200 HNSE Histogram and Cumulative Probability

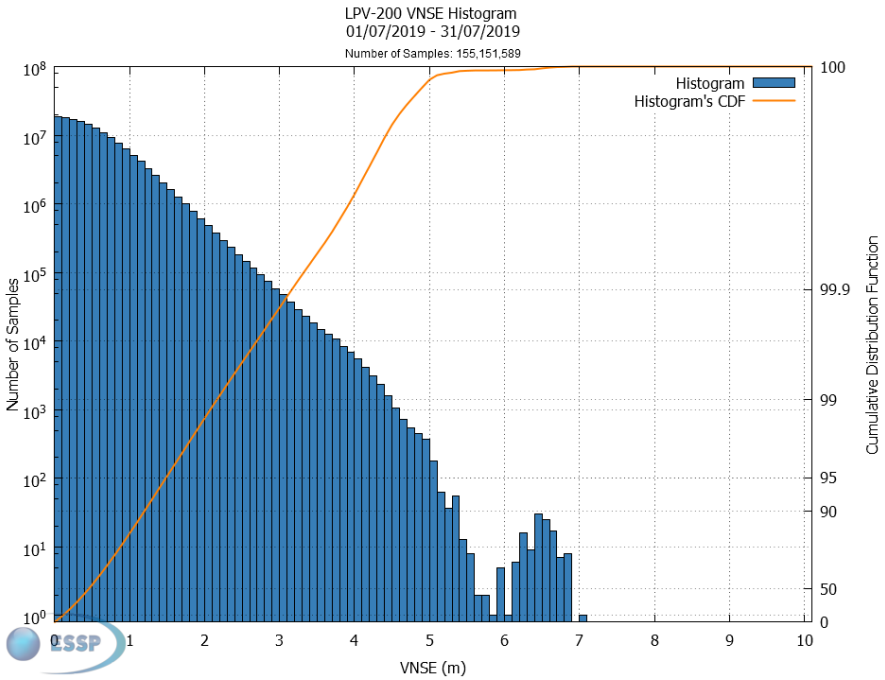

Figure 26 – EGNOS LPV-200 VNSE Histogram and Cumulative Probability

3.3.5 EGNOS LPV-200 Performance at airports

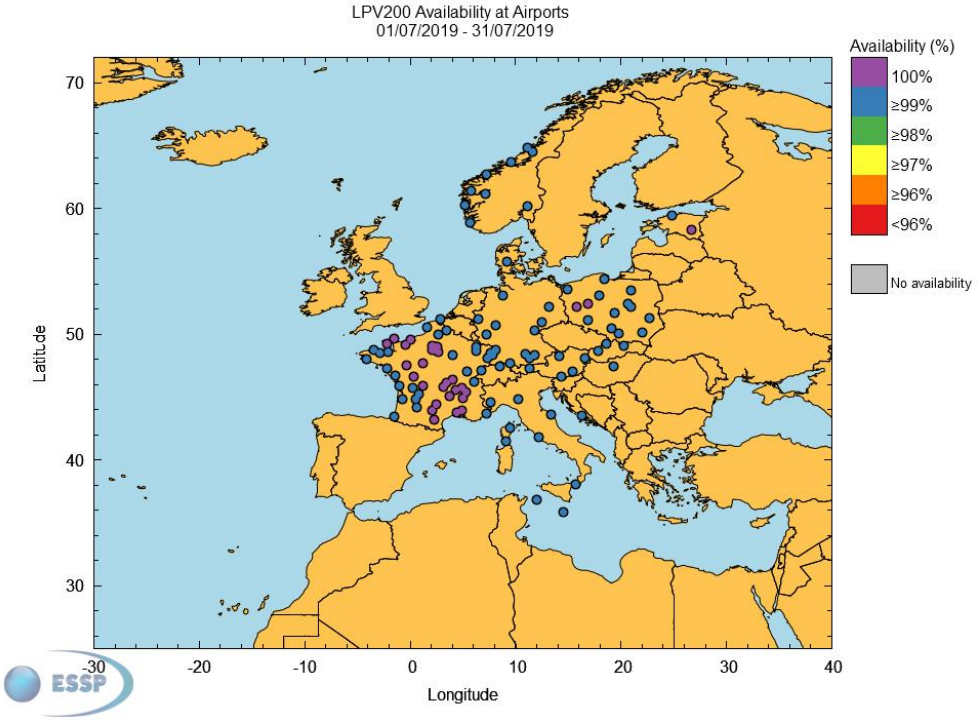

Figure 27 – EGNOS LPV-200 Availability at airports

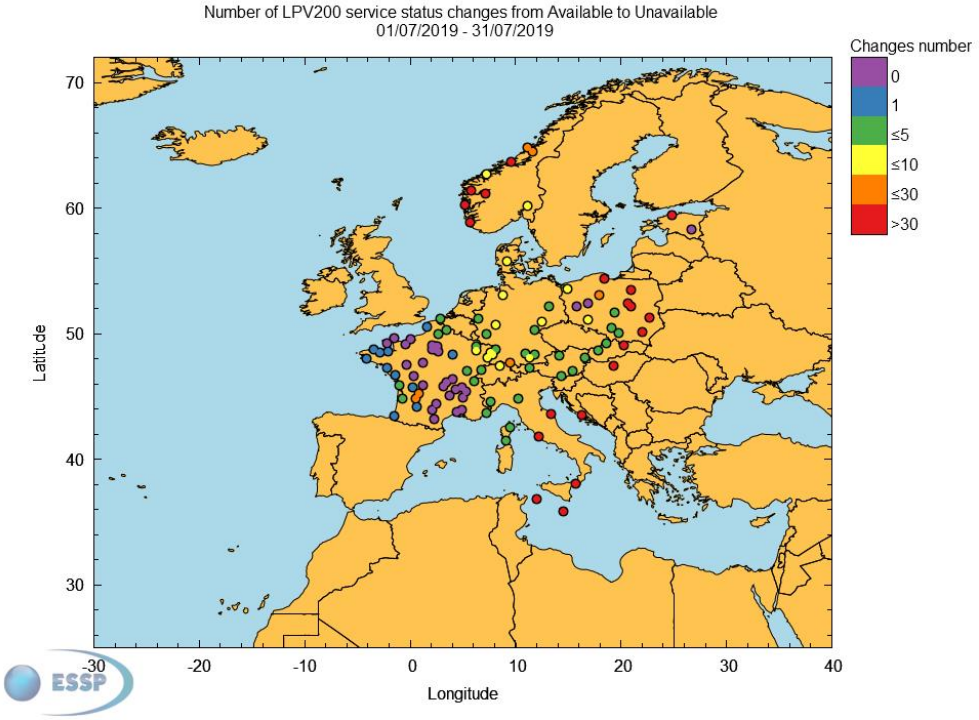

Figure 28 – EGNOS LPV-200 outages

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

3.3.6 EGNOS LPV-200 accuracy extrapolated at 10-7/150s

This section presents the results of extrapolating the accuracy results for every station to 10^{-7}/150 sec. This consists on the characterization of the accuracy distribution tails by means of a Gaussian extrapolation applied to the vertical navigation error.

This information will be updated every six months within the monthly reports of January and July and containing the reporting period corresponding to each semester of the year.

The following results present the values obtained from 1st January 2019 to 30th June 2019. For this period, all the RIMS within LPV-200 service area present extrapolated accuracy values within the requirement: Pr(VNSE>10m) < 10^{-7}/150s.

For the period of analysis, the accuracy tail extrapolated at 10^{-7}/150s values for the RIMS within the LPV200 commitment are:

RIMS	Extrapolated VNSE at 10^{-7}/150s (m)
Aalborg	4.79
Agadir	6.20
Alexandria	5.49
Athens	4.70
Berlin	4.79
Canary Islands	6.84
Catania	4.40
Cork	4.93
Djerba	3.80
Egilsstadir	7.76
Gavle	5.97
Glasgow	4.79
Golbasi	6.15
Jan Mayen	9.42
La Palma	6.16
Lappeenranta	5.46
Lisbon	5.94
Madeira	5.50
Malaga	5.26
Palma de M.	3.43
Reykjavik	8.95
Rome	4.07
Santiago de C.	3.64
Sofia	7.33
Swanwick	5.83
Toulouse	3.71
Tromsoe	7.26
Trondheim	6.72
Warsaw	5.81
Zurich	4.69

Table 6 – Extrapolated VNSE at 10^{-7}/150s in the RIMS within the LPV200 commitment

The highest value is 9.42 m obtained for RIMS Jan Mayen.

Next maps show this information from a geographical point of view:

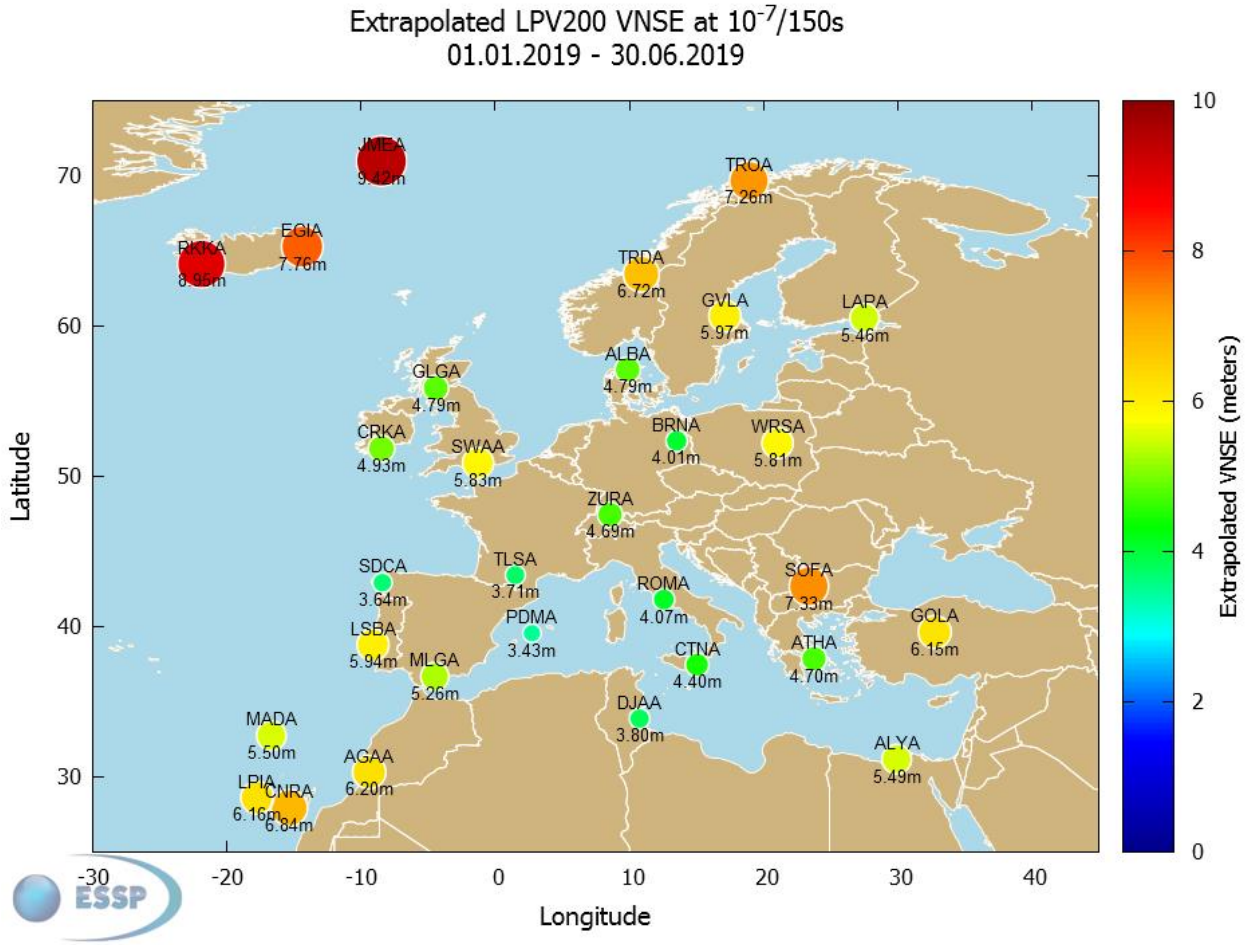

Figure 29 – Extrapolated VNSE at 10^{-7}/150s in the RIMS within the LPV200 commitment

For detailed information of VNSE histogram data extrapolated at 10^{-7}/150s for each RIMS location, please refer to Appendix F.

