



## EGNOS Grant Plan 2020

**Reference:**

**GSA-EGN-PM-PL-A02355**

**Issue/Version: 1.0**

**Date: 16/12/2019**

Change Log:			
WFID	Issue/ Version	Changes & Pages Affected	Date
	1.0	First release	16/12/2019



## TABLE OF CONTENTS

<b>1</b>	<b>INTRODUCTION .....</b>	<b>3</b>
<b>2</b>	<b>ACRONYMS AND ABBREVIATIONS.....</b>	<b>3</b>
<b>3</b>	<b>ACCELERATION OF EGNOS ADOPTION IN THE FIELD OF CIVIL AVIATION.....</b>	<b>4</b>
3.1	LEGAL BASIS .....	4
3.2	BUDGET LINE .....	4
3.3	BACKGROUND .....	4
3.4	PRIORITIES, OBJECTIVES PURSUED AND EXPECTED RESULTS .....	4
3.5	DESCRIPTION OF ACTIVITIES TO BE FUNDED UNDER THIS CALL FOR PROPOSALS .....	5
3.6	INDICATIVE AMOUNT OF THE SPECIFIC GRANT.....	6
<b>4</b>	<b>EGNOS SERVICE PERFORMANCE MONITORING SUPPORT FROM MEMBER STATES.....</b>	<b>7</b>
4.1	LEGAL BASIS .....	7
4.2	BUDGET LINE .....	7
4.3	BACKGROUND.....	7
4.4	PRIORITIES, OBJECTIVES PURSUED AND EXPECTED RESULTS.....	8
4.5	DESCRIPTION OF ACTIVITIES TO BE FUNDED UNDER THIS CALL.....	9
4.6	INDICATIVE AMOUNT OF THE SPECIFIC GRANT.....	10

## LIST OF TABLES

Table 1 - Abbreviations .....	3
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## 1 Introduction

The Agency's 2020 grant plan for European Geostationary Navigation Overlay Service (EGNOS) exploitation contains 2 calls for proposal:

1. Acceleration of EGNOS adoption in the field of civil aviation.
2. EGNOS Service Performance Monitoring Support from Member States

## 2 Acronyms and Abbreviations

Table 1 - Abbreviations

Abbreviation	Definition
ATC	Air Traffic Control
EGNOS	European Geostationary Navigation Overlay Service
EGNSS	European Global Navigation Satellite System
GPS	Global Positioning System
GSA	European GNSS Agency
IFR	Instrument Flight Rule
LPV	Localizer performance with vertical guidance
PBN	Performance Based Navigation
RNP	Required Navigation Performance
SBAS	Satellite-based Augmentation System

## **3 Acceleration of EGNOS adoption in the field of civil aviation**

### **3.1 Legal basis**

The legal basis for this grant is Regulation (EU) No 1285/2013 of the European Parliament and of the Council of 11 December 2013 on the implementation and exploitation of European satellite navigation systems and repealing Council Regulation (EC) No 876/2002 and Regulation (EC) No 683/2008 of the European Parliament and of the Council and Delegation Agreement between the European Union, represented by the European Commission and the European GNSS Agency on the Exploitation Phase of the EGNOS Programme signed on 16 April 2014.

### **3.2 Budget line**

The budget line is 3920.

### **3.3 Background**

The European Global Navigation Satellite System (EGNSS), operated under civilian control, encompasses satellite radio-navigation system established under the Galileo programme and European Geostationary Overlay System (EGNOS). The EGNOS Safety of Life service was certified for use in aviation in March 2011 and today all European Air Navigation Service Providers (ANSPs) are enabled to implement EGNOS based approach procedures.

To meet the overall objectives of the EGNOS programme, the uptake in civil aviation is vital. This call should result in the implementation of EGNOS based operations, increasing safety and reducing distortions for the benefit of European aerodromes and airspace users.

### **3.4 Priorities, objectives pursued and expected results**

Operational implementation of EGNOS in aviation is a strategic goal to ensure the success of the programme. In this context, the objective of this activity is to foster EGNOS adoption in the European aviation, enabling on the one hand, users to equip their aircraft/rotorcraft fleet with Global Positioning System/Satellite-based Augmentation System (GPS/SBAS) enabled avionics and, on the other hand, Air Navigation Service Providers and airports/heliports to implement EGNOS based operations including approaches benefitting from the Localizer performance with vertical guidance 200 (LPV200) service level, PinS LPV procedures and low level Instrument Flight Rule (IFR) routes in Europe, as well as other advanced operations such as Required

Navigation Performance (RNP) AR using SBAS. It will also consider pilot cases on advanced navigation operations benefitting from EGNOS, assessment of new operational scenarios, such as implementation in aerodromes with limited infrastructure and activities promoting the use of EGNOS for other communication and surveillance applications in all phases of flight.

