

Linking space to user needs

# EGNOS Programme Status

EGNOS User Workshop 2024, Dublin

Alberto MADRAZO – Deputy Head of EGNOS Exploitation

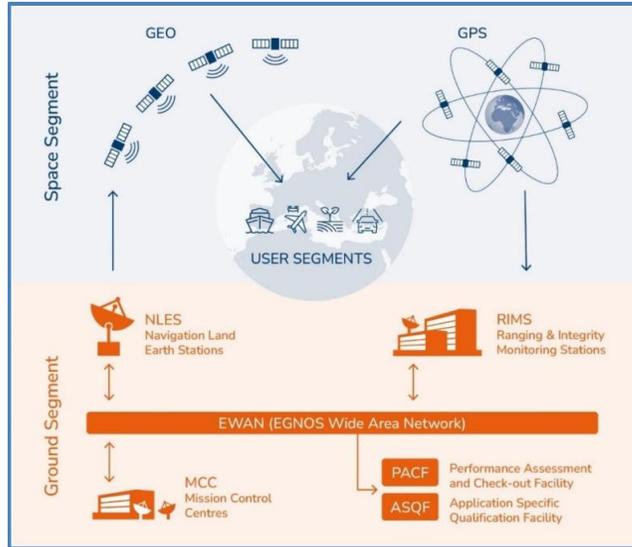
13-14 March 2024



# EGNOS Programme Status

- a. EGNOS Service status and performance**
- b. EGNOS V2 maintenance and improvements**
- c. EGNOS new generation development: EGNOS V3**
- d. EGNOS Maritime Service Declaration**

# EGNOS System Configuration March 2024

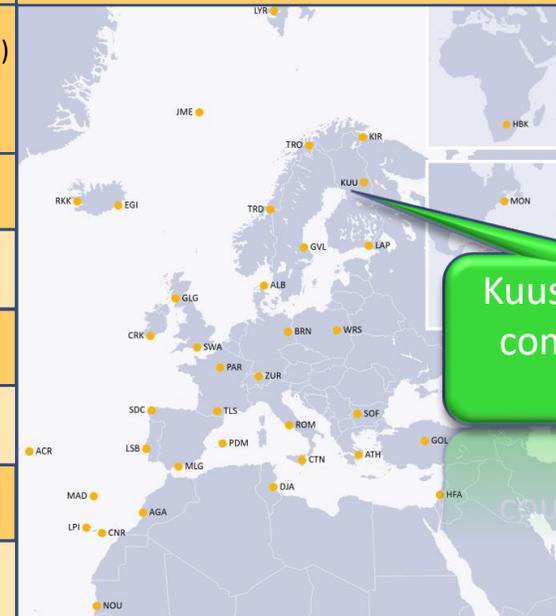


<b>SPACE</b>	SERVICE BROADCAST		BACKUP/TEST
	GEO-1: SES-5 PRN-136 	GEO-2: ASTRA-5B PRN-123 	GEO-3: E5WB PRN-121 

Commissioned in 2023 – Used in test

GEO-4: Hotbird 13G 		Cagliari (IT) Canical (PT) Test
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<b>GROUND</b>	SYSTEM RELEASE <b>EGNOS V242B since November 2023</b>		
	NLES 2 per GEO		RIMS 38 RIMS in Operations
	 <b>Redu-1 (BE)</b> <b>Betzdorf-1 (LX)</b> OP	 <b>Redu-2 (BE)</b> <b>Betzdorf-2 (LX)</b> OP	 <b>Rambouillet (FR)</b> <b>Cagliari (IT)</b> Test
	MCC		
	<b>Ciampino (IT)</b>		<b>Torrejón de Ardoz (ES)</b>
	Service Center (ASQF)		
	Torrejón de Ardoz (ES)		
	Operational Control Centre (PACF)		
	Toulouse (FR)		