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 July 2019 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	-	98.87%	542.06
Service Level 2	-	98.87%	547.32
Ntrip Service	-	98.70%	594.97
SISNeT Service	GEO Operational 1	98.65%	94.32
	GEO Operational 2	98.67%	96.65
Data Filtering Service	RIMS A	98.86%	512.32
	Central	98.86%	468.53
	MEDA	98.91%	512.19
	North-East	98.86%	213.13
	North-West	98.86%	458.48
	South-West	98.86%	471.00
FTP Service	-	98.65%	N/A

Table 7 – Performance of EDAS Services

The availability figures reported in the table above have been affected by a planned intervention done on July 9th to upgrade the EGNOS system network. This intervention, notified to EDAS users one week in advance (refer to the "EDAS Service Outage on 09/07/2019" notification issued on July 2nd), caused a 6h 30 min gap on all the EDAS services.

The EDAS services were also impacted by an unplanned internal network issue on July 16th, sporadically affecting the services with a combined approximate duration of 1h 30 min for EDAS Service Level 0 and Service Level 2, and 2h 50 min for the rest of services (for more information, please, refer to the "EDAS unplanned service outages on 16/07/2019" notification issued on July 17th).

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, it is 100% or very close to 100% all days of the month.

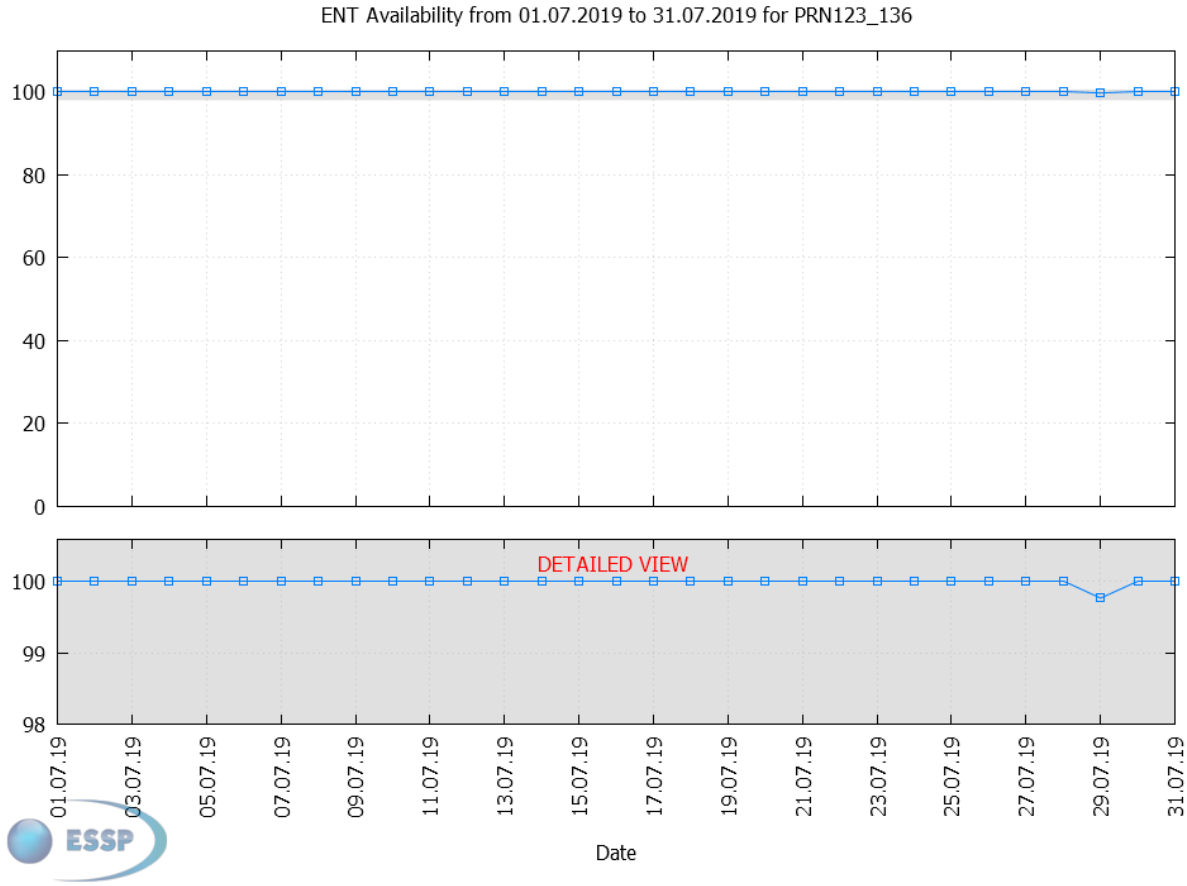

Figure 30 – EGNOS Time Service availability

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 April to June 2019. It can be observed that the offset between them remains below 15 nanoseconds.

[3] EGNOS Time Service availability is computed taking into account that it is not possible to obtain the time solution if the navigation solution is not obtained. 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.

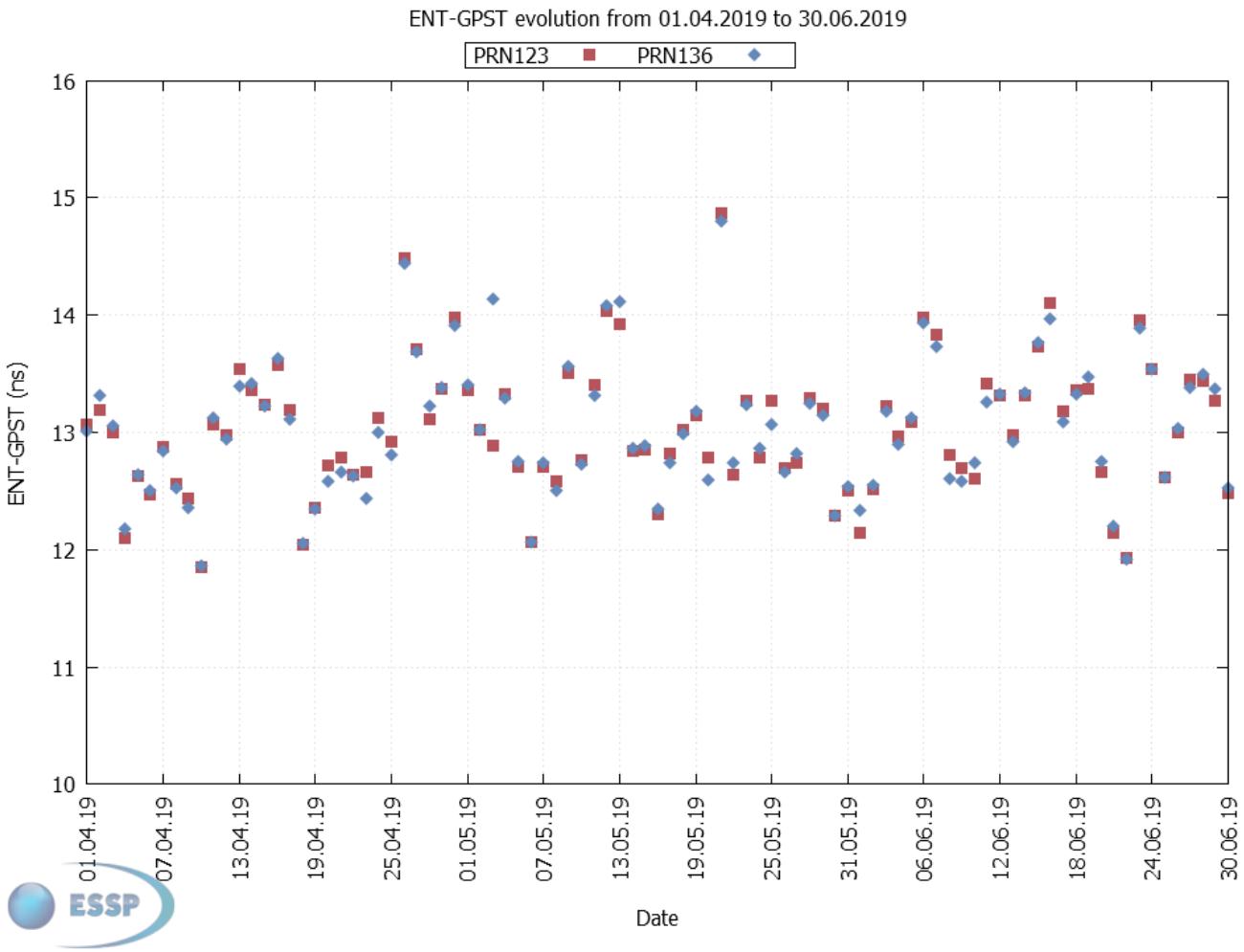

Figure 31 – ENT-GPS offset evolution

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:

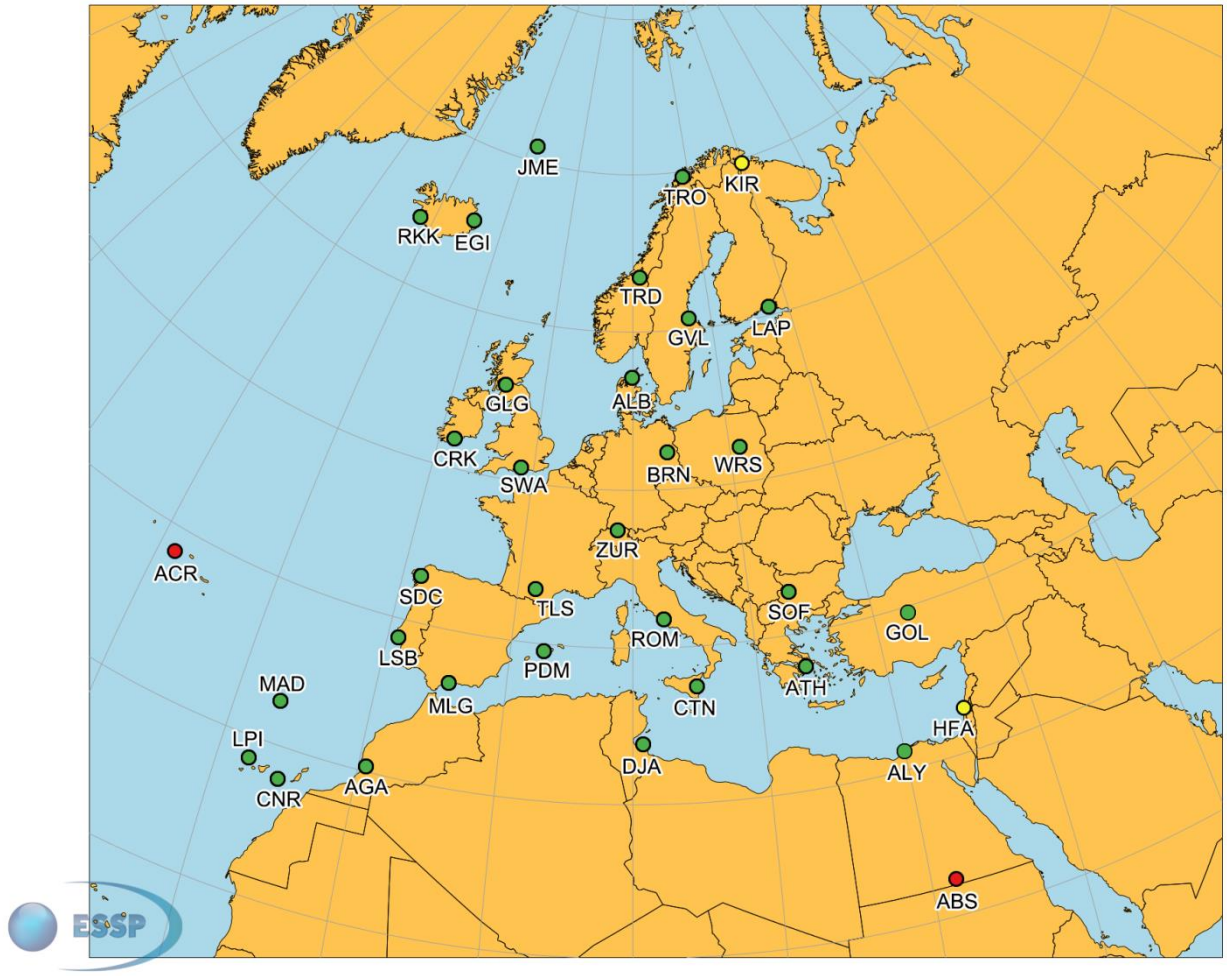

Figure 32 – EGNOS RIMS sites used in this report

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, so as to calculate which service is used each one of them.

