

MURCHISON LAW FIRM, PLLC

Pipeline Safety Basics and Accounting for Pipeline Safety

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The Pipeline & Energy Authority



Course Overview

- Introductions and Course Overview
- Setting the Stage
 - Performance History and High Profile Events
- Oil Pipeline Laws and Regulations
- Roles of State and Federal Regulators
- Activities Required by Regulations
- Current Issues and Initiatives
- Accounting for the Costs Eric
- Q&A





Performance History and High Profile Events

Significant Decline in Hazardous Liquids Spills from 1999 to 2012

- Driven by Industry Performance Improvement Processes
 - Pipeline Performance Tracking System (1999)
 - Data Mining Team & Lessons Learned (PPTS Advisories)
 - What does our history tell us?
 - Performance Excellence Team (2001)
 - How can we do better in the future?
 - PIX: Pipeline Information eXchange (2008)
- Integrity Management Regulations
 - Focus on Integrity Management Programs has had benefits for HCA "could affect" segments as well as non-HCA segments





Liquid Pipeline Safety Record

2001 - 2012



62% decrease of accidents (per 1,000 miles)

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Safety Record by Accident Cause







High Profile Events and Their Implications

- Deepwater Horizon
- Marshall, Michigan
- San Bruno
- Yellowstone
- Allentown
- Mayflower





Deepwater Horizon

- Considered the largest accidental marine oil spill in the history of the petroleum industry
- A sea-floor open-flow well flowed for 87 days, until it was capped on 15 July 2010
- Is a "Riser Pipe" a pipeline?





Marshall, Michigan

- The July 25, 2010 rupture of Enbridge's Line 6B
- The most expensive onshore spill in U.S. history, with cleanup costs exceeding \$800 million
- According to NTSB, more than 80 percent of the total amount spilled was due to controllers erroneously restarting the line twice, not recognizing that a rupture had occurred



San Bruno



In addition to eight deaths, dozens of people were injured, 38 homes destroyed, 70 damaged

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NTSB Report

Board called the San Bruno incident not a simple mechanical failure, but rather "an organizational accident"



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Yellowstone Crude Oil Spill

- July 2011: 1,500 barrels of crude oil impacted approximately 70 miles of the Yellowstone River
- State and federal pipeline safety inspectors worked together to investigate river crossings in Montana and Northern Wyoming for erosion and other potential hazards





Yellowstone: Post-Spill Activities

- PHMSA issued information requests to numerous operators with pipeline water crossings greater than 100 feet in length, prompting depth of cover surveys, worst case discharge studies, and integrity and threat assessments
- Operators of these pipelines spent tens of millions of dollars on improvements and other work to reduce risk





Allentown Gas Pipeline Explosion

- February 9, 2011: Explosion on a cast iron gas main in Allentown, Pennsylvania
- Five killed, three hospitalized, eight homes destroyed







Mayflower Crude Oil Spill

- March 29, 2013: Pegasus Pipeline rupture
- In excess of 5,000 barrels of crude oil out, contaminated 22 homes





High Profile Events and Their Implications

DOT Secretary LaHood Call To Action

- 2010 Incidents Incensed "The Public" The White House Took Notice
- Then DOT Secretary LaHood Called to Task
- Pipeline Safety Forum, April 18, 2011
- Secretary's Report to the Nation on Pipeline Safety
- Pipeline Safety Awareness Website (http://opsweb.phmsa.dot.gov/pipelineforum/)
- The Net Result





High Profile Events and Their Implications: San Bruno

NTSB Recommendations from San Bruno Incident

Key Findings:

- Rupture occurred in the partially welded longitudinal seam of one of six short pipeline segments (pups)
- The fabrication of the pups would not have met the standards at the time installed in 1956; weld defect in the failed pup would have been visible when installed
- PG&E did not know of the welds because its records incorrectly listed the pipe as seamless
- PG&E's integrity management program was based on inaccurate information, used improper examination methods, and resulted in superficial assessment





High Profile Incidents and Their Implications: San Bruno (continued)

