



Risk and Safety  
Management for Off-Shore  
& **On-Shore oil/gas pipelines**  
and **critical infrastructure**



AVIATEK  
PARTNERS

# AVIATEK

energy • aviation • engineering

**e-geos**

AN ASI / TELESPAZIO COMPANY

 **VITROCISSET**  
a LEONARDO company

 **LEONARDO**

The infographic presented in this document is the property of Aviatek SAS, Leonardo Company, and

[www.aviatek .co](http://www.aviatek.co)

# COMPREHENSIVE RISK AND SAFETY MANAGEMENT

## Risk Management, Safety, Integrity

Many companies require better planning to preserve the integrity and security of their assets in different territories, thus being exposed to different types of threats that can affect their operation.

Aviatek has developed a system that allows the different entities and companies to execute studies and risk management plans for incorporation into the territorial order focused on the integrity of their assets. With the developed solution, the different companies can carry out comprehensive analyses identifying climate risks, natural, physical-spatial and social risks, associated with agricultural activities, overflows, floods, droughts, forest fires, landslides, public order, social and economic risks. These threats are increased by the presence of the aforementioned activities that are carried out in areas of special susceptibility where the assets are located, thus increasing the vulnerability to the occurrence of phenomena that cannot be fully controlled.





The solution designed by Aviatek allows to perform an analysis of the information available to carry out both the identification and delimitation of the types of threat present in the area of study, under certain scenarios of occurrence, such as the lifting of the exposed elements and the measure of vulnerability thereof. In doing so, it is possible to quantify and zone the risk for each type of threat, and in this way, propose strategies for risk mitigation in order to be incorporated into the different plans of Territory Planning of the right of way, security and maintenance of assets.

Aviatek through the AviaMET® platform, a technological tool that integrates mathematical models, artificial intelligence (AI), integral risk management services, asset management, natural and social threat management, security management and planning support. The service is based on an early warning system, where graphically and with the support of georeferencing of active data associated with a coordinate identification system, allows to analyze the information corresponding to risks and threats in real time for timely decision making.





# AviaMET®

## Integrates

- Numeric models.
- Weather Platform / WRF Models.
- High resolution hydrodynamic models.
- Model of early detection of possible conditions for flooding and forecasting.
- Sliding susceptibility analysis models.
- Satellite tools and applications.
- Sensors in the field.
- GIS, geographic information system.
- Comprehensive risk management models.
- Support equipment 24/7.

The platform is functional on mobile devices and desktop computers, allowing the visualization of all the client's geo-referenced assets on a virtual platform. This platform also allows real time visualization of security threats that form in the territory, which have a priority classification and generate automatic alerts to emails triggered by the customer. The system also allows the loading of data associated with assets, such as area, value, managers, size, and financial and operational data that facilitate analysis in these areas.

AviaMET® is capable of reporting these threat alerts in real time through a simplified data update system, which operates at all times. datos simplificado, funcionando en todo momento

# Types of Threats that can be identified in the System

## SECURITY THREATS:

1. Harassment
2. Bombing
3. Subversive Attack
4. Road Block
5. Confrontation
6. Combat
7. Explosive Artifacts
8. Extortion
9. Revolutionary Tax
10. Massacre
11. Subversion Shift
12. Murder

