



# ESSP - EGNOS Service Provider



**ICAO APV Workshop  
(26/05/2011)**

# *ESSP Introduction*



AENA

DFS

DGAC

ENAV

NATS

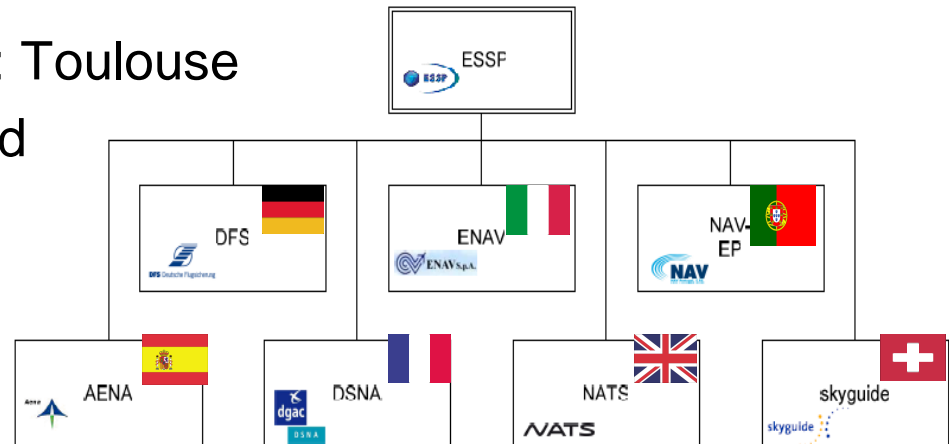
SKYGUIDE

NAV

## European Satellite Services Provider

# ESSP Creation

- **ESSP EEIG founded in 2001**
  - Mission: Operation of EGNOS
  - HQ: Brussels
- **ESSP SAS created in 2008**
  - Mission: EGNOS Service Provider
  - HQ, Safety, Operations units: Toulouse
  - Service Provision Unit: Madrid



## ESSP Status in EGNOS

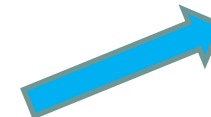
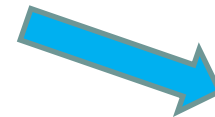
- **ESA Initial Operation Phase (IOP)**

- Ended April 2009
- Ownership transferred to the European Commission



- **EGNOS Signal Continuity Provision (ESCP)**

- 6 Months contract:
- Ended in September 2009

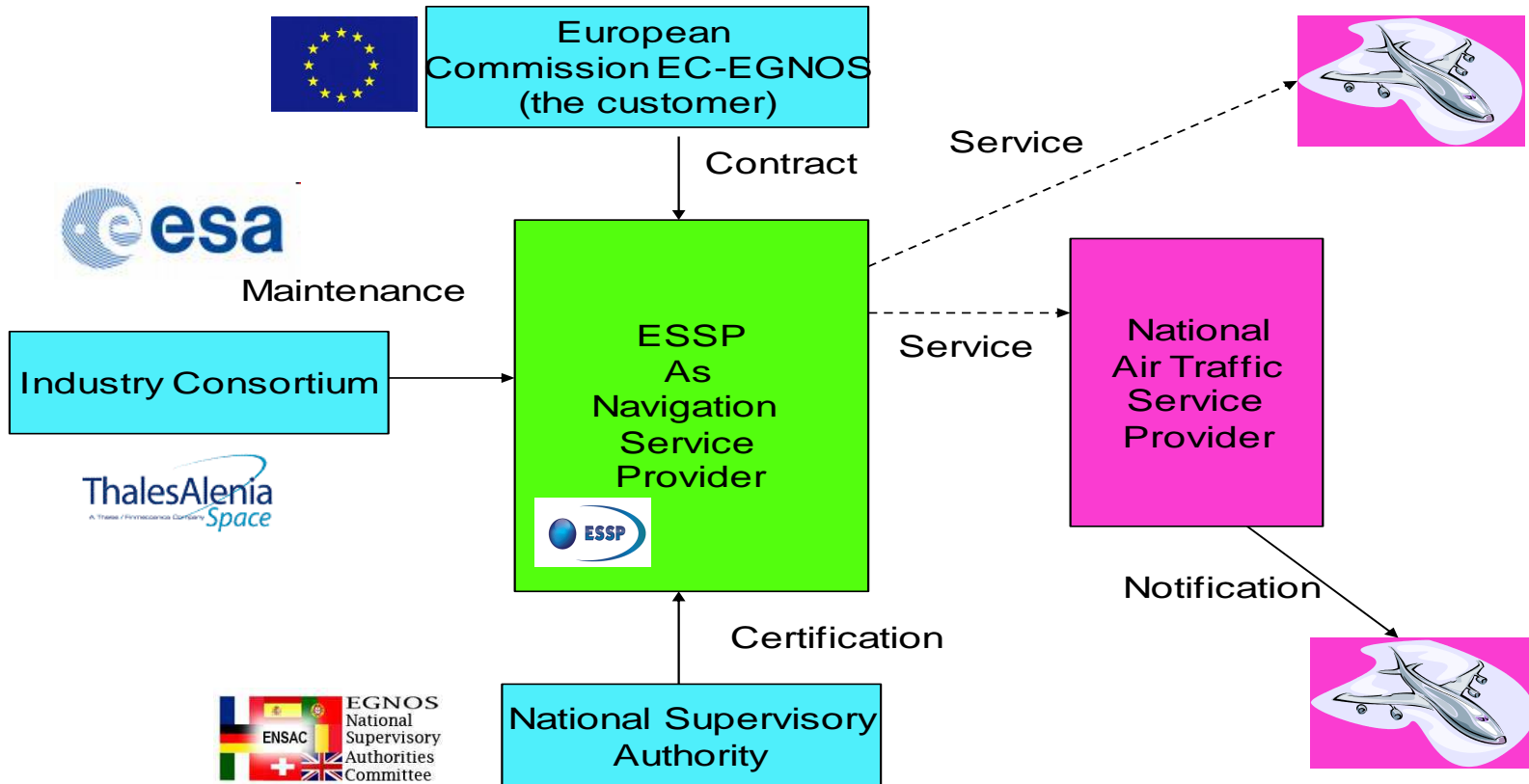


- **EGNOS Service Provision (ESP)**

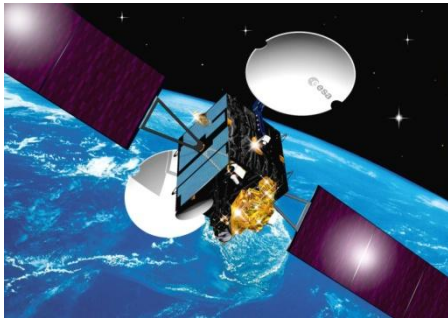
- Contract signed 30 September 2009 for 52 months

