



**UNITED STATES DEPARTMENT OF TRANSPORTATION
PIPELINE AND HAZARDOUS MATERIALS SAFETY ADMINISTRATION**

**Hearing on
Preventing Spills from Oil Pipelines through
Integrity Management; Leak Detection; Shut-off Valves; and
Corrosion Prevention**

**Before the
Subcommittee on Railroads, Pipelines, and Hazardous Materials
Committee on Transportation and Infrastructure
United States House of Representatives**

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**WRITTEN STATEMENT OF CYNTHIA L. QUARTERMAN
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U.S. DEPARTMENT OF TRANSPORTATION
BEFORE THE
COMMITTEE ON TRANSPORTATION AND INFRASTRUCTURE
SUBCOMMITTEE ON RAILROADS, PIPELINES AND HAZARDOUS MATERIALS
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Chairman Brown, Ranking Member Shuster, members of the Subcommittee, thank you for the opportunity to appear today. Secretary LaHood, the employees of the Pipeline and Hazardous Materials Safety Administration (PHMSA), and the entire Department of Transportation (DOT) share public safety as their top priority. The Department holds a strong commitment to preventing spills on all pipelines through aggressive regulation and oversight to ensure the safety and reliability of the nation's pipeline transportation infrastructure.

PHMSA aims to improve the integrity of pipeline systems and reduce risks. This is fundamentally why PHMSA exists. In virtually every decision PHMSA makes it asks: *how does this help reduce the risk of a pipeline system failure?* Historically, PHMSA regulations consisted of prescriptive measures pipeline operators need to follow. However, over time it became clear that to adequately evaluate risk, it was necessary to understand all the system implications. To that end, the Hazardous Liquid Pipeline Integrity Management Program was created with the following objectives:

- ensuring the quality of pipeline integrity in areas with the highest potential for adverse consequences (high consequence areas or HCAs);
- promoting a more rigorous and systematic management of pipeline integrity and risk by operators;
- maintaining the government's prominent role in the oversight of pipeline operator integrity plans and programs; and
- increasing the public's confidence in the safe operation of the nation's pipeline network.

PHMSA's older prescriptive regulations and newer pipeline Integrity Management Programs work together to prevent failures and, when a failure does occur, to reduce the consequences.

PHMSA regulates approximately 497,000 miles of onshore and offshore high pressure transmission pipelines in the United States. This number includes over 173,000 miles of hazardous liquid pipelines. As a first line of defense, PHMSA's comprehensive regulations seek to prevent the leading causes of pipeline failure such as corrosion, or to mitigate pipeline failures by addressing leak detection and leak containment using leading technology and best practices. Corrosion protection mechanisms include establishing safety standards for steel pipes that

address protective coatings and design criteria to prevent corrosion and reduce latent defects. In addition, operators must implement corrosion prevention technologies, including specified cathodic protection systems, electric isolation of pipelines, and atmospheric corrosion prevention methods. With respect to pipeline leak protection, operators are required to deploy a system to detect and repair pipeline leaks as soon as possible. Finally, PHMSA also ensures that hazardous liquid pipeline operators are properly using, locating, and testing relief valves and emergency flow restricting devices or shut-off valves.¹

As an added layer of defense, PHMSA mandates operators to establish Integrity Management Programs to further protect people and the environment in or near HCAs. These programs reflect a recognition that each pipeline is unique and has its own pipeline-specific risk profile dependent on its location, operating environment, the commodity being transported, and many other factors.

This testimony provides an overview of the Hazardous Liquid Pipeline Integrity Management Program requirements and PHMSA's oversight of these programs, highlighting how these programs intersect with regulations relating to corrosion, leak detection, and shut-off mechanisms.

I. HAZARDOUS LIQUID PIPELINE INTEGRITY MANAGEMENT PROGRAMS

Ten years ago, PHMSA mandated that hazardous liquid pipeline operators develop an Integrity Management Program to identify, assess, remediate, and validate, through comprehensive analyses, the integrity of hazardous liquid pipelines that could affect HCAs. This landmark set of regulations added a broad-reaching and fundamentally different approach to improving pipeline safety. Previous concepts of pipeline maintenance and inspection focused on the pipeline itself, investigating a pipeline's physical qualities, supporting systems, the administration of an operator's inspection program, and learning from accidents. The Integrity Management regulations supplement PHMSA's safety requirements with new requirements that are more intelligent, performance and process-oriented, setting expectations for operators and requiring them to identify and address risks unique to their pipelines. Hazardous Liquid Integrity Management Programs apply only to all hazardous liquid pipelines and carbon dioxide pipelines that could affect an HCA.

