
Pipeline Integrity Regulations & Standards

Lee Reynolds, NiSource
Manager Gas Standards



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Objectives

- Why the Need for Integrity Management
- Define Pipeline Integrity Management
- Review Integrity Management Regulations
- Highlight Relevant Industry Standards
- What Does the Future Look Like for Integrity Management (What's Next)



Pipelines link the nation and are largely unnoticed until...



The Need to Do More

U.S. Congress - Pipeline Safety Reauthorization



1970

Minimum Safety Standards (Gas)

- Design specifications
- Operating protocols / limitations
- Inspection & maintenance requirements



2002

Pipeline Safety Improvement Act

- Mandated Integrity Management Program for hazardous liquid and gas transmission pipelines
- Public Awareness
- Operator Qualification



What is Pipeline Integrity Management?



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What is Pipeline Integrity Management?

Integrity Management is a process for identifying, assessing, evaluating and mitigating threats to the integrity of a pipeline system.



What does a Pipeline Integrity Management Program do?



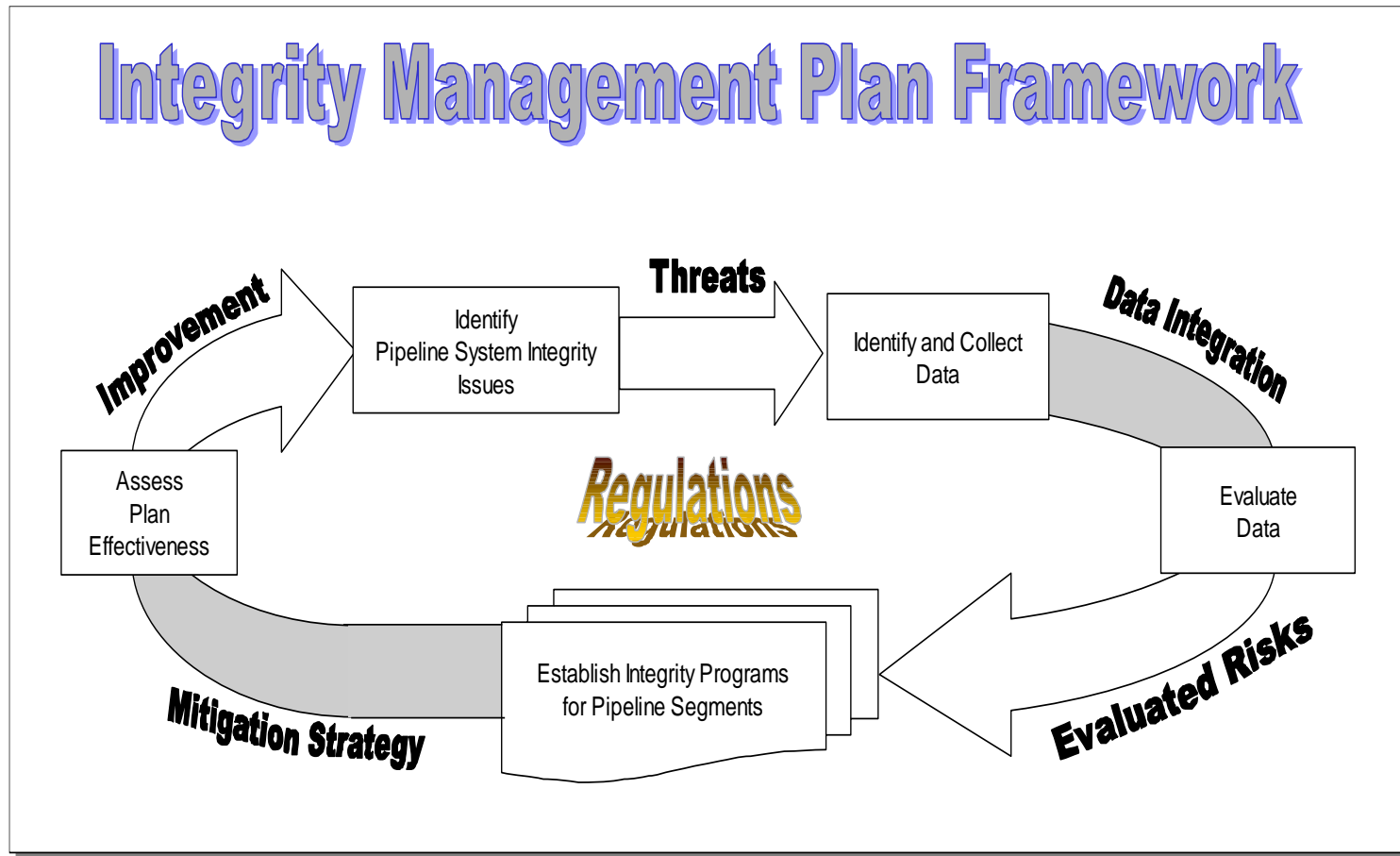
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What does a Pipeline Integrity Management Program do?

- It helps operators comprehensively **evaluate a range of threats** to pipeline integrity by **integrating** and **analyzing** available information about their pipelines.
- It provides a **road map** for the assessment, integration and analysis of the data, and courses of action available in maintaining pipeline integrity.



Integrity Management Framework



Typical Pipeline Threat

During the installation of a housing development, a piece of excavating equipment hits and gouges a pipeline.

The pipeline operator was not notified by the excavator that the pipeline was damaged.



Data Integration Example

- A one-call (811) locate was requested, worked and documented.
- Close interval survey shows a dip in pipe to soil readings in this area, but cathodic protection levels are still adequate.
- In-line inspection indicates a small anomaly on the top portion of the pipeline.
- Each of the three activities on their own may not have raised a flag.
- However, when all of the three pieces of information are put together, we have a better picture of what is going on with this pipeline.



Pipeline Integrity Management Regulations



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PHMSA

Pipeline Integrity Management Goals

- Provide for Increased Assurance to the Public
- Identify Areas Where a Pipeline Rupture Would Produce the Highest Consequence
- Accelerate Integrity Assessment of Pipelines in High Consequence Areas (HCAs)
- Improve Integrity Management Practices within Companies
- Establish a Clear Government Role in Validating Integrity Management



Federal Pipeline Safety Regulations

<https://www.phmsa.dot.gov/phmsa-regulations>

United States Department of Transportation

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Safety Administration

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Pipeline Special Permits & State Waivers

PHMSA Regulations

PHMSA is responsible for regulating and ensuring the safe and secure movement of hazardous materials to industry and consumers by all modes of transportation, including pipelines.

To minimize threats to life, property or the environment due to hazardous materials related incidents, PHMSA's Office of Hazardous Materials Safety develops regulations and standards for the classifying, handling and packaging of over 1 million daily shipments of hazardous materials within the United States.

The Office of Pipeline Safety ensures safety in the design, construction, operation, maintenance, and spill response planning of America's 2.6 million miles of natural gas and hazardous liquid transportation pipelines.

To browse interpretations, please do with the [Interpretations Search](#).

Updated: Friday, September 8, 2017

Related Links

- [Hazardous Materials Safety Regulations \(Title 49 CFR Parts 100-185\)](#)
- [Pipeline Safety Regulations \(Title 49 CFR Parts 190-199\)](#)
- [Legislative Mandates](#)

Contact Us

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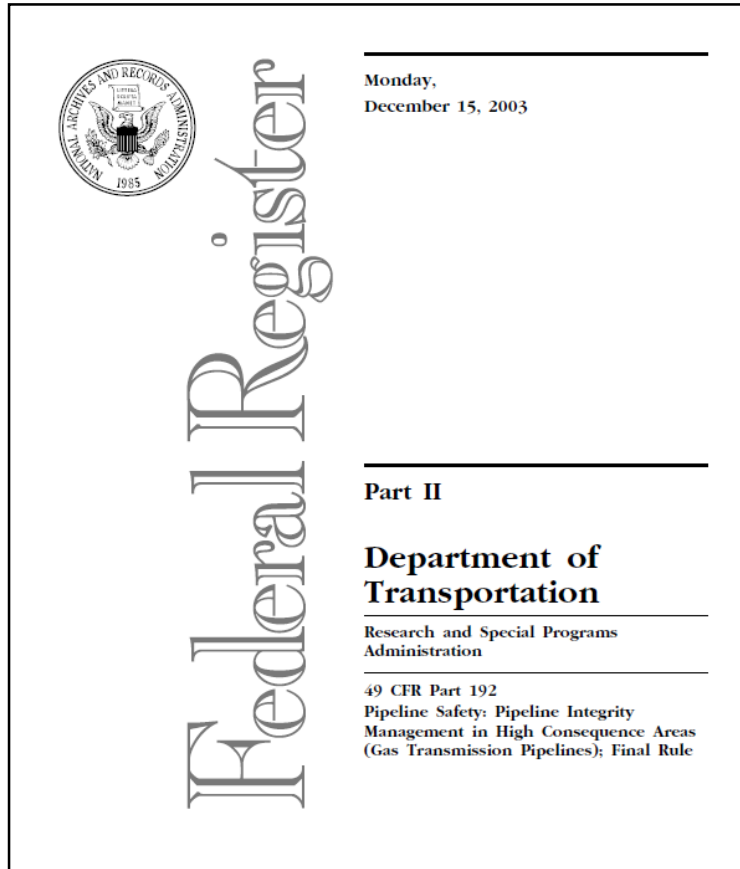
PHMSA's mission is to protect people and the environment by advancing the safe transportation of energy and other hazardous materials that are essential to our daily lives.