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 8 – 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.

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
BIHU / Husavik	Iceland	99.39%	2.60E-04	49	29/03/2019	99.55%	2.54E-04
EBAW / Antwerpen / Deurne	Belgium	99.96%	5.60E-06	2	10/12/2015	99.98%	1.06E-05
EBBR / Brussels-National	Belgium	99.96%	5.60E-06	2	02/03/2017	99.98%	1.18E-05
EBCI / Charleroi / Brussels South	Belgium	99.96%	5.60E-06	2	31/03/2016	99.98%	8.66E-06
EBLG / Liège	Belgium	99.96%	5.60E-06	2	13/10/2016	99.98%	9.48E-06
EBKT / Kortrijk/Wevelgem	Belgium	99.96%	5.60E-06	2	09/11/2017	99.98%	1.43E-05
EDAB / Bautzen	Germany	99.90%	2.62E-05	11	27/04/2017	99.92%	1.74E-05
EDBH / Barth	Germany	99.86%	2.24E-05	6	03/06/2010	99.91%	1.93E-05
EDBM / Magdeburg/City	Germany	99.90%	1.68E-05	4	13/12/2012	99.92%	1.77E-05
EDBN / Neubrandenburg	Germany	99.87%	4.15E-05	18	02/04/2015	99.98%	1.25E-05
EDDB / Berlin/Schönefeld	Germany	99.88%	1.12E-05	2	04/06/2009	99.92%	1.92E-05
EDDC / Dresden	Germany	99.91%	1.87E-05	9	15/12/2011	99.92%	1.60E-05
EDDE / Erfurt-Weimar	Germany	99.92%	1.68E-05	5	15/12/2011	99.92%	1.42E-05
EDDF / Frankfurt Main	Germany	99.95%	8.59E-06	6	15/12/2011	99.92%	1.48E-05
EDDG / Münster/Osnabrück	Germany	99.92%	2.39E-05	14	15/12/2011	99.91%	1.68E-05
EDDH / Hamburg	Germany	99.89%	1.68E-05	4	15/12/2011	99.91%	1.94E-05
EDDK / Köln/Bonn	Germany	99.94%	1.42E-05	7	15/12/2011	99.92%	1.50E-05
EDDL / Düsseldorf	Germany	99.94%	1.49E-05	9	15/12/2011	99.92%	1.46E-05
EDDN / Nürnberg	Germany	99.95%	5.60E-06	2	15/12/2011	99.92%	1.42E-05
EDDP / Leipzig/Halle	Germany	99.92%	2.39E-05	15	15/12/2011	99.92%	1.65E-05
EDDR / Saarbrücken	Germany	99.96%	5.60E-06	2	01/03/2018	99.99%	9.88E-06
EDDS / Stuttgart	Germany	99.97%	1.20E-05	4	15/12/2011	99.92%	1.87E-05
EDDT / Berlin-Tegel	Germany	99.88%	1.12E-05	2	15/12/2011	99.92%	1.90E-05
EDDV / Hannover	Germany	99.91%	1.68E-05	5	15/12/2011	99.91%	1.80E-05
EDFQ / Allendorf/Eder	Germany	99.92%	1.12E-05	4	21/08/2014	99.92%	1.52E-05
EDGS / Siegerland	Germany	99.94%	1.38E-05	8	12/10/2017	99.98%	1.29E-05
EDHI / Hamburg-Finkenwerder	Germany	99.89%	1.68E-05	4	13/12/2012	99.91%	1.99E-05
EDJA / Memmingen	Germany	99.96%	2.32E-05	10	15/12/2011	99.92%	1.88E-05
EDLP / Paderborn/Lippstadt	Germany	99.92%	1.12E-05	4	13/12/2012	99.92%	1.71E-05

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

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
EDLV / Niederrhein	Germany	99.94%	1.12E-05	3	23/06/2016	99.98%	9.47E-06
EDLW / Dortmund	Germany	99.92%	1.42E-05	8	12/12/2013	99.92%	1.60E-05
EDMA / Augsburg	Germany	99.96%	5.60E-06	2	15/12/2011	99.92%	1.80E-05
EDME / Eggenfelden	Germany	99.96%	5.60E-06	2	11/12/2014	99.92%	1.93E-05
EDMS / Straubing	Germany	99.95%	5.60E-06	2	11/12/2014	99.92%	1.64E-05
EDPR / Donauwörth	Germany	99.96%	5.60E-06	2	08/12/2016	99.99%	8.71E-06
EDQC / Coburg-Brandensteinsebene	Germany	99.95%	5.60E-06	2	11/12/2014	99.92%	1.36E-05
EDQD / Bayreuth	Germany	99.95%	5.60E-06	3	15/12/2011	99.92%	1.42E-05
EDQG / Giebelstadt	Germany	99.95%	5.60E-06	2	14/02/2012	99.92%	1.40E-05
EDTD / Donaueschingen-Villingen	Germany	99.97%	5.60E-06	1	11/12/2014	99.92%	1.82E-05
EDTL / Lahr	Germany	99.97%	1.42E-05	9	23/06/2016	99.99%	1.13E-05
EDTM / Mengen-Hohentengen	Germany	99.97%	6.35E-06	2	11/12/2014	99.92%	1.92E-05
EDTY / Schwäbisch-Hall	Germany	99.95%	5.60E-06	2	13/12/2012	99.92%	1.64E-05
EDVE / Braunschweig-Wolfsburg	Germany	99.91%	1.68E-05	5	18/10/2012	99.91%	1.80E-05
EDVK / Kassel-Calden	Germany	99.92%	1.12E-05	4	04/04/2013	99.96%	1.15E-05
EDWE / Emden	Germany	99.90%	1.12E-05	4	30/05/2013	99.98%	1.23E-05
EDWI / Wilhelmshaven JadeWeserAirport	Germany	99.90%	1.12E-05	4	15/12/2011	99.91%	1.78E-05
EDXW / Sylt	Germany	99.89%	1.68E-05	4	10/12/2015	99.97%	1.52E-05
EEKA / KÄRDLA	Estonia	99.89%	5.61E-06	2	31/01/2019	99.94%	1.87E-05
EEKE / Kuressaare	Estonia	99.89%	5.61E-06	2	02/03/2017	99.97%	2.10E-05
EETU / Tartu	Estonia	100.00%	0.00E+00	0	18/07/2019	100.00%	0.00E+00
EFET / Enontekiö	Finland	99.86%	2.11E-04	115	07/12/2017	99.88%	8.80E-05
EFIV / Ivalo	Finland	99.31%	7.29E-04	277	07/12/2017	99.69%	3.01E-04
EFJO / Joensuu	Finland	99.17%	5.01E-04	238	12/12/2013	99.72%	1.59E-04
EFJY / Jyväskylä	Finland	99.75%	2.01E-04	107	07/12/2017	99.90%	7.34E-05
EFKE / Kemi-Tornio	Finland	99.97%	8.85E-05	35	07/12/2017	99.94%	6.25E-05
EFKI / Kajaani	Finland	99.63%	3.23E-04	152	07/12/2017	99.87%	9.82E-05
EFKK / Kokkola-Pietarsaari	Finland	99.91%	5.83E-05	46	07/12/2017	99.96%	3.60E-05
EFKS / Kuusamo	Finland	98.59%	1.14E-03	536	07/12/2017	99.62%	3.56E-04
EFKT / Kittilä	Finland	99.80%	2.22E-04	101	07/12/2017	99.88%	9.22E-05
EFKU / Kuopio	Finland	99.65%	2.90E-04	141	07/12/2017	99.86%	1.01E-04
EFLP / Lappeenranta	Finland	99.56%	3.12E-04	199	07/12/2017	99.85%	9.47E-05
EFMA / MARIEHAMN	Finland	99.86%	2.36E-05	19	29/03/2019	99.89%	2.10E-05
EFOU / Oulu	Finland	99.96%	7.13E-05	31	07/12/2017	99.94%	4.91E-05

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
EFPO / Pori	Finland	99.86%	8.11E-05	65	07/12/2017	99.95%	2.99E-05
EFRO / Rovaniemi	Finland	99.84%	4.17E-04	159	07/12/2017	99.89%	1.19E-04
EFSA / Savonlinna	Finland	99.35%	3.93E-04	211	07/12/2017	99.79%	1.31E-04
EFTP / Tampere-Pirkkala	Finland	99.84%	5.01E-05	18	07/12/2017	99.94%	4.35E-05
EFTU / Turku	Finland	99.87%	2.80E-05	30	07/12/2017	99.96%	2.42E-05
EFVA / Vaasa	Finland	99.91%	2.06E-05	17	07/12/2017	99.96%	3.42E-05
EGEC / Campbeltown	United Kingdom	100.00%	0.00E+00	0	23/06/2016	99.93%	3.60E-05
EGFF / Cardiff	United Kingdom	100.00%	0.00E+00	0	13/10/2016	99.97%	2.23E-05
EGGD / Bristol	United Kingdom	100.00%	0.00E+00	0	21/08/2014	99.97%	1.59E-05
EGHC / Lands End	United Kingdom	100.00%	1.94E-05	18	27/04/2017	99.98%	1.75E-05
EGHG / Yeovil	United Kingdom	100.00%	0.00E+00	0	09/06/2017	99.98%	1.62E-05
EGHI / Southampton	United Kingdom	100.00%	0.00E+00	0	11/10/2018	99.99%	9.61E-06
EGJA / Alderney	Guernsey	100.00%	0.00E+00	0	07/12/2011	99.92%	1.59E-05
EGNL / Barrow/Walney Island	United Kingdom	100.00%	0.00E+00	0	23/06/2016	99.95%	2.89E-05
EGPA / Kirkwall	United Kingdom	99.94%	1.23E-05	8	21/07/2016	99.93%	3.76E-05
EGPB / Sumburgh	United Kingdom	99.91%	2.24E-05	6	11/10/2018	99.91%	5.22E-05
EGPC / Wick	United Kingdom	99.94%	2.69E-05	23	23/06/2016	99.93%	3.43E-05
EGPI / Islay	United Kingdom	100.00%	0.00E+00	0	18/08/2016	99.93%	3.62E-05
EGPN / Dundee	United Kingdom	99.99%	7.84E-06	7	30/03/2017	99.94%	3.13E-05
EGPR / Barra	United Kingdom	100.00%	0.00E+00	0	18/08/2016	99.92%	4.13E-05
EGPU / Tiree	United Kingdom	100.00%	0.00E+00	0	04/02/2016	99.93%	3.86E-05
EGTE / Exeter	United Kingdom	100.00%	0.00E+00	0	21/08/2014	99.98%	1.32E-05
EHAM / Amsterdam	Netherlands	99.96%	1.12E-05	2	13/11/2014	99.97%	1.78E-05
EHGG / Eelde	Netherlands	99.91%	2.28E-05	33	13/11/2014	99.98%	1.27E-05
EHTE / Teuge	Netherlands	99.93%	1.12E-05	4	13/11/2014	99.98%	1.15E-05
EICK / Cork Airport	Ireland	100.00%	0.00E+00	0	16/08/2018	99.95%	3.17E-05
EIDW / Dublin	Ireland	100.00%	0.00E+00	0	25/05/2017	99.95%	3.34E-05
EKAH / Aarhus	Denmark	99.86%	1.12E-05	4	05/03/2015	99.98%	1.43E-05
EKEB / Esbjerg	Denmark	99.88%	1.68E-05	5	15/10/2015	99.97%	1.65E-05
EKKA / Karup	Denmark	99.87%	1.68E-05	5	02/04/2015	99.98%	1.47E-05
EKSB / Sønderborg	Denmark	99.87%	2.09E-05	10	18/08/2016	99.97%	1.45E-05
ENAL / Ålesund/Vigra	Norway	99.88%	1.12E-05	5	03/03/2016	99.96%	2.36E-05