## AMENZAS NATURAL RISKS

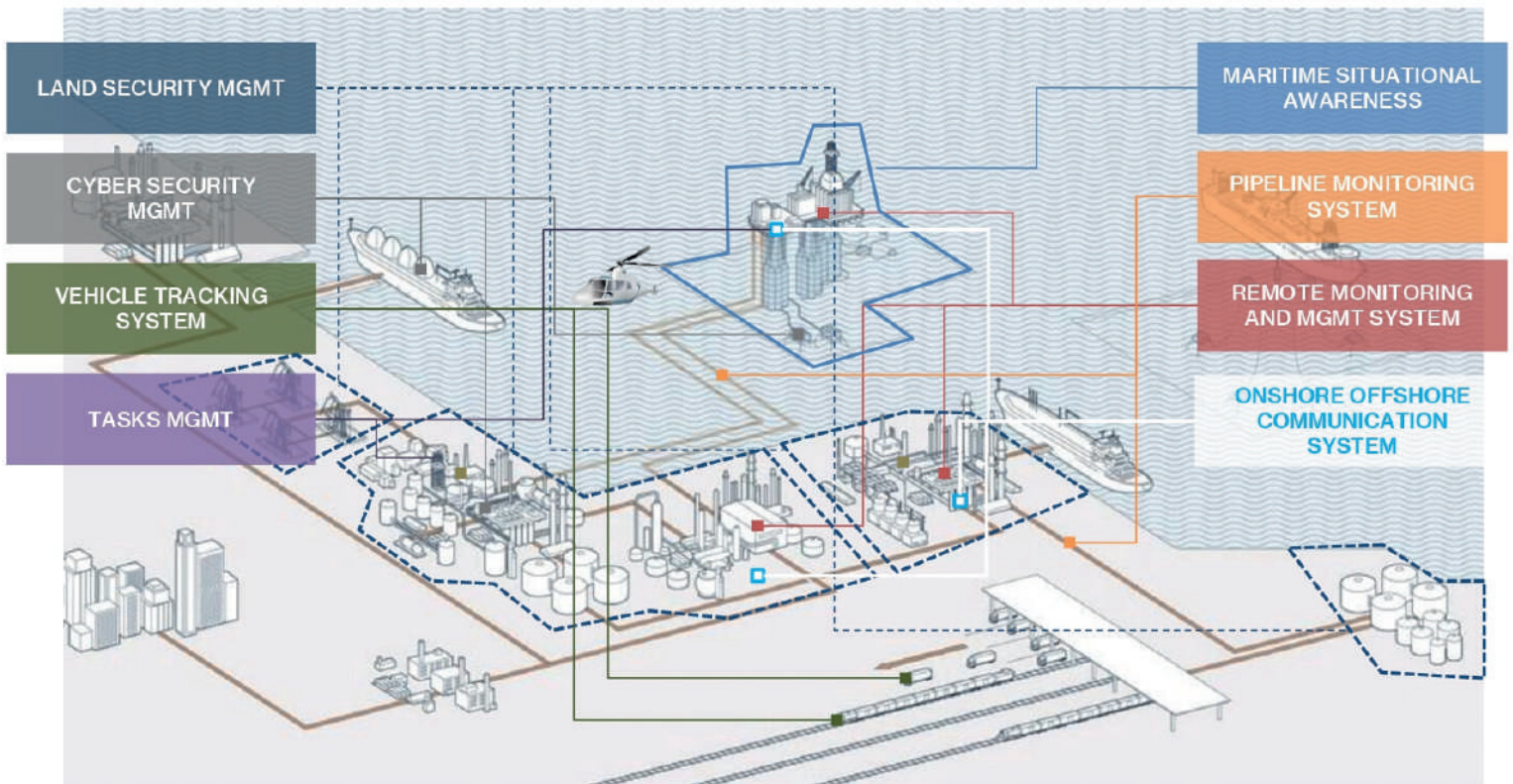
1. Hurricane
2. Tsunami Alert
3. Earthquake
4. Electric Storms
5. Flood
6. Volcanic Eruption Threat
7. Epidemiological Risk
8. Forest Fires
9. Landslides
10. Heavy rains (above the historical low)
11. Drought

## OTHER FEATURES OF THE SOLUTION

1. Smaller-scale threat management
2. Multi-user access with different access profiles and modification of the Information
3. Inclusion or removal of assets as they are acquired or no longer part of the group
4. Includes additional data about assets, such as: number of employees and commercial value of the asset.
5. Performance indicators
6. Staff in charge for different types of risk
7. Inclusion of legal threats, such as the modification of POT or relevant national regulations (exploration permits)



# SOLUTIONS





# Intelligent monitoring system for pipelines

## General

Protecting pipelines from sabotage, illegal exploitation and terrorist action, combined with the detection of leaks and failures in online equipment, is a high priority in all countries, but has been notoriously difficult to achieve.

These facilities are critical infrastructures of great importance and value. If a pipeline is damaged, significant revenue will be lost, environmental damage can be caused and leakage could be a potential hazard to the local population. More importantly, a terrorist attack on an unprotected pipeline could have catastrophic consequences.

Composed in three parts:

- **Control Room** - Equipped with multi-users, multi-interfaces and WEB based tools; provides clear and complete information on the status of leaks and detection of events.
- **VBrain SUITE** - It is the essence of the product, it traces the complete monitoring information and the automation of connections to provide a comprehensive analysis in the field.
- **Sensor Networks** - Built with innovative detection equipment to monitor leaks, illegal extractions and warning events. According to the customer's needs.



