



EGNOS as Enabler for Drone Operations

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INSPECTION



AGRICULTURE



OUR PARTNERS



HEMAV 2017



EMPLOYEES
+100



PLATFORMS
+70



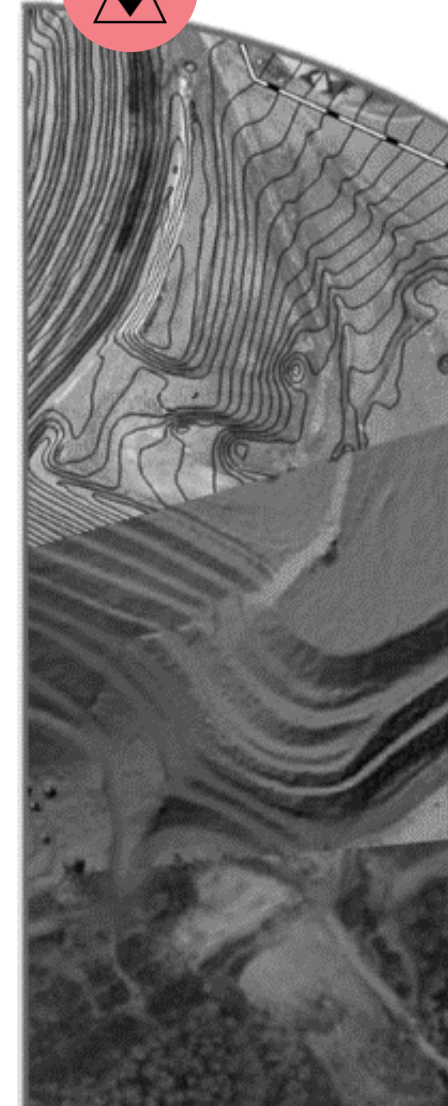
DEALERS
+16

OUR GOALS



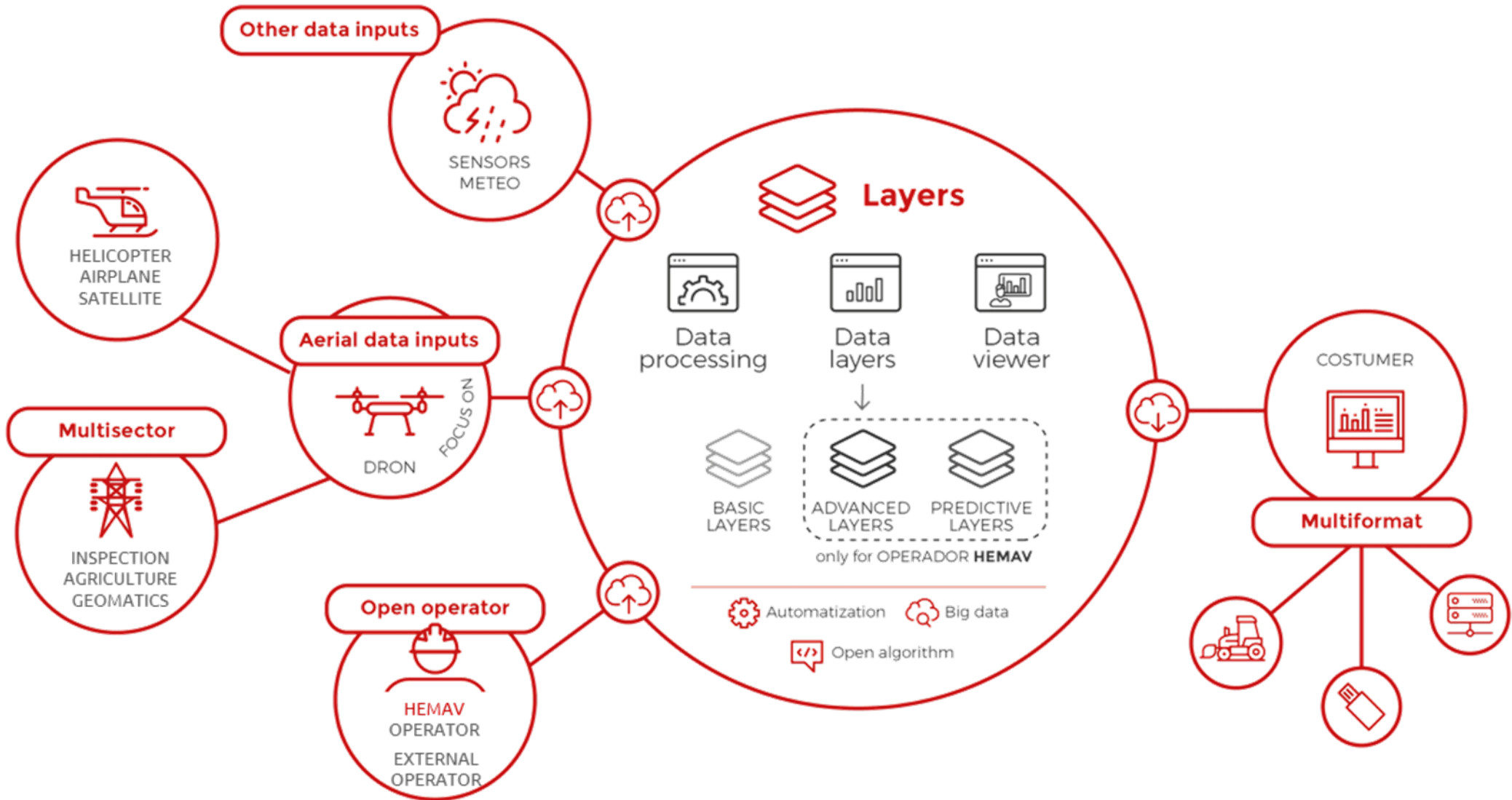
TOP 6 WORLD-WIDE DRONE SERVICE COMPANY

GEOMATICS

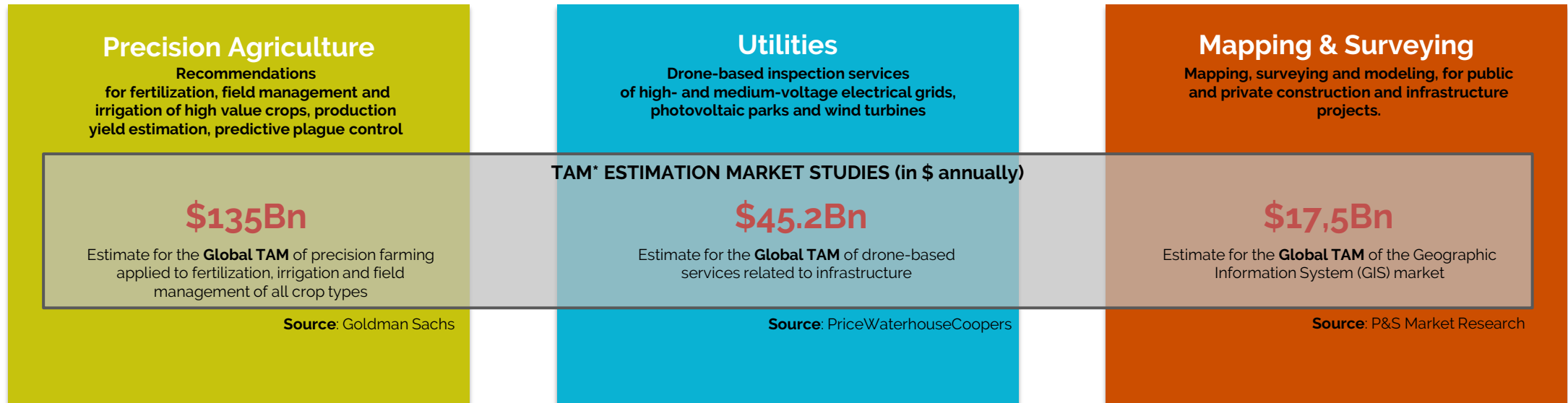


TRAINING





HEMAV is focusing on **3 highly scalable commercial industries**



(*) TAM Total Addressable Market, (**) SAM Serviceable Available Market

1. RELEVANCE OF EGNOS

- EGNOS USE IN RPAS
- PAST & CURRENT EXPERIENCES
- CONCLUSIONS BY INDUSTRY

- EGNOS IMPACT IN DATA PROCESSING
- EGNOS IMPACT IN DATA DELIVERY

2. DIGITALIZATION

3. NEXT STEPS: AERODROME TESTS

- FIELD TEST
- INITIAL RESULTS



EGNOS use in Navigation

