DIMP IMPLEMENTATION

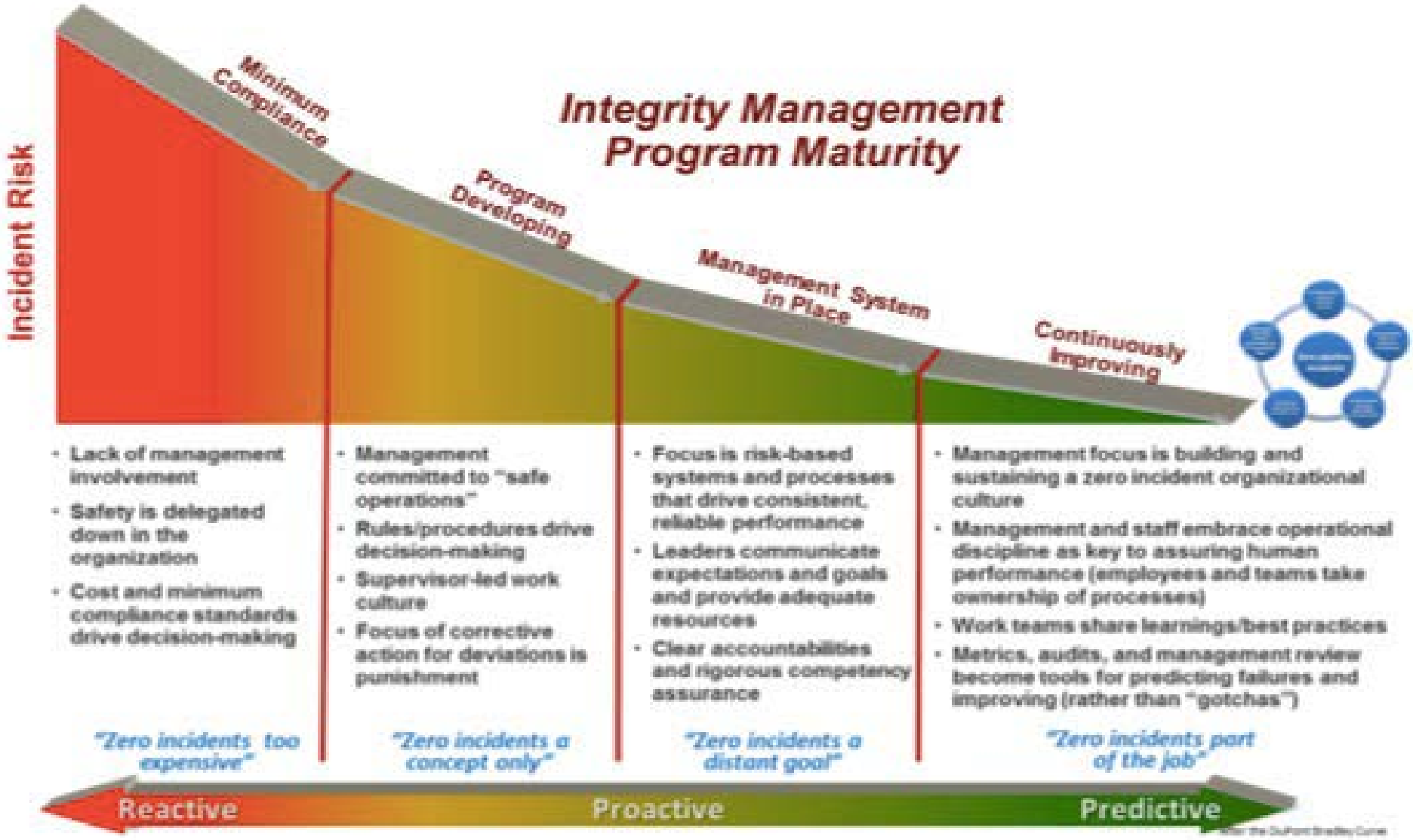
National Association of Pipeline Safety Representatives