# Control Room

AVIATEK's control room ensures the best levels of rigor (Availability, Reliability, Security, Protection) for a critical security system, thanks to the high use interface in terms of information and command teams.

ACTIVATES (scheduled or event-based) planned processes and activities, involving personnel and resources. It can assist the user during the steps required to manage an event, both scheduled and unexpected, giving the necessary resources (systems, people, information) and the related knowledge base.

PROVIDES continuous monitoring on the correct execution of planned activities and disseminates warning information through an alert and process dashboard.

TRACKS each operation and relates the data to different categories, such as service level, forensic analysis, enrichment of the knowledge base, improvement of processes

INTEGRATES all real-time, valuable information for decision-making into a single ecosystem. It also allows the integration of information to suit the emergency plans of different government entities (police, firefighters, security agencies). The solution also allows to integrate all the sensors and existing infrastructure into the ecosystem, optimizing all resources in a functional way.

# Devices and underground pipelines

Pipe ruptures, which require rapid isolation of a particular section, can be easily identified by abnormal changes in flow behavior using appropriate measurement techniques.



By using perfectly matching pairs of transducers, as well as unique measurement algorithms for signal evaluation, the ultrasonic flow meter also detects smaller volume flows with high accuracy.



# Pipelines on the surface

Pipeline handling and control presents unique challenges for its conditions such as its wide length, high value, high risk for exposure and difficulties in access.

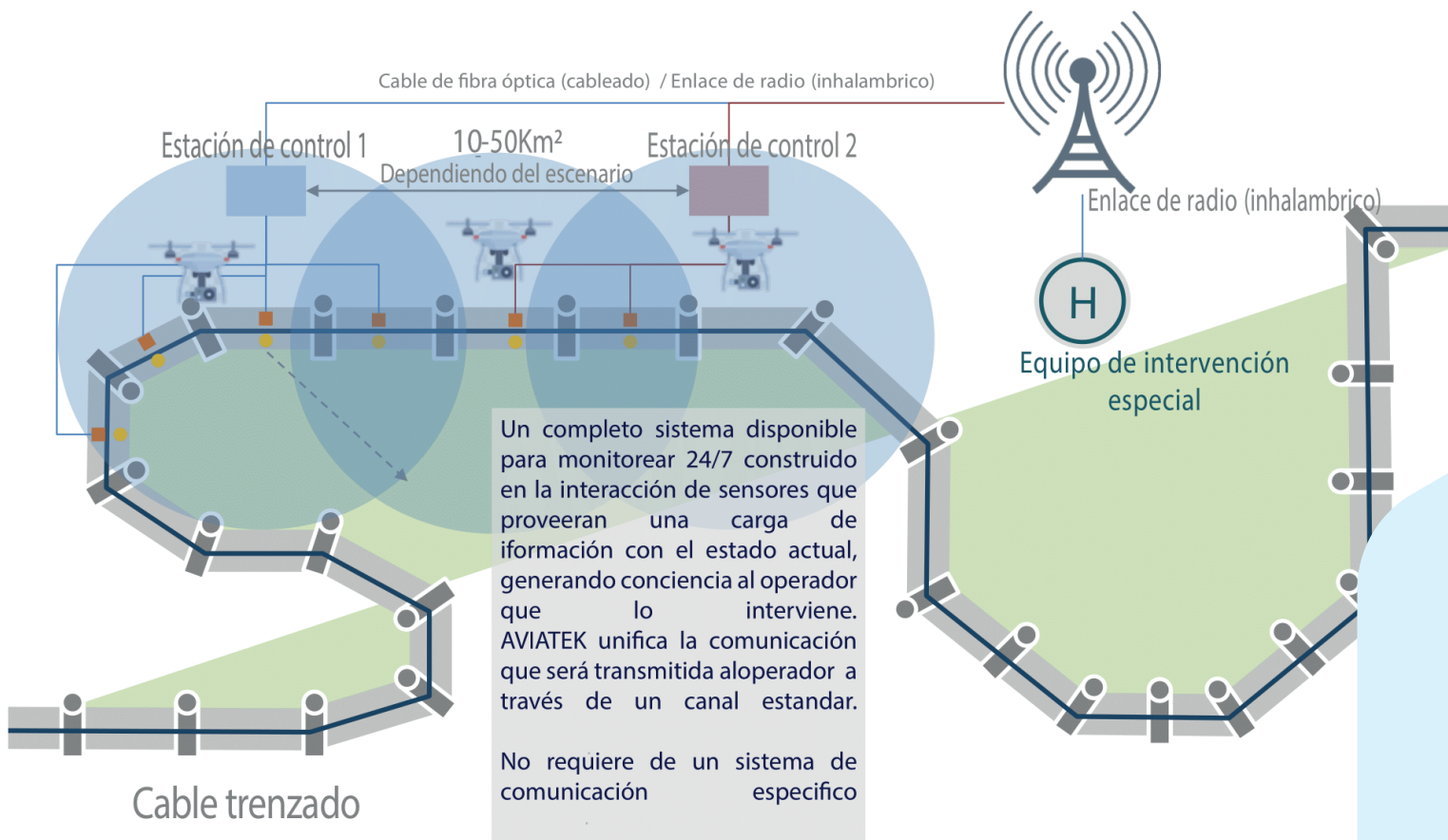
By their nature they require continuous monitoring as well as optimization in maintenance interventions.