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
ENAN / Andøya/Andenes	Norway	99.93%	9.27E-05	41	02/04/2015	99.84%	1.02E-04
ENBL / Førde/Bringeland	Norway	99.85%	2.92E-05	11	28/05/2015	99.96%	2.33E-05
ENBN / Brønnøysund/Brønnøy	Norway	99.94%	5.60E-05	47	08/12/2016	99.95%	3.09E-05
ENBO / Bodo	Norway	100.00%	0.00E+00	0	06/12/2018	99.96%	2.51E-05
ENBR / Bergen/Flesland	Norway	99.87%	2.24E-05	7	03/03/2016	99.96%	2.29E-05
ENCN / Kristiansand/Kjevik	Norway	99.80%	2.24E-05	7	03/03/2016	99.97%	1.78E-05
ENDU / Bardufoss	Norway	99.85%	1.62E-04	89	26/04/2018	99.91%	8.48E-05
ENEV / Harstad/Narvik/Evenes	Norway	99.96%	1.03E-04	56	30/03/2017	99.88%	7.56E-05
ENFL / Florø	Norway	99.87%	3.81E-05	19	02/04/2015	99.96%	2.47E-05
ENHD / Haugesund/Karmøy	Norway	99.85%	4.75E-05	41	03/03/2016	99.96%	2.18E-05
ENKB / Kristiansund/Kvernberget	Norway	99.90%	4.22E-05	11	26/05/2016	99.96%	2.47E-05
ENKR / Kirkenes/Hoybuktmoen	Norway	97.78%	1.29E-03	509	27/04/2017	99.07%	6.48E-04
ENLK / Leknes	Norway	99.98%	1.57E-05	10	02/02/2017	99.90%	6.12E-05
ENMH / Mehamn	Norway	98.31%	1.15E-03	584	29/03/2019	98.79%	7.61E-04
ENMS / Mosjøen/Kjærstad	Norway	99.99%	1.79E-05	16	30/03/2017	99.95%	3.35E-05
ENRS / Røst	Norway	100.00%	8.96E-06	7	06/03/2014	99.85%	8.32E-05
ENRY / Moss/Rygge	Norway	99.82%	5.87E-05	63	10/12/2015	99.97%	1.82E-05
ENSH / Svolvær/Helle	Norway	99.98%	1.79E-05	15	08/12/2016	99.90%	6.40E-05
ENSK / Stokmarknes/Skagen	Norway	99.98%	3.47E-05	26	08/12/2016	99.88%	7.71E-05
ENSO / Stord/Sørstokken	Norway	99.87%	3.03E-05	10	03/03/2016	99.96%	2.19E-05
ENST / Sandnessjøen/Stokka	Norway	100.00%	0.00E+00	0	23/07/2015	99.95%	3.62E-05
ENTO / Sandefjord/Torp	Norway	99.82%	5.69E-05	56	20/08/2015	99.97%	1.77E-05
ENVA / Trondheim/Vårnes	Norway	99.87%	1.12E-05	4	03/03/2016	99.96%	2.38E-05
ESGJ / Jönköping	Sweden	99.86%	1.12E-05	5	09/11/2017	99.97%	1.46E-05
ESGR / Skövde	Sweden	99.85%	1.98E-05	12	31/05/2018	99.96%	1.15E-05
ESGT / Trollhättan-Vänersborgs flygplats	Sweden	99.83%	1.68E-05	6	29/03/2018	99.96%	1.20E-05
ESMK / Kristianstad	Sweden	99.86%	1.12E-05	5	06/12/2018	99.94%	9.01E-06
ESMQ / Kalmar Öland Airport	Sweden	99.86%	1.12E-05	4	29/03/2019	99.89%	1.59E-05
ESMT / Halmstad	Sweden	99.86%	2.43E-05	9	08/11/2018	99.94%	8.24E-06
ESMX / Växjö Kronoberg	Sweden	99.86%	1.12E-05	5	25/04/2019	99.86%	1.60E-05
ESND / Sveg	Sweden	99.85%	8.41E-05	62	31/01/2019	99.91%	2.70E-05
ESNG / Lapland Airport	Sweden	99.98%	3.59E-05	18	20/06/2019	99.96%	4.32E-05

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ESNO / Örnsköldsvik	Sweden	99.91%	5.12E-05	62	07/12/2017	99.97%	2.28E-05
ESNS /Skellefteå Airport	Sweden	99.92%	8.44E-05	64	29/03/2019	99.94%	4.04E-05
ESOE / Örebro Airport	Sweden	99.85%	1.12E-05	5	16/08/2018	99.95%	1.25E-05
ESSL / Linköping/Saab	Sweden	99.85%	1.68E-05	11	31/01/2019	99.92%	1.28E-05
ESSP / Norrköping Kungsängen	Sweden	99.85%	1.42E-05	8	29/03/2018	99.96%	9.63E-06
ESST / Torsby	Sweden	99.83%	5.01E-05	57	23/05/2019	99.79%	3.27E-05
ESTA / Ängelholm	Sweden	99.86%	2.36E-05	8	19/07/2018	99.96%	1.18E-05
ESUT / Hemavan Tärnaby Airport AB	Sweden	100.00%	1.49E-05	5	11/10/2018	99.98%	2.10E-05
GCRR / Lanzarote AD	Spain	99.97%	3.17E-05	20	23/05/2019	99.94%	4.86E-05
LDDU / Dubrovnik	Croatia	100.00%	0.00E+00	0	10/12/2015	99.98%	1.45E-05
LDPL / Pula	Croatia	100.00%	0.00E+00	0	26/04/2018	99.98%	1.37E-05
LDOS / Osijek/Klisa	Croatia	100.00%	0.00E+00	0	29/03/2018	99.98%	1.85E-05
LDZA / Zagreb/Pleso	Croatia	100.00%	0.00E+00	0	29/03/2018	99.98%	1.45E-05
LDZD / Zadar	Croatia	100.00%	0.00E+00	0	11/10/2018	99.97%	1.04E-05
LEAM / Almería	Spain	99.99%	5.60E-06	1	02/02/2017	99.99%	9.79E-06
LEPA / Palma de Mallorca	Spain	99.97%	1.05E-05	9	01/03/2018	99.98%	9.18E-06
LEVC / Valencia	Spain	99.97%	5.60E-06	1	01/02/2018	99.99%	1.04E-05
LEXJ / Santander	Spain	99.98%	5.60E-06	4	17/10/2013	99.95%	3.95E-05
LFAB / Dieppe Saint Aubin	France	100.00%	0.00E+00	0	02/03/2017	99.98%	9.34E-06
LFAC / Calais	France	99.96%	8.96E-06	7	20/09/2012	99.96%	1.57E-05
LFAQ / Albert Bray	France	99.96%	9.71E-06	8	15/11/2012	99.96%	1.34E-05
LFAT / Le Touquet Paris Plage	France	99.98%	1.01E-05	7	04/02/2016	99.98%	1.04E-05
LFAV / Valenciennes Denain	France	99.96%	5.60E-06	2	19/09/2013	99.98%	1.06E-05
LFAY / Amiens Glisy	France	99.98%	9.71E-06	7	27/06/2013	99.96%	1.20E-05
LFBD / Bordeaux Merignac	France	99.99%	5.60E-06	2	08/03/2012	99.91%	1.89E-05
LFBF / Toulouse Francazal	France	99.99%	5.60E-06	1	23/06/2016	99.99%	8.67E-06
LFBH / La Rochelle	France	99.99%	5.60E-06	2	20/09/2012	99.95%	1.74E-05
LFBI / Poitiers Biard	France	100.00%	0.00E+00	0	12/11/2015	99.98%	8.62E-06
LFBK / Montluçon Gueret	France	100.00%	0.00E+00	0	17/12/2013	99.98%	1.57E-05
LFBN / Niort Marais Poitevin	France	99.99%	1.12E-05	14	02/03/2017	99.98%	1.02E-05
LFBO / Toulouse Blagnac	France	99.99%	6.35E-06	3	03/05/2012	99.91%	1.85E-05
LFBP / Pau-Pyrénées	France	99.99%	6.35E-06	2	17/03/2011	99.91%	2.48E-05
LFBR / Muret Lherm	France	99.99%	5.60E-06	1	15/10/2015	99.99%	9.30E-06

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LFBT / Tarbes Lourdes Pyrénées	France	99.99%	8.59E-06	6	28/05/2015	99.98%	9.96E-06
LFCI / Albi Le Sequestre	France	100.00%	0.00E+00	0	26/05/2016	99.99%	1.06E-05
LFCK / Castres Mazamet	France	100.00%	0.00E+00	0	22/08/2013	99.98%	1.80E-05
LFCR / Rodez Marcillac	France	100.00%	0.00E+00	0	31/05/2012	99.91%	1.92E-05
LFCY / Royan Médis	France	99.99%	5.60E-06	2	30/04/2015	99.98%	9.83E-06
LFDH / Auch Lamothe	France	99.99%	5.60E-06	1	28/05/2015	99.98%	9.39E-06
LFEC / Ouessant	France	99.99%	5.60E-06	1	11/12/2014	99.98%	1.39E-05
LFHP / Le Puy Loudes	France	100.00%	0.00E+00	0	04/02/2016	99.98%	9.59E-06
LFHY / Moulins Montbeugny	France	99.97%	5.60E-06	2	01/05/2014	99.96%	1.55E-05
LFJL / Metz Nancy Lorraine	France	100.00%	0.00E+00	0	04/04/2013	99.99%	8.91E-06
LFKC / Calvi Sainte Catherine	France	100.00%	7.47E-06	2	30/04/2015	99.99%	7.89E-06
LFKJ / Ajaccio Napoléon Bonaparte	France	100.00%	0.00E+00	0	23/06/2016	99.98%	1.00E-05
LFLA / Auxerre Branches	France	100.00%	0.00E+00	0	21/08/2014	99.99%	8.37E-06
LFLD / Bourges	France	100.00%	0.00E+00	0	18/08/2016	99.96%	1.59E-05
LFLL / Lyon St Exupery	France	100.00%	0.00E+00	0	07/02/2013	99.98%	1.68E-05
LFLP / Annecy Meythet	France	100.00%	0.00E+00	0	19/09/2013	99.98%	1.41E-05
LFLW / Aurillac	France	100.00%	0.00E+00	0	26/06/2014	99.98%	1.29E-05
LFLX / Chateauroux Deols	France	100.00%	0.00E+00	0	06/02/2014	99.99%	1.11E-05
LFMD / Cannes Mandelieu	France	100.00%	0.00E+00	0	05/02/2015	99.99%	1.01E-05
LFML / Marseille	France	100.00%	0.00E+00	0	08/01/2015	99.99%	9.75E-06
LFMP / Perpignan Rivesaltes	France	100.00%	0.00E+00	0	15/10/2015	99.96%	1.73E-05
LFMU / Béziers Vias	France	100.00%	0.00E+00	0	18/10/2012	99.98%	1.59E-05
LFNB / Mende	France	100.00%	0.00E+00	0	17/12/2013	99.96%	1.37E-05
LFOB / Beauvais	France	99.97%	5.60E-06	2	20/09/2012	99.98%	9.71E-06
LFOK / Chalons Vatry	France	99.99%	6.72E-06	4	02/02/2017	99.98%	9.68E-06
LFOU / Cholet le Pontreau	France	100.00%	0.00E+00	0	04/02/2016	99.98%	1.10E-05
LFOV / Laval Entrammes	France	100.00%	0.00E+00	0	26/04/2018	99.96%	1.43E-05
LFOZ / Orléans St. Denis De L'Hotel	France	100.00%	0.00E+00	0	28/06/2012	99.92%	1.41E-05
LFPB / Paris-Le Bourget	France	100.00%	0.00E+00	0	02/06/2011	99.96%	1.37E-05
LFPO / Paris Orly	France	100.00%	0.00E+00	0	30/05/2013	99.98%	1.01E-05
LFPT / Pontoise Cormeilles en Vexin	France	99.96%	5.60E-06	2	01/05/2014	99.98%	1.12E-05
LFQA / Reims Prunay	France	100.00%	0.00E+00	0	03/04/2014	99.96%	1.51E-05
LFQG / Nevers Fouchambault	France	100.00%	0.00E+00	0	13/12/2012	99.99%	1.26E-05