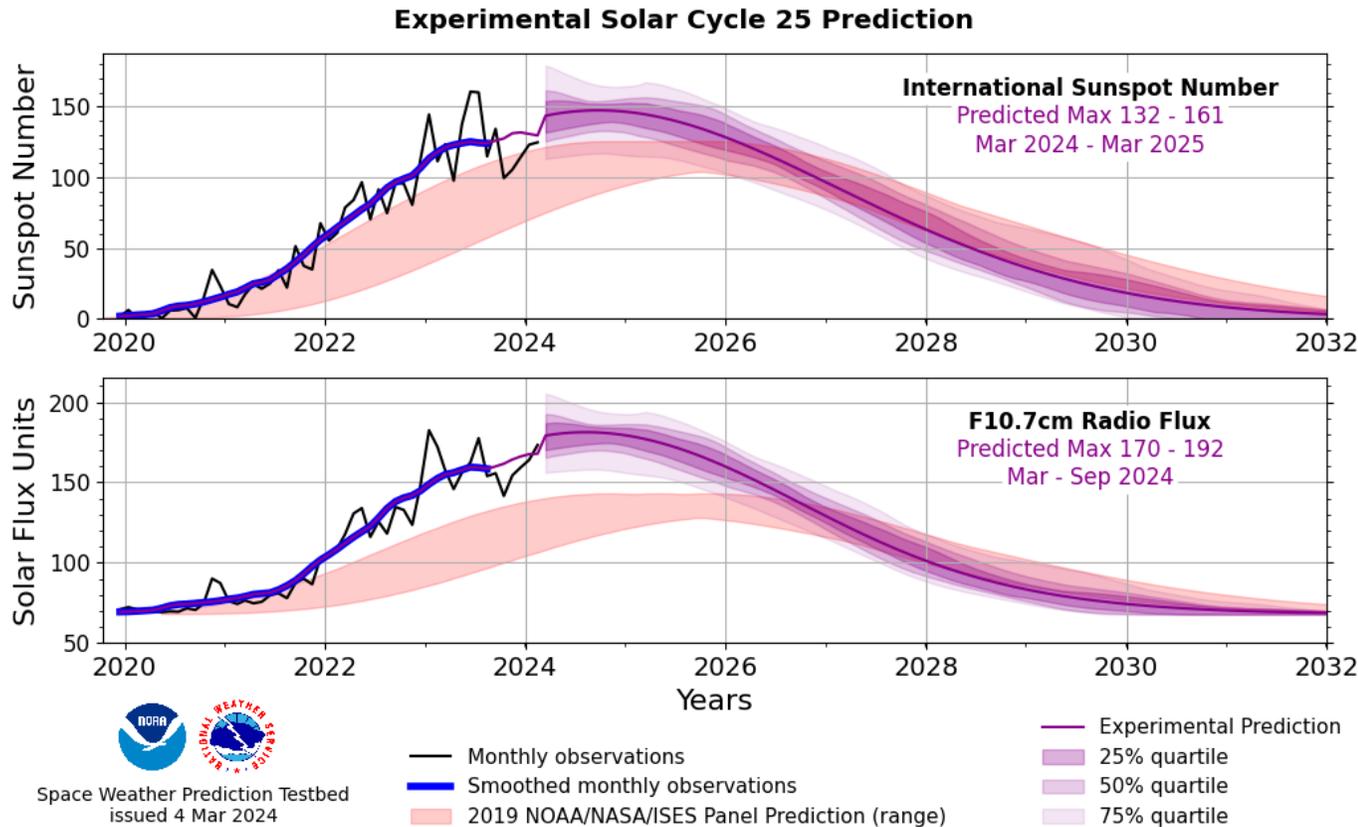


Improved behaviour in front of high ionospheric activity

Kuusamo (FI) RIMS commissioned in 2023

# Updated solar cycle 25 predictions

Highest sun activity since SBAS systems are operational and much higher than the initial predictions.



NOAA's Space Weather Prediction Center (SWPC) issued a revised prediction for solar activity during Solar Cycle 25 that concludes solar activity will **increase more quickly and peak at a higher level** than that predicted by an expert panel in 2019.

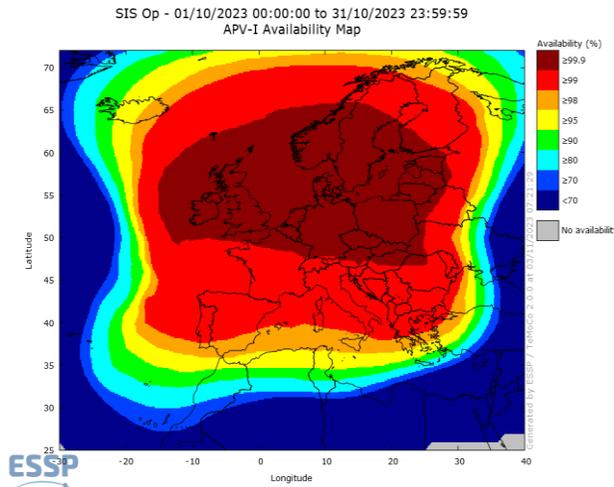
## Updated prediction:

- Solar Cycle 25 to peak between January and October of 2024,
- with a maximum sunspot number between 137 and 173.

