

CHUBB®

Optical Gas Imaging: An Effective LDAR Method



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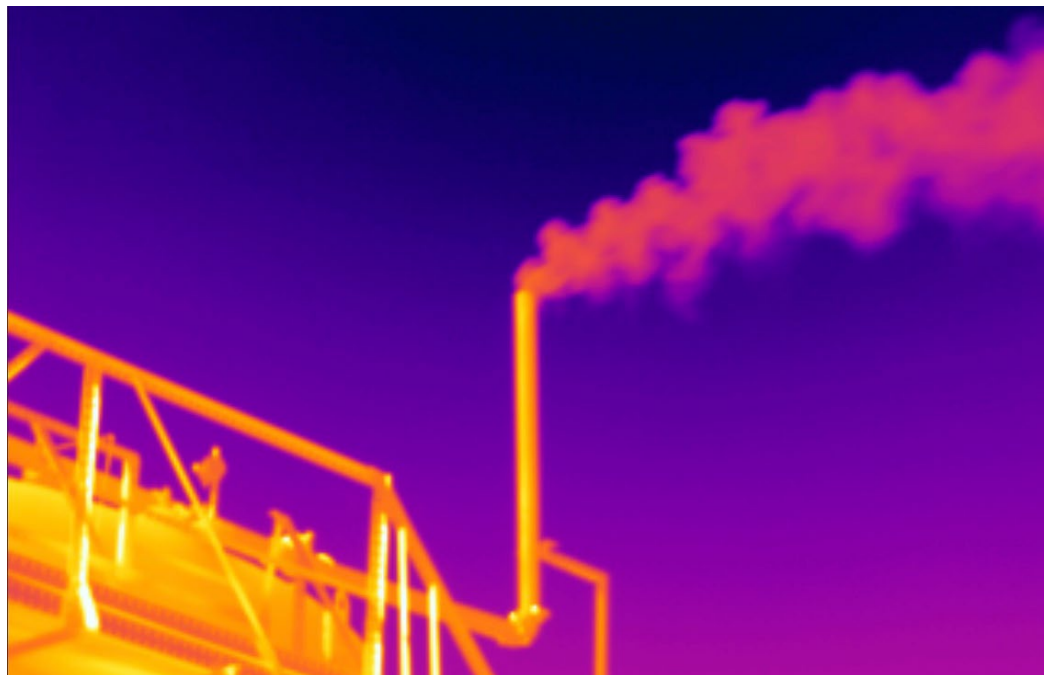
Energy companies face a chronic challenge in their operations: The production, transportation, and refining of oil and gas products frequently results in emissions of greenhouse gases, especially methane. These leaks have environmental consequences—with methane having an impact on global warming that is 28 times greater than CO² over a 100-year period.¹

Methane leaks also represent lost revenues—and can result in increased regulatory fees and other financial impacts. State and federal agencies, as well as the United Nations, have issued new regulations and guidelines aimed at reducing methane emissions in the energy sector. Methane emissions reduction has become an important component of corporate ESG activities.

Reducing emissions with an effective leak detection and repair (LDAR) program

- **To mitigate emissions**—and comply with methane emissions reduction regulations—oil and gas companies should establish a robust leak detection and repair (LDAR) program. The primary focus of an LDAR program is to minimize leaks from equipment, facilities, and infrastructure to decrease environmental impacts and increase production by keeping gas in the pipes. While Optical Gas Imaging (OGI) can be considered the foundational technology of an effective LDAR program, there are numerous other technologies on the market, such as: continuous monitoring with fixed point detection, drone, airplane, or even satellite surveillance.

Each one of these technologies has its own place in the methane monitoring ecosystem, but utilizing a combination of these technologies is key to an effective LDAR program. Combining these various technologies is an effective way not only to better identify leaks, but also manage costs and associated operational risks.