US DOT PHMSA Office of Pipeline Safety

Topics Areas for Discussion

- Safety Culture – we talked about this yesterday
- Inspection Results and Findings
- Mechanical Fitting Failure Report Data/Analysis
- DIMP Inspection Forms
- DIMP Website and Performance Measures Reporting
- Questions and Answers

Assessing Maturity



DIMP Inspection Results and Findings

High Level Observations

- DIMPs need to Mature and be Continuously improved
- The DIMP Rule was designed as a performance based regulation to be flexible and allow operators to implement their DIMP in the most efficient and effective manners to improve pipeline safety.
- Regulators have identified the need/requirement for operators to work with their DIMP on a continuous basis so that programs mature to fit the operator's unique operating environment.
- Findings indicate that operators need to do more work implementing DIMPs to reduce risks.

DIMP Inspections

- Plan development and implementation were required to be complete on August 2, 2011.
- First Round of DIMP Inspections is expected to be completed by the end of 2014.
- For inspections of performance based regulatory programs (Like DIMP), adequate time is required for drill downs of data sets to gather a comprehensive understanding of an operator's system.
- Vacancies created by an aging workforce (turn-over) have created voids in operating knowledge of pipeline systems, and trained personnel have not always been available.

DIMP Rule Provisions (§192.1007)

- IM Plan and Models used to develop IM Plan
- Knowledge of gas distribution system
- Identify threats that could threaten the integrity of pipeline
- Evaluate and rank risk associated with distribution pipelines
- Identify and implement measures to address risks
- Measure performance, monitor results, and evaluate effectiveness of IM program
- Periodic Evaluation and Improvement of IM Program
- Report results of required performance measures
- Records maintained to demonstrate compliance

IM Plans and Development Models

§192.1005

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 O&M 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.

Other DIMP Plan Comments

- 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 or a book on the shelf.
- “To do DIMP right, all involved must understand and support the program. Proper safety culture will be the glue that will make DIMP work”

Knowledge of Gas Distribution System

§ 192.1007(a)

Knowledge of Distribution System

- 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 list data that the Operator has identified that is needed to fill gaps.
- Procedures for identification and collection of additional information must be included or referenced in DIMP to ensure consistent collection and processing.

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.
- To achieve adequate data quality, an appropriate level of resource allocation is required.
- QA/QC checks should be run to ensure incoming data is accurate (e.g., categorizing leaks, determination of probable cause, accurate pipe type and facility information)

Identify Threats to Integrity

§ 192.1007(b)

Threats 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.

Identify Threats to Integrity

- A DIMP must provide adequate details and specificity to address specific potential and existing 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.
- 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
- Threats are Potential and Existing Pipeline Failure Mechanisms or Pipeline Failure Cause Categories
- Identifying Threats is key to Operator Integrity Decisions regarding measures to implement to reduce risk(s)
- Data Gathering, Threat Identification, Data Integration, and Risk Assessment are inter-related and dependent upon each other

Gas Distribution 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

Gas Distribution 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

Potential Threats

- Some Operators struggle with potential threats:
  - Threats the Operator has not previously experienced (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

Identified Potential Threats

Examples of potential threats commonly not being considered by operators:

- 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

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 Existing 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 in their system

Interactive Threats

- Interacting threats are potential threats and 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

§192.1007(c)

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.
- 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.

Evaluate and Rank Risks (cont.)

- The risk ranking model results must be validated. The “COF” can be diluted by Frequency of Failure (“FOF”) – a larger range for consequences may be needed to get reasonable results
- The Plan (or Model used) must address risks specific to services as well as mains
- When risk model changes are made, the risk ranking should be re-run and results incorporated into DIMP promptly
- Operators must consider non-leak failures in analyzing risk and address non leak events (e.g., near miss) as existing or potential threats.