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LFQM / Besançon La Vèze	France	99.96%	5.60E-06	2	18/09/2014	99.98%	8.54E-06
LFQQ / Lille Lesquin	France	99.96%	5.60E-06	2	26/06/2014	99.96%	1.34E-05
LFQT / Merville	France	99.99%	5.60E-06	1	15/11/2012	99.91%	2.02E-05
LFRB / Brest Bretagne	France	99.99%	5.60E-06	1	03/05/2012	99.98%	1.22E-05
LFRD / Dinard	France	100.00%	0.00E+00	0	06/02/2014	99.98%	1.02E-05
LFRG / Deauville Saint Gatien	France	100.00%	0.00E+00	0	18/09/2014	99.96%	1.52E-05
LFRM / Le Mans	France	99.99%	5.60E-06	1	15/11/2012	99.95%	1.54E-05
LFRN / Rennes	France	99.99%	5.60E-06	1	30/05/2013	99.95%	1.77E-05
LFRS / Nantes	France	99.99%	5.60E-06	1	28/06/2012	99.97%	1.17E-05
LFRU / Morlaix Ploujean	France	99.99%	5.60E-06	1	13/10/2016	99.91%	1.78E-05
LFRV / Vannes Meucon	France	100.00%	0.00E+00	0	31/05/2012	99.99%	1.04E-05
LFSB / Bâle-Mulhouse	France	100.00%	0.00E+00	0	10/12/2015	99.99%	9.25E-06
LFSD / Dijon-Longvic	France	99.99%	1.12E-05	2	28/04/2016	99.96%	1.66E-05
LFSG / Epinal Mirecourt	France	99.99%	2.24E-05	21	30/05/2013	99.97%	1.75E-05
LFSL / Brive Souillac	France	100.00%	0.00E+00	0	22/08/2013	99.96%	1.63E-05
LFTW / Nîmes Garons	France	100.00%	2.02E-05	6	18/10/2012	99.98%	1.24E-05
LICA / Lamezia Terme	Italy	100.00%	7.84E-06	2	23/05/2018	99.98%	1.28E-05
LICJ / PALERMO/Punta Raisi	Italy	100.00%	5.60E-06	1	11/10/2018	99.98%	8.58E-06
LIEA / ALGHERO/Fertilia	Italy	100.00%	7.47E-06	2	11/10/2018	99.99%	9.13E-06
LIEO / Olbia/Costa Smeralda	Italy	100.00%	0.00E+00	0	12/11/2015	99.98%	1.13E-05
LIMC / Milano/Malpensa	Italy	100.00%	0.00E+00	0	21/08/2014	99.99%	1.12E-05
LIME / Bergamo / Orio al Serio	Italy	100.00%	0.00E+00	0	20/07/2017	99.96%	1.68E-05
LIML / Milano/Linate	Italy	100.00%	0.00E+00	0	13/12/2012	99.98%	1.60E-05
LIPE / BOLOGNA / Borgo Panigale	Italy	100.00%	0.00E+00	0	03/01/2019	99.95%	2.15E-05
LIPZ / Venezia/Tessera	Italy	99.99%	5.60E-06	1	27/06/2013	99.99%	1.11E-05
LIPX / Verona/Villafranca	Italy	100.00%	0.00E+00	0	22/06/2017	99.99%	9.40E-06
LIRQ / Firenze/Peretola	Italy	99.96%	5.60E-06	2	22/06/2017	99.98%	1.66E-05
LKKU / Kunovice	Czech Republic	99.95%	5.60E-06	1	01/12/2017	99.99%	9.69E-06
LKKV / Karlovy Vary	Czech Republic	99.96%	5.60E-06	2	13/11/2014	99.98%	1.62E-05
LKMT / Ostrava	Czech Republic	99.95%	5.60E-06	1	09/01/2014	99.99%	1.03E-05
LKPR / Praha	Czech Republic	99.96%	5.60E-06	3	09/01/2014	99.98%	1.61E-05
LKTB / Brno	Czech Republic	99.95%	5.60E-06	1	09/01/2014	99.99%	9.80E-06
LKVO / Praha/Vodochody	Czech republic	99.93%	1.99E-04	155	25/06/2015	99.97%	4.07E-05

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LMML / Luqa	Malta	99.96%	5.60E-06	1	11/10/2018	99.97%	1.11E-05
LOAV / Vöslau	Austria	99.96%	5.60E-06	1	28/02/2019	99.97%	1.48E-05
LODO / ÖAMTC/Oberwart	Austria	99.96%	2.67E-05	2	28/02/2019	99.96%	2.67E-05
LPPR / Porto	Portugal	99.97%	1.68E-05	4	12/10/2017	99.97%	3.22E-05
LPPT / Lisboa	Portugal	99.96%	1.68E-05	4	28/05/2015	99.98%	1.74E-05
LRCL / Cluj - Napoca / Avram Iancu	Romania	99.98%	1.79E-04	176	10/11/2016	99.91%	7.16E-05
LSMD / Dübendorf	Switzerland	99.98%	5.60E-06	1	21/08/2014	99.99%	1.34E-05
LSME / Emmen	Switzerland	99.99%	5.60E-06	1	03/04/2014	99.98%	1.20E-05
LSMP / Payerne	Switzerland	100.00%	0.00E+00	0	17/09/2015	99.99%	9.42E-06
LSZB / Berne-Belp	Switzerland	100.00%	0.00E+00	0	07/03/2013	99.96%	1.61E-05
LSZG / Grenchen	Switzerland	100.00%	0.00E+00	0	25/07/2013	99.96%	1.77E-05
LSZH / Zurich	Switzerland	99.98%	6.35E-06	2	06/12/2018	99.99%	8.51E-06
LSZR / St. Gallen-Altenrhein	Switzerland	99.97%	1.27E-05	9	17/11/2011	99.92%	1.77E-05
LZIB / Bratislava-Milan Rastislav Štefánik	Slovak Republic	99.96%	5.60E-06	1	05/02/2015	99.98%	2.36E-05
LZKZ / Košice	Slovak Republic	99.99%	1.38E-05	15	05/02/2015	99.95%	6.04E-05

Table 9 – Monthly APV-I Availability at airports with published procedures using EGNOS

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	99.96%	1.27E-05	4	03/01/2019	99.97%	1.59E-05
EDAC / Leipzig/Altenburg	Germany	99.89%	2.54E-05	10	29/03/2019	99.93%	2.43E-05
EDAZ / Schoenhagen	Germany	99.88%	1.83E-05	5	11/10/2018	99.96%	2.20E-05
EDDM / München	Germany	99.95%	1.31E-05	5	15/12/2011	99.97%	8.77E-06
EDDW / Bremen	Germany	99.90%	2.39E-05	7	30/03/2017	99.97%	1.76E-05
EDFH / Frankfurt Hahn	Germany	99.96%	1.31E-05	4	14/09/2017	99.99%	1.24E-05
EDGS / Siegerland	Germany	99.93%	1.83E-05	6	12/10/2017	99.98%	1.68E-05
EDLN / Moenchengladbach	Germany	99.93%	1.83E-05	5	06/12/2018	99.96%	2.27E-05
EDMA / Augsburg	Germany	99.95%	1.31E-05	5	11/10/2018	99.98%	1.29E-05
EDMO / Oberpfaffenhofen	Germany	99.95%	1.31E-05	6	23/05/2019	99.97%	8.77E-06
EDNY / Friedrichshafen	Germany	99.97%	3.17E-05	19	19/07/2018	99.98%	1.45E-05
EDQM / Hof-Plauen	Germany	99.95%	1.31E-05	5	21/06/2018	99.98%	1.25E-05
EDSB / Karlsruhe/Baden-Baden	Germany	99.96%	1.31E-05	5	27/04/2017	99.98%	1.19E-05
EDTL / Lahr	Germany	99.96%	1.31E-05	6	27/04/2017	99.98%	1.19E-05
EETN / LENNART MERI TALLINN	Estonia	99.79%	1.07E-04	58	06/12/2018	99.92%	4.37E-05
EETU / Tartu	Estonia	100.00%	0.00E+00	0	18/07/2019	100.00%	0.00E+00
EGJJ / Jersey	United Kingdom	100.00%	0.00E+00	0	23/05/2019	100.00%	2.63E-06
EKBI / Billund	Denmark	99.85%	1.87E-05	8	20/07/2017	99.96%	2.54E-05
ENBL / Førde/Bringeland	Norway	99.81%	7.37E-05	59	27/04/2017	99.94%	3.59E-05
ENBR / Bergen/Flesland	Norway	99.86%	7.25E-05	47	28/02/2019	99.91%	4.91E-05
ENGM / Gardermoen	Norway	99.82%	2.99E-05	8	10/11/2016	99.95%	2.40E-05
ENML / Molde/Årø	Norway	99.83%	1.83E-05	6	30/03/2017	99.94%	3.68E-05
ENNM / Namsos	Norway	99.85%	3.74E-05	21	27/04/2017	99.93%	5.04E-05
ENOL / Ørland	Norway	99.85%	4.75E-05	36	12/10/2017	99.95%	4.40E-05
ENRM / Rørvik/Ryum	Norway	99.86%	5.16E-05	29	02/02/2017	99.93%	5.21E-05
ENSG / Sogndal/Haukasen	Norway	99.80%	6.88E-05	59	14/09/2017	99.94%	3.27E-05
ENZV / Stavanger/Sola	Norway	99.83%	6.10E-05	40	09/11/2017	99.94%	3.42E-05
EPBY / Bydgoszcz - Szwederowo	Poland	99.88%	5.23E-05	26	26/04/2018	99.97%	2.35E-05

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

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
EPGD / Gdańsk Lech Wałęsa	Poland	99.87%	6.32E-05	45	26/04/2018	99.96%	2.11E-05
EPKK / Kraków - Balice	Poland	99.96%	1.27E-05	4	26/04/2018	99.96%	3.99E-05
EPKT / Katowice	Poland	99.95%	1.27E-05	4	26/04/2018	99.97%	2.08E-05
EPLB / Lublin	Poland	99.89%	1.04E-04	82	26/04/2018	99.89%	7.70E-05
EPLL / Łódź - Lublinek	Poland	99.90%	1.27E-05	4	21/06/2018	99.97%	2.57E-05
EPMO / Warszawa/Modlin	Poland	99.91%	5.87E-05	40	26/04/2018	99.96%	3.12E-05
EPPO / Poznan Lawica	Poland	100.00%	0.00E+00	0	18/07/2019	100.00%	0.00E+00
EPRZ / Rzeszów - Jasionka	Poland	99.91%	8.33E-05	65	26/04/2018	99.93%	7.04E-05
EPSC / Szczecin - Goleniów	Poland	99.86%	1.83E-05	6	26/04/2018	99.96%	2.16E-05
EPSY / Olsztyn - Mazury	Poland	99.88%	7.06E-05	43	26/04/2018	99.96%	2.85E-05
EPWA / Warszawa - F. Chopin	Poland	99.92%	6.50E-05	37	26/04/2018	99.96%	3.20E-05
EPWR / Wroclaw/Strachowice	Poland	99.91%	2.39E-05	6	26/04/2018	99.97%	1.31E-05
LDSP / Split/Kastela	Croatia	100.00%	0.00E+00	0	29/03/2018	100.00%	0.00E+00
LFAQ / Albert Bray	France	99.91%	2.10E-04	188	21/11/2017	99.94%	9.61E-05
LFAT / Le Touquet Paris Plage	France	99.96%	5.60E-06	2	21/11/2017	99.98%	1.18E-05
LFAV / Valenciennes Denain	France	99.98%	5.60E-06	1	21/11/2017	99.98%	1.48E-05
LFBA / Agen La Garenne	France	99.96%	1.27E-05	4	21/11/2017	99.98%	1.39E-05
LFBD / Bordeaux Merignac	France	99.99%	5.60E-06	1	21/11/2017	99.99%	1.35E-05
LFBE / Bergerac	France	99.99%	5.60E-06	2	21/11/2017	99.98%	1.38E-05
LFBI / Poitiers Biard	France	99.99%	1.94E-05	15	21/11/2017	99.98%	1.42E-05
LFBL / Limoges	France	100.00%	0.00E+00	0	21/11/2017	99.99%	1.24E-05
LFBU / Angoulême Brie Champniers	France	100.00%	0.00E+00	0	21/11/2017	99.99%	1.29E-05
LFBX / Périgueux Bassillac	France	99.98%	5.60E-06	1	25/05/2017	99.98%	1.29E-05
LFBZ / Biarritz Bayonne Anglet	France	99.99%	1.42E-05	15	26/04/2018	99.99%	1.06E-05
LFCI / Albi Le Sequestre	France	99.99%	5.60E-06	1	21/11/2017	99.98%	1.50E-05
LFCR / Rodez Marcillac	France	100.00%	0.00E+00	0	21/11/2017	99.99%	1.35E-05
LFDN / Rochefort Charente Maritime	France	100.00%	0.00E+00	0	23/05/2018	99.99%	1.38E-05
LFGA / Colmar Houssen	France	99.99%	5.60E-06	2	21/06/2018	99.98%	1.37E-05
LFGJ / Dole Tavaux	France	99.98%	2.58E-05	10	21/11/2017	99.98%	1.22E-05
LFHP / Le Puy Loudes	France	100.00%	7.47E-06	3	28/02/2019	99.99%	1.27E-05
LFJL / Metz Nancy Lorraine	France	100.00%	0.00E+00	0	21/11/2017	99.99%	8.93E-06