# ESSP within EGNOS

## Service Provision Current Scenario





# *Introduction to EGNOS System & Services*



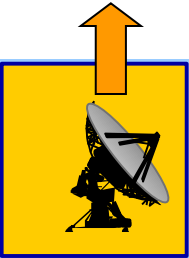
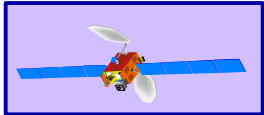
EGNOS

# What is EGNOS?

- EGNOS (*European Geostationary Navigation Overlay Service*) is the European Satellite Based Augmentation System (SBAS)
- EGNOS “augments” the GPS L1 signal
  - Accuracy of positioning is improved up to 1 and 2 meters horizontally and between 2 and 4 meters vertically
  - Accuracy of timing is improved to better than 10 nanoseconds 
  - Integrity and safety is improved by broadcasting alerts within a few seconds of the occurrence of a failure in GPS and by providing a level of confidence on the position computation with EGNOS 

# EGNOS elements

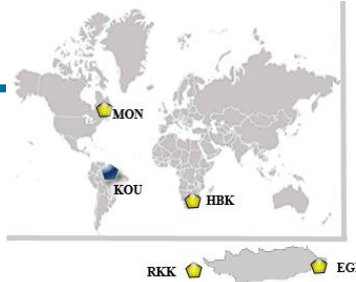
3 Satellites  
EGNOS



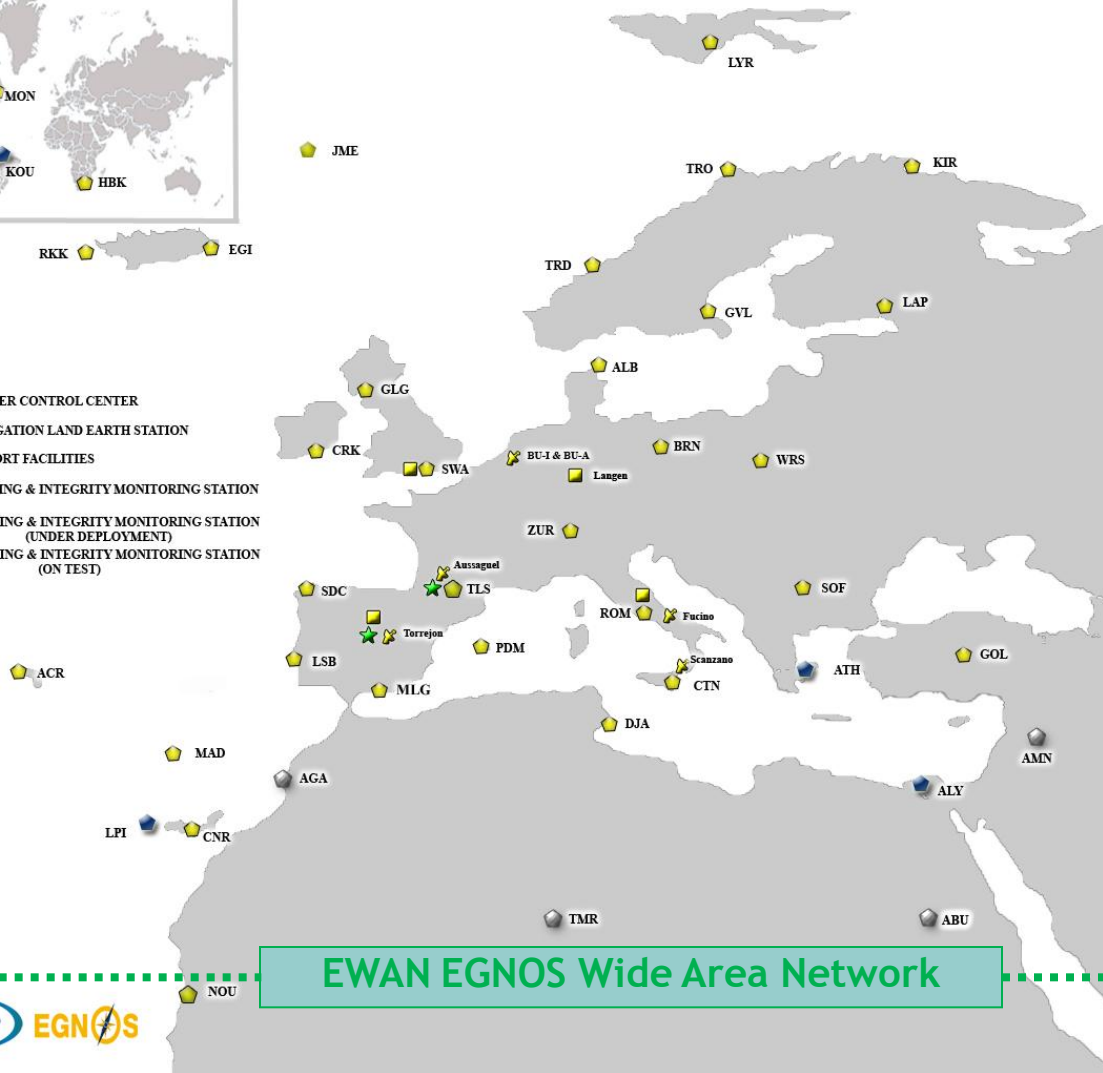
6 NLES  
Navigation  
Land Earth  
Stations

4 MCC  
Mission  
Control  
Centers

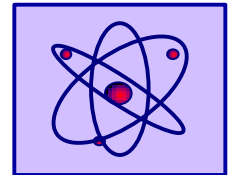
2 Support  
Facilities



-  MASTER CONTROL CENTER
-  NAVIGATION LAND EARTH STATION
-  SUPPORT FACILITIES
-  RANGING & INTEGRITY MONITORING STATION
-  RANGING & INTEGRITY MONITORING STATION (UNDER DEPLOYMENT)
-  RANGING & INTEGRITY MONITORING STATION (ON TEST)



