



delair-tech
AIRBORNE SENSORS

POWER LINES INSPECTION USING MINI-UAV

A fully automated process

Business case study for the UAS Event

Madrid, 27th of May 2014

POWER LINES MONITORING



For maintenance aspects, EDF needs to know the locations where the **vegetation** needs to be cut.

> **400,000 km** in France

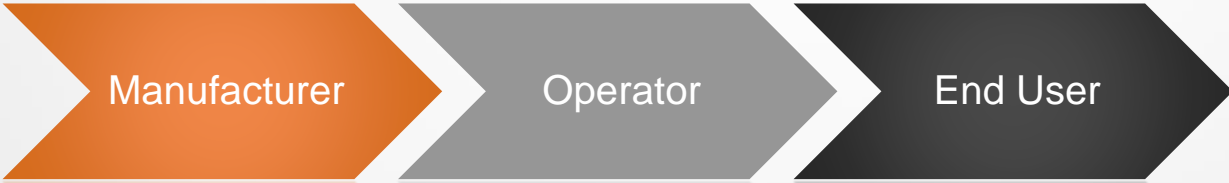
UAV are used as **fully automated process** to create maps where the vegetation is classified according to its distance to the power lines.

Business case study: the power lines network in French Guyana

UAV: **DT-18 by Delair-Tech**

THE BUSINESS MODEL

DELAIR-TECH IS A UAV MANUFACTURER.



DELAIR-TECH REFERENCES IN THE INDUSTRY

OIL & GAS.



POWER GRID.



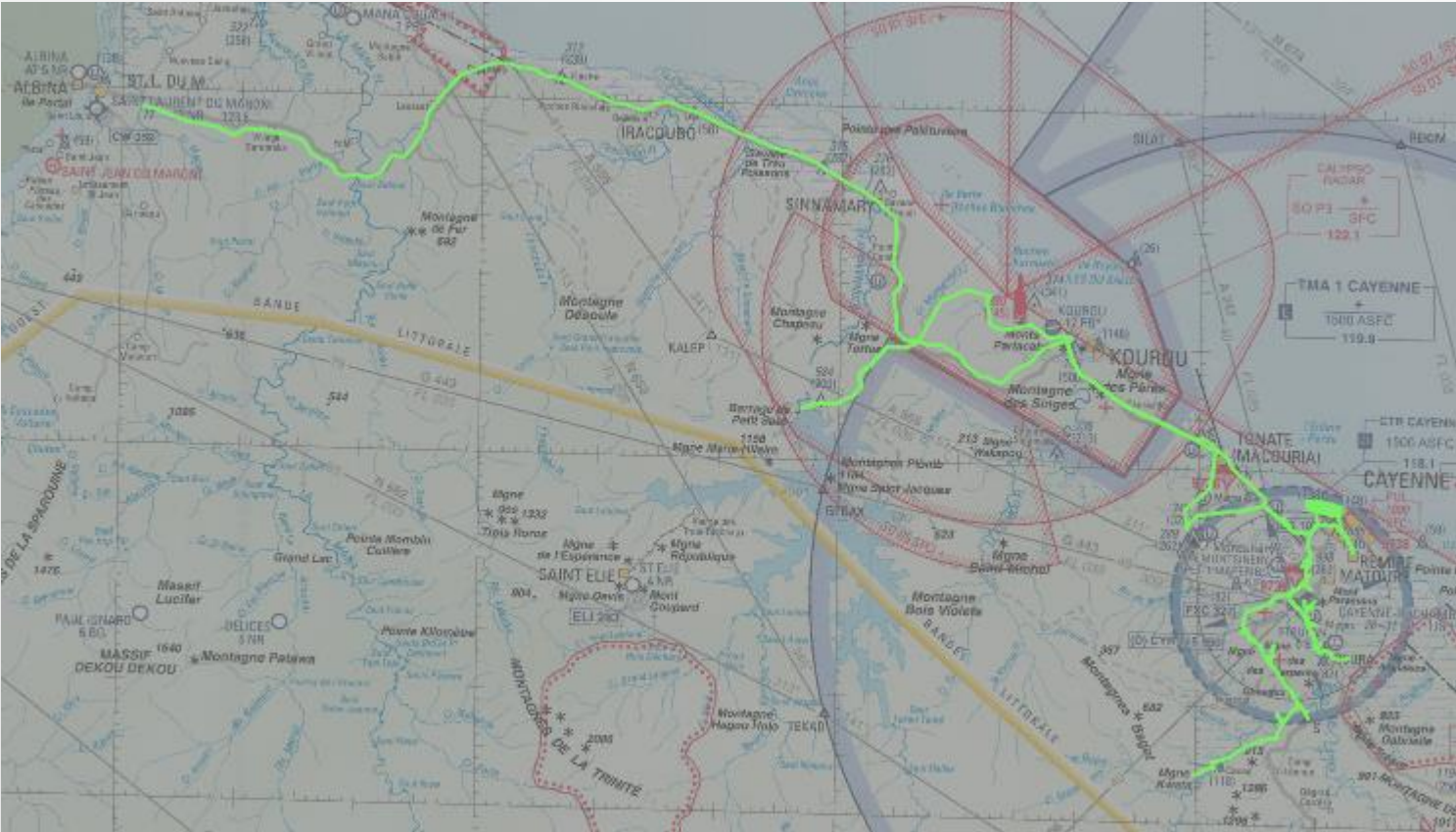
TRANSPORTATION.