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The advantages of OGI for your LDAR program

[OGI cameras](#) are a specialized imaging technology that are tuned to identify specific gases based on their unique spectral signature. These cameras visualize gas emissions by limiting the energy that reaches highly sensitive detectors, making gas emissions appear as “smoke” in the image. Benefits of using OGI include:

- **Protecting employees**—Keeping employees safe is top of mind for any organization. Because OGI is a non-contact technology, inspectors are able to survey for leaks at a considerable distance from the potential source, decreasing the likelihood of injury or illness. For example, an inspector can identify a thief hatch leak without being potentially exposed to the [rapid release of VOCs](#).



- **Minimizing product loss**—Almost every company can benefit from keeping more gas in the pipes. OGI cameras help quickly identify and locate leaks, allowing for rapid repair and limiting the loss of product through fugitive emissions.
- **Avoiding shutdowns**—OGI cameras are capable of monitoring for leaks on live equipment, which is extremely beneficial. OGI's ability to pinpoint leak sources helps avoid the need for total plant shutdowns, which may be required when relying on other technologies that are not as granular as OGI in their detection capabilities. Additionally, OGI cameras have a unique capability of seeing the emission event in real time allowing an operator to better diagnose if the emission event is a leak—fugitive emission—or a vent in the process that could be permitted for safety reasons.
- **Achieving accurate, rapid leak detection**—OGI can pinpoint gas leaks more effectively than other technologies, such as drone or satellite surveillance. Other detection methods such as AVO (audio, visual, olfactory) or sniffer are also not nearly as effective or efficient. A sniffer is only capable of detecting a leak on a single piece of equipment at a time, and AVO is only capable of identifying major issues, such as an open thief hatch. In comparison to other methods that can take days, OGI cameras can survey thousands of points in a single survey. In addition, OGI can enable operators to understand the severity of emissions and whether emissions are operational or fugitive in nature—a capability that many other technologies cannot match.

The use of OGI can also help operators meet regulatory compliance requirements as well as third party initiatives for methane emissions management.

While OGI should be a cornerstone of any LDAR program, its use can incur increased costs and risks associated with technicians traveling from site to site. To help mitigate these exposures, a company may use another form of technology (e.g., fixed point, drone, etc.) to first identify a leak, and then deploy an OGI crew to further pinpoint the leak source.

When deploying OGI cameras, consider following these best practices:

Define detection needs—Not all OGI cameras are created equal. Operators should select the appropriate equipment based on what gases and emissions rates are targeted for detection.

Consider quantitative analysis—OGI cameras by themselves are qualitative analytical tools that simply visualize gas. When combined with a more comprehensive quantitative optical gas imaging system, cameras can measure mass leak rates, volumetric leak rates, and concentrations for most hydrocarbon gases.

Choose a certified camera—Inspections may occur in areas where equipment requires additional safeguarding, such as properly rated electrical protection. Select a camera rated for the proper environment to avoid potential fire or explosion.

Leverage temperature measurement—OGI cameras are often calibrated for temperature measurement, making them dual purpose solutions. Oil and gas customers can use them to both see gas as well as detect hotspots on electrical components for preventive maintenance, identify levels in tanks, inspect separators for inefficiencies, and more. In addition, temperature readings can also help visualize leaking gas.

Invest in training—Specialized training can help improve OGI system design, deployment, and use. Investing in OGI education can help improve the overall success of your LDAR program.

Chubb is here to help

Working with a range of consultants, including Teledyne FLIR, Chubb Risk Engineering Services helps our energy clients manage a variety of risks, including the growing risks associated with methane emissions. Current clients interested in learning more can reach out to their Chubb risk engineer or email methane@chubb.com. If you're new to Chubb, talk to your independent broker or agent about the benefits of working with Chubb.

Visit the Chubb Methane Resource Hub

Chubb has created an in-depth resource portal to help oil and gas companies identify and adopt methane emissions reduction technologies. [Learn more](#)

¹<https://www.epa.gov/ghgemissions/overview-greenhouse-gases#methane>, accessed on October 5, 2023.

Teledyne FLIR designs, develops, manufactures, markets, and distributes technologies that enhance perception and awareness. FLIR brings innovative sensing solutions into daily life through our thermal imaging, visible-light imaging, video analytics, measurement and diagnostic, and advanced threat detection systems.

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