GPS



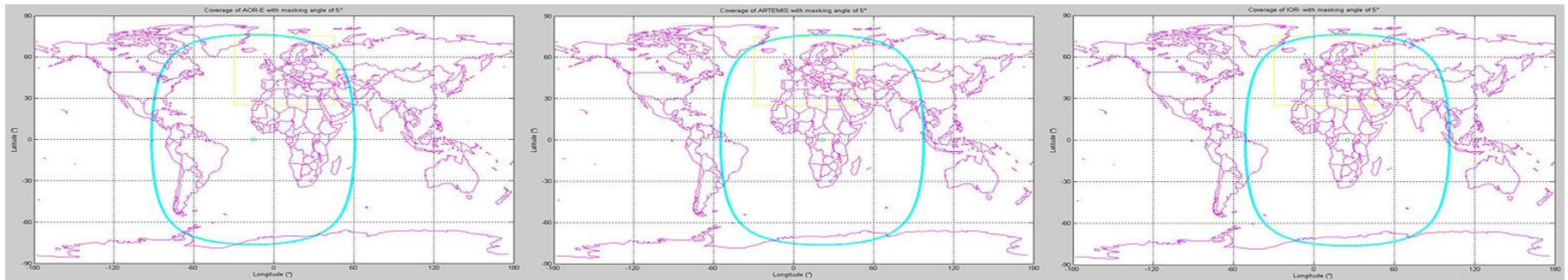
34 RIMS +  
7 under  
deployment

EWAN EGNOS Wide Area Network



# EGNOS Space Segment

## 3 Geostationary Satellites



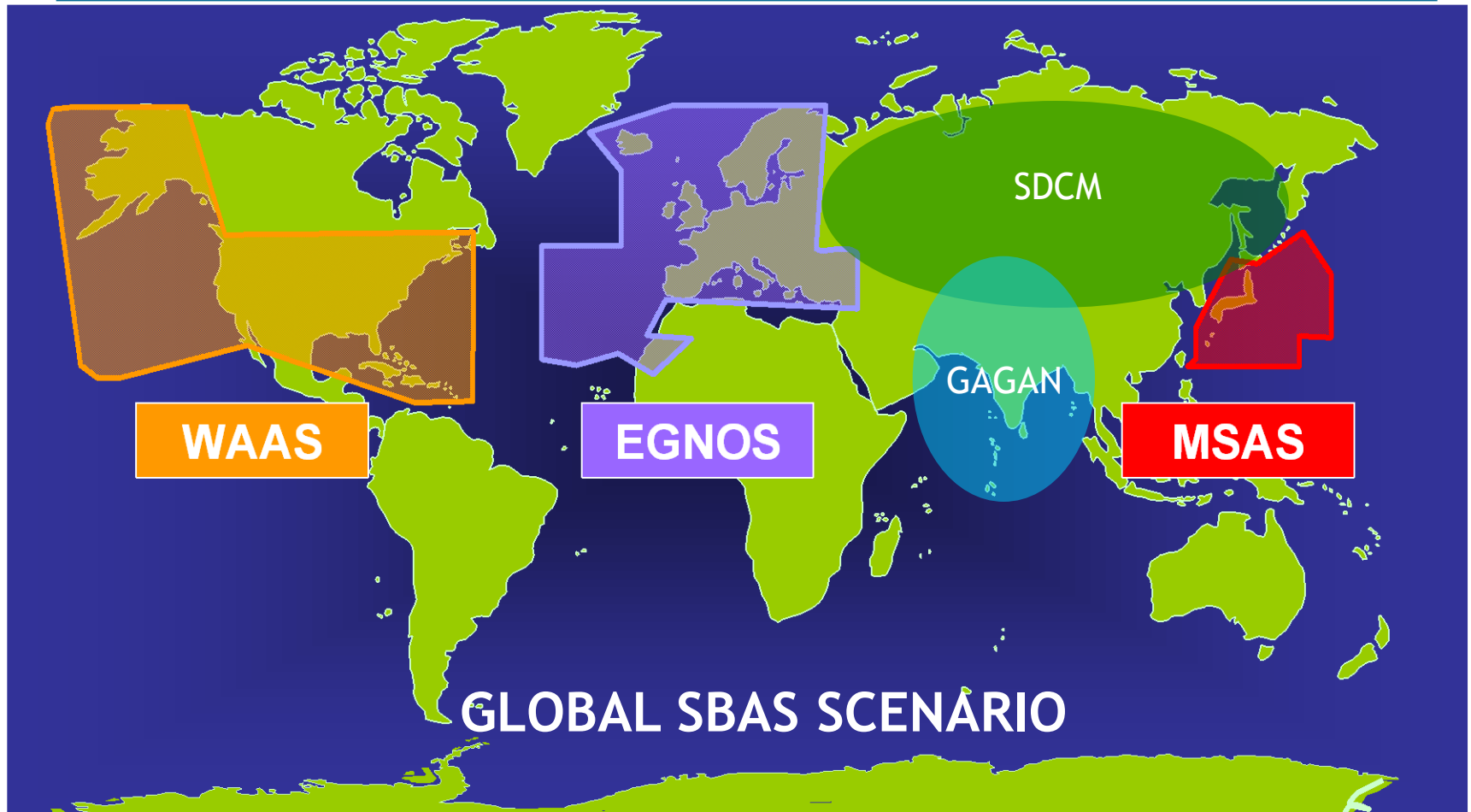
PRN120 Inmarsat AOR-E

PRN124 ESA Artemis

PRN126 Inmarsat IOR-W

- **EGNOS OPS:** PRN120 and PRN124 broadcast EGNOS messages to provide the SIS that is actually used by the EGNOS aviation user
- **EGNOS TEST:** PRN126 is used by industry for EGNOS System Releases tests and operators training and qualification

