



PHMSA /OPS Development of Pipeline Performance Measures

**Presentation to Gas and Liquid
Pipeline Advisory Committees
February 26, 2014**



Wide Variety of Pipeline Performance Information is Currently Available to the Public

- Types of Data Currently Available
 - Accidents/Incidents
 - Pipeline and Facility Characteristics
 - Enforcement and Inspection
 - IM Assessment and Repair
- Different Data Breakdown Levels
 - Operator-Specific
 - State
 - National Aggregate



Wide Variety of Pipeline Performance Information is Currently Available to the Public (cont'd)

- Different Representations of Pipeline Performance Data are Available
 - Raw Data
 - Summary Tables and Graphs
 - Limited Data Analysis



Locations of **Operator- Specific** Pipeline Performance Data

Location	Pipeline Types	Data Types
Stakeholder Communications Operator Pages	HL, GG, GT	Accident/Incident, Mileage, Inspection, Enforcement
Hazardous Liquid IM Performance Pages	HL	Accident, IM Assessment and Repair
Gas Transmission IM Performance Pages	GT	Incident, Failure, Leak, IM Assessment and Repair
Gas Distribution IM Performance Pages	GD	Incident, Leaks Eliminated/ Repaired, Excavation Damage, EFVs Installed



Locations of **Operator- Specific** Pipeline Performance Data (cont'd)

Location	Pipeline Types	Data Types
Cast/Wrought Iron and Bare Steel Pipeline Inventory Pages	GD	Mileage
Stakeholder Communications Enforcement Pages – Individual Operators	Federal Enforcement	Enforcement



Locations of **State-Specific** Pipeline Performance Data

Location	Pipeline Types	Data Types
Stakeholder Communications State Pages	HL, GD, GG, GT, State Enforcement	Accident/Incident, Mileage, Enforcement
Cast/Wrought Iron and Bare Steel Pipeline Inventory Pages	GD	Mileage



Locations of **National Aggregate** **Pipeline Performance Data**

Location	Pipeline Types	Data Types
Stakeholder Communications Accident and Incident Data	HL, GD, GG, GT	Accident/Incident
Hazardous Liquid IM Performance Pages	HL	Accident, IM Assessment and Repair
Gas Transmission IM Performance Pages	GT	Incident, Failure, Leak, IM Assessment and Repair
Gas Distribution IM Performance Pages	GD	Incident, Leaks Eliminated/ Repaired, Excavation Damage, EFVs Installed



Locations of **National Aggregate** **Pipeline Performance Data**

Location	Pipeline Types	Data Types
Cast/Wrought Iron and Bare Steel Pipeline Inventory Pages	GD	Mileage
Stakeholder Communications Enforcement Data	Federal Enforcement	Enforcement



Pipeline Performance Metrics



PHMSA

Pipeline and Hazardous Materials
Safety Administration

U.S. Department of Transportation

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Summary of National/State Pipeline Safety Program Activity

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Related Links

National/State Pipeline Safety Program Summary by Type	FY 2014			
	Hazardous Liquid	Natural Gas Transmission	Natural Gas Distribution	Natural Gas Gathering
Administrative Program				
Total Number of Operators				
Total Pipeline Miles				
Within HCA's				
Cast/Alloyed Iron				
Bare Steel				
Plastic				
Copper				
Other Materials				
Average Age by Decade Installed				
Total States/National				
Total Leaks/Failures per 1,000 HCA Miles				
Top Cause				
By Age of Pipe (Decade Installed)				
Pre-1949				
1949-1949				
1950-1959				
1960-1969				
1970-1979				
1980-1989				
1990-1999				
2000-2009				
2010-2019				
Deaths				
Operator Personnel				
General Public				
Bylines				
Operator Personnel				
General Public				
Inspections and Enforcement				
Total PHMSA Inspections				
Total State Inspections				
Enforcement Actions Taken in Year				
Inventory Management Results				
Total Leaks Eliminated/Repaired				
Total Assessments Miles Completed				
Total HCA Repairs Completed				

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Interactive Portal

- Graphically presented
- Location-based information
- National or state view
- Allows user to drill down, high-level or in-depth
- Compatible with data mart