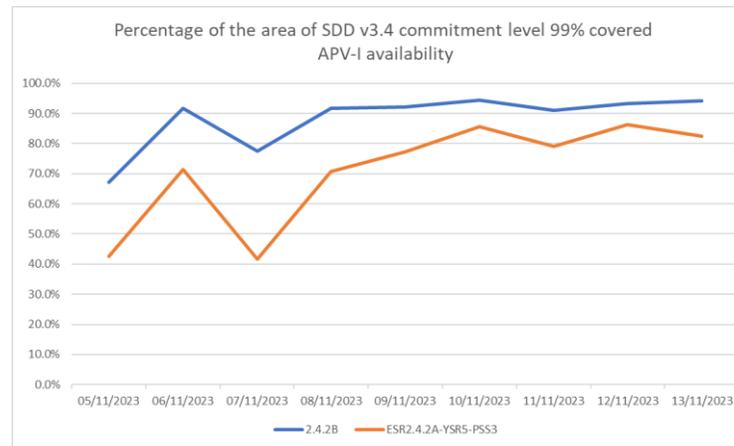
# Performance of EGNOS release 242B

Significant improvement thanks to 242B release since 4th Nov in the north of EGNOS service area.

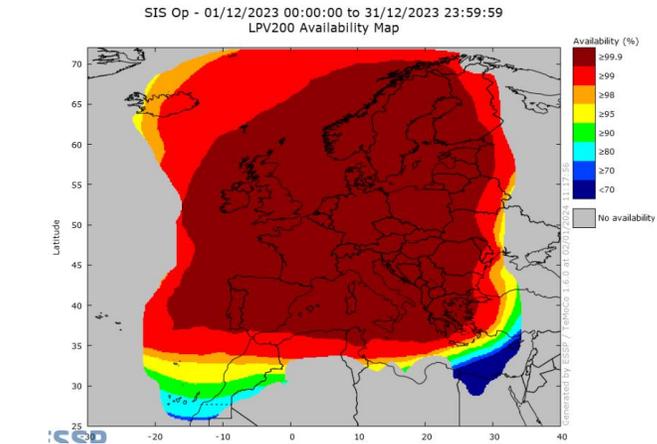
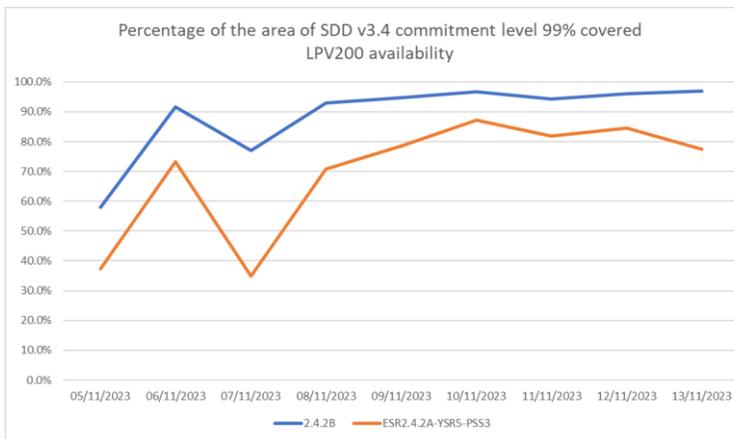
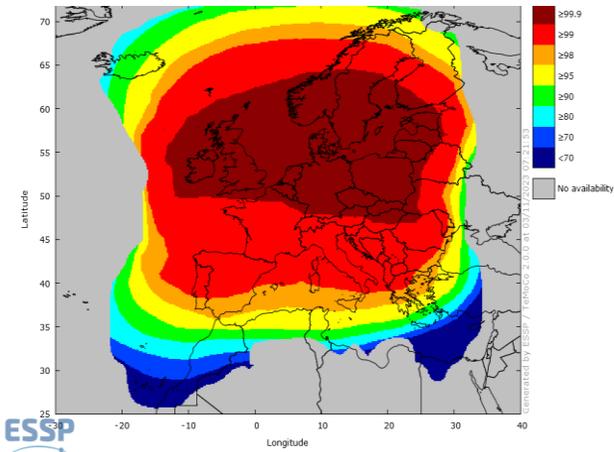
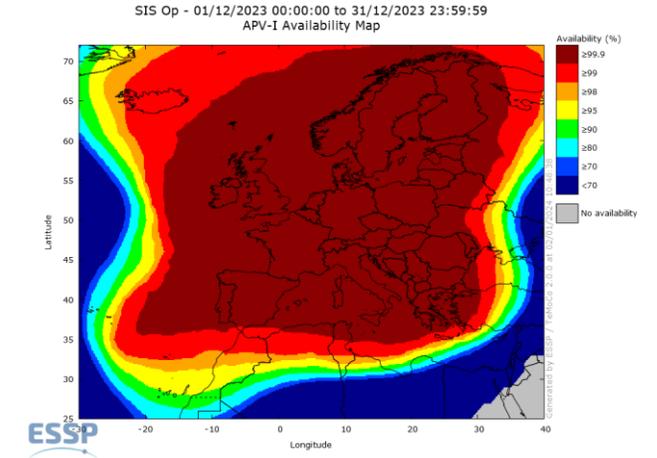
October (242A release)



