

PIPELINE SAFETY: OVERSIGHT OF OUR NATION'S PIPELINE NETWORK

HEARING

BEFORE THE

SUBCOMMITTEE ON SURFACE TRANSPORTATION
AND MERCHANT MARINE INFRASTRUCTURE,
SAFETY AND SECURITY

OF THE

COMMITTEE ON COMMERCE,
SCIENCE, AND TRANSPORTATION
UNITED STATES SENATE

ONE HUNDRED FOURTEENTH CONGRESS

FIRST SESSION

SEPTEMBER 29, 2015

Printed for the use of the Committee on Commerce, Science, and Transportation



U.S. GOVERNMENT PUBLISHING OFFICE

99–959 PDF

WASHINGTON : 2016

For sale by the Superintendent of Documents, U.S. Government Publishing Office
Internet: bookstore.gpo.gov Phone: toll free (866) 512–1800; DC area (202) 512–1800
Fax: (202) 512–2104 Mail: Stop IDCC, Washington, DC 20402–0001

SENATE COMMITTEE ON COMMERCE, SCIENCE, AND TRANSPORTATION

ONE HUNDRED FOURTEENTH CONGRESS

FIRST SESSION

JOHN THUNE, South Dakota, *Chairman*

ROGER F. WICKER, Mississippi	BILL NELSON, Florida, <i>Ranking</i>
ROY BLUNT, Missouri	MARIA CANTWELL, Washington
MARCO RUBIO, Florida	CLAIRE McCASKILL, Missouri
KELLY AYOTTE, New Hampshire	AMY KLOBUCHAR, Minnesota
TED CRUZ, Texas	RICHARD BLUMENTHAL, Connecticut
DEB FISCHER, Nebraska	BRIAN SCHATZ, Hawaii
JERRY MORAN, Kansas	EDWARD MARKEY, Massachusetts
DAN SULLIVAN, Alaska	CORY BOOKER, New Jersey
RON JOHNSON, Wisconsin	TOM UDALL, New Mexico
DEAN HELLER, Nevada	JOE MANCHIN III, West Virginia
CORY GARDNER, Colorado	GARY PETERS, Michigan
STEVE DAINES, Montana	

DAVID SCHWIETERT, *Staff Director*

NICK ROSSI, *Deputy Staff Director*

REBECCA SEIDEL, *General Counsel*

JASON VAN BEEK, *Deputy General Counsel*

KIM LIPSKY, *Democratic Staff Director*

CHRIS DAY, *Democratic Deputy Staff Director*

CLINT ODOM, *Democratic General Counsel and Policy Director*

SUBCOMMITTEE ON SURFACE TRANSPORTATION AND MERCHANT
MARINE INFRASTRUCTURE, SAFETY AND SECURITY

DEB FISCHER, Nebraska, <i>Chairman</i>	CORY BOOKER, New Jersey, <i>Ranking</i>
ROGER F. WICKER, Mississippi	MARIA CANTWELL, Washington
ROY BLUNT, Missouri	CLAIRE McCASKILL, Missouri
KELLY AYOTTE, New Hampshire	AMY KLOBUCHAR, Minnesota
JERRY MORAN, Kansas	RICHARD BLUMENTHAL, Connecticut
DAN SULLIVAN, Alaska	BRIAN SCHATZ, Hawaii
RON JOHNSON, Wisconsin	EDWARD MARKEY, Massachusetts
DEAN HELLER, Nevada	TOM UDALL, New Mexico
STEVE DAINES, Montana	

CONTENTS

Hearing held on September 29, 2015	Page 1
Statement of Senator Fischer	1
Statement of Senator Booker	2
Statement of Senator Moran	48
Statement of Senator Peters	50
Statement of Senator Daines	53
Statement of Senator Klobuchar	55
Statement of Senator Ayotte	57
Statement of Senator Markey	58
Statement of Senator Blumenthal	60

WITNESSES

Susan A. Fleming, Director, Physical Infrastructure Issues, U.S. Government Accountability Office	3
Prepared statement	5
Hon. Christopher A. Hart, Chairman, National Transportation Safety Board ..	13
Prepared statement	14
Michael Bellamy, General Manager, PII Pipeline Solutions	19
Prepared statement	22
Donald F. Santa, President and CEO, Interstate Natural Gas Association of America	23
Prepared statement	25
Terry McCallister, Chairman and Chief Executive Officer, WGL Holdings and Washington Gas, on behalf of the American Gas Association	30
Prepared statement	31

