

European Satellite Services Provider

EGNOS System Certification and Implementation



4th of June 2019
11h00-11h30

ICAO GBAS/SBAS Implementation Workshop
Seoul, Republic of Korea



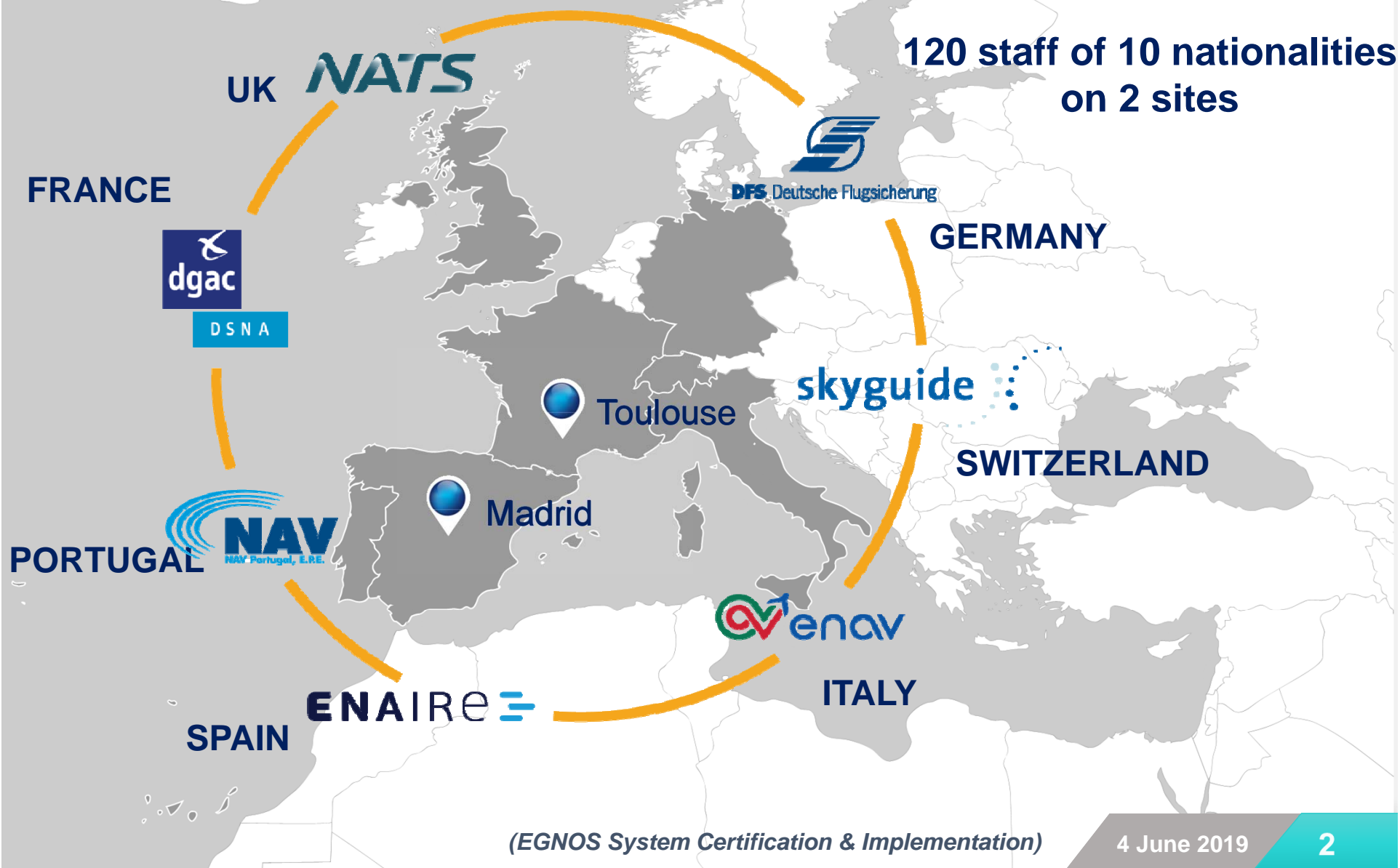
We certify you're there.

The **EGNOS** Service Provider



We certify you're there.