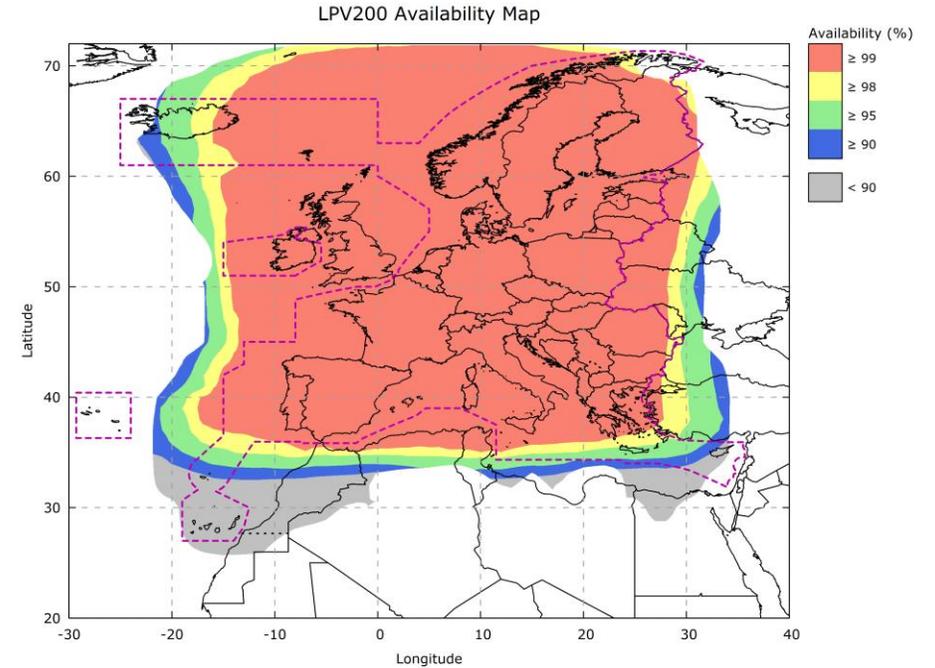
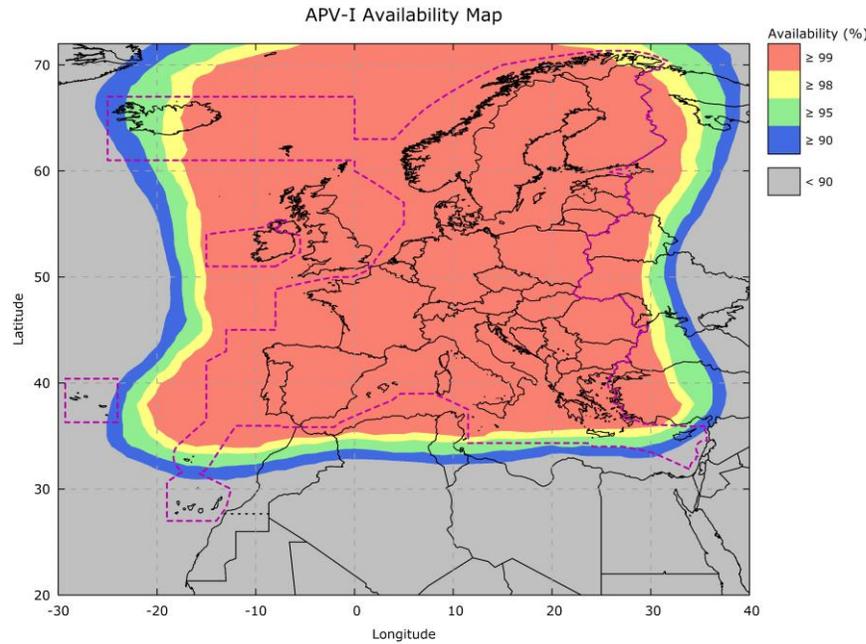
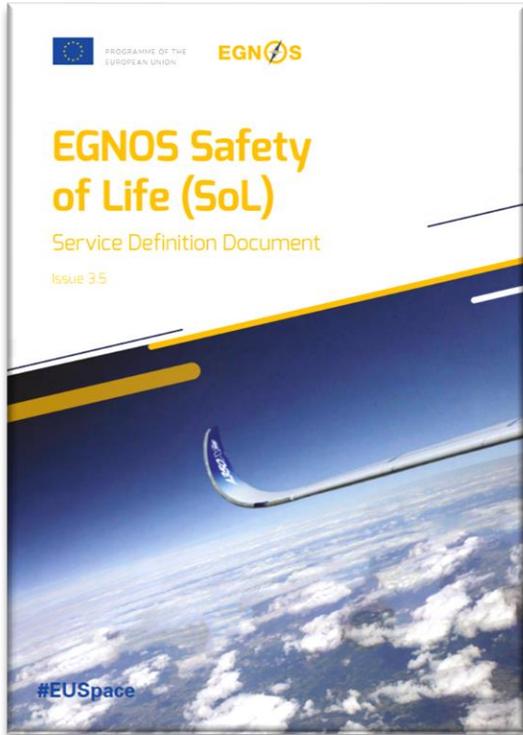
Detail from 4-14 november (242A release)



