PRESS RELEASE

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SEGULA Technologies completes its prototype autonomous drone for safe inspections in complex environments

After two years of research and development, SEGULA Technologies, a global player in engineering and innovation, has announced the completion of its "TOPONE" prototype, an autonomous drone designed to inspect power lines in underground tunnels and other confined spaces. This high-level project led by the Group's Research and Innovation department aims at protecting technicians exposed to high-risk environments.

Tests of the TOPONE autonomous drone prototype in real-life conditions have proved conclusive. (©SEGULA Technologies)

TOPONE **is an autonomous drone** specialising **in the visual inspection of power lines in tunnels and underground galleries that can be visited**. This project stems from the need to reduce the number of work-related accidents among technical staff, one of the jobs where the risk is highest.

Every year, almost 200 people lose their lives in confined spaces due to extreme conditions such as lack of oxygen, high concentrations of noxious gases, extreme temperatures and the

risk of collapse[1] . The TOPONE drone offers **a safe and effective alternative** for technical inspections, **eliminating the need for human intervention** in these high-risk areas.

Cutting-edge technologies for autonomous inspections

The TOPONE drone is distinguished by its advanced technical capabilities, which guarantee smooth navigation and accurate diagnostics, improving the efficiency of inspections in hard-to-reach areas:

- **High-precision sensors and cameras**: the drone is equipped with a camera that provides RGB and thermographic images of the cables, mounted on a gimbal for stability and mobility. Its sensors measure temperature, oxygen percentage and harmful gas levels to identify anomalies, often due to cable breaks or cracks caused by overheating. At the same time, it has a control station (GCS - Ground Control Station) that displays all the information needed to inspect the power lines and visualise the route taken by the drone.
- **Autonomous navigation**: the prototype is equipped with two high-precision cameras and altimeters. The data collected is processed by an on-board computer, enabling the drone to create a 3D model of the environment from a cloud of points and to move around the underground gallery without a constant connection to a control station.
- **Innovative software architecture**: this drone required the development of a complex and innovative software architecture that integrates several modules for localisation and perception, a control and guidance system, and a data collection system specific to each mission.

A multi-sector tool in the making

The TOPONE prototype has been tested in real-life conditions in the galleries of the Málaga Convention Centre (FYCMA) in Spain. These conclusive tests pave the way for commercial use in various sectors:

- **Inspection of rail and industrial infrastructure**: tunnels, power cables and caisson bridges.
- **Applications in caving and rescue**: exploration and intervention in difficult-to-access areas.
- **Mining and construction**: supervision of installations in complex environments.

This prototype drone was developed in the framework of the TOPONE project, funded by the Spanish Centre for Technological Development and Innovation (CDTI).

[1] (source: ILO and OSHA)

Following the success of the initial test phases, TOPONE is now entering its second prototyping phase prior to future commercialisation. For SEGULA Technologies, this innovation is part of a wider strategy to offer global solutions for key industrial sectors.

PHOTOS

Click on the photos to download them in high resolution.
Credit : SEGULA Technologies

Prototype of the TOPONE project drone

TOPONE prototype in the galleries of the FYCMA conference centre in Malaga - photo taken during tests in real conditions.

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About SEGULA Technologies

SEGULA Technologies is a global engineering group, serving the competitiveness of all major industrial sectors: automotive, aerospace, energy, rail, naval and pharmaceuticals. With a presence in more than 30 countries and 140 offices worldwide, the Group is committed to building close relationships with its customers thanks to the skills of its more than 15,000 employees. A leading engineering company that places innovation at the heart of its strategy, SEGULA Technologies carries out large-scale projects, from design through to industrialisation and production.

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