Measures to Address Risks

§ 192.1007(d)

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.
- DIMP Models must rank proposed projects and replacements based on risk and not the cost.
- The Plan must contain or reference an effective leak management plan unless all leaks are repaired when found.
- If an Operator repairs all leaks when found, that must be stated or referenced in the DIMP.

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

§ 192.1007(e)

Performance Measurement

- A DIMP must include procedures for establishing baselines for Performance Measures required in 192.1007(e)
- Operators must develop and monitor performance measures from an established baseline to evaluate the effectiveness of its IM program.
- Each Measure Implemented to Reduce Risk must have a Performance Measure established to monitor its effectiveness
- Operators may identify a single performance measure to evaluate the effectiveness of multiple risk control measures

Periodic Evaluation and Improvement

§ 192.1007(f)

Periodic Evaluation and Improvement

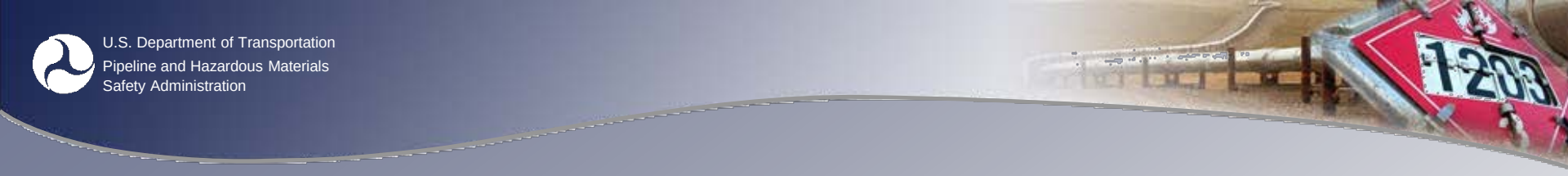
- A Plan must contain procedures for conducting periodic evaluations - changes would be handled with revisions to the original procedure.
- Plans should include procedures for notifying affected operator personnel of changes and improvements made to the plan or plan requirements.
- Plans must provide for the incorporation of pipe replacement programs in the DIMP as the future risk results will be affected by the removal of vintage pipeline facilities.

Periodic Evaluation and Improvement

- Operator's plan must have procedures that include criteria for when re-evaluations are to be done based on timing (< 5 years) or events (e.g., replacement program completed, goals achieved, new significant threats identified).
- Plan re-evaluations may generate changes to the results of the risk ranking and risk mitigation measures needed to address risk.
- Operators should be cognizant of changes that occur in the DIMP as a result of the periodic plan evaluation.

Reporting and Records

§ § 192.1007(g) & 192.1011



Report Results

- If a State agency exercises jurisdiction 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. 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).
- Plans must include an adequate revision log that includes: the Plan effective date, revision dates, and a description of each revision
- Only the records actually used to develop and implement the DIMP should be referenced; otherwise “all” records must be kept for 10 years.

Mechanical Fitting Failures

Reporting and Data Analysis

MFFR Reporting

- **§ 192.1009 What must an operator report when a mechanical fitting fails?** (a) Except as provided in paragraph (b) of this section, each operator of a distribution pipeline system must submit a report on each mechanical fitting failure, excluding any failure that results only in a nonhazardous leak, on a DOT Form PHMSA F–7100.1–2. The report(s) must be submitted in accordance with § 191.12.
- (b) The mechanical fitting failure reporting requirements in paragraph (a) of this section do not apply to the following: (1) Master meter operators; (2) Small LPG operator as defined in § 192.1001; or (3) LNG facilities.

Mechanical Fitting Failures
Reporting and Data Analysis

- The MFFR instructions are being revised to better communicate that Operators are to report all failures involving mechanical fittings and compression type couplings, regardless of material, that result in a hazardous leak.
- Failures resulting from a construction or installation defect should be identified with the “Incorrect Operations” leak cause and not the “Material or Welds/Fusions” leak cause category (as is described in PHMSA F 7100.1-2 and the Instructions).

