EGNOS for the implementation of CAP

- experience from the Member state (CZ)

Lucie Šavelková, Jakub Vlosinský

THE USE OF EGNOS for the CAP:

➤ **Use of EGNOS service by the Czech Agricultural Paying Agency (State Agricultural Intervention Fund – SZIF) in the Framework of the EU Common Agricultural Policy (CAP);**

➤ **In particular for the Integrated Administration and Control System (IACS);**

➤ **Administration and control of the area based CAP and national subsidies (1st and 2nd Pillar schemes);**

➤ **Use of EGNOS Open free service;**

THE USE OF EGNOS for the IACS system:

A. For the LPIS purposes:

Land Parcel Identification System = system of reference parcels for area based subsidies;

- ❑ **Digitisation of reference parcels based on aerial OFM**
  (2 years update cycle);

- ❑ **Supported by field checks for doubtful (suspicious) cases** or **where interpretation** of the situation based on OFM is not possible -→ **GNSS measurement is carried out by PA staff;**

- ❑ **Upload of the GNSS measurements delivered by farmers** for the purpose of the LPIS update (source of LPIS update based on farmer´s request);

THE USE OF EGNOS for the IACS system:

Example: **Field check for the purpose of the LPIS update** (OFM doubtful case), GNSS measurement carried out before completion of reference parcel borders digitisation;

OFM n-1 year

Current status

THE USE OF EGNOS for the IACS system:

B. For the OTSC purposes (on-the-spot checks of area based subsidies, 1st and 2nd Pillar schemes):

1. CLASSICAL CHECKS (field checks/in-situ visits):
 - checks of eligibility and cross-compliance conditions including area measurements **(GNSS measurements)** in terrain by the PA field inspectors;

## 2. FOLLOW-UP CHECKS after the checks with Remote Sensing:
- Checks after the CwRS for specific cases or for cases where CAPI is not possible, including area measurements **(GNSS measurements)** in terrain by the PA field inspectors;

B. For the OTSC purposes:

➢ **The parcel location** **(navigation to parcels)**

➢ **The area measurement**

  ➢ **The direct method** **(measurement of the „whole" field)**

  ➢ **The indirect method** **(only measurement of ineligible/excluded elements/objects)**
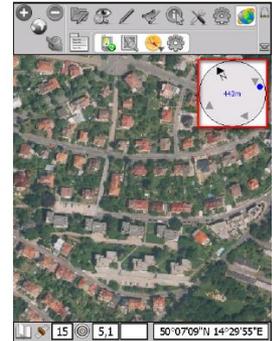
MEASUREMENT = measuring area eligible/ineligible for payment, following the parcel/object perimeter with the GNSS device.

BOTH OPTIONS POSSIBLE = Continuous measurement and logging vertices.

THE USE OF EGNOS for the IACS system:

Example: OTSC GNSS measurement of „whole field"

(the whole field was completely re-measured

by GNSS) **= direct method**

Newly established vineyard

Protokol z měření GPSTr

**Example:** OTSC GNSS measurement of excluded areas (for rest parts the LPIS perimeter is confirmed) **= indirect method**

THE USE OF EGNOS for the IACS system:

EU LEGAL framework for the OTSC:

- EC R. 1306/2013 EP and Council reg. on IACS
- EC R. 640/2014 Delegated act on IACS

- EC R. 809/2014 Implementation act on IACS
- DSCG/2014/32 Guidance for OTSC and Area measurement
- DS-CDP-2016-03 Technical guidance for OTSC and Area measurement

- DS-CDP-2015-08 Technical guidance for OTSC of Crop Diversification
- DS-CDP-2015-09 Technical guidance for OTSC of EFA
- Wikicap, etc.
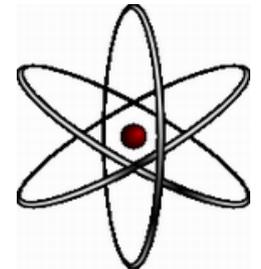
THE USE OF EGNOS for the IACS system:

EU LEGAL framework for the OTSC:

❑ **The competent authority may make the use of GNSS techniques where possible;**

❑ **A single buffer tolerance shall be defined for all areas measurements performed using the GNSS. For this purpose the measurement TOOLS used shall be VALIDATED for at least one validation class of buffer tolerance below the single tolerance.**

❑ **Only GNSS equipment with a buffer width not exceeding 1 m should be used for parcel area measurements.**

❑ **The validation method is designed to determine the inherent tool error (accuracy).**

❑ **Further rules and List of validated device is available at: Wikicap**
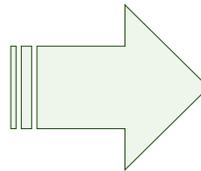   **https://marswiki.jrc.ec.europa.eu/wikicap/index.php/GNSS_valid**

THE USE OF EGNOS for the IACS system:

EU LEGAL framework for the OTSC:

▪ **The results of the validation are <u>strictly related</u> to the tested method of measurement and not only to the device. Therefore, the validation report remains valid as long as the operators use the tested method;**

▪ **The test shall be performed with <u>exactly the same settings</u> that will be used during OTSC checks work** (incl. Max DOP, logging interval, etc.);

THE TEST SHALL COVER:

➢ *Hardware*
➢ *Software*
➢ *Settings*
➢ *Method*

(Parcels with different size, shape, conditions, obstructions of horizon, etc.)

