

Pipeline Leak Detection—Program Management

API RECOMMENDED PRACTICE 1175
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Contents

	Page
1	Scope..... 1
2	Normative References 1
3	Terms, Definitions, Acronyms, and Abbreviations..... 1
3.1	Terms and Definitions 1
3.2	Acronyms and Abbreviations 4
4	Leak Detection Program 5
4.1	Details of the Elements of the Leak Detection Program 5
5	Management Commitment and Leadership..... 7
5.1	General 7
5.2	Leak Detection Culture 8
6	Stakeholder Engagement 8
6.1	General 8
7	Risk Assessment 8
7.1	General 8
7.2	Risk Assessment Factors 8
7.3	Risk Tolerance 10
8	Selection of Leak Detection Methods 10
8.1	Selection Process Overview 10
8.2	Incorporating Regulatory Requirements 11
8.3	Evaluating Industry Knowledge 11
8.4	Integrating Operator Requirements 11
8.5	Leak Detection Strategy Requirements 11
8.6	List and Classification of LDSs 12
8.7	Leak Detection Technology..... 13
8.8	Evaluating and Selecting Suitable Technologies 14
8.9	Modifying Selection for Particular Requirements of Individual Pipelines or Pipeline Segments..... 15
8.10	Periodic Review of Selection..... 15
9	Performance Targets, Metrics, and KPIs 16
9.1	General 16
9.2	Performance Metrics and Key Performance Indicators 16
9.3	Performance Targets..... 19
10	Testing 22
11	Control Center Procedures for Recognition and Response..... 23
11.1	Overview of Procedures 23
11.2	Recognition of a Leak Indication..... 23
11.3	Response to a Leak Indication 23
11.4	Validating the Leak Indication 26
11.5	Reporting and Documentation 27
11.6	Pipeline Restart 28
12	Alarm Management 29

Contents

	Page
12.1 Alarm Management Purpose	29
12.2 Data Collection	29
12.3 Categorization.....	29
12.4 Alarm Review.....	30
12.5 Confirmed Leak Review.....	32
12.6 Threshold Setting.....	32
12.7 Tuning	34
13 Roles, Responsibilities, and Training	35
13.1 Roles and Responsibilities.....	35
13.2 Training	35
14 Reliability Centered Maintenance (RCM) for Leak Detection Equipment	37
14.1 Maintenance Overview	37
14.2 RCM Process.....	37
14.3 Leak Detection Component Identification	38
14.4 Design.....	38
14.5 Maintenance Tracking and Scheduling.....	38
15 Overall Performance Evaluation of the LDP	39
15.1 Purpose and KPIs.....	39
15.2 Internal Review	39
15.3 External Review	40
15.4 Key Performance Indicators (KPIs)	40
15.5 Periodic Reporting	41
15.6 Leading and Lagging Indicators.....	41
15.7 LDP KPI Examples	42
16 Controller Training and Retraining	43
16.1 Hydraulics	43
16.2 Alarming/Performance	43
16.3 Data Presentation	43
16.4 Instrument Failure	43
16.5 Validating LDS Alarms	44
16.6 Line-pack Change (Online)	44
16.7 Trending.....	44
16.8 LDS System Operation.....	44
16.9 Abnormal Functions.....	44
16.10 Other Leak Detection Techniques.....	44
17 Management of Change (MOC)	45
18 Improvement Process	45
18.1 Overview of Improvement Process.....	45
18.2 Identifying and Defining Opportunities.....	45
Annex A (informative) Risk Assessment.....	47
Annex B (informative) Developing a List of Selection Criteria	50
Annex C (informative) Factors Affecting Performance	54

Contents

	Page
Annex D (informative) Example of Performance Metrics and Targets.....	55
Annex E (informative) Common LDS Roles.....	57
Annex F (informative) Example Training Program.....	61
Annex G (informative) Example Risk Score Assessment.....	72
Bibliography.....	73

Figures

1	Leak Detection Program Flow Diagram.....	7
C.1	Effects of Uncertainty Types.....	54
G.1	Example Risk Assessment.....	72

Tables

1	Visualization of an Example LDP.....	12
2	Example LDS Techniques.....	13
3	Example Alarm Categorization Table.....	30
4	Role and Content of Training.....	35
A.1	Consequence Factors.....	47
A.2	Likelihood Factors.....	48
A.3	Preventative Factors.....	49
A.4	IMP Factors.....	49
B.1	LDS Features.....	50
B.2	Types of Leak Monitoring.....	52
B.3	Monitoring Performance Indicators.....	52
B.4	Types of Surveillance.....	53
D.1	Example Performance Metric/Target Table.....	55
D.2	Example Performance Metric/Target Table.....	56
E.1	Other Commonly Used Names for Controllers.....	57
E.2	Other Commonly Used Names for Leak Detection Analysts.....	57
E.3	Other Commonly Used Names for Leak Detection Engineers.....	58
E.4	Other Commonly Used Names for Control Center Staff.....	58
E.5	Other Commonly Used Names for Field Operations Staff.....	59
E.6	Other Commonly Used Names for IT Staff.....	59
E.7	Other Commonly Used Names for Trainers.....	59
E.8	Other Commonly Used Names for Management.....	59
E.9	Other Commonly Used Names for Leak Detection Support Staff.....	60
E.10	Commonly Used Names for Other Stakeholders.....	60
F.1	Example RACI Chart of Leak Detection Stakeholders.....	61
F.1	Example Roles and Level of Training.....	63
F.2	Example Roles and Methods of Training.....	69

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Introduction

Background

This Recommended Practice (RP) provides guidance to operators of hazardous liquid pipeline systems regarding a risk-based pipeline LDP management process.