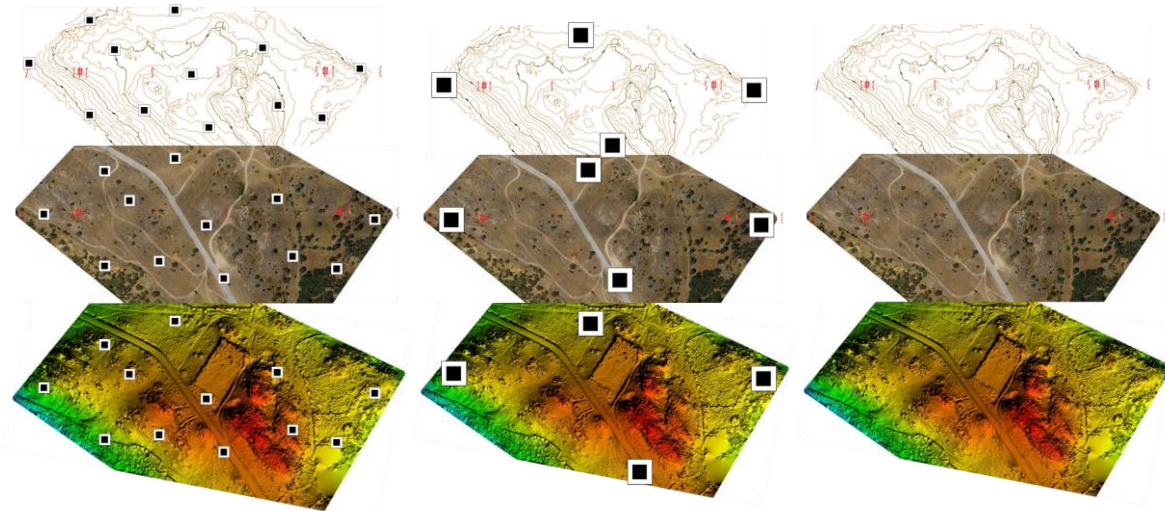
Sidelap reduction
Reduction of GCP needed
Information accuracy and reliability

EGNOS use in Data Processing

Data handling
Significant reduction in data processing
Impact in Business

EGNOS use in applications

Methodology proposed to highlight different
data acquisition methodologies





+35.000 ha

3
Flights /year

Our process in 3 steps



Data acquisition



Data processing



Recommendations



MAP



REPORT

Data acquisition

Data Processing

Data Delivery



Visual App by

HEMAV

iOS

Optimization [% h]



Quality Augmentation





Data acquisition

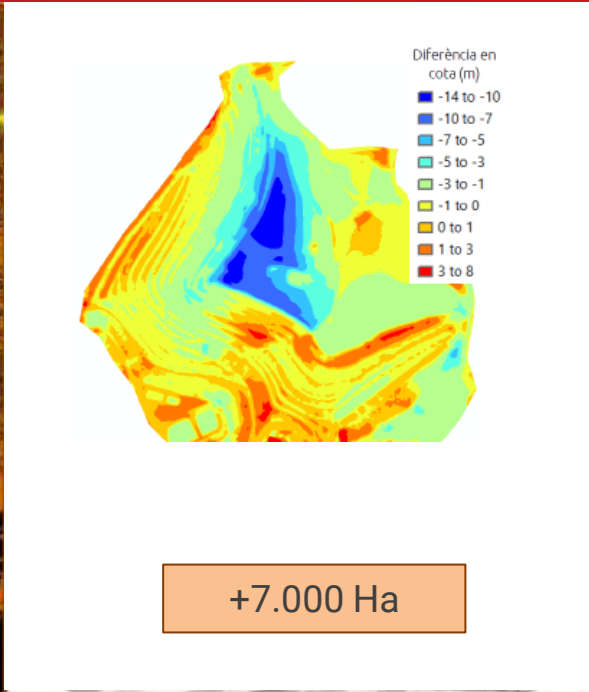
Data Processing

Data Delivery

Optimization [% h]

Quality Augmentation





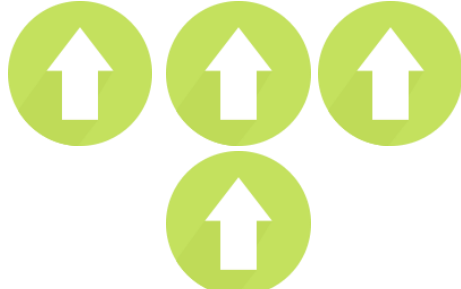
Data acquisition

Data Processing

Data Delivery

Optimization [% h]

