



EUROCONTROL's support to EGNOS certification

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EGNOS, the European GNSS Navigation Overlay Service is a satellite-based augmentation system that improves the services provided by the US Global Positioning System. It provides differential corrections to improve positioning accuracy and signal quality measurements to provide integrity to satellite navigation users in Europe.

EGNOS can be used to support navigation in all phases of flight. However, the most demanding aviation application using EGNOS is the RNAV Approach with vertical guidance down to with LPV minima.

In support of the EGNOS system development and operational implementation, a tripartite agreement was established in 1998 between the European Commission, the European Space Agency and EUROCONTROL. The EC provided funding and political support, ESA was responsible for the development of the system and EUROCONTROL provided civil aviation requirements and support to operational introduction. Part of the Eurocontrol contribution has been the monitoring of the system performance to verify that the aviation requirements are met.

In line with this objective, EUROCONTROL developed the necessary elements for performing independent monitoring of the EGNOS signal-in-space in order to evaluate the performance achievable using EGNOS over the ECAC region. This included:

- Development of the appropriate **tools** for the performance evaluation, the PEGASUS toolset being the most important contribution. PEGASUS has been validated against the RTCA DO229 Minimum Operational Performance Standards (MOPS).
- Deployment, in collaboration with many ANSP's, of the required **infrastructure** of 21 EGNOS receivers across Europe, the EGNOS data collection network (EDCN), to assess the performance over a wide area.
- Implementation of the appropriate **procedures** and methodology for data collection, evaluation, performance assessment and results presentation. In addition, as a means to combine all the results coming from other monitoring activities, EUROCONTROL has coordinated the harmonization of the evaluation methodology with the other actors involved in the EGNOS certification process, such as the future EGNOS service provider (ESSP).

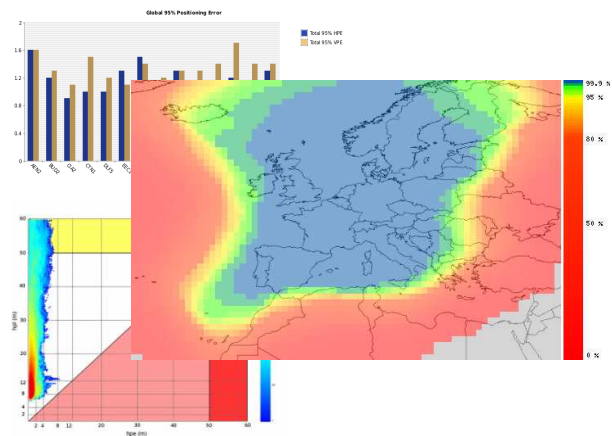


Figure: EGNOS data collection network and independent performance assessment using PEGASUS tool.

The results of the EDCN have been the main contribution to the independent performance assessment using real field data from EGNOS version 2.2, which is the version to be certified. The results of this assessment have been used to compile the EGNOS Independent Performance Report that has been produced in cooperation with the European Commission and the ESSP. This report will be presented as part of the declaration of verification that will form part of the technical file to be submitted to the national supervisory authority in charge of the EGNOS Service provider certification.

The main objective of this performance assessment is to demonstrate that the fielded EGNOS system meets the key requirements and that a user equipped with a MOPS compliant receiver can achieve the navigation performance requirements necessary to perform RNAV Approaches to LPV minima.

The results presented in the independent performance report, including the RIMS and sites managed by ESSP, were also computed using the Eurocontrol PEGASUS software.

The ESSP is aiming to be certified as an Air Navigation Service Provider by mid-2010 and the objective is to provide an operational service useable by aviation by November 2010.

EUROCONTROL plans to continue monitoring the performance of the EGNOS service during operations to ensure that the aviation requirements continue to be met. EUROCONTROL plans to evolve the EDCN infrastructure to monitor also new GNSS signals like GPS L5 and Galileo signals.