WATER.



THE POWER LINES NETWORK IN GUYANA



CORRIDOR MAPPING UAV: THE DT-18

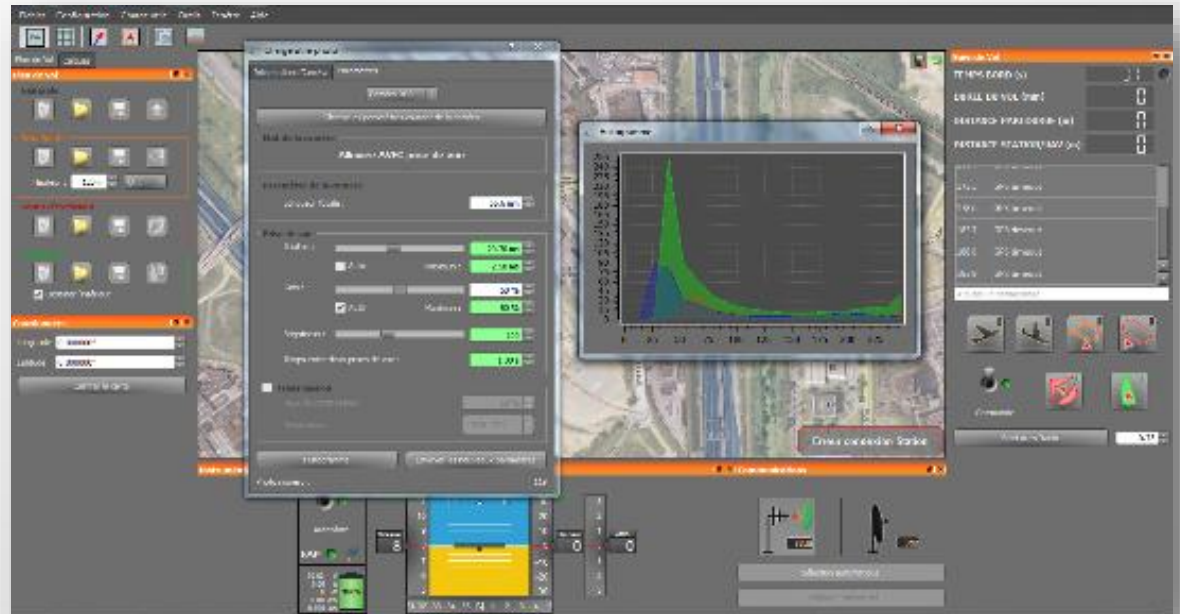
Distance capacity	100km
Autonomy	2 hours
Wingspan (removable wings)	1,80m
Total Weight	2kg
Resistance to winds	Up to 50km/h
Launching	Hand or catapult
Landing	Autonomous
Datalink range (5GHz)	15km
Command & control link (868 MHz)	40km
BLOS telecom	3G/4G
Safety system	Certified



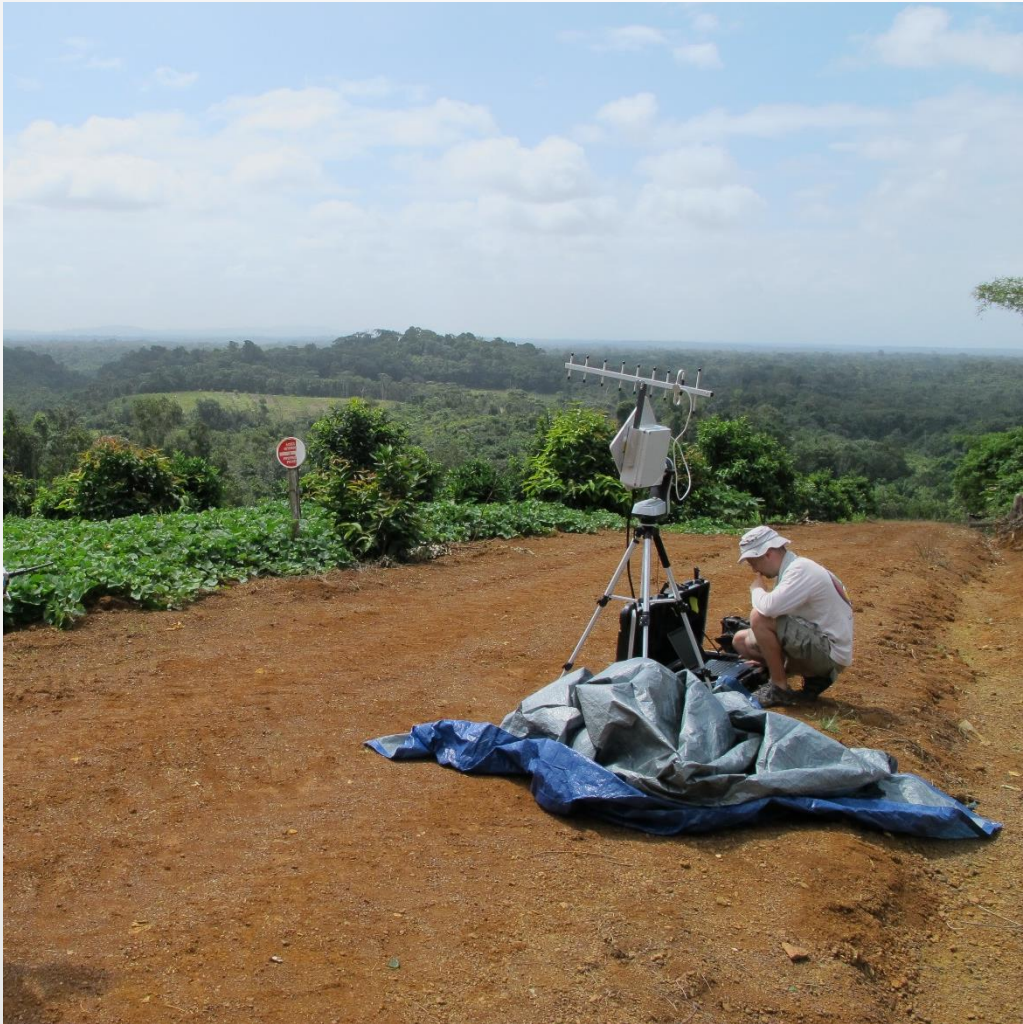
Resolution (alt. 150m)	3 cm
Transmission	Real-time transmission
Onboard processing	Image analysis during the flight

