DIMP – A.D.
(After Deployment)

National Association of Pipeline Safety Representatives
Office of Pipeline Safety

DIMP Website

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U.S. Department of Transportation

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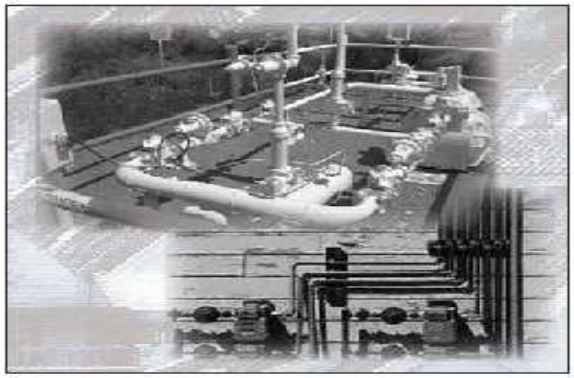
Distribution Integrity Management



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
- Report Results

PHMSA has developed and continues to enhance guidance to help the public and the affected industry understand the requirements of the final rule in the form of FAQs.

What's New:
- 1/26/10: Document page updated to include new content, including Final

http://primis.phmsa.dot.gov/dimp/[2/25/2011 10:44:32 AM]

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

General Observations

- Large, serious effort - began 2007 to early 2010
- Few fully dedicated DIMP personnel; many teams
- Many operators are using GPTC and SHRIMP
- Modifying commercial plan development and risk model tools
- Multi-state and State specific plans
- Change from compliance to integrity management culture
  - Forces a structured approach to prioritize work.
  - Provides "compliance leverage" for funding system integrity projects.

General Observations

Operators are taking a deep look at data

- Modifying data collection procedures
- Improving/implementing computer applications and hardware (office and field)
- Scrubbing data
- Enhancing training on data collection
- Documenting reason for data anomalies
- Requires knowledge of the geographical relationship of data
- Using a minimum of 5-10 yrs, sometimes using much more to develop trend lines.

General Observations

- DIMP should address system integrity issues through data analysis - Newly identified issues may require immediate action
- Substantive effort for apparent cause analysis of mechanical fitting failures (field extraction and lab analysis)
- Not many new risks have been identified; operators tended to focus on known risks rather than look for other risks
- Variety of risk models; material specific replacement models to models including all threats to system

General Observations

- Operators have found developing the criteria for when measures to reduce risk is needed challenging
- TIMP Principles transferred to DIMP – management of change, roles and responsibilities
- Operators expressed interest in sharing of threats, risks and actions to address risk between operators

Shortcomings Found in Plans

- Plans failed to include revision log, version, effective date, revision date.
- Procedures lacked:
  - Operator specific practices and system characteristics.
  - Description of who, what, when, where, and how.
  - References to procedures in other manuals (O&M)
- Not considering failures without a release, e.g. overpressurization
- System subdivision was not sufficient to identify problems.

Shortcomings Found in Plans

- Risk ranking did not include all risks to all facilities.
- Measures to reduce risk were too focused on pipe replacement rather than preventative measures designed to reduce risk.
- Each measure to reduce risk (or group of related measures) did not have a performance metric.
- Some plans contained a generic list of measures to reduce risk. The plan needs to include the specific measures the operator selected.

Expectation of an Operator Plan

- "Develop and Implement" the elements
  - "Implemented" means:
    - Completed risk evaluation
    - Identified measures to address risk
    - Allocated and scheduled resources
- Multi-state operators must create a risk ranking which
  - Encompasses all of an operator's facilities
  - Is State specific and reviewable on a state-by-state basis
- Plan can apply to one or more states

Knowledge Guidance

- "Reasonably available" information
  - Digging up pipe not required
  - Has impact on current pipe integrity
  - May be offsite warehouse
  - To demonstrate include a list of information sources used showing the title, date range (why selected), location
- Consider accuracy and completeness of facility location and material data
- Include a list of the data needed to fill gaps due to missing, inaccurate, or incomplete records
- Update recordkeeping procedures to include obtaining or correct missing or questionable data

Knowledge Guidance

- "Environmental factors" refers to the operating environment (e.g. population density, landslide, corrosive soil, valve placement, etc.)
- Roles & responsibilities including titles or positions is useful
- Be sure to include farm taps in your plan

Threat Identification Guidance

- Good practices that operators were performing:
  - Creating threat matrices
  - Summarizing trending of historical leaks and leak repairs
  - Distinguishing future "unknown" leaks eliminated by replacement
  - Trending "mean year of installation" – older pipe replacement.
  - Looking at rolling averages take out yearly anomalies.
  - Correlating system characteristics to failure rate.

