

Request for Information

On

**Space-Based GNSS Radio Frequency Interference Monitoring
Services and Systems**

1 Introduction

EGNOS (European Geostationary Navigation Overlay Service) is Europe's first concrete venture into satellite navigation. EGNOS uses geostationary satellites and a network of ground stations to receive, analyse and augment GPS, and in the next version (EGNOS V3) Galileo signals, allowing the using of DFMC (Dual Frequency Multi Constellation). EGNOS increases the accuracy of existing satellite positioning signals while providing a crucial 'integrity message', informing users with timely warnings, in the event of an out of tolerance condition of the Signal in Space. It also transmits an accurate universal time signal.

EGNOS makes existing satellite navigation signals suitable for safety critical applications and was certified for use in civil aviation in 2011.

The Galileo programme is Europe's initiative for a state-of-the-art Global Satellite Navigation System (GNSS) completely independent of other existing or potential systems. Galileo is the largest industrial project ever organised on an EU scale, and the first public infrastructure owned by an EU institution. Galileo allows users to know their exact position with high and reliable precision. The Galileo system, once fully operational, will offer a range of high-performance services worldwide (Open Service (OS), Open Service Navigation Message Authentication (OSNMA), High Accuracy Service (HAS), Public Regulated Service (PRS), and Search and Rescue (SAR), Emergency Warning Service (EWS), and Timing Service (TS). The OS shall be used in the civil aviation domain and will be provided in both Single Frequency (SF) usage mode and Dual Frequency (DF) usage mode, and it allows users to continuously estimate their distance to the satellite.

Recently, there has been an escalation of jamming and spoofing events impacting GNSS services at worldwide level. GNSS is one of the main enablers in various market sectors, and particularly in aviation for performance-based navigation (PBN), which provides navigation guidance for all phases of flight, from enroute to precision approach. By providing accurate position and timing information, GNSS enables several systems critical to the safety of flight. GNSS Radio Frequency Interference (GNSS RFI), therefore, poses significant risks to GNSS services, impacting various sectors reliant on accurate positioning and timing, including aviation, maritime, and telecommunications.

2 Acronyms and Abbreviations

Abbreviation	Definition
AWP	Annual Work Programme
CET	Central European Time
DF	Dual Frequency
DFMC	Dual Frequency Multi Constellation

DPO	Data Protection Officer
EC	European Commission
EDPS	European Data Protection Supervisor
EGNOS	European Geostationary Navigation Overlay Service
EU	European Union
EUSPA	European Union Space Programme Agency
EWS	Emergency Warning Service
FR	Financial Regulation
GNSS	Global Navigation Satellite System
GPS	Global Positioning System
GSA	European GNSS Agency (now part of EUSPA)
HAS	High Accuracy Service
OLAF	European Anti-Fraud Office
OP	Open Service
OSINT	Open-Source Intelligence
OSNMA	Open Service Navigation Message Authentication
PPL	Procurement and Planning
PRS	Public Regulated Service
RFI	Radio Frequency Interference
SAR	Search and Rescue
SF	Single Frequency
TS	Timing Service

3 Scope and Purpose of the Request for Information

3.1 Purpose

The purpose of this Request for Information is to gather data on available solutions for:

- Part (A): Space-based GNSS RFI monitoring services, technologies and their providers.
- Part (B): Space-based GNSS RFI monitoring payloads (to be hosted in EU constellations for an EU-owned service) and their manufacturers.

It is important to note that Part (A) (focused on a full-service solution) and Part (B) (focused on payloads and system-level capabilities) are independent from each other.

Part (A), the Request for Information aims at:

- Identifying industry capabilities regarding space-based GNSS RFI monitoring services and technologies;
- Understanding the technological requirements for continuous monitoring, detection, and reporting of GNSS RFI events on GNSS frequencies (Galileo E1, E5a, E5b, E6; GPS L1, L2, L5);
- Exploring the feasibility of providing real-time or near-real-time monitoring data with a focus on the parameters indicated in Question no 3, Section 4, part (A), below;
- Understanding which are the challenges and/or technical limitations in providing space-based GNSS RFI monitoring services and technologies;
- Understanding future developments on space-based GNSS RFI monitoring services and technologies;
- Evaluating market readiness, assessing the availability of GNSS RFI monitoring services and technologies beyond 2025.