APPENDIX

Response to written questions submitted to Susan A. Fleming by:	
Hon. Deb Fischer	65
Hon. Cory Booker	65
Hon. Joe Manchin	66
Hon. Gary Peters	67
Response to written questions submitted to Hon. Christopher A. Hart by:	
Hon. Cory Booker	67
Hon. Joe Manchin	68
Hon. Gary Peters	69
Response to written questions submitted to Michael Bellamy by:	
Hon. Cory Booker	69
Hon. Joe Manchin	70
Hon. Gary Peters	71
Response to written questions submitted to Donald F. Santa by:	
Hon. Cory Booker	71
Hon. Joe Manchin	72
Hon. Gary Peters	72
Response to written questions submitted to Terry McCallister by:	
Hon. Cory Booker	72
Hon. Joe Manchin	73
Hon. Gary Peters	74

PIPELINE SAFETY: OVERSIGHT OF OUR NATION'S PIPELINE NETWORK

TUESDAY, SEPTEMBER 29, 2015

U.S. SENATE,
SUBCOMMITTEE ON SURFACE TRANSPORTATION AND
MERCHANT MARINE INFRASTRUCTURE, SAFETY, AND SECURITY,
COMMITTEE ON COMMERCE, SCIENCE, AND TRANSPORTATION,
Washington, DC.

The Subcommittee met, pursuant to notice, at 2:30 p.m., in room SR-253, Russell Senate Office Building, Hon. Deb Fischer, Chairman of the Subcommittee, presiding.

Present: Senators Fischer [presiding], Ayotte, Moran, Daines, Booker, Klobuchar, Blumenthal, Markey, Peters, and Manchin.

OPENING STATEMENT OF HON. DEB FISCHER, U.S. SENATOR FROM NEBRASKA

Senator FISCHER. Good afternoon. I am pleased to convene the Senate Subcommittee on Surface Transportation and Merchant Marine Infrastructure, Safety, and Security for our ninth hearing titled "Pipeline Safety: Oversight of Our Nation's Pipeline Network."

Pipeline infrastructure transports vital energy resources to homes, businesses, schools, and commercial centers across the United States. According to the Pipeline and Hazardous Materials Safety Administration, or PHMSA, more than 2.5 million miles of pipeline traverse the United States. Half a million miles of pipeline transports natural gas, oil, and hazardous materials to critical infrastructure, including powerplants, military bases, and airports. In addition, pipelines move approximately 75 percent of our Nation's crude oil and 60 percent of our refined petroleum products.

In order to protect the safety and natural resources of Nebraskans and of all Americans, Congress must maintain robust oversight over PHMSA's activities. State and Federal officials must also ensure that pipelines across the country can continue operating efficiently. After all, pipelines are renowned as the safest way to transport crude oil and natural gas.

Two weeks ago, I traveled to Montana with Senators Daines and Tester to convene a field hearing on the importance of State and local perspectives in pipeline safety. With an excellent panel of witnesses, our hearing focused on the safe movement of liquid materials on rural pipelines. We heard from the newly confirmed PHMSA administrator about the agency's organizational assessment aimed at refocusing resources and streamlining PHMSA's work. Thanks to an inquiry by Senator Daines, we learned that the

pipeline operators are seeking faster turnaround times on the results of PHMSA inspections, which can often take more than a year.

Today—today’s hearing will focus on the transportation of natural gas throughout our Nation’s vast pipeline network. In addition to natural gas pipeline operators, we’re fortunate to have pipeline inspections technology represented, as well as officials from the Government Accountability Office and the National Transportation Safety Board.

As many of you are aware, in 2010 a natural gas pipeline exploded in San Bruno, California, killing eight people, injuring 60 people, and destroying 37 homes. Most experts cite this incident as among the worst pipeline accidents in recent history.

In March 2014, a natural gas pipeline in Fremont, Nebraska, exploded, burning nearly 4 hours. Fortunately, this accident took place in the middle of a cornfield, and so no one was injured.

Through stronger oversight and collaboration between stakeholders, we can be better prepared for pipeline incidents. I look forward to hearing how natural gas pipeline operators are working with local communities and with PHMSA on risk-based approaches to preventing pipeline accidents. Most importantly, we must work to help PHMSA reprioritize and complete the outstanding requirements from the 2011 PHMSA reauthorization bill.