MFFR Data Analysis

- Make an entry in each block for which data are available. Some companies may have very old pipe for which installation records do not exist. Make a best effort at quantifying data.
- ***Avoid entering "Unknown" if possible.***

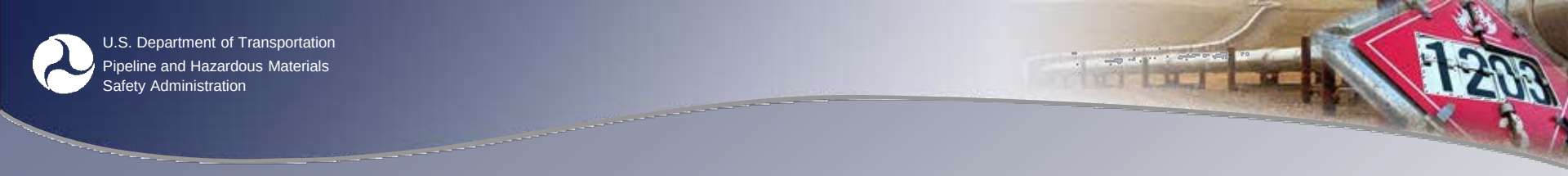
Specify the Mechanical Fitting Involved

Stab Type

Nut Follower

Bolt Type

Other(s)

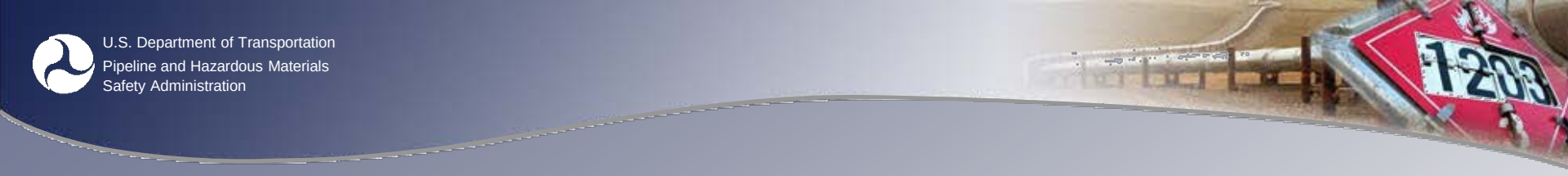


MFFR Data Analysis

- Communication of Performance Data is through the DIMP web page. To view MFFR data, go to:
- **http://primis.phmsa.dot.gov/dimp/perfmeasures.htm**
- Total Report Submitted Numbers *(03/31/2014)*:
  - MFFRs submitted in 2011 – 8349
  - MFFRs submitted in 2012 – 7585
  - MFFRs submitted in 2013 – 9240
- Data submitted for 2013 shows similar trends to previous 2 years of data collection.

MFFR Data Analysis

- The majority of mechanical fitting failures resulting in a hazardous leak involve nut-follower, coupling type fittings.
- Valves are involved in 14% of reported failures.
- Equipment failure is the leading reported cause of leaks (41%), and Natural forces is second (17%).
- The majority of leaks occur outside (98%), belowground (87%) involving service-to-service connections (60%).
- Steel fittings (62%) are involved the majority of reports, and plastic fittings are second (26%).