A European private company under French law
A joint venture of 7 key European Air Navigation Service Providers,
the ESSP shareholders



European Satellite Services Provider

- Created as a French simplified joint stock company in 2009
- ESSP's main mission is to act as the EGNOS Service Provider for the European Commission
- ESSP is a certified Air Navigation Service Provider

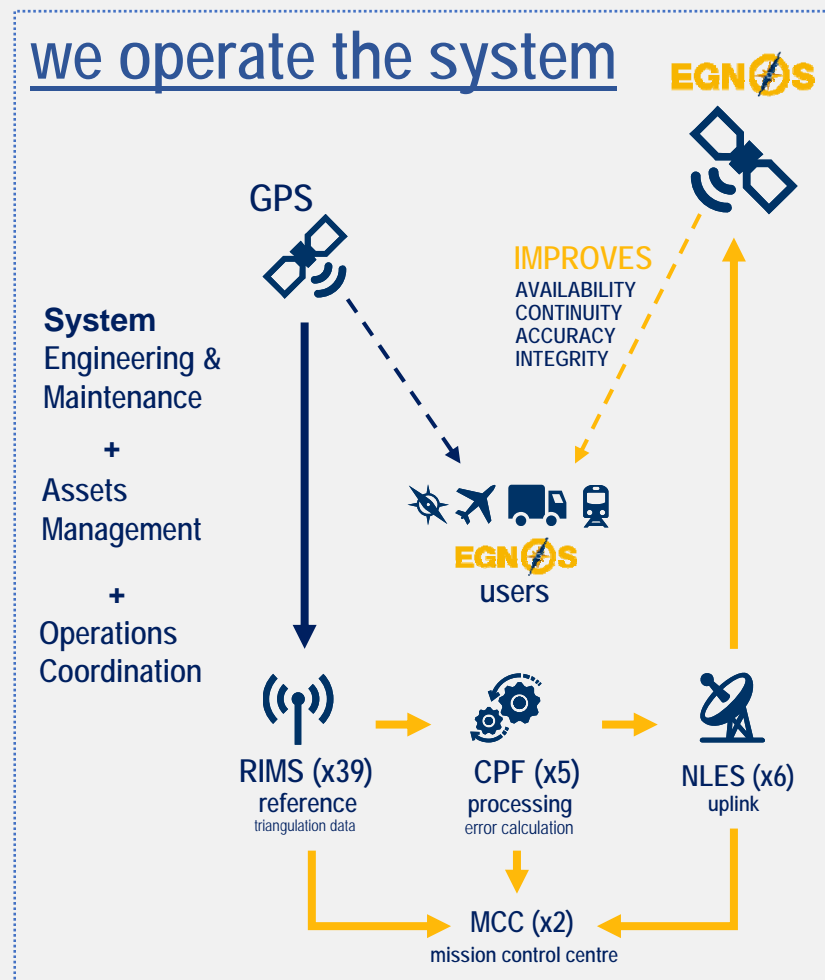


European
Global Navigation
Satellite Systems
Agency



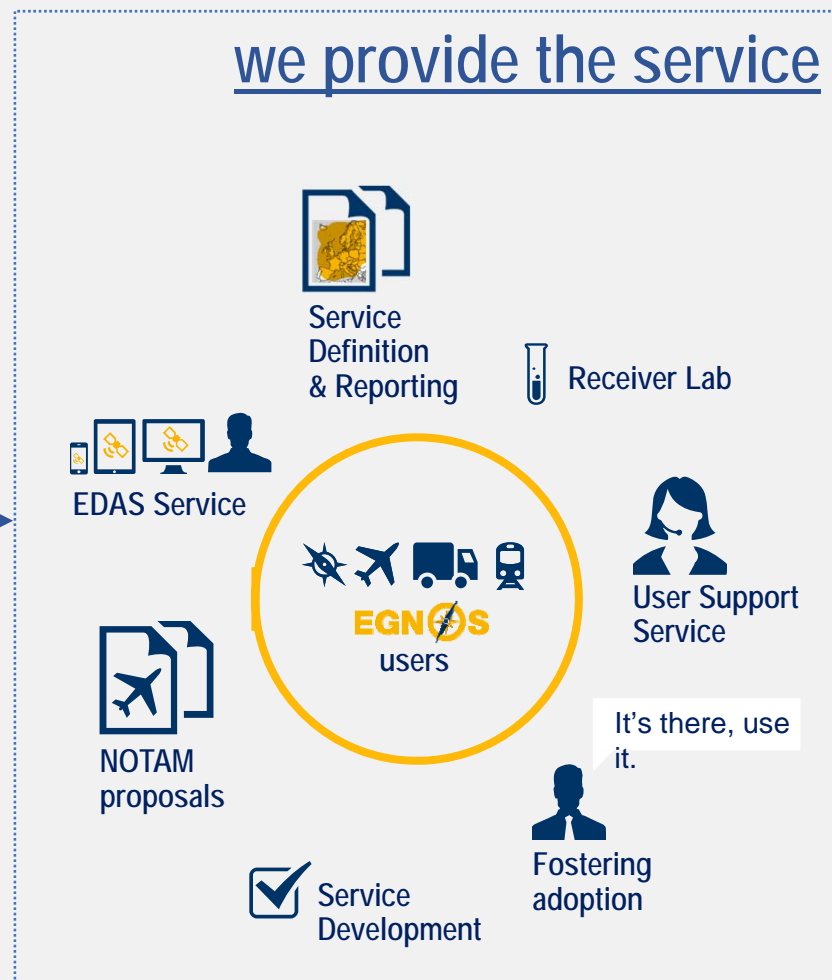
ESSP Toulouse office, France

System Operations Unit & Compliance Management Unit

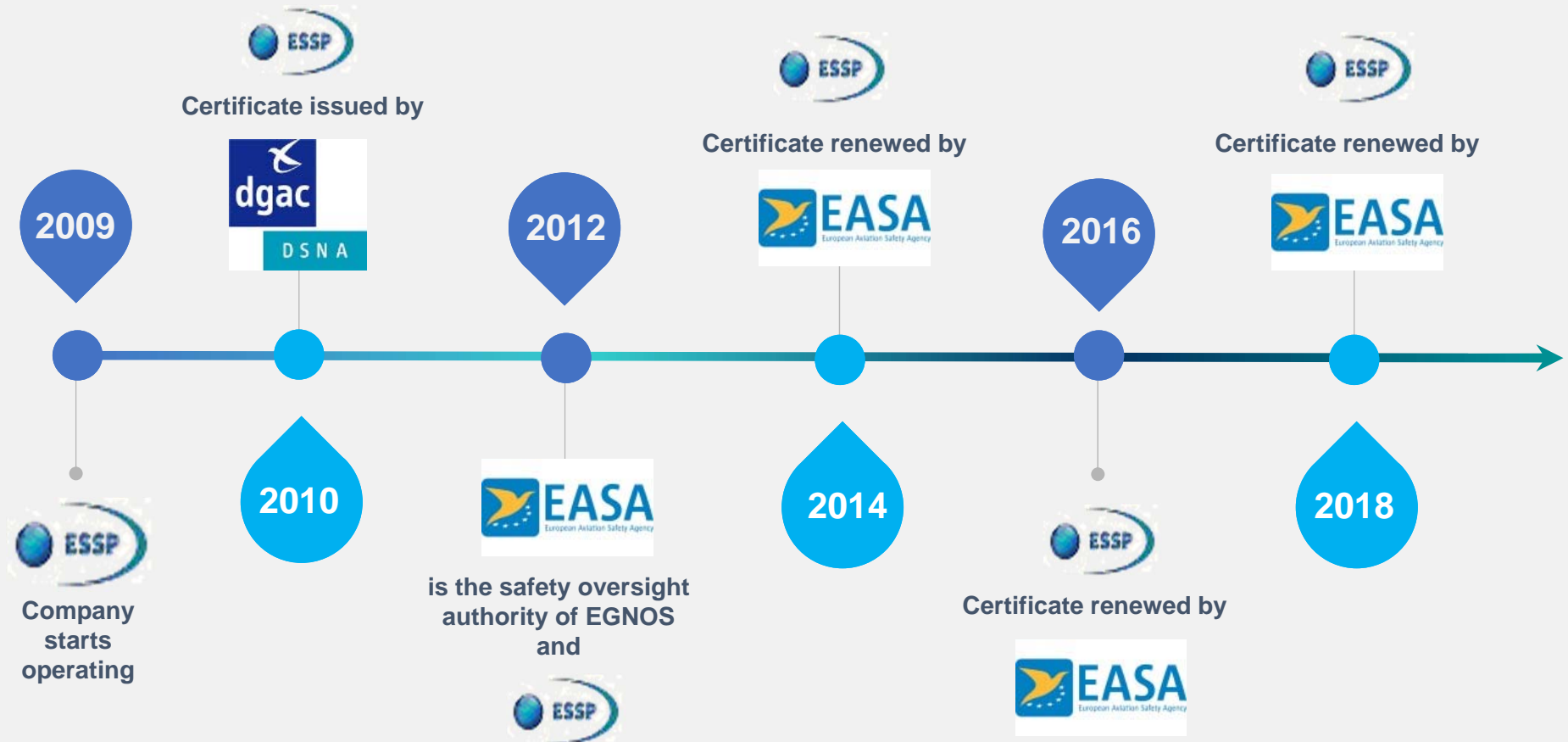


ESSP Madrid office, Spain

Service Provision Unit

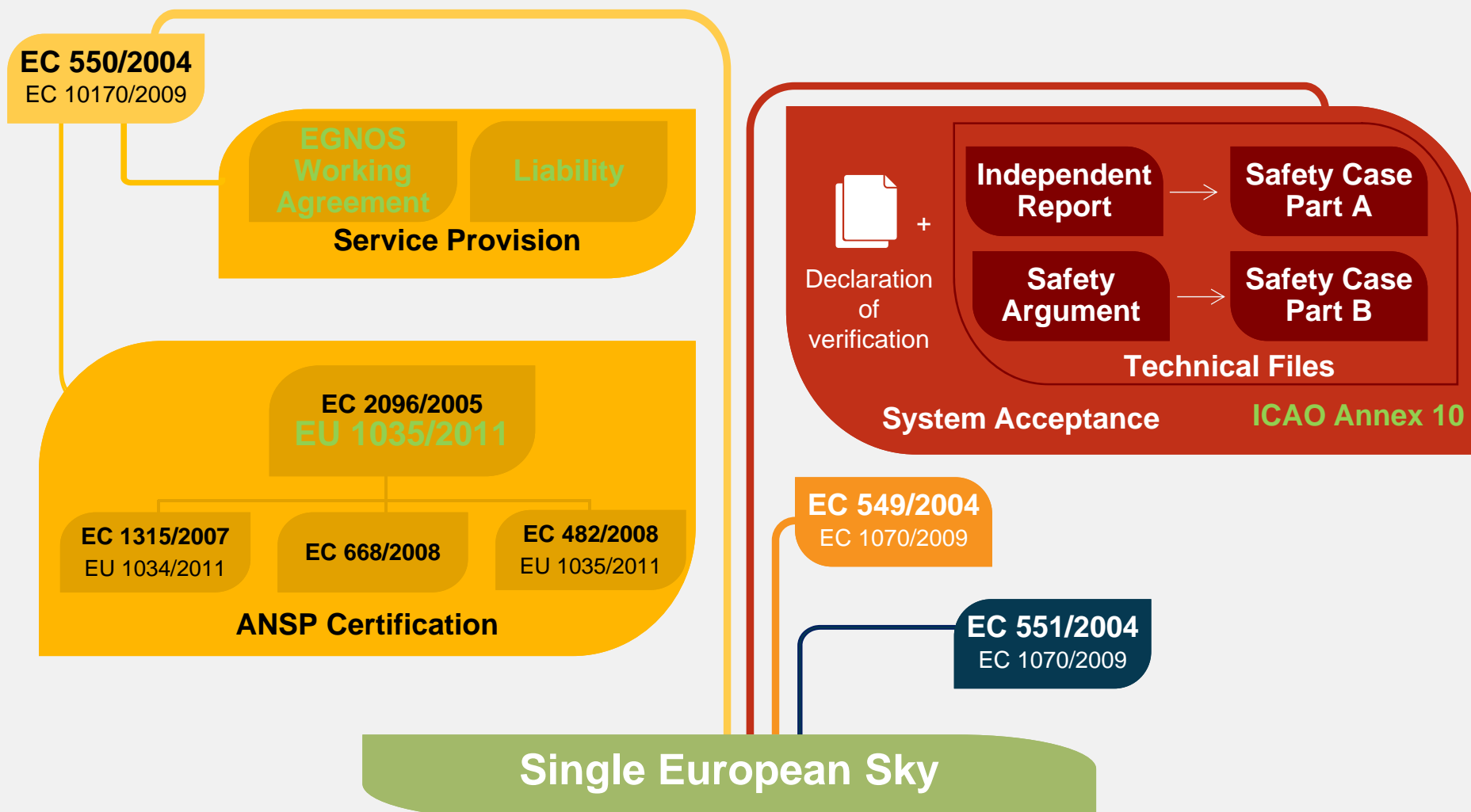


Certification of ESSP



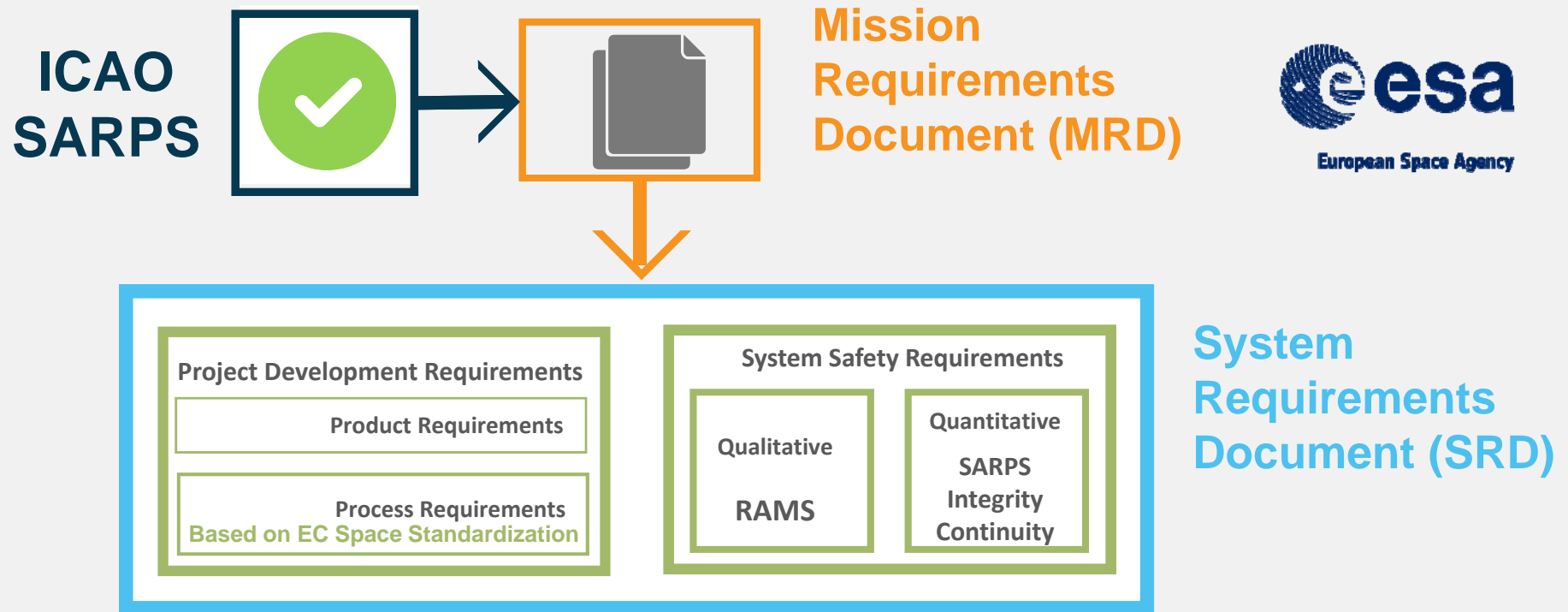
- EASA is the **European Aviation Safety Agency**
- ESSP is one of the very few to own a pan-European ANSP certificate from EASA
- With the new 373 regulation, the certificate will be valid indefinitely

Single European Sky regulatory framework



Certification: demonstrate system compliance

EGNOS system design



- EGNOS has been designed by **ESA** based on **ICAO Annex 10** Volume 1 Aeronautical Telecommunications - Radio Navigation Aids (SARPS)
- The SARPS have been declined into the MRD then into the SRD for the system manufacturer
- Time To Alert (6 sec)

EGNOS Safety Case

EGNOS Signal-in-Space
System Safety Case Part **A**



EGNOS Operations
Safety Case Part **B**

Safety Argument for EGNOS
introduction in European Air
Traffic Management Network
(EATMN)