Quality Augmentation



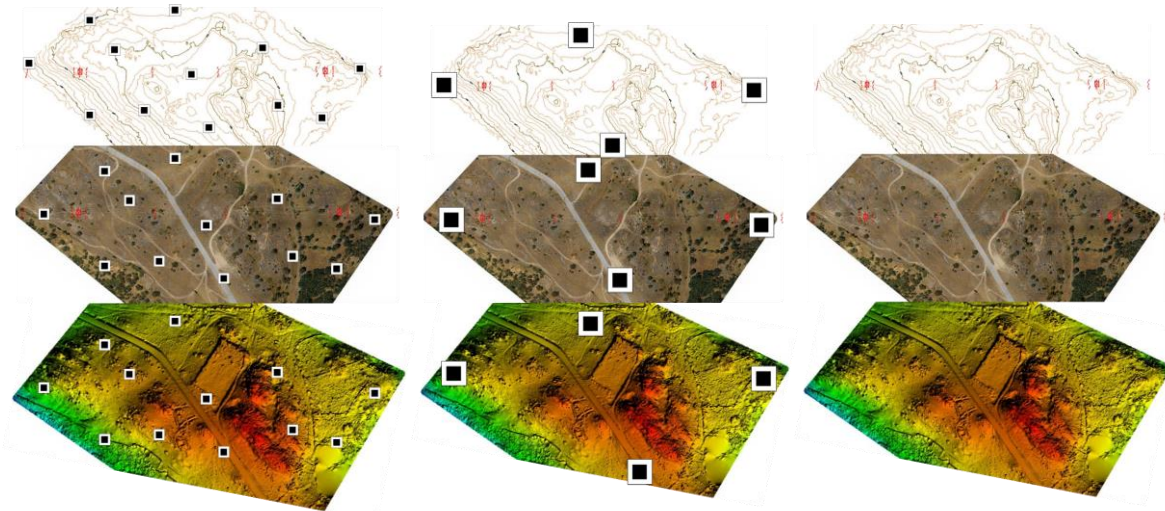


U-space concept:



- ✓ Preparation of drone mission.
- ✓ Submission of a flight request and reception of an acknowledgement.
- ✓ Execution of the Flight.
- ✓ Mission completed.



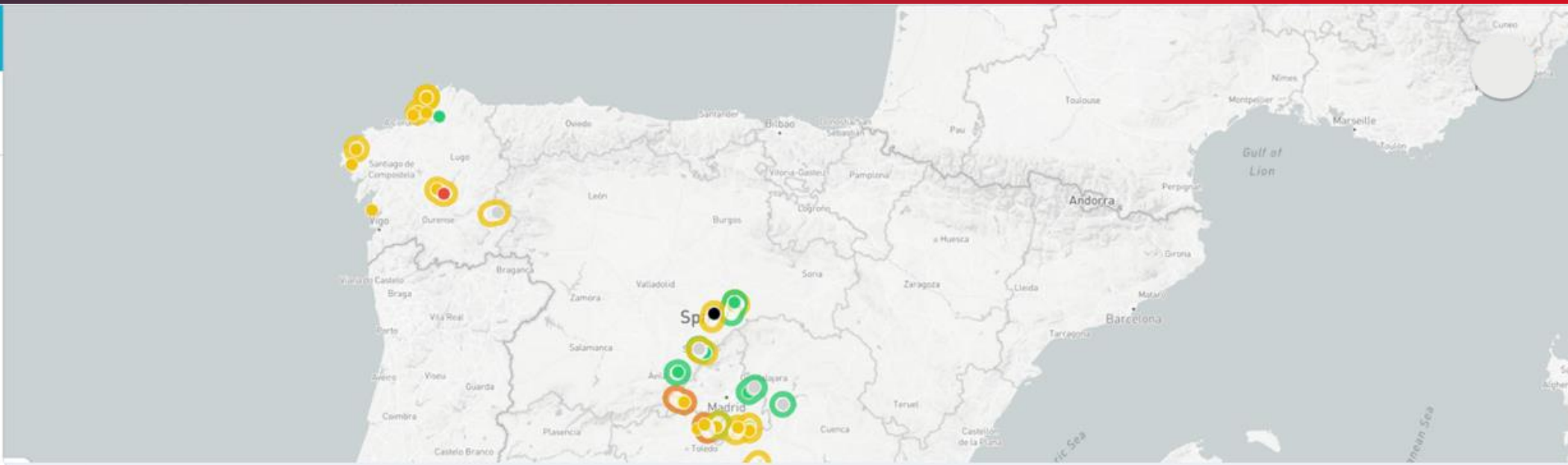




Type your text

- Revisions**
- No Revisada
 - Sin Incidencias
 - Low
 - Medium
 - High

- DASHBOARD**
- Torres
 - Incidencias
 - Mantenedoras




Tower Tower_28267
 Latitude 40.39850435
 Longitude -4.42092853

Circuit 11 N°1 / 1
 Line C2 PTN SJV 132

Revision N°1
 Mantenedora Cobra
 28/4/2017 Revisada

Incidence N°1 / 4 < >
 3/5/2017 high




Description
 En Fase Superior.
Tipo
 AISLADORES FOGUEADOS
Code 2.14
Video Time 0:02:14

Tower Tower_28267
 Latitude 40.39850435
 Longitude -4.42092853

Circuit 11 N°1 / 1
 Line C2 PTN SJV 132

Revision N°1
 Mantenedora Cobra
 28/4/2017 Revisada

Incidence N°2 / 4 < >
 3/5/2017 low




Description
 Se Aprecian Placas De Óxido En La Estructura.
Tipo
 APOYO CON PINTURA DEFECTUOSA (DESCUBRE IMPRIMACIÓN)
Code 3.3
Video Time 0:00:08

Tower Tower_28267
 Latitude 40.39850435
 Longitude -4.42092853

Circuit 11 N°1 / 1
 Line C2 PTN SJV 132

Revision N°1
 Mantenedora Cobra
 28/4/2017 Revisada

Incidence N°3 / 4 < >
 3/5/2017 low




Description
 En Las Tres Fases.
Tipo
 AISLADORES SUCIOS O POLUCIONADOS
Code 2.12
Video Time 0:01:24

