



# Proposal of EGNOS Service Provision scheme for Rotorcraft Operators in Class G Airspace

Manuel Santos – Aviation Consultancy Expert

José María Lorenzo – Aviation Development Expert

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# Purpose

**1. *What is EGNOS?***

**2. *Which are the benefits of using EGNOS?***

**3. *What do Rotorcraft need for flying EGNOS based procedures?***



# Table of Contents

1. EGNOS and ESSP Overview
2. EGNOS based procedures
3. Real Case of EGNOS Provision scheme for NOLAS
4. Conclusions

# How to complete HEMS Operations in IMC?



**GNSS**

**EGNOS**

**PBN**



# Global Navigation Satellite System



**EGNOS** was born to meet Civil Aviation requirements

so that key concepts in EGNOS come from ICAO

## What is GNSS:

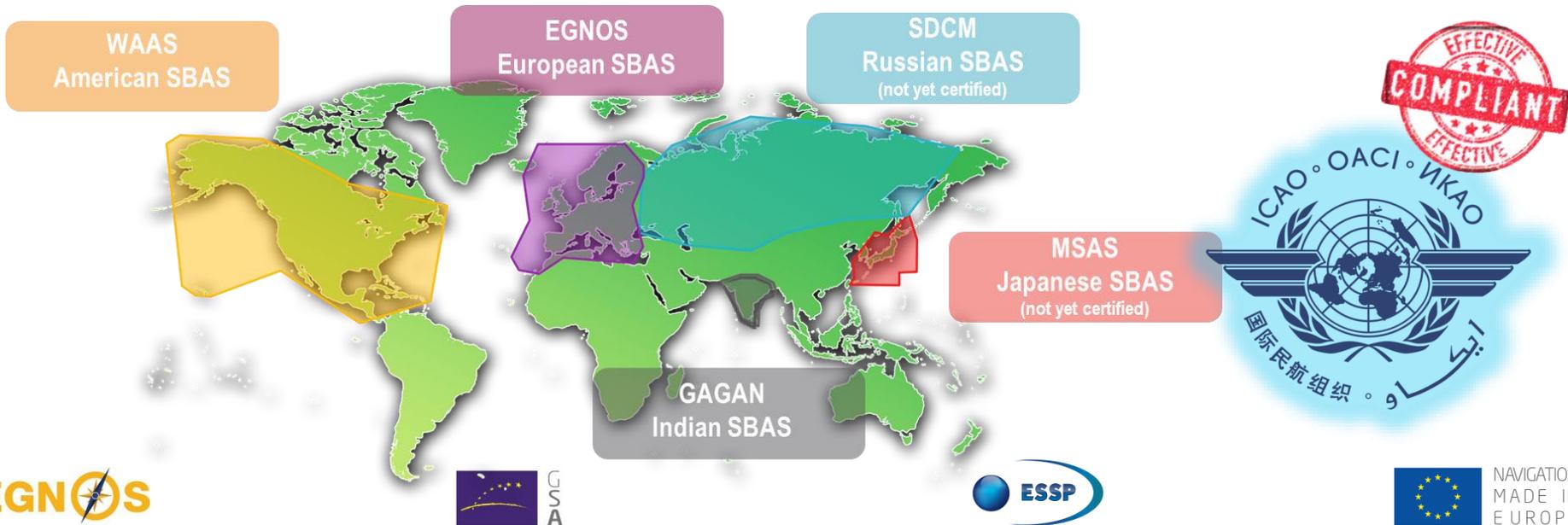
GNSS (ICAO SARPS) is a “worldwide position and time determination system that includes one or more satellite constellations, aircraft receivers and system integrity monitoring, augmented as necessary to support the required navigation performance for the intended operation”



# Global Navigation Satellite System

## European Geostationary Navigation Overlay Service

-  **EGNOS** is the European SBAS system augmenting GPS signal over ECAC area.
-  **EGNOS** meets stringent Aviation requirements (ICAO) for all phases of flight.
-  **EGNOS** might also be used in a wide range of other application domains.
-  **EGNOS** is fully interoperable with all other SBAS worldwide.