The Performance Based Navigation (PBN) regulation published by the EC in July 2018, mandates RNP APCH down to LPV minima to all EU airports by 2024 and paves the way to full PBN environment by 2030, with rationalisation of conventional navigation procedures. The activity aims at facilitating airspace users to get ready for such change, encouraging SBAS equipage in commercial, regional, business (corporate) aviation, general aviation (training, emergency services) and rotorcraft. OEMs and avionics manufacturers interested in benefitting from EGNOS are also encouraged to apply to the call.

The result of this activity will be a wide scale operational implementation of the EGNOS based operations throughout European airports and airspace users.

### **3.5 Description of activities to be funded under this call for proposals**

Proposals submitted to the call for proposals should cover at least one of the activities described below:

- Design, development and operational implementation of EGNOS LPV/LPV 200 approach procedures, PinS, low level IFR routes at different European airports/heliports/routes.
- Design, development and operational implementation of other operations with EGNOS and assessment of operational benefits, such as RF legs and RNP AR.
- Pilot cases aiming at assessing new operational scenarios, such as LPV to aerodromes without Air Traffic Control (ATC) or non-instrument runways.
- Installation of GPS/EGNOS enabled avionics and granting of airworthiness certification for RNP APCH procedures down to LPV minima, including PinS.
- Development of retrofit and forwardfit solutions including LPV capabilities.
- Design and implementation of other communication, navigation and surveillance applications benefitting from EGNOS for all phases of flight.

- Development of enablers and other EGNOS based operations, such as, but not limited to simulators, validation tool, training materials or drones.

### **3.6 Indicative amount of the specific grant**

Indicative amount: € 3,000,000 with the possibility to extend to € 10,000,000 pending budget availability.

## **4 EGNOS Service Performance Monitoring Support from Member States**

### **4.1 Legal basis**

The legal basis for this grant is Regulation (EU) No 1285/2013 of the European Parliament and of the Council of 11 December 2013 on the implementation and exploitation of European satellite navigation systems and repealing Council Regulation (EC) No 876/2002 and Regulation (EC) No 683/2008 of the European Parliament and of the Council and Delegation Agreement between the European Union, represented by the European Commission and the European GNSS Agency on the Exploitation Phase of the EGNOS Programme signed on 16 April 2014.

### **4.2 Budget line**

The budget line is 3920.

### **4.3 Background**

The Commission has delegated tasks related to the EGNOS Exploitation programme to the European GNSS Agency. This agreement entrusts the Agency with the management of operational activities relating to the exploitation of the Programme, including infrastructure management, maintenance and continuous improvement in accordance with the Programme Management Plan.

In line with article 30 of the GNSS Regulation<sup>1</sup> the Agency may have recourse to technical assistance, particularly from national agencies competent in the space sector. It also may have recourse to the assistance of independent experts and bodies capable of providing impartial analyses and opinions on the progress of the programme.

In this framework, the Agency wishes to launch a call for proposals for the establishment of a stable and structured partnership between itself and national agencies, institutions, independent experts and/or bodies from EU Member States, and from third countries participating in the GNSS Programme. These entities shall

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<sup>1</sup> Regulation (EU) No 1285/2013 of the European Parliament and of the Council of 11 December 2013 on the implementation and exploitation of the European satellite navigation systems and repealing Council Regulation (EC) No 876/2002 and Regulation (EC) No 683/2008 of the European Parliament and of the Council, OJ L 347, 20.12.2013.

commit themselves to establish, maintain and implement an EGNOS performance monitoring network. The objective is threefold: (1) to guarantee analysis and investigations independent of the service provider and of other stakeholders; (2) to establish a relationship with not-for-profit partners; (3) to benefit from, and contribute to, long-term key expertise, continuity and competences for the programme. Additionally, this activity takes advantage of past public investments and of existing capacities available at Member States level. In September 2015 the Agency signed a Framework Partnership Agreement (FPA) with a Consortium coordinated by CNES for a period of 7 (seven) years to establish cooperation between itself and the partners. The first specific grant was signed on 10 November 2015 for a period of 12 months to initiate the activities defined for such cooperation. It was followed by a second specific grant of a duration of 24 months and a third grant which is on-going and will run until 10 November 2020. Considering the need to ensure continuity of the above activities after this date, the Agency plans to launch the fourth specific grant during 2020.