# EGNOS coverage



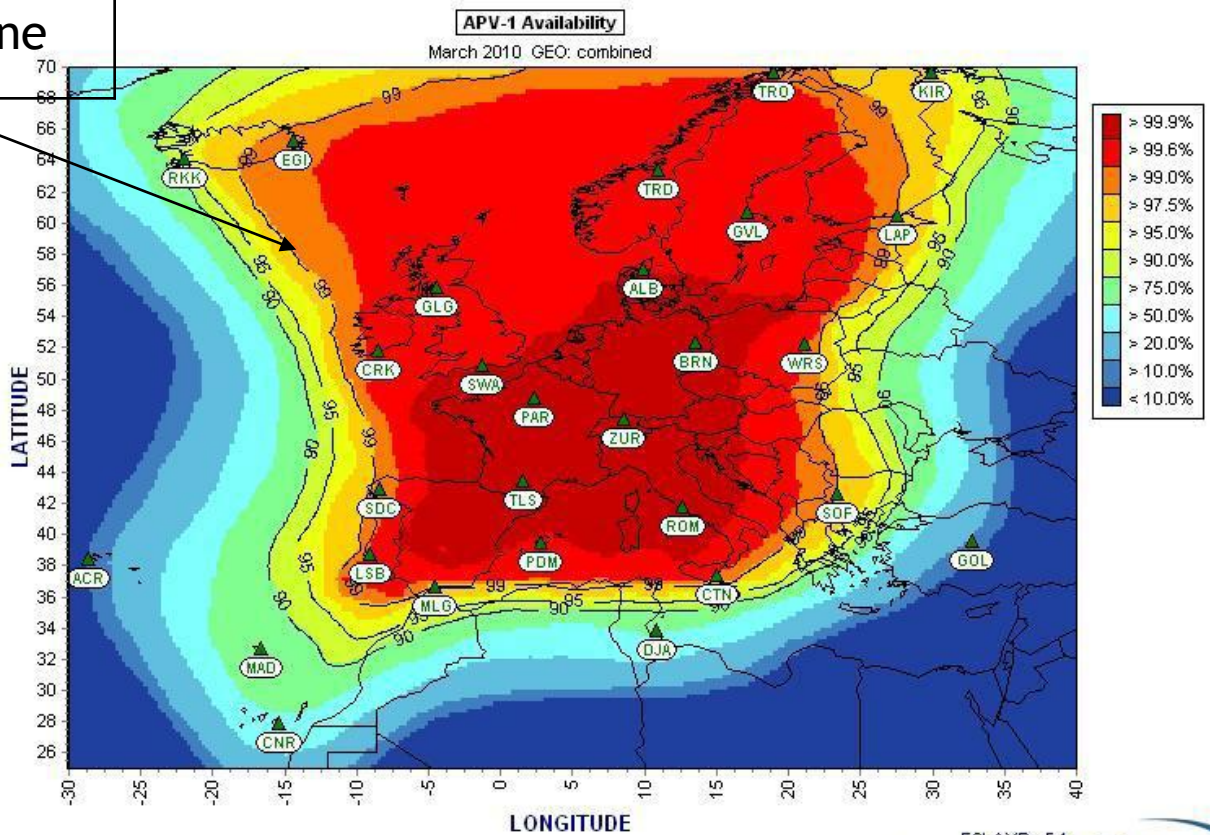
# EGNOS short term improvements

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- **Current EGNOS V2.2ext** achieving good levels of performance toward Aviation ICAO SARPS
- **New EGNOS V2.3.1+ (end of 2011) with**
  - 3 New RIMS stations (La Palma, Athens, Alexandria)
  - Improvement in EGNOS functions (CPF Iono monitoring and operator monitoring capabilities)
- **Increased service area and improved service robustness in border areas**

# APV-1 Availability(99%) over ECAC Typical day

99% isoline

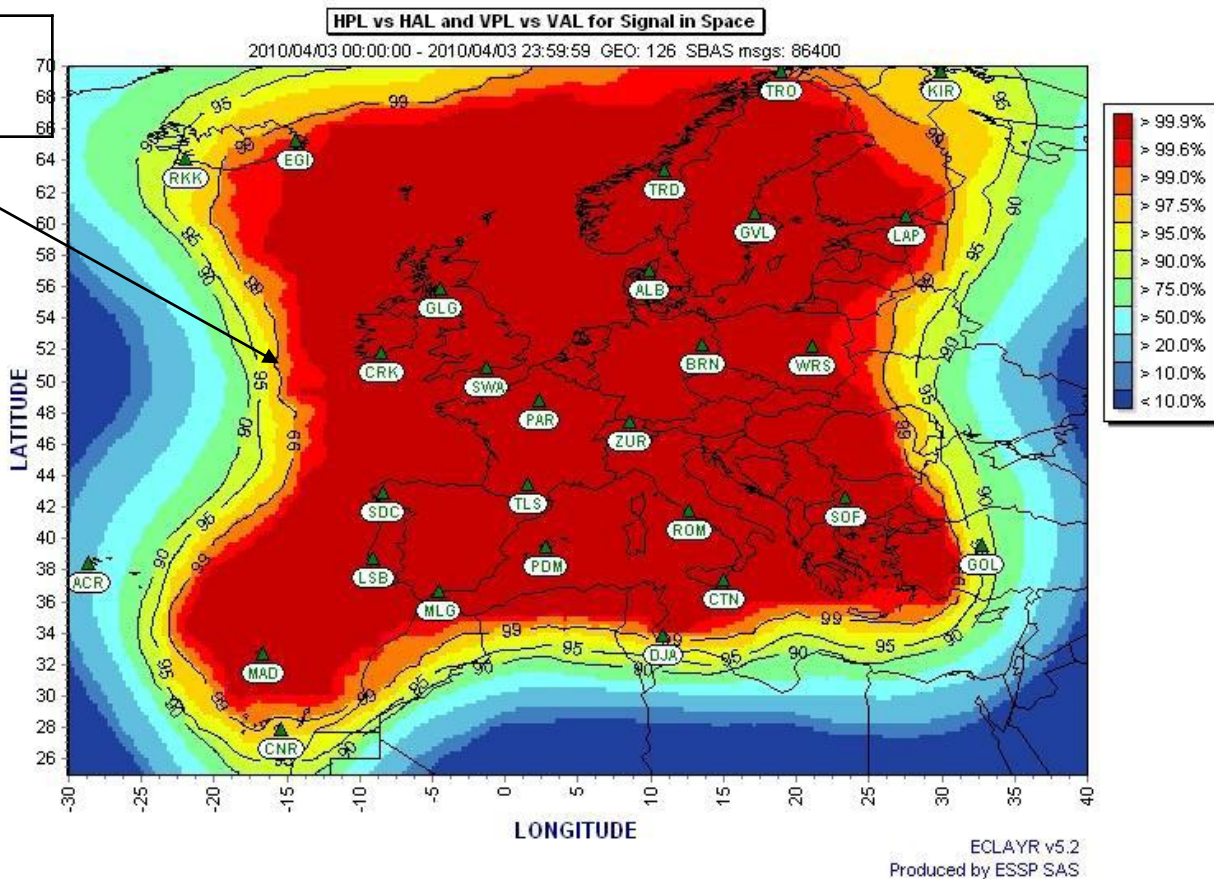




# APV-1 Availability Extension (2011)

## Typical day

99% isoline



# EGNOS Services

- **EGNOS Open Service (OS)**

- Service Declaration: 1<sup>st</sup> October 2009
- [http://www.essp-sas.eu/service\\_definition\\_documents](http://www.essp-sas.eu/service_definition_documents)



- **EGNOS Safety-of-Life (SoL) Service**

- Service Declaration: 2<sup>nd</sup> March 2011
- [http://www.essp-sas.eu/service\\_definition\\_documents](http://www.essp-sas.eu/service_definition_documents)



- **EGNOS Data Access Service (EDAS)**

- EDAS Service provided by ESSP available since 2009
- Service evolutions under definition by EC



