Meaningful Metrics for DIMP

2015 South Dakota / North Dakota Pipeline Safety Operator Training

Wednesday, April 15th

PHMSA OPS Inspector Training and Qualifications Division

Charlie Helm

Advisory Bulletin (ADB)

http://www.phmsa.dot.gov/pipeline/regs/advisory-bulletin

Definitions

- mean·ing·ful
  - having a serious, important, or useful quality or purpose.
  - "making our lives rich and meaningful"

Definitions

- met·rics
  - a method of measuring something, or the results obtained from this.
  - "the report provides various metrics at the class and method level"

Definitions

“Meaningful Metrics” actually does mean something …. Not just a buzzword. The way you measure the effectiveness of your IMP program is VERY important and goes WAY beyond just a discussion at a meeting or a report on your desk.

2014 Advisory Bulletins

Advisory Bulletins (ADB)

- 2014-05 - Guidance for Meaningful Metrics
  - ADB–2012-10 Using Meaningful Metrics in Conducting Integrity Management Program Evaluations

NTSB Failure Investigation Report of San Bruno, CA incident

NTSB concluded that the company's self-assessments were ‘‘superficial and resulted in no improvements to the integrity management program.’’

As a result, NTSB recommended that PG&E: “Assess every aspect of your integrity management program, paying particular attention to the areas identified in this investigation, and implement a revised program that includes, at a minimum, ..”

NTSB Failure Investigation Report of San Bruno, CA incident

Recommendation P–11–29 .. (4) an improved self-assessment that adequately measures whether the program is effectively assessing and evaluating the integrity of each covered pipeline segment

ADB – 2012-10

Remind operators of their responsibilities, under Federal IM regulations, to perform evaluations of their IM programs using meaningful performance metrics. Program evaluation is a required integrity management program element as established in §192.911(i)

ADB – 2012-10

A critical program element of an operator's integrity management program is the systematic, rigorous evaluation of the program's effectiveness using clear and meaningful metrics.

ADB – 2012-10

When executed diligently, this self-evaluation process will lead to more robust and effective integrity management programs and improve overall safety performance.

ADB – 2012-10

This process is critical to achieving a mature IM program and a culture of continuous improvement.

ADB – 2012-10

- Metrics that measure and provide insights into how well an operator's processes associated with the various IM program elements are performing.
- Specific threats that include both leading and lagging indicators for the important integrity threats on an operator's systems, including:
  - Activity Measures that monitor the surveillance and preventive activities that are in place to control risk
  - Deterioration Measures that monitor operational and maintenance trends to indicate if the program is successful or weakening despite the risk control activities in place
  - Failure Measures that reflect whether the program is effective in achieving the objective of improving integrity.

NTSB Failure Investigation Report of San Bruno, CA incident

NTSB Findings 25 & 26

25 - Because PG&E and the CaPUC have not incorporated the use of effective and meaningful metrics as part of their performance-based pipeline safety management programs, neither PG&E nor CaPUC is able to effectively evaluate or assess the integrity of PG&E's pipeline system

NTSB Failure Investigation Report of San Bruno, CA incident

NTSB Findings 25 & 26

26 - Because PHMSA has not incorporated the use of effective and meaningful metrics as part of its guidance for effective performance-based pipeline safety management programs, its oversight of state public utility commissions regulating gas transmission and hazardous liquid pipelines needs improvement.

NTSB Failure Investigation Report of San Bruno, CA incident

NTSB Recommendation P-11-19 to PHMSA

(1) Develop and implement standards for integrity management and other performance-based safety programs that require operators of all types of pipeline systems to regularly assess the effectiveness of their programs using clear and meaningful metrics, and to identify and then correct deficiencies; and (2) make those metrics available in a centralized database. (P-11-19)

ADB – 2014-05

Pipeline Safety: Guidance for Meaningful Metrics

- Root cause analyses reveal:
  - Management systems and Organizational program deficiencies contribute to pipeline accidents
- Finding #19 - The PG&E gas transmission integrity management program was deficient and ineffective.
- Finding #21 - The deficiencies identified during this investigation are indicative of an organizational accident.
- Finding #22 - The multiple and recurring deficiencies in PG&E operational practices indicate a systemic problem
- Weakness in implementing and using Meaningful Metrics is one of the issues identified

ADB – 2014-05

Overview …

- Operators need an established method to measure program effectiveness – TIMP & DIMP provide methodologies
  - ➢ IM as a part of QA/QC program
- Liquid: API 1160 “Managing Integrity for Hazardous Liquid Pipelines” provides guidance on evaluating and improving performance.
- Gas Transmission: using guidance from B31.8S-2004
- Gas Distribution – SubPart P provides structure

ADB – 2014-05

- PHMSA developed guidance on the elements and characteristics of a mature program evaluation process that uses meaningful metrics
- Major topic areas addressed in the guidance document include:
  - Establishing Safety Performance Goals
  - Identifying Required Metrics
  - Selecting Additional Meaningful Metrics
  - Metric Monitoring and Data Collection
  - Program Evaluation Using Metrics

