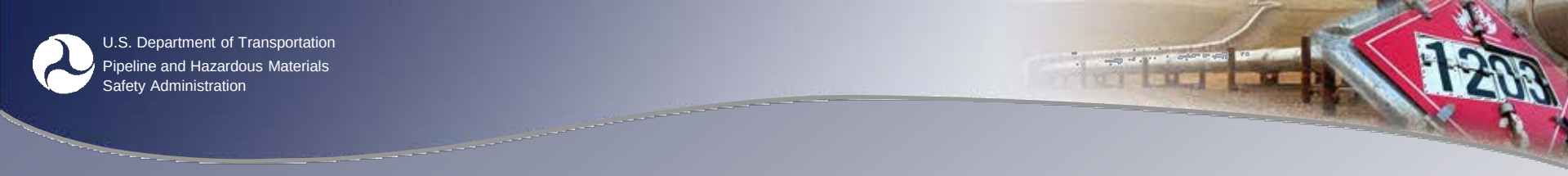

DIMP IMPLEMENTATION
Insights for Operators

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US DOT PHMSA Office of Pipeline Safety

2013 Louisiana Gas Association Pipeline Safety Conference
Thursday, July 25, 2013 New Orleans, LA
2:00-2:30PM

Topics Areas for Discussion

- Inspection Results and Findings
- DIMP Website and Performance Measures Reporting
- Current Regulatory Topics for Distribution Operators
- Questions and Answers

DIMP Inspections

- Plan development and implementation were required to be complete on August 2, 2011.
- State Programs and PHMSA have been conducting DIMP inspections since the implementation date of the Rule.
- Performance based regulatory programs (Like DIMP) can be a challenge to inspect. Time is required during inspections for drill downs of data sets and gathering a comprehensive understanding of an operator's system.
- Today's presentation will include some of the key findings from the inspections conducted to date and discussion of the expectations of regulators on these findings.

DIMP Rule Provisions – §192.1007

a) Knowledge of gas distribution system

b) Identify threats that could threaten the integrity of pipeline

c) Evaluate and rank risk associated with distribution pipelines

d) Identify and implement measures to address risks

e) Measure performance, monitor results, and evaluate effectiveness of IM program

f) Periodic Evaluation and Improvement of IM Program

g) Report results of required performance measures

§192.1011 - Records maintained to demonstrate compliance

IM Plans and Development Models

- When a “Model” Program is used, documentation of how the “Model” Program works must be integrated or referenced.
- An Operator’s Operations, Maintenance, and Inspection procedures may need to be integrated or referenced in the DIMP depending on program’s structure.
- Procedures are required in 192.1007, and plans must contain adequate procedural documentation.
- Procedure means a fixed, step-by-step sequence of activities or course of action (with definite start and end points) that must be followed in the same order to correctly perform a task.
- Multi-state operators may have one or more plans but must be able to “filter” their risk ranking and measures to reduce risk by state.

Other DIMP Plan Comments

- Pre-DIMP risk reduction measures need to be incorporated into the DIMP plan.
- If risk evaluation concludes new or additional risk reduction measures are not needed to address a particular threat, that may be acceptable and needs to be explained in the Plan.
- The DIMP rules may require something that is already being done in another context – copy it over or link to it.
- The Plan should culminate in a ranked/prioritized list of threats, risk reduction measures, and performance measures.
- Treat DIMP as a tool to analyze needs and progress, not as a regulatory exercise.

Knowledge of Gas Distribution System

- Where DIMP relies upon subject matter expert (SME) input, the operator must be able to demonstrate why the SME is an expert.
- SME decisions and conclusions must be documented.
- Operators must specify how field information is to be relayed into DIMP. Some Operators have modified field data acquisition forms and internal processes to incorporate new information and correct inaccurate information.
- Plan must reference the missing information list when it resides outside of the DIMP.
- Procedures for identification and collection of additional information must be included or referenced in DIMP to ensure consistent collection and processing.