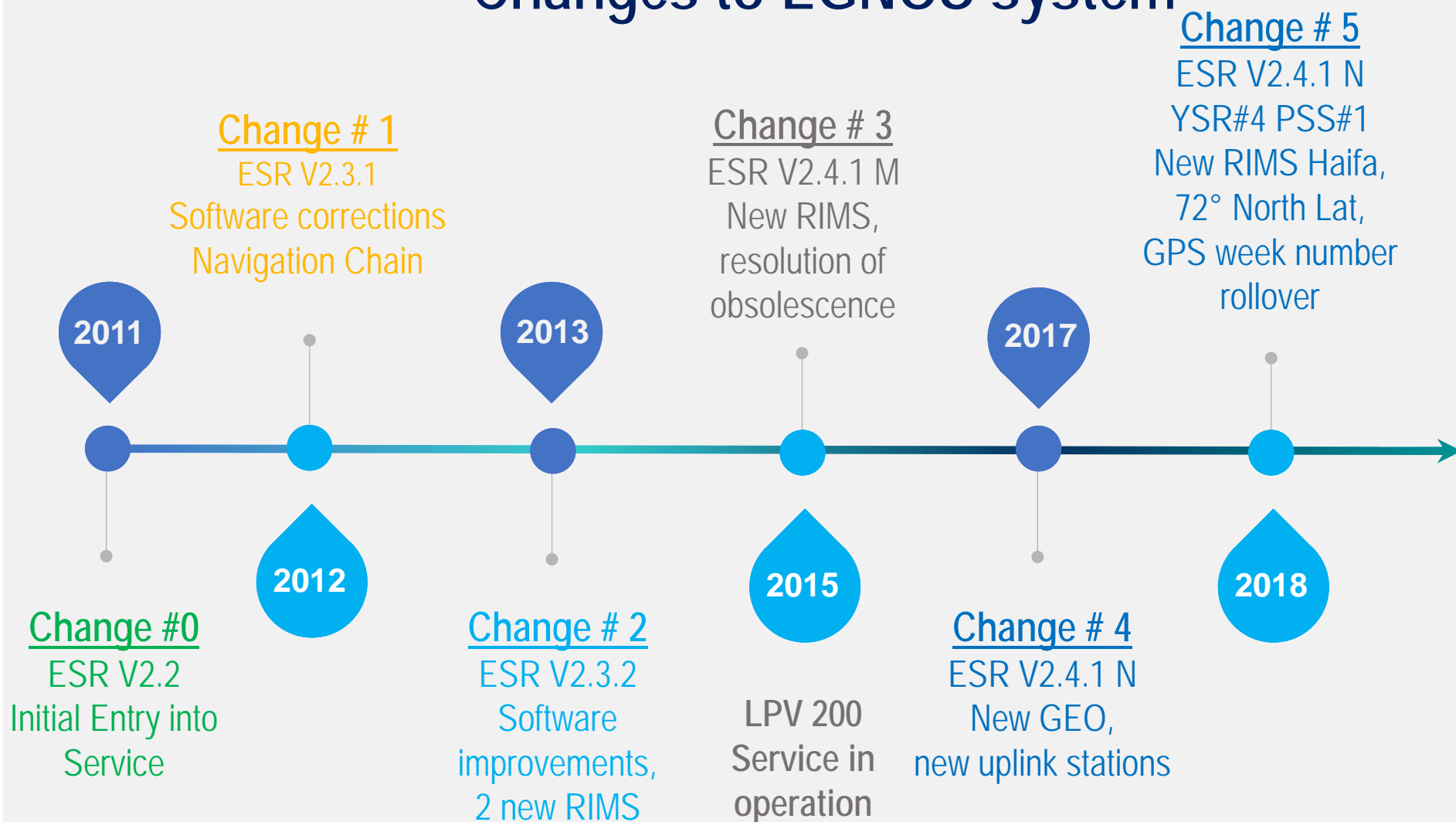




We certify you're there.

