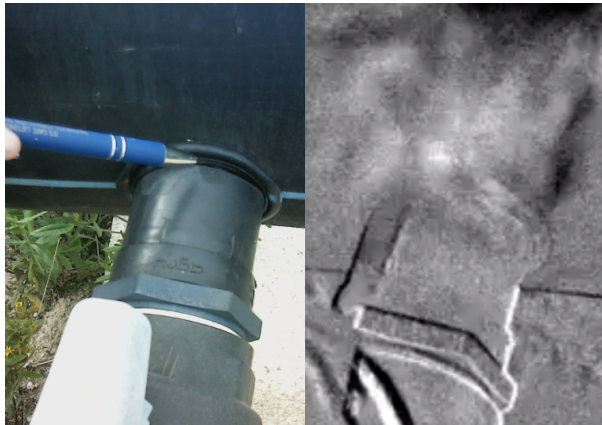


LDAR Leak Detection

LDAR (Leak Detection and Repair) is a proven methodology used in the oil and gas and energy industries **to identify, quantify, and manage fugitive emissions from industrial facilities**. By systematically detecting leaks of methane and other volatile gases across storage, production, and distribution systems, LDAR programs help operators reduce environmental impact, improve occupational safety, and minimize economic losses associated with unintended emissions.

Increasing regulatory pressure, climate commitments, and the need for transparent emissions reporting make LDAR programs a critical component of modern asset integrity and emissions management strategies.



THE Applus+ SOLUTION

LDAR Leak Detection and Repair: Improving Performance and Emissions Management in Oil and Gas

LDAR "Leak Detection and Repair" is the tailored service provided by Applus+ to improve companies' performance in the Oil and Gas industry. Knowledge acquired through years of working with companies that perform LDAR as part of their regulatory requirements is applied, ensuring the best results and alignment with internationally recognised fugitive-emissions management practices and standards, such as ISO 17025 or Method 21 for Volatile Organic Compound Leaks.



The Leak Detection and Repair (LDAR) Program is a methodology based on the inspection of all elements of a facility that comprise the storage, production, and distribution lines, identifying any type of volatile substance that may leak in the system using recognised techniques such as Optical Gas Imaging (OGI) and PID/FID measurements. These leaks cause losses that affect the environment, occupational safety, and the system's overall economic performance, as well as the performance of its parts.

The Applus+ LDAR Solution Aligned with OGMP 2.0 and International Methane Standards

Applus+ implements, develops, and maintains LDAR Programs applied to the following sectors, incorporating practices aligned with OGMP 2.0 (Oil and Gas Methane Partnership 2.0) guidelines:

- **Petrochemical:** Hydrocarbons and other Volatile Organic Compounds (VOCs), Ethanol, Hydrogen.
- **Energy and Gas:** Methane (CH₄).
- **Landfills and Treatment Plants:** Methane (CH₄) and other residual gases.
- **Livestock:** Methane (CH₄) and other residual gases.

Applus+ also actively participates in improving measurement and testing processes and in the operational verification of new technologies developed to provide the oil and gas industry with better quantification of their methane emissions. This is done to ensure alignment with the latest internationally recognised methodologies for methane-emissions reduction, with goals for the progressive reduction and mitigation of methane emissions.

To strengthen the operational management of LDAR Programs, Applus+ provides its own software, [FEMA+, a digital platform specifically designed for fugitive emissions control.](#) FEMA+ allows users to generate dashboards, track inspection campaigns, manage and create inventories with our smart drawing reader, and analyse leak evolution, offering real-time visibility into the entire LDAR process with full traceability. The platform supports offline work, enables 3D visualization of facilities, and centralizes all campaign information to improve traceability, productivity, and decision-making.

Who Benefits from LDAR Programs: Target Customers and Operational Use Cases



The LDAR program provides detailed and useful information for decision-making affecting maintenance, operations, the environment, procurement, prevention, and management, ensuring a consistent and auditable approach based on:

- **Establishing an inventory of all possible leakage points** in a facility and the process lines included in the LDAR Program.
- **Qualitative evaluation of detected leaks** using Optical Gas Imaging (OGI) cameras with infrared (IR) technology.
- **Quantitative evaluation of detected leaks** using measurement and testing equipment based on PID/FID technologies (Photoionization/Flame Ionization), and monitoring their leak flow rates.
- **Calculating theoretical emission factors** for leaks and developing emission factors specific to each installation.
- **Monitoring and re-monitoring leakage points** after repair and maintenance. Reducing fugitive emissions of volatile organic compounds (VOCs), lowering occupational risks, and minimizing raw material and product losses.

Using FEMA+, all these activities can be visualised, recorded, and evaluated through customisable dashboards, facilitating the monitoring of repair status, historical leak behaviour, and compliance.

Key Customer Benefits of LDAR Programs: Cost Reduction, Safety, and Regulatory Compliance

Partnering with Applus+ for the implementation and monitoring of LDAR Programs offers, among others, the following benefits to clients, ensuring measurable improvements and compliance support:

- **Immediate quantification of economic losses** associated with unintended fugitive emissions of raw materials, products, and by-products influencing direct operating costs.
- **Identifying maintenance issues** that are not visible to the human eye, allowing for timely repairs.
- Provides **an objective overview of an installation's condition** and relevant information for decision-making associated with the acquisition of equipment and components.

Detailed information is available to assess the risks posed by leaks of volatile gases of any nature to human health and the environment, supporting transparent reporting and mitigation planning.