Knowledge (continued)

- Specific source data and documents used in development and implementation of DIMP must be included in DIMP.
- Procedure for collection of additional or missing information must be documented; and if there is no missing or unknown information, the DIMP must state this assumption.
- Plan must list data that the Operator has identified that is needed to fill gaps.
- Plan must include procedure for recording new pipe data, including location and materials used. It may be necessary to modify field data acquisition forms and internal processes to incorporate new information and correct inaccurate information.

Knowledge (continued)

- Data quality is a common concern;
  - Outdated, incomplete, obvious errors.
  - Outdated data systems difficult to use or sort.
  - Data cleanup and scrubbing is often required.
- Reasonable balance between SME and hard data is important.
- Integration of data to identify existing and potential threats requires an appropriate level of resource allocation.
- When scrubbed data becomes available threat identification may need to be re-run.

Identify Threats to Integrity

- A DIMP must provide adequate details or specificity to address specific threats and risks in the Operator's unique operating environment.
- Consideration must be given to applicable operating and environmental factors affecting consequence (e.g., paved areas, business districts, hard to evacuate) relating to the Consequence of Failure (COF) when evaluating risk.
- DIMP procedures must provide for the re-evaluation of threats and the identification of new or potential threats.
- Plan must include procedures to evaluate and obtain data from external sources that are reasonably available to identify existing and potential threats.

Threat Identification

- Threat categories
  - Time Dependent
  - Time Independent
- Threat Identification, Data Gathering, Data Integration, and Risk Assessment are inter-related and dependent upon each other
- A failure of one of these processes can result in threats to the integrity of the pipeline not being addressed
- Threats are Potential Pipeline Failure Mechanisms or Pipeline Failure Cause Categories
- Identifying Threats is key to Operator Integrity Decisions regarding measures to implement to reduce risk(s).

Incident Causes or Threats to the Integrity of a Pipeline from B31.8S

- Third Party Damage
  - Third party inflicted damage (instantaneous/immediate fail)
  - Previously damaged pipe (delayed failure mode)
  - Vandalism
- Corrosion Related
  - External
  - Internal
- Miscellaneous Equipment and Pipe
  - Gasket O-ring failure
  - Stripped threads/broken pipe/coupling fail
- Control/Relief equipment malfunction
  - Seal/pump packing failure
  - Wrinkle bend or buckle
  - Miscellaneous
- Incorrect Operations
  - Incorrect operation company procedure
- Weather Related
  - Cold weather
  - Lightning
  - Heavy rain or floods
  - Unknown
- Manufacturing Related Defects
  - Defect pipe seam
  - Defective pipe
- Welding/Fabrication Related
  - Defective pipe girth weld
  - Defective fabrication weld
- Outside Forces
  - Earth movement
- Environmental Cracking
  - Stress corrosion cracking

Threat Categories from GPTC G-192-8

- External Corrosion
  - Bare Steel Pipe (CP or no CP)
  - cast iron pipe (graphitization)
  - coated and wrapped steel pipe (CP or no CP)
  - Other metallic materials
- Internal corrosion
- Natural Forces
  - Outside force/weather: steel pipe
  - Outside force/weather: plastic pipe
  - Outside force/weather: cast iron pipe
- Excavation Damage
  - Operator (or its contractor)
  - Third-party
- Other Outside Force Damage
  - Vehicular
  - Vandalism
  - Fire/Explosion (primary)
  - Leakage (previous damage)
  - Blasting
  - Mechanical damage: Steel pipe, Plastic pipe, Pipe components

Threat Categories from GPTC G-192-8 (Continued)

- Material or Weld
  - Manufacturing defects
  - Materials/Plastic
  - Weld/Joint
- Equipment Failure
  - System Equipment
- Incorrect operation
  - Inadequate procedures
  - Inadequate safety practices
  - Failure to follow procedures
  - Construction/Workmanship defects
- Other Failure Causes that the Operator has experienced

Threat Identification from DIMP Rule

- §192.1007 What are the required elements of an integrity management plan? A written integrity management plan must contain procedures for developing and implementing the following elements:
- (b) Identify threats. The operator must consider the following categories of threats to each gas distribution pipeline: **Corrosion, natural forces, excavation damage, other outside force damage, material or welds, equipment failure, incorrect operations, and other concerns that could threaten the integrity of its pipeline**. An operator must consider reasonably available information to **identify existing and potential threats**. Sources of data may include, but are not limited to, incident and leak history, corrosion control records, continuing surveillance records, patrolling records, maintenance history, and excavation damage experience.

