CASE STUDY

GAS COMPRESSOR STATION SURVEILLANCE

Background

Gas compressor stations are key infrastructures in the natural gas transmission network. Their role is to maintain gas pressure and flow along the pipelines, ensuring reliable delivery from source to consumption zones. With around thirty such stations in France and many more across Europe, the security of these facilities is paramount.
In recent years, SPYNEL-M has been deployed in multiple countries to secure these sensitive sites. Each station typically covers a surface of approximately 200 by 400 meters, and even though existing surveillance systems are often in place, the need for more reliable, passive, and low-maintenance solutions has driven the adoption of SPYNEL technology.

Challenges

Compressor stations present specific constraints when it comes to surveillance:

- **Critical infrastructure:** Any intrusion or sabotage can disrupt national gas transmission, making them potential targets for terrorism, theft, or vandalism.
- **Explosive risk zones (ATEX):** These areas require passive technologies to avoid ignition sources. Active sensors like radars are not ideal in such environments.
- **False alarm management:** The sites are often located in rural or remote areas where animals frequently trigger alerts on conventional systems.
- **Infrastructure constraints:** Installing multiple cameras around the entire perimeter can be costly and complex due to the size of the site and existing layout.
- **Integration:** Existing security systems use Video Management System (VMS), making it crucial for new technologies to integrate seamlessly.

Solution

To address these challenges, HGH deployed **SPYNEL-M**, a panoramic infrared imaging system offering 360° surveillance with automatic intrusion detection, classification and tracking through **CYCLOPE** software.

A single SPYNEL-M unit is typically installed in the centre of the gas compressor station. It can detect a human intrusion at up to 700meters and classify it at 250 meters. Given the flat layout of pipelines, there are no major blind spots, allowing for optimal line-of-sight coverage. The system monitors both the perimeter fencing and specific zones inside the facility, differentiating between restricted and authorized-access areas.

CYCLOPE software is fully integrated with the existing VMS via the ONVIF plugin, allowing operators to receive real-time alarms and video feeds directly on their familiar interface. In several installations, SPYNEL-M is either the primary detection layer or part of a **dual-layer detection** setup, working alongside buried sensors or smart fences for enhanced threat validation.

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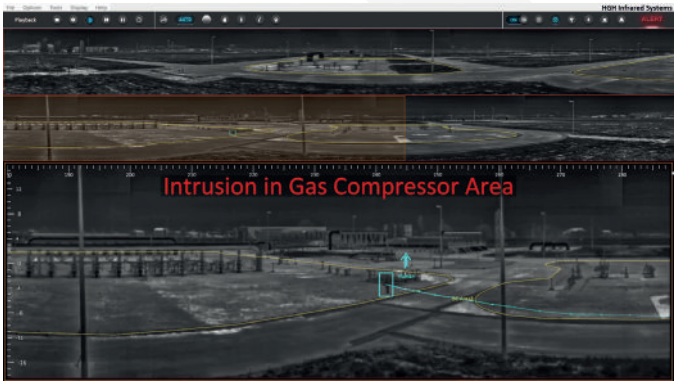
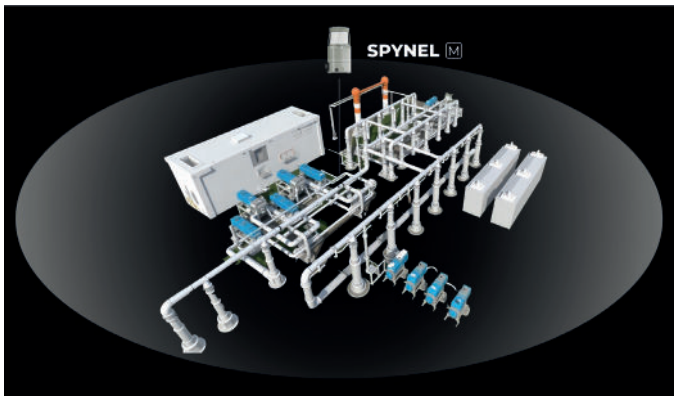
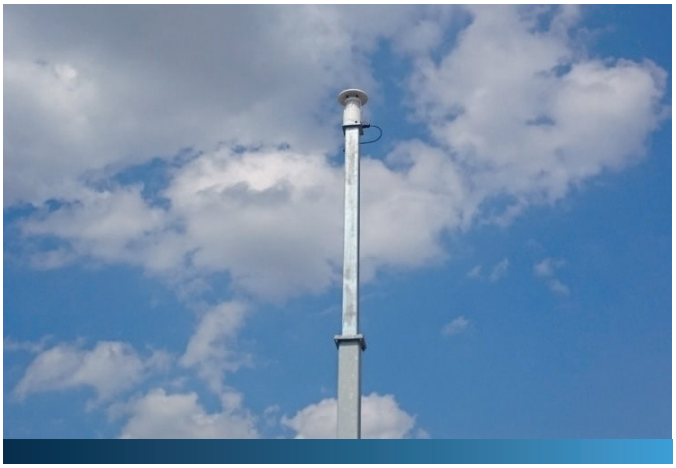
Advantages of SPYNEL-M for Gas Compressor Stations

- **Passive and safe:** Unlike radars, SPYNEL-M is passive and emits no Electro-Magnetic signals, making it suitable for ATEX-like environments.
- **Low False alarm Rate:** The system effectively filters out non-threatening movements, such as animals, reducing unnecessary alerts.
- **Minimal infrastructure:** One unit can cover the entire site, eliminating the need for multiple cameras and reducing the cost of complex installations.
- **No maintenance needed:** SPYNEL-M has operated for years in harsh environments without requiring preventive maintenance.
- **Seamless integration:** Thanks to ONVIF compliance, CYCLOPE has been easily embedded into various VMS solutions in different countries.
- **Advanced tracking:** Intrusions are geolocated with GPS coordinates and recorded with full tracking history.
- **Autonomous:** No operator is needed on site; alerts are automatically triggered, recorded, and transmitted.
- **Supports PTZ cameras:** CYCLOPE software can slew-to-cue Pan-Tilt-Zoom cameras for visual confirmation of intrusions.



Cyclope software Graphical User Interface





Spynel-M sensor on mast

> Conclusion

SPYNEL-M has proven to be a reliable, low-maintenance, and highly effective solution for the surveillance of gas compressor stations in multiple European countries. Its passive operation, ease of integration, and ability to perform in challenging environments make it the preferred choice over radar and other active systems. By enhancing situational awareness and reducing operational costs, SPYNEL-M contributes to the robust protection of critical energy infrastructures.

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Contact us : hgh@hgh-infrared.com | hgh-infrared.com

EUROPE
10 rue Maryse Bastié
91430 Igny, FRANCE
Phone: +33 1 69 35 47 70

USA
1240 E Campbell Rd Ste. 200,
Richardson, TX 75081, USA
Tel: +1 805 965 6701

ASIA
1 Paya Lebar Link, #04-01
Singapore 408533
Phone: +65 6955 8585