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	99.96%	1.31E-05	5	21/11/2017	99.98%	1.50E-05
LFKB / Bastia Poretta	France	100.00%	0.00E+00	0	07/12/2017	99.98%	1.27E-05
LFKF / Figari Sud Corse	France	100.00%	7.09E-06	2	21/11/2017	99.98%	2.20E-05
LFLC / Clermont-Ferrand Auvergne	France	100.00%	7.09E-06	2	21/11/2017	99.98%	2.45E-05
LFLN / Saint Yan	France	100.00%	0.00E+00	0	02/03/2017	99.99%	1.27E-05
LFLS / Grenoble Isere	France	100.00%	0.00E+00	0	13/10/2016	99.98%	1.12E-05
LFLU / Valence	France	100.00%	0.00E+00	0	21/11/2017	99.98%	1.02E-05
LFLV / Vichy Charmeil	France	100.00%	0.00E+00	0	26/04/2018	99.98%	1.23E-05
LFLY / Lyon Bron	France	100.00%	0.00E+00	0	28/09/2016	99.99%	1.02E-05
LFMH / Saint Étienne Bouthéon	France	100.00%	0.00E+00	0	02/02/2017	99.98%	1.03E-05
LFMK / Carcassonne Salvaza	France	100.00%	0.00E+00	0	21/11/2017	99.98%	1.03E-05
LFMN / Nice Côte d'Azur	France	100.00%	0.00E+00	0	24/04/2019	99.98%	1.40E-05
LFMV / Avignon Caumont	France	100.00%	7.09E-06	2	21/06/2018	99.98%	1.23E-05
LFOH / Le Havre Octeville	France	100.00%	0.00E+00	0	21/11/2017	99.98%	1.02E-05
LFOQ / Blois le Breuil	France	100.00%	0.00E+00	0	24/04/2019	99.99%	1.20E-05
LFPB / Paris-Le Bourget	France	100.00%	0.00E+00	0	21/11/2017	99.98%	1.03E-05
LFPG / Paris Charles de Gaulle	France	100.00%	0.00E+00	0	28/04/2016	99.99%	1.15E-05
LFPM / Melun Villaroche	France	100.00%	0.00E+00	0	21/11/2017	99.98%	7.88E-06
LFPN / Toussus Le Noble	France	100.00%	0.00E+00	0	27/04/2017	99.99%	1.24E-05
LFPO / Paris Orly	France	100.00%	0.00E+00	0	21/11/2017	99.99%	9.24E-06
LFPT / Pontoise Cormeilles en Vexin	France	100.00%	0.00E+00	0	21/11/2017	99.99%	1.18E-05
LFQB / Troyes Barberey	France	100.00%	0.00E+00	0	18/08/2016	99.99%	1.15E-05
LFRC / Cherbourg Maupertus	France	100.00%	5.60E-06	1	23/06/2016	99.98%	8.43E-06
LFRD / Dinard	France	100.00%	0.00E+00	0	21/11/2017	99.98%	9.68E-06
LFRI / La Roche Sur Yon	France	99.99%	5.60E-06	1	10/11/2016	99.98%	1.36E-05
LFRK / Caen Carpiquet	France	99.99%	5.60E-06	1	21/11/2017	99.98%	1.16E-05
LFRO / Lannion	France	100.00%	0.00E+00	0	21/11/2017	99.99%	1.24E-05
LFRQ / Quimper	France	99.99%	5.60E-06	1	21/11/2017	99.98%	1.68E-05
LFRT / Saint Brieuc Armor	France	99.99%	5.60E-06	1	21/11/2017	99.97%	1.96E-05
LFRZ / Saint Nazaire Montoir	France	99.99%	5.60E-06	1	21/11/2017	99.98%	1.58E-05
LFSN / Nancy Essey	France	99.99%	5.60E-06	1	26/04/2018	99.98%	1.44E-05
LFST / Strasbourg Entzheim	France	99.97%	2.43E-05	6	21/11/2017	99.98%	1.35E-05

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
LFTW / Nîmes Garons	France	99.96%	1.31E-05	6	21/11/2017	99.98%	1.47E-05
LHBP / Budapest Liszt Ferenc	Hungary	100.00%	0.00E+00	0	15/09/2016	99.98%	1.20E-05
LICG / Pantelleria	Italy	99.97%	1.65E-04	143	31/05/2018	99.95%	6.61E-05
LICR / Reggio Calabria	Italy	99.89%	3.45E-04	304	19/07/2018	99.95%	7.59E-05
LIMP / Parma	Italy	99.83%	3.26E-04	295	23/05/2018	99.93%	1.31E-04
LIMZ / CUNEO/Levaldigi	Italy	100.00%	7.09E-06	2	23/05/2018	99.98%	1.91E-05
LIPY / ANCONA / Falconara	Italy	100.00%	7.47E-06	3	03/01/2019	99.98%	1.02E-05
LIRF / Roma/Fiumicino	Italy	99.98%	1.81E-04	158	23/05/2019	99.96%	9.23E-05
LMML / Luqa	Malta	99.98%	1.71E-04	145	11/10/2018	99.99%	1.46E-04
LOWG / Flughafen Graz	Austria	99.64%	5.76E-04	470	01/03/2018	99.89%	1.88E-04
LOWI / Innsbruck	Austria	99.97%	1.27E-05	3	01/02/2018	99.96%	4.77E-05
LOWK / Klagenfurt	Austria	99.96%	1.31E-05	5	11/10/2018	99.98%	2.42E-05
LOWL / Linz	Austria	99.98%	1.27E-05	3	02/02/2017	99.96%	3.89E-05
LOWW / Wien - Schwechat	Austria	99.96%	1.27E-05	4	02/02/2017	99.97%	2.69E-05
LSGC / Les Eplatures	Switzerland	99.96%	1.27E-05	3	26/05/2016	99.97%	4.02E-05
LSGG / Genève	Switzerland	100.00%	7.47E-06	3	13/09/2018	99.98%	8.93E-06
LSZH / Zurich	Switzerland	100.00%	7.47E-06	3	25/05/2017	99.98%	1.14E-05
LZPP / Piešťany	Slovak Republic	99.98%	1.94E-05	6	02/02/2017	99.99%	1.12E-05
LZTT / POPRAD-Tatry	Slovak Republic	99.96%	1.27E-05	3	29/03/2018	99.97%	4.05E-05
LZZI / Žilina	Slovak Republic	99.96%	3.74E-05	36	25/05/2017	99.94%	7.94E-05

Table 10 – Monthly LPV-200 Availability at airports with published procedures using EGNOS

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/library/official_docs/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/library/official_docs/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)

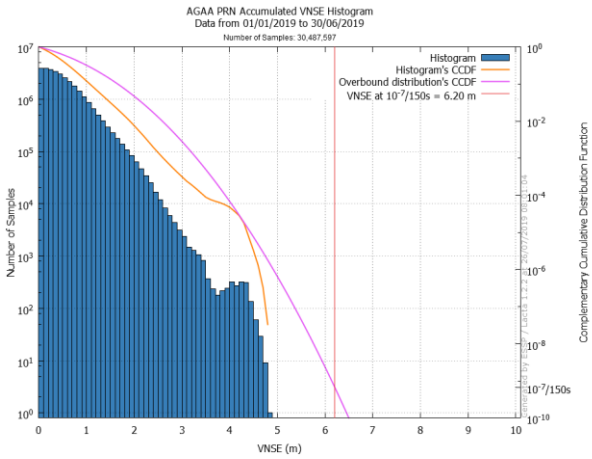
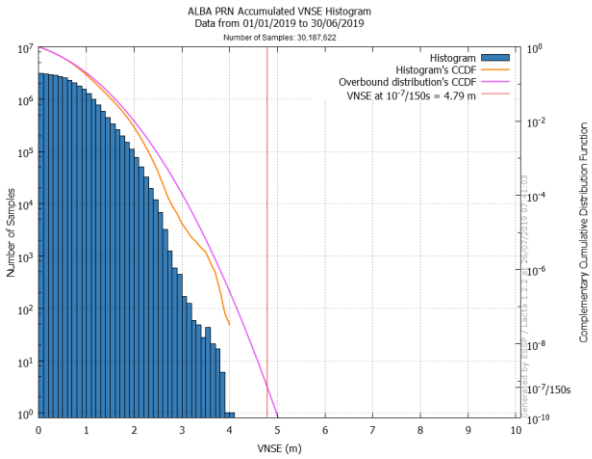
APPENDIX E LIST OF ACRONYMS

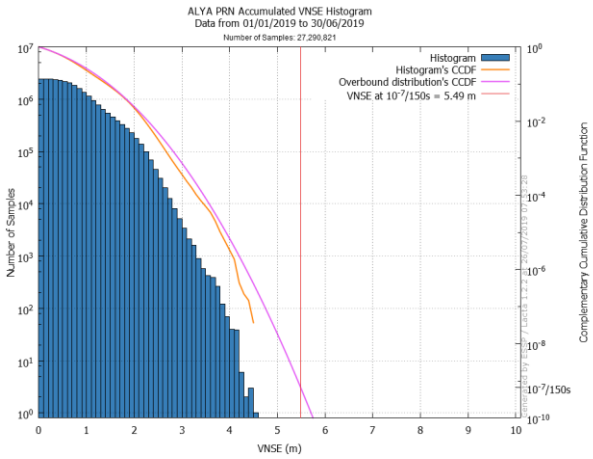
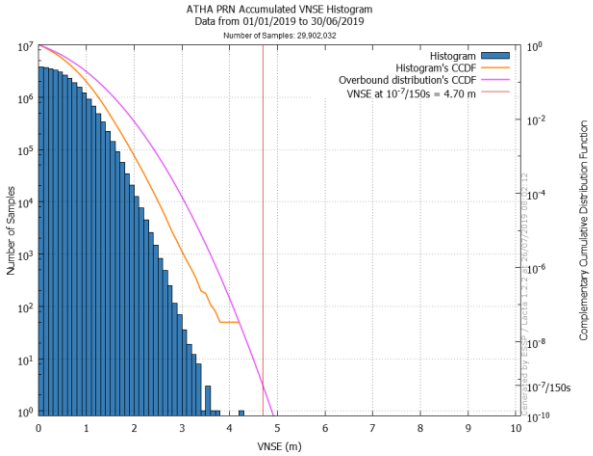
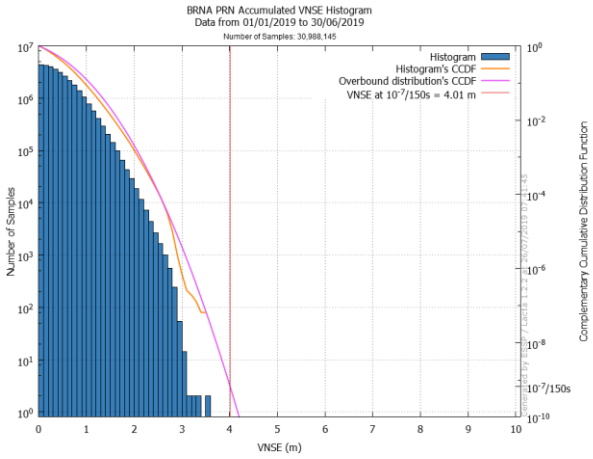
Acronym	Definition
APV	Approach with Vertical Guidance
ASN	Abstract Syntax Notation
ECAC	European Civil Aviation Conference
EDAS	EGNOS Data Access Service
EGNOS	European Geostationary Navigation Overlay Service
ENT	EGNOS Network Time
ESSP	European Satellite Services Provider
FTP	File Transfer Protocol
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