National/State Pipeline Safety Program Summary by Type	FY 201X			
	Hazardous Liquid	Natural Gas Transmission	Natural Gas Distribution	Natural Gas Gathering
Infrastructure Profile				
Total Number of Operators				
Total Pipeline Miles				
Within HCA's				
Cast/Wrought Iron				
Bare Steel				
Plastic				
Copper				
Other Materials				
Incidents and Consequences				
Total State/National				
Total Leaks/Failures per 1,000 HCA Miles				
Top Cause				
By Age of Pipe (Decade Installed)				
Pre-1940				
1940-1949				
1950-1959				
1960-1969				
1970-1979				
1980-1989				
1990-1999				
2000-2009				
2010-2019				
Deaths				
Operator Personnel				
General Public				
Injuries				
Operator Personnel				
General Public				
Environmental Impact				
Inspections and Enforcement				
Total PHMSA Inspections				
Total State Inspections				
Enforcement Actions Taken in Year				
Integrity Management Results				
Total Leaks Eliminated/Repaired				
Total Assessments Miles Completed				
Total HCA Repairs Completed				



Four categories

- Infrastructure profile
- Incidents & consequences
- Inspections & enforcement
- Integrity management results



Pipeline Performance Metrics— Non-graphical Alternative



PHMSA Pipeline Safety Data and Statistics

Serious Incidents

Gas Distribution

Incidents

Serious, Significant, and All-Reported. Views by-State and by-Cause. Access to full Incident Report data download.

Main Miles and Service Counts

Views by-State, by-Material, and by-Decade Installed. Access to full Annual Report data download.

Integrity Management (DIMP) Performance

tbd

Cast and Wrought Iron Pipeline Replacement Update

Bare Steel Pipeline Replacement Update

Gas Gathering

Mileage

Incidents

Gas Transmission

Incidents

Mileage

Miles by MAOP Determination Method

Miles by Pressure Test Range

Miles by ILI-ability

Integrity Management Performance

Bare Steel Pipeline Replacement Update

Hazardous Liquids, excluding Carbon Dioxide (CO₂)

Accidents

Mileage

Integrity Management Performance

Bare Steel Pipeline Replacement Update

Carbon Dioxide (CO₂)

Liquefied Natural Gas

Find a Pipeline Operator

Search by Operator ID

Enter a valid Operator ID and Click "Apply"

Operator ID [Go!](#)

- Two clicks on the "Apply" button may be required (depending on browser and browser settings)

- The Operator Dashboard will open in a new window. Check your browser settings if the new window is not displayed (new windows may be blocked by your browser)

Advanced Operator Search

Notes:

- Enter only one word or part of a word, from the operator name.
- You may also search by Region, State and System Type and / or default selection is "Active"

Enter search criteria and click "Apply"

Operator Name (enter partial name)	Region
<input type="text"/>	<input type="text" value="[All Column Values]"/>
System Type	Operator Status
<input type="text" value="[All Column Values]"/>	<input type="text" value="ACTIVE"/>

Opens FDM Operator dashboard in a new window



Pipeline Performance Measures

- Pipeline Performance Measures are Currently Included the DOT Scorecard
 - Accidents/Incidents Resulting in Fatality or Serious Injury
 - Liquid Pipeline Accidents with Environmental Impact
- More Complete Set of Measures Needed
 - Stakeholder Teams charged with Developing 6-12 Pipeline Performance Measures



Performance Measures Approach - Liquid Team



Top Down Approach

- First - Identify the BIG Questions
- Second – Identify what Measures would Answer the Big Questions
- Third – Determine if the Data is Currently Available
- Fourth – Make sure the Data is of Good Quality and Available to Everyone
- Fifth – If the Data is not of Good Quality or Available, develop a plan to address the gap(s)
- Make sure both teams are consistent.



Performance Measures Approach - Gas Team



- Measure Both Operator & Regulator
 - Operator Performance & Infrastructure
 - Regulations & Regulator Oversight
- Evaluate Key Measures Defined by Stakeholder Teams
- Use Currently Available Data
 - Federally-Reported
 - Industry (e.g., PPDC)
- Coordinate between Teams to Present Consistent Picture
- Identify Gaps for Future Information Collection
- Post Publicly



Data Quality and Analysis Teams

- Gas and Liquid Data Quality and Analysis Teams to Identify Performance Measures
- Representation from PHMSA & State Regulators, Pipeline Operators & Industry Associations, Pipeline Safety Advocates
- Liquid Team Developing Measures based on what we believe Stakeholders will Want to Know.
- Gas Team Identified Measures that may be Evaluated using Data Currently Available from Annual & Incident Reports



Liquid Team - Big Questions and Possible Measures

- What is the Impact of Liquid Pipelines on People and the Environment? (Possible Measure: Significant Accidents per Mile)
- How many Times have Liquid Pipelines impacted People or the Environment?
- How is the Pipeline Industry Managing Integrity? (Possible Measure: Releases Attributable to Integrity Related Failures per Mile)



Liquid Team - Big Questions and Possible Measures

- What is Being Done to Reduce Pipeline Risk?
- What is Going Through Liquid Pipelines and is there a Different Risk Associated with Different Liquids?
 - What about Crude vs. Refined Product vs. HVLs vs. CO₂?
- What Kind of Oversight is in Place?
 - If the Number of Inspections is not an Indicator of Performance, is Enforcement an Indicator of Performance?