- Geographic relationship of data is critical

- Identify failures without a release, e.g. overpressurization

Threat Identification Guidance

- Potential threats are threats where the operator has not experienced a failure but they have conditions conducive to the threat (e.g. atm. corrosion, hurricanes, flooding)
- Examples operators considered:
  - Trenchless technology – unknowingly bored thru sewer or water lines
  - Future utility/road improvement projects
  - Discovery of a material not previously known to be in the system
  - Customers overbuilt on pipelines
  - Inside piping that no longer has adequate separation
- May need a procedure on how to handle a potential threat if it is encountered.

Example Threats

- Pre-1940 oxy-acetylene girth welds of large diameter pipe
- Gas lines cross-bored through sewers
- Gophers eating small diameter plastic pipe
- Small systems exceeding MAOP during periods of low demand- now install secondary relief valve.
- High volume tapping tees failures. Performed root cause analysis and now prepare the surface differently, improved the installation tooling, and provided additional training to minimize human error.
- Flooding – increased stresses and damage to facilities – operator maintains a flood list. They performs flood surveys and shut-off impacted facilities under flood conditions.

Risk Evaluation Guidance

- Understand how your risk model works. Each current and potential threat requires a consequence and likelihood weighting
- Subdivide facilities by measures to reduce risk; balance enough granularity with too much granularity to identify problems
- "Reasonable result" – is the ranking logical, justified through quantitative data, in agreement with SME validation?
- Multi-state operators should have a risk ranking for each State (either separately or be able to filter by State)

Measures to Reduce Risk Guidance

- Risk reduction measures are more than a replacement program.
- Include all risk reduction measures required by the DIMP risk evaluation in your plan.
- Additional risk reduction measures you voluntarily perform may be included in their plan but are not required to be

Example Measures to Reduce Risk

- Measures to reduce risk operators selected:
  - Hurricane Plans to shut in systems
  - Pot Holing every locate
  - Patrol and leak survey at more frequent than code
  - Monthly rectifier readings
  - Riser replacement programs
  - Cast iron surveys after earthquakes
  - Pipe replacement program

"Effective" Leak Management Guidance

Effective Leak Management Program includes:

- Locate the leaks in the distribution system;
- Evaluate the actual or potential hazards associated with these leaks;
- Act appropriately to mitigate these hazards;
- Keep records; and
- Self-assess to determine if additional actions are necessary to keep people and property safe.

Performance Measures Guidance

- Each measure or group of measures to reduce a risk needs a performance measure
- Establish a baseline for every performance measure
  - May only have one data point as the data will be collected going forward
  - Explain why that performance measure was chosen
  - Describe how the data is or will be collected

Performance Measure Example

Threat:
Other Outside Forces, Damage to above ground facilities by vehicles and vandalism.

Measures to Reduce Risk:
- Idle riser program for monitoring and maintaining idle risers.

- High priority to meters at risk of future vehicular damage identification program. Work Request packets created and work prioritized for meters in vehicular zones.

Performance Measure:
Track and monitor the frequency of failures due to vehicles in vehicular zones.

Periodic Evaluation and Improvement Guidance

- What are possible program review triggers?
  - Completion of a measure to reduce risk
  - Completion of a replacement program
  - Leak rate are not decreasing

- Solely rerunning the risk model or reviewing the performance measure data does not constitute a review

Periodic Evaluation & Improvement Guidance

What constitutes a program review?

- Review frequency of periodic evaluation, < 5 years
- Verify general information
- Incorporate new system information
- Re-evaluation of threats and risk
- Review the frequency of the measures to reduce risk
- Review the effectiveness of the measures to reduce risk
- Modify the measures to reduce risk and refine/improve as needed
- Review performance measures, refine/improve as needed

Records Guidance

- Maintain records demonstrating compliance for 10 years
  - Includes records used for risk evaluation
  - For example, if 20 years of CP records were reviewed, maintain them for 10 additional years