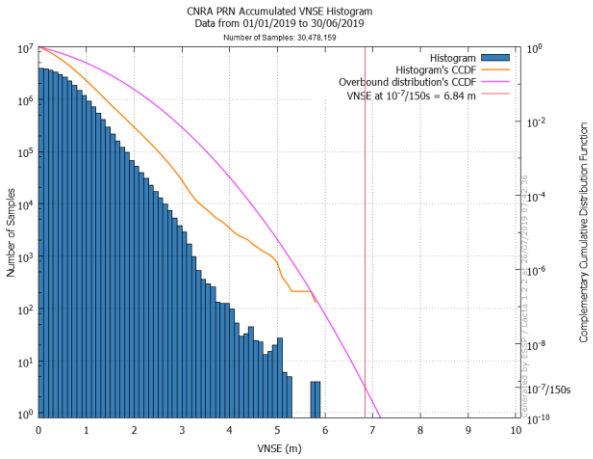
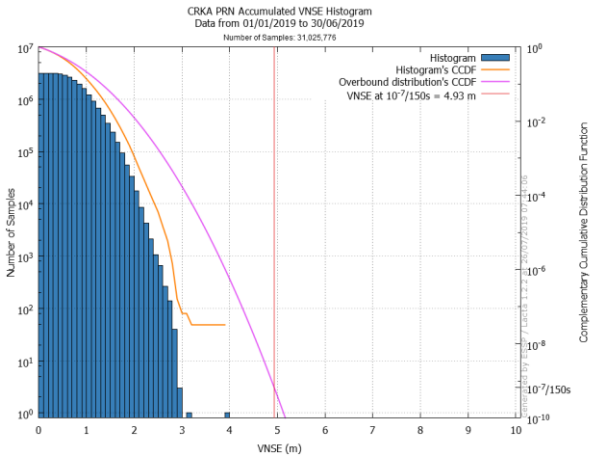
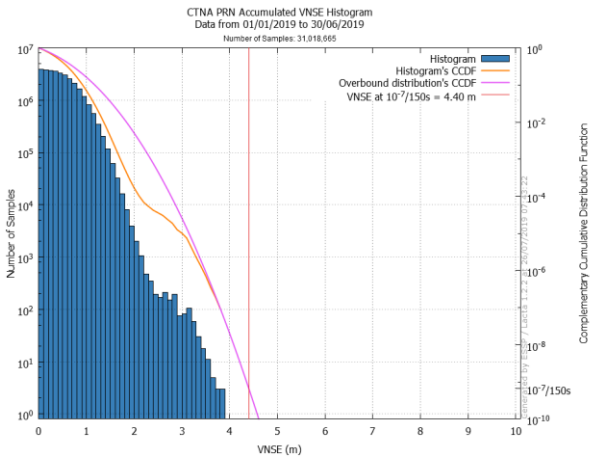
APPENDIX F VNSE HISTOGRAM DATA EXTRAPOLATED AT 10-7/150S FOR EACH RIMS LOCATION

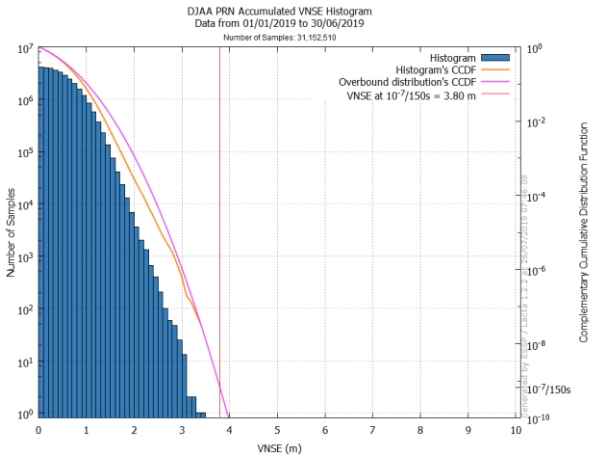
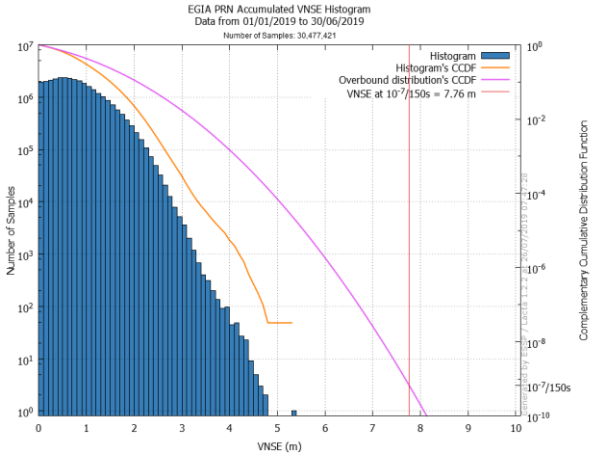
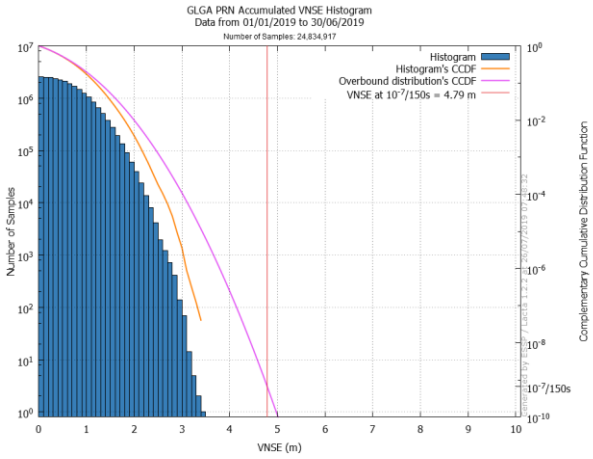
For each RIMS, accumulating measurements from both EGNOS GEO, the following figures present:

1. Accumulated VNSE histogram in dark blue and referenced to the vertical axis on the left.
2. Cumulative probability of the accuracy distribution in orange and referenced to the vertical axis on the right.
3. Cumulative probability of the overbounding Gaussian distribution in pink and referenced to the vertical axis on the right.
4. VNSE extrapolated to 10^{-7}/150s in the right top corner.

	Extrapolated LPV-200 VNSE at 10^{-7}/150s
AGADIR	
ALBORG	

	Extrapolated LPV-200 VNSE at 10^{-7}/150s
ALEXANDRIA	
ATHENS	
BERLIN	

	Extrapolated LPV-200 VNSE at 10^{-7}/150s
CANARY ISLANDS	
CORK	
CATANIA	

	Extrapolated LPV-200 VNSE at 10^{-7}/150s
DJERBA	
EGILSSTADIR	
GLASGOW	

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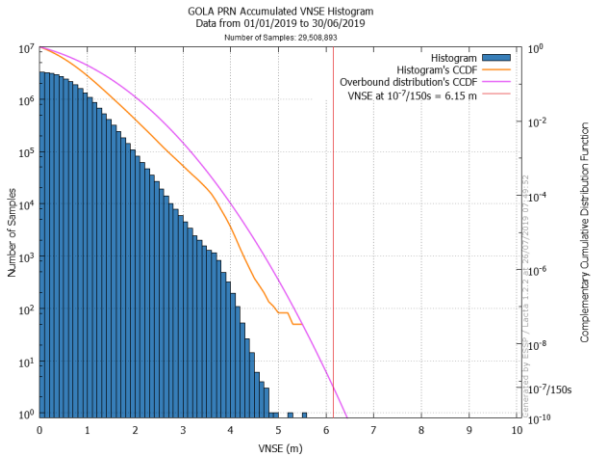
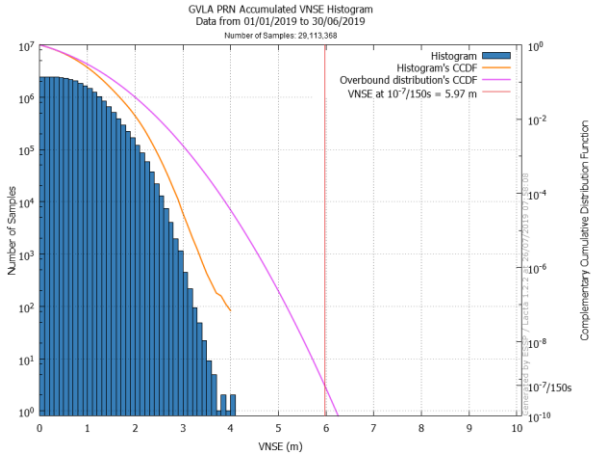
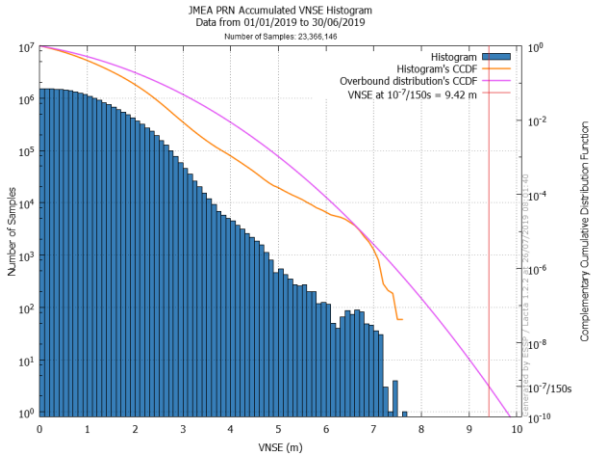
GOLBASI	
GAVLE	
JAN MAYEN	

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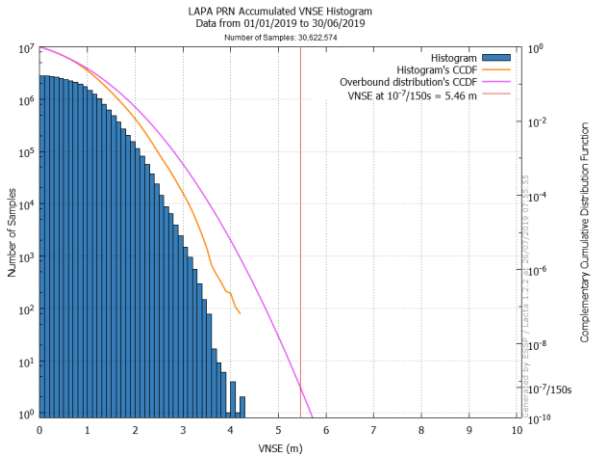
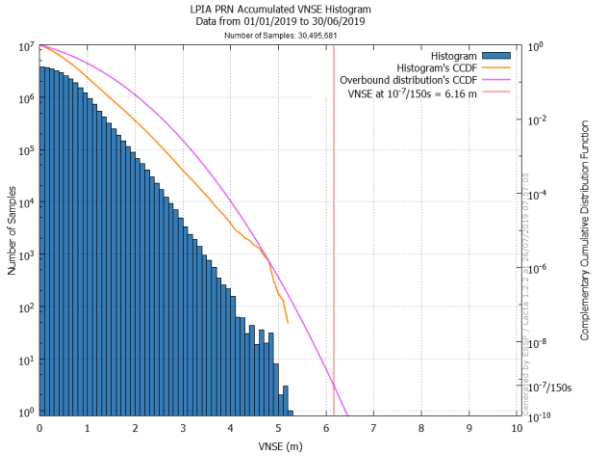
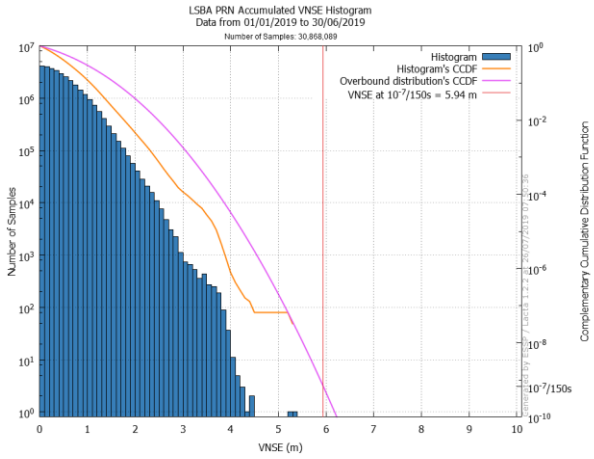
LAPPEERANTA	
LA PALMA	
LISBON	