# EGNOS System: how does it work?

**2x MCC**

Mission Control Centers



**40x RIMS**

Ranging & Integrity Monitoring Stations



GPS signal

**6x NLES**

Navigation Land Earth Stations



**EGNOS**

2 GEO satellites in EGNOS OP

**EGNOS RECEIVER**

GPS signal

EGNOS corrections

*Improvement of accuracy*

# EGNOS Services Characteristics



- **EGNOS** OS
- EGNOS corrects errors with **certified**
- EGNOS **integrity** making
- **EDAS** by the real time to **authorized users**.

**Position Integrity**  
(bounding of the position errors)

is key for Civil Aviation and the main “differentiator” of SBAS w.r.t. GPS

me SiS for

**accuracy** by equipped **specific**

**accuracy** and receiver

generated through the internet in real and non-

# EGNOS SoL SERVICE SERVICE DEFINITION DOCUMENT



## Service Definition Documents



*describe the characteristics, terms and conditions of access to the corresponding EGNOS services offered to users*

- **Seventh issue v3.3 published on the 26th March 2019**
  - New commitment maps due to 72°N extension.
  - Accommodation of **new users** (included in v3.2 since 28/09/2018)



# Shareholders & location

**NATS**



**DFS** Deutsche Flugsicherung



**DSNA**



Toulouse



Madrid

**skyguide**



**NAV**  
NAV Portugal, E.P.E.



**ENAV**

**ENAIRe**



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# IFR/EGNOS Benefits

IFR

Increases airport accessibility

 SAFETY

↑ SAFETY due to INSTRUMENTAL aid

Reduces environmental impact

EGNOS

