

EGNOS NOTAM PROPOSALS: STATUS UPDATE

RAISG/PBN TF – 13/03/2014

Juan Vázquez, ESSP-SAS, juan.vazquez@essp-sas.eu



The **EGNOS** Service Provider

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- Introduction
- EGNOS NOTAM Proposals: Status Update
- What's next?
- AI OPS discussion: GNSS NOTAM related docs

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ICAO Recommendations

*ICAO SARPs, Annex 10, Aeronautical Telecommunications
Am. 82, July 2006*

1. Need for a NOTAM service:

*“Before publishing procedures based on SBAS signals, a **State is expected to provide a status monitoring and NOTAM system.** [...] a mathematical service volume model is to be used.”*

2. Notification timeliness:

*“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 minutes, or longer, duration”*

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TWOFOLD TARGET FOR THE EGNOS NOTAM PROPOSALS SERVICE

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The European Concept for GNSS NOTAM

- Discussions at **European Level** started in 2006 with the objective to define a **harmonized approach**.
- *The European Concept for GNSS NOTAM covers GPS RAIM and EGNOS NOTAM. For EGNOS NOTAM:*
 - *EGNOS NOTAM will indicate periods of time at an airport when **EGNOS is predicted not to be available to support RNAV (GNSS) approach to LPV minima.***
 - *The criteria for EGNOS to support LPV apply for **EGNOS to support LNAV/VNAV in case the local supervisory authority allows the use of EGNOS for approaches to LNAV/VNAV minima.***

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The European Concept for GNSS NOTAM by

EUROCONTROL

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The EGNOS NOTAM generation chain

1. **Detection:** An event at EGNOS and/or GPS system level is detected.
2. **Prediction and formatting:** impact of the event on the user performances is assessed and, if a service unavailability is predicted, it is formatted in an EGNOS NOTAM Proposal.
3. **Trasmission:** The EGNOS NOTAM proposal is distributed to the concerned NOTAM Office (NOF). Transmission can be done directly or through EAD via AFTN.
4. **Validation & Publication:** The NOTAM Office validates the EGNOS NOTAM proposal correctness and creates and distributes the EGNOS NOTAM

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The EGNOS NOTAM Proposals Provision

- **Entry into service:**
March 2nd, 2011 (**EGNOS SoL Service declaration**).
- **Current Operations concept** (Service Level 4– January 1st 2014):
 - **Scheduled events:** EGNOS and GPS system *planned maintenance activities* updated weekly (at minimum).
 - **Unscheduled events:** *unscheduled GNSS system events* updated upon change.
 - **H24 7/7:** Unscheduled EGNOS+GPS system assets status changes are detected and assessed in near-real time (few minutes delay).

NOTIFICATION DELAY: 2 HOURS MAXIMUM.

The EGNOS NOTAM Proposals Provision -Evolution Roadmap-

GNSS events	Notification Timeliness			
	SL1	SL2	SL4 NOW	SL5 (TBC)
Scheduled	72 h in advance			
Unscheduled (Working hours)	16 hours max.	2 hours max.	2 hours max.	15 min max
Unscheduled (Non- working hours)	16 hours max.	16 hours max.	2 hours max.	15 min. max

FINAL TARGET (Service Level 5): H24 service with minute level reaction time to unscheduled GNSS system events.

Real-time interface with EGNOS system

- **Dedicated real-time interface with EGNOS system**, providing the following information to the EURONOTAM tool:
 - GPS PRN list and EGNOS GEO PRN list.
 - EGNOS RIMS stations list
 - GPS satellite status
 - EGNOS GEO satellite status
 - EGNOS RIMS stations status

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Unscheduled GNSS system events (*ICAO recommendation*)

Information delivered on connection and **UPON CHANGE**

Coverage of events

Event	Type	COVERED	Notification Timeliness
Ionospheric Activity	Scheduled	N/A	N/A
	Unscheduled	NO*	N/A
RIMS status (including network cuts)	Scheduled	YES	72 h advance
	Unscheduled	YES	2h (H24)
GPS constellation	Scheduled	YES	72 h advance
	Unscheduled	YES	2h (H24)
EGNOS GEO status	Scheduled	YES	72 h advance
	Unscheduled	YES	2h (H24)
EGNOS SIS to OS/test mode	Scheduled	YES	72 h advance
	Unscheduled	YES	2h (H24)
GPS satellites to NM/DU	Scheduled	N/A	N/A
	Unscheduled	YES	2h (H24)

Contingency/Warning NOTAMs

- Warning NOTAMs are **currently applicable** as part of **ESSP Contingency Communication to ANSPs** (ESSP-MEMO-7562)
- Sent in case a **contingency situation** is declared **and impacts an airport** with EGNOS based procedure(s) published.

