EUROPEAN SPACE WEEK
CONNECTING THE FUTURE

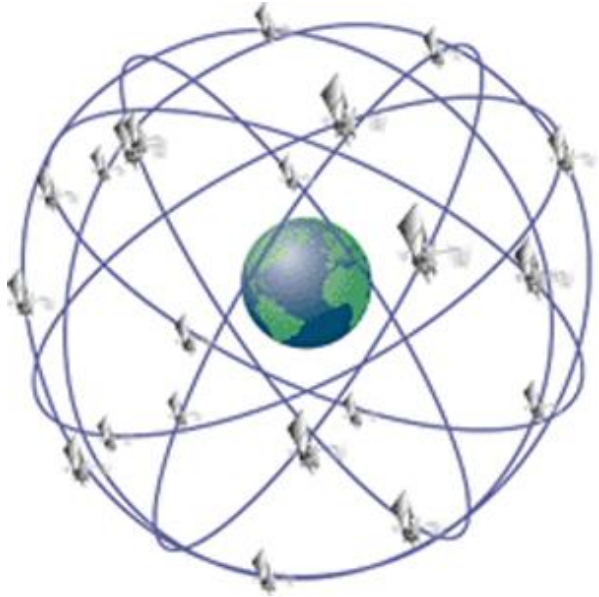
EGNOS Aviation market strategy and status

European Space Week 2018

Carmen Aguilera, Head of Sector, Aviation and Application R&D

5th December 2018, Marseille

EGNOS is evolving to meet new user needs



P = Position
N = Navigation
T = Timing

NAV applications: fixed wing, rotorcraft

P N T | P N T | P N T | P N T

SUR applications

Flight and distress tracking applications

RPAS and Drone Applications

Flying Taxis? Suborbital flights?

New applications, New regulations

New entrants

New requirements

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Aviation highlights in 2018:
EGNOS adoption is supported by new Regulations

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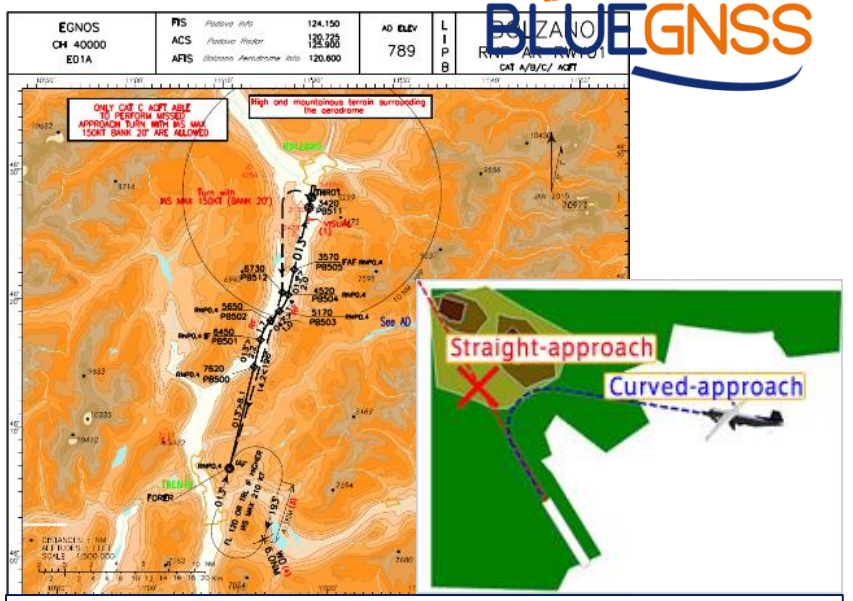
BLUEGNSS

EGNOS in all EU IRE by 2024

Enhanced and Synthetic vision systems minima below 200ft & low visibility ops



Towards curved segments with SBAS

PBN Regulation EC Reg 2018/1048

NPA 2018-06
All weather operations

CS-ACNS Update: NPA 2018-02
Airworthiness criteria for RNP AR with SBAS

The offer of LPV solutions for EU fleet grow, but airspace users and ANSPs demand support