Threat Identification

An Operator Must :

- Consider and Evaluate Existing and Potential Threats
- Justify Elimination of Threats from Consideration

So, there is more to do than account for just Time Dependent and Time Independent Threats

- An Operator must look at “near misses”, known threats identified in Industry literature, PHMSA Advisory Bulletins, etc. and understand how threats interact with each other
- An Operator should also consider that Interactive Threats (interaction of multiple threats) can be a potential threat.

Potential Threats

- Some Operators are struggling with potential threats:
  - Threats the Operator has not previously experienced, but identified from industry or PHMSA information
  - Threats from aging infrastructure and materials with identified performance issues may need to be considered existing threats depending on the materials in question and the operating environment
  - Threats that endangered facilities but have not resulted in a leak (e.g., exposed pipe, near misses).
  - Non-leak threats (overpressure, exposure)
  - Manufacturing and Construction Threats
  - Maintenance history

Potential Threat Identification

- This is a thoughtful consideration of what else could go on that standard risk assessment models do not account for
- Consider what other threats (and interactive threats) exist in the Operator's unique operating environment
- Consideration of near miss events and abnormal operating condition events (just to name a couple of potential threat identification areas) is needed
- It can be resource intensive depending on the materials and operating environment
- Sufficient time and resources should be committed to the task(s)

Identified Potential Threats

Examples of potential threats often not being considered:

- Over pressurization events
- Regulator malfunction or freeze-up
- Cross-bores into sewer lines
- Materials, Equipment, Practices, etc. with identified performance issues
- Vehicular or Industrial activities
- Incorrect maintenance procedures or faulty components
- Rodents, plastic eating bugs, tree roots
- Other potential threats specific to the operator's unique operating environment

Interactive (Potential) Threats

- Distribution Operators should look to their Leak and Incident history and Operations and Maintenance history to identify interactive threats specific to their system.
- Examples of interacting threats to consider include:
  - Slow crack growth in older plastics where pipeline was pinched during operational event or where over-squeeze occurred due to improper tools or procedure
  - Slow crack growth in older plastics where non-modern construction practices were used
  - Water main leakage areas or areas of soil subsidence with cast iron mains
  - Installation of mechanical fittings without restraint (category 2 & 3) in soils or conditions (excavation damage) that cause pipe to pull out of fitting

Evaluate and Rank Risks

- System subdivision for the evaluation and ranking of risks must be sufficient to appropriately analyze risk(s) present in the Operator's unique operating environment.
- System subdivisions may be predicated on threats (materials, construction, etc.) and consequences (wall-to-wall pavement, high density population areas, etc.)
- Geographical segmentation may be appropriate when systems are separated by space or a specific, predominate threat exists (e.g., where flooding can be expected, earthquake prone area). However, different materials may be a predominate threat in a region, and segmentation may need to be refined to accommodate different failure rates.
- Risk ranking must include all risks to pipeline facilities.

Evaluate and Rank Risks (cont.)

- Operators must consider non-leak failures in analyzing risk. DIMP should address failures that do not result in a release (e.g., near miss) to identify potential threats.
- The risk ranking model results must be validated. One operator identified that the “COF” can be diluted by Frequency of Failure (“FOF”) – a larger range for consequences was needed to get reasonable results.
- Plan must provide explanation of the process used to validate the data used in the risk ranking and to review the output of the risk ranking model for “reasonableness”.
- The Plan (or Model used) must address risks specific to services as well as mains.
- When changes are made to a risk model, the risk ranking should be re-run and results incorporated into DIMP promptly.

Measures to Address Risks

- The Plan must provide for a link between the specific risk (either a threat or consequence) and the measure to reduce risk that has been identified and implemented.
- The Plan must contain or reference an effective leak management plan unless all leaks are repaired when found.
- Self-assessment by the operator of their leak management program is a key component of an effective plan.
- If an Operator repairs all leaks when found, that must be stated or referenced in the DIMP.
- Intervals must be established for the re-evaluation of implemented measures to reduce risks to gage their effectiveness and identify if the measure is appropriate.
- DIMP Models must rank proposed projects/replacements based on risk and not the cost.