Key Findings: Emergency Response

- PG&E lacked a detailed and comprehensive procedure for responding to large scale emergencies
- SCADA system could not pinpoint location of break
- No automatic or remote shut off valves

Key Findings: Public Awareness Programs

• PG&E had not provided adequate information to first responders regarding the pipeline or response procedures





High Profile Events and Their Implications: Marshall, Michigan

NTSB Recommendations from Marshall, Michigan Incident PHMSA

- Revise integrity management regs to address assessment of cracks, including environmentally assisted cracks (SSC)
- Revise integrity management regs to address "discovery of condition," and timing of receipt of adequate information to make a determination of a threat to integrity
- Issue Advisory Bulletins about deficiencies in IMP and facility response planning
- Require team training of control center staffs
- Harmonize Part 194 FRP requirements with Coast Guard and EPA regulations **U.S. DOT**
 - Audit PHMSA's Facility Response Plan Practices Add Resources

API

Develop Pipeline Safety Management System Recommended Practice





Oil Pipeline Laws and Regulations The Pipeline Safety Act

The Hazardous Liquids Pipeline Safety Act of 1979 (HLPSA)

- The HLPSA was cloned from the Natural Gas Pipeline Safety Act of 1968 (NGPSA)
- The NGPSA and the HLPSA were recodified in 1994 into the Pipeline Safety Act (PSA)
- 49 United States Code 60101, et seq
- Reauthorization Every 5 years +/-
- Next Up: 2015







Oil Pipeline Laws and Regulations The Pipeline Safety Act

Power and Authority

• The PSA grants authority over pipeline safety to the Secretary of the U.S. Department of Transportation

Among the powers granted by Congress:

- To promulgate safety standards (regulations) for the design, installation, inspection, emergency plans and procedures, testing, construction, extension, operation, replacement, and maintenance of pipelines
- To inspect pipeline systems for adherence to the safety standards
- To enforce compliance with the safety standards
- To direct that unsafe, or hazardous, pipeline systems be made safe





Oil Pipeline Laws and Regulations The Pipeline Safety Act

Among the powers granted by Congress (continued):

- To certify State pipeline safety programs for oversight of intrastate pipelines
- To encourage State damage prevention programs
- To grant funds for State programs and research activities (49 CFR Part 198)
- To collect user fees from pipeline operators





Roles of State and Federal Regulators Regulation: Interstate vs. Intrastate Pipelines

- Interstate Systems
 - Transportation Crossing State or International Boundaries (Sort of)
 - Federally Regulated for Uniformity (Ummm . . .)
 - Lessens Local Interference Or Does It?
 - Federal Supremacy
- Intrastate Systems
 - Transportation Wholly Within a State (Sort of)
 - Regulated by Individual States
 - Allows Local "Control"
 - Must Meet Certain Minimum Federal Standards
 - Pipeline Safety
 - Enforcement







Roles of State and Federal Regulators Jurisdictional Overview: Interstate vs. Intrastate

Interstate Jurisdiction

The Office of Pipeline Safety (OPS) in the Pipeline and Hazardous Materials Safety Administration (PHMSA) is delegated the Secretary's powers

PHMSA/OPS is the agency with primary safety jurisdiction over interstate pipelines

States also may inspect for PHMSA as *interstate agent* (5 states for hazardous liquids)

Intrastate Jurisdiction

States exercise safety oversight under regulatory programs certified by PHMSA (14 states for hazardous liquids)

State regulatory program must be no less stringent than the federal program (but may be more stringent)





Roles of State and Federal Regulators

Environmental Protection:

- Federal Level
 - Clean Water Act
 - Clean Air Act
 - Endangered Species Act
 - National Environmental Policy Act
 - And More
- State Corollaries
- Federal Preemption







Roles of State and Federal Regulators Many Agencies Oversee Pipelines

NTSB Most Wanted List

Critical changes needed to reduce transportation accidents and save lives.

