

# Distribution Integrity Management Programs (DIMP)

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# DIMP

- Part 192, Subpart P (1001-1015)

- 192.1001 [What definitions apply to this subpart?](#)
- 192.1003 [What do the regulations in this subpart cover?](#)
- 192.1005 [What must a gas distribution operator \(other than a master meter or small LPG operator\) do to implement this subpart?](#)
- 192.1007 [What are the required elements of an integrity management \(IM\) plan?](#)
- 192.1009 [What must an operator report when a mechanical fitting fails?](#)
- 192.1011 [What records must an operator keep?](#)
- 192.1013 [When may an operator deviate from required periodic inspections under this part?](#)
- 192.1015 [What must a master meter or small liquefied petroleum gas \(LPG\) operator do to implement this subpart?](#)



# DIMP Inspections

- Plan development and implementation were required to be complete on August 2, 2011
- Plans were inspected in 2012 / 13 / 14
  - Emphasis on program development
- 2016 / 2017 inspections
  - Comprehensive inspection of program, plan, and records.



# DIMP Observations

- Much less stringent than Transmission Integrity Management Programs.
- Performance-based language results in significantly less progress than prescriptive-based language.
- Easier to justify budget for prescriptive regulations.
- 26 TIMP Rules vs. 8 DIMP Rules



# DIMP Requirements

- *§ 192.1007 What are the required elements of an integrity management plan?*
  - (d) Identify and implement measures to address risks. Determine and implement measures designed to reduce the risks from failure of its gas distribution pipeline...*
    - And that's the only thing that states what an operator has to physically do on their system (asides from trending and monitoring data)
    - There are no required assessments.



# DIMP Findings

- Most non-compliance issues are found with the program development, not program implementation.
  - Lack of “teeth” in the regulations regarding what operators are required to do to reduce the risk on their systems.
- Varying degrees of “measures to reduce risk.”
  - Range for main replacement programs to something as minor as an additional leak survey per year.

A scenic sunset over a beach. The sky is a mix of orange, red, and yellow. In the foreground, there are waves crashing onto the shore. In the middle ground, a long pier extends into the water, with several people walking on it. To the left, a lighthouse is visible on a small island. The text "DIMP Inspections" is overlaid in large, bold, yellow letters.

# DIMP Inspections

- Program: What you do
- Plan: How you do it (Plan = Manual)
- Records: Prove you did it



# 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



# Knowledge of Gas Distribution System

§ 192.1007(a)



# Knowledge of Distribution System

- SME decisions & 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 of Distribution System

- 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.
- 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.



# Knowledge of Distribution System

- 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.
- When scrubbed data becomes available threat identification may need to be re-run.
- 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)



# Identify Threats to Integrity

- §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.



# Identify Threats to Integrity

- 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



# Threat Categories (Cont.)

- 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 (Cont.)

- 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

- An Operator should also consider that Interactive Threats (interaction of multiple threats) can be a potential threat.
- Interactive threats are 2 or more threats that, when occurring simultaneously, pose a threat to pipeline integrity.



# Interactive Threats

- Examples of interacting threats 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

- 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.
- 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.
- DIMP Models must rank proposed projects and replacements based on risk and not the cost.

# Measures to Address Risks

- 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 are expected to 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.



**DIMP**

## 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

- 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.

# Questions or Comments?





**Thank You!**