# *EGNOS SoL Service Provision Status*



**EGNOS**

# EGNOS SoL Service: Implementation Schedule (1/2)

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- **ESSP Certification as Air Navigation Service Provider (ANSP)**

The French NSA delivered the ANSP certificate to ESSP on the 12/7/10

- **EGNOS Declaration of Verification (DoV) production**

ESSP submitted the EGNOS DoV on the 13/7/10

- **Safety Case 0 (Demonstration of the SoL Service safe introduction)**

Corresponding safety dossiers formally accepted on the 30/7/10



# EGNOS SoL Service: Implementation Schedule (2/2)

- **SoL Transition Phase (MT0 removal) & Observation Period**

Starting from August 2<sup>nd</sup>

TRANSITION PHASE: Group of tasks leading to the MT0 removal from the EGNOS signal followed by an

OBSERVATION PERIOD: Devoted to operational monitoring (at system and user level) after the MT0 removal

In parallel EASA publicated:

- Safety Information Bulletin (SIB): To warn pilots and communicate reporting channels available
- Continuing Airworthiness Review Item (CARI): Sent to receiver manufacturers to collect any identified issue after MT0 removal

- **SoL Service Declaration to Users...**

## EGNOS Safety-of-Life Service available as of 2<sup>nd</sup> of March 2011



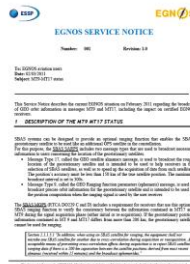
Communications sent to EC 27 MS

# LPV implementation status (I/II)

- **EGNOS SoL Service Definition Document (SDD)** describing the characteristics and conditions of access to the service. Published on the 2<sup>nd</sup> March 2011



- **EGNOS Service Notices** generated whenever there is any complementary information to be provided to users that could affect the SoL SDD contents. First one issued on the 2<sup>nd</sup> March 2011



# LPV implementation status (I/II)

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- **First EGNOS Working Agreement** has been already signed with DSNA on the 2<sup>nd</sup> March 2011
- **EGNOS NOTAM proposals** generated by ESSP as of 2<sup>nd</sup> March 2011
- **First LPV procedure** is operational in Pau Airport from the 17<sup>th</sup> March 2011
  - LPV in **Clermont-Ferrand published** on the **5<sup>th</sup> May 2011**
  - LPV in **Le Bourget planned** for the **2<sup>nd</sup> of June 2011**
  - **14 LPVs are planned to be published in France within 2011!**
- **Other LPV procedures** planned over Europe in 2011 (Les Eplatures, St. Gallen-Altenrhein, Alderney...)

