



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

**Oversight Hearing on
Construction and Operation of Carbon Dioxide Pipelines**

**Before the
Committee on Energy and Natural Resources
United States Senate**

**Written Statement of Krista L. Edwards
Deputy Administrator
Pipeline and Hazardous Materials Safety Administration
U.S. Department Of Transportation**

**Expected Delivery 10:00 a.m.
January 31, 2008**

**WRITTEN STATEMENT OF KRISTA L. EDWARDS
DEPUTY ADMINISTRATOR
PIPELINE AND HAZARDOUS MATERIALS SAFETY ADMINISTRATION
U.S. DEPARTMENT OF TRANSPORTATION
BEFORE THE
COMMITTEE ON ENERGY AND NATURAL RESOURCES
UNITED STATES SENATE**

January 31, 2008

Chairman Bingaman, Ranking Member Domenici, members of the Committee: Thank you for the opportunity to discuss the safety programs administered by the U.S. Department of Transportation's Pipeline and Hazardous Materials Safety Administration (PHMSA) and our experience in overseeing the commercial transportation of carbon dioxide.

As the Committee considers future requirements for carbon capture and sequestration, I am pleased to confirm that large volumes of carbon dioxide (CO₂) are shipped safely in the U.S. today, including by pipeline. PHMSA's existing programs and standards governing CO₂ transportation provide effective protection to life and property, with due regard for the efficiency and performance of the transportation system.

As the DOT agency with jurisdiction over the movement of hazardous materials by all transportation modes, PHMSA has extensive experience managing the risks of compressed CO₂, in each of its physical states: gas, liquid, and solid (dry ice). Unlike natural gas and other gases regulated as hazardous materials, CO₂ is noncombustible and nontoxic. A colorless, odorless by-product of human respiration, CO₂ is present naturally in the environment and, at normal atmospheric levels, is vital to plant life and poses no immediate hazard to people or animals. In higher concentrations, as when

CO₂ is contained for transport or storage, exposure to CO₂ can cause respiratory problems, including suffocation. CO₂ reaches its liquid state at combinations of high pressure and low temperature. Both variables affect the consequence of a release of liquefied CO₂ in each case depending on the proximity of people and the location and surrounding conditions. In a remote, unpopulated area, even a large release of liquefied CO₂ will vaporize harmlessly into the atmosphere and is unlikely to cause serious injury. By contrast, a large, sudden release of liquefied CO₂ could have catastrophic consequences in a populated area. Because it is heavier than air, compressed CO₂ tends to pool near the ground, displacing all oxygen, and form a vapor cloud as it dissipates.

Because of these properties when compressed and/or in high concentrations, CO₂ has long been considered a hazardous material subject to the Hazardous Materials Transportation Laws, 49 U.S.C. 5101 et seq., and DOT's implementing regulations, 49 C.F.R. parts 171-180, governing transportation by air, rail, highway, and water. PHMSA's Hazardous Materials Regulations (HMR) prescribe a comprehensive risk management framework for CO₂ transport, covering classification, packaging, handling, and hazard communication (shipping documentation and labeling). The packaging standards for CO₂ transport vary based on volume, pressure, and transportation mode; in each case, the HMR mandate the use of an approved cylinder or tank, subject to specific requirements for design, testing, certification, and filling.

The Department assumed oversight of CO₂ pipelines in 1988, under legislation directing the Secretary to develop regulations for the safe transportation of CO₂ by pipeline. Pursuant to the mandate, in 1991, the Department extended its existing hazardous liquid pipeline rules (49 C.F.R. part 195) to these operations. CO₂ pipelines became subject to additional integrity management requirements when the liquid IM program was adopted in 2000.

As with liquid operations generally, PHMSA shares oversight of certain CO₂ pipelines with authorized State programs. Together with these State partners, PHMSA currently oversees close to 4,000 miles of CO₂ transmission pipelines (as depicted in Figure 1) – amounting to roughly five percent of all hazardous liquid pipeline mileage under our jurisdiction. Of these CO₂ lines, approximately 66 percent are interstate (crossing State borders) pipelines with the remaining 34 percent classified as intrastate (within State borders). Located primarily in the States of Texas, New Mexico and Wyoming, these pipelines deliver CO₂ for a variety of industrial purposes, including enhanced oil recovery activities. Within the national pipeline network as a whole, the CO₂ lines are relatively new: approximately 91 percent were constructed after 1980.