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Part 192 – Subpart O

Gas Transmission Pipeline Integrity Management



Operators are required to have a written plan which describes aspects (program elements) of the operator's Integrity Management efforts.

Part 192 prescribes minimum program elements that must be included.



Part 192 – Subpart O

Gas Transmission Pipeline Integrity Management

Elements of Integrity Management Program

- Identification of High Consequence Areas
- Data Integration, Identification of Threats, and Use of Risk Assessment to Prioritize Segments
- Development of a Baseline Assessment Plan
- Development of a Direct Assessment Plan
- Development of Criteria for Remedial Actions
- Continual Process of Assessment and Evaluation
- Identification of Preventative and Mitigative Measures



Part 192 – Subpart O

Gas Transmission Pipeline Integrity Management

Elements of Integrity Management Program

- Performance Plan
- Record Keeping Requirements
- Management of Change Plan
- Quality Assurance Plan
- Communication Plan
- Process for Providing Copy of IMP to Regulators
- Process for Ensuring Environmental Protection and Safety



PHMSA Website Gas Transmission Integrity Management

<https://primis.phmsa.dot.gov/gasimp/index.htm>

PHMSA

Pipeline and Hazardous Materials Safety Administration

Search PHMSA site

[ABOUT PHMSA](#) [SAFETY](#) [REGULATIONS AND COMPLIANCE](#) [RESOURCES](#)

Home » Technical Resources » Pipeline Technical Resources » Gas Transmission Integrity Management

Gas Transmission Integrity Management (GT IM) Overview

This site provides information regarding the Gas Transmission Integrity Management Rule (68 FR 69778), commonly referred to as the "Gas IM Rule", or alternatively, the "GT IM Rule."

The GT IM Rule resulted in regulations (49 CFR Part 192, Subpart O) which specify how pipeline operators must identify, prioritize, assess, evaluate, repair and validate the integrity of gas transmission pipelines that could, in the event of a leak or failure, affect High Consequence Areas (HCAs) within the United States. These HCAs include certain populated and occupied areas. Operators were given until December 17, 2004 to write and implement their IM programs.

For an overview of the progress being made under the gas transmission pipeline integrity management (GT IM) regulations, please see the [Performance Measures](#) page. There you will find graphs and charts which depict progress and other aspects of operator implementation of the GT IM regulations. You will also find a link to the data provided by pipeline operators in accordance with these regulations.

Other GT IM menu links on the left provide additional information,

Related Links

- [Gas Transmission Integrity Management FAQs](#)

Contact Us

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[Pipeline Technical Resources](#)
[Gas Transmission Integrity Management \(GT IM\) Overview](#)
[GT IM Fact Sheet](#)
[GT IM Performance Measures](#)
[GT IM Key Documents](#)
[GT IM Meetings](#)
[GT IM Notifications](#)

Pipeline Operator Resources

Office of Pipeline Safety Web Site Gas and Liquid Integrity Management

- Frequently Asked Questions (FAQs)
- Inspection Protocols
- Enforcement Guidance



Frequently Asked Questions

<https://www.phmsa.dot.gov/pipeline/gas-transmission-integrity-management/gas-transmission-integrity-management-faqs>

[Gas Transmission Integrity Management: FAQs](#)

The Pipeline and Hazardous Materials Safety Administration (PHMSA) provides written clarification of the pipeline safety regulations (49 CFR Parts 190-199) in the form of frequently asked questions (FAQs) and other guidance materials. The FAQs contained on this page are intended to clarify, explain, and promote better understanding of the gas transmission pipeline integrity management (IM) regulations. These FAQs reflect PHMSA's current application of the regulations to the specific implementation scenarios presented. FAQs are not substantive rules, themselves, and do not create legally enforceable rights, assign duties, or impose new obligations not otherwise contained in the existing regulations and standards, but are provided to help the regulated community understand how to comply with the regulations. However, an operator who is able to demonstrate compliance with the FAQs is likely to be able to demonstrate compliance with the relevant regulations. If a different course of action is taken by a pipeline operator, the operator must be able to demonstrate that their conduct is in accordance with the regulations. Written regulatory interpretations regarding specific situations may also be obtained from PHMSA in accordance with 49 CFR Part 190, § 190.11.

FAQ Topical Categories

- [General](#) (12)
- [Rule Basics](#) (2)
- [Rule Applicability](#) (6)
- [Time Periods](#) (4)
- [Integrity Management Programs](#) (9)
- [HCA Identification](#) (37)
- [Threat/Risk Analysis](#) (7)
- [Identification of Threats](#) (1)
- [Data Integration](#) (4)
- [Risk Analysis and Prioritization](#) (6)
- [Specific Threats](#) (3)
- [Assessment](#) (15)
- [Baseline Assessment Plan \(BAP\)](#) (3)
- [Assessment Methods](#) (28)
- [Continual Assessment and Evaluation](#) (12)
- [Remediation](#) (16)
- [Preventive and Mitigative Measures](#) (5)
- [Performance Measures](#) (5)
- [Record Keeping](#) (3)
- [Management of Change \(MOC\)](#) (1)
- [Regulatory and External Interaction](#) (2)
- [Communication Plan](#) (1)
- [Notification](#) (7)
- [Inspection](#) (3)
- [Enforcement](#) (3)
- [State Agencies and Intrastate Pipelines](#) (2)
- [Exceptional Performance Deviations](#) (2)
- [ECDA for Cased Pipe](#) (30)



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Gas Transmission IMP Inspection Protocols

<https://primis.phmsa.dot.gov/gimdb/prolist.gim#files>

Inspection Protocols

The PHMSA Inspection Protocols for implementing Gas Integrity Management, Revision 0, are provided below. Please note the Inspection Protocols are subject to change. Following the links for each protocol will provide additional detail and regulation references. If you would like to print the entire set of protocols for a **single** program element, navigate to that element below, and use the either the "Protocol as Offline Form" or "Protocol as Offline Document" (same, but without fillable form areas) links to display all the protocols for that element. A single downloadable Microsoft Word (.doc) version of all protocol elements as well as fishbone diagrams of the protocols are also available from the [Key Documents page](#).

See: [related downloads...](#)

Follow links below to see protocol elements for each area:

[A. Identify HCAs \[View as Form...\]](#)

[A.01](#) Program Requirements

[A.02](#) Potential Impact Radius

[A.03](#) Identified Sites

[A.04](#) Identification Using Class Locations (Method 1)

[A.05](#) Identification Using Potential Impact Radius (Method 2)

[A.06](#) Identification and Evaluation of Newly Identified HCAs, Program Requirements

[B. Baseline Assessment Plan \[View as Form...\]](#)

[B.01](#) Assessment Methods

[B.02](#) Prioritized Schedule

[B.03](#) Use of Prior Assessments

[B.04](#) New HCAs/Newly Installed Pipe

[B.05](#) Consideration of Environmental and Safety Risks

[B.06](#) Changes

[C. Identify Threats, Data Integration, and Risk Assessment \[View as Form...\]](#)

[C.01](#) Threat Identification

[C.02](#) Data Gathering and Integration

[C.03](#) Risk Assessment



PHMSA IMP Enforcement Guidance

Gas Transmission Integrity Management Enforcement Guidance Sections 192.901 through 192.951

INTRODUCTION

The materials contained in this document consist of guidance, techniques, procedures and other information for internal use by the PHMSA pipeline safety enforcement staff. This guidance document describes the practices used by PHMSA pipeline safety investigators and other enforcement personnel in undertaking their compliance, inspection, and enforcement activities. This document is U.S. Government property and is to be used in conjunction with official duties.