# *EGNOS in Aviation: First LPV Implementation Approach*

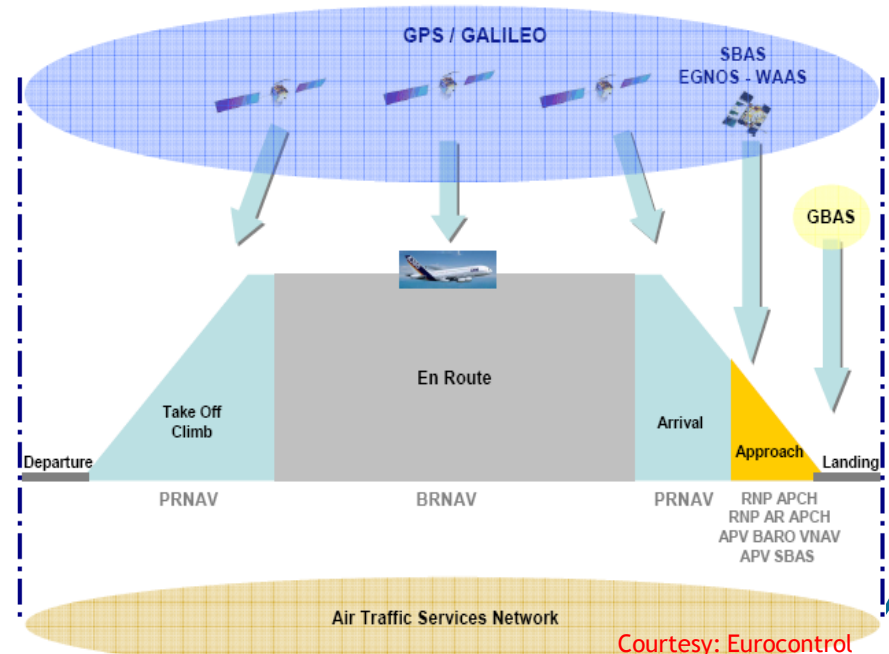


EGNOS 

# EGNOS SoL: WHY ?

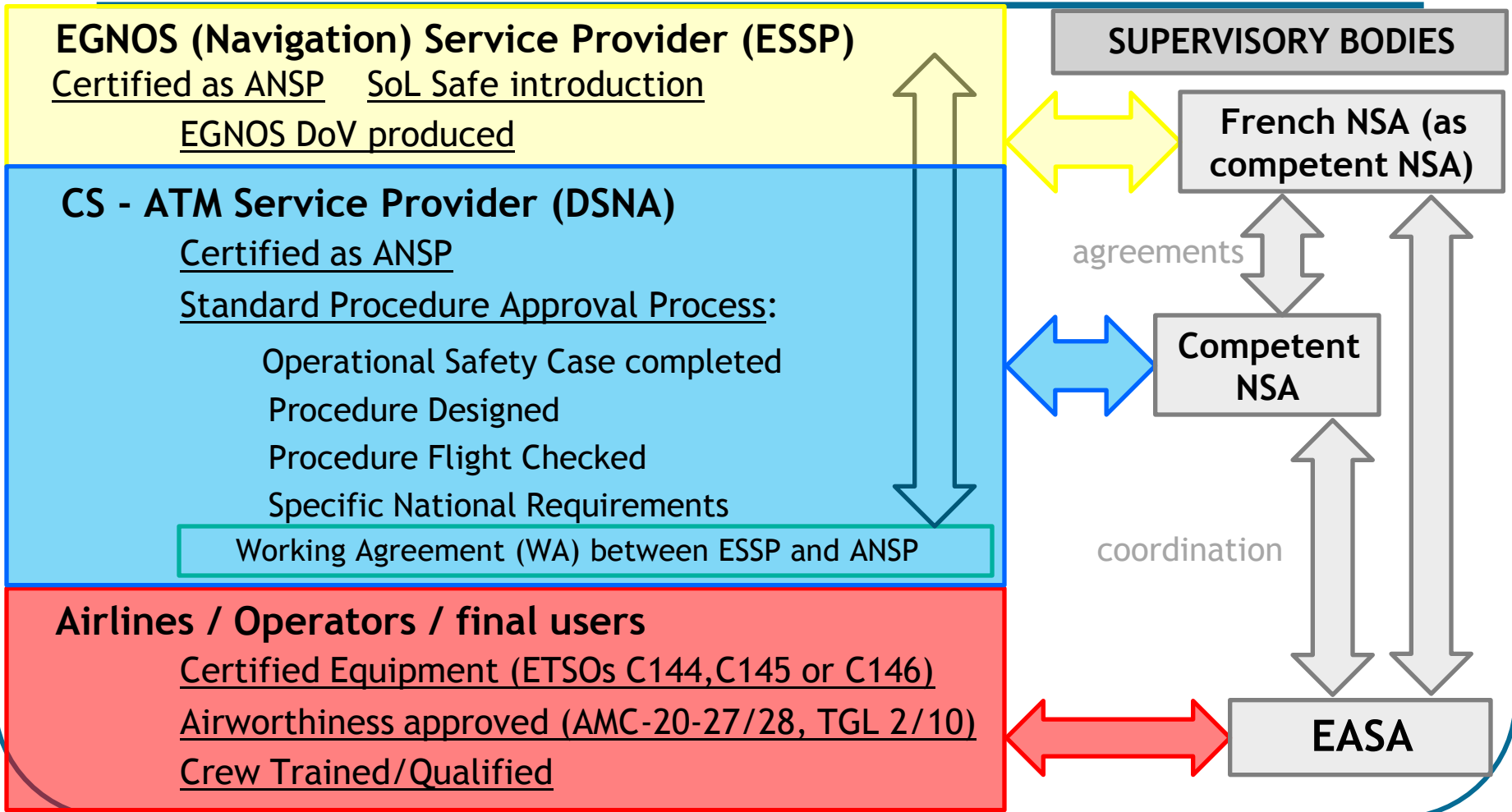
## Civil Aviation GNSS strategy

- **11th ICAO ANC (2003):**  
Aviation approach for GNSS:  
 Final Objective: If GNSS is the better solution with regard to safety and cost/benefit, it should be used as “unique navigation means” for all phases of flight.
- **36<sup>th</sup>/37<sup>th</sup> ICAO Assemblies (2007/2010):**  
Implementation of RNAV and RNP ops for en-route and TMA  
Implementation of APV Baro-VNAV and/or SBAS  
 Possibility of LNAV  
**in every IFR runway in 2016**

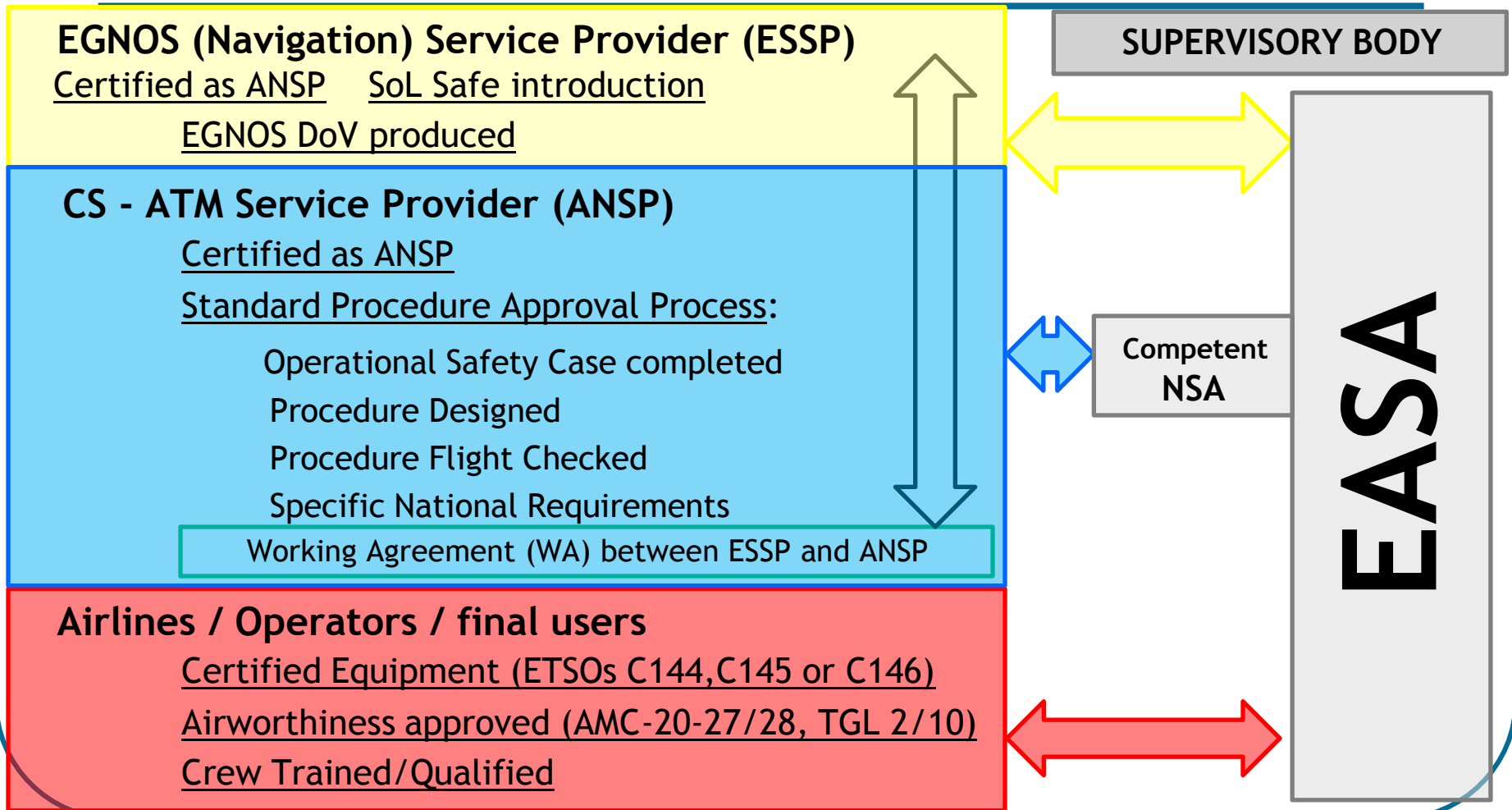




# First LPV publication: WHO DID WHAT?



# Future LPV Implementations: WHO WILL DO WHAT? (mid term scenario)





# *EGNOS Working Agreement (EWA)*



# The need for the EWA's (I/II)

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- **SES regulatory framework analysis**
  - **RE (CE) 550/2004, Article 10:** “*Air navigation service providers shall formalise their working relationships by means of **written agreements** or equivalent legal arrangements, setting out the specific duties and functions assumed by each provider and allowing for the exchange of operational data between all service providers in so far as general air traffic is concerned. Those arrangements shall be notified to the national supervisory authority or authorities concerned.*”
  - **RE (CE) 2096/2005 Annex I, 7.** “*An air navigation service provider which avails itself of services of another air navigation service provider shall ensure that the agreements cover the allocation of liability between them.*”