Q) **LFBB**/QGAXX/I/NBO/A/000/999/**4100N00200E005**

A) **LFBO**

B) **120417**0000

C) **120423**2359

~~D) 0000-2359~~

E) 00xx/12 NOTAMPN

"BE AWARE OF POTENTIAL EGNOS UNAVAILABILITIES:

- LPV flight planning still possible
- For more information, please refer to XXXX¹"

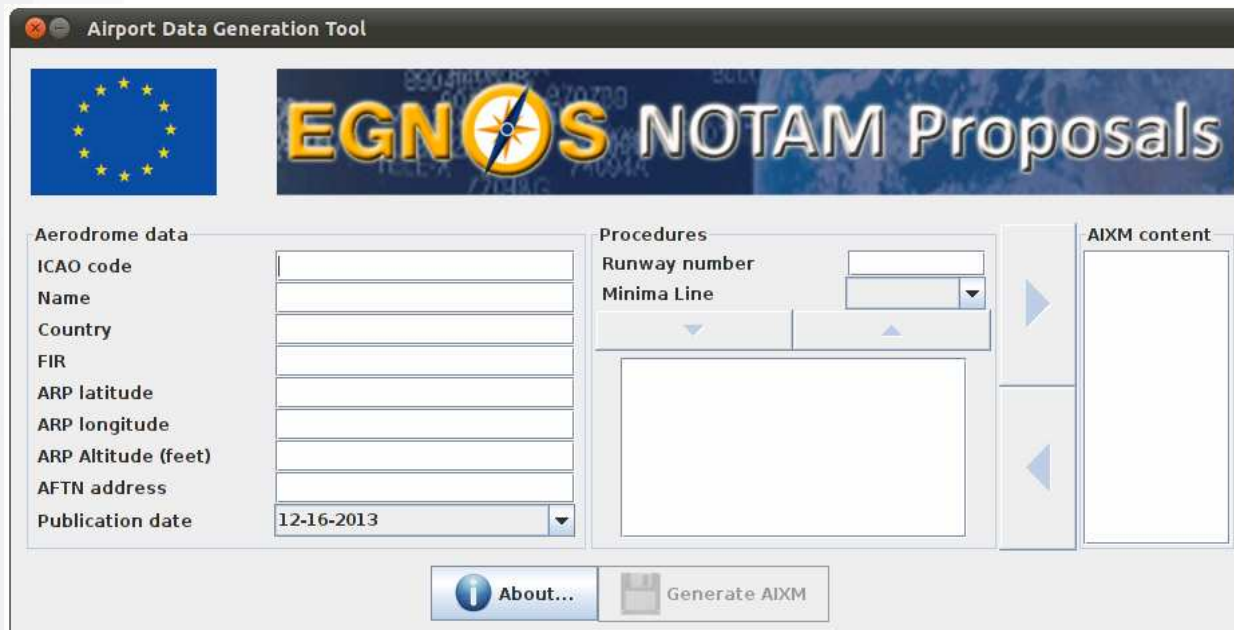
Under discussion

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Airport data exchange procedure update

- ESSP has developed a **User Application to simplify the process and increase automation** (lower risk of human error):
 - **ANSP side:** **File** with airport/procedure data **automatically generated**
 - **ESSP side:** **File import** at Euronotam tool level **automatic**
- Exchange process: **ANSP to send file to ESSP** - CRC protected



The screenshot shows the 'Airport Data Generation Tool' window. It features a header with the European Union flag and the 'EGNOS NOTAM Proposals' logo. The main area is divided into three sections: 'Aerodrome data', 'Procedures', and 'AIXM content'. The 'Aerodrome data' section includes input fields for ICAO code, Name, Country, FIR, ARP latitude, ARP longitude, ARP Altitude (feet), AFTN address, and a dropdown for Publication date (set to 12-16-2013). The 'Procedures' section has input fields for Runway number and Minima Line, with a large empty text area below. The 'AIXM content' section is currently empty. At the bottom, there are 'About...' and 'Generate AIXM' buttons.

Applicability of new procedure: Q2 2014.

EGNOS NOTAM Proposals for RNP 0.3 routes

- ESSP is investigating the possibility to provide EGNOS NOTAM proposals for RNP 0.3 routes (*Ref: ICAO Doc 9613 (PBN manual), Volume II, Chapter 7*)

7.2.1 NAVAID infrastructure considerations

The RNP 0.3 specification is based upon GNSS; its implementation is not dependent on the availability of SBAS. DME/DME based RNAV systems will not be capable of consistently providing RNP 0.3 performance, and States should not plan on implementing RNP 0.3 operations through application of DME/DME-based navigation. States must also not use RNP 0.3 in areas of known navigation signal (GNSS) interference. Operators relying on GNSS are required to have the means to predict the availability of GNSS fault detection (e.g. ABAS RAIM) to support operations along the RNP 0.3 ATS route. The on-board RNP system, GNSS avionics, the ANSP or other entities may provide a prediction capability. The AIP should clearly indicate when prediction capability is required and acceptable means to satisfy that requirement. This prediction will not be required where the navigation equipment can make use of SBAS augmentation and the planned operation will be contained within the service volume of the SBAS signal.

Note.— Should the State permit the operator of an SBAS-equipped aircraft to disregard the requirement for a RAIM prediction when the RNP 0.3 operation occurs in an SBAS service area, then it is recommended the State consider establishing a requirement for that operator to check SBAS NOTAMS prior to the flight to ensure the availability of the SBAS SIS.

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- **Drivers:**
 - Scalable service – available to all EWA signatories
 - Flexible
 - Route lengths/turns
 - Text adaptable

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AI OPS discussion: supporting documents

- **ESSP will provide comments** to Eurocontrol (mainly to *RAISG2 – WP1*):
 - Ongoing discussions are linked only to contingency NOTAMs
 - Iono related degradations:
 - Inability to predict iono related degradations is not a limitation of a service volume (intrinsic to the nature of these degradations).
 - Operational impact of observed iono degradations not discussed.
 - Service volumes have demonstrated to be fully capable of estimating EGNOS performance degradations
 - FAA approach for GNSS NOTAM to be reviewed



EGNOS

Thanks!