Enhance Pipeline Safety

The National Transportation Safety Board is an independent Federal agency charged by Congress with investigating every civil aviation accident the United States and significant accidents in other modes of transportation – railroad, highway, marine and pipeline. The NTSB determines the probable cause of the accidents and issues safety recommendations aimed at preventing future accidents. In addition, the NTSB carries out special studies concerning transportation safety and coordinates the resources of the Federal Government and other organizations to provide assistance to victims and their family members impacted by major transportation disasters.



WWW.NTSB.GOV/MOSTWANTED

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Roles of State and Federal Regulators NTSB – Pipeline and Hazardous Materials Division

- The Pipeline staff investigates accidents occurring during the pipeline transportation of natural gas or hazardous liquids
- The Division investigates pipeline accidents in which there is a fatality, substantial property damage, or significant environmental impact





The Oil Pipeline Safety Regulations

Title 49, Code of Federal Regulations, Part 195

- Subpart A: General
- Subpart B: Annual, Accident, and Safety-Related Condition Reporting
- Subpart C: Design Requirements
- Subpart D: Construction
- Subpart E: Pressure Testing
- Subpart F: Operation and Maintenance
- Subpart G: Qualification of Pipeline Personnel
- Subpart H: Corrosion Control
- See also, Oil Spill Response Plans (49 CFR Part 194)
- See also, Drug and Alcohol Testing (49 CFR Part 199)





The Oil Pipeline Safety Regulations

Overarching Subjects

- Performance-Based Regulation
 - Performance vs. Prescriptive
 - Desired safety objectives can be reached
 - Without impeding future industry innovations
 - 33 Fed. Reg. 10213 (July 17, 1968)
- Standards Incorporated by Reference
 - API, ASTM, ASME, NACE, NFPA, Etc.
- Best Practices You Will Be Compared To Others...
- Safety Culture, Safety Management Systems





- Operation and Maintenance
- Integrity Management
- Reporting
- Enforcement

Following are Select Provisions of Part 195 (Many Have Been Omitted From This Presentation)





Operation and Maintenance – Subparts F, G & H

- § 195.401 General Requirements
 - No operator may operate or maintain its pipeline systems at a level of safety lower than that required by this subpart
- § 195.402 Procedural Manual for operations, maintenance, and emergencies
 - General
 - Maintenance and normal operations
 - Abnormal operation
 - Emergencies
 - Safety-related condition reports





Operation and Maintenance

- § 195.403 Emergency response training
- § 195.404 Maps and records
- § 195.406 Maximum operating pressure
- § 195.410 Line markers
- § 195.412 Inspection of ROW and navigable water crossings
- § 195.420 Valve maintenance
- § 195.432 Inspection of in-service breakout tanks
- § 195.436 Security of facilities





Operation and Maintenance (continued)

- § 195.440 Public awareness programs
- § 195.442 Damage prevention programs
- § 195.444 Computational pipeline monitoring leak detection systems
- § 195.446 Control room management
- § 195.501 Qualification of pipeline personnel
- Subpart H Corrosion Control





Integrity Management – Hazardous Liquids

- § 195.452 Pipeline integrity management in high consequence areas
 - Applies to each [and every] hazardous liquid pipeline and carbon dioxide pipeline that <u>could affect</u> a high consequence area
 - Develop a written integrity management program that addresses the risks on each segment of pipeline
- § 195.450 High Consequence Areas
 - Commercially navigable waterways
 - High population areas
 - Other populated areas
 - Unusually sensitive areas





Pipeline Integrity Management

- § 195.452 Pipeline integrity management in high consequence areas
 - What are the elements of an integrity management program?
 - A process for identifying which pipeline segments could affect a high consequence area (update)
 - A baseline assessment plan (new system)
 - An analysis that integrates all available information about the integrity of the entire pipeline system and the consequences of a failure
 - Criteria for remedial actions to address integrity issues raised by the assessment methods and information analysis
 - A continual process of assessment and evaluation to maintain a pipeline's integrity
 - Identification of preventive and mitigative measures to protect the high consequence areas
 - Methods to measure the program's effectiveness
 - A process for review of integrity assessment results and information analysis





