DIMP State-Federal Implementation Team Pilot and Initial Inspection Findings

National Association of Pipeline Safety Representatives
Office of Pipeline Safety

What Principles Underlie DIMP?

- Requirements are high-level, performance-based
- DIMP requires operators to…

  Know Your System
  Identify Threats
  Rank and Mitigate Risks
- DIMP does not stipulate specific assessment or mitigation actions
- Allows the regulator to investigate internal operator risk management practices

Objective of DIMP Pilot Inspections

- Test the inspection form:
  - Are the inspection questions clear?
  - How did the operator interpret the question?
  - Did the documentation the operator provided demonstrate compliance with the regulation?
  - What level of detail was provided?

Distribution Integrity Management Program (DIMP)

Inspection Form

For Operators of Gas Distribution Systems

For Requirements of 192.1005 – 192.1011

Version 9/23/2011

Objectives of DIMP Pilot Inspections

- Identify if additional FAQ's are needed.
- Develop a consensus for expectations among regulators.
- Collect material for PHMSA T&Q's inspector training.
- Type of Plan Development Tool
  - SHRIMP
  - NGA/SGA Framework
  - MEA Preparation Aid
  - Operator Developed Plan

DIMP 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.

DIMP 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.

DIMP General Observations

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

DIMP 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

Common DIMP Shortcomings

- Plans failed to include revision log, version, effective date, revision date.
- Not considering failures without a release
  - e.g. overpressurization, loss of customers
- System subdivision was not sufficient to identify problems.
- Plans did not include data validation process
- Links between assessed risk and accelerated actions not clear
- Did not incorporate pipe replacement programs
- Data sources

Common DIMP Shortcomings

- Procedures lacked adequate detail:
  - Operator specific practices and system characteristics.
  - Description of who, what, when, where, and how.
  - O&M manual not adequately integrated or referenced
  - References to other manuals (O&M, Emergency Plan, OQ, Damage Prevention)
  - No selection process for SME's or DIMP team
  - Processes for field information to get back to DIMP team
  - Review process

Common DIMP Shortcomings

- 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.

Common DIMP Shortcomings

- Not taking credit for everything operator already does
  - Shortened inspection cycles
  - Additional inspections
  - Replacement programs
- Draw a line in the sand for data, and quit worrying about past.

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.)
- Geographic relationship of data is critical
- 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.
- Identify failures without a release

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 voluntarily perform may be included in your 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
  - Pipe inspections for every exposure
  - More frequent patrol or leak surveys
  - 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 rates are not decreasing
  - New or other changes in data

- 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

Report Results Guidance

- Online Filing Required (hardship exceptions)
- Webinar
  http://www.phmsa.dot.gov/pipeline/library
- Gas Distribution Annual Report for CY 2010
  - DIMP Performance Measures
  - EFVs
- Gas Distribution Mechanical Fitting Failure Form for 2011

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