



Percepto At Koch- Enid

INDUSTRIES



Oil & Gas



Energy



Green
Energy



Mining



Airports



Sea Ports



Automotive





Industrial sites inspections are necessary

Industrial sites operators must safeguard their investments while optimizing operations and cutting costs.

Yet inspections are challenging:

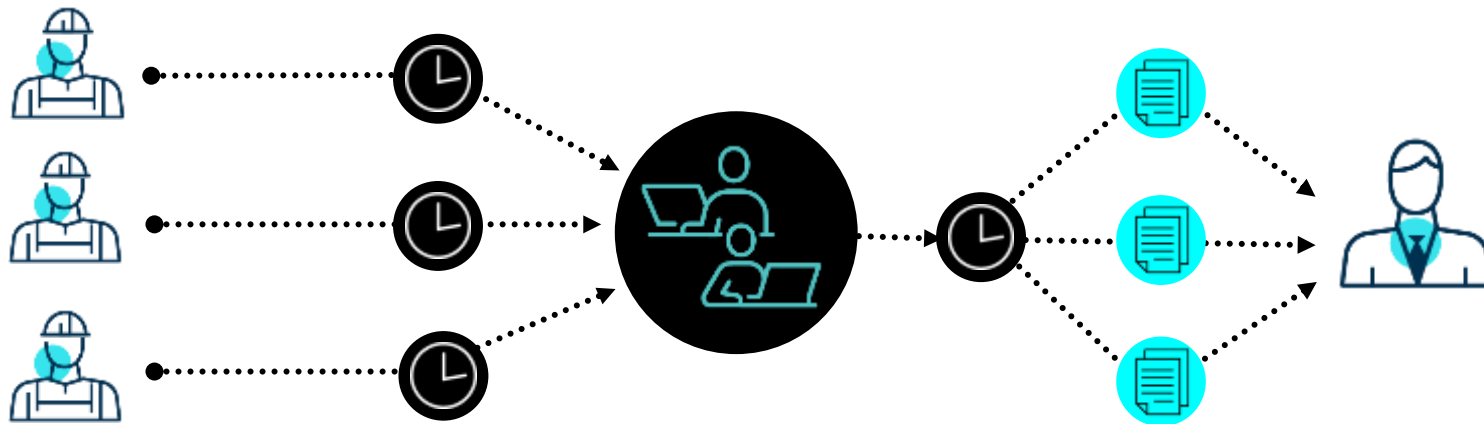
- Remote, unattended
- Bearing risk to personnel
- Labor intensive
- Costly
- Often require planned downtime

Current inspection practices fall short

Data collection & upload

Data sifting and analysis

Reports



Labor
intensive

Limited
coverage

Limited
frequency

Limited
data quality

Siloed
information

Inconsistent
management

Harnessing robotics for autonomous inspections



End-to-end inspection & monitoring solution, from air and ground.
From capture to insight.

On-site multi-mission autonomous robots

- Remote operations



- Security



- Compliance



- Inspection



- Safety & Emergency Response



- Monitoring



- Modeling & Measurement



Security solutions



Security patrol

Increase patrol frequency while reducing costs



Detection & tracking

Enhance patrols with autonomous detection and tracking for effective security



Immediate security response

Missions can be launched immediately either on-demand or via integrated 3rd party system threat notification (e.g. smart fences)

Safety solutions



Autonomous inspection

Decrease danger to employees during inspections of hard-to-reach locations/dangerous infrastructure



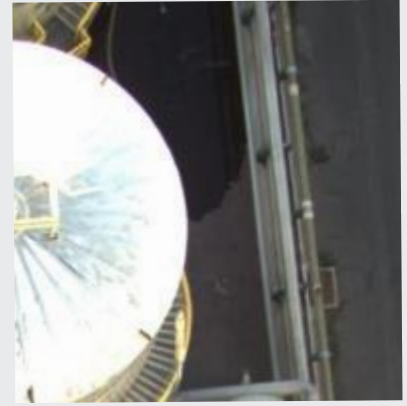
Emergency response

Improve response times and increase situational awareness in the event of a fire or other emergency