Tower Tower_28267
 Latitude 40.39850435
 Longitude -4.42092853

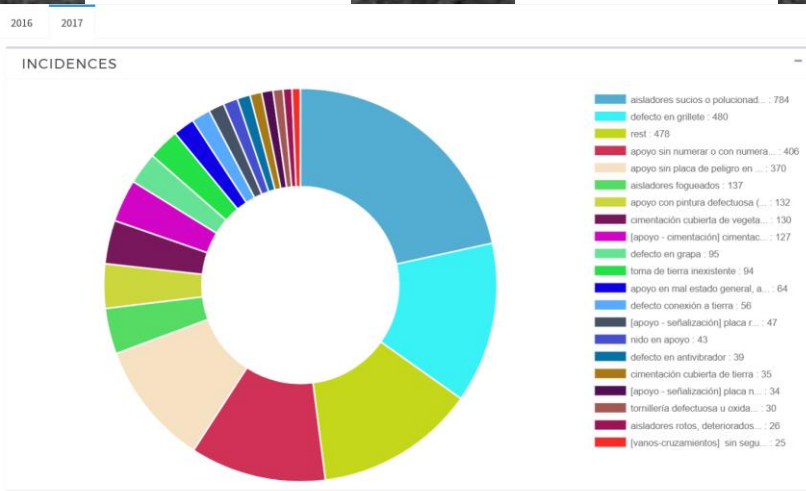
Circuit 11 N°1 / 1
 Line C2 PTN SJV 132

Revision N°1
 Mantenedora Cobra
 28/4/2017 Revisada

Incidence N°4 / 4 < >
 3/5/2017 low



Description
 Oxidación Del Grillete En Fase Superior.
Tipo
 DEFECTO EN GRILLETE
Code 2.1
Video Time 0:02:10



ANOMALY LOCALIZATION

GIS IMPROVEMENTS



Acquisition of **GNSS/SBAS** data from the different operative scenarios around an **ILS approach**.

This **approach** has been **segmented** in order to be able to meet with the present **Spanish drone regulations**.

Some parts of the Missions **were not flown** due to airport **temporary restrictions** and **will be essayed** in coming tests.





LEDA Sept 2017



Date: 7th September 2017.

Airport: Lleida/Alguaire (LEDA).

Objectives of the test campaign:

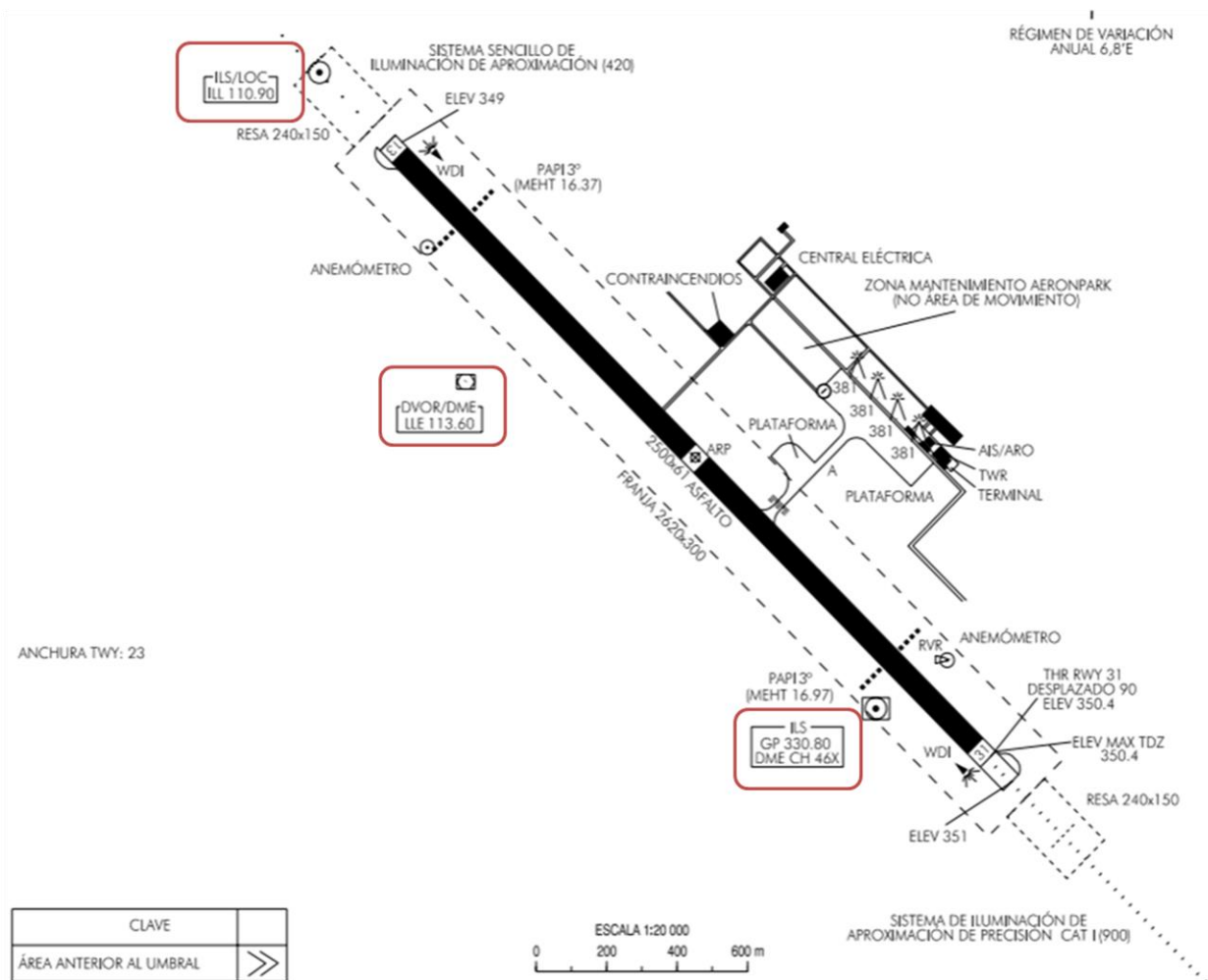
Fly segment of **ILS Approach Procedure**

Acquire and store **GNSS data** to be processed off-line.