# The need for the EWA's (II/II)

- **EWA need discussions:**

- **NSA Committee (30/04/2010)**: (France, Belgium, Spain, Germany, Portugal, Italy, Switzerland and UK NSAs): Recommend EU NSAs not to approve local APV safety case if an agreement with ESSP is not signed.
- **34<sup>th</sup> and 35<sup>th</sup> SES Committee Meetings (23/03/2010 and 09/07/2010)**: The principle of agreements being established between the ANSPs concerned and the EGNOS Service Provider (ESSP) in compliance with Article 10 of the SES Service Provision Regulation was agreed.
- **EUNSA Meeting: (05/07/2010)**: 2 different agreements to be signed:
  - An Agreement between the ESSP and the ANSP.
  - An agreement between the NSA of a member state where an SBAS approach is being implemented and the authority in charge of EGNOS service provider oversight. This agreement is required in application of SES regulation (article 2 of the regulation 550/2004 as amended by regulation 1070/2009).”

**MAIN CONCLUSION: Need for an EWA between ESSP and the ANSP identified to be confirmed / required by each national NSA**

# The EWA contents

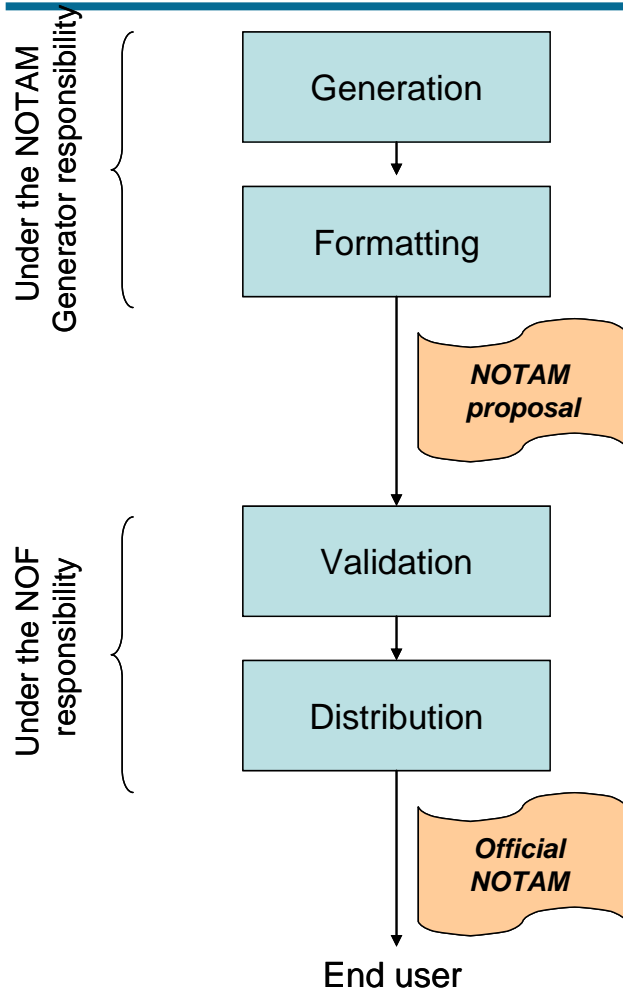
- **EWA content definition:**
  - Interactions with ESSP shareholders: 7 meetings and 14 teleconferences for the EWA skeleton definition.
  - Date of approval by ESSP BoD of the **skeleton** of the EWA: 22-09-2010
- **EWA contents:**
  - EWA document: The agreement itself containing only contractual liability.
  - Annex 1: Including the “ESSP SAS SoL Service Commitment” as stated in the referenced document EGNOS SoL Service Definition Document (EGN-SDD SoL v1.0) published on the 2<sup>nd</sup> of March 2011.
    - A reference to contingency coordination is included as well.
  - Annex 2: Including the “Service Arrangements” defined between the ESSP and the ANSP with the purpose to enable the ANSP to implement Performance Based Navigation (PBN) procedures based on EGNOS, namely:
    - NOTAM Proposal Origination
    - EGNOS Data Recording
    - Collaborative Decision Making (CDM)

## EWA progress

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- **Several ANSPs showed a renewed interest** on the EWA:
  - Skyguide
  - PANSAs
  - Alderney state
  - Aena
  - Austrocontrol
  - Avinor
  - Expectations on FP7 projects participating ANSPs
- **All EWA related information / discussions will be managed by ESSP through the already communicated focal points:**
  - Further information will be provided in the EGNOS Service Provision Workshop
  - Any interested ANSP is kindly invited to contact us through:  
MAILBOX: [EGNOS-working-agreement@essp-sas.eu](mailto:EGNOS-working-agreement@essp-sas.eu)