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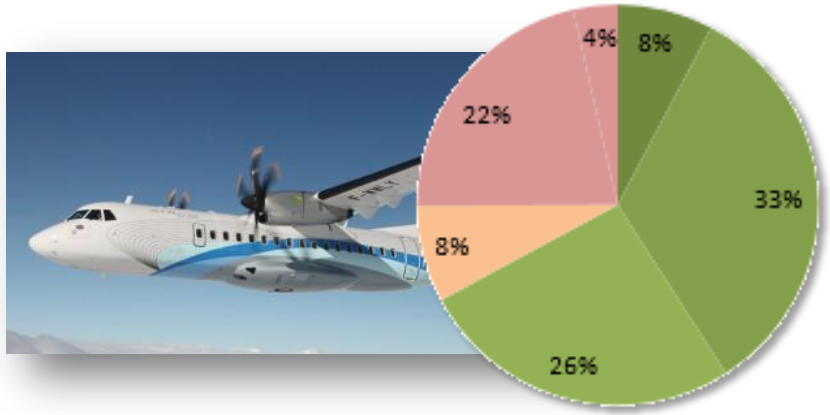
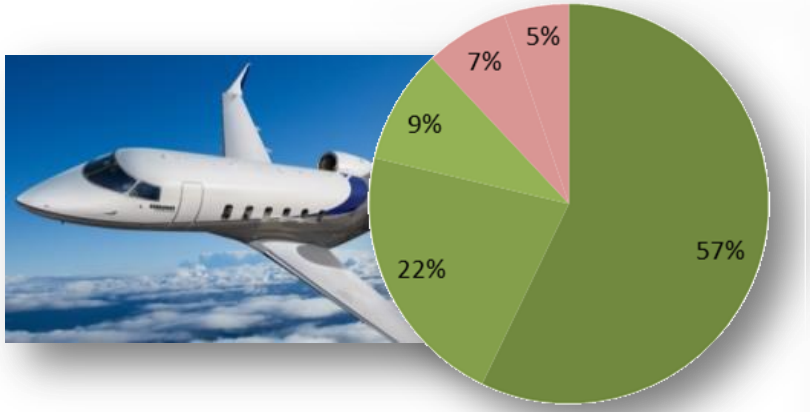
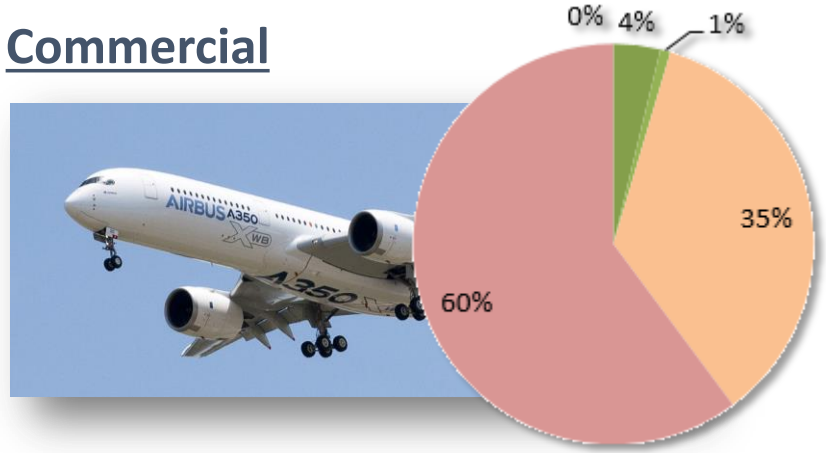
Regional