Tests defined by



Tests operated by



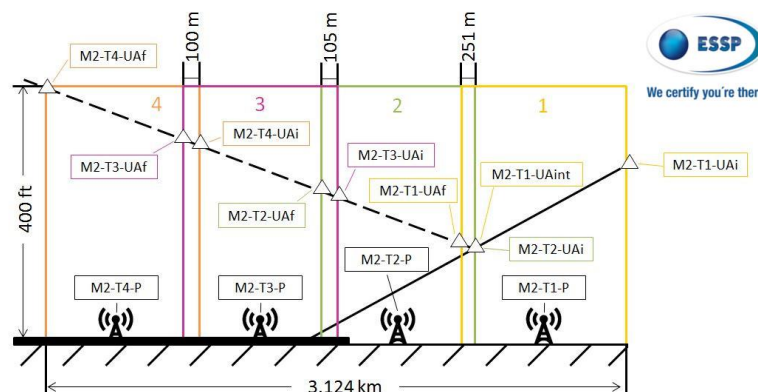
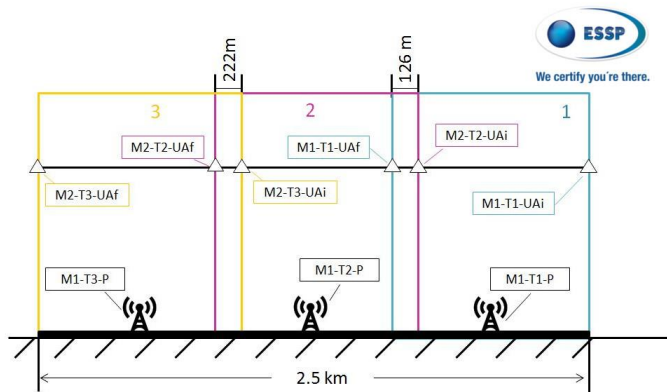
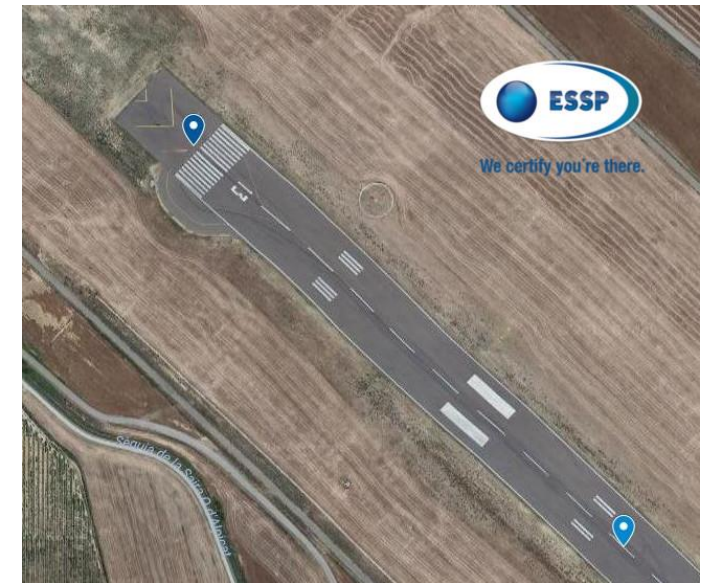
MISSION 1

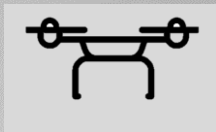


MISSION 2



MISSION 3





HIR9: Hemav Inspection Rotor



RF equipment integrated



20 minutes



Data telemetry (d>1km)