Higher performances → Lower minima

Not Temperature/Pressure dependent

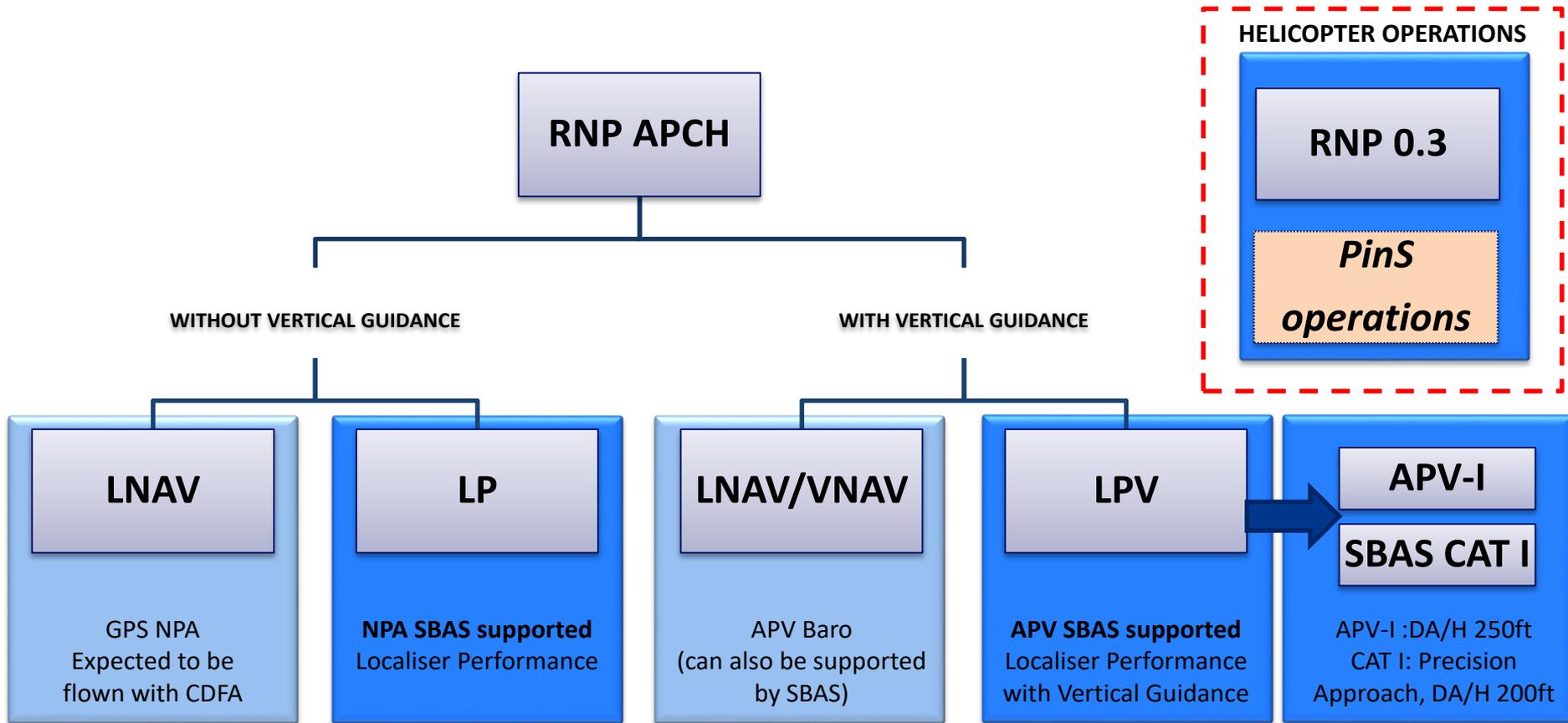
LPV Procedure is ILS look alike

No RAIM check

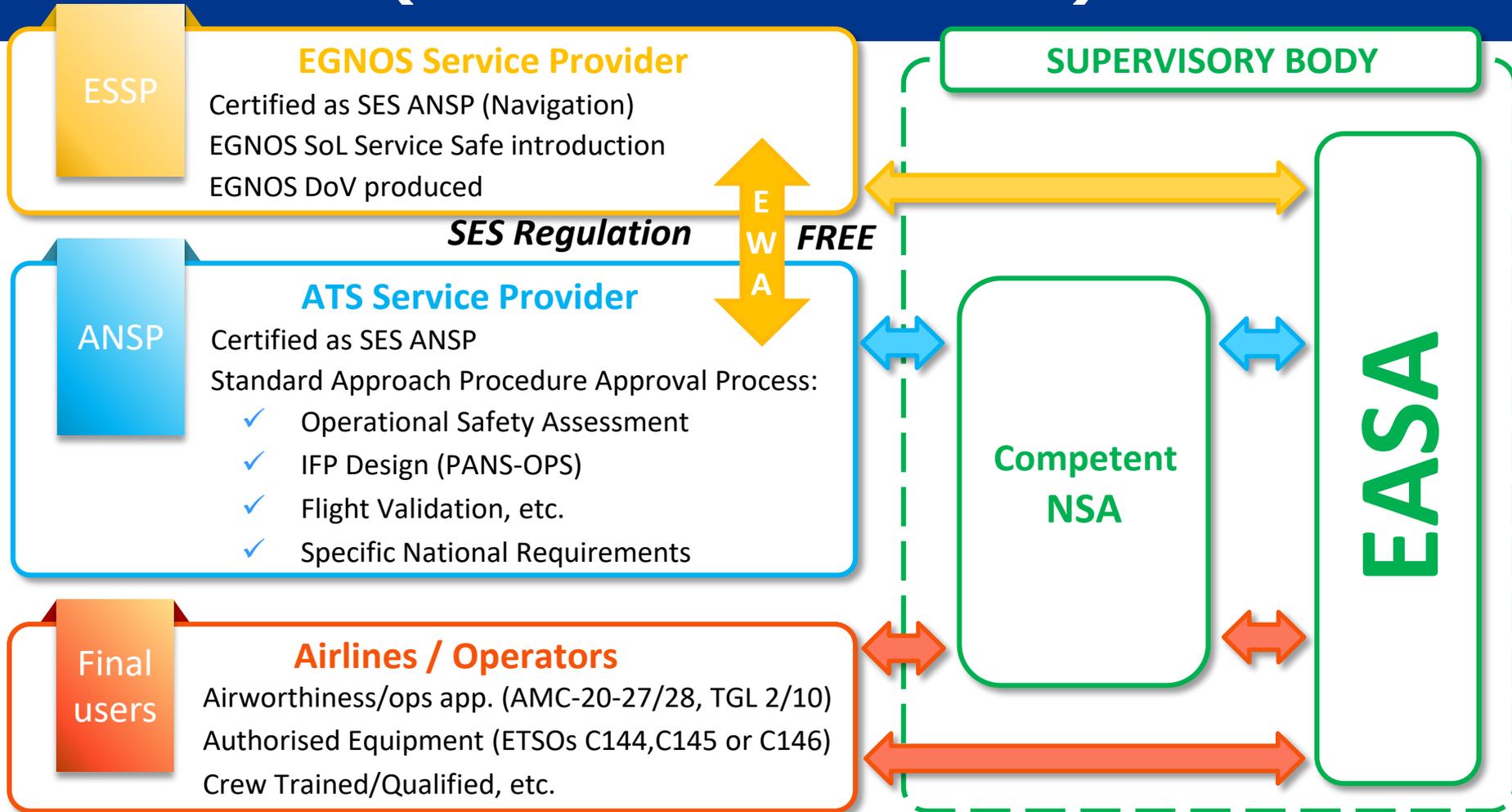
No ground infrastructure at the airport



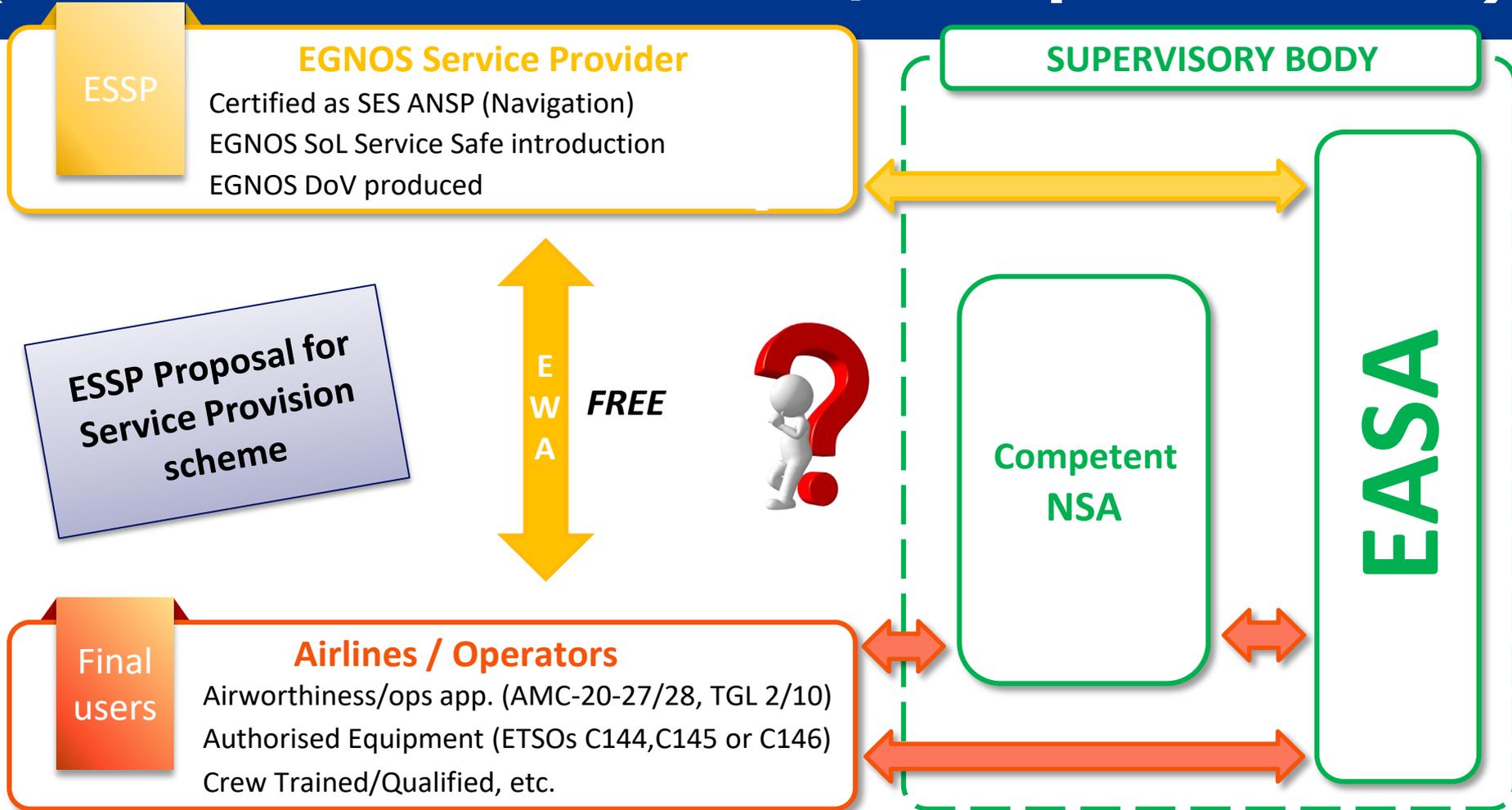
# PBN operations enabled by EGNOS



# EGNOS based procedures: Who does what? (ANSP Environment)



# EGNOS based procedures: Who does what? (Non-ANSP Environment / Airspace Class G)



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# Norsk Luftambulans AS | NOLAS

## National Provider of HEMS in Norway and Denmark:

- Aprox 15 000 helicopter missions / year
- Aprox 6000 car missions / year
- 70 HEMS crew
- 22 helicopters (AW 139, H145, H135 and EC 135)
- 16 bases H 24/7