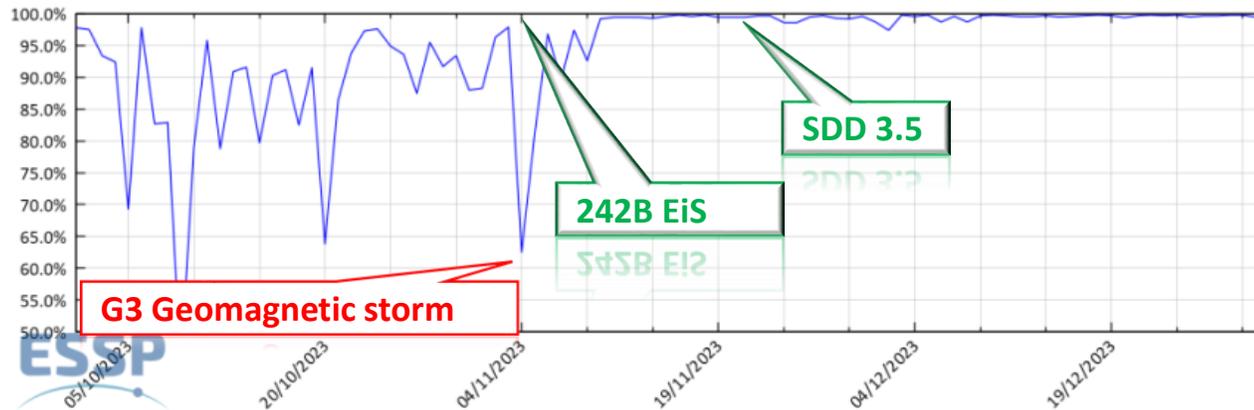
December (242B release)