P/L < 0,8 kg



Parachute & Cut-Off installed



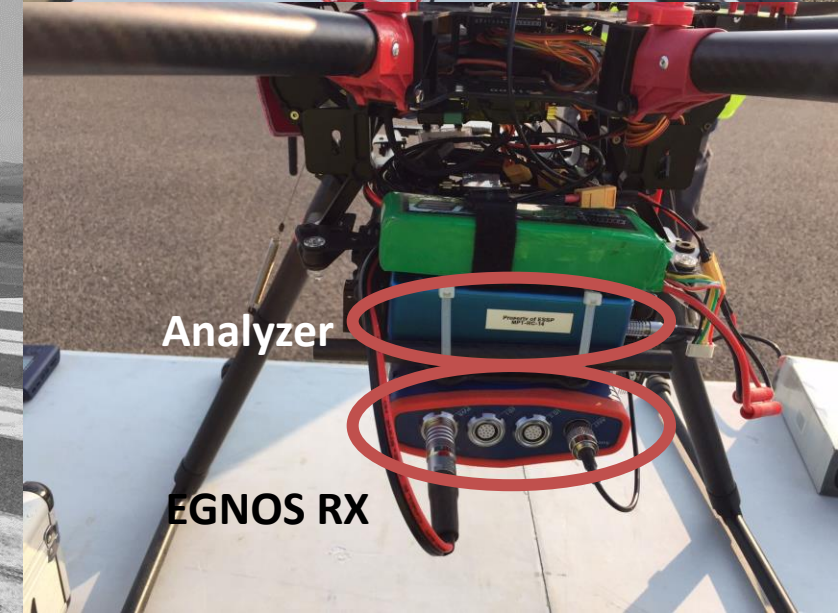
Wind < 30 km/h

EGNOS RX Antenna

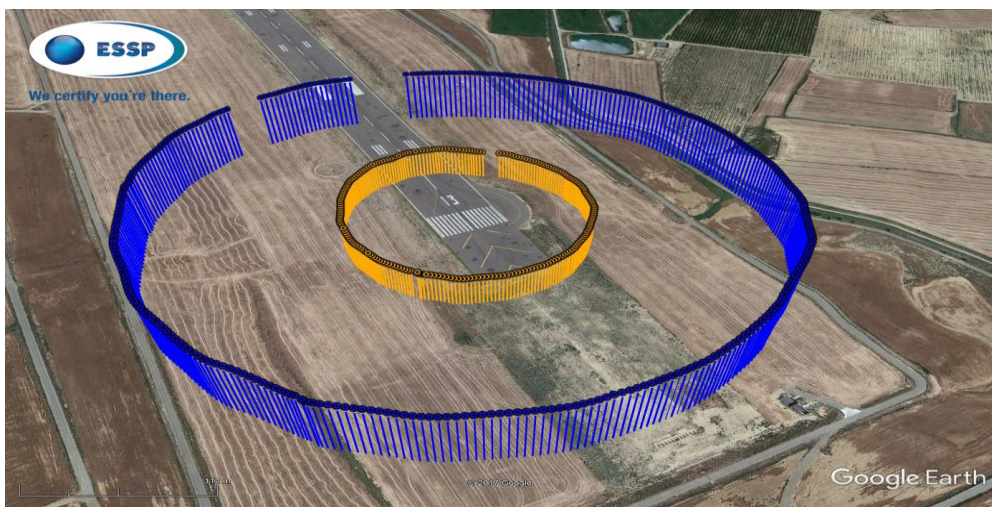
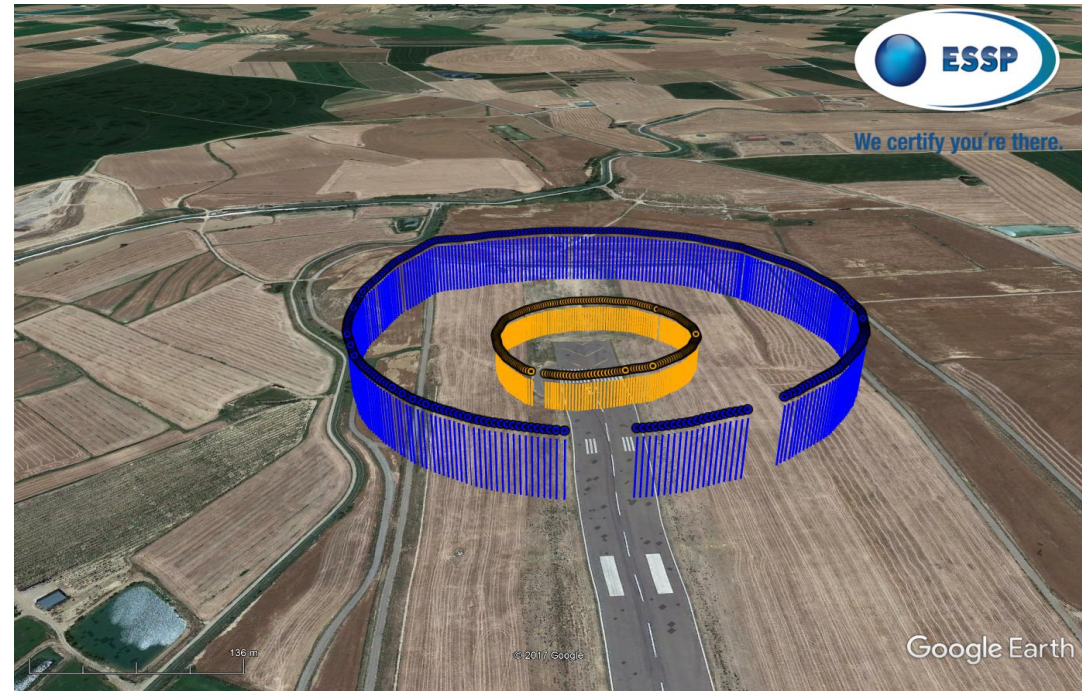
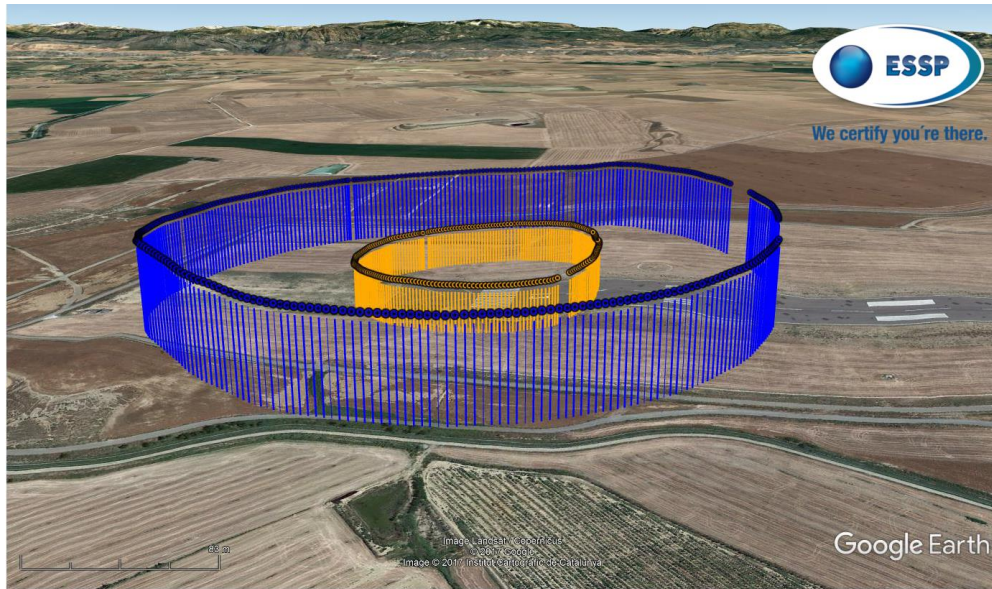