NORSK LUFTAMBULANSE



# EGNOS Service Provision scheme in Class G Airspace



*REQUIRES THE EXISTENCE OF AN AGREEMENT  
TO ENSURE THE SERVICE PROVISION SCHEME*



*EWA SIGNED IN AUGUST 2019*



**NORSK LUFTAMBULANSE**



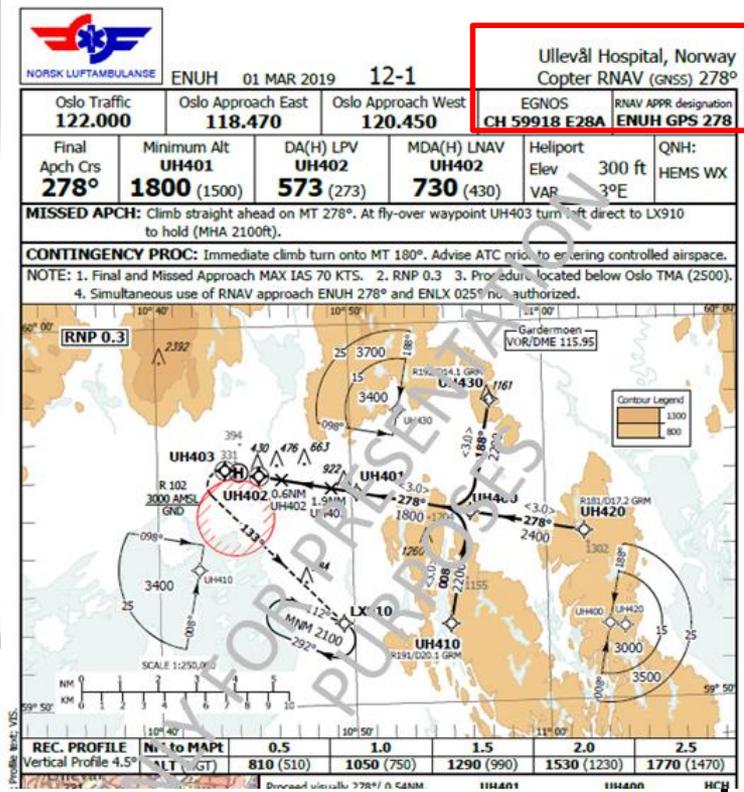
## AOC HOLDER

*PBN APPROVAL*

*EGNOS CAPABLE → CERTIFIED RECEIVER*



# NOLAS - EGNOS based procedures in Class G Airspace



<b>LPV</b>	MISAP gr 10.2% to 700	<b>DA(H) 573 (273)</b>	<b>LNAV</b>	MISAP gr 4.2%	<b>MDA(H) 730 (430)</b>
<b>VIS 1000 m</b>	<b>Gnd speed-Kts</b>	<b>60</b>	<b>70</b>	<b>80</b>	<b>90</b>
	<b>Descent Gr FAF-MAPt 4.5° (7.9%)</b>	<b>478</b>	<b>558</b>	<b>638</b>	<b>717</b>

# NOLAS - EGNOS based procedures in Class G Airspace

 NORWAY CAA REQUIRES THE EXISTENCE OF AN AGREEMENT → EWA SIGNED

 ALL LANDING SITES WILL HAVE AN OFFICIAL ICAO CODE.