Leak detection

Early detection of a safety & operational risk



Spill detection

Early detection of a safety & operational risk

Operational solutions



Automated inspection

Increase inspection cycles, decrease risk and improve productivity



Anomaly detection

Applying deep learning to detect irregularities at site



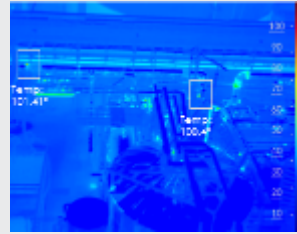
2D high resolution mapping

In leveraging drone 4K UHD camera for autonomous mapping of the facility



Thermal inspection

Early detection of overheating or cooling



Temperature measurement

Early detection of damage or temperature breach

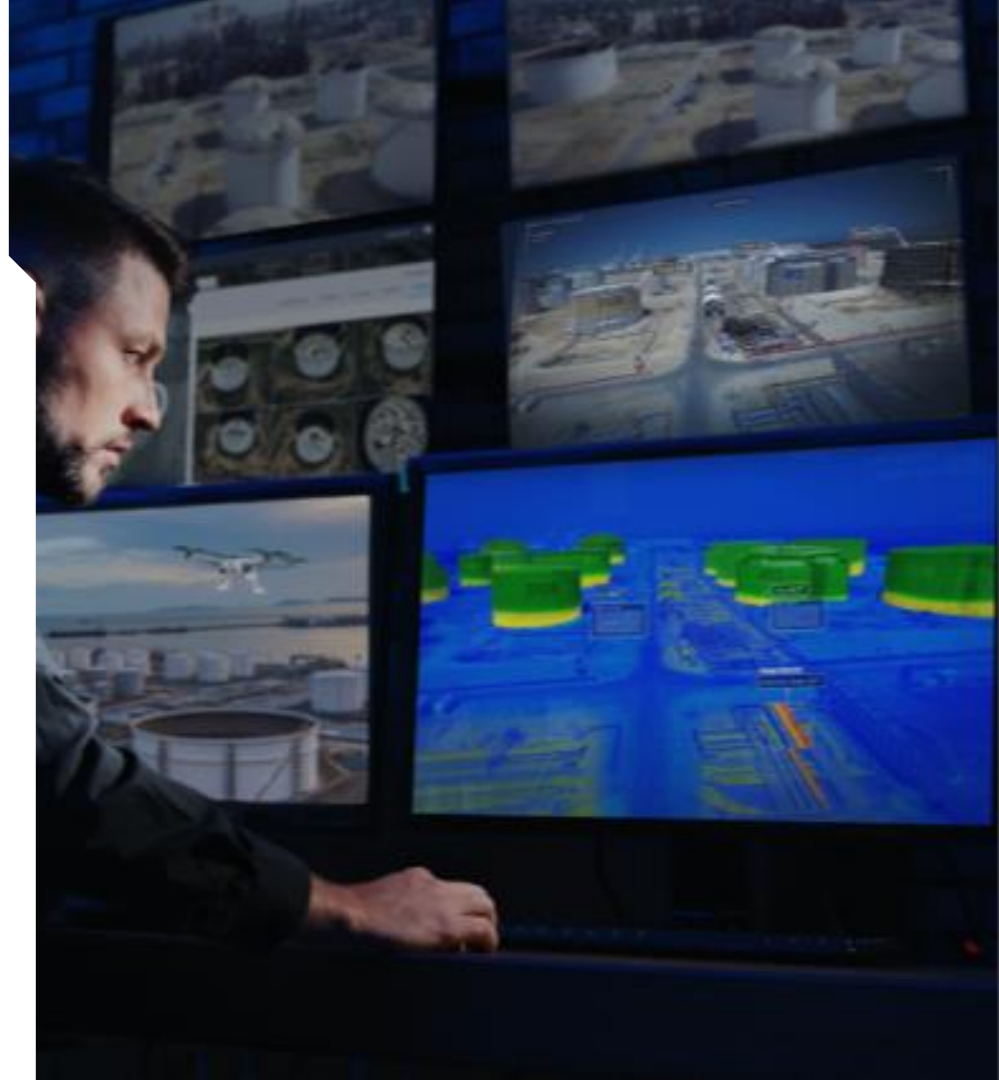


3D modeling

Elevation maps, volume assessment, and pile inspections



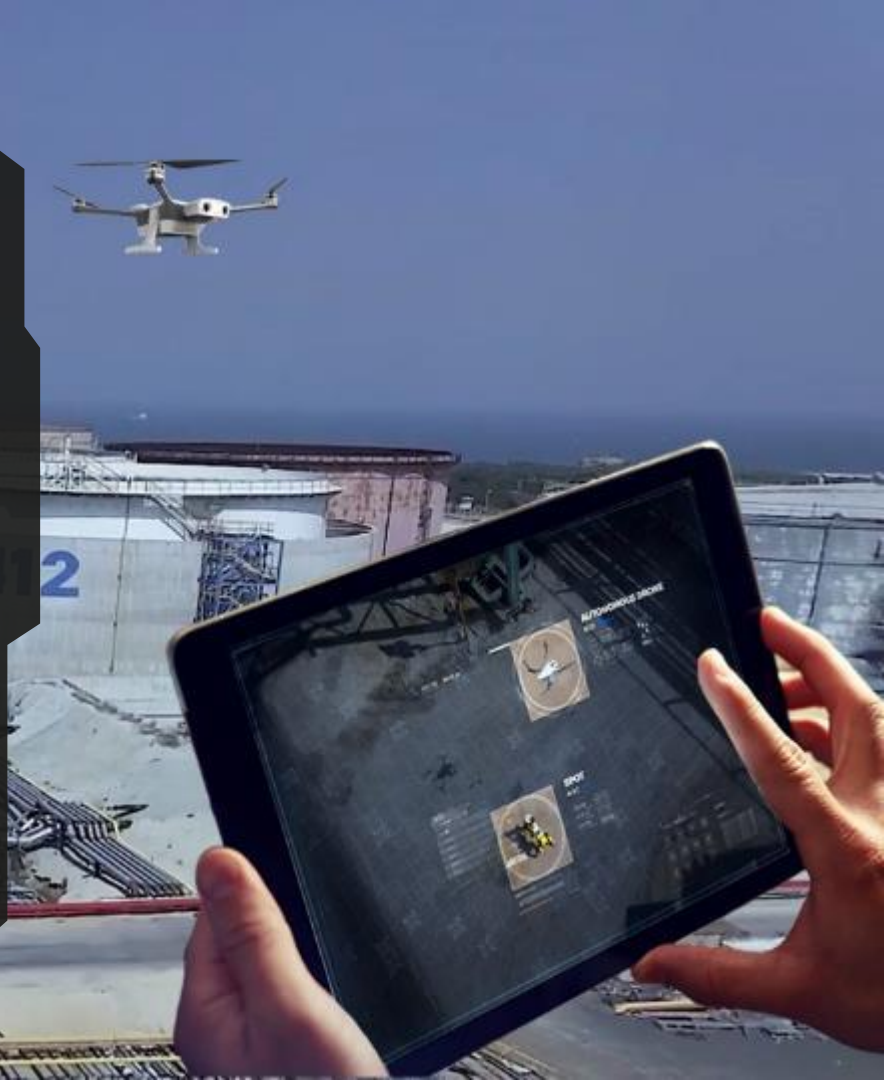
Percepto AIM



- **Percepto AIM**

An end-to-end software solution that redefines how industrial sites and critical infrastructure are holistically, comprehensively inspected and monitored end-to-end.

Harnessing remote robotics to autonomously collect, aggregate and analyze visual data.



