



AMERICAN PETROLEUM INSTITUTE

API Recommended Practice 1175

Pipeline Leak Detection—Program Management

FIRST EDITION | DECEMBER 2015 | 94 PAGES | \$160.00 | PRODUCT NO. D11751

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 (specifically, 49 CFR Part 195).

This RP is specifically designed to provide pipeline 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 a pipeline operator's individual companies. It is important that pipeline operators understand system vulnerabilities, risks, and program management best practices when reviewing a pipeline LDP management process either for a new program or for possible system improvements.

This RP focuses on using a risk-based approach to each pipeline operator's LDP and following the guidance set forth assists in creating an inherently risk mitigating LDP management system. The overall 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 leak detection systems (LDSs).

For ordering information:

Online: www.api.org/pubs

Phone: 1-800-854-7179
(Toll-free in the U.S. and Canada)

(+1) 303-397-7056
(Local and International)

Fax: (+1) 303-397-2740

API members receive a 30% discount where applicable.

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 5
4	Leak Detection Program 6
5	Leak Detection Culture and Strategy 7
5.1	Leak Detection Culture 7
5.2	Leak Detection Strategy 9
6	Selection of Leak Detection Methods 13
6.1	Selection Process Overview 13
6.2	Risk Assessment 13
6.3	Incorporating Regulatory Requirements and RPs 16
6.4	Leak Detection Strategy Requirements 18
6.5	List and Classification of LDSs 19
6.6	Evaluating and Selecting Suitable Technologies 20
6.7	Modifying Selection for Particular Requirements of Individual Pipelines 21
6.8	Periodic Review of Selection 21
7	Performance Targets, Metrics, and KPIs 22
7.1	General 22
7.2	Performance Metrics and Key Performance Indicators 22
7.3	Performance Targets 25
8	Testing 28
9	Control Center Procedures for Recognition and Response 28
9.1	Overview of Procedures 28
9.2	Recognition of a Leak 29
9.3	Analysis of a Leak Indication 29
9.4	Response to a Leak Indication 30
9.5	Validating the Leak Indication 32
9.6	Reporting and Documentation 33
9.7	Pipeline Restart 34
10	Alarm Management 34
10.1	Alarm Management Purpose 34
10.2	Data Collection 35
10.3	Categorization 35
10.4	Alarm Review 36
10.5	Threshold Setting 39
10.6	Tuning 41
11	Roles, Responsibilities, and Training 42
11.1	Roles and Responsibilities 42
11.2	Training 42
12	Reliability Centered Maintenance (RCM) for Leak Detection Equipment 46
12.1	Maintenance Overview 46

Contents

	Page
12.2 RCM Process	46
12.3 Leak Detection Component Identification	47
12.4 Design	47
12.5 Maintenance Tracking and Scheduling	49
13 Overall Performance Evaluation of the LDP	49
13.1 Purpose and KPIs	49
13.2 Internal Review	50
13.3 External Review	50
13.4 Key Performance Indicators (KPIs)	51
13.5 Periodic Reporting	51
13.6 Leading and Lagging Indicators	52
14 Management of Change (MOC)	55
15 Improvement Process	55
15.1 Overview of Improvement Process	55
15.2 Identifying and Defining Opportunities	56
15.3 Initiating and Monitoring the Improvement Process	57
Annex A (informative) Risk Assessment	59
Annex B (informative) Developing a List of Selection Criteria	63
Annex C (informative) Factors Affecting Performance	67
Annex D (informative) Example of Performance Metrics and Targets	68
Annex E (informative) Roles in the Use of the LDSs	70
Annex F (informative) Example Training Program	74
Bibliography	83
Figures	
1 Leak Detection Program Flow Diagram	8
2 Mitigating Risk with Leak Detection	16
3 Levels of Process Safety (similar to API RP 754)	53
C.1 Effects of Uncertainty Types	67
Tables	
1 Visualization of an Example LDP	18
2 List and Classification of LDSs	19
3 Alarm Category Table	36
4 RACI Chart	43
5 Role and Content of Training	44
6 Level 1 KPIs	53
7 Level 2 KPIs	54
8 Level 3 KPIs	54
9 Level 4 KPIs	55
A.1 Consequence Factors	59
A.2 Likelihood Factors	60
A.3 Preventative Factors	61
A.4 IMP Factors	62

Contents

	Page
B.1 LDS Features	63
B.2 Types of Leak Monitoring	66
B.3 Types of Surveillance	66
B.4 Monitoring Performance Indicators	66
D.1 Example Performance Metric/Target Table	69
E.1 Other Commonly Used Names for Pipeline Controllers	70
E.2 Other Commonly Used Names for Leak Detection Analysts	70
E.3 Other Commonly Used Names for Leak Detection Engineers	71
E.4 Other Commonly Used Names for Control Center Staff	71
E.5 Other Commonly Used Names for Field Operations Staff	72
E.6 Other Commonly Used Names for IT Staff	72
E.7 Other Commonly Used Names for Trainers	72
E.8 Other Commonly Used Names for Management	72
E.9 Other Commonly Used Names for Leak Detection Support Staff	73
E.10 Commonly Used Names for Other Stakeholders	73
F.1 Roles and Level of Training	74
F.2 Roles and Methods of Training	80