Docket No. PHMSA-2007-28993
Materials For Review and Comment on
Internal Corrosion Regulations for Hazardous Liquid Pipelines

- Briefing paper dated July 24, 2007 prepared for the meeting of Technical Hazardous Liquid Pipeline Safety Standards Committee (THLPSSC) on that date. The briefing paper contains questions on the adequacy of the internal corrosion regulations.
- Data on Internal Corrosion on Hazardous Liquid Pipelines. The data updates and expands on data consistent with the discussion by the THLPSSC.

Briefing Paper **July 24, 2007**

Technical Hazardous Liquid Pipeline Safety Standards Committee
Adequacy of Internal Corrosion Regulations for Hazardous Liquid Pipelines

Committee action: Discussion.

Contact: Barbara Betsock

Statutory direction: Section 22 of the Pipeline Integrity, Protection, and Enforcement Safety Act of 2006 directs PHMSA

> . . . in consultation with the Technical Hazardous Liquid Pipeline Safety Standards Committee and other appropriate entities [to] review the internal corrosion control regulations set forth in subpart H of part 195 of title 49 of the Code of Federal Regulations to determine if such regulations are currently adequate to ensure that the pipeline facilities subject to such regulations will not present a hazard to public safety or the environment.

Current regulations on internal corrosion:

- Section 195.579(a) requires an operator who transports a hazardous liquid that would corrode the pipeline to take adequate steps to mitigate internal corrosion.
- If an operator uses corrosion inhibitors, an operator must follow § 195.579(b) which sets requirements for inhibitors and coupons.
- When an operator removes pipe from a pipeline, §195.579(c) requires an operator to check for internal corrosion.
- If a pipeline's failure could affect an HCA (commercially navigable waterway, high population area, other populated area, or unusually sensitive area), the operator must identify whether internal corrosion is a threat. If it is, § 195.452 requires an operator to have a continual process of evaluation and assessment to maintain integrity.

Risk history:

- Between 2002 and mid-2007, hazardous liquid pipeline accidents due to internal corrosion reported to PHMSA resulted in $10.9 million in property damage, and 72.7 thousand lost barrels. Property damage includes damage to the property of the operator or others, cost of clean-up and recovery, value of lost product. It is reportable to the extent it exceeds $50,000.
- Slow leaks due to internal corrosion can go undetected for years and pollute aquifers and soils.
- Based on PHMSA data from the past 5 years, 91% of internal corrosion accidents on hazardous liquid pipelines occurred on crude pipelines. This includes $7 million of the damages and 67.9 thousand lost barrels.
- An unregulated BP low pressure pipeline failed on March 2, 2006, and spilled an estimated 201,000 gallons of crude oil onto the tundra on the North Slope of Alaska near Prudhoe Bay. The cause was internal corrosion. Because the pipeline is not regulated, the accident is not included in PHMSA data.

- *Is this extent of risk acceptable? Explain why or why not?*
- *Is leak detection in use on most crude lines sufficient to detect internal corrosion leaks?*

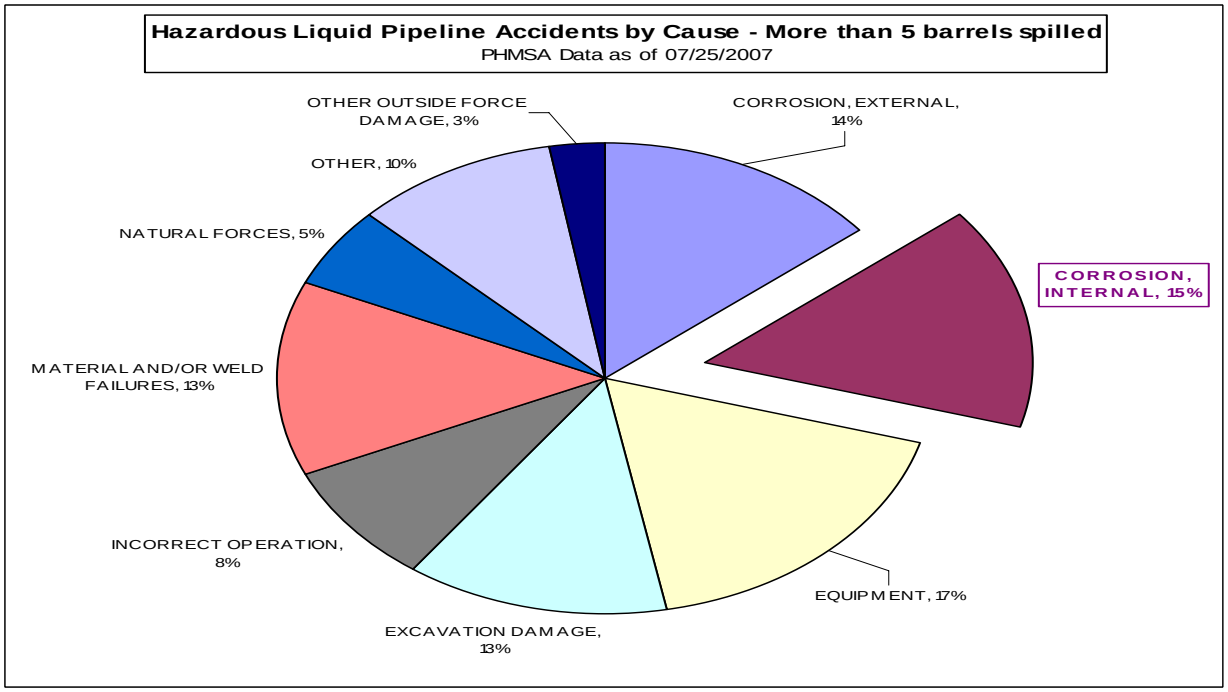
Control of risk:

- *What consensus standards or best practices exist on internal corrosion?*
- *Are these standards/practices adequate forms of risk control?*
- *Would you use any particular strategy to assign priorities to risk control options? If so, what might these be?*
- *Should PHMSA get involved in controlling risks here? If so how (by regulating, sponsoring best practices workshops, participating in development of consensus standards, etc.)*
- After the BP accident, PHMSA proposed to require low stress pipelines in high consequence areas to be continually monitored for internal corrosion in a notice of proposed rulemaking published in September 2006. Because the low stress lines covered in this first phase of low stress regulation will be covered by the continual evaluation requirement in integrity management, PHMSA decided to drop the requirement for continual monitoring for internal corrosion risk. In the supplemental notice of proposed rulemaking issued in May 2007, PHMSA noted that it would consider the need for continual monitoring for internal corrosion for all pipelines (including those operating above 20 percent SMYS) in the second phase of the rulemaking on low stress lines. *How should PHMSA handle this?*
- Operators commonly include use of cleaning pigs and corrosion inhibitors as part of internal corrosion programs. *Is there good guidance on this method of control? If more is needed, what is the best approach?*
- The transportation of hazardous liquids poses a greater risk of internal corrosion than the transportation of natural gas. At the recommendation of the National Transportation Safety Board, PHMSA adopted design and construction standards addressing internal corrosion in gas transmission pipelines. (72 FR 20055, April 23, 2007). *Is there good guidance for hazardous liquid pipelines? If more is needed, what is the best approach?*

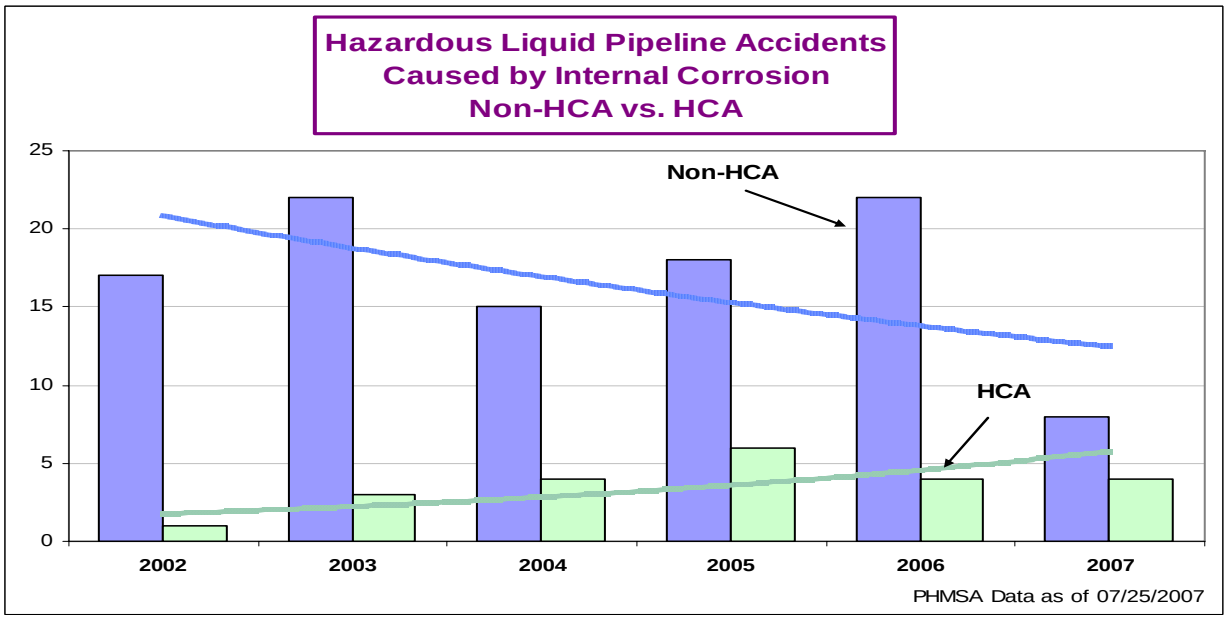
Data on Internal Corrosion on Hazardous Liquid Pipelines