Although PHMSA has made substantial progress, the agency must work to complete the remaining requirements to provide regulatory certainty to industry and our local communities. With regard to staffing, PHMSA is experiencing challenges competing with the private sector for highly skilled labor. I would like to explore the ways in which we can work together to accelerate the agency’s hiring practices. I hope to learn more about PHMSA’s work with pipeline operators on the agency’s risk-based integrity management assessment programs and pipeline inspection requirements. Accurate and ample data is key to the success of PHMSA’s Integrity Management Program. PHMSA should continue to work with stakeholders on best practices for data-sharing to better educate ancillary industries and the public on pipeline safety. This is especially important when it comes to high consequent areas, including drinking aquifers, environmentally delicate regions, and population centers.

Thank you all again for being here today. And together, I’m certain we can pass a bipartisan reauthorization bill that enhances pipeline safety for all Americans.

I would now invite my Ranking Member, Senator Booker, for his opening remarks.

**STATEMENT OF HON. CORY BOOKER,
U.S. SENATOR FROM NEW JERSEY**

Senator BOOKER. Thank you very much, Senator Fischer. It’s an honor to continue to be your Ranking Member on this very important committee.

I know that this transcript will be a hot topic—hot item later, and will be read for months to come, so let the record show that the room is packed, and there are people waiting in the wings.

There are tons of press crowded around just to make sure—hanging on every word that we have to say.

In many ways, pipelines remind me of my time serving as a lineman on the Stanford field goal team. Nobody really notices you at all unless something goes wrong, and then they zero in on you. And that is the truth of pipelines. And, unfortunately, we know that when things go wrong, they can go horribly wrong and have consequences to our environment and to life itself.

And so, in many ways, that's why we're here, is to make sure that we're doing everything we can to prevent something going wrong. As we've seen in San Bruno, California, pipeline accidents are—have devastating impacts. This is one of the reasons why—and, because, in my home state of New Jersey, we have a higher per-capita population than any other places in the country, it's one of the reasons why I'm very concerned, because, in my state especially, pipelines—pipeline problems could have catastrophic consequences.

And so, while pipeline safety in recent years has gotten much better—and I've heard and read now about a lot of things that are being done—we will continue to stay vigilant. And I'm sure there are always things we can do to be better.

While PHMSA has made substantial progress on pipeline safety, there—more has to be done. We continue to see devastating accidents like some were mentioned by Senator Fischer. These incidents are worrisome. I look forward to hearing from the NTSB and GAO on what steps we should be doing. I think they have important things to contribute.

In addition, technology is rapidly advancing in the industry, and this is something that both Senator Fischer and I are very interested in. These changes can be—can dramatically change how we use and analyze data, and, importantly, how we can improve safety. I also look forward to hearing from the industry on how they are working to implement new technologies to address these safety challenges.

Today is a great opportunity to assess where we are and to consider what steps we could be using to go forward.

With that, I again want to thank the Chairwoman, and I look forward to today's testimony.

Senator FISCHER. Thank you, Senator Booker.

I would like to welcome our panel today. I appreciate you taking the time to be here and provide us with information that will be very important to us as we work on this reauthorization.

First, we will hear from Ms. Susan Fleming, the Director of GAO. She manages GAO's surface safety, rail financing, and airline competition work.

So, welcome.

**STATEMENT OF SUSAN A. FLEMING, DIRECTOR,
PHYSICAL INFRASTRUCTURE ISSUES,
U.S. GOVERNMENT ACCOUNTABILITY OFFICE**

Ms. FLEMING. Thank you. Chairman Fischer, Ranking Member Booker, and members of the Subcommittee, thank you for the opportunity to participate in this hearing on pipeline safety and PHMSA's reauthorization.

Pipeline safety is critical to our Nation's economy. We rely on a pipeline network of over 2.6 million miles to transport about two-thirds of our domestic energy supply in the form of hazardous liquids and natural gas. Pipelines are a relatively safe means of transporting these hazardous materials, but these catastrophic incidents can and do occur.

PHMSA establishes regulation that pipeline operators must follow to, first, prevent and, if needed, respond to incidents. My statement today is based on our recent reports which cover the following three issues: the safety of gathering pipelines, particularly in light of the boom in oil and natural gas production from shale sources; pipeline operator incident response; and the current requirements for reassessing natural gas transmission pipelines at least every 7 years. In response to recommendations we made in those reports, PHMSA has begun, but not completed, efforts to improve regulations, data, and guidance in these three areas.

Let me begin with gathering pipelines. Gathering pipelines transport products from production areas to processing facilities. About 90 percent of these pipelines are not federally regulated because they are in rural areas and typically have smaller diameters and lower operating pressures. States may regulate gathering pipelines, but most do not. While gathering pipelines generally pose lower safety risk than other types of pipelines, PHMSA does not collect comprehensive data to identify these risks.

