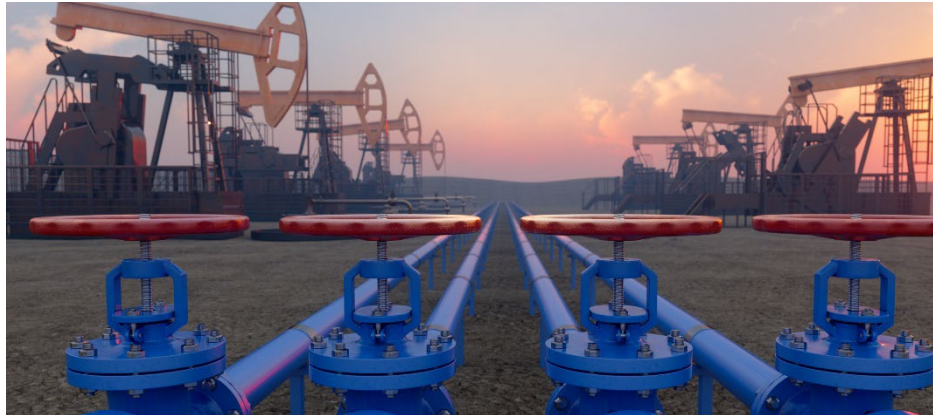


To The Point Leak Detection and Repair (LDAR) Program

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A leak detection and repair (LDAR) program is a comprehensive set of activities designed to identify, monitor, and mitigate fugitive emissions and leaks of volatile organic compounds and methane. These emissions can occur during oil and gas extraction, production, processing, storage, and transportation.

The LDAR program's main goal is to minimize leaks from equipment and components such as valves, pumps, tanks, piping, and other oil and gas infrastructure. By promptly identifying and repairing leaks, companies can reduce their environmental impact, comply with regulatory requirements, optimize operational efficiency and product recovery, and promote safety and fire prevention in some circumstances.

Program Components

At a minimum, a model LDAR program contains the following components:

- **Equipment Inventory:** Identify equipment and components at a site-specific level with the potential for methane leaks. Once identified, they should be assigned an identifier for tracking purposes.
- **Definition of a Leak:** Define what a leak is based on the applicable site specification regulation(s). It is a best practice to use the lowest applicable leak definition while allowing a safety margin to compensate for errors when monitoring equipment. Leak definitions should also be specific to the type of process and equipment being monitored.
- **Leak Detection Methods:** Utilize methods for detecting leaking components specified in applicable regulatory requirements or those adopted by a specific industry group. Common standards include the American Petroleum Institute (API)

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recommended practices and Method 21. Method 21 often speaks to the type of monitoring equipment used, calibration of monitoring equipment, placement of monitoring equipment, etc.

- **Frequency of Monitoring:** Monitor for leaks regularly. Regulatory LDAR programs specify frequencies ranging from once annually up to six times or more per year, sometimes varying by site or facility type and size. Quarterly monitoring is considered effective at many site types.
- **Prompt Leak Repair:** Repair or replace the leaking component within the time specified in the LDAR program. While repairs or replacement should be completed at the earliest convenience, common timeframes are to repair or replace within five days of discovery, and a second attempt, if required, be completed within 15 days.¹
- **Training:** Develop and implement an ongoing monitoring program based on the findings of the initial leak detection study. A training program ensures that the LDAR program will function properly. The program should educate personnel on their roles and responsibilities, proper use and maintenance of monitoring equipment, monitoring protocols, repair protocols, and recordkeeping requirements.
- **Recordkeeping:** Record LDAR monitoring practices, emission results, and repair activities for regulatory compliance and to validate the LDAR program's effectiveness regarding continuous improvement.

- **Management of Change (MOC):** Develop a MOC procedure to ensure that any impact from equipment addition, modification, or replacement is fully assessed before a change occurs.
- **LDAR Program Audits:** Audit the LDAR program to ensure that it is being administered as intended and is driving results toward continuous improvement. Audit schedules must be spelled out in the LDAR program, and audit findings must be properly documented to drive corrective and preventive actions (CAPA).

LDAR Benefits

An effective LDAR program can bring many benefits to an organization, from improving public image to compliance with various regulations. While there may be many more, the following are commonly recognized benefits:

- Reduces methane and other Greenhouse Gas (GHG) emissions.
- Reduces product loss and potentially lost revenue.
- Enhances workplace safety conditions for both employees and contractors performing work on owned assets.
- Enhances public perception.
- Decreases impact on public health as the result of volatile organic compound (VOC) and hazardous air pollutant (HAP) emissions.
- Ensures compliance with various local and federal regulations while avoiding potential fees and penalties.

Importance of LDAR

An established LDAR program that is site-specific and can be consistently applied across all operating assets is crucial in providing evidence-based fugitive emissions management. LDAR is a foundational program for addressing remedial emissions issues while supporting methane inventorying activities.

References:

1. **Environmental Protection Agency (EPA): Leak Detection and Repair – A Best Practice Guide,**
<https://www.epa.gov/sites/default/files/2014-02/documents/ldarguide.pdf>

Resources:

1. **Environmental Protection Agency (EPA): Method 21,**
https://www.epa.gov/sites/default/files/2017-08/documents/method_21.pdf
2. **Methane Guiding Principles: Equipment Leaks Best Practice Guide,**
<https://methaneguidingprinciples.org/resources-and-guides/best-practice-guides/equipment-leaks/>
3. **American Petroleum Institute (API): Standards,**
<https://www.api.org/products-and-services/standards/>
4. **United Nations Environment Programme (UNEP): OMGP 2.0,**
<https://ogmpartnership.com/guidance-documents-and-templates/>

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