Pipeline Integrity Management

- § 195.452 Pipeline integrity management in high consequence areas (continued)
 - Assess the integrity of the line pipe
 - Internal inspection tool or tools capable of detecting corrosion and deformation anomalies including dents, gouges and grooves
 - Pressure test conducted in accordance with subpart E of Part 195
 - External corrosion direct assessment
 - A schedule for completing integrity assessments
 - An explanation of the assessment methods selected and evaluation of risk factors considered





Pipeline Integrity Management

- § 195.452 Pipeline integrity management in high consequence areas (continued)
 - Risk factors for establishing an assessment schedule:
 - Results of previous integrity assessments, defect type and size that the assessment method can detect, and defect growth rate
 - Pipe size, material, manufacturing information, coating type and condition, and seam type
 - Leak history, repair history, and cathodic protection history
 - Product transported
 - Operating stress level
 - · Existing or projected activities in the area
 - Local environmental factors that could affect the pipeline (e.g., corrosivity of soil, subsidence, climatic)
 - Geo-technical hazards
 - Physical support of the segment (e.g., a cable suspension bridge)




Integrity Management – Hazardous Liquids

Integrity Management (continued)

- Preventive and mitigative measures
- An operator must take measures to prevent and mitigate the consequences of a pipeline failure that could affect a high consequence area
- Conducting a risk analysis
- Assessment intervals
- An operator must establish five-year intervals, not to exceed 68 months, for continually assessing the line pipe's integrity





Required Activities

Reporting – Subpart B

- § 195.49 Annual Report Form 7000-1.1
- § 195.55 Safety-Related Conditions
 - Corrosion; Movement or loading; Impaired serviceability; Surge greater than 110% MOP; A leak that constitutes an emergency; Pressure reduction (20%) or shutdown
- § 195.50 Accidents
 - Explosion or fire
 - Release of 5 gallons (ROW/facility exception)
 - Death or Injury requiring inpatient hospitalization
 - Damage greater than \$50,000
- § 195.64 National Registry Construction (60 days)
 - Rehab, replacement, etc. > \$10 million
 - 10+ miles new pipeline or a new facility





Enforcement

- Inspections
- Investigations
- Notice of Amendment
- Warning Letter
- Notice of Probable Violation
- Compliance Order
- Civil Penalty (Penalties)
- Safety Order
- Corrective Action Order
- Administrative Procedure







Current Issues and Initiatives

API-AOPL Leadership Safety Initiatives

- Leak Detection
- Damage Prevention
- Enhanced Data Integration
- Sharing Practices
- External Communications
- Strategic Planning
- Research & Development/Enhanced Technology
- Emergency Response

Purpose: Undertake significant near-term and long-term actions that will make real improvements in industry performance





Current Issues and Initiatives

Verification of Records Establishing Maximum Operating Pressure (MOP)

- San Bruno incident raised issue of reliability/accuracy of records
- National Transportation Safety Board recommendation
- Advisory Bulletin January 2011 MOP records must be reliable, traceable, verifiable and complete
- Advisory Bulletin May 2012 Defined traceable, verifiable and complete
 - Traceable: Can be linked to original information about a pipeline/facility
 - Verifiable: Information confirmed by separate documentation?
 - Complete: Record is "finalized" by a signature, date, or other marking





Integrity Verification

Hazardous Liquids

- Not Yet Proposed (Gas Transmission in process)
- However, see Hazardous Liquid Proposed Rulemaking
 - ANPRM October 2010
 - NPRM Now Advanced to Office of Management and Budget (Major Rule)
 - IMP 2.0 Expected







- Hazardous Liquids (Cont.)
 - "address[ing] effective procedures that hazardous liquid operators can use to improve the protection of High Consequence Areas (HCA) and other vulnerable areas along their hazardous liquid onshore pipelines. PHMSA is considering whether changes are needed to the regulations covering hazardous liquid onshore pipelines,
 - whether other areas should be included as HCAs for integrity management (IM) protections, what the repair timeframes should be for areas outside the HCAs that are assessed as part of the IM program, whether leak detection standards are necessary, [whether] valve spacing requirements are needed on new construction or *existing* pipelines
 - [whether] PHMSA should extend regulation to certain pipelines currently exempt from regulation.