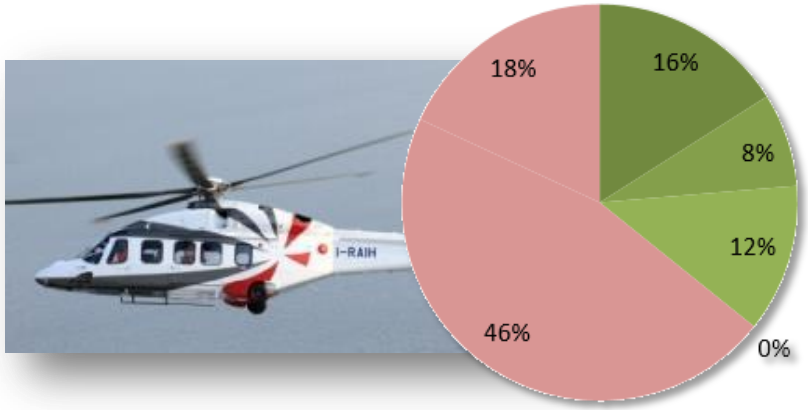
Business



Commercial

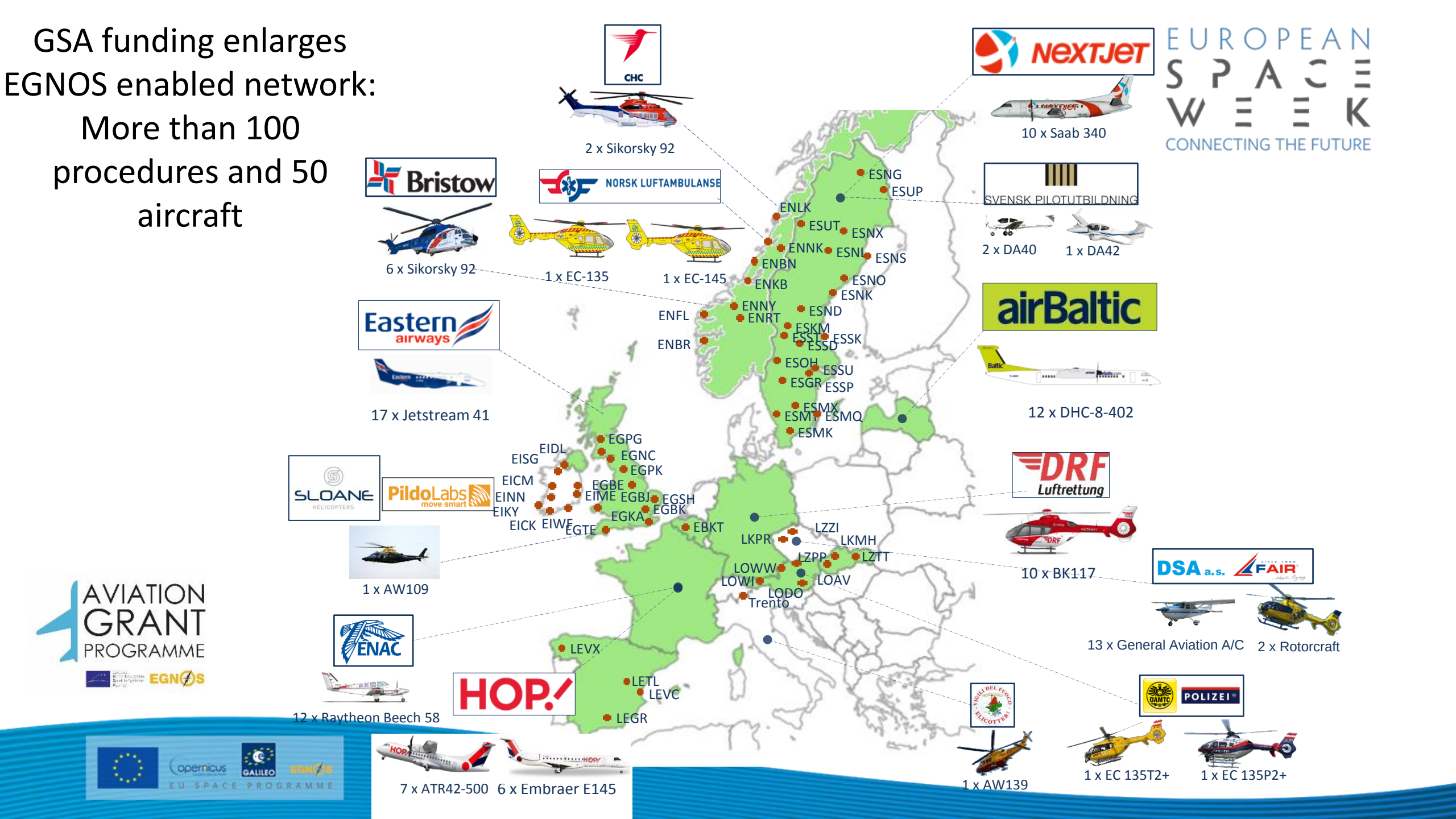


Rotorcraft



Standardfit
Ongoing
Forwardfit
Unavailable
Retrofit
Unkown

GSA funding enlarges EGNOS enabled network: More than 100 procedures and 50 aircraft