THE PAYLOAD

In-house developed sensors



OPERATIONS



OPERATIONS



OPERATIONS



Forward looking video

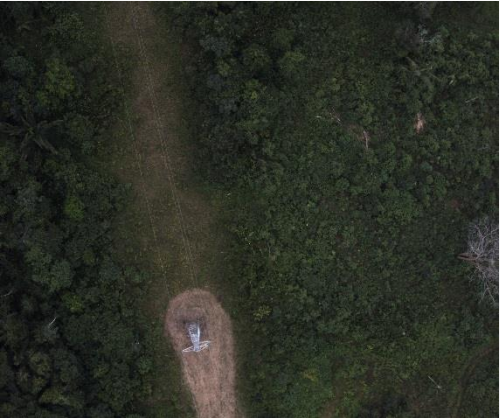
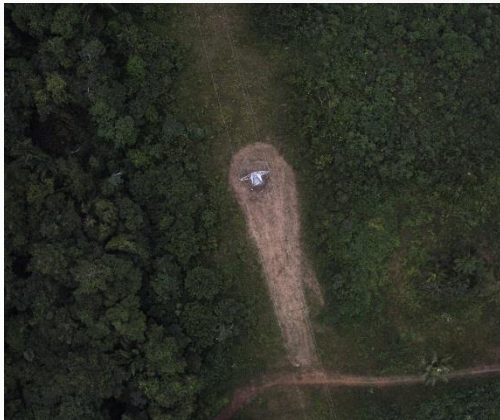
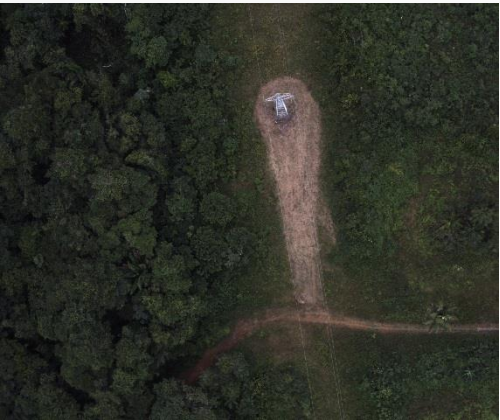
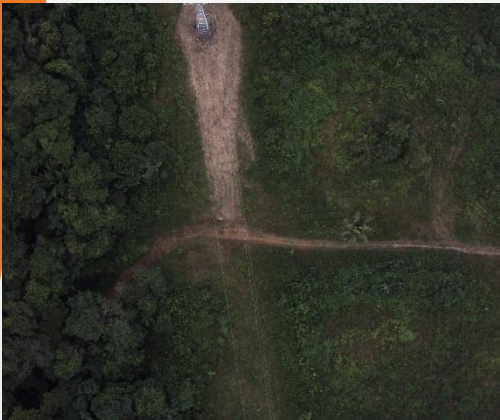
PICTURES