Liquid Team - Big Questions and Possible Measures

- Is Pipeline Performance (physical pipe) More or Less Important than Operator Performance (managing risks)?
 - Is Management of Risk Reflective of a Company's Safety Culture?
- How Good is the Data Quality? Does it Adequately Reflect What is Really Going On with the Infrastructure?



Performance Measures Corresponding to Key Objectives – Gas Team

Objective	Potential Performance Measures
Maintain Pipeline Integrity	Leaks per Mile; Incidents per Mile; Repairs per Mile
Protect Human Safety and the Environment	Incidents with Impact on the Public per Mile; Incidents with Environmental Impact per Mile
Protect High Consequence Areas	Incidents in HCAs per HCA mile



Performance Measures Corresponding to Key Objectives – Gas Team (cont'd)

Objective	Potential Performance Measures
Comply with and Enforce Pipeline Safety Regulations	Violations per Inspection (example only)
Maintain Safety of Pipeline Infrastructure	Miles of Cast / Wrought Iron Pipe Miles of Bare Pipe



Gas Transmission Performance Measures Identified by Gas Data Team

- Incident Report Data
 - Total Number & Consequences
 - In HCA vs. Outside HCA
 - Onshore/Offshore
 - Important Cause Categories
 - Material/Seam Failure, Corrosion, Third Party Damage
- Annual Report Data
 - Failures and Leaks
- Measure Incidents/Leaks per Mile to Normalize



GT PMs Identified by Gas Data Team

- Integrity Management Program Related Measures
 - HCA Miles with Integrity Assessment
 - Number of IM Repair Conditions Identified and Repaired in HCAs
 - Miles with Integrity Inspections (HCA and non-HCA) and
 - By Inspection Method (ILI, Pressure Test, DA)
 - Number of Anomalies Identified
 - Mileage Capable of Running ILI Tools



GT PMs Identified by Gas Data Team

- Mileage of Potentially Higher Risk Pipe
 - Cast Iron / Wrought Iron Pipe
 - Bare Steel Pipe
 - Cathodically Unprotected Steel Pipe
 - Pre-1940 or Unknown Installed Pipe
 - Pre-1950 Installed Pipe



Gas Distribution Performance Measures Identified by Gas Data Team

- Incidents
- Leaks eliminated/Repaired
- Excavation Damage
- Mileage of Potentially Higher Risk Pipe
 - Cast / Wrought Iron Pipe
 - Bare Steel Pipe
 - Pre-1950 installed Pipe
- EFVs Installed



PHMSA's Operator Scorecard (ideas to noodle on)

- Integrity Management Program Related Measures
 - Miles ILI Inspected or Pressure Tested
 - HCA ILI Immediate, 60-day, or 180-day Repairs
 - HCA ILI Repairs per Mile ILI
 - Pressure Test Failures – Total and HCA
 - Pressure Test Failures per Mile Tested – Total and HCA
 - % HCA Miles Piggable



PHMSA's Operator Scorecard (ideas to noodle on)

- Incident Data
 - Large and Small Spills per Mile – Total and HCA
 - Large Spill Gross and Net Volume per Barrel Mile
 - Tank spills per Tank
 - Large Off-Property Spills per Mile – Total and HCA
 - LF? or HF? ERW Failures per ERW Mile
 - Serious Incident per Mile
 - Significant Incident per Mile – All and HCA



PHMSA's Operator Scorecard (ideas to noodle on)

- Incident Data
 - Average Elapsed Time to Failure Site
 - Average Elapsed time until Shutdown
 - Average Length of Pipe Isolated – Total and HCA



PHMSA's Operator Scorecard (ideas to noodle on)

- Miles of Potentially Higher-Risk Pipe
 - Miles pre-1950 & Unknown
 - % Bare Pipe
 - % Coated Steel Unprotected
 - % HCA Miles Pressure Tested < 1.25 MAOP
 - % pre-70 LF/DC ERW
 - % pre-70 HF ERW
 - % Miles Grandfather



PHMSA's Operator Scorecard (ideas to noodle on)

- Enforcement-Related Measures
 - % Random Drug Test Positive
 - Proposed Civil Penalty per Probable Violation (failure and non-failure)
 - Assessed Civil Penalty per Violation (failure and non-failure)
 - % Repeat Offences
 - Probable Violations per Mile of Pipe
 - Probable Violations (non-failure) per AFO Day (non-failure)
 - % Proposed Penalties Assessed