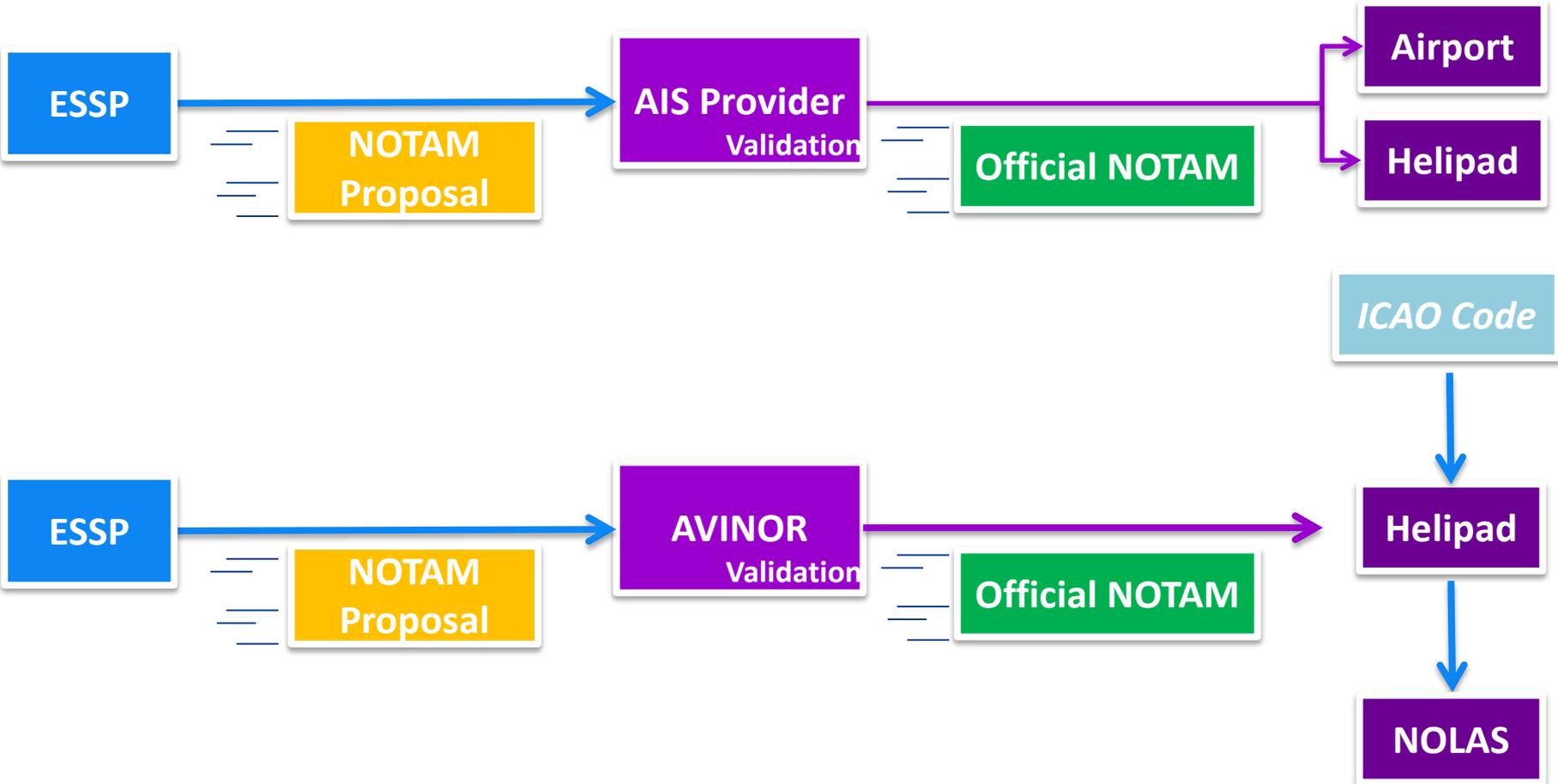
 FREE SERVICE PROVISION SCHEME FOR USER → VALIDATED BY  
PENDING ON



 EWA INCLUDES NOTAM DISTRIBUTION.

*AIR-OPS REGULATION: "PILOTS TO BE AWARED NAVAID STATUS (EGNOS STATUS) FOR HEMS OPERATIONS".*

# NOTAM Distribution



# Service Provision in Airspace Class G

## Same Service Provision Scheme (EWA)



### EWA Core:

- Identified with  An AOC holder

### Annex 1:

- SoL Service Definition Document (SDD).
- Service Notices (SN).
- Contingency.

### Annex 2:

- Collaborative Decision Making (CDM).
- GNSS Data Recording.
- NOTAM Proposal.

# EGNOS Users

EWA

## ANSP

Certified Air  
Navigation Service  
Providers



Conventional  
operations

## AOp

Licensed Aerodrome  
Operator



Non-ATS  
environments

## ROp

Rotorcraft Operator  
as AOC holder



Non-ATS for  
Rotorcraft

## Other



Under  
study

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# Conclusions

- FREE SERVICE PROVISION SCHEME
- INCREASES SAFETY
- NAVAID (EGNOS) STATUS → NOTAM (PROPOSAL) DISTRIBUTION

***HARMONIZED SOLUTION → IDENTICAL  
SERVICE PROVISION SCHEME NO MATTER***

***THE ENVIRONMENT***

# Conclusions

## 1. What is EGNOS?

*European SBAS system augmenting GPS signal over ECAC area (provides integrity)*

## 2. Which are the benefits of using EGNOS?

*Increases safety and accessibility (best source of positioning)*

*Enables PBN operations*

*Free of charge harmonized Service Provision scheme*

## 3. What do Rotorcraft need for flying EGNOS based procedures?

*AOC for PBN operations → SBAS certified receiver*

*If requested an agreement with ESSP to ensure the service provision scheme*



**ARE YOU WILING TO USE EGNOS ?**

**LET'S  
COLLABORATE**



# Aviation Portal

## Dashboard

- EGNOS System status
- Active and planned unavailability
- Services performance
- Airports availability information

## Contractual doc.

EWA + Serv. Arr.