In 2014, we found that construction of larger, higher-pressure gathering pipelines had increased due to the increased production of oil and gas. This raises safety concerns, because an incident from a larger gathering pipeline could affect a greater area than an incident from one of the traditionally smaller pipelines. At that time, we recommended that DOT move forward with a proposed rulemaking to address safety risk, including emergency response requirements as well as improved data collection to help identify risk. PHMSA has sought comment on expanding the regulation of gathering pipelines, including collecting additional data and plans to issue proposed rules this fall.

Next, pipeline operator incident response. 2013, we found that, while PHMSA had a goal for operators to respond to incidents in a prompt and effective manner, this goal was not linked to performance measures. We further found that PHMSA's data on operators' incident response times was not reliable. We recommended that PHMSA improve its data, which would allow it to determine appropriate response-time goals for different types of pipelines based on location and other factors. PHMSA plans to improve its incident response data and to develop a performance-based response standard by the end of 2016.

Our work has also addressed the use of automated valves to improve incident response. We've found that such valves can help operators to quickly shut down a pipeline if a rupture occurs, but it can also disrupt service to customers or even cause a rupture in some cases. We concluded that deciding where to install these valves should be done on a case-by-case basis, and recommended that PHMSA improve guidance to assist operators in making that decision. PHMSA plans to improve its guidance and to publish a Notice of Proposed Rulemaking on this issue in February 2016.

Finally, pipeline integrity assessment. There is a statutory requirement for natural gas transmission pipeline operators to reassess the integrity of their pipelines every 7 years. In June 2013, we found that this requirement provides a safeguard that operators are regularly addressing problems, but it is not fully consistent with risk-based practices. Such practices could lead to more, or less, frequent assessments for specific pipelines, depending on the situation. We also found that guidance for calculating assessments intervals is lacking, and, as a result, operators may perform a less rigorous determination of reassessment intervals. PHMSA plans to issue such guidance in 2016 and is researching the feasibility of risk-based assessments less often than the current 7-year requirement.

Mr. Chairman, this concludes my statement. I'd be pleased to answer any questions you or members of the Subcommittee may have.

[The prepared statement of Ms. Fleming follows:]

GAO HIGHLIGHTS

Why GAO Did This Study

The nation relies on a pipeline network of more than 2.6 million miles to transport hazardous liquids and natural gas. This network includes gathering pipelines that transport products to processing facilities and transmission pipelines that transport products from processing facilities to users (see figure). Pipeline safety oversight from PHMSA, along with state partners, covers issues such as incident response planning and integrity management. PHMSA uses a risk-based approach to regulate pipelines, resulting in regulation of all transmission pipelines and about 10 percent of gathering pipelines. Specifically, PHMSA does not regulate gathering pipelines that are smaller, operate at lower pressure, and are located in rural areas. This statement addresses PHMSA's efforts in the areas of (1) gathering pipeline safety, (2) pipeline operator incident response, and (3) assessment of natural gas pipeline integrity. It is based on GAO's March 2012, January 2013, June 2013, and August 2014 reports on pipeline safety and July 2015 updates from PHMSA on its actions to respond to the reports' recommendations.

What GAO Recommends

In its reports, GAO made seven recommendations to DOT to improve pipeline safety data and guidance and to move forward with proposed rulemaking to address safety risks. GAO recommended, for example, that DOT move forward with proposed rulemaking to address risks from newer gathering pipelines. DOT is taking actions to respond to the recommendations.

PIPELINE SAFETY—DEPARTMENT OF TRANSPORTATION NEEDS TO COMPLETE REGULATORY, DATA, AND GUIDANCE EFFORTS

What GAO Found

The Department of Transportation's (DOT) Pipeline and Hazardous Materials Safety Administration (PHMSA) has begun but not completed efforts to improve pipeline safety in response to GAO's prior recommendations:

- *Gathering pipelines:* In 2012, GAO found that while gathering pipelines that are not regulated by PHMSA were generally considered to present less safety risk than other pipelines, PHMSA did not collect comprehensive data to identify such risks. GAO concluded that such data could help pipeline safety officials and pipeline operators increase the safety of these pipelines by better identifying and quantifying safety risks. In 2014, GAO found that construction of larger, higher-pressure gathering pipelines had increased due to the increased production of oil and gas, raising safety concerns because an incident could affect a greater area than an incident from a smaller, lower-pressure pipeline. PHMSA plans to issue proposed rules in fall 2015 that include collecting data on unregulated gathering pipelines.
- *Pipeline operator incident response:* In January 2013, GAO found that PHMSA's data on operators' incident response times were not reliable, limiting the agen-

cy's ability to move to a performance-based approach for incident response. Improved data would allow PHMSA to determine appropriate response times for different types of pipelines, based on location and other factors. PHMSA plans to require changes in operator reporting to improve its incident response data and develop a performance-based standard as part of an upcoming rulemaking.