PHMSA Proposed Rulemakings (Haz Liq)

- Proposed Rules (Actually Published, PHMSA Working On It)
 - Enforcement of State Excavation Damage Laws (NPRM April 2012)
 - Miscellaneous Amendments to the Pipeline Safety Regulations (NPRM Nov 2011)
 - Updates of Regulatory References to Technical Standards NPRM Aug 2013)
- Upcoming Rules (Being Developed for Publication and Comment)
 - Safety of On-Shore Hazardous Liquid Pipelines (ANPRM in 2010; NPRM Expected ...?)
 - Operator Qualification, Cost Recovery and Other Changes (NPRM Under Development)
 - Rupture Detection and Valve Rule (NPRM Under Development within PHMSA)



2011 Pipeline Safety, Regulatory Certainty, and Job Creation Act of 2011

Pending Issues

- Integrity Management expansion required to be reviewed
- Automatic and remote controlled valves could be required on line replacements
- Leak detection requirements and standards could be required
- Depth of cover requirements at certain water crossings could be changed





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Credit Where Credit's Due: AOPL/API/PET/PPTS/DMT Andy Black Darren Hunter Kinetic Peter Lidiak Chris Paul Chris Stimpson



Accounting for Pipeline Safety

Eric McKee Plains All American Pipeline







PHMSA* – Hazardous Liquid Integrity Management Program (IMP) – Goals

Improve pipeline safety through:

Accelerating the integrity assessment of pipelines in HCAs,
Improving integrity management systems within companies,
Improving the government's role in reviewing the adequacy of integrity programs and plans, and
Providing increase public assurance in pipeline safety

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*U.S. Department of Transportation – Pipeline and Hazardous Materials Safety Administration



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PHMSA – Integrity Management Program (IMP) – Summary

- •Written integrity management program that addresses risks
- •Identify portions of pipeline systems that are high consequence areas (HCA) and rank according to risk
- •Perform baseline assessments of HCA pipe in risk order
- •Investigate anomalies and remediate defects

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- •Identify preventative and mitigative measures to protect HCAs
- •Measure IMP's effectiveness and continually improve the program







PHMSA – Integrity Management Program (IMP) – Impact

Impact on pipeline companies:

- •Initial baseline assessments were to be completed within 7 years of new rule 2001
- •Companies must reassess every 5 years
- Increased use of In-line inspection tools
- •Increased costs to pipeline companies
- •Decrease in number of releases







Liquids IMP Spending AOPL Survey Results









Liquids IMP Spending AOPL Survey Results

According to the survey, respondents conducted over

13,000 digs

in 2012, resulting in over 10,000 repairs.







Integrity Management Program (IMP) Costs

•All costs associated with inspection and examinations

- •In-line inspections
- •Tank checks
- •API 653 inspections
- •Tank Cleaning
- •Employee time
- •Risk analysis and ranking
- •System data review and analysis
- •Maintenance and repair costs









Integrity Management Program (IMP) Cost Types

- Smart Pigging
 A smart pig is an inspection tool used to identify various anomalies in a pipeline without stopping the flow of the product in the line
- Hydrotesting
 A hydrostatic test is a way in which pipelines and fuel tanks can be tested for strength and leaks. The test involves filling the vessel or pipe with a liquid, usually water, and pressurization of the vessel/pipe to the specified test pressure
- Cathodic
 Protection against environmental corrosion (soil or moisture) of underground or submerged pipelines through the use of negative potential applied by an external source to the structure