Fundamentally, an Integrity Management Program seeks to identify, prevent, and mitigate the potential consequences of failure of a specific pipeline at its location. The key components of an Integrity Management Program are: (1) HCA segment identification and initial risk analysis, (2) baseline and recurring pipeline assessment, (3) remediation of certain conditions and anomalies that could cause a pipeline failure, and (4) post-assessment risk analysis and establishment of specific plans to address known threats, including corrosion.

¹ Relief valves are a type of valve used to limit the pressure in a pipeline system. Shut-off valves are automatic or remote controlled valves that close the flow on pipelines.

PHMSA requires each operator to know which parts of its pipeline system could affect an HCA in the event of a failure. High consequence areas are defined as (1) high population urbanized areas or other areas with a concentrated population, (2) unusually sensitive areas, and (3) commercially navigable waterways. PHMSA applied this definition to identify HCAs and made maps depicting those areas available to operators. Operators are responsible for independently evaluating information about the area around their pipeline to identify changes in circumstance that could result in new areas becoming HCAs.

The rule further requires an operator to consider how each pipeline segment could affect an HCA. In particular an operator must consider factors they identify as relevant to their operations and the HCA, as well as PHMSA-identified common factors, the Department's technical guidance, and reports by the National Transportation Safety Board (NTSB) and the Environmental Protection Agency. Next, operators must develop processes and tools to identify and analyze their pipeline's unique risks for failure. Among the mechanisms they employ to protect HCAs, operators must employ an effective means of detecting leaks on its pipeline system.

PHMSA's Integrity Management Program emphasizes prompt and remote detection of leaks through monitoring of operational parameters and engineered leak detection systems for all pipelines. Instead of requiring computer-based leak detection systems, PHMSA addresses existing leak detection system inadequacies with each operator by analyzing and evaluating each operator's leak detection capabilities for individual pipeline systems. PHMSA encourages, and in some cases requires, timely and comprehensive adoption and application of particular technology commensurate with the system-specific needs of each operator. The use of appropriate leak detection technologies enhances an operator's ability to detect and repair hazardous liquid pipeline leaks at the soonest possible time to mitigate any damages and risks. Earlier this year, PHMSA published an advisory bulletin informing all operators of PHMSA's expectations regarding pipeline leak detection systems, not just those operating in HCAs. The bulletin stated that the operating plans and procedures required by the pipeline safety regulations should include an engineering analysis to determine whether a computerized leak detection system is necessary to improve leak detection performance and line balance processes. The advisory resulted in the closure of an NTSB recommendation.

PHMSA's regulations set requirements for installing and locating valves during a pipeline's construction, as well as periodic testing. PHMSA requires operators to install relief or shut-off valves as appropriate to protect HCAs. In making the determination of where or whether to install shut-off or relief valves, an operator must consider the following factors: (1) the swiftness of leak detection and pipeline shutdown capabilities; (2) the type of commodity being carried; (3) the rate of a potential leakage; (4) the volume that can be released; (5) the topography or pipeline profile; (6) the potential for ignition; (7) the proximity to power sources; (8) the location of nearest response personnel; (9) the specific terrain between the pipeline segment and the high consequence area; and (10) the benefits expected by reducing the spill size. While the regulations provide operators with discretion in locating shut-off valves, PHMSA inspectors ensure that the operators have adequately considered all appropriate considerations and placed shut-off valves appropriately. This determination has given operators as well as responders a greater awareness of the areas most susceptible to damage from pipeline failures.

As a result, there is now a better understanding of where these most vulnerable areas are located and where additional protection is warranted.

After the operator has identified the HCAs and the potential risks, PHMSA requires operators to assess conditions on the relevant pipelines. Figure 1 shows the most common types of assessment methods used to evaluate the risks unique to each pipeline.