The Federal pipeline safety regulations (49 CFR Parts 190-199) discussed in this guidance document contains legally binding requirements. This document is not a regulation and creates no new legal obligations. The regulation is controlling. The materials in this document are explanatory in nature and reflect PHMSA's current application of the regulations in effect at the time of the issuance of the guidance. In preparing an enforcement action alleging a probable violation, an allegation must always be based on the failure to take a required action (or taking a prohibited action) that is set forth directly in the language of the regulation. An allegation should never be drafted in a manner that says the operator "violated the guidance."

Nothing in this guidance document is intended to diminish or otherwise affect the authority of PHMSA to carry out its statutory, regulatory or other official functions or to commit PHMSA to taking any action that is subject to its discretion. Nothing in this document is intended to and does not create any legal or equitable right or benefit, substantive or procedural, enforceable at law by any person or organization against PHMSA, its personnel, State agencies or officers carrying out programs authorized under Federal law.

Decisions about specific investigations and enforcement cases are made according to the specific facts and circumstances at hand. Investigations and compliance determinations often require careful legal and technical analysis of complicated issues. Although this guidance document serves as a reference for the staff responsible for investigations and enforcement, no set of procedures or policies can replace the need for active and ongoing consultation with supervisors, colleagues, and the Office of Chief Counsel in enforcement matters.

Comments and suggestions for future changes and additions to this guidance document are invited and should be forwarded to your supervisor.

The materials in this guidance document may be modified or revoked without prior notice by PHMSA management.

Enforcement Guidance	Part 192, Gas Transmission Pipeline Integrity Management
Revision Date	12/7/2015
Code Section	§192.901
Section Title	What do the regulations in this subpart cover?
Existing Code Language	This subpart prescribes minimum requirements for an integrity management program on any gas transmission pipeline covered under this part. For gas transmission pipelines constructed of plastic, only the requirements in §§192.917, 192.921, 192.935 and 192.937 apply.
Origin of Code	Amdt. 192-95, 68 FR 69778, December 15, 2003
Last Amendment	Amdt. 192-95A, 69 FR 9307, December 20, 2003
Interpretation Summaries	
Advisory Bulletin/Alert Notice Summaries	<p>Advisory Bulletin ADB -12-03 Notice to Operators of Driscopipe 8000 High Density Polyethylene Pipe of the Potential for Material Degradation</p> <p>On March 6, 2012, PHMSA issued this advisory bulletin to alert operators using Driscopipe® 8000 High Density Polyethylene Pipe (Drisco8000) of the potential for material degradation. Degradation has been identified on pipe between one-half inch to two inches in diameter that was installed between 1978 and 1999 in desert-like environments in the southwestern United States. However, since root causes of the degradation have not been determined, PHMSA cannot say with certainty that this issue is isolated to these regions, operating environments, pipe sizes, or pipe installation dates. While the manufacturer has attempted to communicate with known or suspected users, PHMSA and the National Association of Pipeline Safety Representatives (NAPSR) have identified several operators currently using Drisco 8000 pipe who had not received communications about the issue. PHMSA is issuing this advisory bulletin to all operators of Drisco 8000 pipe in an effort to ensure they are aware of the issue, communicating with the manufacturer and their respective regulatory authorities to determine if their systems are susceptible to similar degradation, and taking measures to address it.</p>
Other Reference Material & Source	<p>ASME B31.8S-2004, Supplement to B31.8 on Managing System Integrity of Gas Pipelines</p> <p>Gas Piping Technology Committee (GPTC)</p> <p>Part 192, Appendix E.I</p>



Distribution Integrity Management Program



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The Need to Do More

U.S. Congress - Pipeline Safety Reauthorization

1971

Minimum Safety Standards

- Design specifications
- Operating protocols / limitations
- Inspection & maintenance requirements

2002

Pipeline Safety Improvement Act

- Mandated Integrity Management Program for hazardous liquid and gas transmission pipelines
- Public Awareness
- Operator Qualification

2006

Pipeline Inspection, Protection, Enforcement, & Safety Act

- Mandated Distribution Integrity
- Damage Prevention
- Control Room Mgmt



DIMP Regulation & Elements

Part 192 Subpart P

- 1 – Know the Distribution System & How It's Operated & Maintained
- 2 – Identify Threats (existing & potential)
- 3 – Evaluate and Rank groups based on risk
- 4 – Identify and Implement appropriate measures to manage risks
- 5 – Measure performance and monitor results
- 6 – Periodically evaluate & improve program
- 7 – Make periodic reports to government agencies



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Federal Register

Friday,
December 4, 2009

Part III

**Department of
Transportation**

Pipeline and Hazardous Materials Safety
Administration

49 CFR Part 192
Pipeline Safety; Integrity Management
Program for Gas Distribution Pipelines;
Final Rule

PHMSA Website Distribution Integrity Management

<https://primis.phmsa.dot.gov/dimp/resources.htm>

PHMSA
Pipeline and Hazardous Materials
Safety Administration

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ABOUT PHMSA SAFETY REGULATIONS AND COMPLIANCE RESOURCES

Home » Technical Resources » Pipeline Technical Resources » Gas Distribution Integrity Management Program

Pipeline Technical Resources

Gas Distribution Integrity Management Program (DIMP) Overview

DIMP: History

DIMP: Meetings

DIMP: Performance Measures

DIMP: Resources

Gas Distribution Integrity Management Program (DIMP)

This site is administered by the Pipeline and Hazardous Materials Safety Administration (PHMSA). PHMSA published the final rule establishing integrity management (IM) requirements for gas distribution pipeline systems on December 4, 2009 (74 FR 63906). The effective date of the rule was February 12, 2010, resulting in IM regulations for gas distribution pipelines (49 CFR Part 192, Subpart P). Operators were given until August 2, 2011 to write and implement their distribution integrity management programs (DIMPs).

PHMSA previously implemented integrity management regulations for hazardous liquid and gas transmission pipelines. These regulations aim to assure pipeline integrity and further improve the safety of pipeline transportation of energy products. Congress and other stakeholders expressed interest in understanding the nature of similarly focused requirements for gas distribution pipelines. Significant differences in system design and local conditions affecting distribution pipeline safety precluded applying the same tools and management practices as were used for transmission and other cross-country pipeline systems. Therefore, PHMSA took a slightly different approach for distribution integrity management following a joint effort involving PHMSA, the gas

Related Links

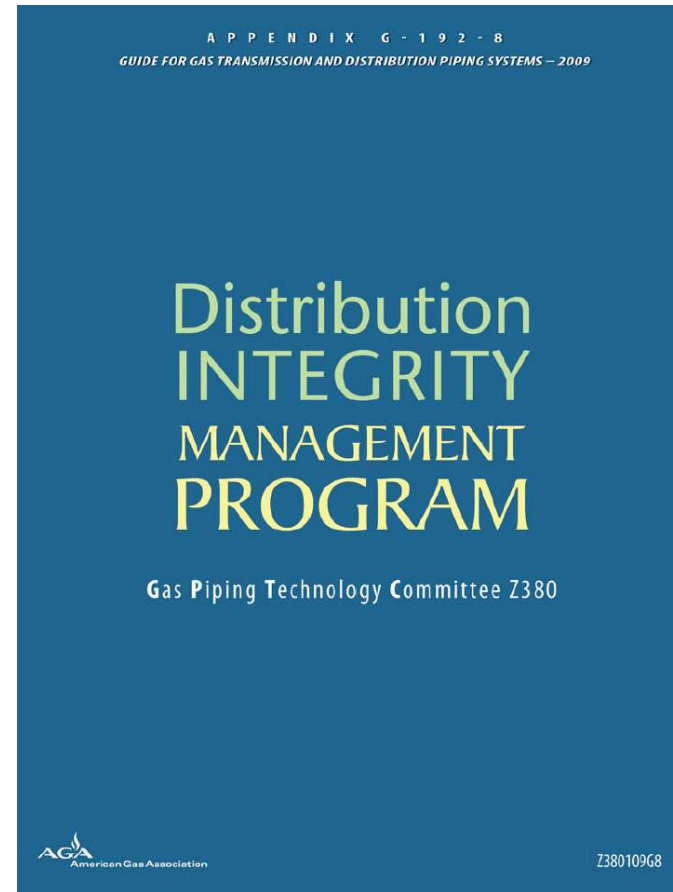
- Gas Distribution Integrity Management: FAQs
- Gas Distribution Integrity Management: Farm Tap FAQs

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GPTC Guide Material - Appendix G-192-8

- Guide material provides examples of
 - Threat identification
 - A simple risk assessment method
 - Risk management actions
 - Performance measures
- Appendix G-192-8 is available for purchase thru American Gas Association (AGA)



Small Operators

Simple, Handy Risk-based Integrity Management Plan (SHRIMP)

Developed by the American Public Gas Association (APGA)

<https://apgasif.org/sif-tools/shrimp-dimp/>

- **SHRIMP** stands for “Simple, Handy, Risk-based Integrity Management Plan.” It is an on-line tool that operators of gas distribution systems may use to create a written Distribution Integrity Management Plan.
- The basic purpose of the software is to generate a written integrity management plan that is appropriate for the unique circumstances of each utility.
- It addresses the needs of small utilities that lack in-house engineering and/or risk management expertise.