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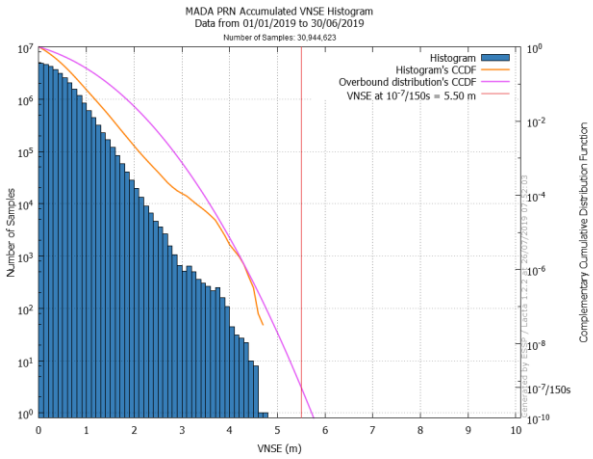
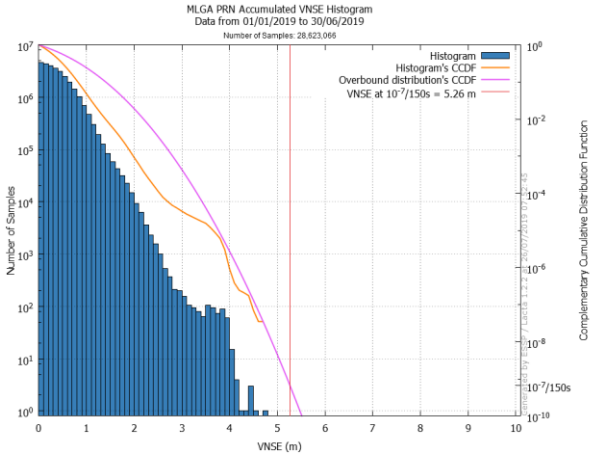
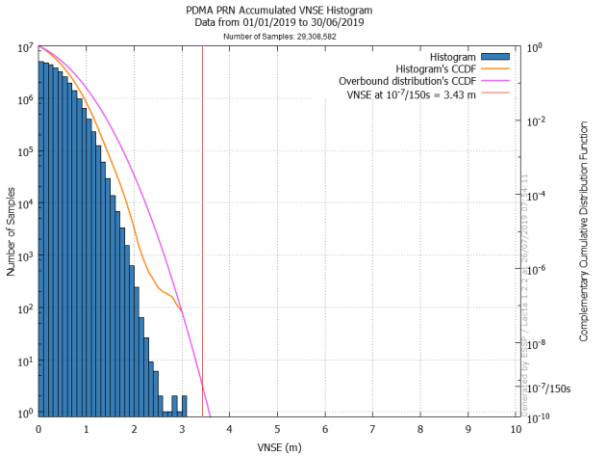
MADEIRA	
MALAGA	
PALMA MALL.	

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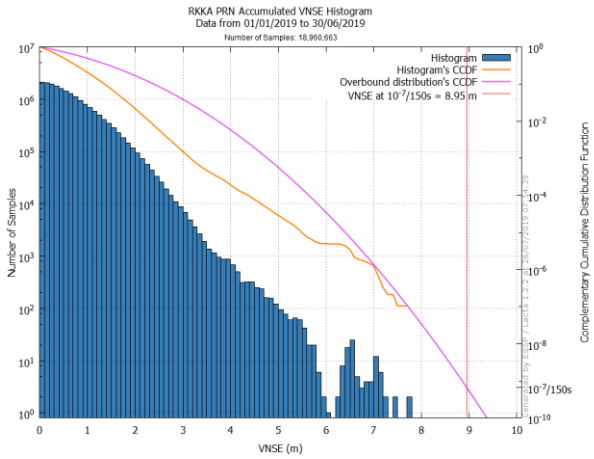
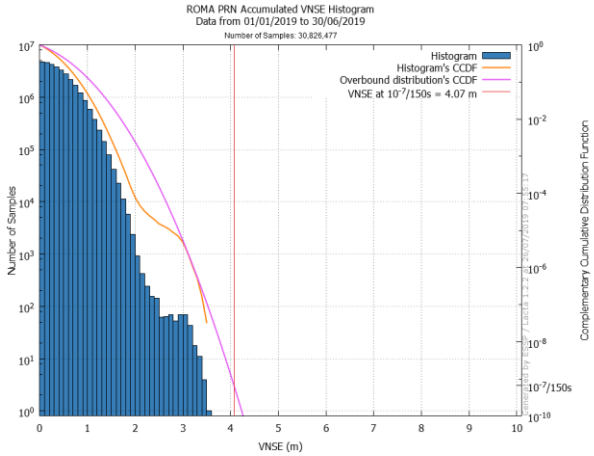
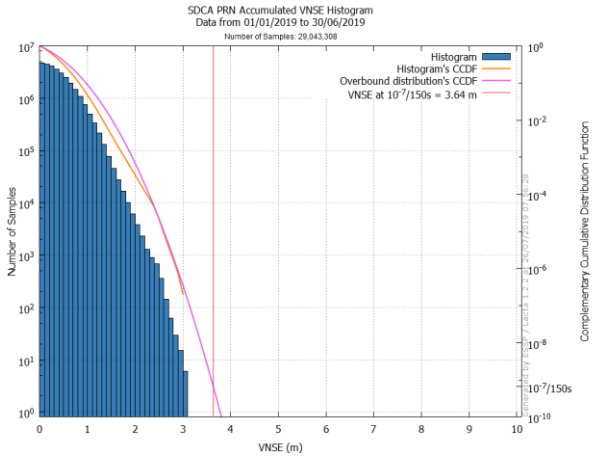
REYKJAVIK	
ROME	
SANTIAGO C.	

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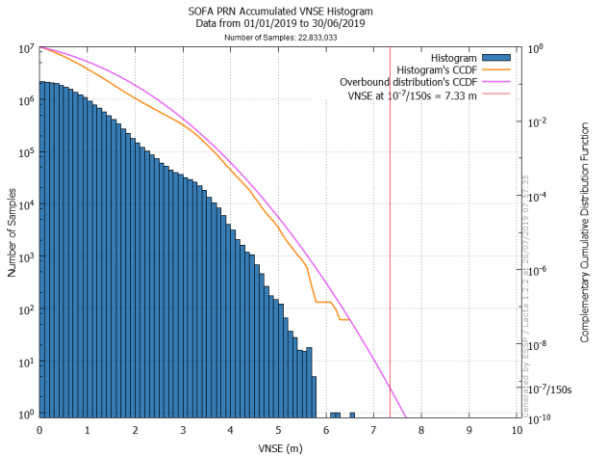
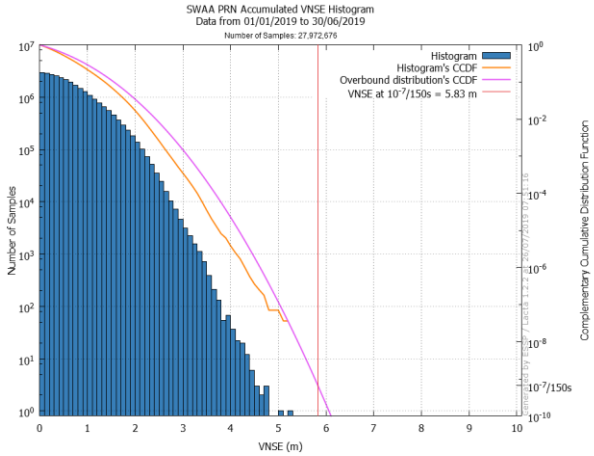
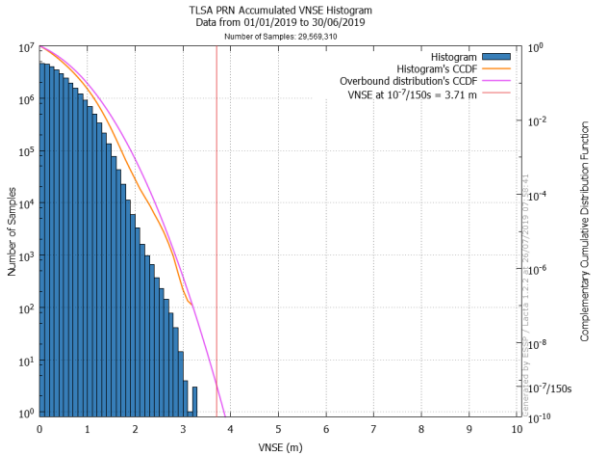
SOFIA	
SWANWICK	
TOULOUSE	

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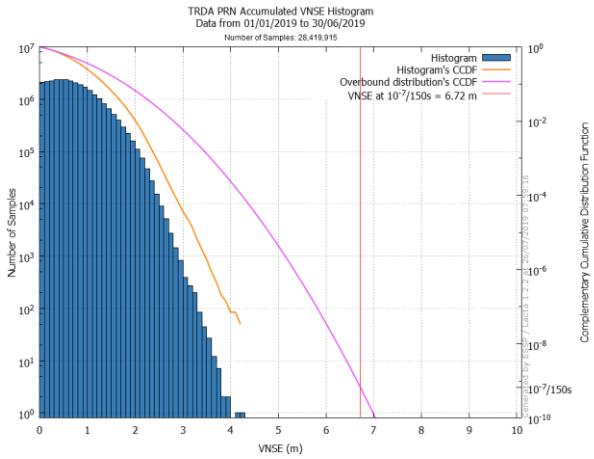
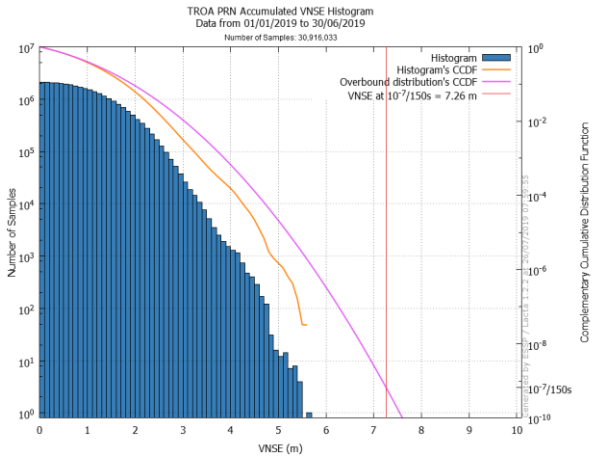
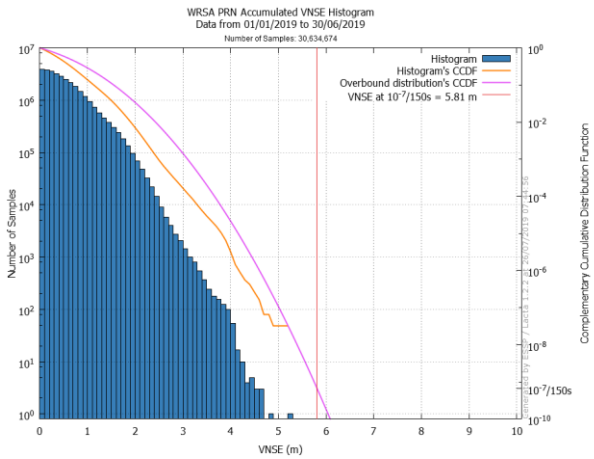
TRONDHEIM	
TROMSOE	
WARSAW	

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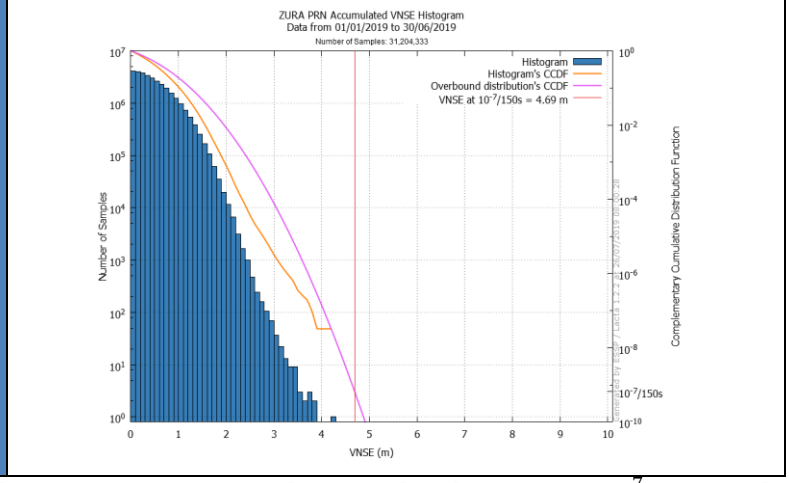
ZURICH	

Table 11 – Histograms and extrapolated VNSE at 10^{-7}/150s in the RIMS

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