- *Gas pipeline assessment:* In June 2013, GAO found that a requirement for gas transmission pipeline operators to reassess the integrity of their pipelines every 7 years provided a safeguard that issues were regularly addressed, but was not fully consistent with risk-based practices. A risk-based approach based on individual pipeline characteristics could call for assessments to occur more or less frequently than 7 years. However, implementing intervals longer than 7 years could require additional inspection resources to verify that operators appropriately assessed risk. GAO also found that guidance for calculating assessment intervals was lacking. PHMSA plans to issue guidance in 2016 and is researching the feasibility of risk-based assessments occurring less frequently than every 7 years.

PREPARED STATEMENT OF SUSAN A. FLEMING, DIRECTOR, PHYSICAL INFRASTRUCTURE ISSUES, U.S. GOVERNMENT ACCOUNTABILITY OFFICE

Chairman Fischer, Ranking Member Booker, and Members of the Subcommittee:

Thank you for the opportunity to participate in this hearing on pipeline safety. The Department of Transportation's (DOT) Pipeline and Hazardous Materials Safety Administration (PHMSA), working in conjunction with state pipeline safety offices, oversees a vital network of over 2.6 million miles of pipelines carrying oil and natural gas products to refineries, businesses, and homes. This network includes gathering pipelines that convey crude oil and natural gas from production wells to processing facilities; transmission pipelines that transport the processed products over long distances to communities and large-volume users; and distribution pipelines that split off from natural gas transmission pipelines to deliver gas to residential, commercial, and industrial customers. As you know, pipelines are a relatively safe means of transporting these hazardous materials; however, catastrophic incidents¹ can and do occur when pipelines leak or rupture, resulting in death, injury, and environmental and property damage. PHMSA establishes regulations that pipeline operators must follow to construct and maintain pipelines, as well as prepare for and respond to incidents. Since 2002, PHMSA has required operators to follow a risk-based approach to pipeline safety. For example, the Pipeline Safety Improvement Act of 2002 required PHMSA to implement a risk-based "integrity management" program for natural gas transmission pipeline safety that required pipeline operators to complete a baseline safety assessment of their pipelines and complete reassessments of those pipelines at least every 7 years.²

My statement today highlights our past work on:

- (1) the safety of gathering pipelines, particularly in light of the boom in oil and natural gas production from shale sources;
- (2) the ability of transmission pipeline operators to respond to incidents; and
- (3) requirements for reassessing the integrity of natural gas transmission pipelines.

For this statement, we drew from our reports on these topics issued from 2012 through 2014.³ For these reports, we analyzed PHMSA pipeline incident data; reviewed pipeline regulations; conducted literature reviews; and interviewed selected pipeline operators, representatives of safety and industry groups, state pipeline safety officials, and PHMSA officials. For the 2012 report on gathering pipelines, we

¹In its regulations, PHMSA refers to the release of natural gas from a pipeline as an "incident" and a spill from a hazardous liquid pipeline as an "accident." (49 C.F.R. Part 195, Subpart B). For simplicity, this statement will refer to both as "incidents."

²Pub. L. No. 107-355, § 14(a), 116 Stat. 2985, 3002 (2002) (codified as amended at 49 U.S.C. § 60109(c)(3)(A)-(B)).

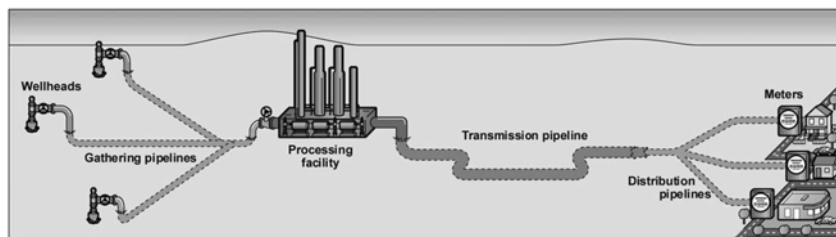
³GAO, *Pipeline Safety: Collecting Data and Sharing Information on Federally Unregulated Gathering Pipelines Could Help Enhance Safety*, GAO-12-388 (Washington, D.C.: Mar. 22, 2012); *Pipeline Safety: Better Data and Guidance Needed to Improve Pipeline Operator Incident Response*, GAO-13-168 (Washington, D.C.: Jan. 23, 2013); *Gas Pipeline Safety: Guidance and More Information Needed before Using Risk-Based Reassessment Intervals*, GAO-13-577 (Washington, D.C.: June 27, 2013); and *Oil and Gas Transportation Safety: Department of Transportation Is Taking Actions to Address Rail Safety, but Additional Actions Are Needed to Improve Pipeline Safety*, GAO-14-667 (Washington, D.C.: Aug. 21, 2014).