<u>*LOCAL CONDITIONS*</u>*:* **every MS/region**, *type of corrections, continuous and vertex method, etc.*

If EGNOS is used for the OTSC measurement, the MS shall validate the device for such setting.

HISTORY overview of use of EGNOS for IACS by PAs:

A. 2005 – 2008:

- **Strong support from DG JRC, DG AGRI on use of EGNOS for IACS/CAP;**
- **Validation method not stipulated;**
- **Primarily method of direct measurement applied during OTSC;**
- **Main focus on area determination (not positional accuracy);**
- **Tolerance: 5% of measured area or a buffer of 1,5 m applied;**
- **Problems with EGNOS signal interruptions, limiting availability of signal,**
- **EGNOS accuracy and precision seemed to be OK;**
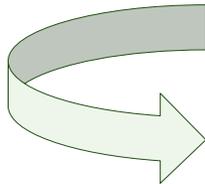
Despite some limitations EGNOS was strongly used by Paying Agencies (MS) for the IACS purposes;
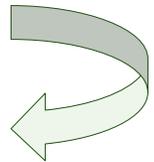
THE USE OF EGNOS for the IACS system:

HISTORY overview of use of EGNOS for IACS by PAs:

B. 2009 – 2016:

- Neutral position of EU bodies on the use of EGNOS for IACS/CAP;
- Validation method legally stipulated;
- Mainly method of indirect measurement applied during OTSC;
- Besides focus on area determination the positional accuracy is important;
- Tolerance: no more % tolerance, buffer tolerance applied (based on validated class = 0,50m, 0,75m, 1,00m buffer width classes);
- Focus on harmonisation of OTSC area measurement rules from the EK;
- Problems with EGNOS signal interruptions and limiting availability in some areas of the countryside;

Alternative solutions found (e.g. use of national permanent reference stations)

Limitations in use of EGNOS by Paying Agencies (MS) for the IACS purposes;

THE USE OF EGNOS for the IACS system:

SZIF DECISSIONS on use of GNSS devices/EGNOS:

❑ **Preferably use indirect measurement method** (based on LPIS and GNSS measurements only for deducted areas);

❑ **Use of differential GNSS devices – SBAS, DGPS** (results can be uploaded in LPIS and used for the LPIS update later on);

❑ **The GNSS device shall be of adequate quality** (changes/updates of devices implies additional validation test, min. 6 months period);

❑ **When inspector goes in terrain the measurement shall be carried out** (in reality no time to wait for „perfect" conditions);

❑ **Due to time pressure on realisation of OTSC the measurements shall be effective;**

THE USE OF EGNOS for the IACS system:

SZIF DECISSIONS on use of GNSS devices/EGNOS:

❑ **Strong need of signal availability, no signal interruptions**;

❑ **The results of the measurements shall be available in real time on the field** (minimise cases of post-processing);

❑ **Validation method is time and personally demanding for the PA** (when validation is done the mid-term aspect shall be considered);

❑ **The validation method does not allow the flexible changes of devices/software/settings/methods during the OTSC running campaign** (to allow the flexibility during the OTSC it is better to validate more options = more validation tests);

❑ **The OTSC results audit trail** (incl. measurements must allow the clear audit trail);

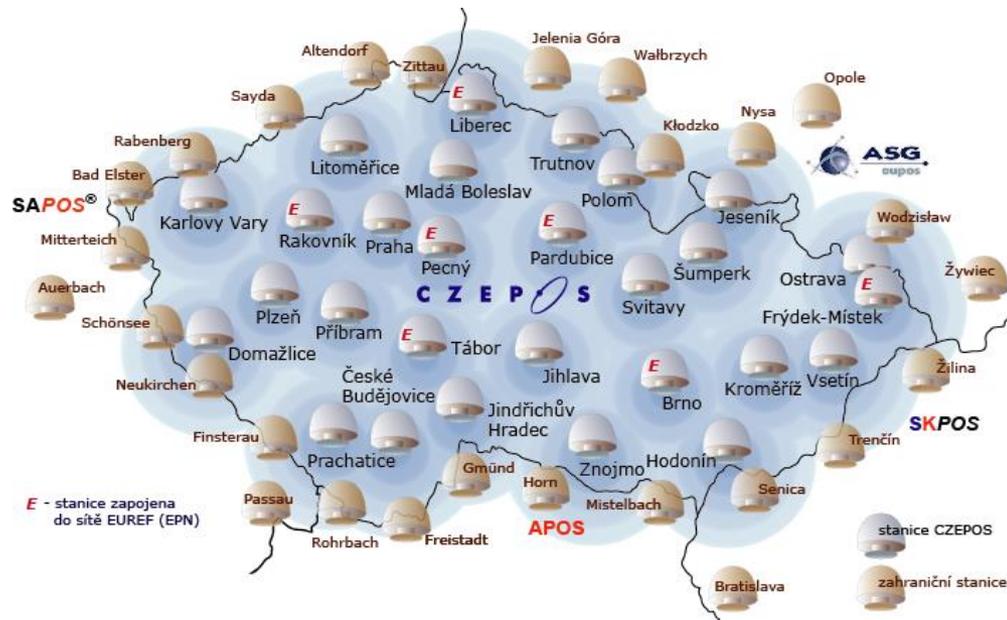# THE USE OF EGNOS for the IACS system:

OUTCOMES OF SZIF DECISSIONS:

➢ **The field conditions are very changeable in the CZ;**

➢ **The internal test of area measurements indicates EGNOS Signal Blockage sometimes -** *cases when satellite link is lost due to shadowing by a close obstacle (shadows from mountains, deep valleys, multipath from trees). And aspect of moving North to higher latitudes (the geostationary satellites are seen lower on the user's horizon and therefore are more susceptible to masking).*

➢ **The signal availability must be „always arranged" during the OTSC in real time = we cannot purely rely only on EGNOS;**

➢ **Combined solutions:**

   ❑ *national permanent reference stations* (paid service)
   ❑ *EGNOS* (free service)

THE USE OF EGNOS for the IACS system:

COMBINED SERVICES: paid + free
(PA pays up to 2.200 Euro per month during the main OTSC campaign)

EGNOS RIMS sites

THE USE OF EGNOS for the IACS system:

OUTCOMES OF SZIF DECISSIONS:

➢ **Combined solution GNSS device (switching capability of options):**

1. **GNSS systems + national permanent reference stations** (real-time, post-processing option) – *difficulties in areas without signal from the mobile operator;*

2. **GNSS systems + EGNOS –** *limiting signal availability in some areas*

3. **Autonomous GNSS** - *difficulties with accuracy* (=not used)

➢ **The GNSS customised software automatically calculates the best alternative.**
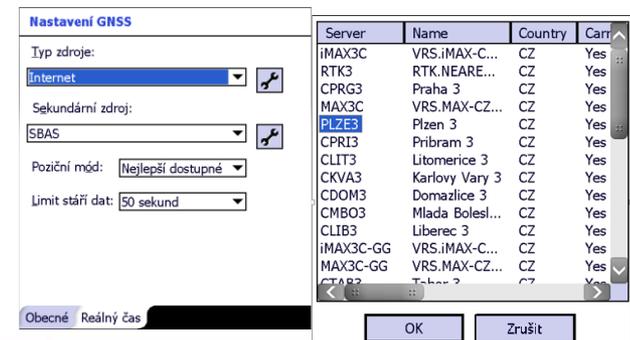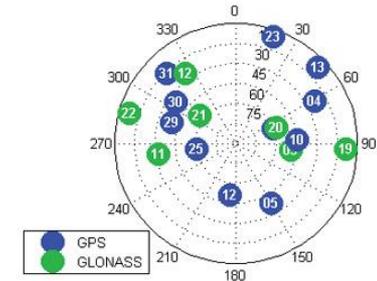
THE USE OF EGNOS for the IACS system:

OUTCOMES OF SZIF DECISSIONS:

➤ **The field inspector has possibility to visualise the satellites positions on the GNSS device at any time;**

➤ **Validation test for combined approach (= validation for more options);**

➤ **Last GNSS device update in 2016;**

➤ **New national permanent reference stations providers** *(cheaper: price and time versus new validation test to be considered)*

CHANGE IN NEAR FUTURE OR STATUS QUO ???

THE USE OF EGNOS for the IACS system:

SUMMARY of MAIN ISSUES FOR THE USE OF EGNOS for CAP:

Limiting factors:

➢ **Signal interruptions and still limiting availability in some areas;**

➢ **Validation scheme requirements = validation is demanding, therefore when validation is done the PAs/MS prefer to keep the status quo,** (sometimes despite the innovations, cheaper options);

➢ **Limited awareness by agri public sector/limited promotion for CAP;**

Positive factors:

▪ **Sufficient accuracy for the CAP purposes;**

▪ **Free of charge service;**

EDAS might meet our requirements.

Therefore, we appreciate to get more info/pilot project.

Support from EU bodies in deploying EGNOS for the CAP purposes;

THE USE OF EGNOS for the IACS system:

Thank you for your attention.

lucie.savelkova@szif.cz
jakub.vlosinsky@szif.cz