The EGNOS Aviation Grants Programme develops retrofit solutions suitable for more than 250 aircraft of 25 different operators

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Aircraft type	GSA project	STC developer	Avionics	Estimated fleet size in Europe
DHC8-400	AirBaltic	CanardAerospace	UNS1-Ew	**140**
JetStream41	Eastern Airways	Cranfield Aerospace	UNS	**20**
Saab340	NextJet	Scandinavian Avionics	UNS1-Ew	**54**
ATR42-500	HOP!	AeroConseil	CMC	**19**
Embraer E145	HOP!	N/A	UNS	**23**

AVIATION GRANT PROGRAMME
EGNOS

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Aviation highlights in 2018:
New EGNOS users demand increase

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New EGNOS Users

Point in Space and Low Level Routes

Emergency and Medical operations

Police

Training

General aviation

28% of IFR GA is LPV capable

RPAS/UAV

GNSS is a must for BVLOS
> 10 drone receiver models EGNOS capable

EGNOS rotorcraft operations grow on ground and airbone

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NORSK LUFTAMBULANSE

2 x EC-135

2 x EC-145

CHC

2 x Sikorsky 92

Bristow

6 x Sikorsky 92

SLOANE

AW109

DRF Luftrettung

10 x BK-117

DSA a.s.

2 x Rotorcraft:
1 AS355 & 1 EC135

POLIZEI

1 x EC 135T2+

1 x EC 135P2+

1 x AW139

AVIATION GRANT PROGRAMME
European Global Navigation Satellite Systems Agency
EGNOS

opernicus GALILEO EGNOS
EU SPACE PROGRAMME

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FLAG: The first European Helicopter group on EGNOS operations is consolidated, responding to users, authorities and manufactures demand

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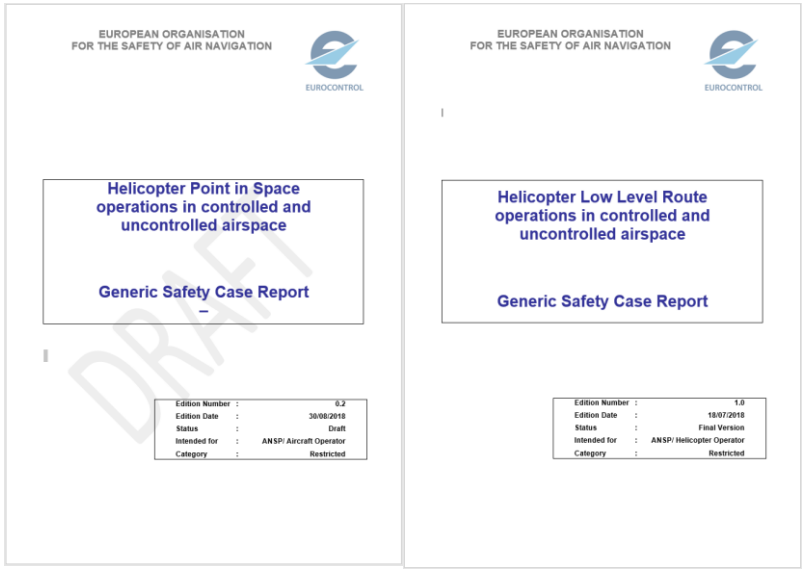
ENAV
austro CONTROL
dgac
DSNA
Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra
ANAC
ENAC
LEONARDO
AIRBUS HELICOPTERS
FLAG
PildoLabs move smart
Rockwell Collins
Building trust every day
JEPPESEN
rega
babcock
trusted to deliver™
NORSK LUFTAMBULANSE
DRF Luftrettung