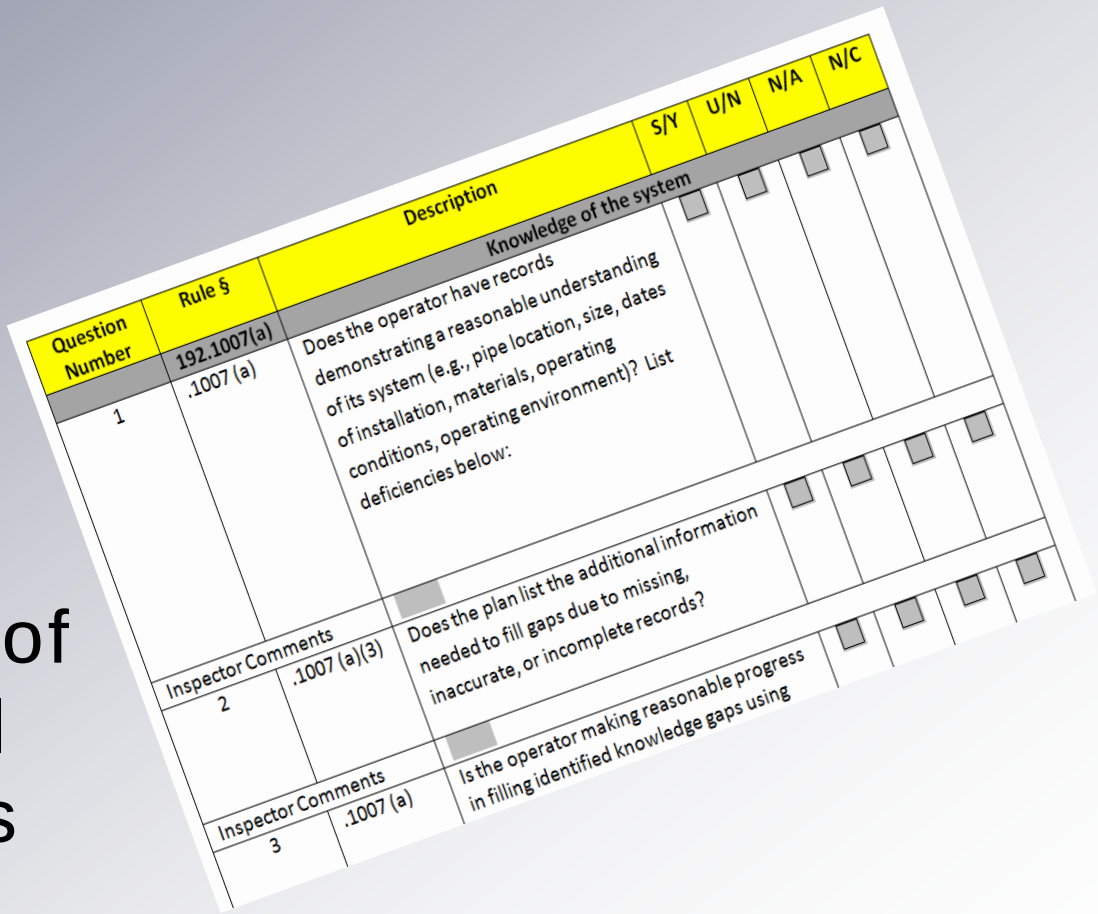
DIMP Inspection Forms

DIMP Inspection Forms

- PHMSA DIMP Inspection Forms for 192.1005 and 192.1015 distribution operators are available at http://primis.phmsa.dot.gov/dimp/resources.htm as well as the PHMSA Forms Library at http://phmsa.dot.gov/pipeline/library/forms
- Revisions were implemented in September, 2011 that made the forms more user friendly for Inspectors.
- Recently, Question 19 on Form 22 has been approved by PHMSA Legal to be regulatory required rather than for information only.

Record and Field Inspection Form

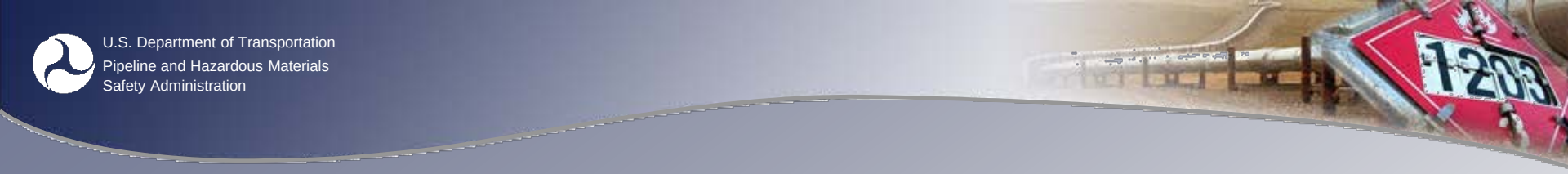
- PHMSA Form 24 has been posted for use
- Intended for inspections of Implementation of DIMP after initial DIMP inspections