ADB – 2014-05

- Tables 1 & 2 are lists of metrics required by Part 192 and ASME B31.8S-2004 **TO BE USED!**

Table 3 - IM Programmatic Performance Metrics

	Leading ----------Indicators----------*Lagging*		
Program Element	**Selected IM Process, Operational or Activity Metrics**	**Operational Deterioration Indicators**	**Failure or Direct Integrity Metrics**
1. Identification of pipeline segments that could impact HCAs	• Frequency of updates to segment identification analysis • Frequency and nature of reviews conducted to identify new HCAs • Frequency of field district surveys or ROW inspections identifying new HCAs – or segments that could affect HCAs • Frequency and nature of review of procedures and assumptions made in identifying segments that could affect HCAs • Frequency of updates to aerial photography used for HCA segment analysis • Frequency of contacts with public safety officials and others having local knowledge for information on potential "identified sites" or could affect segments	• No. of newly acquired or newly identified assets not incorporated within the IMP within the required timeframe • No. of previously mis-identified HCAs identified as HCAs in updates to the segment identification analysis • No. of PIR calculations using an inappropriate formula for product transported (Gas Trans) • No. of new HCAs or could affect segments identified due to changing conditions (pipeline modifications, new public construction, change in public use of existing buildings, etc.) • No. of abnormal weather conditions (e.g., stream flow rate) that exceed assumptions used in HCA or could affect segment identification	• No. of releases which reached an HCA from pipe that was not determined to be a "could affect" segment (Haz Liq) • No. of releases with adverse impacts beyond the PIR (Gas Trans) • No. of releases which had different impacts to HCAs than determined by the "could affect" analysis • No. of releases which reached different HCAs than determined by the "could affect" analysis • No. of releases that exceeded the highest estimated volume that could be released in a segment (Haz Liq)
2. Threat Identification and Risk Assessment	• Threat identification program • Identification of interacting threats	• No. of mitigation activities for interacting threats (e.g., cyclic fatigue interaction with	• No. of releases involving a previously unidentified threat

ADB – 2014-05

Table 4 - System and Threat-Specific Performance Measurement

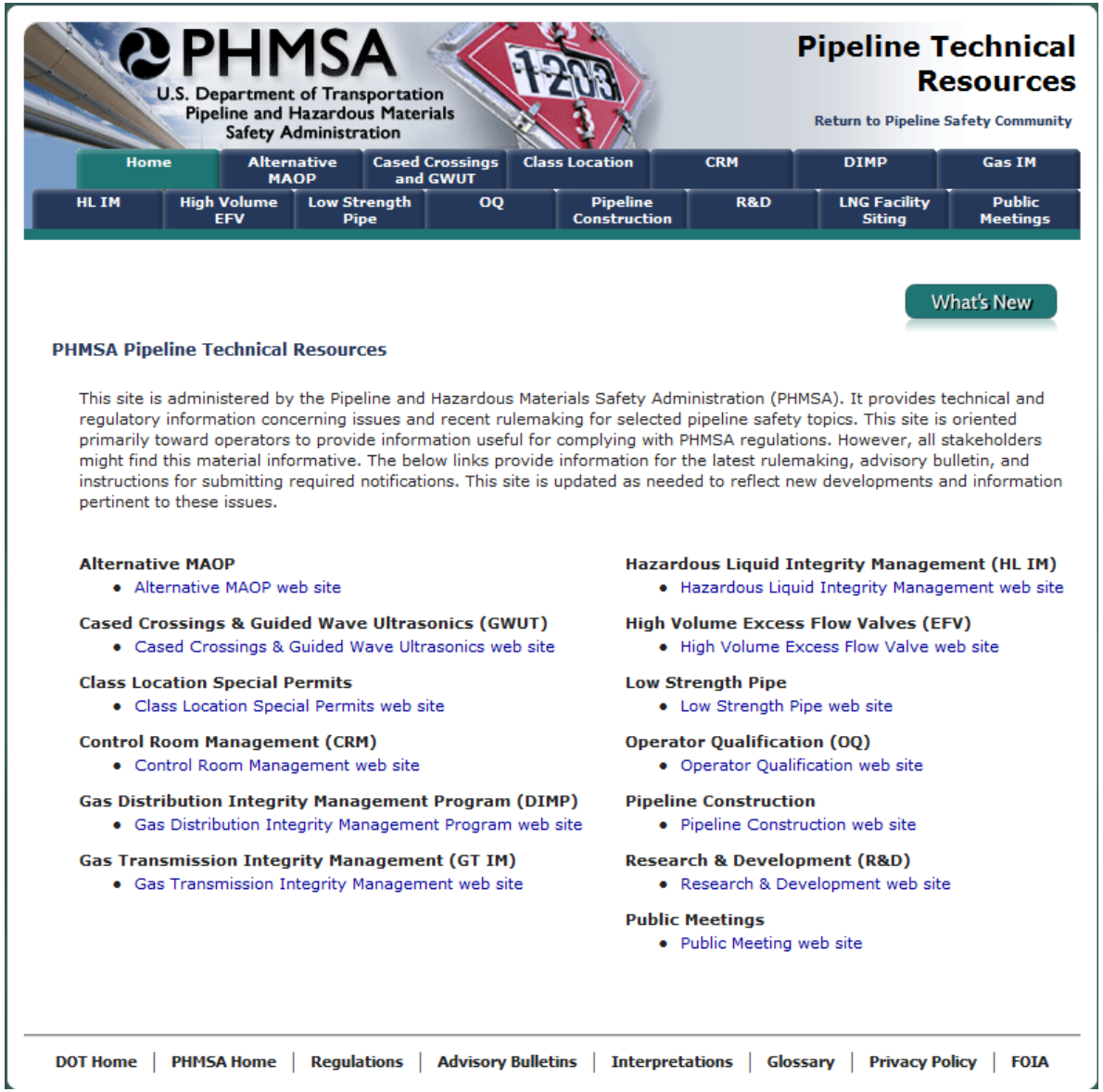
	Leading ----------Indicators----------*Lagging*		
Failure Mechanism	**Selected Process or Operational Activities for Threat Prevention or Management**	**Deterioration Indicators**	**Failure or Direct Integrity Metrics**
Mechanical Damage			
First-party (operator) and second-party (contractor) damage	• Operator procedures for excavation on or near its own pipeline • Contractor procedures for excavation on or near the pipeline • Use of current system / facility maps	• No. of improper locates • No. of excavations outside locate area • No. of incidents / accidents where procedures were not followed or where appropriate care was not exhibited • No. of damages not reported • No. of enforcement actions taken by enforcement authority • Increase in frequency of damage	• Releases due to first or second party damage
Third-party excavation, construction or other work at the time of failure Excavation, construction or other work activity occurring at some time prior to failure	• Damage prevention program • Public awareness program • Active participation in appropriate one-call systems • Notification of public and specific others on use of one-call system • Identification of public and other stakeholders along the ROW and notification of pipeline location, threats, etc.	• No. of ROW encroachments • No. of one-call tickets (comparison of third-party damage to one call tickets) • Timeliness of one-call notification ticket responses • No. of improper and inaccurate locates or other inadequate one-call follow-up • No. of unreported excavation damage • No. of unmonitored excavations	• Releases due to third-party damage • Third-party damage from excavations that should have been monitored by operator but that were not • Releases following targeted ILI tool run or pressure test • Third party damage incidents / accidents without a release • Cover increases causing load issues