AIM autonomous workflow: from capture to insights



A33



View entity's visual history >

AIM autonomous workflow: from capture to insights



Entity visual history



Request more/new data



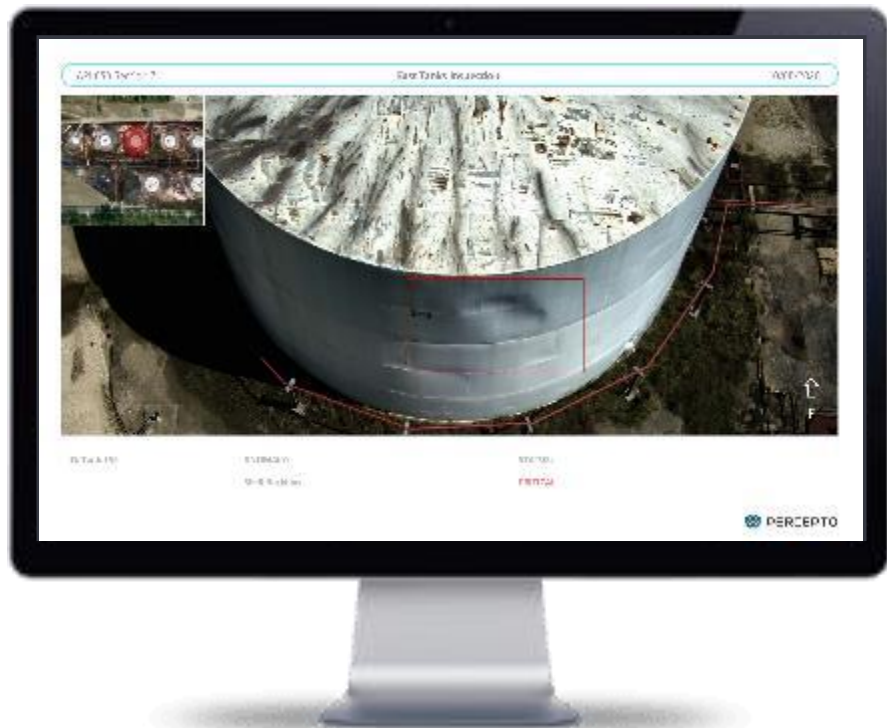
Mission launched
(autonomous data collection)



Autonomous Analytics



Autonomous reporting



Sophisticated yet simple

The solution is powered by the most cutting-edge technology, yet all you need to do to request visual data insights is press a button, similar to placing any order online.





The operational benefits



End to End solution

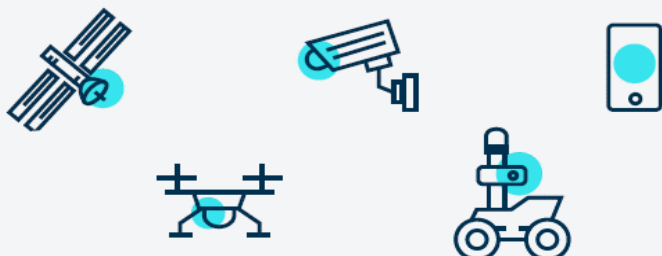
Democratize visual data



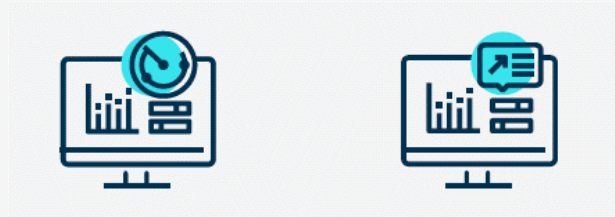
Automate data collection via autonomous robots' management