DIMP Inspection – PHMSA Forms 23 & 24

PHMSA Form 23 Question Set (IA Equivalent)
Distribution Integrity Management Program (MMLPGIM) Inspection Form

Master Meter and Small LPG Distribution Integrity Management - Plan Implementation

1. Plan Implementation - Implement Date (confirm) Was the plan written and implemented per the requirement of 192.1015 by 08/02/2011? (MMLPGIM.QA.PLANIMPLEMENT.P) (confirm)

192.1015(a)	Sat+	Sat	Concern	Unsat	NA	NC

Notes

Master Meter and Small LPG Distribution Integrity Management - Knowledge of the System

1. System Knowledge - Information Considered (confirm) Do the written mechanisms or procedures to address how the operator will demonstrate knowledge of the system, extent known, should include the approximate location and material of its pipeline? (MMLPGIM.RA.INFOCONSIDER.P) (confirm)

192.1015(b)(1)	Sat+	Sat	Concern	Unsat	NA	NC

Notes

2. System Knowledge - Information Needed (confirm) Do the written mechanisms or procedures to address how the operator will demonstrate knowledge of the system, extent known, should include the approximate location and material of its pipeline? (MMLPGIM.RA.INFONEEDS.P) (confirm)

192.1015(b)(2)	Sat+	Sat	Concern	Unsat	NA	NC

Notes

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PHMSA Form 24 Question Set (IA Equivalent)
Distribution Integrity Management Program (GDIM) Implementation Inspection Form

Gas Distribution Integrity Management - GDIM Implementation

1. Issues Identified in Previous Integrity Management Inspections (detail) Have all issues raised in previous DIMP inspections been satisfactorily addressed? (GDIM.QA-ISSUESIMPL.R) (detail)

192.1005	Sat+	Sat	Concern	Unsat	NA	NC

Notes

2. System Knowledge - Gaps (detail) Is missing or incomplete system information and data needed to fill knowledge gaps to assess existing and potential threats being collected? (GDIM.RA.GAPSIMPL.R) (detail)

192.1007(a)(3)	Sat+	Sat	Concern	Unsat	NA	NC

Notes

3. System Knowledge - Information Needed (detail) Is missing or incomplete system information and data needed to assess existing and potential threats being collected? (GDIM.RA.INFOIMPL.R) (detail)

192.1007(a)(3)	Sat+	Sat	Concern	Unsat	NA	NC

Notes

4. System Knowledge - Information Needed (O&M) (detail) Has any new or missing information identified since August 2, 2011 been captured (e.g., location, wall thickness/SDR, manufacturer, lot/production number)? (GDIM.RA.INFOIMPL.R) (detail)

192.1007(a)(3)	Sat+	Sat	Concern	Unsat	NA	NC

Notes

5. System Knowledge - New Pipe Data (detail) Have required data on any new pipeline installations since August 2, 2011 been captured (e.g., location, wall thickness/SDR, manufacturer, lot/production number)? (GDIM.RA.NEWPIPEIMPL.R) (detail)

192.1007(a)(5)	Sat+	Sat	Concern	Unsat	NA	NC

Notes

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Form 23: Master Meter/Small LPG Operators

Form 24: Gas Distribution Operators



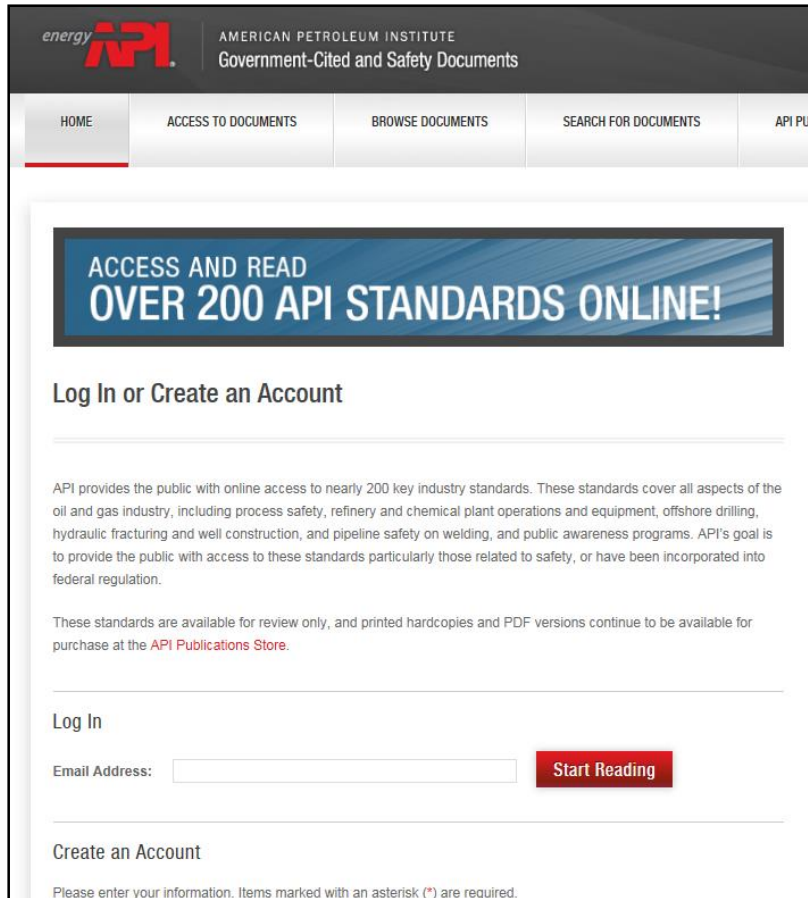
Pipeline Integrity Management Standards



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API Standards – Public Access – Read Only

<http://publications.api.org/>



The screenshot shows the API website homepage. At the top left is the "energy API" logo. To its right, it says "AMERICAN PETROLEUM INSTITUTE Government-Cited and Safety Documents". Below this is a navigation bar with tabs: "HOME", "ACCESS TO DOCUMENTS", "BROWSE DOCUMENTS", "SEARCH FOR DOCUMENTS", and "API PUB". A large blue banner with white text reads "ACCESS AND READ OVER 200 API STANDARDS ONLINE!". Below the banner is a section titled "Log In or Create an Account". The text explains that API provides online access to nearly 200 key industry standards covering various aspects of the oil and gas industry. It also notes that these standards are available for review only, and printed/hardcopy versions are available for purchase at the API Publications Store. There is a "Log In" section with an "Email Address:" label and a text input field, followed by a red "Start Reading" button. Below that is a "Create an Account" section. At the bottom, a small note says "Please enter your information. Items marked with an asterisk (*) are required."

- API provides online public access to key industry standards, including a broad range of safety standards, most of which were previously only available for purchase.
- These standards will be available as "Read Only" access, and API will host these documents on www.api.org.
- These documents are available for public interest purposes only, and will not be able to be edited, downloaded, printed, or shared.