Question Number	Rule §	Description	S/Y	U/N	N/A	N/C
		Knowledge of the system				
1	192.1007(a) .1007 (a)	Does the operator have records demonstrating a reasonable understanding of its system (e.g., pipe location, size, dates of installation, materials, operating conditions, operating environment)? List deficiencies below:				
Inspector Comments						
2	.1007 (a)(3)	Does the plan list the additional information needed to fill gaps due to missing, inaccurate, or incomplete records?				
Inspector Comments						
3	.1007 (a)	Is the operator making reasonable progress in filling identified knowledge gaps using				

PHMSA Form 24

- PHMSA Form 24 is for the evaluation of an operator's implementation of its DIMP through a review of its records and actions performed on pipeline facilities.
- Intended for inspections of Implementation of DIMP after initial DIMP inspections
- The form asks inspectors to review records and perform field observations regarding the implementation of the DIMP required elements.



DIMP Website and Posting of DIMP Performance Measures

DIMP Home

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

Pipeline Technical Resources

Return to Pipeline Safety Community

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HL IM | High Volume EFV | Low Strength Pipe | OQ | Pipeline Construction | R&D | LNG Facility Siting | Public Meetings

Gas Distribution Integrity Management Program

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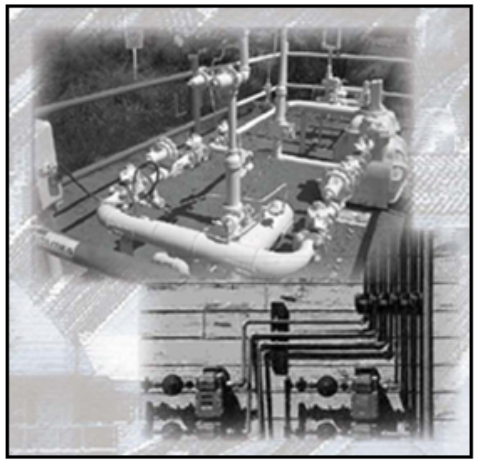
The Pipeline and Hazardous Materials Safety Administration (PHMSA) published the final rule establishing integrity management requirements for gas distribution pipeline systems on December 4, 2009 (74 FR 63906). The effective date of the rule is February 12, 2010. Operators are given until August 2,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

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

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Gas Distribution Integrity Management Program: Resources

DIMP Inspection Forms

The State-Federal DIMP Implementation Team was created to support improvements in the integrity of the Nation's gas distribution pipeline systems through development of inspection methods and guidance for evaluation of an Operator's Distribution Integrity Management Program. The Team developed inspection forms for evaluation of an Operator's Distribution Integrity Management Program. States will implement the DIMP rule under their individual state statutory authority. Since State authority and regulatory structures differ, operators should contact the regulatory authority exercising jurisdiction over the their distribution pipeline for more information. Two inspection forms were created:

- DIMP Inspection Form 192.1005 (pdf) (All operators except master meter/small LPG operators)
- DIMP Inspection Form 192.1005 (doc) (All operators except master meter/small LPG operators)
- DIMP Inspection Form 192.1015 (pdf) (Master meter/small LPG operators)
- DIMP Inspection Form 192.1015 (doc) (Master meter/small LPG operators)

Technical Reports

The following reports are intended to serve as a technical resource for OPS and State pipeline safety inspectors evaluating operators' distribution integrity management (DIMP) programs.

