



Drone Operations in Industrial Environments Case Studies

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SkyeBase is a Belgian company that combines drones & robots and platform technology & AI for industrial asset inspections. The company is ISO9001:2015 and VCA Petrochemical certified. It was founded in 2020 as a total solutions company, starting with asset condition inspections, including the required proprietary AI-based data processing, and delivers actionable data for asset health management.

The company currently has 20 employees and focuses on performing drone & robot inspections for various industry sectors, including storage tank terminals, container terminals and critical infrastructure, with the purpose to increase safety, reduce ecological risks, as well as increase uptime and reduce maintenance costs.

The data capture takes place by means of inspections using various types of drones, robots (aerial, ground, water) and associated high-tech imaging and measurement equipment. The data processing takes place by means of I-Spect, the company's proprietary asset inspection platform, making use of artificial intelligence. The objective is to obtain crystal-clear insights into the condition of assets, permitting to take (preventive) maintenance & repair decisions.

The following case studies give an overview of the typical missions conducted by the the company.

Mission I

Electro-optical & thermal inspection of 2 coldboxes with a height of 65 metres.

Customer

Industrial gas production company

Drone

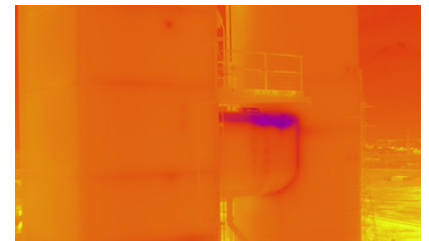
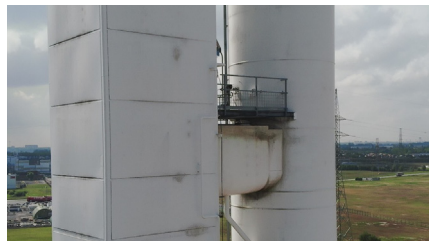
SB-01-M300 RTK - DJI, China

Goal

Detection of shortage of insulation material (consisting of granulates) causing cold losses. This can be visible from the outside (condensation, icing, etc).

End product

Report locating the detected defects by means of 3 types of images (zoom, high resolution and thermal) permitting targeted maintenance.



Payload: Zenmuse H20T - DJI, China

Camera Sensor	Wide Angle 1/2.3» CMOS 12 MP	Zoom 1/1.7» CMOS 20 MP	Thermal Uncooled VOx Microbolometer
Lens	DFOV: 82.9° Focal length: 4.5 mm (equivalent: 24 mm) Aperture: f/2.8	DFOV: 66.6°-4° Focal length: 6.83-119.94 mm (equivalent: 31.7-556.2 mm) Aperture: f/2.8-f/11 (normal) f/1.6-f/11 (night scene) Focus: 1 m to ∞ 8 m to ∞ (telephoto)	DFOV: 40.6° Focal length: 13.5 mm (equivalent: 58 mm) Aperture: f/1.0 Focus: 5 m to ∞
Zoom	-	23 x optical zoom 200 x digital zoom	8 x digital zoom

Mission II

Electro-optical inspection of a distillation column with 3 main pipes.

Customer

Industrial chemical company

Drone

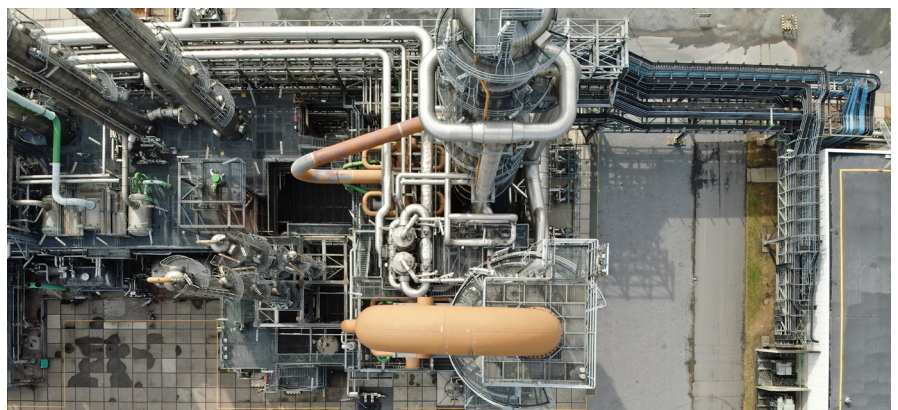
SB-01-M300 RTK - DJI, China

Goal

Detection of damage & corrosion on the pipes, specifically welds, supports & joints.

End product

Report locating the detected defects by means images (zoom, high resolution) permitting targeted maintenance.



Payload Integrated into Drone by Manufacturer (Flyability, Switzerland)		
Camera Sensor	Electro-optical 1/2.3» CMOS Effective pixels: 12.3 MP low light optimised Video recording resolution: 4k Ultra HD: 3840 x 2160 at 30 fps Video streaming resolution: FHD: 1920 x 1080 at 30 fps, or SD 640 x 480 at 30 fps	Thermal Lepton:3.5 FLIR Video recording resolution: 160 x 120 at 9 fps Wave length: 8-14 µm
Lens	DFOV: 82.9° Focal length: 2.71	FOV: 56° x 42° Depth of field: 15 cm to ∞ Sensitivity (NEDT):<50 mk

Mission III

Electro-optical & thermal inspection of storage tanks (interior & exterior).

Customer

Waste treatment company

Drone

Elios 2 - Flyability, Switzerland

Goal

Inspection of storage tank walls inside the storage tanks.

Storage tank wall thickness measurements conducted from the outside.

End product

Report with a map of wall thickness measurements and defect annotations, permitting targeted maintenance & repair.



M300 - DJI, China

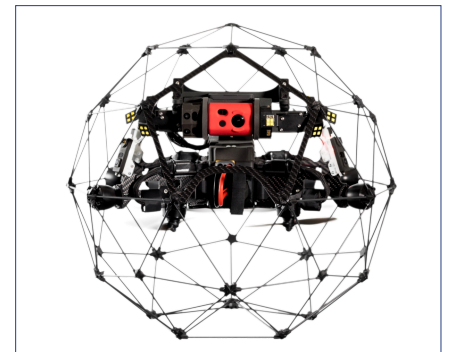


Used for Missions I & II



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Elios 2 - Flyability, Switzerland



Used for Mission III