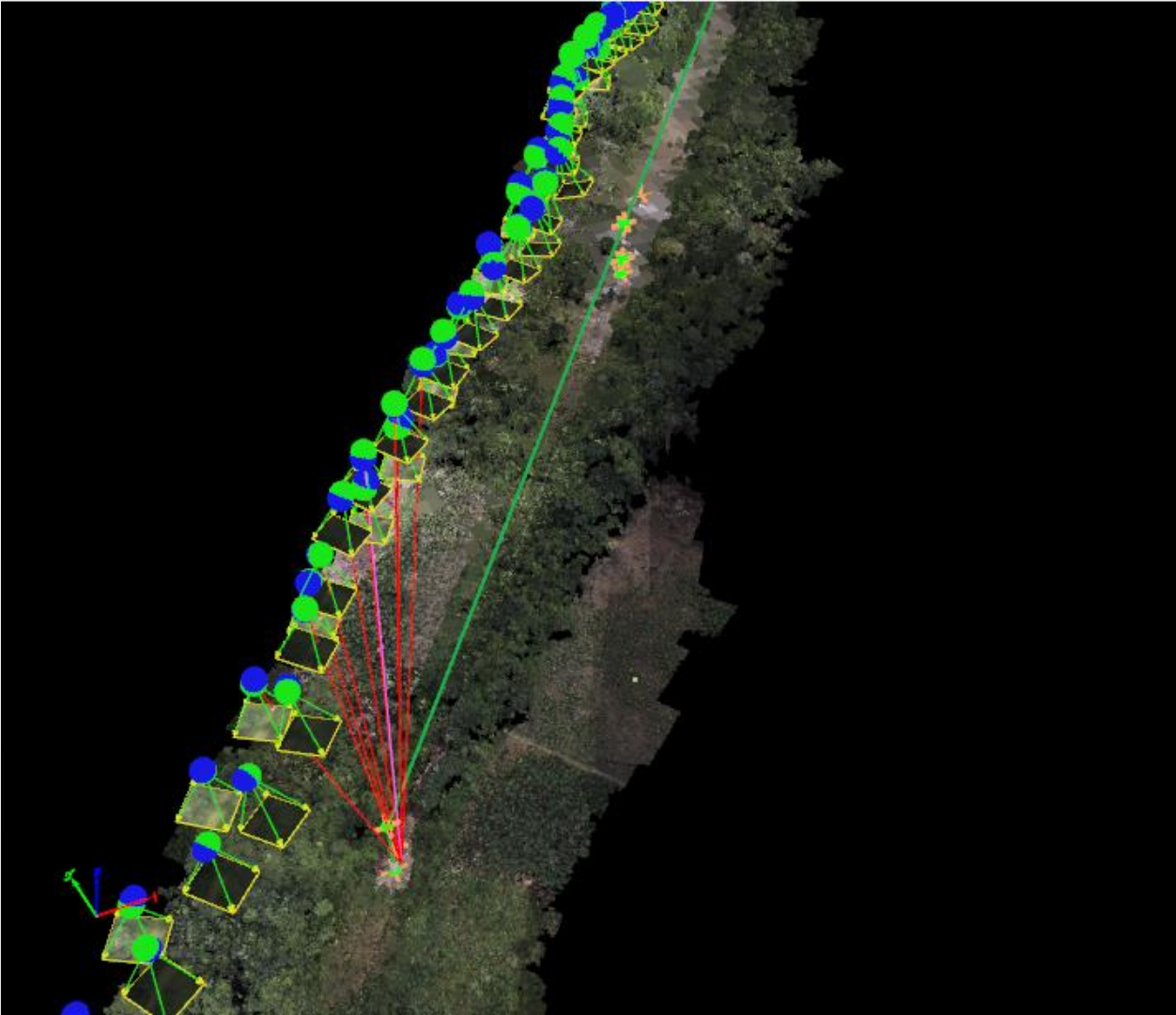
PICTURES



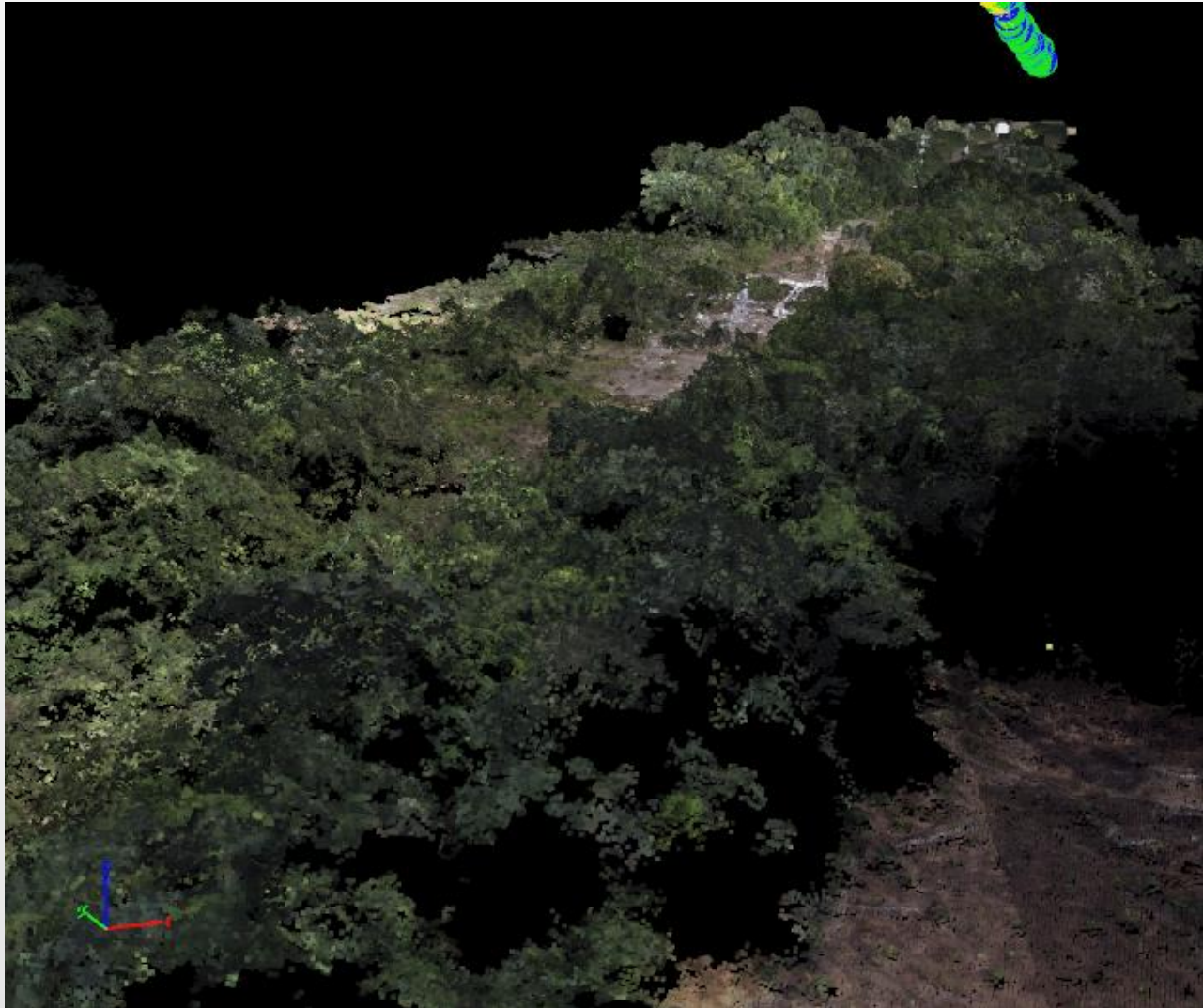
PICTURES



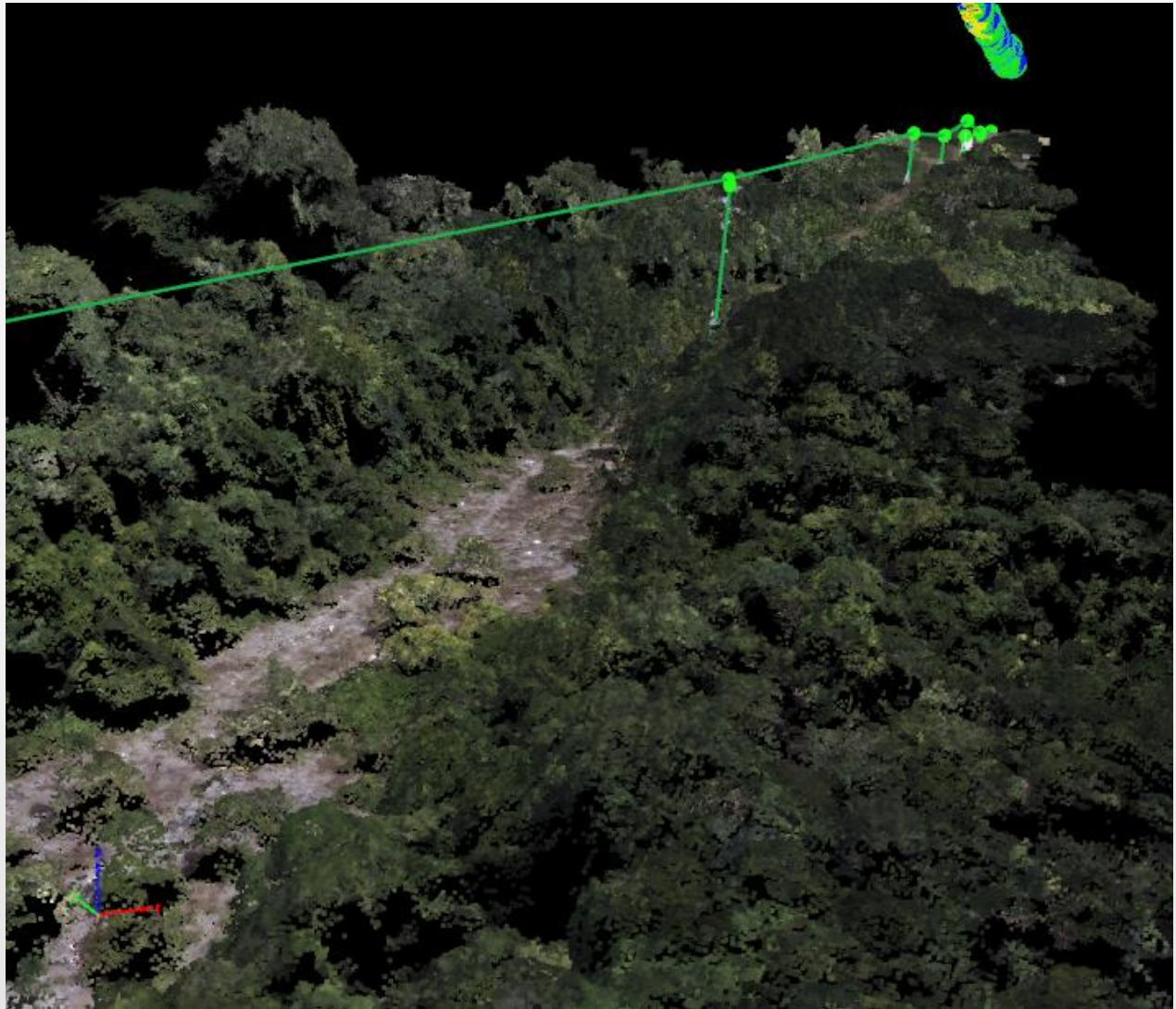
3D RECONSTRUCTION



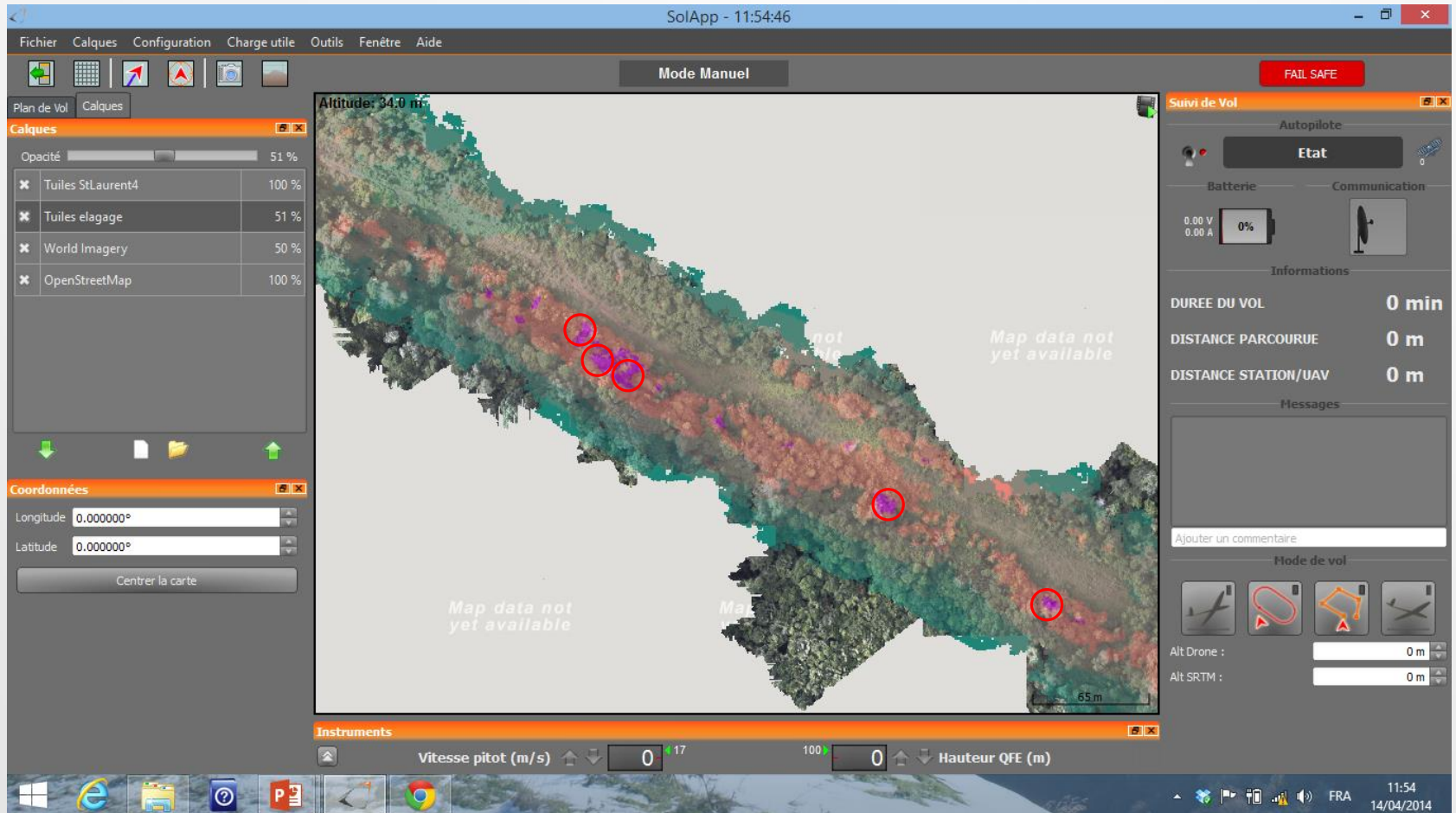
POINTS CLOUD



POWER LINE RECONSTRUCTION

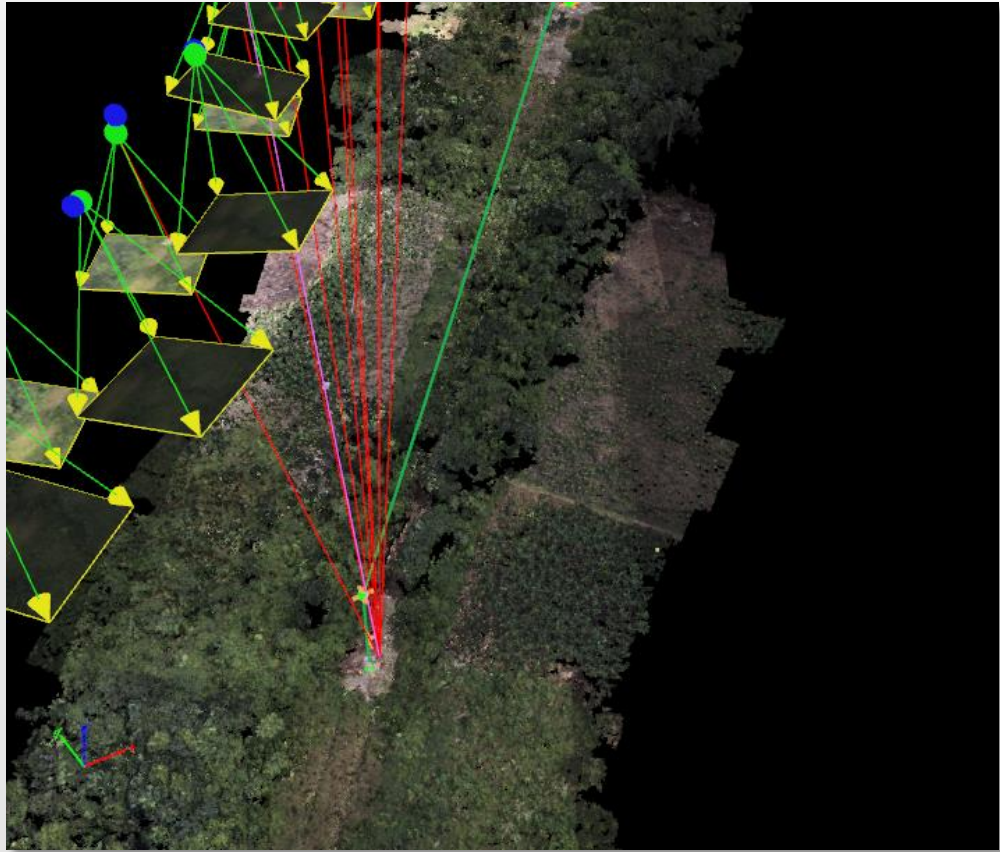