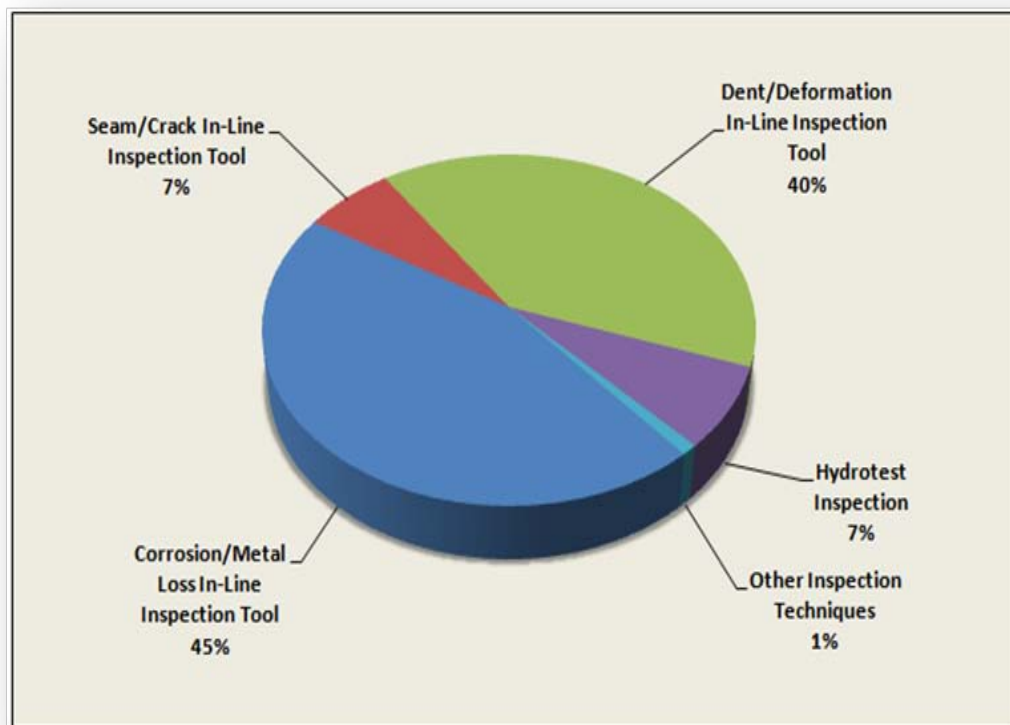


Figure 1: Types of Pipeline Inspections under the IM Rule 2001-2009

With respect to corrosion, the Integrity Management Program requires specific testing. An operator must use inline inspection tools and/or other approved inspection methods to identify corrosion and other deformities of the pipeline so that problem areas can be corrected and mitigating measures can be taken before a pipeline failure occurs. Figure 2 shows a downward trend of corrosion related accidents since the implementation of the Integrity Management Program and associated corrosion control regulations.