ASME B31.8S 2004

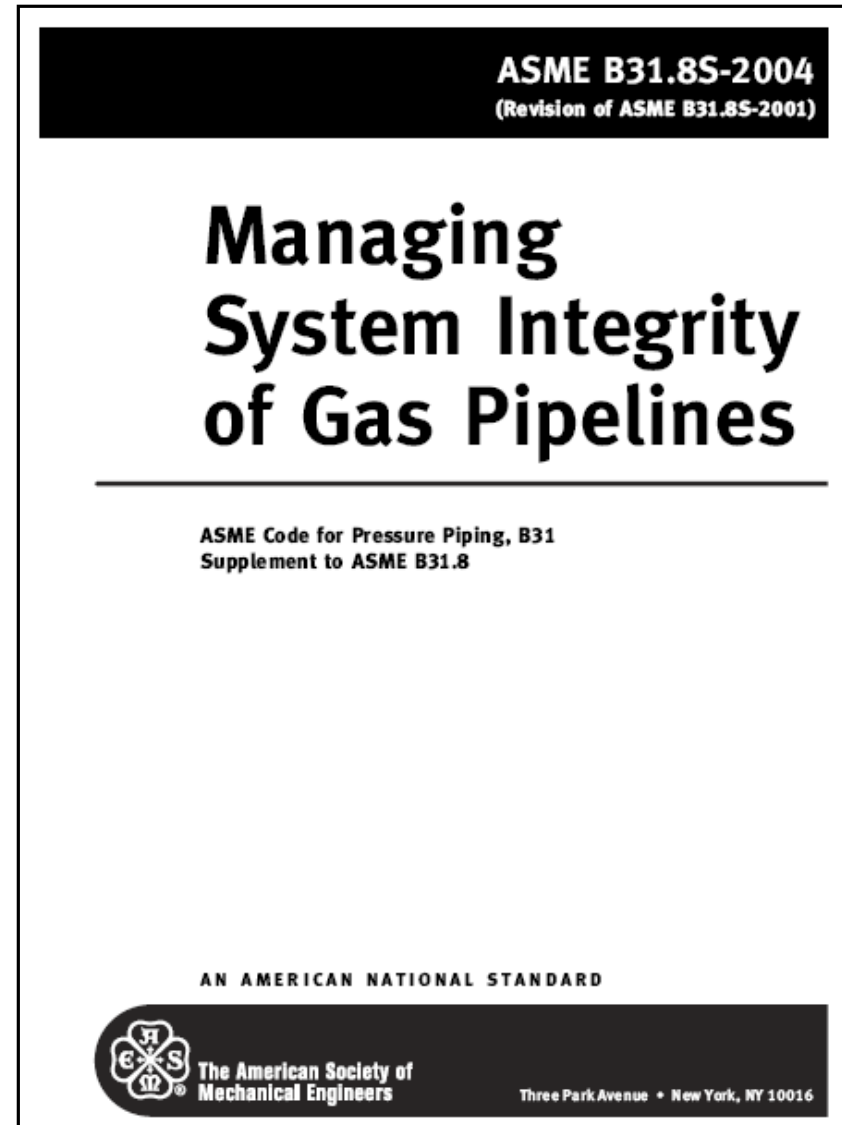
Managing System Integrity for Hazardous Liquid Pipelines

API STANDARD 1160
FIRST EDITION, NOVEMBER 2001
ANSI/API STD 1160-2001



ASME B31.8S 2004

- Standard for Gas Operators of Onshore, Ferrous Materials
- Incorporated by Reference Into Part 192



NACE International

Corrosion Threat Assessment
Integrity Standards



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SP0102-2017 “In-Line Inspection of Pipelines”

- Outlines a process of related activities that an operator can use to plan, organize, and execute an ILI project.
- Companion Guide available
 - Technical Committee Report
 - “In-Line Nondestructive Inspection of Pipelines”
 - NACE Publication 35100

NACE International Standard Practice (SP0102-2017)

In-Line Inspection of Pipelines

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SP0502-2010 “Pipeline External Corrosion Direct Assessment Methodology”

Outlines a four-step structured process that is intended to improve safety by assessing and reducing the impact of external corrosion on the pipeline.

- Pre-Assessment
- Indirect Inspections
- Direct Examinations
- Post Assessment



ANSI/NACE SP0502-2010

NACE International Standard Practice

Pipeline External Corrosion Direct Assessment Methodology

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SP0206-2016 “Internal Corrosion Direct Assessment Methodology for Pipelines Carrying Normally Dry Natural Gas (DG-ICDA)”

The methodology is described in terms of a four-step process and is applicable to natural gas pipelines that normally carry dry gas, but may suffer from infrequent, short-term upsets of liquid water (or other electrolyte).



Internal Corrosion Direct Assessment Methodology for Pipelines Carrying Normally Dry Natural Gas (DG-ICDA)

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SP0204-2015 “Stress Corrosion Cracking (SCC) Direct Assessment Methodology”

Outlines a four-step structured process that is intended to improve safety by assessing and reducing the impact of stress corrosion cracking on the pipeline.



Appalachian Underground Corrosion Short Course

SP0204-2015

NACE International Standard Practice

Stress Corrosion Cracking (SCC) Direct Assessment Methodology

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What's Next?

Recent pipeline and underground storage incidents have called for more review, guidance, standards, and regulations to improve safety.



Liquids Pipeline Accident



Appalachian Underground Corrosion Short Course

NTSB Recommendation Pipeline Safety Management Systems

NTSB Recommendation P-12-17

To the American Petroleum Institute:

Facilitate the development of a **safety management system** standard specific to the pipeline industry that is similar in scope to your Recommended Practice 750, Management of Process Hazards. The development should follow established American National Standards Institute requirements for standard development.



Appalachian Underground Corrosion Short Course

Enbridge Incorporated
Hazardous Liquid Pipeline Rupture and Release
Marshall, Michigan
July 25, 2010



Accident Report

NTSB/PAR-12/01
PB2012-916501



National
Transportation
Safety Board

Pipeline Safety Management Systems

API Recommended Practice 1173
(Published July 2015)



Pipeline Safety Management Systems

ANSI/API RECOMMENDED PRACTICE 1173
FIRST EDITION, JULY 2015



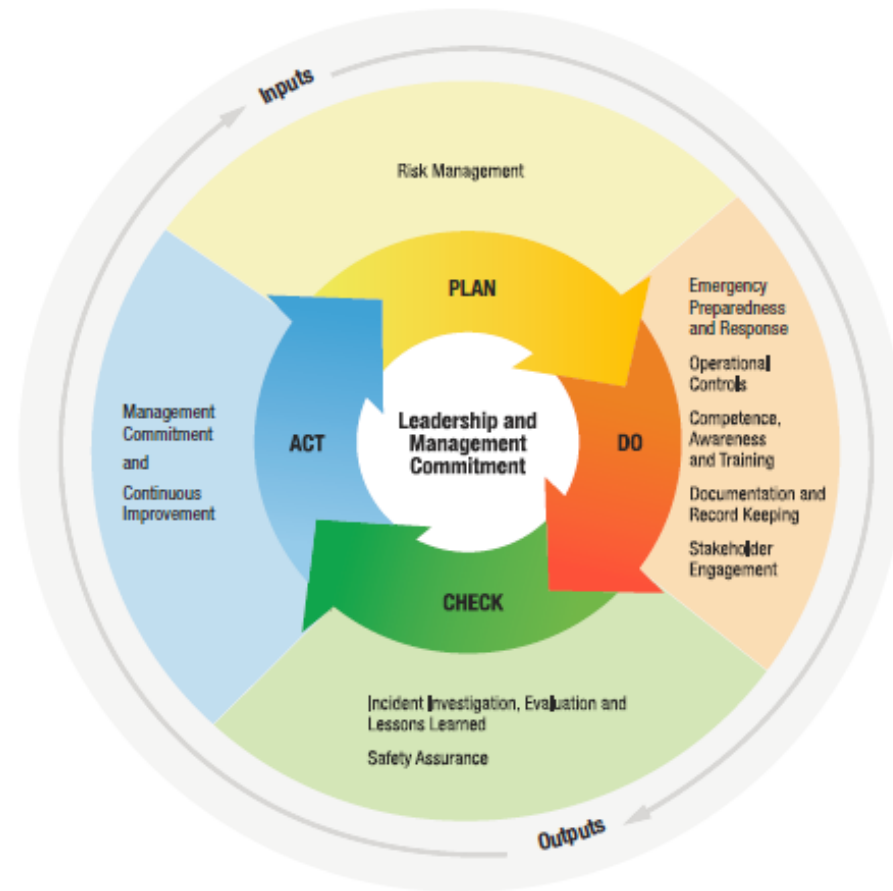
Elements of a Pipeline Management Safety System

- Leadership and Management Commitment
- Stakeholder Engagement
- Risk Management
- Operational Controls
- Incident Investigation, Evaluation, and Lessons Learned
- Safety Assurance
- Management Review and Continuous Improvement
- Emergency Preparedness and Response
- Competence, Awareness, and Training
- Documentation and Record Keeping

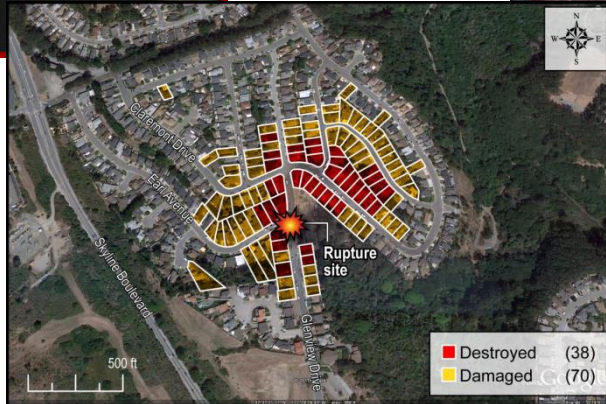


Safety Management System (SMS) “Plan-Do-Check-Act”

- **Plan:** Establish objectives and processes necessary to deliver results in accordance with the organization’s policies and the expected goals.
- **Do:** Execute the plan designed in the previous step.
- **Check:** Review results and compare with established objectives. Looking for deviation in implementation from the plan.
- **Act:** Take action to continuously improve process performance, including corrective actions on significant differences between actual and planned results, analyzes the differences to determine their root causes, and determines where to apply changes that will include improvement.