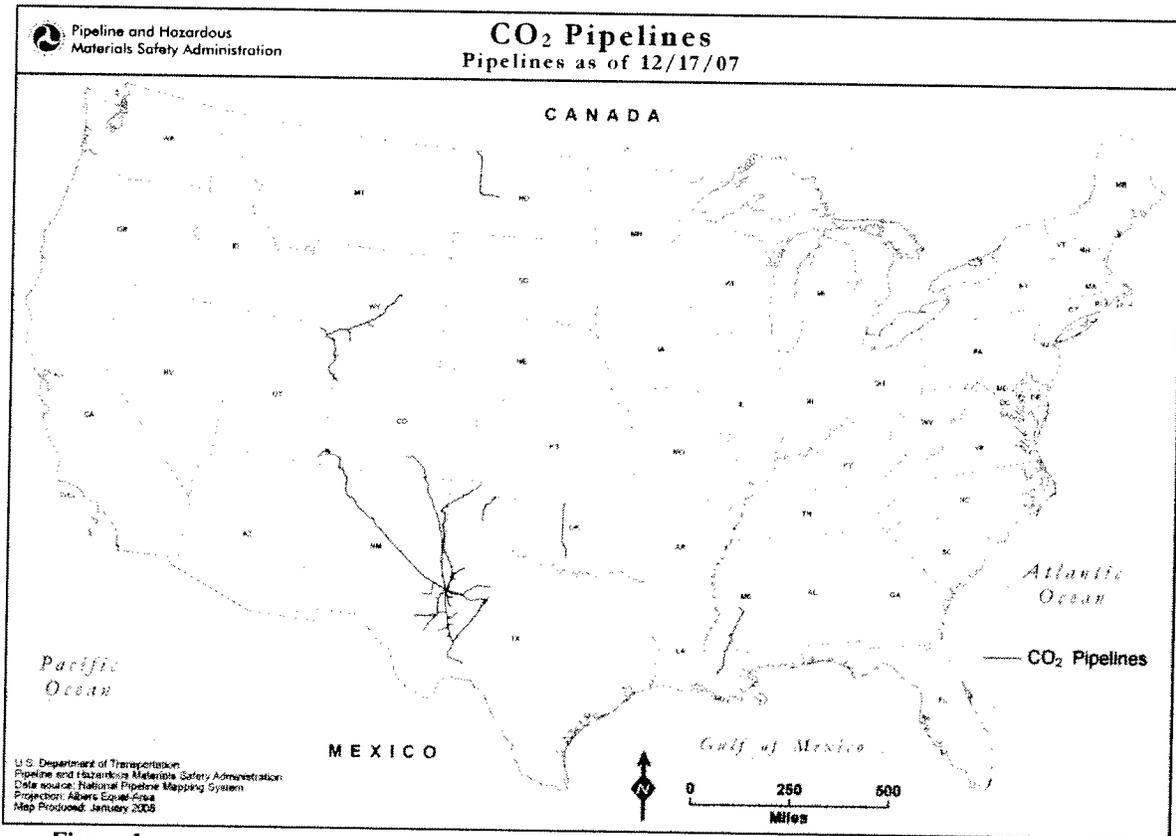


Figure 1

As the Administration and Congress work to enhance our Nation's energy security and protect the environment, we understand the need to extend the transportation infrastructure – including the delivery of alternative fuels and the transport of CO₂ for sequestration or use in energy production. And we understand the importance of pipeline transportation for safe and efficient movement of large volumes of hazardous materials. With the right risk controls in place, pipelines can operate safely anywhere – it's not a matter of "if," but "how."

PHMSA's pipeline safety program aims to promote continuous improvement in public safety, environmental protection, and system performance by identifying and addressing all threats to pipeline integrity and mitigating the consequences of pipeline failures. Our regulations cover the design, construction, maintenance, and operation of liquefied natural gas (LNG) facilities and hazardous liquid and natural gas pipelines, both interstate and intrastate, including the gas distribution systems that directly serve homes and businesses. We work closely with national and international standards organizations and encourage the development of consensus standards complementing our performance-based regulations.