The main focus for customers comes from possible leaks that can have a severe impact on the environment and leave the pipeline out of service for further repair.



# SUPERFICIE

## Off-Shore & On-Shore





# Safety in underground pipelines

The complex structure of a pipe network in urban areas represents the most critical and complex expression for monitoring and protecting the infrastructure.

- Multiple ramifications in the structure
- External interference affecting the detection of variations or damage
- Difficulty intervening
- High costs

AVIATEK provides a system capable of monitoring the infrastructure in real time, optimizing the process, reducing losses and reducing risk without an intervention that invades the infrastructure.



# Monitoring of the underground pipe

## Probing/Exploration

Due to the highly volatile nature of methane gas and the complexity in its detection, probes have a very difficult task that can be simplified entirely thanks to a provision of accurate and conscious data.

The most common and effective probes are:

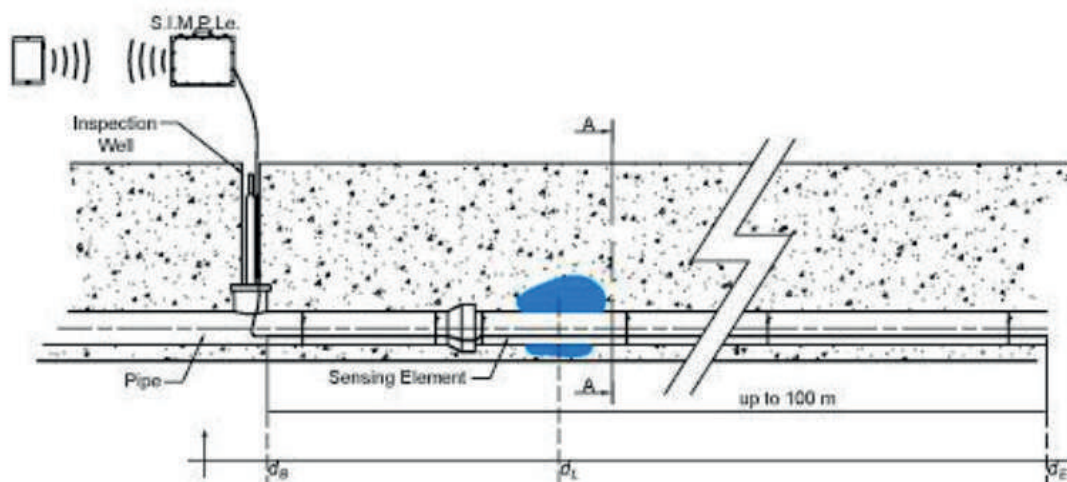
Lidar systems - usually use a laser as a lighting source.

Broad band absorption systems - use lamps as a source

Millimeter wave radar systems - use a special radar over natural gas pipelines

These probes can be fixed, mobile or even be installed in vehicles or drones that patrol the city.

Each and every system has advantages and limitations, and only the combination can be a solution.