Prepared by PHMSA August 8, 2007

- Internal corrosion is one of the most common causes of reportable failure in hazardous liquid pipelines[1]:



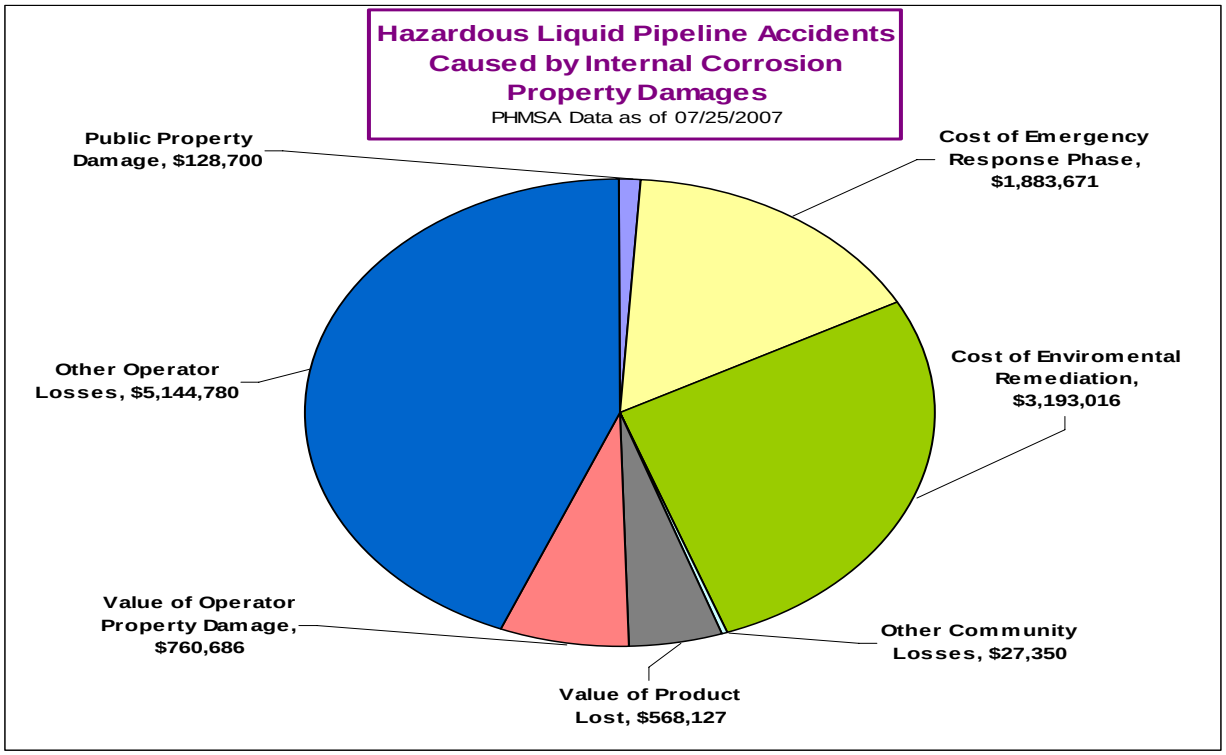
- Between 2002 and mid-2007, operators reported 124 hazardous liquid pipeline accidents due to internal corrosion. Eighty-two percent of these occurred on pipelines whose failure would not effect a high consequence area (HCA)[2]. These non-HCA pipelines are not required to be covered by integrity management programs.



[1] Unless otherwise specified, data comes from accident reports filed with PHMSA between January 1, 2002 and July 27, 2007.