Our integrity management regulations, which currently apply to transmission pipelines (liquid and gas), require operators to conduct risk assessments of the condition of their pipelines; develop and implement risk control measures to remedy safety problems, worst first; and evaluate and report on program progress and effectiveness. Under integrity management programs, operators are identifying and repairing pipeline defects before they grow to failure, producing steady declines in the numbers of serious incidents.

Along with risk-based standards and practices, technological advances are driving significant improvement in the control of pipeline risks. PHMSA administers a cooperative research program that promotes the development of new methods, materials, and tools for improving leak detection systems and detecting and preventing corrosion, outside force damage, and other threats to pipeline integrity. We work closely with informed stakeholders, including other Federal agencies, our State partners, and industry, to target our limited R&D funding on promising technologies to address the most urgent safety

issues. Most recently, in preparation for the growing use of alternative fuels, our R&D program is focused extensively on technical issues associated with the movement by pipeline of ethanol and ethanol-blended fuels.

As an agency dedicated to the safe transportation of hazardous materials, PHMSA must be more than a regulator. Our success depends on our ability to leverage non-regulatory solutions and to work closely with all stakeholders who can contribute to safety outcomes, including communities in the path of existing or new pipelines. Although PHMSA has no authority in pipeline siting, we work closely with the Federal Energy Regulatory Commission (FERC) in reviewing designs for proposed gas transmission pipelines and liquefied natural gas (LNG) facilities and in responding to local concerns about pipeline safety. We consult with other Federal and State agencies on how our regulatory requirements relate to their permitting decisions about pipelines. Recognizing that public decisions affecting transportation and energy supply often must be made at a national level, we believe a pipeline safety program can and must involve local communities, including zoning and planning officials and emergency responders. As part of a comprehensive approach to pipeline safety, we believe in preparing communities to make risk-informed land use decisions and in building local capability to respond to pipeline incidents. PHMSA works closely with fire service organizations on numerous safety projects, including the development of training standards and educational materials concerning pipeline incident response.

To carry out our oversight responsibilities, PHMSA operates five regional pipeline safety offices and is authorized to employ 111 inspection and enforcement professionals for fiscal year 2008. In addition to compliance

monitoring and enforcement, PHMSA's regional offices respond to and investigate pipeline incidents and participate in the development of pipeline safety rules and technical standards. Our regional offices also work closely with PHMSA's State program partners, which employ approximately 400 pipeline inspectors and directly oversee the largest share of the U.S. pipeline network, including most intrastate pipelines. Under our Congressionally-authorized Community Assistance and Technical Services (CATS) program, PHMSA's regional offices provide safety-focused community outreach and education. With the current wave of pipeline expansion, and increasing commercial and residential development around existing pipelines, the CATS program is serving a vital role in educating the public about pipeline safety and encouraging risk-informed land use planning and safe excavation practices.