Unify visual data



Automate insights

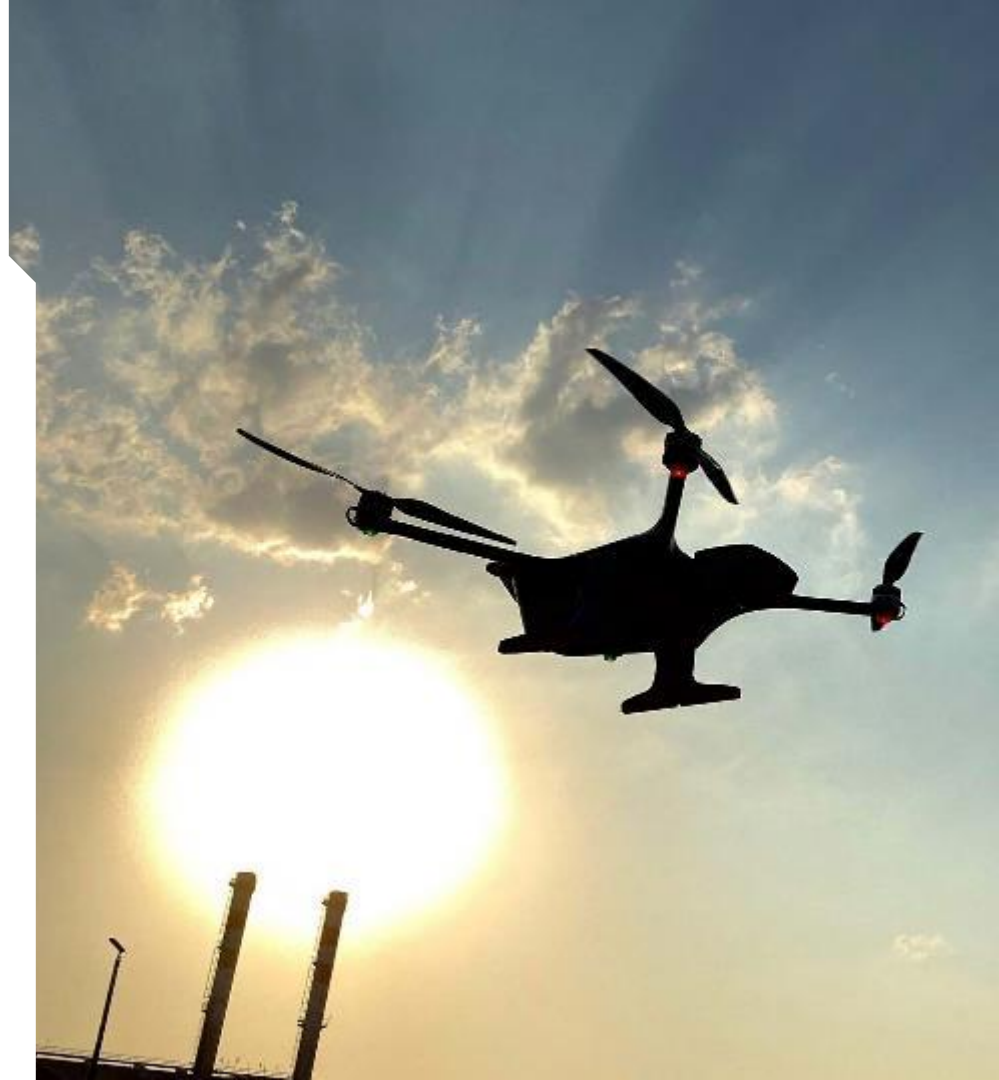


The value of integrated robots

- Multiple robotics hardware working together in an automated, autonomous workflow.
- Advanced interoperability and collaboration between the various elements of your operation, building “connected” and smart hardware.
- Specific industries can focus on the special equipment, use cases and expertise they require.



Percepto Sparrow





Percepto Drone-in-a-Box



Dual payload
(4K & thermal cameras)



Percepto Core
Onboard Module



Charger connector

Shelter | Charge | Health Checks | Upload | Weather Station



• Boston Dynamics Spot

- Equipped with Percepto Core and payloads for high-resolution imaging and thermal vision.
- Completely managed by AIM.
- Providing a ground level picture.
- Can access inside and roofed spaces where drones can't fly.
- Future expansion of the use cases beyond inspection: autonomous ground robots carrying out repairs or other assistance.



OGI Sensor



DETECTABLE GASES:

Acetic Acid, Ammonia, Benzene, Butadiene, Butane, Ethane, Ethylbenzene , Ethylene, Heptane, Hexane, Isoprene, Methyl Ethyl Ketone (MEK), Methane, Methanol, MIBK, Octane, 1-Pentane, Propane, Propylene, Sulphur Dioxide, Toluene, Vinyl Chloride and Xylene.



Use Cases



ENHANCED SECURITY

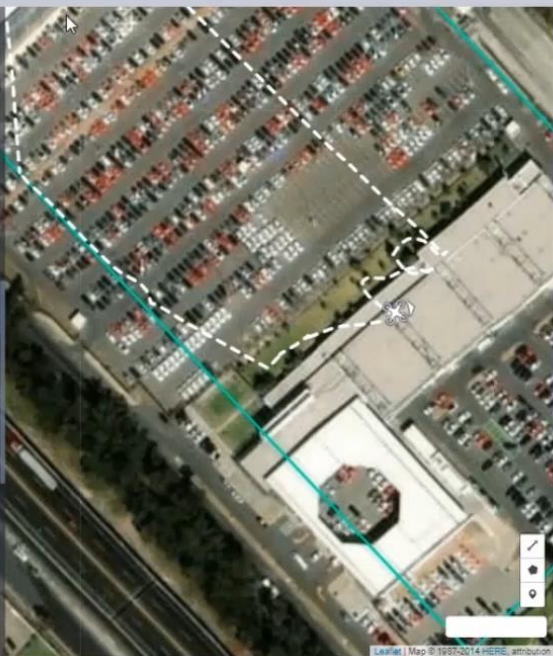
drone.percepto.co/#site/36/missions/past_mission/11495