Gas Pipeline Accident



The Need to Do More

U.S. Congress - Pipeline Safety Reauthorization

1971

Minimum Safety Standards

- Design specifications
- Operating protocols / limitations
- Inspection & maintenance requirements

2002

Pipeline Safety Improvement Act

- Mandated Integrity Management Program for hazardous liquid and gas transmission pipelines
- Public Awareness
- Operator Qualification

2006

Pipeline Inspection, Protection, Enforcement, & Safety Act

- Distribution Integrity
- Damage Prevention
- Control Room Mgmt.

2011 Pipeline Safety, Regulatory Certainty and Job Creation Act

- Damage Prevention
- Shut Off Valves (RCVs - ASVs)
- Integrity Management and Class Expansion



The Need to Do More

- PIPELINE SAFETY, REGULATORY CERTAINTY, AND JOB CREATION ACT OF 2011
- Automatic/Remote Controlled Valves (Sec 4)
- Mandated PHMSA to evaluate whether TIMP requirements, or elements thereof, should be expanded beyond HCAs (Sec 5)
- MAOP Record Verification (Sec. 23)
- Signed into law 1/3/12

Public Law 112–90 112th Congress

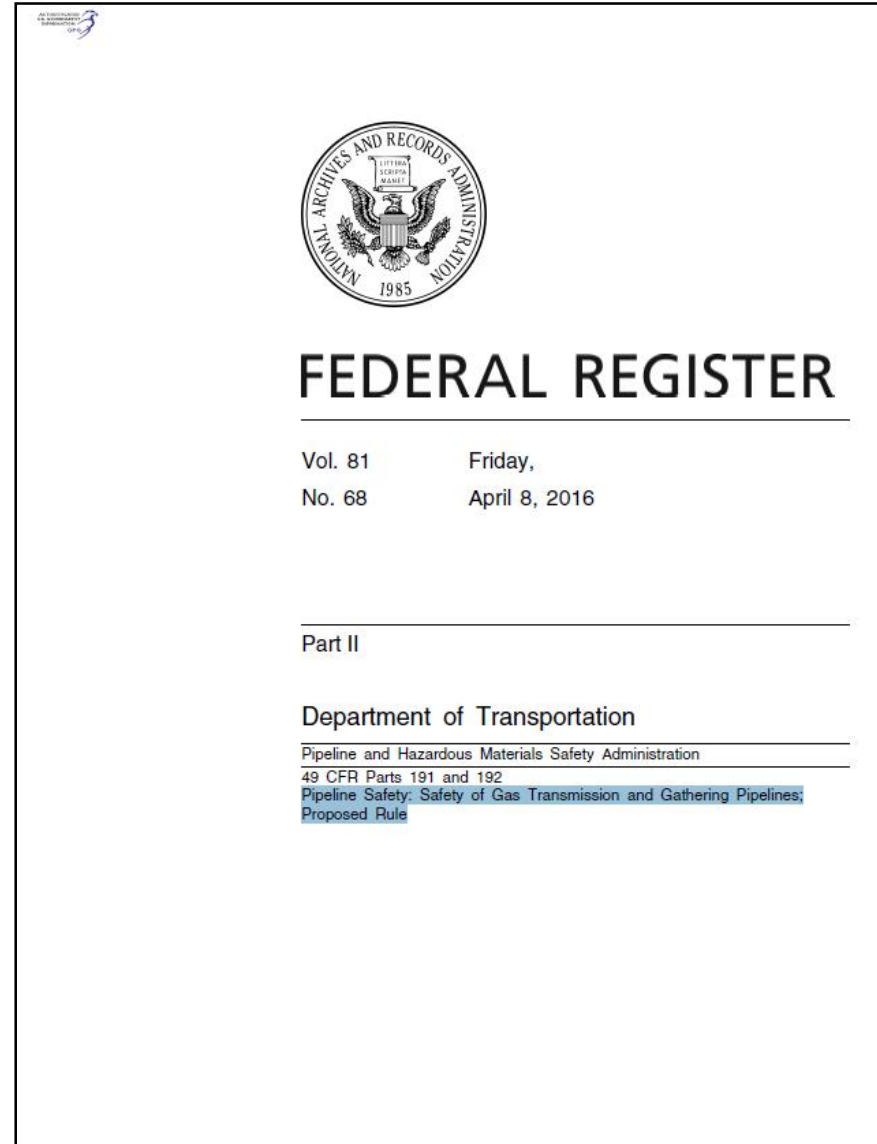
PIPELINE SAFETY, REGULATORY CERTAINTY, AND JOB CREATION ACT OF 2011

- Sec. 1. Short title; amendment of title 49, United States Code; definitions; table of contents.
- Sec. 2. Civil penalties.
- Sec. 3. Pipeline damage prevention.
- Sec. 4. Automatic and remote-controlled shut-off valves.
- Sec. 5. Integrity management.
- Sec. 6. Public education and awareness.
- Sec. 7. Cast iron gas pipelines.
- Sec. 8. Leak detection.
- Sec. 9. Accident and incident notification.
- Sec. 10. Transportation-related onshore facility response plan compliance.
- Sec. 11. Pipeline infrastructure data collection.
- Sec. 12. Transportation-related oil flow lines.
- Sec. 13. Cost recovery for design reviews.
- Sec. 14. Biofuel pipelines.
- Sec. 15. Carbon dioxide pipelines.
- Sec. 16. Study of transportation of diluted bitumen.
- Sec. 17. Study of nonpetroleum hazardous liquids transported by pipeline.
- Sec. 18. Clarifications.
- Sec. 19. Maintenance of effort.
- Sec. 20. Administrative enforcement process.
- Sec. 21. Gas and hazardous liquid gathering lines.
- Sec. 22. Excess flow valves.
- Sec. 23. Maximum allowable operating pressure.
- Sec. 24. Limitation on incorporation of documents by reference.
- Sec. 25. Pipeline safety training for State and local government personnel.
- Sec. 26. Report on minority-owned, woman-owned, and disadvantaged businesses.
- Sec. 27. Report on pipeline projects.
- Sec. 28. Cover over buried pipelines.
- Sec. 29. Seismicity.
- Sec. 30. Tribal consultation for pipeline projects.
- Sec. 31. Pipeline inspection and enforcement needs.
- Sec. 32. Authorization of appropriations.



NPRM - Pipeline Safety: Safety of Gas Transmission and Gathering Pipelines - Published April 8, 2016

- The Pipeline and Hazardous Materials Safety Administration (PHMSA) is proposing to change the Federal pipeline safety regulations in 49 CFR Parts 191 and 192, which cover the transportation of gas by transmission and gathering pipelines.



NPRM - Pipeline Safety: Safety of Gas Transmission and Gathering Pipelines - Published April 8, 2016

Specifically, PHMSA is proposing to issue new regulations and revise existing regulations to address the following topic areas:

1. Integrity Assessment and Remediation for Segments Outside High Consequence Areas (HCAs) and to re-establish Maximum Allowable Operating Pressure (MAOP)
2. Integrity Management Program Process Clarifications
3. Management of Change
4. Corrosion Control
5. Inspection of Pipelines Following Extreme Events
6. MAOP Exceedance Reports and Records Verification
7. Launcher/Receiver Pressure Relief
8. Expansion of Regulated Gas Gathering Pipelines



Gas Transmission Rule (3 Publications)

- Rule 1 – Focus on Congressional Mandates
 - MAOP reconfirmation
 - Material verification
 - Non-HCA assessments
 - Planned publication Aug 2019
- Rule 2 – Focus on Non-mandates
 - Repair Criteria (HCA and non-HCA)
 - Management of Change
 - Corrosion control
 - Planned publication Dec 2019
- Rule 3 – Gas Gathering (TBD)



Gas Transmission Rule (Rule 2)

Subpart I Corrosion Control (Proposed)

- 192.461 Protective Coating (and 192.319)
 - 1,000 contiguous feet buried, conduct surveys to assess coating damage
 - Remediate severe coating damage within 6 months
- 192.465 Monitoring
 - Complete remedial action within 12 months or as soon as practicable after obtaining permits
- 192.473 Interference Currents
 - Increase requirements for electrical stray current surveys and remedial action



The Need to Do More

U.S. Congress - Pipeline Safety Reauthorization

- 1970**
Minimum Safety Standards
- Design specifications
 - Operating protocols / limitations
 - Inspection & maintenance requirements

- 2002**
Pipeline Safety Improvement Act
- Mandated Integrity Management Program for hazardous liquid and gas transmission pipelines
 - Public Awareness
 - Operator Qualification

- 2006**
Pipeline Inspection, Protection, Enforcement, & Safety Act
- Distribution Integrity
 - Damage Prevention
 - Control Room Mgmt.