## Manuals

- Airport Data Generation Tool
- Contingency

## Contact form

## Points of Contact

- Information
- Modification request

## Airport Data Generation Tool

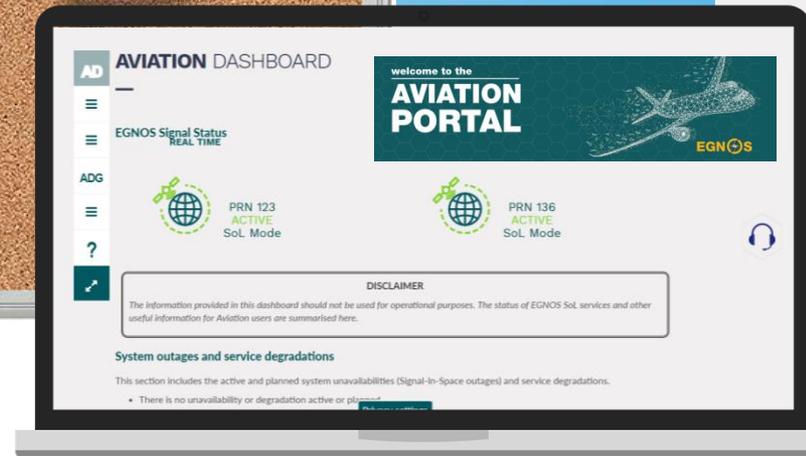
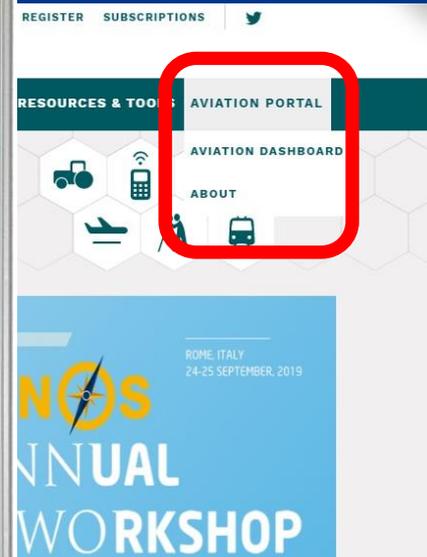
AIXM file generation

## Contingency

Comm. repository

## GNSS Data Recording Forms

- Access request
- Data request



# EGNOS User Available tools

## NEW EGNOS User Support website



Find the support you need!

- New Library**  
Filter by document type, market segment and more
- Easy access EGNOS Helpdesk**  
New floating icon available on every page
- Redistributed Navigation panel**  
Relevant information per market segment at a glance
- Restyled Look & feel**
- Handy Dashboard**

<http://egnos-user-support.essp-sas.eu>

## For free! The information you need available at your fingertips! EGNOS APP



Get it on **iOS** and **Android** for free



EGNOS APP features:

- EGNOS Helpdesk: Accessible from app
- Signal in Space: EGNOS system information
- Docs and tools: Browse official documents & tools
- EGNOS performance: Sol, EDAS, OS services

Download on the **Google Play** store and the **App Store**.



Online LPV Flight Simulator  
<https://www.essp-sas.eu/>

The image shows a flight simulator interface with a 3D terrain view, a cockpit instrument panel, and a map view. The cockpit includes a speedometer, altimeter, heading indicator, and vertical speed indicator. The map view shows a flight path and various navigation aids.



[www.essp-sas.eu](http://www.essp-sas.eu)

[Manuel.Santos@essp-sas.eu](mailto:Manuel.Santos@essp-sas.eu)

[Jose-Maria.Lorenzo@essp-sas.eu](mailto:Jose-Maria.Lorenzo@essp-sas.eu)

<http://egnos-user-support.essp-sas.eu>

[egnos-helpdesk@essp-sas.eu](mailto:egnos-helpdesk@essp-sas.eu)

+34 911 236 555 (H24/7)

Corporate Video

**THANK YOU!**



**Time for QUESTIONS!**