# SoL SDD 3.5 published 23/11/2023



Compliance area percentage wrt ECAC Landmasses - APV-I

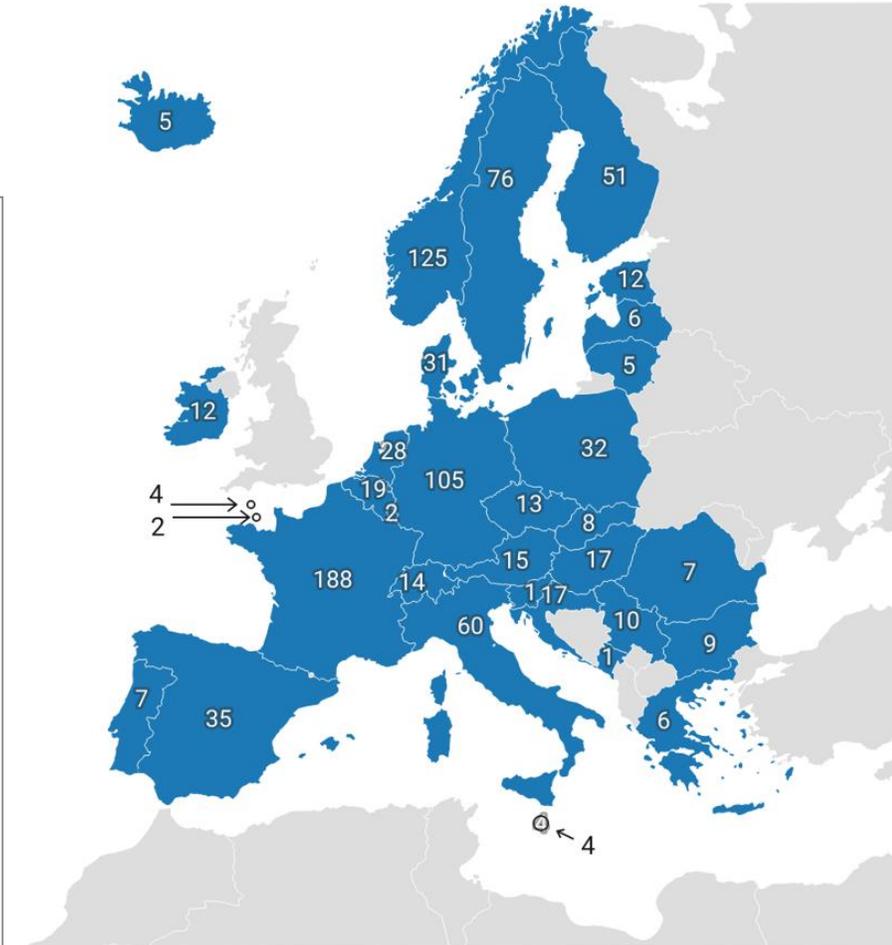
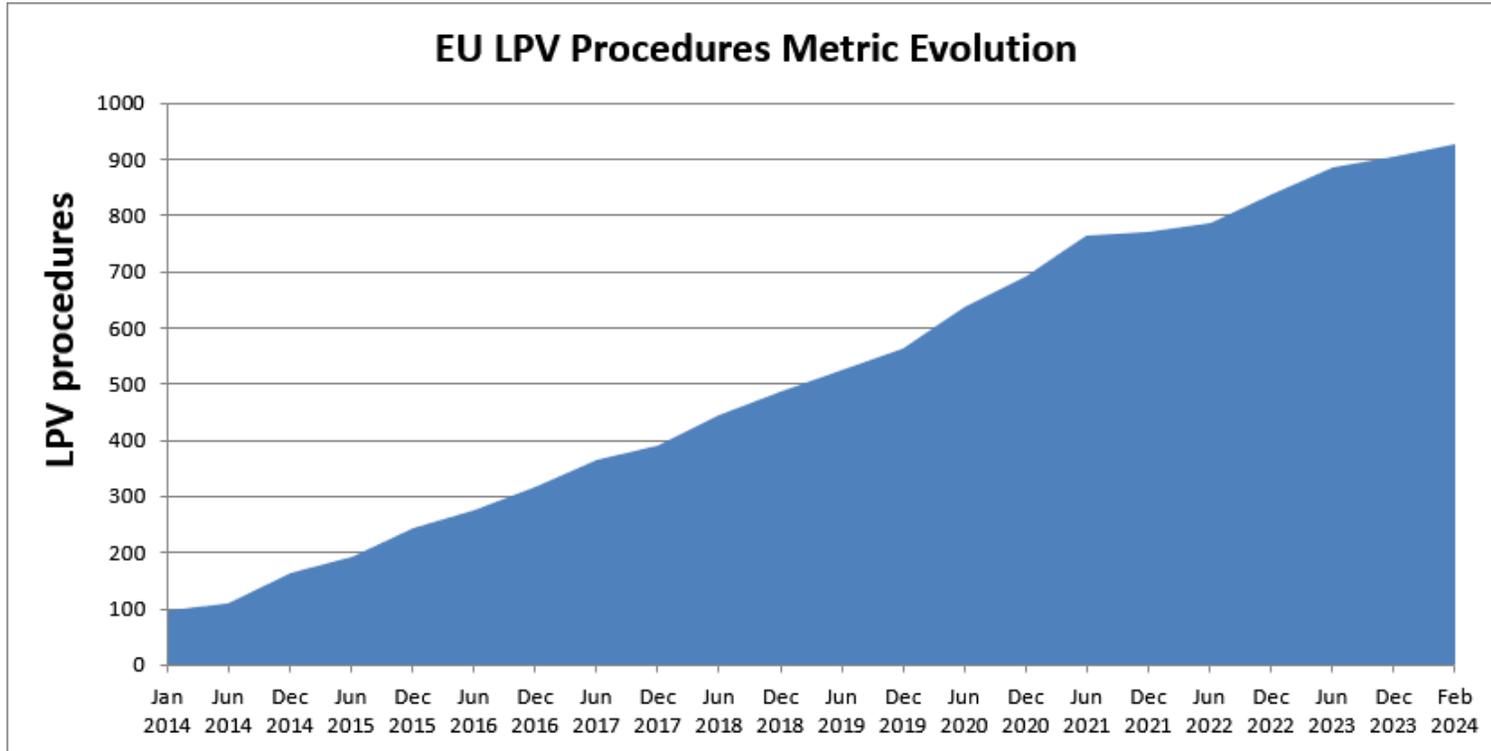