Associate members

BABCOCK UK/PT/SP/IT/FR
AIR GREEN
NUCLEO ELICCOTTERI
SECURITE CIVILE
GENDARMERIE
ADAC LUFTRETTUNG
OAMTC
FLUGPOLIZEI
BRISTOW
CHC



Safey guidance material for PinS and LLR by early 2019

GSA
EUROCONTROL
EASA European Aviation Safety Agency

opernicus GALILEO EGNOS
EU SPACE PROGRAMME

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General and Business aviation demand LPV also to small aerodromes…

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EASA
European Aviation Safety Agency

General Aviation

6 Objectives we are committed

IFR Flying
Easier access of GA pilots to IFR rating, as a concrete measure that will improve safety.

Training
By end of 2018 the 3rd option for licensing will be fully developed providing a simple system for pilot training outside ATO.

Part-M 'Light'
Work towards a simpler and more proportionate framework for aircraft maintenance and license: a Part-M 'Light'.

Technology
Continue development of CS-STAN and other similar tools to enable the introduction of new technologies which contribute to safety.

Simpler Certification
Towards a simpler framework for certifying LSA aircraft in the short term by increasing the support to applicants e.g. workshops , document templates etc. in the long term by amending applicable regulations in order to bring a radical simplification.

Industry standards
Build on the improvements of CS-23/Part-23 on other CS or regulations in order for EASA to focus on its safety objectives and to delegate the preparation of associated standards to industry groups (ASTM, ASD etc.)

Potential market

777 420

475 366

EU28 – 2673 airports with non-instrument RWYs

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… and GSA, ESSP and EASA take the task: Guidelines on GNSS-based IFP implementation in non instrument runways

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What it is?

- ✓ Safety promotion material
- ✓ Proportionate Solutions for implementation of LPV in non instrument runways
- ✓ Enablers for key elements: MET, ATS, ADR, publication
- ✓ Best practices in EU and beyond

How is it done?

- ✓ Leverages contribution from general aviation associations, ANS, CAAs
- ✓ More than 100 comments received and processed during this year

EASA European Aviation Safety Agency — Within RMT.0379 All Weather Ops

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EGNOS in entering drones operations

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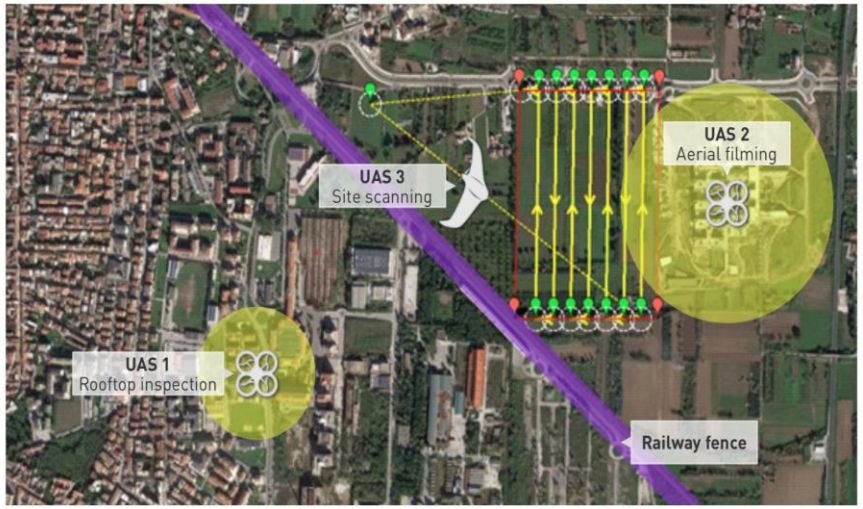
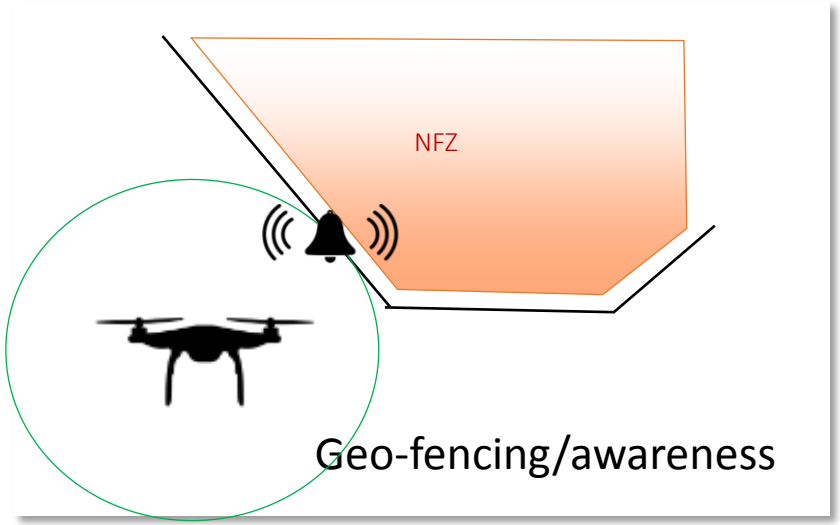
Enhanced performance in challenging environments