Part (B), the Request for Information aims at:

- Identifying industry capabilities regarding the manufacturing of space-based GNSS RFI monitoring payloads;
- Understanding the technological requirements of spacecraft payloads, for continuous monitoring and detection of GNSS RFI events on frequencies (Galileo E1, E5a, E5b, E6; GPS L1, L2, L5);
- Exploring the feasibility of acquiring real-time or near-real-time monitoring data from space, with a focus on the parameters indicated in Question no 3, Section 4, part (B), below;
- Understanding which are the challenges and/or technical limitations in the manufacturing and integration of space-based GNSS RFI monitoring payloads;
- Understanding future developments on space-based GNSS RFI monitoring payloads;
- Evaluating market readiness, assessing the availability of the payloads beyond 2025.

This Request for Information is addressed to:

- Part (A): GNSS RFI monitoring services and technologies providers;
- Part (B): GNSS RFI monitoring payloads manufacturers.

Economic operators having expertise in satellite-based monitoring services or systems relevant to GNSS RFI detection are encouraged to respond.

4 Questions to participants

Part (A)

Based on the information provided above, the participants are invited to answer the following questions:

1. Please briefly describe your organization's core business and the activities related to GNSS RFI monitoring services and technologies.
2. What technologies would you utilize in providing your space-based GNSS RFI monitoring service?
3. Please provide technical details (including system architecture, detection algorithms, and latency considerations) for the parameters listed below:
 - Geolocation of interference sources;
 - Signal type identification (e.g., jamming, spoofing, unintentional interference);
 - Number of concurrently detected interferers;
 - Interference sensitivity (minimum detectable interference levels);
 - Time required to localize the interferer and notify users;
 - Probability of missed detections and false alarms;
 - Frequency and update rate at which your system can capture and report GNSS RFI activities.
4. Would you consider it feasible to provide a real-time or near-real-time GNSS RFI monitoring service with the parameters indicated above?
5. What existing challenges and/or technical limitations (e.g. accuracy in geolocating jammers and spoofers) might affect the effectiveness of providing your space-based GNSS RFI monitoring service?
6. Which is the coverage (e.g. global, EU etc) of the services you provide?
7. Are you able to provide services monitoring RF emissions on the Galileo frequencies (E1, E5a, E5b, E6) and GPS frequencies (L1, L2, L5) and detecting interference impacting both Galileo and GPS services?
8. Is your service able to handle classified information according to the applicable regulations?
9. Does the service require authorization from a National Security Authority (NSA)? In such a case, what is the contact of the relevant NSA?
10. What is the planned roadmap for the provision of your space-based GNSS RFI monitoring service? Specifically, what improvements are expected in terms of accuracy, reliability, and reaction time? Please provide a timeline on when you would be able to provide your space-based GNSS RFI monitoring service (e.g., Q2 2025, 2026, etc.).
11. Which are the future developments on space-based GNSS RFI monitoring services and technologies you have in mind?

Part (B)

Based on the information provided above, the participants are invited to answer the following questions:

1. Please briefly describe your organization's core business and the activities related to the manufacturing of GNSS RFI monitoring payloads.
2. What technologies would you utilize in producing your space-based GNSS RFI monitoring system?
3. Please provide technical details regarding the payload characteristics, as per below:
 - Capability to monitor the Galileo frequencies (E1, E5a, E5b, E6) and GPS frequencies (L1, L2, L5) for GNSS RFI emission detection;
 - Capability to locate the GNSS RFI emission source and associated technology (single-satellite, multiple-satellite);
 - Signal type identification (e.g., jamming, spoofing, unintentional interference);
 - Number of concurrently detected interferers;
 - Interference sensitivity (minimum detectable interference levels);
 - Time to localize the interferer;
 - Probability of missed or false detections;
 - Payload mass, volume and power consumption requirements;
 - Antenna characteristics;
 - Data download requirements (bandwidth, buffering needs, etc) and proposed technology;
 - Target orbit characteristics (e.g. altitude) and limitations;
 - Any other constraints or requirements required from the satellite platform (e.g. thermal control, etc);
4. Does the payload manufacturing, integration and operation require the classified information according to the applicable regulations?
5. Would a contract require authorization from a National Security Authority? In such a case, what is the contact of the relevant NSA?
6. What is the planned roadmap for the manufacture of your space-based GNSS RFI monitoring payload? Please provide a timeline on when you would be able to provide your space-based GNSS RFI monitoring payload (e.g., Q2 2025, 2026, etc.).
7. Which are the future developments on space-based GNSS RFI monitoring payload and technologies you have in mind?

5 Confidentiality

The Agency is committed to maintaining the strictest confidentiality regarding the responses received to this Request for Information. The replies will only be shared with the **European Commission** and **Member States** within the framework of the **Space Programme Committee – Galileo and EGNOS Configuration (SPC-GEC)**, with the objective of obtaining their feedback on the data gathered from this Request for Information in **Q2 2025**.