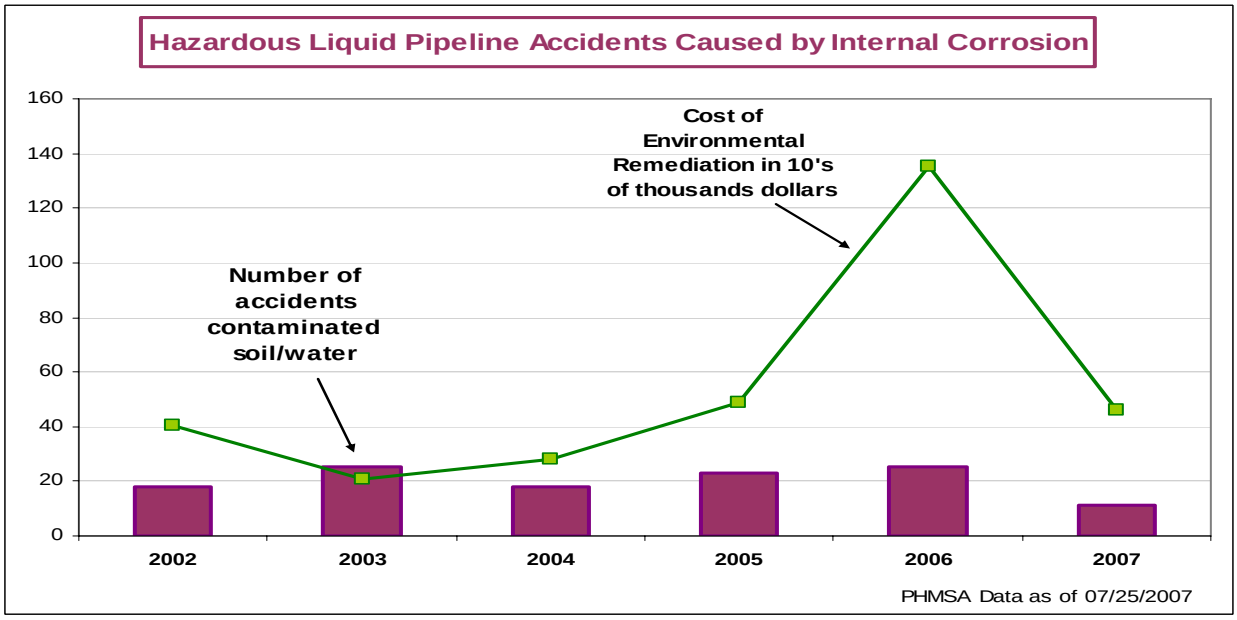
[2] An HCA is defined at 49 CFR § 195.450. It includes a commercially navigable waterway, a high population area (an urbanized area with a population of 50,000 or more and a density of 1,000 or more), an other populated area (defined by the Census Bureau as having a concentrated population), or an unusually sensitive area (with respect to environmental damage).

- Each of these accident resulted in a release of more than 5 barrels. The total released was 73.0 thousand barrels of hazardous liquid. These accidents resulted in a total of $11.7 million in property damage. Property damage includes damage to the property of the operator or others, cost of clean-up and recovery, value of lost product. It is reportable to the extent it exceeds $50,000. Approximately half of the accidents occurred on interstate and half on intrastate pipelines.



- In addition, during this period, there were an additional 65 hazardous liquid pipeline accidents resulting in a release of between 5 gallons and 5 barrels for which the cause was corrosion. There is no breakdown between internal and external corrosion. These caused a total of $ 6,100,699 in damage and resulted in 129 lost barrels.

- Slow leaks due to internal corrosion can go undetected for years and pollute aquifers and soils. Between 2002 and mid-2007, operators reported the following environmental damage:



- Approximately half of the reports of corrosion accidents on hazardous liquid pipelines do not specify whether the release resulted in a leak or a rupture. Of those that do, none indicate that an internal corrosion accident resulted in a rupture.

- Ninety-three percent of internal corrosion accidents on hazardous liquid pipelines occurred on crude pipelines. This includes $7 million of the damages and 67.7 thousand lost barrels.

- An unregulated BP low stress pipeline failed on March 2, 2006, and spilled an estimated 201,000 gallons (4,786 barrels) of crude oil onto the tundra on the North Slope of Alaska near Prudhoe Bay. The cause was internal corrosion. Because the pipeline is not regulated, the accident is not included in PHMSA data. PHMSA has proposed regulating low stress pipelines not currently regulated; namely, those in rural areas; in a phased approach. PHMSA anticipates completing the first phase of regulation, extension of regulation to rural low stress lines impacting unusually sensitive areas, this year.

- Ten states, comprised of 126.1 million people, contain 64.2 percent of the non-HCA liquid pipeline mileage[3]. Thirty seven percent of the population in those states, 46.9 million people, live within 5 miles of a non-HCA hazardous liquid pipeline. Fourteen percent, 18 million people, live within 5 miles of a non-HCA crude pipeline.

[3] Based on PHMSA mapping data.