Analyzer

EGNOS RX

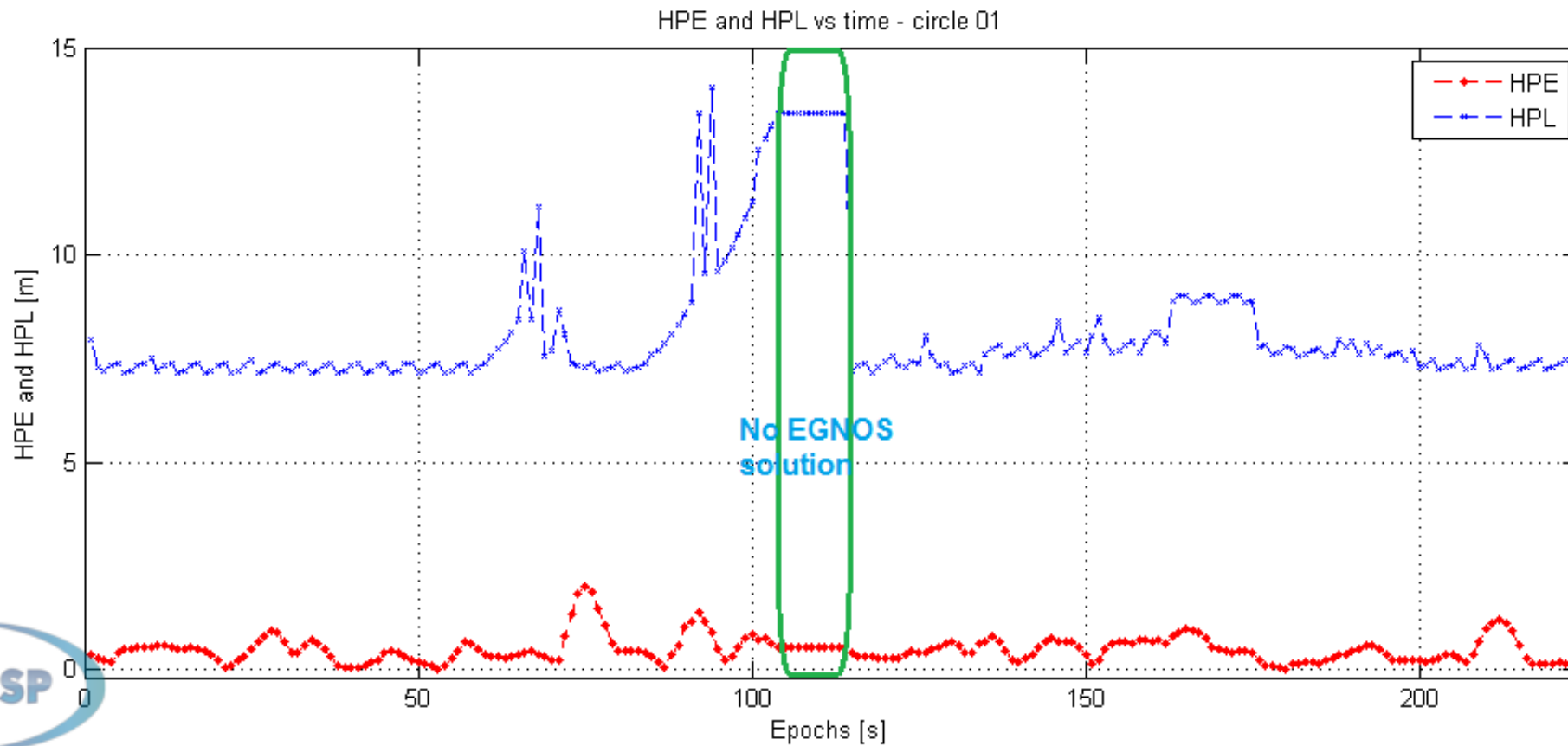




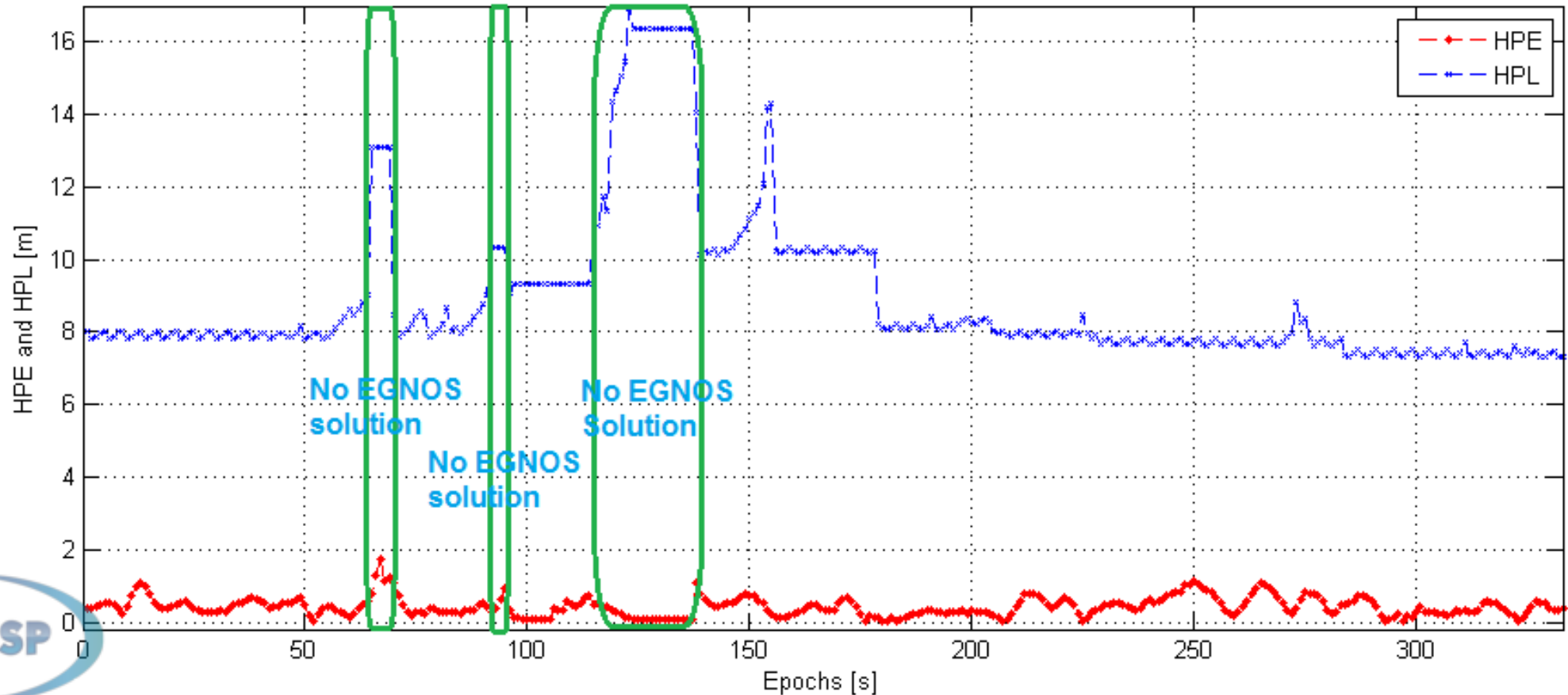


ORANGE circle: Flown at a speed = 3m/s, height 30 m, radius 100m.
HPE average = 0.473m – VPE average = 0.759m.