- 2011**
Pipeline Safety, Regulatory Certainty and Job Creation Act
- Damage Prevention
 - Shut Off Valves (RCVs - ASVs)
 - Integrity Management and Class Expansion

- 2016**
Protecting our Infrastructure of Pipelines and Enhancing Safety Act
- Underground Storage



2016 Pipeline Safety Reauthorization “SAFE PIPES Act”

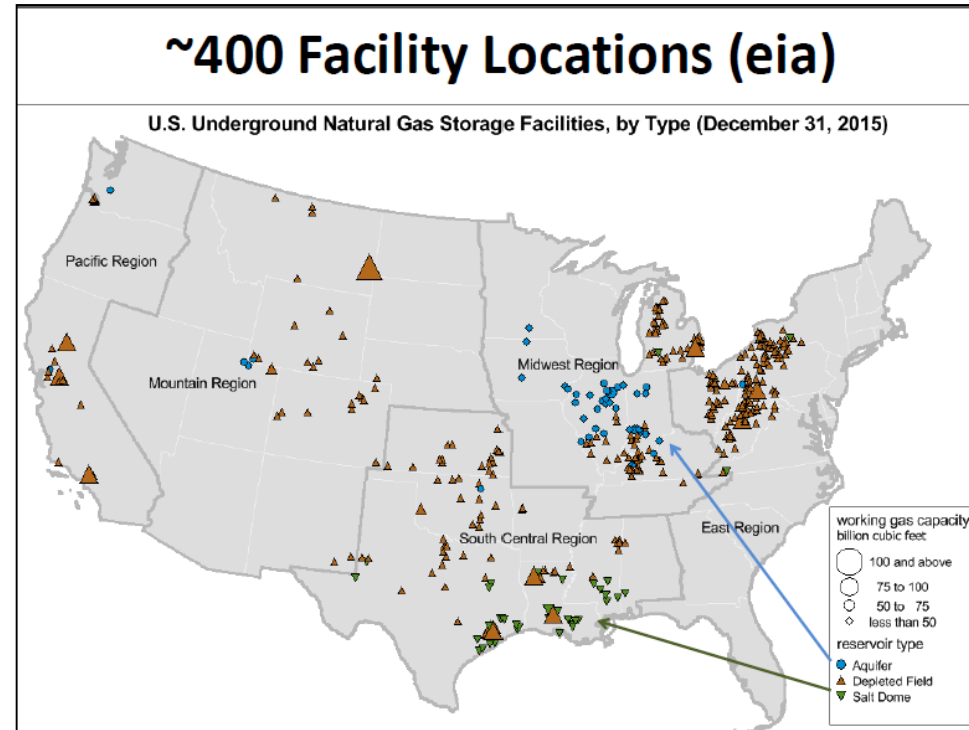
- Proposed – Requires the Secretary of Transportation to issue minimum safety standards for the operation and integrity management of underground gas storage facilities (Section 12) no later than two years after the date of enactment and establishes an underground natural gas storage facility safety account in the Pipeline Safety fund

- Sec. 1. Short title; table of contents.
- Sec. 2. Authorization of appropriations.
- Sec. 3. Regulatory updates.
- Sec. 4. Natural gas integrity management review.
- Sec. 5. Hazardous liquid integrity management review.
- Sec. 6. Technical safety standards committees.
- Sec. 7. Inspection report information.
- Sec. 8. Improving damage prevention technology.
- Sec. 9. Workforce management.
- Sec. 10. Information-sharing system.
- Sec. 11. Nationwide integrated pipeline safety regulatory database.
- Sec. 12. Underground gas storage facilities.
- Sec. 13. Joint inspection and oversight.
- Sec. 14. Safety data sheets.
- Sec. 15. Hazardous materials identification numbers.
- Sec. 16. Emergency order authority.
- Sec. 17. State grant funds.
- Sec. 18. Response plans.
- Sec. 19. Unusually sensitive areas.
- Sec. 20. Pipeline safety technical assistance grants.
- Sec. 21. Study of materials and corrosion prevention in pipeline transportation.
- Sec. 22. Research and development.
- Sec. 23. Active and abandoned pipelines.
- Sec. 24. State pipeline safety agreements.
- Sec. 25. Requirements for certain hazardous liquid pipeline facilities.
- Sec. 26. Study on propane gas pipeline facilities.
- Sec. 27. Standards for certain liquefied natural gas pipeline facilities.
- Sec. 28. Pipeline odorization study.
- Sec. 29. Report on natural gas leak reporting.
- Sec. 30. Review of State policies relating to natural gas leaks.
- Sec. 31. Aliso Canyon natural gas leak task force.



Underground Natural Gas Storage

- There are approximately 400 interstate and intrastate underground natural gas storage facilities currently in operation in the U.S.
 - 326 depleted hydrocarbon reservoirs
 - 43 depleted aquifers
 - 31 salt caverns



Natural Gas Underground Storage



From October 23, 2015 to mid-February 2016 a natural gas leak (California) from an injection well's pipe casing seeping up through the ground received national attention.



Appalachian Underground Corrosion Short Course

Natural Gas Underground Storage Interim Final Rule (IFR) – 12/19/2016

- Issued in Federal Register 12/19/16
- Effective Date January 18, 2017
- Compliance Date January 18, 2018
- Final Rule – Pending 2019



Appalachian Underground Corrosion Short Course

 91860 Federal Register / Vol. 81, No. 243 / Monday, December 19, 2016 / Rules and Regulations

its ability to provide Title X services. OPA will send a letter summarizing the change to current recipients of Title X funds and post the letter to its Web site. Language conforming to this final rule will be included in forthcoming FOAs and continuation application guidance. OPA also has other existing channels for disseminating information to stakeholders. Therefore, based on previous experience, the Department estimates that preparing and disseminating these materials will require approximately one to three percent of a full-time equivalent OPA employee at the GS-12 step 5 level. Based on federal wage schedule for 2016 in the Washington, DC area, GS-12 step 5 level corresponds to an annual salary of \$87,821. The salary cost is doubled to account for overhead and benefits. As a result, the Department estimates a cost of approximately \$1,800-\$5,300 to disseminate information following publication of the final rule.

c. Grant Recipient Costs To Evaluate and Implement the Policy Change

The Department expects that stakeholders, including grant applicants and recipients potentially affected by this final policy change, will process the information and decide how to respond. This change will not affect the majority of current recipients and, as a result, the majority of current recipients will spend very little time reviewing these changes before deciding that no change on their part is required. For the states that currently hold Title X grants and have laws or policies restricting eligibility of Title X subrecipients based on reasons other than their ability to deliver Title X services, the final rule may implicate the state's law or policy. State agencies that currently restrict subrecipients would need to consider their current practices carefully in order to comply with this final rule if they wish to continue obtaining Title X grants and engaging subrecipients.

The Department estimates that current and potential recipients will spend an average of one to two hours processing the information and deciding what action to take. The Department notes that individual responses are likely to vary, as many parties unaffected by these changes will spend a negligible amount of time in response to these changes. According to the U.S. Bureau of Labor Statistics,¹ the average hourly wage for a chief executive in state government is \$54.26, which the Department believes is a good proxy for the individuals who will spend time on these activities. After adjusting upward by 100 percent to account for overhead and benefits, it is estimated that the per-hour cost of a state government executive's time is \$108.52. Thus, the average cost per current or potential grant recipient to process this information and decide upon a course of action is estimated to be \$108.52-\$217.04. OPA will disseminate information to an estimated 89 Title X grant recipients. As a result, it is estimated that dissemination will result in a total cost of approximately \$9,700-\$19,300.

d. Summary of Impacts

Public funding for family planning services has the potential to shift to providers that see a higher number of patients and provide higher quality services. Increases in the quantity and quality of Title X service utilization could lead to fewer unintended pregnancies, improved health outcomes, reduced Medicaid costs, and increased quality of life for many individuals and families. The final rule's impacts will take place over a long period of time, as it will allow for the continued flow of funding to provide family planning services for those most in need, and it will prevent future attempts to prohibit Title X funding to current and potential subrecipients for reasons other than their ability to meet the objectives of the Title X program.