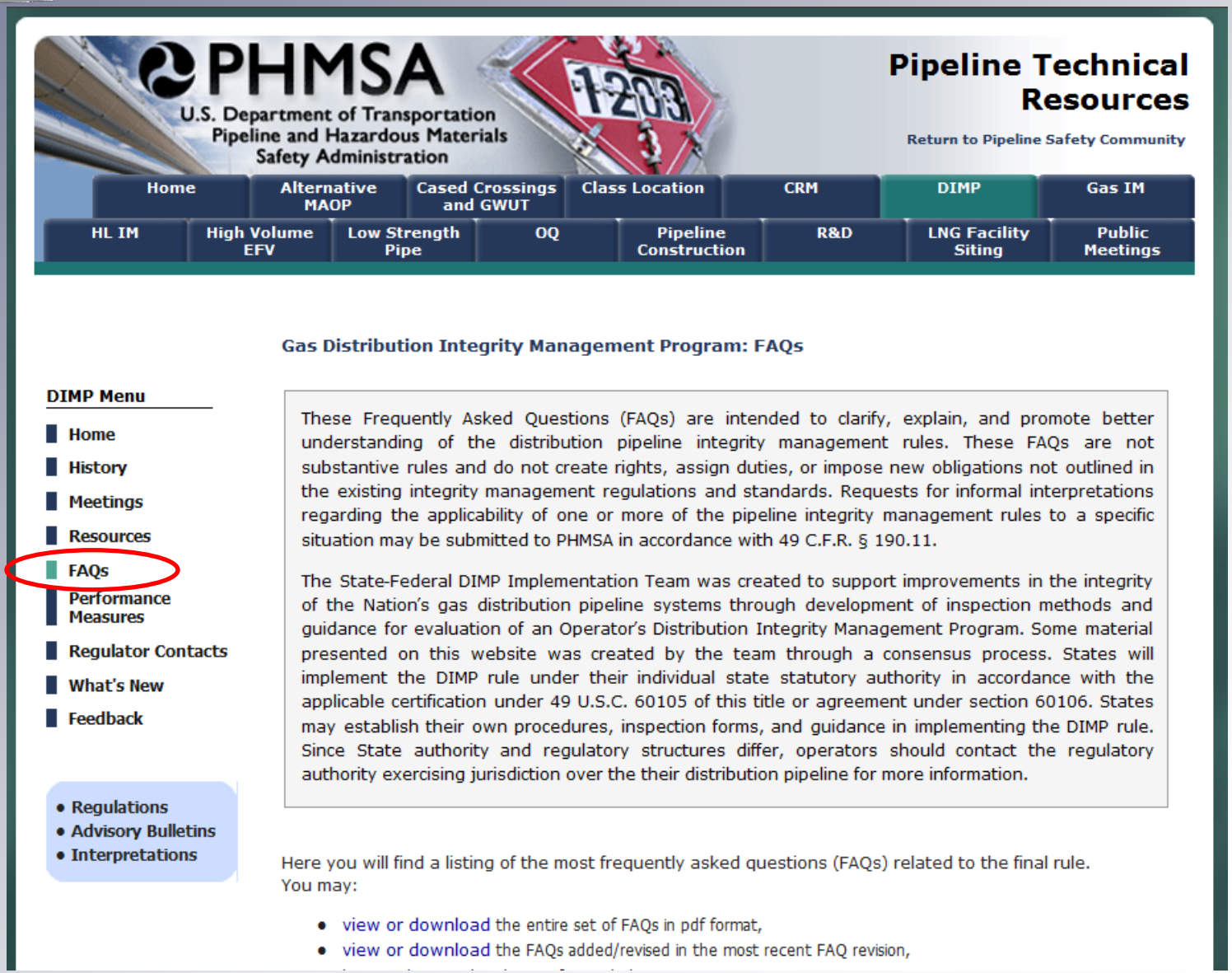
- Mechanical Damage in Pipelines, Final Report, Michael Baker Jr., April 2009
  Mechanical_Damage_Final_Report.pdf
- Pipeline Corrosion, Final Report, Michael Baker Jr. Inc., November 2008
  - Pipeline Corrosion Final Report