MISSION PLAYBACK

MISSION STORY

- 08:41 min
Navigate (%75)
 - 09:12 min
Navigate (%73)
 - 10:43 min
Detector off (%68)
 - 10:50 min
Drone started tracking
 - 11:05 min
Detector on (%66)
 - 11:10 min
Detector off (%66)
 - 13:49 min
Detector off (%60)
 - 16:04 min
Return Home (%48)
- PLANNED UNPLANNED



Leaflet | Map © 1997-2014 HERE, attribution

60% 0 m/s 49m Download Share



11:03

21:36

DATA

TIME: 10/28/19 11:45 AM
NAME/ID: Jump To Alert-406 / 11495
CREATED BY:
TOTAL TIME: 00:20:26

PLANNED MISSION:
1. takeoff
2. navigate

MEDIA



A PRIVATE SATELLITE

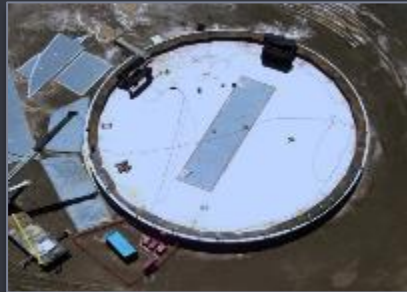
GOOGLE MAPS



HIGH RES MAPPING (4K)