Measure to Address Risks (Threats)

- Table 1 in PHMSA DIMP Inspection Forms 22 & 23 provides a quick overview of risk reduction and monitoring methods

	Primary Threat Category	Threat Subcategory, as appropriate	Measure to Reduce Risk	Performance Measure
1	Corrosion	External Corrosion on Copper Service Lines	Replace approximately 100 copper service lines each calendar year	Track number of leaks caused by external corrosion per 1000 copper service lines annually
2	Excavation Damage	Third Party Damage	Conduct pre-construction meetings or Monitor locate for life of ticket	Track frequency of failures per 1000 excavation tickets annually
3	Equipment Failure	Mechanical Fittings, Couplings or Caps/Seals	Repair or replace problem materials as found	Track frequency of failures by equipment type annually

Performance Measurement

- Operators must develop and monitor performance measures from an established baseline to evaluate the effectiveness of its IM program.
- A DIMP must include procedures for establishing baselines for Performance Measures required in 192.1007(e)
- Some Operator's Plans identified “triggers” to initiate development of new performance measures depending on the program performance and the operating environment
- Each Measure Implemented to Reduce Risk must have a Performance Measure established to monitor its effectiveness
- Operators have identified a single performance measure to evaluate the effectiveness of multiple risk control measures

Periodic Evaluation and Improvement

- A Plan must contain procedures for conducting periodic evaluations.
- If it is found necessary to make changes to the periodic evaluation procedure when an Operator implements this element, the changes would be handled with revisions to the original procedure.
- Plans are expected to include procedures for notifying appropriate operator personnel of changes and improvements made to the plan or plan requirements when they are affected by the change.
- The Plan must provide for the incorporation of pipe replacement program in the DIMP as the future risk results will be affected by the removal of vintage pipeline facilities.

Report Results

- The DIMP must include (or reference) procedure(s) describing the collection and reporting of Annual Report data as part of the annual report to PHMSA.
- If a State agency exercises jurisdiction over the Operator's pipeline and requires reporting, a procedure must include instruction to send reporting information to the state pipeline safety authority.
- While Performance Measures 192.1007(e)(v) & (vi) are not required to be reported, they must be monitored by the operator and maintained for inspections. Some Operators are failing to collect and analyze these performance measures that address hazardous leaks eliminated or repaired categorized by material ((e)(v)) and performance measures developed to monitor actions implemented to control identified threats and reduce risks ((e)(vi)).

Records Required to be Maintained

- An operator must maintain records demonstrating compliance with the requirements of this subpart for at least 10 years (Including records not otherwise kept for 10 years).
- The Plan must describe how superseded plans and data will be maintained and kept secure
- Plans must include an adequate revision log that includes: the Plan effective date, revision dates, and a description of each revision
- Some Plans included statements that “all Company records were used in the development of the DIMP.” Only the records actually used to develop and implement the DIMP should be referenced; otherwise all records must be kept for 10 years.

DIMP Website

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

Pipeline Technical Resources

Return to Pipeline Safety Community

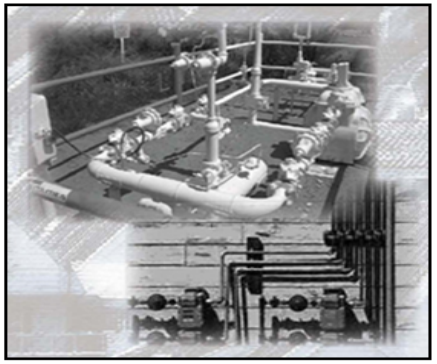
Home | Alternative MAOP | Cased Crossings and GWUT | Class Location | CRM | DIMP | Gas IM
HL IM | High Volume EFV | Low Strength Pipe | OQ | Pipeline Construction | R&D | Public Meetings

DIMP Menu

- Home
- History
- Meetings
- Resources
- FAQs
- Performance Measures
- Regulator Contacts
- What's New
- Feedback

- Regulations
- Advisory Bulletins
- Interpretations

Gas Distribution Integrity Management Program



The Pipeline and Hazardous Materials Safety Administration (PHMSA) published the final rule establishing integrity management requirements for gas distribution pipeline systems on December 4, 2009 (74 FR 63906). The effective date of the rule is February 12, 2010. Operators are given until August 2, 2011 to write and implement their program.