also surveyed state pipeline safety officials in all 50 states and the District of Columbia. In addition, in July 2015, we obtained updates from PHMSA on its actions to respond to the recommendations we made in these reports. Additional information on the scope and methodology for each report can be found in these reports. Our work on each pipeline safety report was conducted in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Background

Pipelines transport roughly two-thirds of domestic energy supplies through over 2.6 million miles of pipelines across the United States. These pipelines carry hazardous liquids and natural gas from producing wells to end users, such as businesses and homes. Within this nationwide system, there are three main types of pipelines—gathering, transmission, and gas distribution—managed by about 3,000 operators. (See fig. 1.)

Figure 1: Pipeline System



Sources: Pipeline and Hazardous Materials Safety Administration; and GAO. / GAO-15-843T

Gathering pipelines. Gas gathering pipelines collect natural gas from production areas, while hazardous liquid gathering pipelines collect oil and other petroleum products. These pipelines then typically transport the products to processing facilities, which in turn refine the products and send them to transmission pipelines. Unlike the other types of pipelines, many of these pipelines have not been subject to PHMSA regulation because they are generally located in rural areas, are smaller in diameter than transmission pipelines (traditionally about 2 to 12 inches), and operate at lower pressures, ranging from about 5 to 800 pounds per square inch (psi).⁴ PHMSA regulates gathering pipelines in nonrural areas, resulting in regulation of approximately 10 percent of gathering pipelines.⁵

Transmission pipelines. Transmission pipelines carry hazardous liquid or natural gas, sometimes over hundreds of miles, to communities and large-volume users (e.g., factories).⁶ For natural gas transmission pipelines, compression stations located periodically along the pipeline maintain product pressure. Similarly, pumping stations along hazardous liquid transmission pipelines maintain product flow. Transmission pipelines tend to have the largest diameters and pressures of the three types of pipelines, generally ranging from 12 to 42 inches in diameter and operating at pressures ranging from 400 to 1440 psi. PHMSA's regulations cover all hazardous liquid and natural gas transmission pipelines.

Gas distribution pipelines. Natural gas distribution pipelines transport natural gas from transmission pipelines to residential, commercial, and industrial customers. These pipelines tend to be smaller, sometimes less than 1 inch in diameter, and operate at lower pressures—0.25 to 100 psi.

⁴PHMSA has limited statutory authority to regulate such pipelines under 49 U.S.C § 60101(b). The law authorizes PHMSA, if deemed appropriate, to define which gathering pipelines are regulated on the basis of factors such as location, length, operating pressure, throughput, diameter, and composition of the transported gas or hazardous liquid. Crude oil gathering pipelines with a diameter of not more than 6 inches that operate at low pressure and are located in a rural area that is not unusually sensitive to environmental damage are specifically exempted from regulation.

⁵49 C.F.R. Part 192.5 and 49 C.F.R. §§ 195.1(a)(4) and 195.11(a)(2).

⁶For the purposes of this statement, we use the term transmission pipeline to refer to both hazardous liquid and natural gas pipelines carrying product over long distances to users.

PHMSA estimated that in 2014 there were about 200,000 miles of hazardous liquid pipelines,⁷ 302,000 miles of gas transmission pipelines, 18,000 miles of gas gathering pipelines, and 2.2 million miles of gas distribution pipelines based on annual reports from pipeline operators.