DISTANCE TO VEGETATION AUTOMATIC CALCULATION



Possibility to define the thresholds according to the specific needs

CHECKING POSSIBILITY



CHECKING POSSIBILITY



THE FINAL REPORT



Zone d'élagage 1

Zone Etoile-Organabo entre les pylônes 12 et 13.

A l'est de Organabo à proximité du pylône 13.

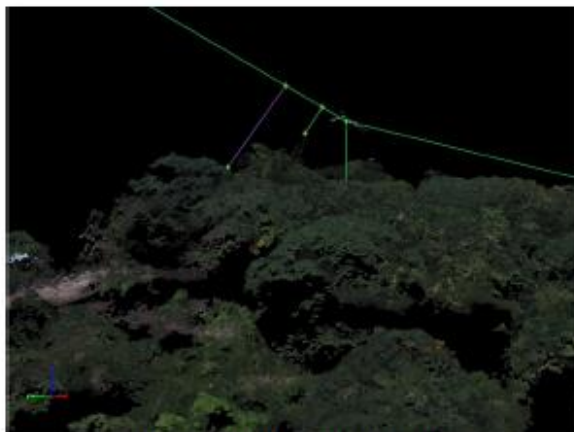
Coordonnées de la zone à élaguer:

Lon = -53.475384°

Lat = 5.547089°



Vue 3D



Sur cette vue on peut voir l'état de la végétation.



A FULLY AUTOMATED PROCESS

1. The UAV flies above the power lines and takes high resolution pictures of it
2. Automatic image processing for a ray cloud construction
3. Points cloud analysis for automatic detection of georeferenced interested points. Creation of a global map
4. Automatic generation of results reports.
5. Manual pruning

