ICAO APV Workshop (26/05/2011)
ESSP Introduction

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

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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

European Commission EC-EGNOS (the customer)

Contract

Service

Industry Consortium

Maintenance

ESSP As Navigation Service Provider

Service

National Air Traffic Service Provider

Certification

National Supervisory Authority

Notification

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Introduction to EGNOS System & Services
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

EGAN EGNOS Wide Area Network

GPS

34 RIMS + 7 under deployment

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EGNOS Space Segment

3 Geostationary Satellites

- **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

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EGNOS coverage

GLOBAL SBAS SCENARIO

WAAS
EGNOS
MSAS

SDCM
GAGAN

(26/05/2011)
EGNOS short term improvements

- **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**

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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\textsuperscript{st} 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\textsuperscript{nd} 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

(26/05/2011)
EGNOS SoL Service Provision Status
EGNOS SoL Service: Implementation Schedule (1/2)

- **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\textsuperscript{nd}

**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 published:

- **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\textsuperscript{nd} of March 2011

Communications sent to EC 27 MS

Courtesy Dassault Aviation
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\(^{nd}\) 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\(^{nd}\) March 2011
LPV implementation status (I/II)

- First EGNOS Working Agreement has been already signed with DSNA on the 2\textsuperscript{nd} March 2011

- EGNOS NOTAM proposals generated by ESSP as of 2\textsuperscript{nd} March 2011

- First LPV procedure is operational in Pau Airport from the 17\textsuperscript{th} March 2011
  - LPV in Clermont-Ferrand published on the 5\textsuperscript{th} May 2011
  - LPV in Le Bourget planned for the 2\textsuperscript{nd} 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…)

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EGNOS in Aviation: First LPV Implementation Approach
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.

- **36th/37th 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

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First LPV publication: WHO DID WHAT?

EGNOS (Navigation) Service Provider (ESSP)
- Certified as ANSP
- SoL Safe introduction
- EGNOS DoV produced

CS - ATM Service Provider (DSNA)
- Certified as ANSP
- Standard Procedure Approval Process:
  - Operational Safety Case completed
  - Procedure Designed
  - Procedure Flight Checked
  - Specific National Requirements
- Working Agreement (WA) between ESSP and ANSP

Airlines / Operators / final users
- Certified Equipment (ETSOs C144, C145 or C146)
- Airworthiness approved (AMC-20-27/28, TGL 2/10)
- Crew Trained/Qualified

SUPERVISORY BODIES
- French NSA (as competent NSA)
- Competent NSA
- EASA

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(26/05/2011)
Future LPV Implementations: WHO WILL DO WHAT? (mid term scenario)

EGNOS (Navigation) Service Provider (ESSP)
- Certified as ANSP
- SoL Safe introduction
- EGNOS DoV produced

CS - ATM Service Provider (ANSP)
- Certified as ANSP
- Standard Procedure Approval Process:
  - Operational Safety Case completed
  - Procedure Designed
  - Procedure Flight Checked
  - Specific National Requirements
- Working Agreement (WA) between ESSP and ANSP

Airlines / Operators / final users
- Certified Equipment (ETSOs C144, C145 or C146)
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- Crew Trained/Qualified

SUPERVISORY BODY
- EASA

Competent NSA
The need for the EWA’s (I/II)

- 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.”

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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.
  - **34th and 35th 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.
  - **EUNSAs 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 2nd 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

- Several ANSPs showed a renewed interest on the EWA:
  - Skyguide
  - PANSA
  - 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

(26/05/2011)
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

(26/05/2011)
EGNOS NOTAM Proposals

- **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

- **Service Development:**
  miguel-angel.sanchez@essp-sas.eu
  francisco-javier.deblas@essp-sas.eu
It will take place next June 16th 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)
THANK YOU!!

Courtesy Dassault Aviation