Transporting hazardous liquids and natural gas by pipelines is associated with far fewer fatalities and injuries than other modes of transportation. From 2010 to 2014, there was an average of about 14 fatalities per year for all pipeline incidents reported to PHMSA, including an average of about 2 fatalities per year resulting from incidents on hazardous liquid and natural gas transmission pipelines. In comparison, in 2013, 3,964 fatalities resulted from incidents involving large trucks and 703 additional fatalities resulted from railroad incidents. Yet risks to pipelines exist, such as corrosion and third-party excavation, which can damage a pipeline's integrity and result in leaks and ruptures. A leak is a slow release of a product over a relatively small area. A rupture is a breach in the pipeline that may occur suddenly; the product may then ignite, resulting in an explosion.⁸ According to pipeline operators we met with in our previous work, of the two types of pipeline incidents, leaks are more common but generally cause less damage. Ruptures are relatively rare but can have much higher consequences because of the damage that can be caused by an associated explosion.

PHMSA administers two general sets of pipeline safety requirements and works with state pipeline safety offices to inspect pipelines and enforce the requirements.⁹ The first set of requirements is minimum safety standards that cover specifications for the design, construction, testing, inspection, operation, and maintenance of pipelines. Under PHMSA's minimum safety standards, operators are required to have a plan for responding to an incident that addresses leak detection, coordinating with emergency responders, and shutting down the affected pipeline segment. The amount of time it takes to shut down a pipeline segment depends on the type of valve installed on the pipeline. For example, manual valves require a person to arrive on site and either turn a wheel crank or activate a push-button actuator. In contrast, automated valves generally take less time to close than manual valves. They include remote-control valves that can be closed via a command from a control room and automatic-shutoff valves that can close without human intervention based on sensor readings.¹⁰ PHMSA's minimum safety standards dictate the spacing of all valves, regardless of the type of equipment installed to close them.¹¹

The second set of requirements is part of a supplemental risk-based regulatory program termed "integrity management," whereby operators are required to systematically identify and mitigate risks to pipeline segments that are located in "high-consequence areas" where an incident would have greater consequences for public safety or the environment.¹² For example, natural gas transmission pipeline operators were required to assess the integrity of their pipelines within high-consequence areas by December 2012, repair or otherwise address anomalies found during the assessment, and reassess these segments at least once every 7 years thereafter. Integrity management regulations also require that all transmission pipeline operators consider the use of automated valves when identifying and mitigating pipeline risks. These requirements have been in effect for all hazardous liquid pipelines since 2002, for natural gas transmission pipelines since 2004, and for natural gas distribution pipelines since 2010.

Gathering Pipelines Pose Safety Risks That PHMSA Is Working to Address

In our 2012 and 2014 reports, we identified safety risks associated with gas and hazardous liquid gathering pipelines that PHMSA was planning to but had not yet addressed through regulatory proposals. In 2012, we found that PHMSA does not

⁷ PHMSA's data do not categorize hazardous liquid pipelines into transmission and gathering pipelines.

⁸ The risks and consequences posed by gas and hazardous liquids incidents also differ. Natural gas tends to ignite more easily, resulting in more explosions. Hazardous liquids ignite less easily, but can spill and pollute the environment.

⁹ For pipelines, there are 48 states, the District of Columbia, and Puerto Rico in PHMSA's natural gas pipeline program and 17 states in its hazardous liquid pipeline program (49 U.S.C. § 60104(c)).

¹⁰ Hazardous liquid regulations refer to emergency flow restriction devices, which include remote-control valves and "check" valves that automatically prevent product from flowing in a specific direction. See 49 C.F.R. § 195.452(i)(4). We refer to all of these valves as automated valves.

¹¹ 49 C.F.R. §§ 192.179, 195.260.

¹² High-consequence areas are defined differently for hazardous liquid and natural gas pipelines. For hazardous liquid pipelines, such areas include highly populated areas (*i.e.*, urban areas), other populated areas (*i.e.*, a city, town, or village), navigable waterways, and areas unusually sensitive to environmental damage. For natural gas pipelines, high-consequence areas typically include highly populated or frequented areas, such as parks.

collect comprehensive data on safety risks associated with gathering pipelines.¹³ Although gathering pipelines generally pose lower safety risks than other types of pipelines, our survey of state pipeline safety agencies found problems including construction quality, maintenance practices, unknown or uncertain locations, and limited or no information on current pipeline integrity as safety risks for federally unregulated gathering pipelines. Operators of federally unregulated gathering pipelines are not required by Federal law to report information on such risk factors. Furthermore, the survey, as well as interviews with other pipeline industry stakeholders, identified land-use changes—namely urban development encroaching on existing pipeline rights-of-way—and the increased extraction of oil and gas from shale as changes in the operating environments that could increase the safety risks for federally unregulated gathering pipelines. Consequently, Federal and state pipeline safety officials do not know the extent to which individual operators collect such information and use it to monitor the safety of their pipelines.