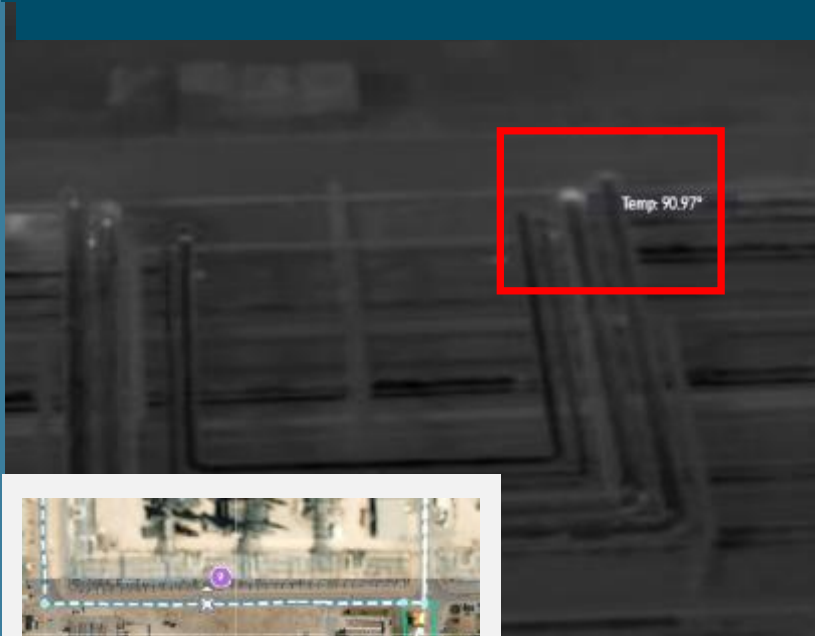
SITE CONSTRUCTION MONITORING



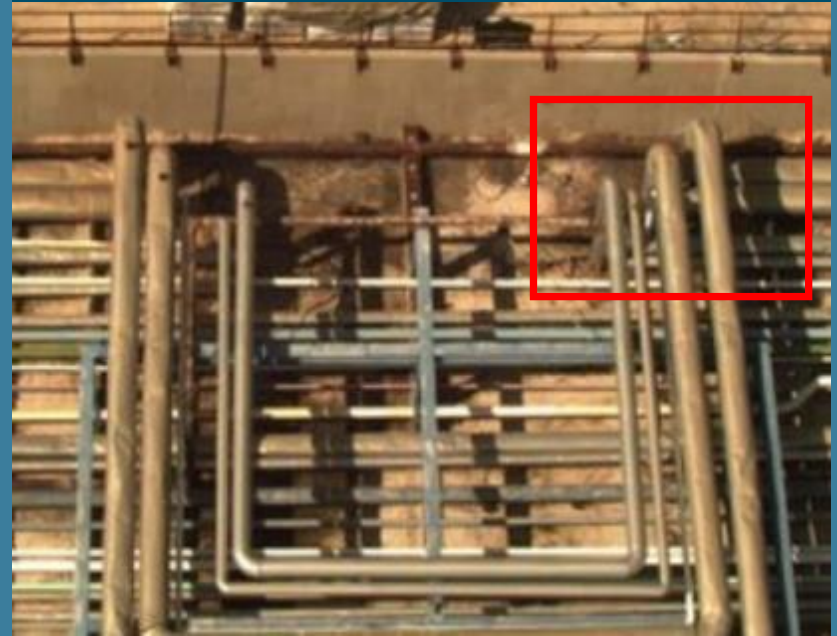
LOCATION: Central America
SITE: Refinery
Duration: 30 days