PHMSA Websites are One of Our Primary Forms of Communication

PHMSA Pipeline Safety

http://phmsa.dot.gov/pipeline

Pipeline Technical Resources



http://primis.phmsa.dot.gov/ptr.htm

DIMP Home

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

Pipeline Technical Resources

Return to Pipeline Safety Community

Home | Alternative MAOP | Cased Crossings and GWUT | Class Location | CRM | DIMP | Gas IM

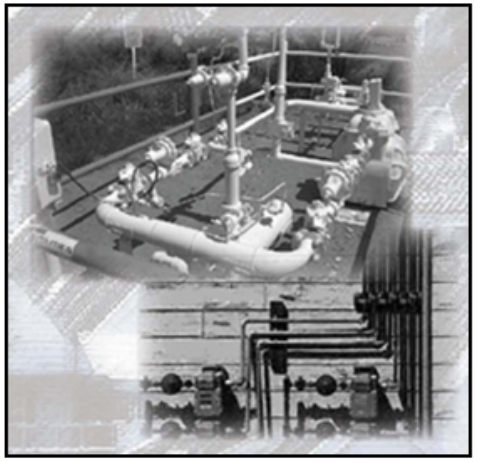
HL IM | High Volume EFV | Low Strength Pipe | OQ | Pipeline Construction | R&D | LNG Facility Siting | Public Meetings

DIMP Menu

- Home
- History
- Meetings
- Resources
- FAQs
- Performance Measures
- Regulator Contacts
- What's New
- Feedback

- Regulations
- Advisory Bulletins
- Interpretations

Gas Distribution Integrity Management Program



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

Public Meetings

http://primis.phmsa.dot.gov/meetings/

PHMSA Meeting Registration and Document Commenting

All Pending and Recent Meetings:

1. **11/17/2014** PHMSA National Pipeline Mapping System Public Meeting (Mtg #101)
2. **10/21/2014** Joint GPAC and the LPAC Committee Meeting (Mtg #100)
3. **08/06/2014** Government/Industry Pipeline R&D Forum (Mtg #98)
4. **08/05/2014** Managing Pipeline Cracking Challenges (Mtg #97)
5. **07/02/2014** Public Workshop on Pipeline Safety Management Systems (Mtg #99)
6. **04/16/2014** Class Location Methodology Public Workshop (Mtg #95)
7. **02/27/2014** Safety Management Systems Workshop (Mtg #96)

PHMSA Websites

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/

Questions?