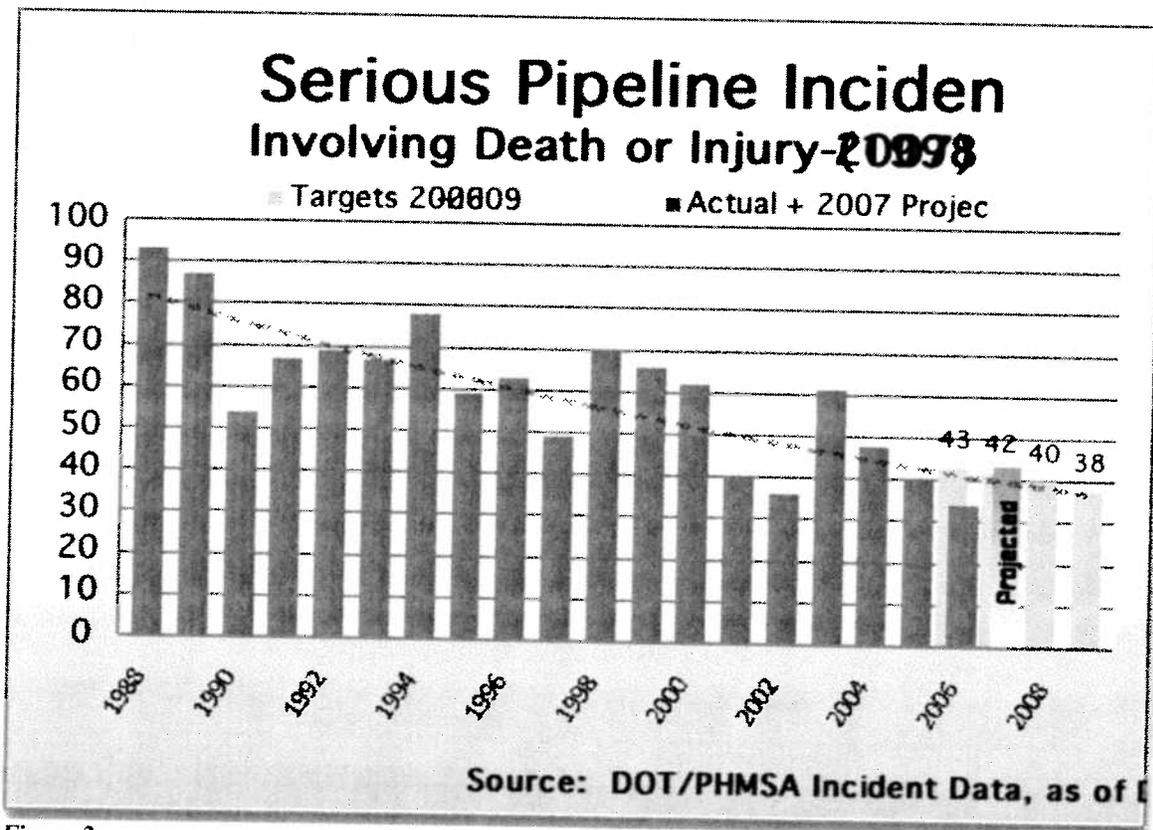


Figure 2

With safety our top priority, under Secretary Peters' leadership, the Department is targeting the prevention of all transportation-related deaths and injuries. Although further improvement is needed, the safety record for hazardous materials transportation is good and getting better in all sectors, including hazardous liquid pipeline operations. Since the introduction of IM programs in 2000, the annual number of serious incidents involving hazardous liquid pipelines has reached historic lows, even as the size of the pipeline network has grown. Although the data sets are not yet large enough to make statistically significant comparisons, the trend line over the past 20 years (as depicted in Figure 2) is favorable.

Within these data, the safety record for CO₂ pipelines is particularly good. Of the 3,695 serious accidents reported on hazardous liquid pipelines since 1994, only 36 involved CO₂ pipelines. Among the 36 incidents, only one injury, and no fatalities, was reported. In all other instances, the accidents were classified as serious based on the extent of property damage (including damage to the pipeline facility) or product loss.

With the benefit of this experience and record, PHMSA is pleased to work with the Committee, our Federal and State partners, and industry to prepare for the safe operation of new or extended CO₂ pipelines. The existing pipeline safety program administered by PHMSA has provided effective oversight of CO₂ pipelines since 1991 and will accommodate new and expanded carbon dioxide pipelines, however they are configured. We are happy to work with the Department of Energy and other Federal partners to evaluate the feasibility of particular pipeline configurations and/or plan for their development.

Likewise, PHMSA is committed to working with any agency or agencies involved in siting CO₂ pipelines, just as we work with FERC today in connection with the licensing of gas transmission pipelines and LNG facilities. We offer our agency's considerable experience and technical expertise to the Committee as it considers and addresses the transportation requirements associated with CO₂ capture and sequestration.

Mr. Chairman, I want to assure you and members of the Committee that the Administration, Secretary Peters, and the dedicated men and women of PHMSA share your strong commitment to safe, clean, and reliable pipeline transportation. Like you, we understand the importance of PHMSA's mission to the Nation's economic prosperity and energy security, and we look forward to working with the Committee to address the current challenges. Thank you.
