



RP 1175

API RP 1175
Pipeline Leak Detection
Program Management



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The industry focus is prevention, aiming to achieve the goal of zero releases. While operators are taking significant steps towards their objective, they must have a mitigation strategy should a release occur, and the appropriate leak detection program, composed of effective leak detection systems, is a part of successful mitigation.

What Is It? 7

API RP 1175, Pipeline Leak Detection-Program Management, gives operators valuable guidance on the components needed, with culture and strategy being of utmost importance.

How To Begin? 27

The instruction in API RP 1175 is flexible and scalable, allowing any pipeline operator the opportunity to implement it. Industry must begin to implement effective LD programs, though, by identifying the gaps between their existing program and what is detailed in the RP. Then, industry must take steps to close these, with necessary reviews at periodic intervals in the program's life cycle.





WHY DO WE NEED IT?

Leak Detection Programs are essential to minimize releases

Minimize impact of releases on people
Public and employees

Minimize impact of releases on the environment
Animals, plants, waterways, and soil

Minimize impact of releases on infrastructure
Buildings, roads, bridges, other utilities, and pipelines

Driving industry performance toward a goal of zero releases

We need systems, processes, and people to detect problems quickly and resolve them promptly



WHY WAS THIS RP NEEDED?

Pipeline Leak Detection — Program Management

It's not enough to have a Leak Detection (LD) system

It must be designed and installed appropriately
Various operating situations and conditions

It must be maintained so it works when needed
Reliability, availability, maintainability

It must be tuned so it works as needed
Alarms only and always when it should

People must know what to do along with others

- Roles and responsibilities
- Documented procedures
- Training, testing, and drills

Leadership must support

Effective leadership strategy and supportive culture



Photo courtesy of Plains All American Pipeline

Leak Detection (LD) Task Force

Guidance document to address concerns of mandate.

LD Initiatives & Rulemaking Considerations

PHMSA presented to API April 17, 2013, seeking feedback on path forward.

General Accounting Office (GAO) Study

"DOT should: 1) improve incident response data and use these data to evaluate whether to implement a performance-based framework for incident response times and 2) share guidance and information on evaluation approaches to inform operators' decisions."

NTSB Recommendation P-11-10

"Require that all operators of natural gas transmission and distribution pipelines equip their SCADA systems with tools to assist in recognizing and pinpointing the location of leaks, including line breaks; such tools could include real-time leak detection system and appropriately spaced flow and pressure transmitters along covered transmission lines."

Congressional Mandate

"Pipeline Safety, Regulatory Certainty and Job Creation Act of 2011, Section 8 – Leak Detection required to analyze technical, operational, and economic feasibility aspects on leak detection systems..."

Proactive

Comprehensive integration

- Establishes a framework for LD program management for pipelines
- Enhances conformity with regulations; augments (does not replace) existing standards and requirements

Tactical

Analyze

- Integrate data
- Share guidance
- Decision support

Reactive

High-level interest



WHAT IS IT?

Overview of Leak Detection Program

Pipeline leak detection shall be managed by structuring the various elements of leak detection into a leak detection program

API RP 1175 divides a Leak Detection (LD) program into the following components:

LD culture and strategy

Selection of LD methods

Performance targets, metrics, and KPIs

Testing

Control center procedures for recognition and response

Alarm management

Roles, responsibilities and training

Reliability Centered Maintenance (RCM) for LD equipment

Overall performance evaluation of the LD program

Management of change

Improvement process

API RP 1175 focuses on LD programs, not only LD systems

LEAK DETECTION

Leak Detection Culture

Management support for the Leak Detection (LD) program
– visible and ongoing

Employees understand the LD strategy

Recognition and integration of all methods
of leak detection

Ongoing support toward improving pipeline
leak detection (even if the pipeline operator is meeting
leak detection goals)

Promotion and endorsement of teamwork within
departments and across the organization

Collaboration between the different entities involved
in the LD program

Culture is maintained by having a healthy sense
of vulnerability

**A strong LD culture promotes prompt action to help
reduce the consequences of a leak**



Leak Detection Strategy

A written document that promotes the company's Leak Detection (LD) Culture and transforms it into action

