

# INSPECTION OF UNDERGROUND PIPELINE

| LINEAR INFRASTRUCTURE | OIL AND GAS | INDUSTRY |

## THE CLIENT

**GDF SUEZ**

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GDF SUEZ is a French multinational utility company with over €180 billion in assets. GRTgaz, a subsidiary of GDF SUEZ, is a natural gas transmission system operator. GRTgaz has over 4,400 delivery stations in its vast pipeline network.

## Associated UAV packages:

- ✓ Observer
- ✓ Observer XL
- ✓ Big Mapper
- ✓ Big Mapper XL
- ✓ Ultimate

## THE NEED

**VEGETATION CONTROL**

GRTgaz, the subsidiary of GDF SUEZ, is responsible for transporting gas in France and manages more than 30,000 km of underground pipelines. GDF SUEZ is responsible for the weekly monitoring of sections of pipeline to ensure that there is no unauthorized construction over the pipeline that could cause damage to the infrastructure. Today these inspections are done by staff on foot, walking along the length of the infrastructure and also by manned aircraft with observers. GDF SUEZ wants to be able to accurately and quickly determine the locations of potential hazards in order to be able to respond.

*"DT18 has demonstrated its ability to regularly observe GRT GAZ's infrastructure network and allowed us to improve our efficiency in pipeline monitoring."*

Bruno Raguin, GDF SUEZ

For GDF SUEZ's needs, Delair-Tech chose the Big Mapper drone package (based on the DT18) to photograph the linear infrastructure. After landing, the images were sent to the Delair-Analytics data center to generate the orthomosaic and automatically detect the desired anomalies (in this case; mechanical excavators, construction vehicles, and signs that construction is or has taken place). A comparison with previously generated maps from the Big Mapper was also performed in order to make inventory of the surrounding buildings.

## THE SOLUTION



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## THE OPERATION

GDF Suez asked Delair-Tech to monitor a 30 km pipeline on the outskirts of Brive, France. The pipeline was flown in a 1 hour round-trip by the DT18 which generated 5,000 pictures along the route. No antenna relay was necessary for the fulfillment of this mission.



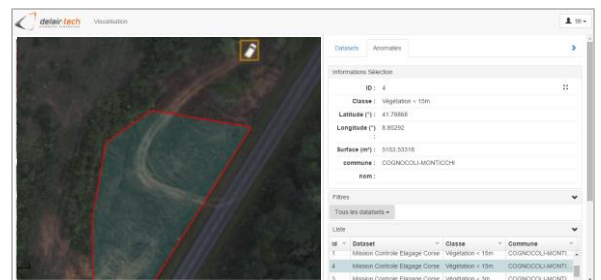
## DATA ANALYSIS

Over 5,000 images were generated by the DT18 then analyzed by the Delair-Analytics Data Center which produced a single georeferenced, orthorectified mosaic image of the infrastructure. Algorithms were applied to the resulting mosaic image to detect anomalies:

- Creating a 2D orthophoto and a 3D model of the pipeline with a GSD of 4.5 cm
- Automatic detection of anomalies (mechanical excavators, construction vehicles, signs of construction, etc.)
- Comparison and change detection – displaying locations of detected anomalies on the Delair-Analytics web visualization tool

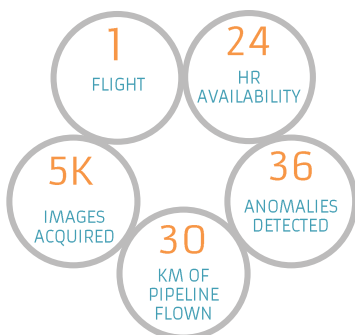
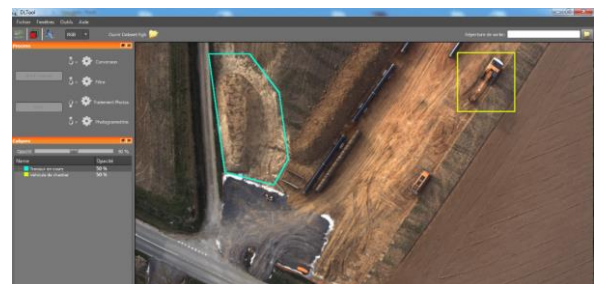
## DELIVERABLES

- » A report that indicates the GPS coordinates of detected anomalies along with photos and information on the applicable specifics
- » A web visualization tool for viewing and archiving past results
- » Integrating the data into GDF Suez's own GIS software



## CONCLUSION

- ✓ The long endurance of Delair-Tech's DT18 makes this a cost-effective solution in comparison to manned aircraft
- ✓ Data gathered in one flight serves roles beyond inspection; topography can be studied and vegetation analyzed
- ✓ Delair-Tech's UAV + data solution is ready for large-scale, worldwide deployment on oil and gas pipelines



*"We are studying the enormous potential of this new technology ... in terms of monitoring [and] the rapid identification of incidents."*

Marc Brudigou, ERDF