This RP is designed to provide operators with a description of industry practices in risk-based pipeline LDP management and to provide the framework to develop sound program management practices within an operator's individual companies.

It is recognized that this RP creates requirements and practices that may take time to fully implement.

Objectives

This RP is written to provide guidance to operators for developing and maintaining management of pipeline LDPs. The elements of this RP are written to conform to current pipeline regulations and to encourage operators to "go beyond" and, in so doing, to promote the advancement or stronger utilization of LDPs in hazardous liquid pipelines.

This RP builds on and augments existing requirements and is not intended to duplicate requirements of any other consensus standards or regulations.

Each operator is expected to tailor their LDP to their requirements.

The goal of an operator is to operate their pipelines safely and reliably, so that there are no adverse effects on the public, employees, the environment, or the pipeline assets. This pipeline LDP management RP aids in this primary goal by the following:

- Providing hazardous liquid operators with guidance on development, implementation, and management of a sustainable LDP to minimize the size and consequences of leak events.
- Providing operators with enhanced guidance on selection of leak detection systems (LDSs) using a risk-based approach and on establishing performance measures for the capabilities of LDSs unique to each pipeline to meet or exceed the requirements of 49 C.F.R. part 195, such as in 195.452(i)(3), pertaining to leak detection related preventive and mitigative measures an operator shall take to protect a sensitive area.
- Addressing identified gaps and incorporating guidance into a comprehensive program document.

The LDP decisions rely on a thorough assessment and analysis of risk and threats as they apply to leak detection and should integrate with the operator's acceptable risk level. An LDP may reduce the consequence of a leak and contribute to the development from a "thinking to knowing" leak detection culture.

This RP does not include the following:

- detailed technical design of LDSs (as this is operator, LDSs, and infrastructure dependent);
- SCADA system design (as this is already covered in other API documents, for example API RP 1113¹, API RP 1125, or API RP 1167);
- specific performance metrics (an individual operator's risk-based approach and engineering evaluation covers this);

¹ This is a historical document and is no longer supported by API.

- field response (as this is covered in an operator’s emergency response plan);
- presentation of information to controllers (covered in RP 1165);
- equipment selection criteria (as these are specific to an operator, LDS, and vendor selection);
- a universal metric for pipeline leak detection performance (it is not a practical objective); or
- a definition of the relationship between emergency flow restriction devices (EFRDs) and leak detection (EFRDs and leak detection are two different mitigation systems).

Pipeline Leak Detection—Program Management

1 Scope

API Recommended Practice (RP) 1175 establishes a framework for Leak Detection Program (LDP) management for hazardous liquid pipelines that are jurisdictional to the U.S. Department of Transportation. This RP is an industry consensus document revised by hazardous liquid pipeline operators, leak detection manufacturers, consultants, and others. API RP 1175 focuses on using a risk-based approach to each operator's LDP. Reviewing the main body of this document and following the guidance set forth assists in creating an inherently risk mitigating LDP management system. API RP 1175 represents industry best practices in managing an LDP.

All leak detection systems (LDSs) used by a pipeline operator should be managed in a coordinated manner. The goal of the LDP is to detect leaks quickly and with certainty, thus facilitating quicker shutdown and therefore minimizing negative consequences. This RP focuses on management of LDPs, not the design of LDSs, and therefore contains relatively little technical detail. As with API RP 1130, API RP 1175 is intended for single-phase pipelines only; however, the approach may be applicable to pipelines that are not single phase.

Leak detection reduces the consequences of a LOC but does not reduce the likelihood of a leak. An appreciation and evaluation of leak event likelihoods, threats, and vulnerabilities drives the design of the LDP.

2 Normative References

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document applies (including any addenda/errata).

API Recommended Practice 1130, *Computational Pipeline Monitoring for Liquids*

API Technical Report 1149, *Pipeline Variable Uncertainties and Their Effects on Leak Detection Sensitivity*

API Recommended Practice 1160, *Managing System Integrity for Hazardous Liquid Pipelines*

API Recommended Practice 1167, *Pipeline SCADA Alarm Management*

API Recommended Practice 1173, *Pipeline Safety Management Systems*

3 Terms, Definitions, Acronyms, and Abbreviations

3.1 Terms and Definitions

For the purposes of this document, the following terms and definitions apply.

3.1.1

continuous leak detection

Leak detection system that is operating in real time or near real time.

3.1.2

consequence level

Ranking of the possible consequences of a leak based on a calculated value or a relative value of the consequences.

3.1.3

dynamic leak volume

Amount of hazardous liquid that is leaked after the onset of a leak prior to the shutdown of the pipeline or other appropriate operational response is initiated.