# EGNOS NOTAM Proposal Service

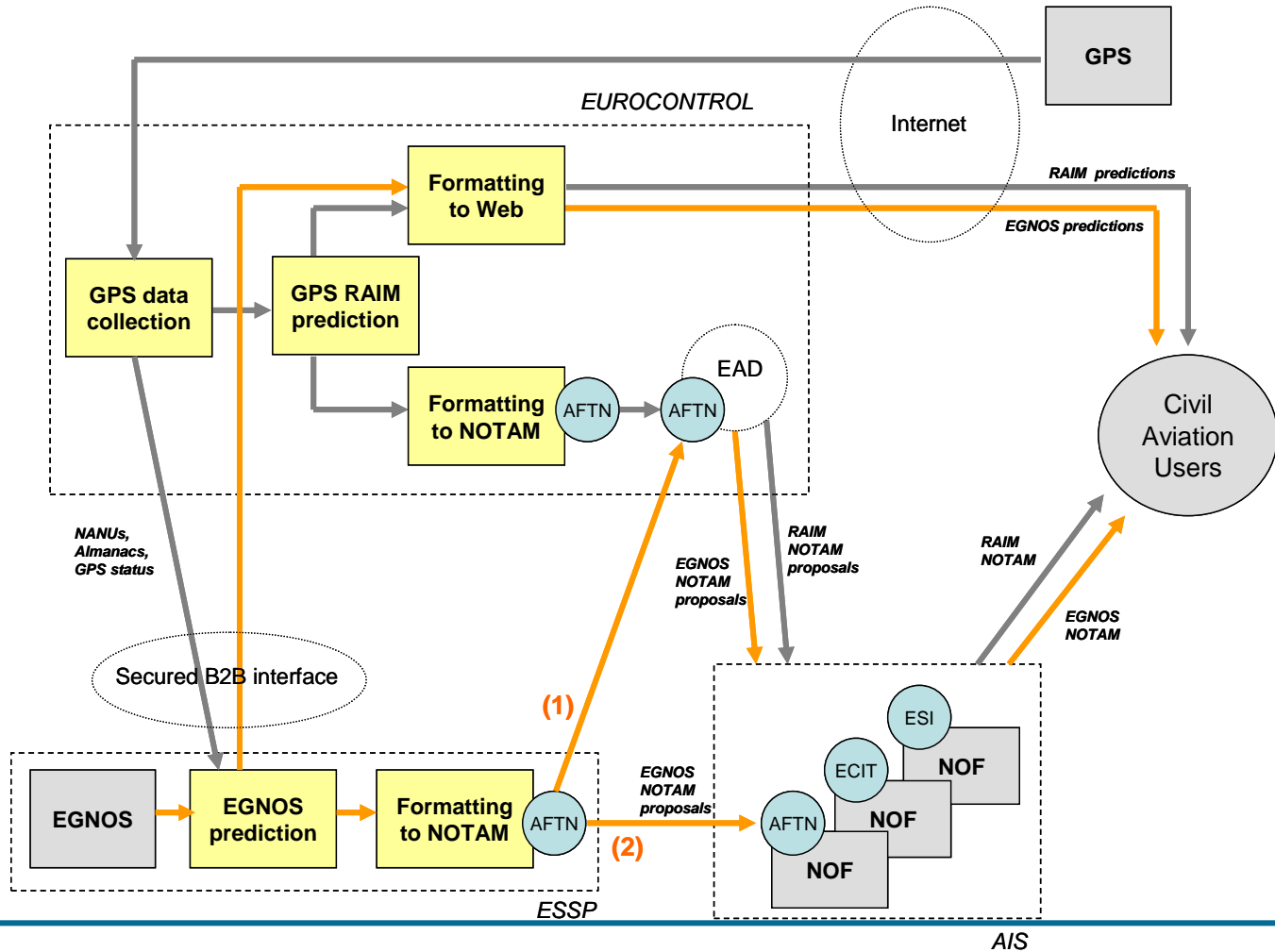


- ESSP is the EGNOS NOTAM **Data Originator** providing EGNOS **NOTAM proposals** to the NOFs using Eurocontrol's Euronotam tool
- ESSP will not be an Aeronautical Information Services (AIS)

# EGNOS NOTAM

## Roles & Responsibilities (current status)

Courtesy of Eurocontrol



# EGNOS NOTAM Proposals

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- **Service Level 1+** includes NOTAM proposals resulting from:
  - GNSS predicted outages generated minimum 72 hours in advance
  - GNSS unplanned outage handled within one working day, every calendar day (7/7)
- **NOTAM Proposals Generation operational** since the 2nd of March 2011
- **NOTAM tool roadmap** towards ICAO recommendations
  - ICAO SARPS Annex 10 Attach D Section 9.3
    - Timing of notification
    - For **scheduled events**, notification should be given to the NOTAM authority at least 72 hours prior to the event. For **unscheduled events**, notification to the NOTAM authority should be given within 15 minutes. Notification should be given for events of 15-minute, or longer, duration.



# How to Contact ESSP?

- **ESSP Website:**  
Information related to EGNOS and the ESSP  
[www.essp-sas.eu](http://www.essp-sas.eu)
- **EGNOS User Support:**  
EGNOS performances on a daily basis  
Website: Link via ESSP Website
- **EGNOS User Helpdesk:**  
Website: Link via ESSP Website  
[Egnos-helpdesk@essp-sas.eu](mailto:Egnos-helpdesk@essp-sas.eu)
- **Service Development:**  
[miguel-angel.sanchez@essp-sas.eu](mailto:miguel-angel.sanchez@essp-sas.eu)  
[francisco-javier.deblas@essp-sas.eu](mailto:francisco-javier.deblas@essp-sas.eu)



# EGNOS Service Provision Workshop

- It will take place next June 16<sup>th</sup> in the ESSP headquarters (Toulouse)
  - Invitations already sent to European GNSS stakeholders
  - Information / presentations about EGNOS performances, Service Improvements, user interfaces, EWA and current APV SBAS implementations will be given.
  - Discussion Sessions organized to address topics of interest
  - EGNOS Service Provision Yearly report distribution
- **Check your organization has been invited!** (in case of any specific request let us know)



**EGNOS Service Provision Workshop - 2011**

ESSP, the European Satellite Services Provider, kindly invites you to participate to the annual **EGNOS Service Provision Workshop** that will take place next **June 16<sup>th</sup>** at ESSP Headquarters in Toulouse, France.

**Preliminary Agenda**

09:30 - 09:30	Registration and Offices
09:30 - 09:45	Welcome and introduction
09:45 - 10:00	The way to the EGNOS Sol Service Declaration
10:00 - 11:00	EGNOS Sol Service Provision <ul style="list-style-type: none"><li>- EGNOS Sol Service Definition &amp; Performance</li><li>- EGNOS Service Improvements</li><li>- EGNOS User Interfaces</li></ul>
11:00 - 11:15	Coffee break
11:15 - 11:45	Discussion Session 1 (30 min): EGNOS Sol Service Provision
11:45 - 13:00	EGNOS Sol Service Implementation <ul style="list-style-type: none"><li>- APV SBAS implementation guidelines</li><li>- First LPV implementation in Europe</li><li>- EGNOS Working Agreement</li><li>- European initiatives supporting LPV implementation</li></ul>
13:00 - 14:00	Lunch
14:00 - 14:45	Discussion Session 2 (45 min): EGNOS Working Agreement
14:45 - 15:30	Discussion Session 3 (45 min): Fostering EGNOS introduction in aviation
15:30 - 15:45	Coffee break
15:45 - 16:30	Discussion Session 4 (45 min): Topic of specific interest
16:30 - 17:00	End word of the ESSP president

The Workshop will take place at the **Room Leonardo de Vinci**, inside the **CNES** site  
18 Avenue Edouard Belin 31401 Toulouse  
\* Passport from not EU members will be requested at CNES reception  
Attendance confirmation is needed before **May 25<sup>th</sup>**: [communication@essp-sas.eu](mailto:communication@essp-sas.eu)



THANK YOU!!



Courtesy Dassault Aviation