Adherence to SDD commitment have been restored thanks to updated SDD and 242B release

# Adoption in aviation sector. LPV procedure development

## Status End January 2024:

- > 920 procedures published
- 65% of instrumental runway ends equipped



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# EGNOS V2 System Release Plan (1/2)

Release name	V242-B	V243
Key Features	<ul style="list-style-type: none"> <li>• RIMS-C obsolescence</li> <li>• New RIMS sites: Kuusamo, Kyiv</li> <li>• Coverage &amp; iono perfos robustness</li> <li>• Increased robustness to L2 losses</li> <li>• CMF/CPF anomalies correction</li> </ul>	<ul style="list-style-type: none"> <li>• Introduction of GEO3 in V2 OPS</li> <li>• NLES G2 obsolescence</li> <li>• RIMS-A/RIMS-B obsolescence refresh</li> <li>• Security enhancement and accreditation</li> </ul>
Kick-Off	Done	<b>PDR: done</b> <i>Phase C/D KO: Jan.2022</i>
Critical Design Review – CDR	<b>CDR-1 Done</b> <b>CDR-2: Done</b>	<b>CDR-1 Done</b> <b>CDR-2: Done</b>
Qualification Review - QR	<b>March 2023: SQR-1 Done</b> <b>May 2023: SQR-2 Done</b>	July 2024
Entry in operations	<b>DONE on 4 Nov 2023</b>	Dec 2024

RIMS = Ranging and Integrity Monitoring Station  
 G2 = second generation

NLES = Navigation Land Earth Station  
 CMF/CPF: Common Mode Failure / Central Processing Facility

# EGNOS V2 System Release Plan (2/2)

## • LIFEX Study scope:

- Maintenance of EGNOS V2 in Operation Conditions (MOC) addressing in particular:
  - Obsolescence of RIMS-A and RIMS-B (New generation RIMS)
  - Obsolescence of TWAN (including impacts on Front End Equipment) and non-navigation chain sub-systems;
  - Reshuffling EGNOS RIMS network to accommodate decommissioning of several non-EU RIMS sites, decommissioning of all RIMS-C legacy units and their replacement by RIMS-C G2 units;
  - L2P(Y) decommissioning;
  - Introduction of GPS Block III F to mitigate any service degradation induced by the associated decommissioning of Block II satellites.

## • LIFEX Study schedule:

- LIFEX 1 Preliminary Design Review: May 2024
- LIFEX 2 Preliminary Design Review : Dec 2024

Release name	LIFEX 1 (to be procured)	LIFEX 2 (to be procured)
Key Features	<ul style="list-style-type: none"> <li>• NLES G2 obso. for GEO-2</li> <li>• RIMS sites move</li> <li>• Complete RIMS C legacy replacement by RIMS C G2</li> <li>• Network obsolescence definition and testing</li> </ul>	<ul style="list-style-type: none"> <li>• Network Obsolescence (deployment phase)</li> <li>• RIMS NG qualification and deployment in some sites</li> <li>• CPF G2 functionally qualified for L2C</li> </ul>
Phase C/D Kick-Off	2024	2025
Critical Design Review – CDR	2024-25*	2025-26
Qualification Review - QR	2025-26*	2027
Entry in operations	2026-27*	2028