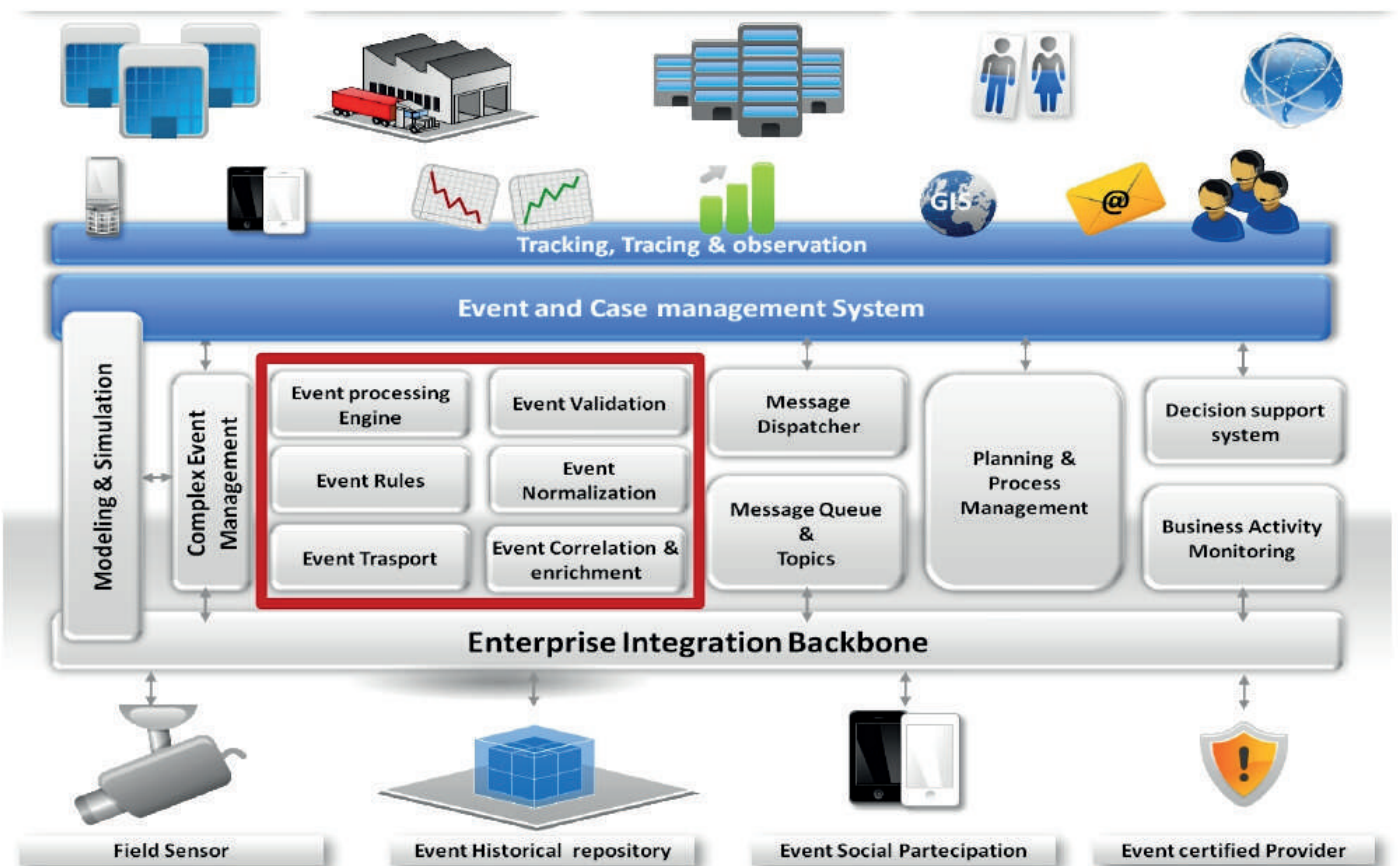




# Architecture system

The control room is universally organized and designed like logical architectures.