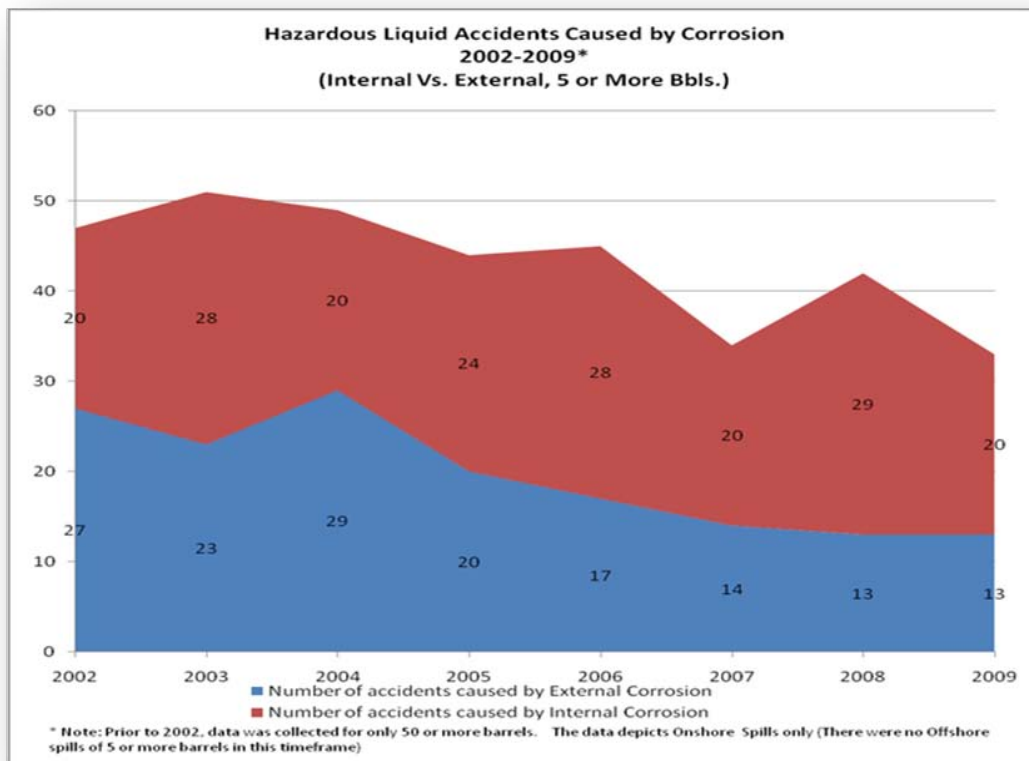


Figure 2: Onshore Hazardous Liquid Corrosion Accident Trends - 2002-2009

The Integrity Management Program imposed deadlines on hazardous liquid pipeline operators to complete an initial baseline assessment of pipelines that could affect HCAs. Approximately 44 percent of the hazardous liquid pipeline mileage falls within an area that could affect an HCA. Operators of large pipeline systems were required to complete their initial baseline assessments of all pipeline segments that could affect an HCA by March 31, 2008. Small operators with less than 500 miles were required to complete baseline assessments of their systems by February 17, 2009. PHMSA’s inspections and the mandated annual reporting by operators (certified by company executives) have shown that these deadlines were met. Operators are now conducting the second round of assessments of these same pipeline segments. This assessment will increase our overall knowledge about the condition of the nation’s pipelines in and beyond HCAs. Operators have internally inspected, pressure tested, or otherwise assessed approximately 86 percent of the total hazardous liquid pipeline mileage, well beyond areas designated as those that could affect an HCA.

Operators must remediate anomalies identified during their assessments that meet a certain defined criteria in a timely manner. PHMSA has defined the remediation timeframes for various types of anomalies. To date, Integrity Management Program pipeline assessments have revealed over 35,000 dangerous conditions within HCAs that pipeline operators have

remediated. An additional 78,000 anomalies that were identified, but were not categorized as constituting dangerous conditions have been remediated, many of which were outside of HCAs. Those anomalies were not required to be repaired by the Integrity Management Program, but were discovered and proactively remediated as a result of assessments. Figure 4 depicts the number of repairs completed over and above those required by the Integrity Management Program regulations.

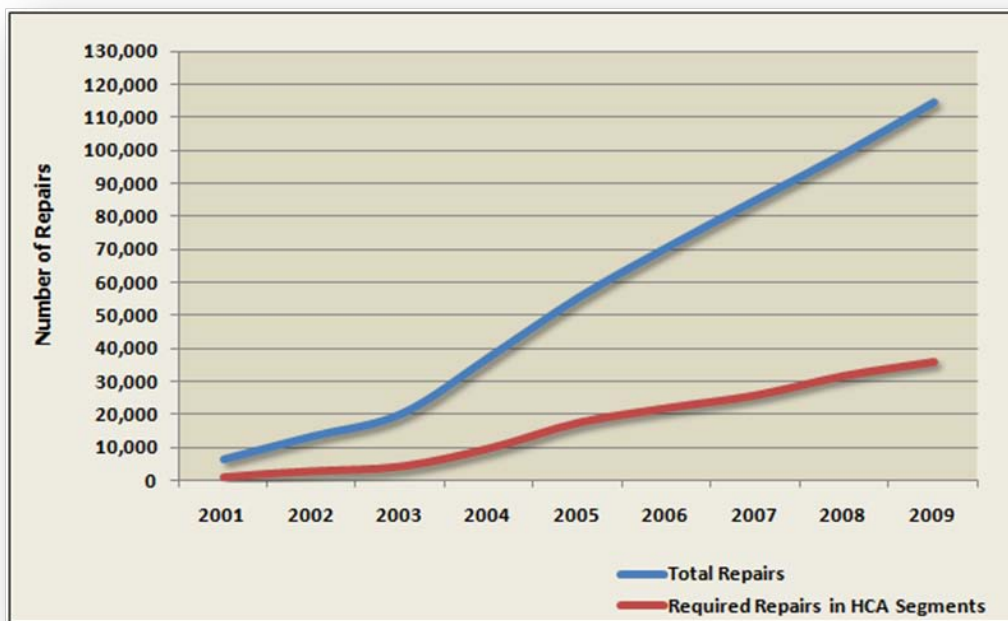


Figure 4: Repairs Made Under the Liquid IM Rule 2001-2009 (Cumulative)

After the initial assessment and remediation efforts, the Integrity Management Program requires operators to establish systematic approaches for using risk assessments to identify and implement additional preventive and mitigative measures. For example, operators must develop and implement a plan to mitigate the potential effects of corrosion if their assessments indicate corrosion risks. Pipeline operators are required to monitor the effectiveness of their preventive and mitigative programs, and re-evaluate the program if there are changed circumstances.