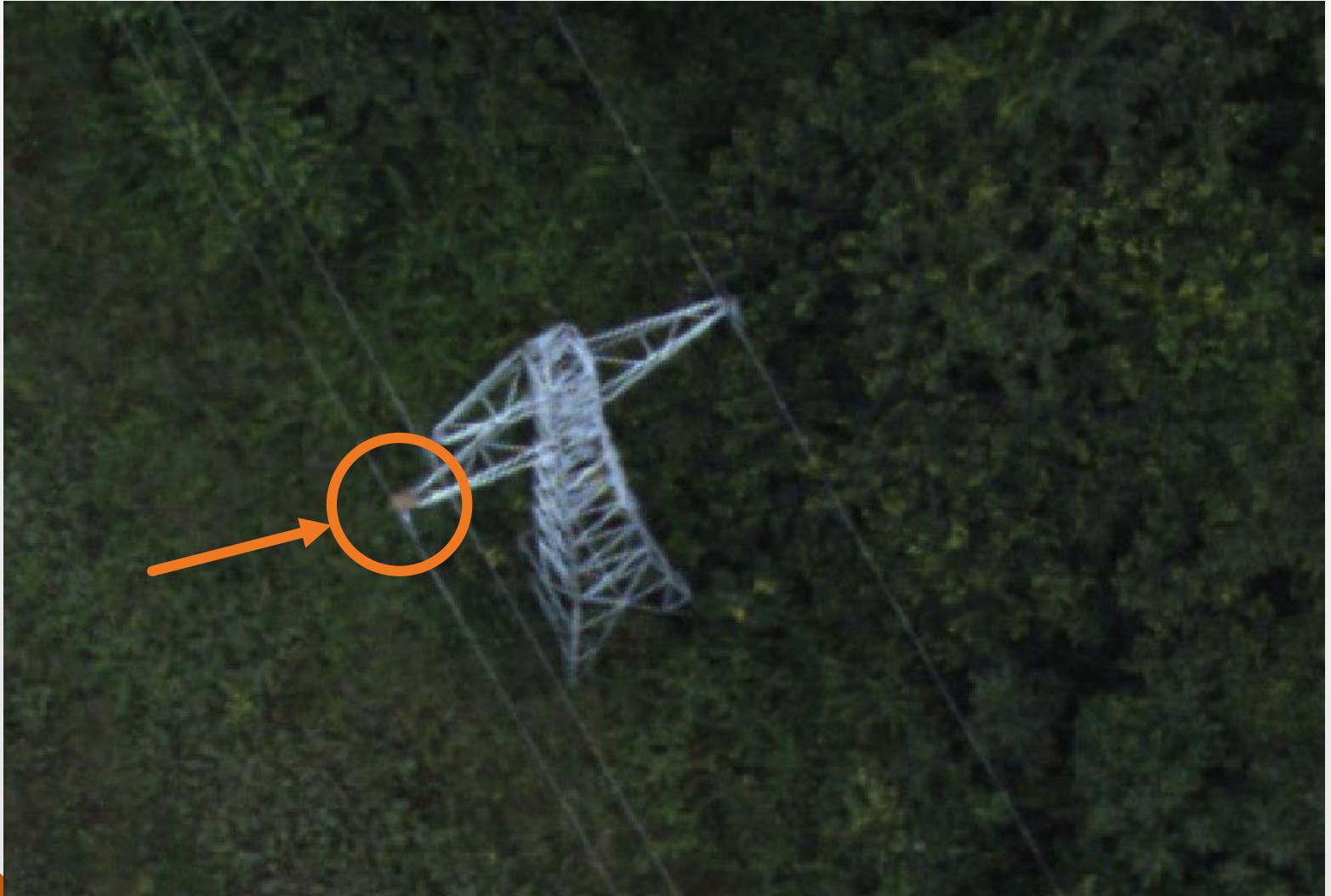
Fully automated process for a minimal human intervention:

- Cost effective
- Less time consuming
- Minimization of human mistakes
- Record keeping



PYLON INSPECTION

BIRDS NESTS DETECTION



ISOLATION ANOMALIES





FUTURE DEVELOPMENTS

FUTURE DEVELOPMENTS

1. Power lines modelization
2. Multi and hyperspectral cameras for vegetation characterization
3. Simplification of the image analysis for a less time-consuming process
4. Longer focal length for specific detection above pylons
5. Pop-up stations all along the infrastructure
6. 3G/4G – Satcom
7. Integration into the civilian airspace





THANK YOU

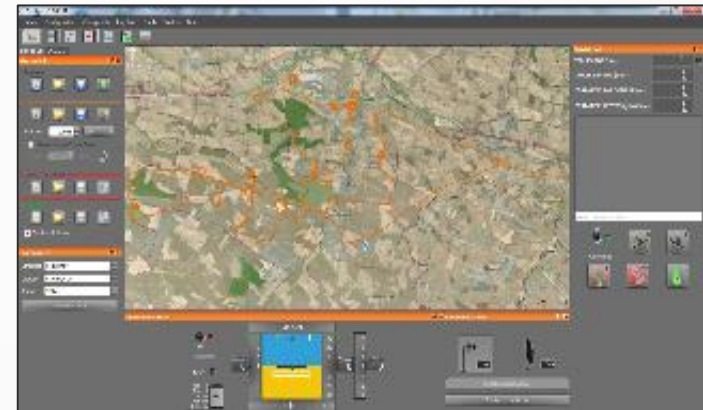
Delair-Tech SAS
contact@delair-tech.com
3, avenue Didier Daurat
31400 – Toulouse
09.50.01.93.52

DEPLOYMENT

1 System deployment



2 Waypoints definition



3 Drone launching



4 Real-time video transmission



DESCRIPTION OF A FULL SYSTEM

Description

- 1 DT-18 with its transport suitcase
- 1 Solapp with its transport suitcase
- 1 payload