High accuracy for new demanding applications and drone separation



TOPVIEW
LOOKING OVER

Increased accuracy and integrity for safe UAS operations



EU SPACE PROGRAMME

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GSA 2018 survey to drone operators: Users demand increased accuracy and integrity

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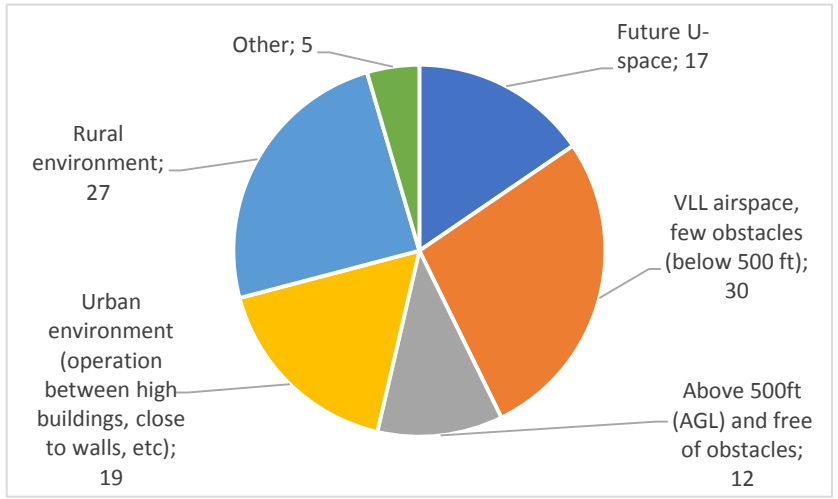
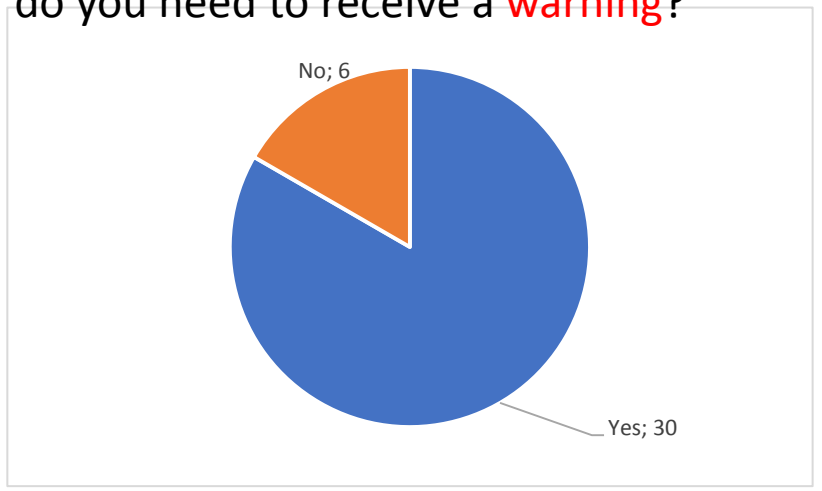
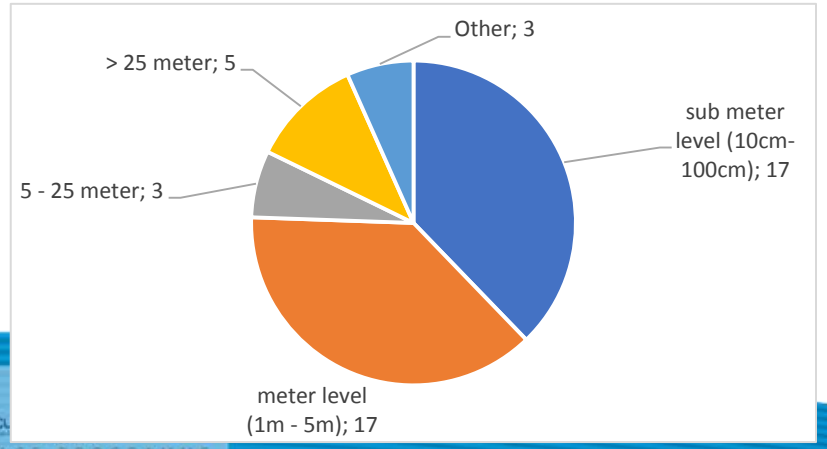
Operating environment