#### **4.4 Priorities, objectives pursued and expected results**

The fourth Grant shall, in accordance with the FPA's Strategic Plan, address:

- 1) Continuity of the SPMS expertise network.
- 2) SBAS Service and Signal Performance Watch: to monitor and compare SBAS signals and service performance (addressing all available SBAS: EGNOS, WAAS, SDCM, GAGAN, MSAS, etc. and all available services). Some of the parameters to be monitored are: ICAO SARPS compliance, analysis of potential configuration changes in the SBAS or GPS, evaluation of SIS availability, local assessment of accuracy, integrity, availability and continuity, global assessment of the availability and continuity of the different SBAS, etc.
- 3) To investigate abnormalities in EGNOS Service performance (e.g. signal anomalies, service underperformance, etc.)
- 4) To support EGNOS programme activities as per Agency requests (e.g. to contribute to EGNOS service provision technical reviews; to participate in boards and workings groups; to perform specific analysis, simulations or investigations; etc.)



## 4.5 Description of activities to be funded under this call

The high-level activities are described below:

- 1) Maintenance of the SPMS expertise network established since the first specific grant.

The SPMS network was created to fulfil the FPA objectives. It is now a well-established network of committed experts in the field of GNSS, with the ambition to drive, stimulate and coordinate the EGNOS performance monitoring. The network relies upon individuals with a high level of specific knowledge and expertise in EGNOS performance monitoring who are backed and supported by relevant organisations in the field and/or by national authorities. The SPMS network shall be maintained to the same level to allow the implementation of the objectives of this fourth specific grant.

- 2) SBAS Service and Signal Performance Watch

To monitor and compare SBAS signals and service performance addressing all available SBAS: (EGNOS, WAAS, SDCM, GAGAN, MSAS, etc.) and all available services. The monitoring shall be based on real data collected from multiple reference stations spread over the coverage area of each SBAS system in a representative way. The network of reference stations shall be independent from EGNOS system.

The monitoring shall address:

- a) Signal/message configuration:

- Analysis of compliance of the broadcast SBAS messages to the ICAO SARPS and of the GPS navigation message to its Interface Control Document;
- Analysis of potential changes in the SBAS or GPS.

- b) Service performance:

- SBAS satellites SiS Availability
- Local assessments of the accuracy, integrity, availability, continuity, of the different SBAS systems and their OS and SOL services;
- Global assessment of the availability and continuity of the different SBAS systems and their OS and SOL services over their coverage area.

- c) Surveillance of new GEO-SBAS and issue of warnings and recommendations about potential impacts on EGNOS.

d) Issue of anomaly reports upon detection of any unexpected result from the monitoring.

3) To investigate EGNOS Service performance abnormal events

The Agency may require independent SPMS investigation of abnormal events in EGNOS Service performance through the activation of specific tasks to be agreed with the consortium (objectives, efforts, schedule, outputs) depending on the particular investigation. Such events may be signal in space anomalies or service underperformances (due to internal system anomalies, due to ionosphere conditions or any other external factor). Sensitivity analysis of the impact of changes in the system or the environment may also be considered under this task (examples: different RIMS configuration, reduction of GPS constellation, etc.).

4) To support EGNOS programme activities as per Agency requests

The Consortium is expected to support the Agency in different EGNOS programme activities when needed. Such activities may include, but are not limited to, the contribution to EGNOS service provision technical reviews, the participation in boards and workings groups and the execution of analysis, simulations or investigations.

5) For the SPMS coordinator, coordination of SPMS activities:

- a) Act as the Agency's interface for all matters related to the grant activities, the submission and publication of deliverables, the organisation of internal checkpoints with the partners, the organisation of progress meetings and of the yearly review, etc.
- b) Administrative and technical supervision of the fulfilment by the partners of their respective role and responsibilities.

## 4.6 Indicative amount of the specific grant

Indicative amount: € 1,000,000

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