\* LIFEX 1 is planned to be implemented through 2 System releases (2.4.4 and 2.4.5)

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# EGNOS V3 updated development baseline

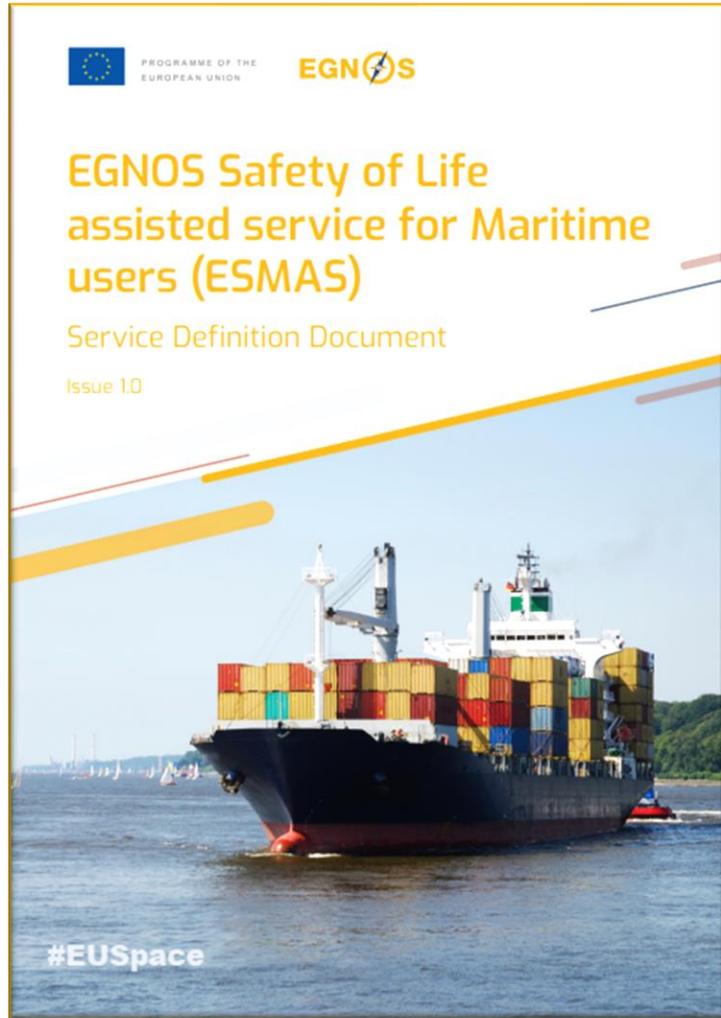
- Last EGNOS V3.1 Critical Design Review successfully passed (2023)
- Recently approved (Dec 2023) contract amendment to accommodate changes to the requirements applicable to industrial development contract:
  - Change in RIMS sites (locations, calendar)
  - Flow down of Security Accreditation Strategy updates
  - New GEO2 position and updated GEO4 baseline
  - Last updates of applicable GNSS/SBAS standards (GPS ICD, ICAO SARPs, MOPS)
  - SECMON external interface
- V3 scope/schedule:

V3 Releases	V3.1	V3.2
<b>Key Features</b>	<ul style="list-style-type: none"> <li>• Legacy L1 services with improved performance over full EU + NW</li> <li>• Messages change: MT-27 to MT-28 transition</li> <li>• Full renewal of all sub-systems</li> <li>• Built-in security design</li> <li>• Integrate secured V3 sites</li> <li>• Integrate GEO-4</li> </ul>	<ul style="list-style-type: none"> <li>• DFMC L5 services (L1-L5 dual-Frequency, GPS-Galileo)</li> <li>• Coverage extension (Iceland, South&amp;East neighborhood)</li> </ul>
<b>Planned entry in operations</b>	2028	2029

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# EGNOS Programme declares ESMAS Service TODAY



The EGNOS Safety of Life assisted service for **MA**ritime user**S** (ESMAS) is provided by EUSPA openly and free of charge.

The service offers an alternative to national DGNSS services using existing EGNOS L1 SIS. Target users are merchant vessels navigating in ocean waters, harbour entrances, harbour approaches and coastal waters.



<https://edas-maritime.gsc-europa.eu>





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