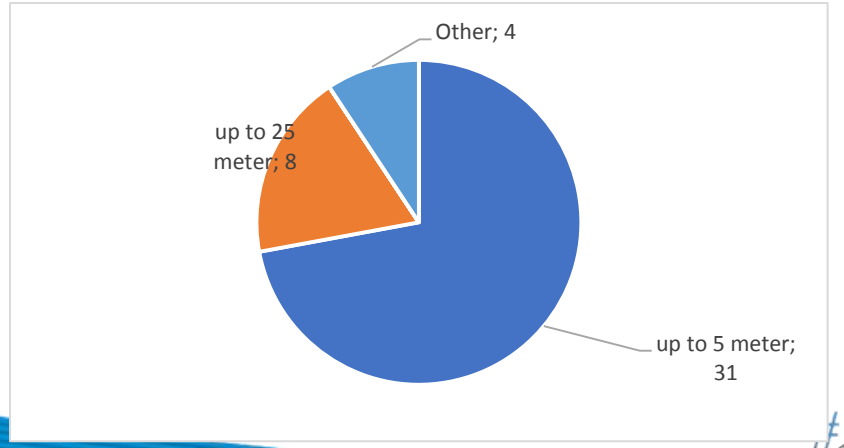
Assuming a failure in the GNSS system, do you need to receive a warning?



Horizontal accuracy for geo-awareness



Vertical accuracy for geo-awareness in



The Spanish Civil Aviation Authority (AESA) define preliminary minimum requirements on drone positioning looking at EGNOS to mitigate operations risks

Low risk (SAIL I & II)		Medium risk (SAIL III)		High risk (SAIL IV, V & VI)	
VLOS	BVLOS	VLOS	BVLOS	VLOS	BVLOS
Height measurement system with error less than 20 meters	**GNSS equipment with error less than 5m, 95% of the time** (alternatively coverage of at least 12 satellites available at the same time)	**GNSS equipment with error less than 5m, 95%** of the time (alternatively coverage of at least 12 satellites available at the same time)	**GNSS equipment with error less than 4m, 95%** of the time (alternatively coverage of at least 12 satellites available at the same time)	**GNSS equipment with error less than 4m, 95%** of the time (alternatively coverage of at least 12 satellites available at the same time)	**GNSS equipment augmented with INS with error less than 4m, 95%** of the time (alternatively coverage of at least 12 satellites available at the same time)

2nd GNSS User Consultation platform

Thank you to

Next steps: EGNSS contribution to Specific Operations Risk Assessment (SORA) for drones

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EUROCAE:

SORA Focus Team (leaded by CATEC) within WG-105 has performed an analysis on SORA to identify future required standardization work, and it has concluded that:

Work on the design of guidelines for the use of multi-GNSS (especially considering EGNOS and Galileo) for UAS at robustness Levels M and H

2nd GNSS User Consultation platform

Thank you to FADA FUNDACIÓN ANDALUZA PARA EL DESARROLLO AEROESPACIAL

Linking space to user needs

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