Certification: demonstrate system compliance

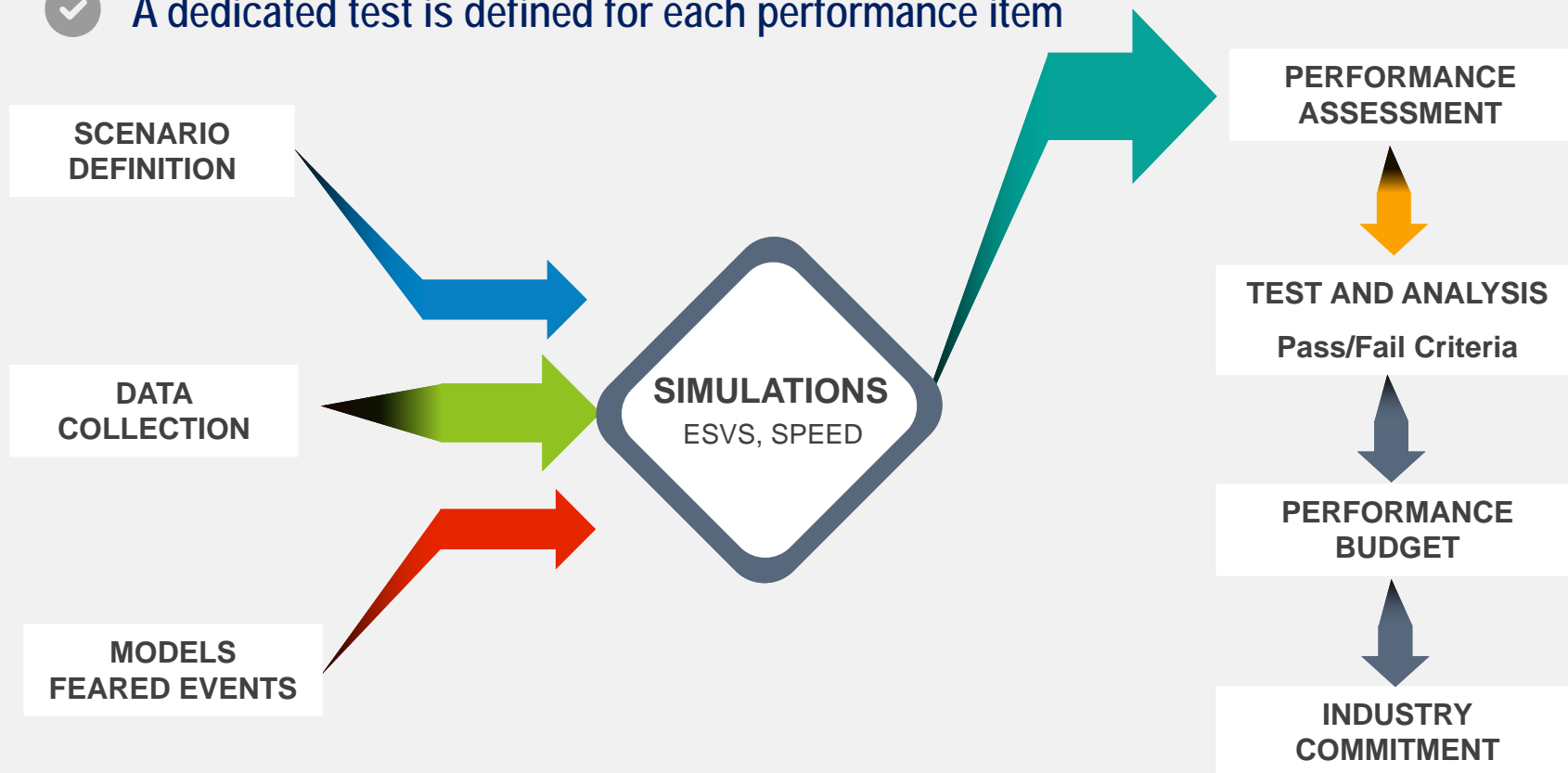
Changes to EGNOS system



Certification: demonstrate system performance

Initial System Performance Demonstration

- ⚙️ Qualified tools and processes are used for data generation and simulation
- 📄 Collected real data is used for the Qualification Phase
- ✓ A dedicated test is defined for each performance item





We certify you're there.

Certification: demonstrate system performance

System Performance Demonstration

User applicable service area is specific for each system release and is defined by ESSP by taking into account both industry commitment and long duration performance assessment using real Signal In Space data.



Real Data Collection
(Long duration)

Computed performance



Industry Commitment



Final User
Commitment per
service type

EGNOS sites



2 ESSP offices

- 2 Mission Control Centres
- 39 ranging&monitoring stations
- 4 processing facilities
- 6 uplink stations

How to maintain the system ?

EGNOS System Maintenance

3 types of maintenance:

- Hardware preventive maintenance
- Hardware corrective maintenance
- Software Corrective maintenance
(development of new minor System Release)

Levels of maintenance:

- Level 1: orchestrated by Mission Control Centre, may need support from Hosting Entity
- Level 2: orchestrated by ESSP, in-depth analysis, troubleshooting, organises a replacement
- Level 3: industry support, for repairs in factory or when deep source code knowledge is needed



● 2 Mission Control Centres

● 39 RIMS stations
● 4 processing facilities
● 6 uplink stations
= 49 Hosting Entities

Mandatory: ensure continuity of system performance and availability during maintenance and upgrade operations so that there is no impact on EGNOS users



We certify you're there.

Implementation: maintain the system

EGNOS System Upgrades

2 types of upgrades:

- Major releases: European Space Agency
- Corrective releases: ESSP
- Industry (Thales) develops & qualifies releases

Deployment: main actors & roles:

- **ESSP**: coordinates all actors & operations, defines processes
- **Mission Control Centres** : perform upgrade procedures
- **Hosting Entities**: support upgrades when needed (e.g. on-site interventions)



European Space Agency



● **2 Mission Control Centres**

● ● ● **49 Hosting Entities**

Mandatory: ensure continuity of system performance and availability during maintenance and upgrade operations so that there is no impact on EGNOS users