The Integrity Management Program goes beyond simply assessing pipeline segments and repairing defects. Improving operator Integrity Management Programs, analytical processes, and their application is also a critical objective. The ability to integrate and analyze threat and integrity related data from many sources is essential for proactive safety management.

II. PHMSA'S OVERSIGHT AND ENFORCEMENT OF INTEGRITY MANAGEMENT PROGRAMS

PHMSA developed an inspection program to assure compliance with the Integrity Management Program requirements. It also developed a comprehensive set of inspection protocols that not only check for compliance with the regulation's prescriptive requirements, but also support a detailed audit of an operator's management and analytical systems, processes, and practices on pipeline integrity. PHMSA developed a specialized training program for federal and state inspectors to inspect these protocols. To date, 383 Federal and State inspectors have been trained to inspect Integrity Management Programs. The Integrity Management Program of every operator PHMSA regulates has been inspected at least once. All large hazardous liquid pipeline operators have been inspected a second time to be sure they are continuing to manage pipeline integrity and making progress in building robust and effective Integrity Management Programs.

When operators fall short of meeting the requirements for Integrity Management Program development, PHMSA takes enforcement action to accelerate program development and address program deficiencies with the individual operators. PHMSA issued enforcement letters in 85% of all its Integrity Management inspections. PHMSA also has not hesitated to exercise its civil penalty authority when violations of the rule's requirements occur.

PHMSA also ensures that operators comply with corrosion standards through inspection and aggressive enforcement. PHMSA has initiated 272 enforcement cases resulting from 657 probable violations or procedural inadequacies involving corrosion problems since 2000. It has proposed \$1,798,950 in fines on those actions. In addition, many of the Integrity Management enforcement actions addressed corrosion issues.

Similarly, PHMSA inspectors have identified a number of issues related to an operator evaluation of their leak detection capabilities using the Integrity Management inspection protocols. PHMSA has initiated enforcement actions, or formally documented its concerns, with respect to approximately 40 percent of hazardous liquid pipeline operators to date. In response to the enforcement actions, operators are required to submit revised procedures to correct inadequacies in their leak detection evaluations. Operators must then evaluate (or reevaluate) their leak detection capabilities in accordance with these corrected procedures. Before a case is closed, PHMSA reviews the revised procedures, and determines that the revisions satisfactorily address identified issues.

Transparency has been a hallmark of PHMSA's regulatory oversight. PHMSA has a website for Implementing Integrity Management to provide information to the public on the rule as well as PHMSA's oversight of the program. This publicly accessible website includes hundreds of Frequently Asked Questions to explain the rule's provisions and PHMSA's expectations. This resource also provides the inspection protocols, an Integrity Management fact sheet, a glossary, a flow chart of the Integrity Management process, reference documents, and industry performance measures. The public also has access to information on enforcement cases stemming from PHMSA's Integrity Management inspections via the website. PHMSA has taken

unprecedented steps to inform the public and all other stakeholders about the protections provided by the Integrity Management Program and PHMSA's oversight.

PHMSA looks forward to seeing Integrity Management Programs continue to mature and yield results. With this in mind PHMSA will continue to look at performance measures and ways we can improve the data that we collect. Having better data will enable PHMSA to make risk based informed regulatory decisions.

With anticipated increases in transportation of new products like ethanol, hydrogen, carbon dioxide, and potentially other bio-fuels, PHMSA is working to ensure a solid regulatory framework to prevent accidents and ensure safety. PHMSA is committed to taking whatever steps are necessary to ensure that such transportation will be conducted safely. We coordinate with other federal agencies to forecast the transportation implications from the inception of marketing new fuels, as part of a systemic oversight process. We coordinate with other countries to benefit from their experience. We continue to work with individual operators, identifying safety concerns that must be satisfied, both with the infrastructure and with the surrounding community. We continue to collaborate with the pipeline industry, emergency response organizations, and others to investigate and solve technical challenges.

In closing PHMSA looks forward to working with Congress to address issues related to hazardous liquid pipeline safety, including finding ways to prevent pipeline failures and mitigate the effect of any failure. PHMSA very much appreciates the opportunity to report on the status of our progress in preventing spills from hazardous liquid pipelines.

Thank you. I would be pleased to answer any questions you may have.

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