Begins with a gap assessment to identify areas for improvement

Outlines the requirements of the LD program

Sets goals and establishes timelines and responsibility

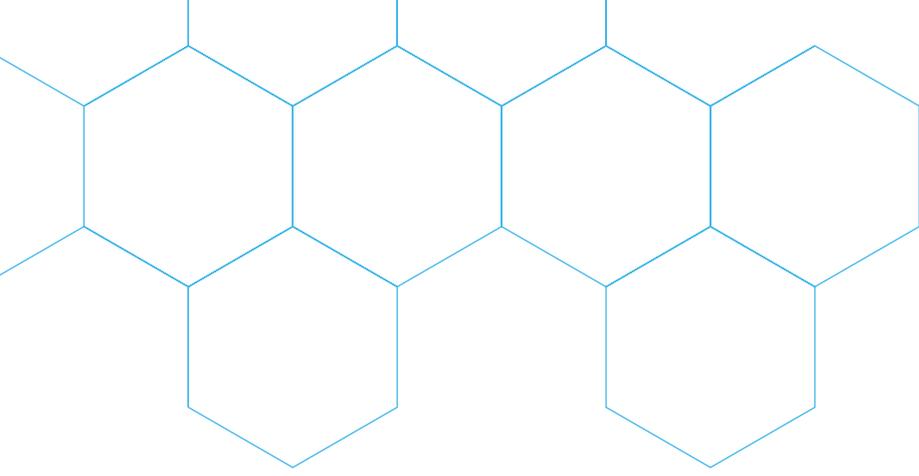
Describes how the company will meet regulatory requirements and go beyond the minimum to implement industry best practices