PHMSA previously implemented integrity management regulations for hazardous liquid and gas transmission pipelines. These regulations aim to assure pipeline integrity and improve the already admirable safety record for the 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 preclude applying the same tools and management practices as were used for transmission pipeline systems. Therefore, PHMSA took a slightly different approach for distribution integrity management, following a joint effort involving PHMSA, the gas distribution industry, representatives of the public, and the National Association of Pipeline Safety Representatives to explore potential approaches.

The regulation requires operators, such as natural gas distribution companies to develop, write, and implement a distribution integrity management program with the following elements:

- Knowledge
- Identify Threats
- Evaluate and Rank Risks
- Identify and Implement Measures to Address Risks
- Measure Performance, Monitor Results, and Evaluate Effectiveness
- Periodically Evaluate and Improve Program

http://primis.phmsa.dot.gov/dimp/index.htm

DIMP Performance Measures

Summary of Gas Distribution Pipeline Performance

Time run: 3/22/2013 4:57:19 AM

SMART Data as of **3/21/2013 7:45:24 PM**
Portal Date as of **3/22/2013 12:37:01 AM**

	2005	2006	2007	2008	2009	2010	2011	2012
Total Leaks Eliminated/Repaired	516,307	502,501	485,737	487,367	553,096	484,770	481,744	489,992
Hazardous Leaks Eliminated/Repaired						185,581	192,847	186,657
Excavation Damages per 1000 Excavation Tickets						3.8	3.7	3.5
Total Number of EFVs on Single-Family Residential Services Installed During Year						504,861	597,596	677,747
Estimated Number of EFVs in System at End of Year						6,357,362	6,912,980	7,612,315

(Note: Hazardous Leaks and Excavation Damages were not required to be reported prior to 2010.)

Click here to see year-by-year plots of **Total Leaks** eliminated/repaired as well as plots of Leaks by Failure Cause.

Click here to see a table depicting **Hazardous Leaks** by Failure Cause.

Click here to see plots depicting **Incidents** by Year and Failure Cause.

Quick Facts on Mechanical Fitting Failure Reporting for Distribution Integrity Management [More]

Quick Facts on Pipe Material in Distribution Pipeline Systems [More]

http://primis.phmsa.dot.gov/dimp/perfmeasures.htm

DIMP Website

Please regularly use PHMSA websites as they are a primary form of communication with Stakeholders