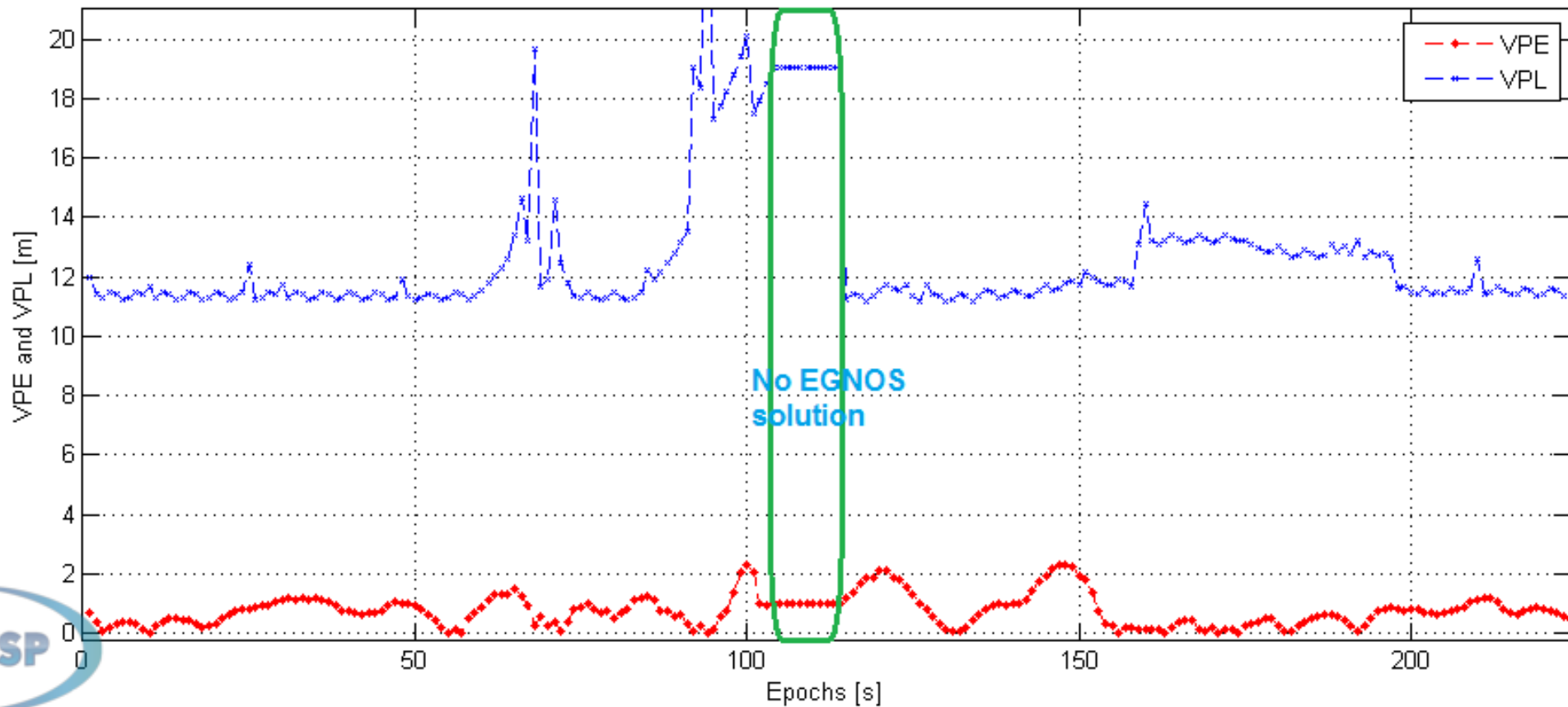
BLUE circle: Flown at a speed = 5m/s, una height = 60 m, radius = 250m.
HPE average = 0.445m - VPE average = 0.579m.

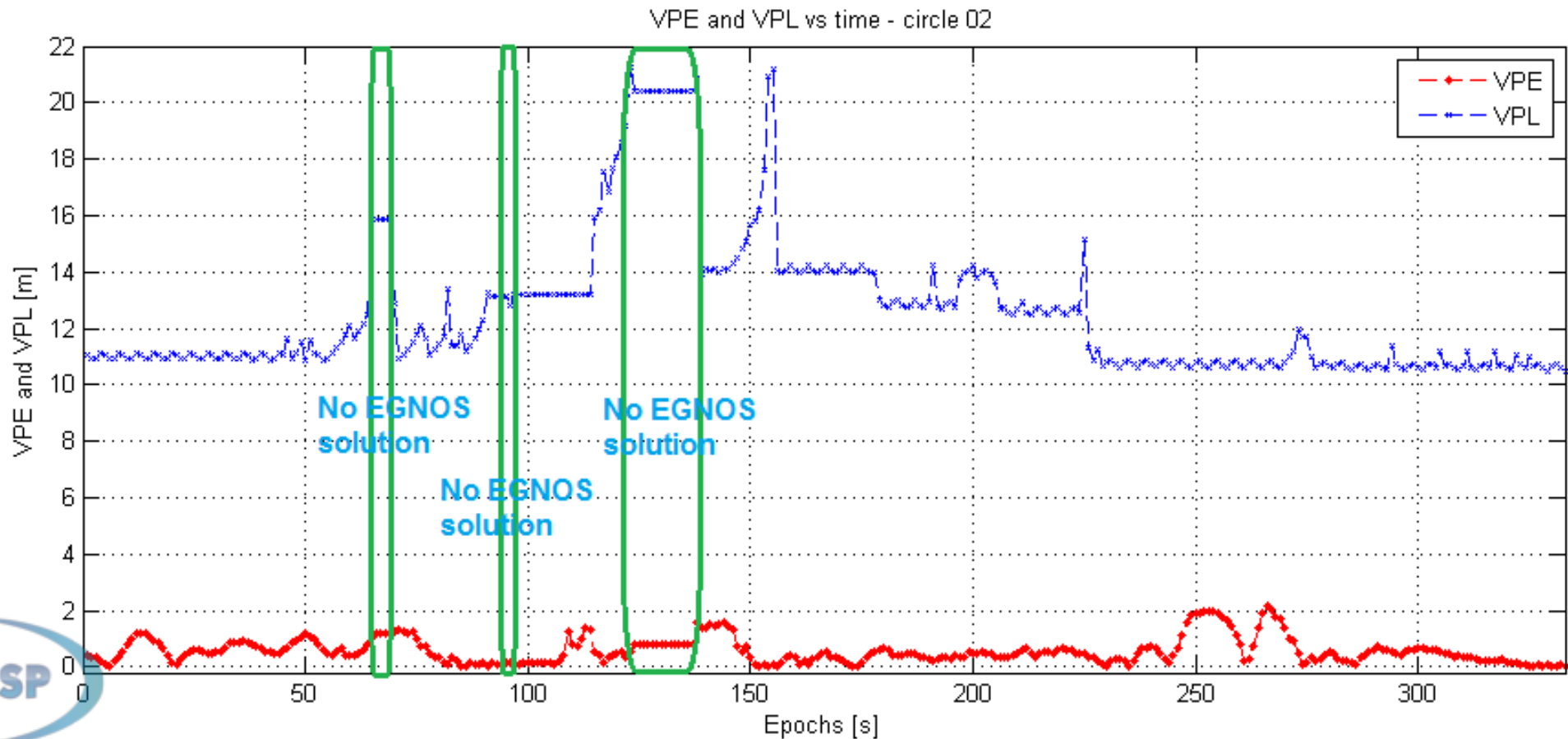


HPE and HPL vs time - circle 02



VPE and VPL vs time - circle 01







1 | Beginning of something BIG:
RPAS Industry

2 | Relevant Impact in RPAS
Operations

3 | Need to spread the WORD about
EGNOS impact in RPAS world

4 | Initial Conclusions on Flight
Tests



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