

New Distribution Integrity Management Regulations Promote Risk Analysis

By: Glen Armstrong, Senior Technical Specialist
Jenny Hudson, P.E., Senior Project Manager
EN Engineering, Woodridge IL

Over the past three years APGA has helped develop guidelines for the integrity management of nearly 2 million miles of gas distribution piping in the U.S. The goal: improving public safety, while also intelligently minimizing the potentially prohibitive expense and complexity that new regulations could have on APGA membership and the public gas industry.

These guidelines, with seven key elements (see sidebar), were issued in the summer of 2008 as the Distribution Integrity Management Program (DIMP) rules. Issued by the U.S. Department of Transportation's Pipeline and Hazardous Materials Safety Administration (PHMSA), the DIMP regulations follow those established by the same authority in 2001 for liquid pipelines and in 2004 for natural gas transmission pipelines, but with a significant difference. The DIMP regulations are far less prescriptive and have much greater flexibility for natural gas distribution operators.

The flexibility of implementation may pose problems for APGA members in terms of interpretation, particularly in an industry with significant variance in regulatory oversight and enforcement from state to state.

The manner in which the distribution integrity rules will be enforced is probably what most concerns operators. Although the DIMP rules are federal regulations, the commissions that audit the programs are on a state level. Every system audit is going to be different.

Operators of gas and liquid transmission pipelines have faced fines — in some cases large fines — for failures of implementation. That is not anticipated with the DIMP rules, at least not at the outset. It is safe to assume that there will be enforcement at some time, as regulators themselves normally define the reporting requirements and time frames. Although the specifics of regulatory enforcement of DIMP are yet to be determined, there is no question that compliance with DIMP will have its consequences.

Start With Risk Analysis

At the very minimum, every operator is going to have to understand the DIMP rules, write a program and do a risk analysis — the risk analysis being a big issue for operators. Operators may not know yet how they are going to prioritize and devote attention to their highest areas of risk. Doing the risk analysis helps with this. It is anticipated that most operators will use a combination of internal and external subject matter experts and mathematical models to assess and prioritize their risks.

To assist smaller gas system operators in developing compliance programs, the APGA is modeling a software program through the APGA Security and Integrity Foundation that is internally referred to as “SHRIMP” (Simple, Handy, Risk-based Integrity Management Plan). Now in beta form, it is expected to be available by the end of 2008 and can be used to complement internal expertise and outside consultants on developing compliant plans and analyses.

Different Integrity Management Approach for Distribution Piping

In the regulations for gas transmission pipelines, operators were required to identify high consequence areas where population density could result in greater possibility of damage and injury, and then to devote attention to the highest risk areas. A different integrity management approach is necessary for gas distribution piping, as most of the piping is right next to people all the time because the service goes directly into homes, businesses and offices. For a variety of structural reasons, distribution gas pipelines can't be internally inspected like transmission lines, so there may have to be an intensive data research effort to perform a risk analysis.

Operators can benefit from an 'outsider's' perspective to risk analysis and program development. For example, when transmission clients took a customized approach to plan development and risk analysis, which at times meant utilizing the expertise of third-party consulting firms, they fared much better in their audits than clients who took a 'one-size-fits-all' approach.

Knowing Your Infrastructure is Key

Knowledge of an operator's infrastructure is basic to compliance with DIMP. It makes sense that a program developed for a bare steel system with a history of corrosion leaks will be different from a program for a plastic system. Knowing your system and your infrastructure is more than just knowing its physical components, such as design, size and materials. It is also knowledge of what's happening in and to the system — which includes things like leak histories, special field surveys and information gathered through routine operation and maintenance activity.

Operators may mitigate risk by treating their distribution system as separate segments rather than as a single system, if its parts are significantly different in terms of pressure, materials, age of infrastructure, and maintenance histories. An operator's risk analysis might not necessarily result in replacing pipe. There are other controls that can be put in place to mitigate risk. Through their risk analyses, operators may determine that no additional actions are required.

Measured Improvement

One expected outcome of DIMP is continuous improvement. Operators will have to define some internal performance measures to examine on a regular basis to see if what they're doing is improving the safety of their system. There is flexibility in the determination of what specific internal and external performance measures are appropriate, such as tracking the number of corrosion leaks or tracking the number of third-party hits to measure the effectiveness of damage prevention programs. According to the DIMP rules, for each significant threat identified to a system one or more performance measurements need to be identified to help the operator determine if they are achieving the desired results.

Best Practices of Industry

The term "distribution integrity" may be new to the industry, but the concept of risk management programs is not. There are a number of best practices that have evolved in the gas industry, and some aspects of the DIMP regulations may already be covered by an operator's existing procedures. What is different is a degree of formalization. For example, almost all public gas companies perform some type of leak surveys, pipe surveys and line patrolling. But these

operations may have been performed by different groups in the past with little interaction. That may have to change.

With the release of the DIMP regulations the public gas industry now has a clearer picture of the steps required by regulators to help ensure continued safety of their distribution systems. But despite being a high-level, flexible regulation, DIMP may still require increased expenditures for compliance. Areas of the country that have taken proactive steps for cost recovery, such as Ohio, are already well ahead of other areas anticipating the requirements of DIMP. At EN Engineering we're working with a number of companies on everything from developing programs to risk analysis to replacing pipe. Each company has its unique needs, but they are all working within their budgets and doing what they can to make their systems safe and more reliable for their customers.

Author: Glen Armstrong, Senior Technical Specialist, with EN Engineering a full service pipeline engineering design and consulting firm located in Woodridge, IL. Glen has been with the Technology group of EN Engineering for the last four years concentrating on IMP programs, O&M Plans, Public Awareness, OQ and Emergency Plan development and enhancement for both gas and liquids pipelines. Glen participated on the Distribution Integrity Phase 1 study team and served as chairperson of the Gas Pipeline Technical Committee task group that developed and provided guidance for the DIMP regulations. Previously, Glen was with Peoples Gas in Chicago for 37 years in all areas of Operations, Engineering and Code Compliance.

Author: Jenny Hudson, Senior Project Manager, with EN Engineering is a graduate of the University of Missouri at Rolla with 10 years of industry experience. She currently holds a NACE CP Technologist certification and is a registered professional engineer in the state of Illinois. As a Senior Project Manager with EN Engineering she leads Integrity Management activities and continues to work with multiple utility clients and industry organizations to develop IMP plans and provide guidance for state and federal (PHMSA) regulatory audits.