In the red square are the application logic tools that make up the EDAT. In this case, the red square is the logical representation of Vbrains EMS (Management System for Events and Occurrences)





# Command and control systems for the protection and management of

## DRONES

AIR MONITORING  
MISSION PLANNING AND MGMT  
3D MAPPING OF LARGE DRONE SWARM AREAS  
WITH AN OPERATOR

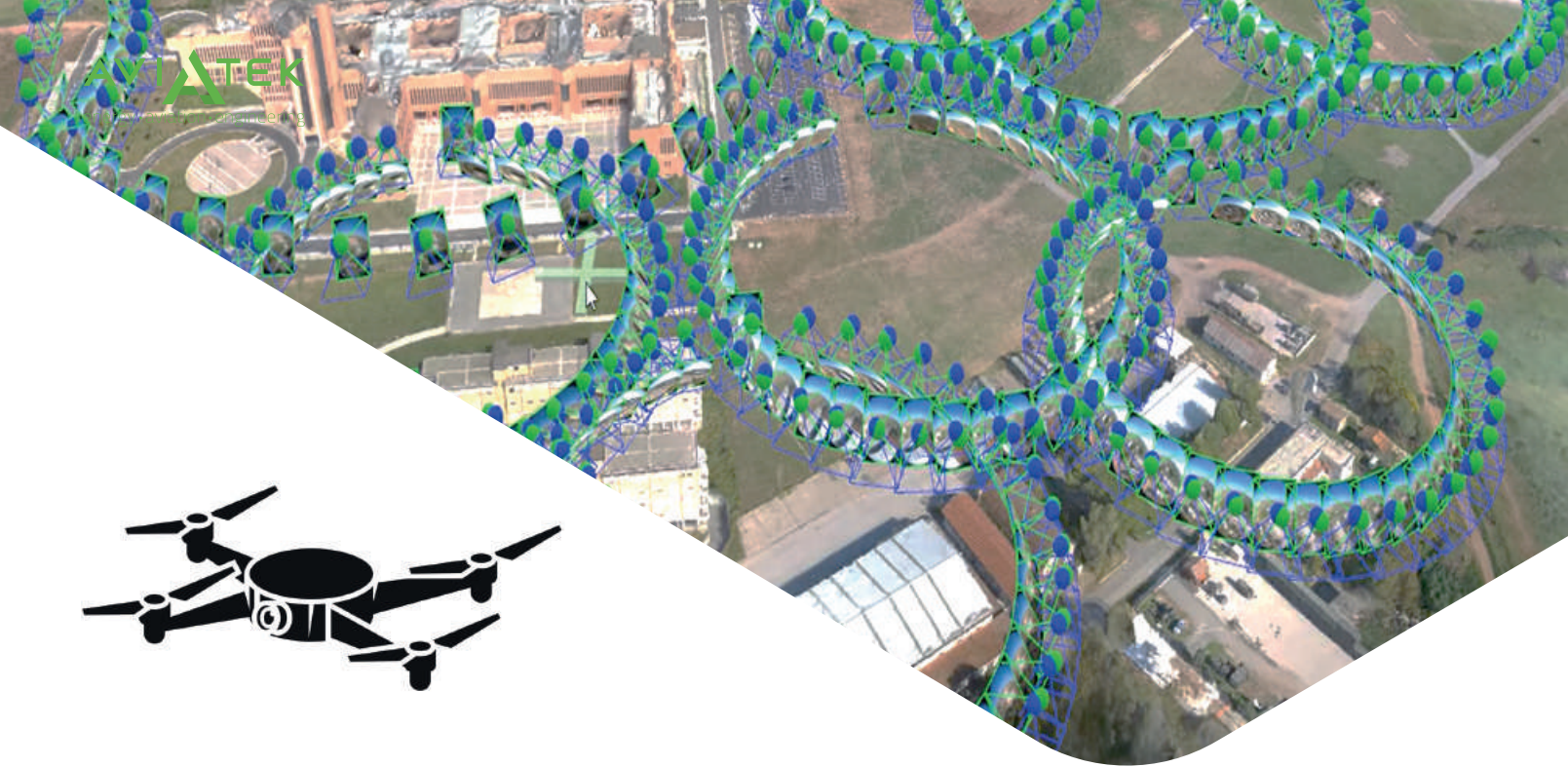


## SISTEMA ANTI-DRONES

THREAT  
HETEROGENEOUS THREAT  
DRONE SWARM ATTACK  
NO NEED FOR GPS







Platform for the provision of advanced products, services and analytical tools for monitoring and managing critical assets and infrastructures.

### Integral solutions for asset and infrastructure management.

It is used to monitor the status of assets by identifying non-conformities, to control the asset environment, it supports day-to-day operations and activities around the operation.



# AVIA ATEK

energy • aviation • engineering



+57 7550996

+1 7862288821



info@aviateksas .com

[www.aviatek .co](http://www.aviatek.co)