1. **DIMP Inspection Forms**
2. **Technical Reports**
3. **DIMP Guide for Master Meter/Small LPG**

4. **SHRIMP**
5. **GPTC**
6. **Associations**
7. **CGA**
8. **PPDC**

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

DIMP FAQs



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Gas Distribution Integrity Management Program: FAQs

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These Frequently Asked Questions (FAQs) are intended to clarify, explain, and promote better understanding of the distribution pipeline integrity management rules. These FAQs are not substantive rules and do not create rights, assign duties, or impose new obligations not outlined in the existing integrity management regulations and standards. Requests for informal interpretations regarding the applicability of one or more of the pipeline integrity management rules to a specific situation may be submitted to PHMSA in accordance with 49 C.F.R. § 190.11.

The State-Federal DIMP Implementation Team was created to support improvements in the integrity of the Nation's gas distribution pipeline systems through development of inspection methods and guidance for evaluation of an Operator's Distribution Integrity Management Program. Some material presented on this website was created by the team through a consensus process. States will implement the DIMP rule under their individual state statutory authority in accordance with the applicable certification under 49 U.S.C. 60105 of this title or agreement under section 60106. States may establish their own procedures, inspection forms, and guidance in implementing the DIMP rule. Since State authority and regulatory structures differ, operators should contact the regulatory authority exercising jurisdiction over the their distribution pipeline for more information.

Here you will find a listing of the most frequently asked questions (FAQs) related to the final rule. You may:

- view or download the entire set of FAQs in pdf format,
- view or download the FAQs added/revised in the most recent FAQ revision,

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

DIMP Performance Measures

Gas Distribution Integrity Management Program: Performance Measure Reporting

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Protecting America's Gas Distribution Pipelines

Gas distribution pipeline operators are required to submit annually performance measure reports on their Integrity Management (IM) programs and on their pipeline infrastructure. PHMSA and State Pipeline Safety Programs use these reports – due on March 15 for the previous calendar year – to monitor and report on industry progress in meeting the requirements of the Distribution IM Rule (which took effect in August of 2011), and to respond to inquiries about both PHMSA's and individual State's oversight programs.

The Distribution IM performance measure reports have only been required beginning in 2010, and these measures provide key information pertaining to operators' IM programs, including the total number of leaks either eliminated or repaired by cause, the number of hazardous leaks eliminated or repaired by cause, the number of excavation damages, the number of excavation tickets (based on One-Call notifications), the total number of Emergency Flow Valves (EFV's) installed on residential services, and the estimated number of EFV's existing in distribution systems at the end of the year.

You can see progress being made under the Distribution IM Rule, for the entire Nation, an OPS Region or an individual State, at the links below. Important definitions are included at the bottom of this page.

Leaks/Incidents shows the new Distribution IM data collected beginning in 2010 along with the historical leak data collected since 2005. The historical data consists of the total number of leaks which were repaired or otherwise eliminated, whereas the new Distribution IM data being collected includes this same leak count while also breaking out separately those leaks defined as hazardous. Additionally, beginning in 2010, data pertaining to Excavation Damage and Emergency Flow Valves (EFV's) is also being collected. Gas distribution incidents by-year and by-cause since 2005 are also shown. Incident causes are grouped as follows:

- ALL OTHER CAUSES - the number of incidents by year whose cause is currently unknown, or where investigation into the cause has been exhausted and the final judgment as to the cause remains unknown, or where a cause has been determined which does not fit into any of the other cause categories shown.

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/

Pipeline Replacement Updates

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

DIMP Enforcement Guidance

- DIMP Enforcement Guidance is posted and publicly available on PHMSA's website with the other Enforcement Guidance documents 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 participating