



CHEMICAL MONITORING OF CRITICAL SITES & INFRASTRUCTURES

EARLY WARNING & OPTIMUM RESPONSE TO CHEMICAL THREATS & LEAKS

CONTEXT

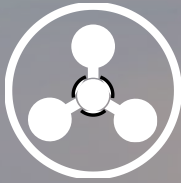
Today's chemical risks are increasingly complex, hybrid and shape-shifting, whether they are linked to high-intensity conflicts, terrorist attacks or industrial accidents.

In most cases, the release of chemical substances poses a real threat to health, leads to serious economic consequences and undermines the sovereignty of States. In recent years, incidents involving chemical substances have multiplied:

- **2019:** The Aramco group's factories in Saudi Arabia were victim to a drone attack. The attack affected 18 critical installations, including stabilization towers and fuel tanks.
- **2019:** The fire at the Lubrizol chemical plant in Rouen, France, classified as a "Seveso high threshold" facility storing phosphorus and organosulphur products, caused major air pollution, with black smokes reaching more than 20 km.
- **2020:** A massive stockpile of 3,000 tons of ammonium nitrate caused two explosions in the port of Beirut, Lebanon. The incident caused extremely heavy loss of life and property, as well as considerable environmental damage.
- **2022:** The sabotage of the Nord Stream gas pipelines caused large-scale methane leaks into the Baltic Sea, leading to significant environmental pollution in areas close to the explosions.

With increasing incidents involving chemical substances, private and governmental organizations need more than ever to work together to limit health and economic effects, and to respond optimally in emergency scenarios.

This requires reliable, advanced technologies to monitor and detect any type of chemical threat in and around critical infrastructures.



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BERTIN SOLUTION

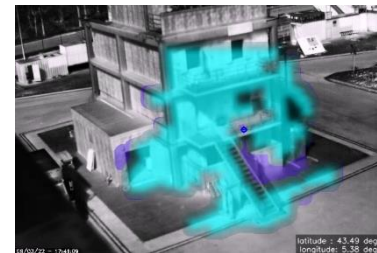
To monitor chemical threats, Bertin Technologies offers Second Sight, a **remote gas cloud monitoring system**. Featuring the **widest field of view** of any remote chemical detector, this **infrared multispectral camera** visualizes one or more gas clouds, for **effective day/night surveillance** in complex environments.

In no more than 10 seconds, Second Sight **detects, visualizes and identifies chemical gases**, which it displays in **real time** on its man-machine interface. This gives operators concrete information on the **location of the source**, the **point of contamination**, the **name of the gas** and an **estimate of its surface concentration**, to help them implement the appropriate countermeasures.

Able to identify **Chemical Warfare Agents (CWAs)**, **Industrial Toxic Compounds (TICs)** and **Volatile Organic Compounds (VOCs)**, Second Sight also has an 'X-Gas' function to detect mixed gases, impure and unlisted gases.

Easy to use, versatile and remotely operable, Second Sight can be mounted on buildings, tripods and vehicles, with an optional Pan&Tilt system, for 360° viewing of chemical gases from a critical infrastructure or its surroundings.

For petrochemical platforms, an **IECEx cabinet** has been developed to withstand explosions, in compliance with current industrial standards.



IHM



Tripod & Pan&Tilt configuration



IECEx cabinet

USE CASE

Explosive gas leaks represent a real operational risk for refinery operators, requiring constant anticipation and local monitoring. Gas can accumulate to form dangerous clouds that can ignite or explode when they reach a certain concentration, causing a major health, industrial and environmental risk.

To prevent this risk, an Oil & Gas company operating in **Saudi Arabia** awarded Bertin Technologies a contract to supply, install and commission a **gas leak detection system** consisting of **8 Second Sights**. Two cameras installed on top of 35-meter masts provide **overall surveillance of the plant**, while the other six, placed on the ground, **monitor strategic storage places**.

If an alarm is triggered, the camera **locates the source of the leak**, **displays the contaminated area**, and **shows the direction and progress of the gas cloud**, enabling refinery operators to intervene with full situational awareness and implement the **appropriate countermeasures**.

CONCLUSION

More than ever, chemical threats are a major issue for the environment and public safety. It is therefore vital to be equipped with a **precise, high-performance solution** like Second Sight.

This chemical detection camera can **provide an early warning** and **visualize the source of the cloud in real time**, enabling first-responders to **optimize their response** in the event of a proven threat. It is the ideal solution for 24/7 protection and surveillance of sensitive sites and critical infrastructures against toxic industrial compounds and volatile organic compounds.