PHMSA Office of Pipeline safety

http://phmsa.dot.gov/pipeline

DIMP Home Page

http://primis.phmsa.dot.gov/dimp/index.htm

Pipeline Safety Stakeholder Communications

http://primis.phmsa.dot.gov/comm/

Cast Iron Discussion Page

http://opsweb.phmsa.dot.gov/pipeline_replacement/

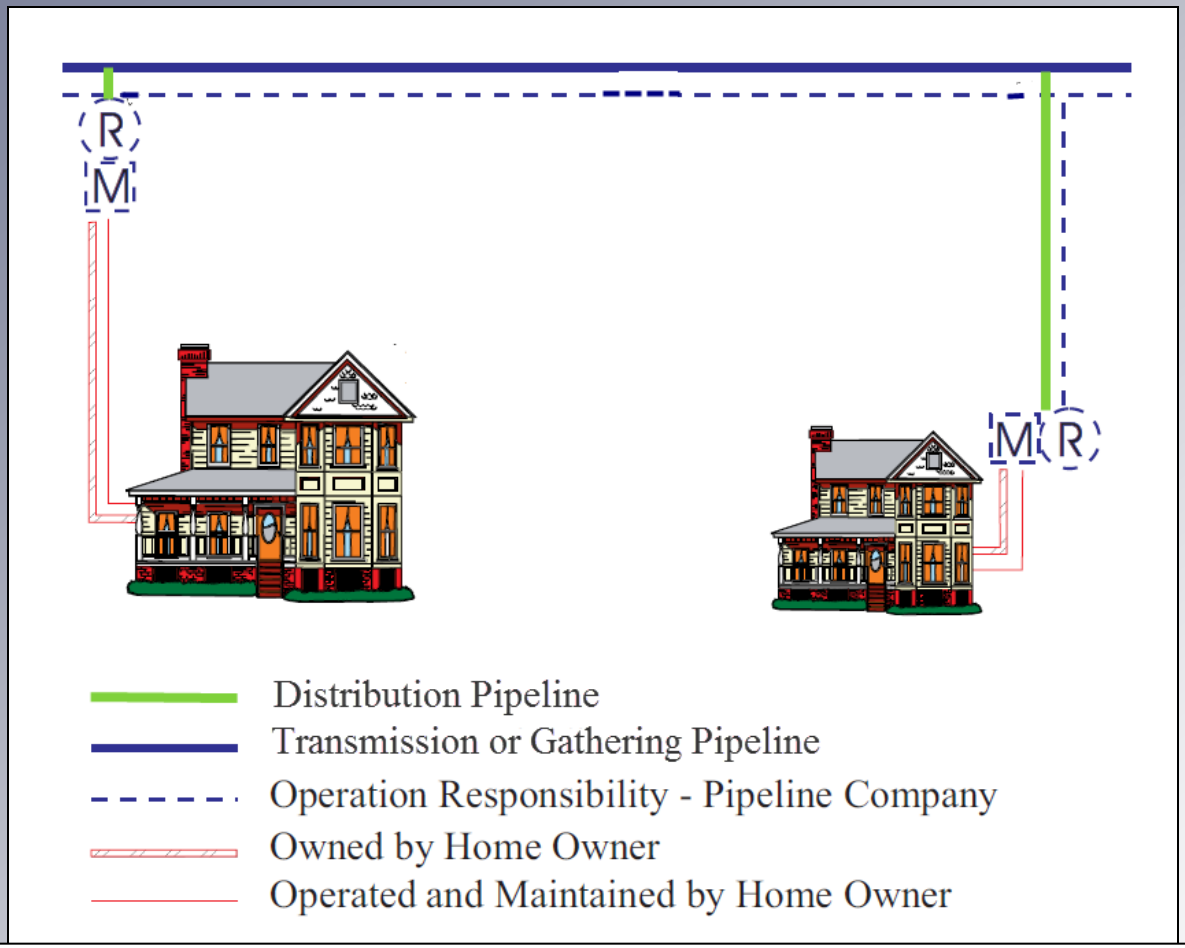
Farm Taps

Quotes from preamble materials in "Customer-Owned Service Lines", 60 Fed. Reg. 41821, 41823 (August 14, 1995):

PHMSA has defined a 'farm tap' as "industry jargon for a pipeline that branches from a transmission or gathering line to deliver gas to a farmer or other landowner."

"… Some operators primarily engaged in the gathering or transmission of gas also operate distribution pipelines. They do so when they deliver gas directly to customers through farm taps and industrial taps. In fact, because portions of these delivery lines qualify as service lines, gathering and transmission operators report them as distribution pipelines under 49 CFR 191.13. Moreover, farm and industrial tap customers are not immune from harm by potential hazards that could occur on their piping. And surely not all farm and industrial tap customers know enough about gas piping safety to make even a single maintenance notice unnecessary."

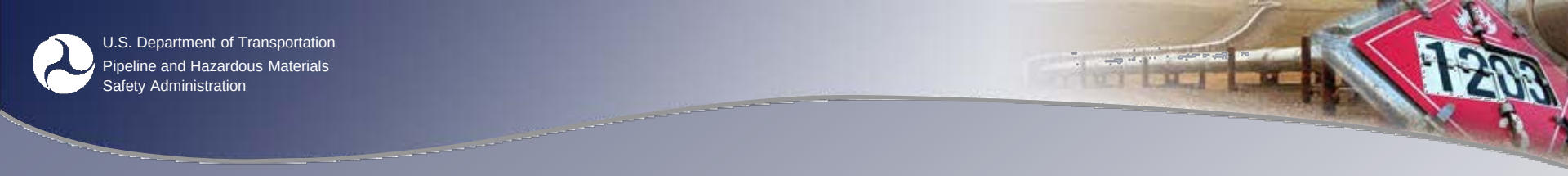
Farm Taps – Distribution Service Lines



- Do the facilities meet the definition of Gathering? No.
- Do they meet the definition of transmission? No.
- If No to both,

Then the facilities are distribution.