Clearly defined roles, responsibilities, policies, procedures, and processes

Involves strategy planning and strategic thinking

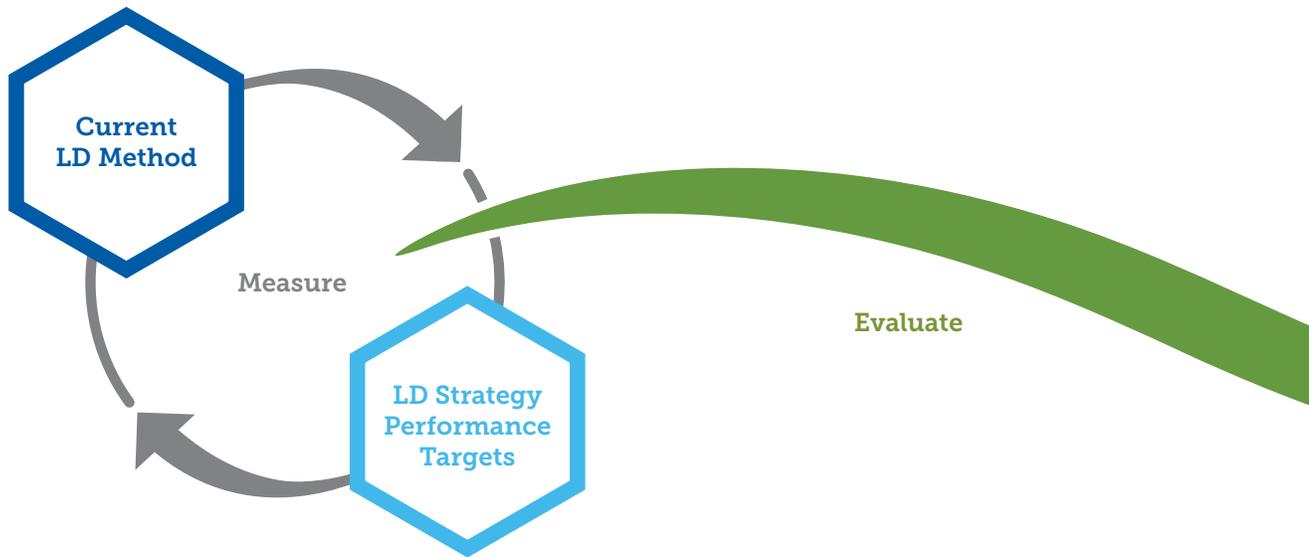


Photo courtesy of Phillips 66 Pipeline



Key Leak Detection Strategy Elements

- Visible management commitment and leadership
- Consistency with company goals and requirements
- How goals and requirements should be satisfied
- Employment of risk management
- Selection of Leak Detection (LD) methods
- Integration of all forms of leak detection employed
- Consideration of regulatory requirements and industry standards
- Ongoing measurement of program's performance
- Training, testing, and operations/procedures
- Reporting
- Review and approvals
- Management of change
- Ongoing improvement



Selection of Leak Detection Methods

Perform risk assessment with Leak Detection (LD) focus

Include regulatory requirements and best practices

Identify options for an integrated LD strategy

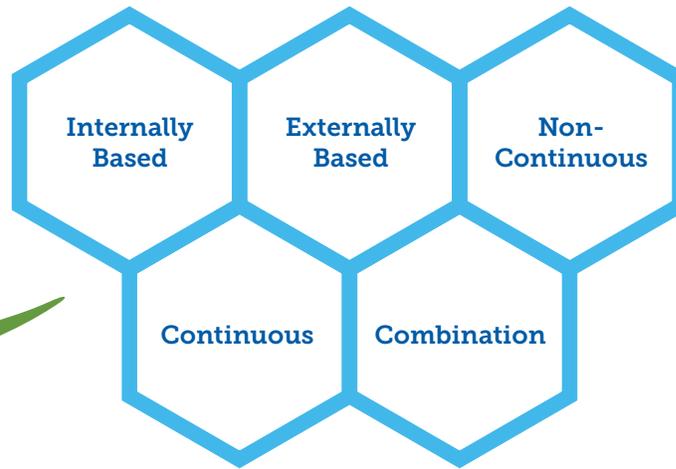
Consider primary, complementary, and alternative LD

Assess requirements of individual pipelines

Link to LD strategy performance targets

Evaluate best available technologies to meet LD strategy

Select LD Technology Options



Evaluating Leak Detection Technology Options

Leak Detection (LD) methodologies and technologies cover a wide range of different approaches and principles

LD methodologies can be classified into internally-based and externally-based detection principles; They can be continuous or non-continuous

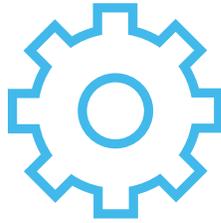
LD options may depend on the complexity of the pipeline system and its operations

Evaluate how the options meet your specific pipeline system design and its operations

It is helpful to review LD selection options with other industry users, vendors, and consultants



**Establish
Targets**



Define



**Track &
Revise**



Performance Targets, Metrics, and KPIs

Establish performance targets, metrics, and KPIs for the Leak Detection (LD) systems

- Draw the line between satisfactory and unsatisfactory

Define, then track to ensure goals are met

Revise as part of a continual improvement process

Performance targets are part of the operator's strategy, and selection process

API RP 1130, Annex C defines these metrics as:

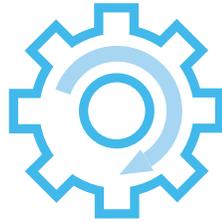
- Sensitivity, reliability, accuracy, and robustness

The metrics may be applied to any LD system

In this RP, the terms "metric" and "KPI" are closely related



Implement



Test



Verify

Testing

Leak Detection (LD) systems shall be tested when implemented, after significant pipeline changes, and on a regular basis not to exceed five years

Testing shall include the requirements of API RP 1130 tailored to the specific pipeline LD system implementation

A detailed, rigorous test plan should be developed and executed using sound engineering judgment

Some LD systems (such as external) may require system-specific testing methods or detailed checklist evaluations (see API RP 1162, Annex E)

The pipeline operator may also consider methods to test control-room staff and LD response procedures

Opportunity to improve the culture, procedures, and knowledge levels



Photo courtesy of Phillips 66 Pipeline