PIPELINE INSPECTION

Gas Leak Detection - Thermal



Gas Leak Detection - Optical



UNDERGROUND INSULATION DETERIORATION

REPORT | UNDERGROUND THERMAL IMAGING

13 SEP 2019

GENERAL

SITE	LOCATION	
	XXXX SCOT	
OPERATING TEAM	DRIVER	OPERATOR
	SS	Chris Arnes

MISSION DESCRIPTION

INFRASTRUCTURE	Pipes section B	DATE	13 SEP
MISSION #	9527	TIME	07:41
DURATION	27:52	LINK	

INSTRUCTIONS

MISSION TYPE	ANOMALY	THRESHOLD SET
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RESULTS

FOUND LOCATIONS	OVER 120
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MISSION LOCATION - ZONE 02

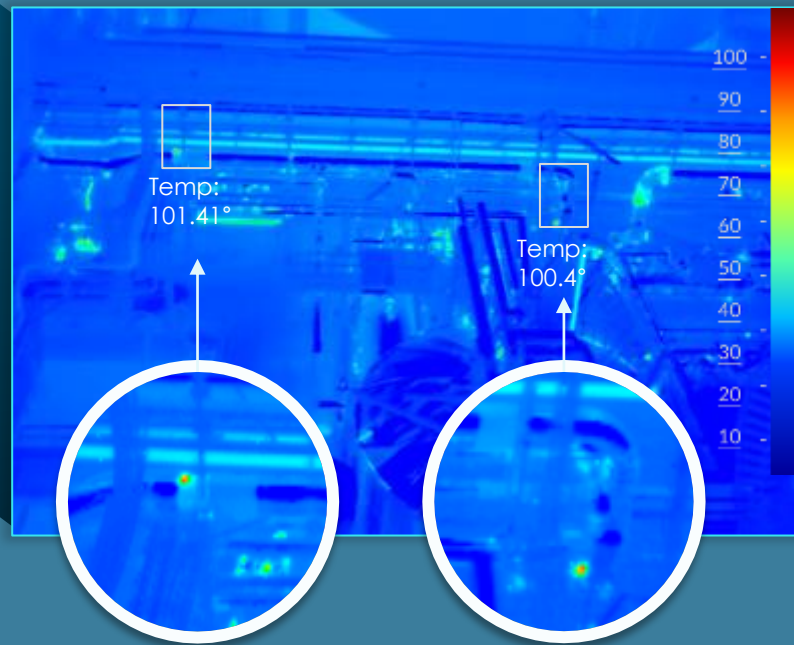


REPORT | UNDERGROUND THERMAL IMAGING

13 SEP 2019



ANOMALY DETECTION USING THERMAL CAM



FLARE TOWER INSPECTION

Flare Tower Inspection- Thermal



Flare Tower Inspection- Optical

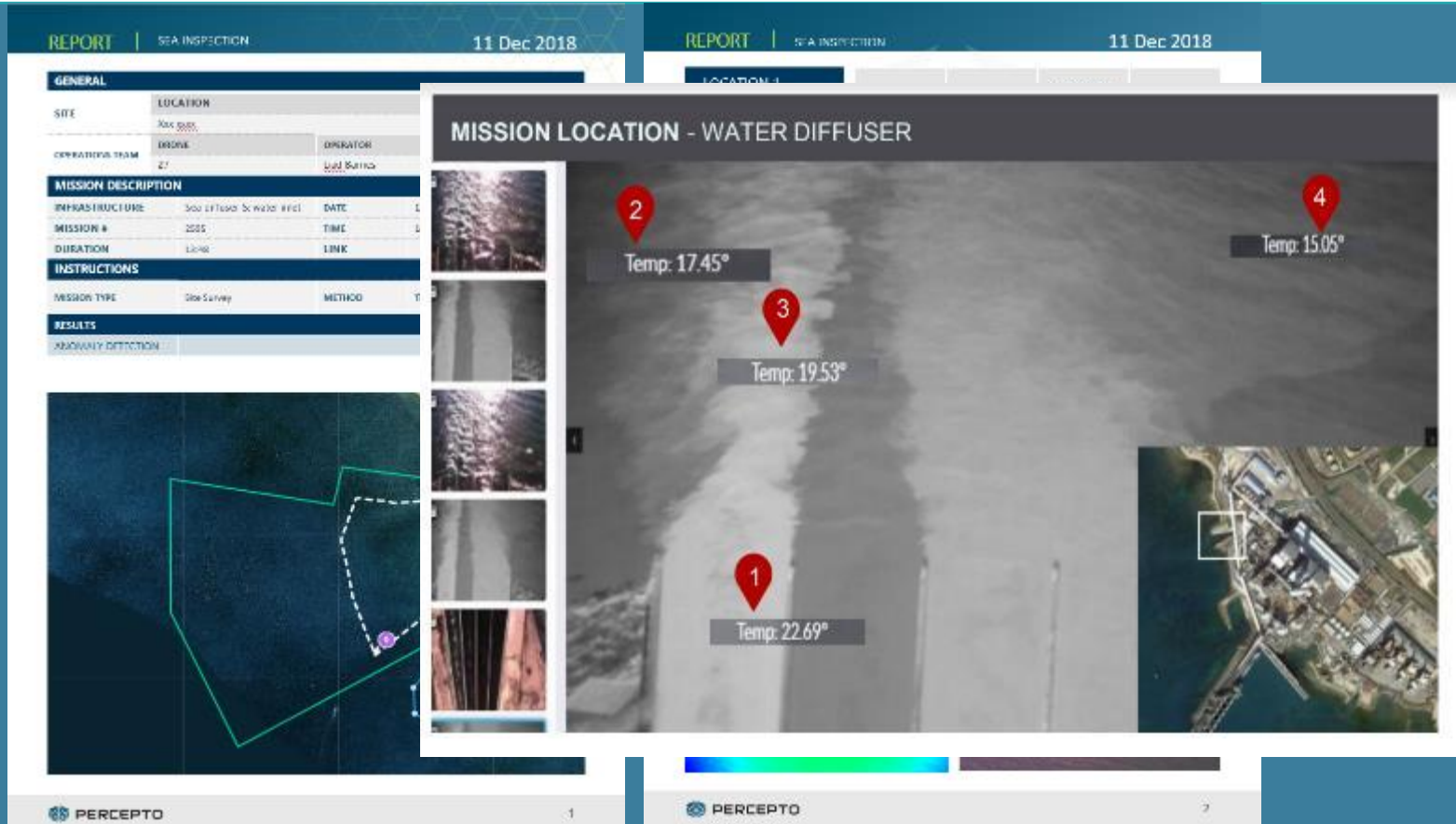


Zoom in view



Flame size validation - compliance with environmental regulations

ENVIRONMENTAL COMPLIANCE



●

Increase safety & productivity



Inspection



Mapping &
modeling



Work progress
monitoring



Security &
Safety



Emergency
response

Reduce costs & minimize risks



Percepto & Koch



Major Milestones

- Deployed at Enid for 8 months – 551 missions
- 24/7 operations during the recent Enid TA
- Will deploy at Ft. Dodge in September
- FHR stationary cameras integration

Main use cases:

- Pool level measurement
- Leak detection
- Flare inspection
- Tank inspection
- Railcar count
- Traffic monitoring
- Blind inspection
- Critical lift monitoring
- Tower inspection
- Boiler inspection
- Security
- Area mapping





PERCEPTO

Thank You