Integrity Management Program (IMP) Cost Types - continued

• API 653 Inspection

- Facility Piping Inspection
- Close Interval Survey (CIS)
- NSPS Inspection

- Inspections of above ground tank is required on a periodic basis and frequency of inspection is dictated by type and size of tank. Certified inspectors assess the internal and external condition of tank to determine suitability for continued service
- Visual and internal inspections of pipeline within a facility
- A CIS is conducted to identify possible corrosion problems in pipelines and verify the integrity of the pipeline coating (i.e. pipe to soil readings)
- Periodic inspections required by New Source Performance Standards (NSPS). NSPS are pollution control standards issued by the EPA







In-line Inspection (ILI)

- •Methods to inspect pipelines include:
 - In-line inspection tools "Smart pigs"
 - •Direct assessment (use in limited circumstances)
 - •Hydrostatic Pressure Test
- •Costs Associated with ILIs include:
 - •Rent/buy the analysis tool
 - •Analyze the data
 - •Excavation and manual inspection











Smart Pig















In-line Inspection (ILI) Tools

•Many different types of smart pigs assess the pipeline, including:

- •Test metal loss, corrosion
- •Deformations or cracks
- Measure wall thickness
- •Dents, buckles, and ripples







Accounting for IMP Costs

•Regulated U.S. oil pipeline accounting procedures are governed by:

- •Generally Accepted Accounting Principles (GAAP)
- •Internal Revenue Service (IRS)
- •Federal Energy Regulatory Commission (FERC)

•In June 2005, FERC issued an order Docket A105-1

•Describes how FERC-regulated companies should account for costs associated with implementing IMP requirements







Stringing Pipe on Right of Way









Welding the Pipe









Aerial View of Pipeline









Accounting for IMP Costs

New Construction

•<u>Capitalize</u> all costs related to new construction projects

Major Reconstruction

•<u>Capitalize</u> all costs related to major reconstruction projects which would improve the life of the asset







Repairs and Relocations





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Accounting for IMP Costs – Repairs and Relocation

Expense

- Costs related to initial inspections or identification of general repairs which maintain the life of the asset, but do not extend the life of the asset
- All costs related to the relocation of assets currently in use to another location

Capitalize

 Costs related to general repairs which **extend** the life of the asset







Replacement





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Accounting for IMP Costs – <u>**Replacement**</u>

Expense

Capitalize

- Costs related to initial inspections or identification of replacements needed or
- When costs are incurred to replace an item which is less than a single unit of property
- Costs related to replacements of items resulting from inspections when these costs relate to a single unit of property
- When the costs provides additional protection/purpose which the previous item did not (i.e. extending the life of the asset) or
- Costs are the result of change of service provided







Costs Reported on FERC Form 6

FERC regulations* segregate Operating Expenses into two broad categories

•Operations and Maintenance (300-series of accounts) •Expenses incurred in directly providing transportation service

•General (500-series of accounts) •Expenses incurred in admin support functions

*FERC regulations as stated in the Uniform System of Accounts for Oil Pipeline Companies (USoA) in the federal regulatory code, at 18 CFR 352









Costs Reported on FERC Form 6 O&M Expenses

Includes expenses incurred directly providing transportation service as follows:

- •Personnel directly engaged in transportation operations and repair and maintenance of transportation property
- •Supplies consumed and expended in operations and support of the maintenance activity
- •Operating and maintenance services
- •In support of operations and maintenance activities







Costs Reported on FERC Form 6

Four Accounts appear in both Broad Classifications

<u>0&M</u>

- Salaries & Wages 300
- Materials & Supplies 310
- Outside Services 320
- Other Expenses 390

General

- Salaries & Wages 500
- Materials & Supplies 510
- Outside Services 520
- Other Expenses 590







Outside Service Costs

69%

Outside service costs are a measure of pipeline costs related to integrity management

The median change in outside service costs in FERC Account 320 increased 69 percent between 2004-2009






Future IMP Costs

- Smart pigs are getting smarter
 - More data, more analysis, more excavation, more inspections
- Smart pigs are becoming more specialized
 - More use of ILI tools
 - I.E., more tools are run (esp. new ones)
- Each use of a tool costs more







Q&A

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