The Department estimates approximate costs in the range of \$11,400-\$24,600 in the first year following publication of the final rule. This rule is beneficial to society in increasing access to and quality of care.

e. Analysis of Regulatory Alternatives

The Department carefully considered the option of not pursuing regulatory action. However, as discussed previously, not pursuing regulatory action would allow the continued denial of Title X funds to entities for reasons other than their ability to provide Title X services. This, in turn, means accepting reductions in access to and quality of services to populations who rely on Title X. As a result, the Department chose to pursue regulatory action.

G. Paperwork Reduction Act of 1995

The amendments in this rule will not impose any additional data collection requirements beyond those already imposed under the current information collection requirements that have been approved by the Office of Management and Budget.

Date: December 12, 2016.
Sylvia M. Burwell,
Secretary.

List of Subjects in 42 CFR part 59
Birth control, Family planning, Grant programs.

Therefore, under the authority of section 1006 of the Public Health Service Act as amended, and for the reasons stated in the preamble, the Department amends 42 CFR part 59 as follows:

PART 59—GRANTS FOR FAMILY PLANNING SERVICES

■ 1. The authority citation for Part 59 continues to read as follows:
Authority: 42 U.S.C. 300a-4.

■ 2. Section 59.3 is revised to read as follows:

§ 59.3 Who is eligible to apply for a family planning services grant or to participate as a subrecipient as part of a family planning project?

(a) Any public or nonprofit private entity in a State may apply for a grant under this subpart.

(b) No recipient making subawards for the provision of services as part of its Title X project may prohibit an entity from participating for reasons other than its ability to provide Title X services. [FR Doc. 2016-30276 Filed 12-14-16; 8:45 am]

BILLING CODE 5140-34-P

DEPARTMENT OF TRANSPORTATION

Pipeline and Hazardous Materials Safety Administration

49 CFR Parts 191 and 192

[Docket No. PHMSA-2016-0016; Amdt. Nos. 191-24; 192-122]

RIN 2137-AF22

Pipeline Safety: Safety of Underground Natural Gas Storage Facilities

AGENCY: Pipeline and Hazardous Materials Safety Administration (PHMSA), Department of Transportation (DOT).

ACTION: Interim final rule.

SUMMARY: This interim final rule (IFR) revises the Federal pipeline safety regulations to address critical safety issues related to downhole facilities, including wells, wellbore tubing, and casing, at underground natural gas storage facilities. This IFR responds to Section 12 of the Protecting our Infrastructure of Pipelines and Enhancing Safety Act of 2016, which was enacted following the serious

Underground Gas Storage IFR Summary

- Revises the Federal pipeline safety regulations to address critical safety issues related to downhole facilities, including wells, wellbore tubing, and casing, at underground natural gas storage facilities.
 - (§ 192.12 Underground natural gas storage facilities)
- The promulgation of minimum federal standards would, for the first time, establish safety standards under the Pipeline Safety Regulations at title 49, CFR parts 191 and 192, for the currently unregulated downhole facilities at
 - 197 interstate underground gas storage facilities, and
 - provide consistent, minimum standards for the remaining 203 intrastate facilities.
- This IFR incorporates by reference two American Petroleum Institute (API) Recommended Practices (RP)
 - API RP 1170, “Design and Operation of Solution-mined Salt Caverns used for Natural Gas Storage,” issued in July 2015; and
 - API RP 1171, “Functional Integrity of Natural Gas Storage in Depleted Hydrocarbon Reservoirs and Aquifer Reservoirs,” issued in September 2015.



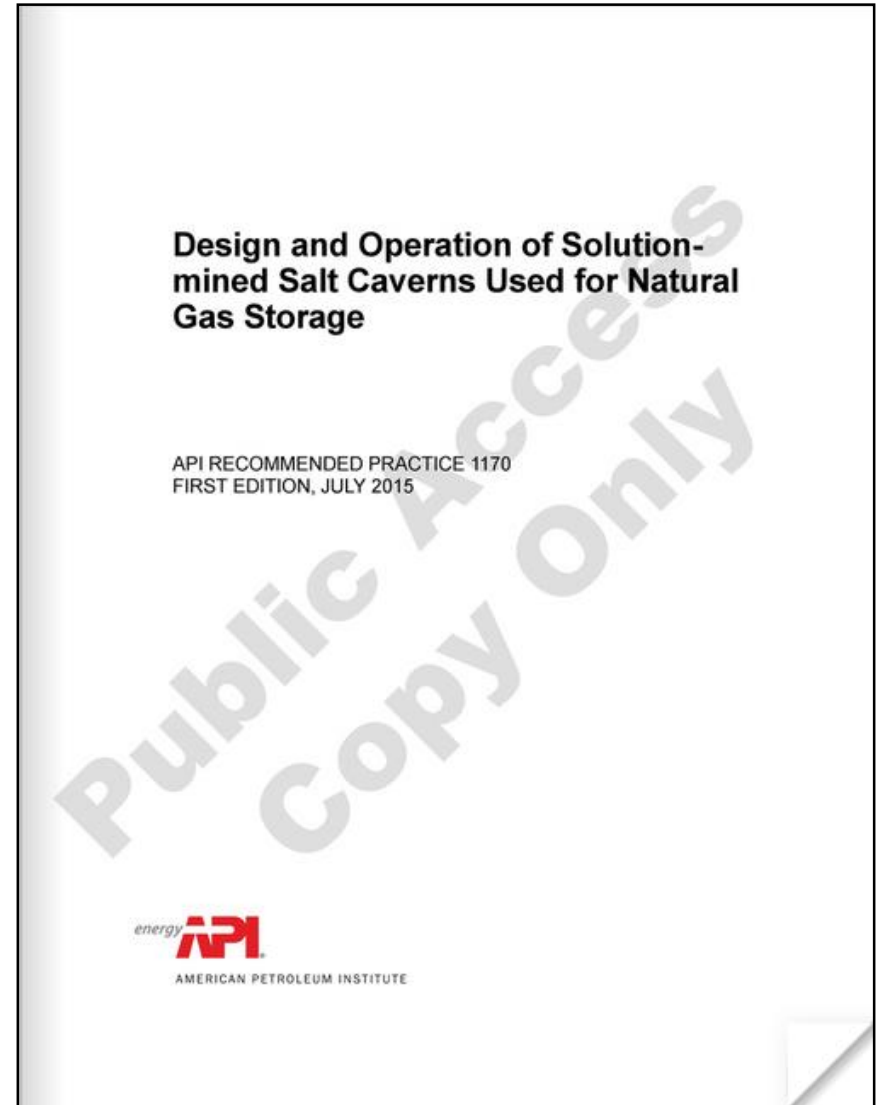
API Recommended Practice 1170

Published September 2015

API RP 1170

Design and Operations of Solution-mined Salt Caverns Used for Natural Gas Storage

- Covers facility geomechanical assessments, cavern well design and drilling, solution mining techniques and operations, including monitoring and maintenance practices.



API Recommended Practice 1171

Published September 2015

API RP 1171

Functional Integrity of Natural Gas Storage in Depleted Hydrocarbon Reservoirs and Aquifer Reservoirs

- Applies to natural gas storage in depleted oil and gas reservoirs and aquifer reservoirs.
- Focuses on storage well, reservoir, and fluid management for functional integrity in design, construction, operation, monitoring, maintenance, and documentation practices.

Functional Integrity of Natural Gas Storage in Depleted Hydrocarbon Reservoirs and Aquifer Reservoirs

API RECOMMENDED PRACTICE 1171
FIRST EDITION, SEPTEMBER 2015



Appalachian Underground Corrosion Short Course



AMERICAN PETROLEUM INSTITUTE

Summary PHMSA IMP ACTIONS

- **Hazardous Liquid (Part 195)**
 - 2001 Final Rule
 - 2015 Notice of Proposed Rulemaking (NPRM)
 - Final Rule Pending 2019
- **Gas Transmission (Part 192)**
 - 2003 Final Rule
 - 2011 Advanced NPRM
 - 2016 NPRM
 - Final Rule Pending 2019
- **Gas Distribution (Part 192)**
 - 2008 NPRM
 - 2010 Final Rule
 - 2011 Final Rule Mechanical Fitting Failure Reporting
- **Underground Gas Storage (Part 192)**
 - 2016 Interim Final Rule
 - Final Rule Pending 2019



The Need to Do More

U.S. Congress - Pipeline Safety Reauthorization



Objectives Discussed

- Why the Need for Integrity Management
- Define Pipeline Integrity Management
- Review Integrity Management Regulations
- Highlight Relevant Industry Standards
- What Does the Future Look Like for Integrity Management



Questions

Lee Reynolds, NiSource
Manager Gas Standards



Appalachian Underground Corrosion Short Course