6 Data protection section

The European Union Agency for the Space Programme (EUSPA) is committed to protect your personal data and to respect your privacy. Any personal data that may be included in the replies to the present Request for Information will be processed in compliance with (1) the applicable rules on the protection of natural persons with regard to the processing of personal data by the EU institutions, bodies,

offices, and agencies and on the free movement of such data (currently Regulation (EU) 2018/1725) and (2) the modalities of the following privacy statement:

Identity of the controller:

- **Controller:** European Union Agency for the Space Programme (EUSPA), Engineering Department, Janovského 438/2 170 00 Prague 7, Czech Republic, fabien.frossard@euspa.europa.eu.
- **Data Protection Officer:** EUSPA Data Protection Officer, Janovského 438/2 170 00 Prague 7, Czech Republic, dpo@euspa.europa.eu.

Purpose of the processing: The management and administration of the Request for Information.

Data concerned:

Data subjects shall submit the following mandatory data when responding to the Request for Information: their email address and company/agency/body and department they work for.

Non-mandatory data the data subjects can submit are other contact information of theirs, such as their first name and last name, position, postal address, telephone numbers. However, these are not necessary for the purposes of responding to this Request for Information.

Legal basis: Articles 5(1)(a) and 5(1)(b) of Regulation (EU) 2018/1725

Lawfulness of the processing: Article 5(1)(a): the processing is necessary for the performance of a task carried out in the public interest or in the exercise of official authority vested in the Union institution or body. In particular, the processing is necessary “for the management and functioning of those institutions and bodies” (Recital 22).

Article 5(1)(b): the processing is necessary for compliance with a legal obligation to which the controller is subject. Your data will be processed for compliance with legal obligations as per Regulation (EU, Euratom) 2018/10462 (hereinafter referred to as “the Financial Regulation”), Regulation (EU) 2021/6963 (hereinafter referred to as “the EU Space Programme Regulation”) and European GNSS Agency Financial Regulation 2019 adopted by its Administrative Board on 16 August 2019.

Recipients of the data processed: For the purpose detailed above, access to your personal data is given to a limited number of EUSPA staff and contractors of EUSPA on a “need to know” basis.

This is without prejudice to a possible transmission to the bodies in charge of a monitoring or inspection task in accordance with European Union law (i.e., EUSPA might disclose personal data to the Court of Auditors and the European Anti-Fraud Office (OLAF), if need be).

Information on the storage locations and retention period of personal data: Responses to the stakeholder Request for Information, including personal data provided therein, will be retained by EUSPA for a period of 5 years following the closure of the file to which the present Request for Information belongs. A file is closed at the latest once there has been a final outcome in relation to the initiative to which the targeted Request for Information contributed.

Personal data is stored electronically on the servers of the EUSPA or of its contractors located in the EU.

Data subject's rights and contact data:

Data subjects have the right:

- To obtain confirmation as to whether or not their personal data are being processed, access the data, and obtain detailed information on the processing.
- Of rectification of inaccurate personal data.
- Of erasure of personal data if the statutory provisions are met.
- Of restriction of processing if the statutory provisions are met.
- To object to processing.
- To lodge a complaint to the European Data Protection Supervisor at EDPS@edps.europa.eu should they consider that the processing operations do not comply with Regulation (EU) No 2018/1725.

Any request for the exercise of any of the abovementioned rights shall be addressed to the EUSPA EGNOS Exploitation Department at egnos-exploitation@euspa.europa.eu. Data subjects are kindly requested to describe their requests explicitly.

The data subjects may contact:

- Regarding the processing of their personal data: egnos-exploitation@euspa.europa.eu;
- Regarding the interpretation, application, or breach of Regulation (EU) 2018/1725: dpo@euspa.europa.eu.

The data subjects have the right to have recourse (i.e., lodge a complaint) to the European Data Protection Supervisor (EDPS@edps.europa.eu) if they consider that their rights under Regulation (EU) 2018/1725 have been infringed as a result of the processing of their personal data by the data controller.

7 Submission of Responses

Submission of a response implies acceptance of the conditions of the Request for Information. The participants shall answer the questions listed in Section 4.

The responses to this Request for Information should be in English indicating as a minimum the submitter's email address, company/agency/body, and department, and should be sent in electronic format by email to the following address: tenders@euspa.europa.eu.

The deadline for submission of responses is 27th February 2025, 23:59 CET (at the latest).

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