The “farm tap” is pipeline upstream of the outlet of the customer meter or connection to the customer piping, whichever is further downstream, and is responsibility of the operator. The pipeline downstream of this point is the responsibility of the customer. Some States require the operator to maintain certain portions of customer owned pipeline. The pipeline maintained by the operator must be in compliance with 49 Part 192.



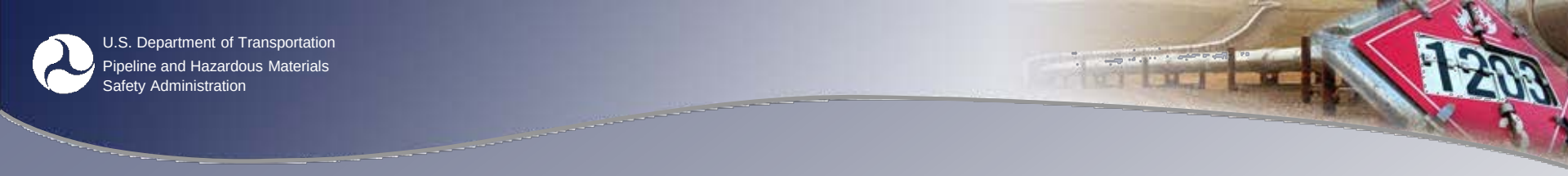
Treatment of Farm Taps in DIMP

We have discussed the treatment of farm taps in DIMP FAQ C.3.7 (issued 08/02/2010) and in the 3 DIMP Webinars.

PHMSA's position is that since a farm tap is neither a transmission pipeline or a gathering pipeline it is a distribution pipeline

From 192.3 Definitions:

- "Gathering Line means a pipeline that transports gas from a current production facility to a transmission line or main."
- "Transmission line means a pipeline, other than a gathering line, that: (1) transports gas from a gathering line or storage facility to a gas distribution center, storage facility, or large volume customer that is not down-stream from a gas distribution center; (2) operates at a hoop stress of 20 percent or more of SMYS; or (3) transports gas within a storage field."



Treatment of Farm Taps in DIMP

- PHMSA continues to meet with and talk to industry groups to gather information, understand the need for change, and discuss solutions, and the Farm tap discussion involves regulated and unregulated production, gathering, transmission, and distribution pipeline operators.
- PHMSA takes Industry's concerns on the treatment of Farm Taps and their inclusion in DIMP very seriously, but there is a process that we have to go through in this matter. It is not a simple matter, and there are ramifications in each option that we discuss with Industry.
- PHMSA has considered Industry's concern over the inclusion of farm taps in the DIMP rule and believes that the risk to the public from farm taps is generally low. Therefore, PHMSA is considering amending Part 192 to exempt farm taps from the requirements of Part 192, Subpart P - Gas Distribution Pipeline Integrity Management..

Distribution Annual Report Revisions

Distribution Annual Report modifications to align leak causes with the Incident Report have initiated and should be completed in time for the 2012 Annual Report submittals.

Other modifications are being discussed and solutions identified for their implementation, and these include:

- Easier data input fields for mileages and services
- Definition of the type of operator
- Definition of the commodity transported
- Enhanced descriptions of excavation damage causes

DIMP Enforcement Guidance

- DIMP Enforcement Guidance has been posted.
- This guidance is publicly available and posted on PHMSA's website with the other Enforcement Guidance documents currently posted at http://www.phmsa.dot.gov/foia/e-reading-room
- This posting allows Operators to understand Regulators' expectations with regards to the DIMP Regulation

Questions and Answers

Thank you for Your Participation