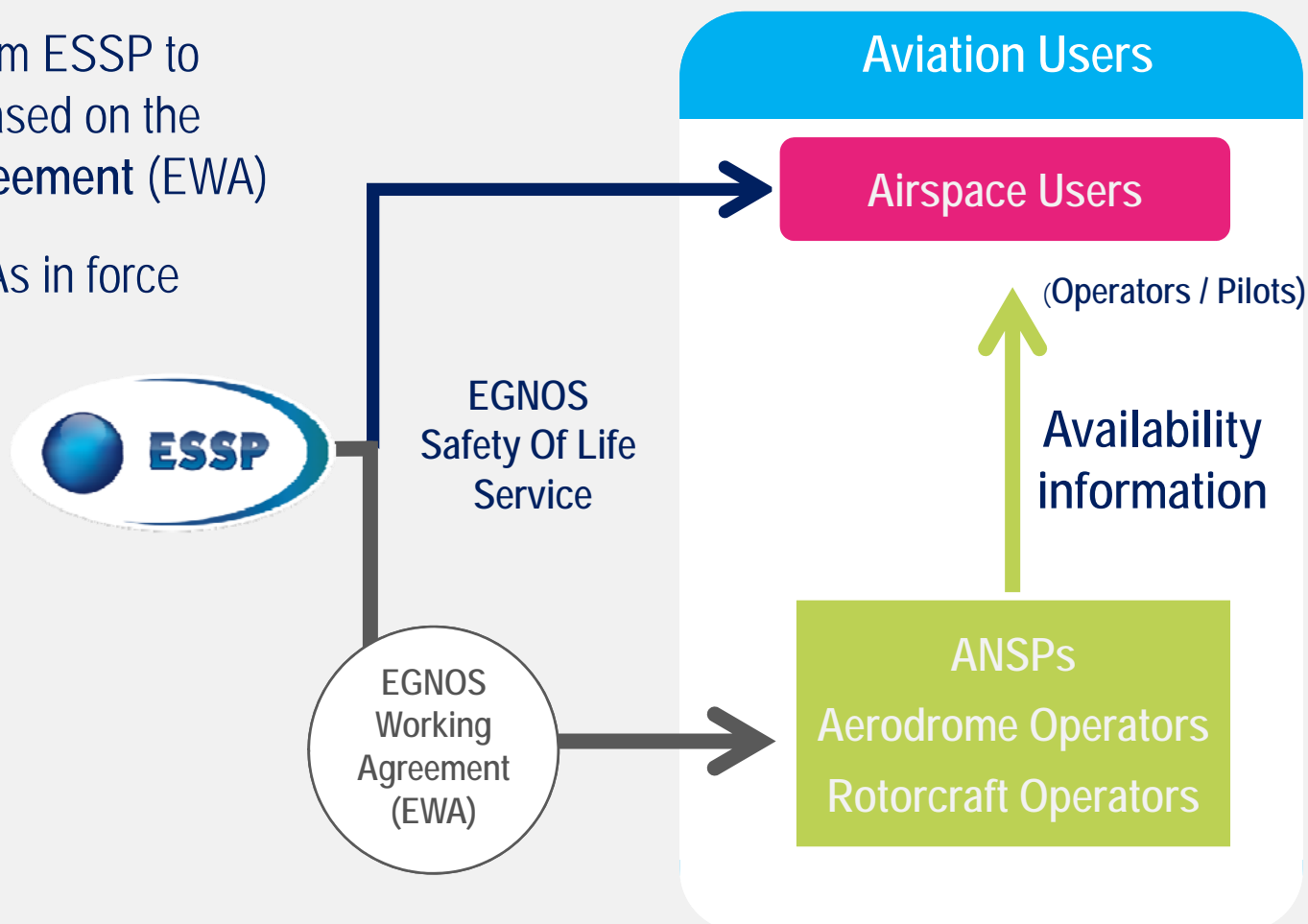
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Implementation: deliver the service to airspace users

EGNOS Service Provision Scheme

Communication from ESSP to Aviation users is based on the EGNOS Working Agreement (EWA)

There are 72 EWAs in force



Implementation: deliver the service to airspace users

EWA core:

- Requested by Single European Sky (SES) Regulation
- Contractual liability.

Annex 1:

- **SoL Service Definition Document (SDD):**
Terms, conditions and characteristics of the Service.
- **Service Notices:**
Temporary amendments to the Safety of Life SDD.
- **Contingency:**
Covering non-compliances with the commitment maps included within the Safety of Life SDD during a fixed time.

Annex 2:

- **NOTAM Proposal:**
Terms and conditions under which ESSP provides the EGNOS NOTAM Proposal to the corresponding NOF.
- **Collaborative Decision Making :**
Involvement of both the signatory & ESSP in the EGNOS use decision making process.
- **GNSS Data Recording:**
Terms and conditions under which ESSP provides the GNSS data recorded for accident/incident investigation.

Core

Contractual
document

Annex 1

SoL Service
Commitment

Annex 2

Service
Arrangements

EGNOS
Working
Agreement



We certify you're there.

72 EGNOS
Working
Agreements
in force

Implementation: deliver the service to airspace users

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



New Safety of Life SDD v3.3 Release

The new version of the Service Definition Document (SDD) for the EGNOS Safety of Life service has been published today! The EGNOS Safety of Life service (SoL)... read more

EGNOS Safety of Life (SoL)
Service Definition Document
Issue 3.3

EGNOS User Support Website

EGNOS Signal Status



PRN 123
ACTIVE
SoL Mode



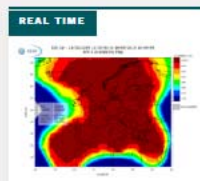
PRN 136
ACTIVE
SoL Mode



PRN 126
OUTAGE
Test Mode

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

Safety of Life Service



FORECAST

APV-I AVAILABILITY map unavailable.



Open Service



EGNOS SIS availability forecast

The top part of each cell in the calendar represents the availability forecast of PRN 123, the bottom one shows the status of PRN 136.

MAY 2019						
S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

Planned Signal Available: Green square
Planned Signal Outage: Red square
Risk of Signal Outage: Orange square
TSC Signal Available: Yellow square

Get it on iOS and Android for free



EGNOS APP



EGNOS Helpdesk

Accessible from
app



Signal in Space

EGNOS system
information



Docs and tools

Browse official
documents & tools



EGNOS performance

SoL, EDAS, OS
services



GET IT ON
Google Play



Download on the
App Store

thank you!

www.essp-sas.eu

thierry.racaud@essp-sas.eu



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

egnos-helpdesk@essp-sas.eu

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