In our 2012 report, we found that the data PHMSA collects for regulated pipelines help Federal and state safety officials and pipeline operators increase the safety of these pipelines by better identifying and quantifying safety risks, as well as by implementing mitigation strategies, and addressing potential regulatory needs. We concluded that collecting such data about gathering pipelines could facilitate quantitatively assessing the safety risks posed by unregulated gathering pipelines. We recommended that PHMSA collect data from operators of federally unregulated onshore hazardous liquid and gas gathering pipelines subsequent to an analysis of the benefits and industry burdens associated with such data collection. We recommended that data collected should be comparable to what PHMSA collects annually from operators of regulated gathering pipelines (*e.g.*, fatalities, injuries, property damage, location, mileage, size, operating pressure, maintenance history, and the causes and consequences of incidents). In July 2015, PHMSA officials told us that regulatory proposals the agency plans to issue for both natural gas and hazardous liquid pipelines will call for collecting data on unregulated gathering pipelines through both annual reports and accident/incident reports. As of September 2015, DOT estimated that Notices of Proposed Rulemaking on these issues would be published in October 2015.

We also found in our 2012 report that a small number of state pipeline safety agencies we surveyed reported using at least one of five practices that were most frequently cited to help ensure the safety of federally unregulated pipelines.¹⁴ However, we also found that the sharing of information among states on the safety practices used appeared to be limited, and that some state and PHMSA officials we interviewed had limited awareness of safety practices used by other states. We recommended that PHMSA establish an online clearinghouse or other resource for sharing information on pipeline safety practices. In response, PHMSA requested that the National Association of Pipeline Safety Representatives develop an online resource document library for states to obtain and post information related to gathering pipelines. This online library was established in May 2014 and includes, among other things, state-specific regulatory information for gathering pipelines, such as rules, definitions, and inspection form examples.

In our 2014 report, we examined the transportation impacts of increased oil and gas extraction and found that construction of larger, higher-pressure gathering pipelines had increased to meet the increased oil and gas production.¹⁵ Such pipelines, if located in rural areas, are generally not subject to DOT safety regulations that apply to other pipelines. This includes requirements for emergency response planning that apply to other pipelines but do not apply to rural unregulated gathering pipelines. For example, transmission pipeline operators with pipelines similar in size to the new gathering pipelines are required to develop comprehensive emergency response plans and coordinate with local emergency responders. Emergency response officials we spoke with stated that without information about the location of some gathering pipelines, responders—particularly in rural areas—may not be adequately prepared to respond to an incident. Consequently, response planning in

¹³ GAO-12-388. Although PHMSA has the legal authority to collect data on unregulated gathering pipelines, the agency is not required and has not yet exercised its authority to do so.

¹⁴ These practices include (1) damage prevention programs, (2) considering areas of highest risk to target resources, (3) safety inspections, (4) public outreach and communication, and (5) increased regulatory attention on operators with prior spills or leaks.

¹⁵ GAO-14-667. We found that the increase in pipeline mileage is unknown because data on gathering pipelines are not systematically collected by PHMSA or by every state. Technology advancements such as horizontal drilling and hydraulic fracturing (pumping water, sand, and chemicals into wells to fracture underground rock formations and allow oil or gas to flow) have allowed companies to extract oil and gas from shale and other tight geological formations. As a result, oil and gas production increased more than fivefold from 2007 through 2012.

rural areas with federally unregulated gathering pipelines may be inadequate to address a major incident. Historically, gathering pipelines were smaller and operated at lower pressure and thus posed less risk than long-distance pipelines. However, state pipeline regulators, PHMSA officials, and pipeline operators we spoke with said that some newly built gathering pipelines have larger diameters and higher operating pressures that more closely resemble transmission pipelines than traditional gathering pipelines. For example, while gathering pipelines have traditionally been 2 to 12 inches in diameter, one company operating in a Texas shale region showed us plans to build 30- and 36-inch natural gas gathering pipelines, which is near the high end of diameters for regulated transmission pipelines. The recent increase in their size and pressure raises safety concerns because they could affect a greater area in the event of an incident. Although states may regulate some gathering pipelines in rural areas, a 2013 report on state pipeline oversight by an association of state pipeline regulators showed that most states do not currently regulate gathering pipelines in rural areas.¹⁶

PHMSA has been working to propose regulatory changes to address safety risks of unregulated gathering pipelines, but this effort is not yet complete. PHMSA issued Advance Notices of Proposed Rulemaking for onshore hazardous liquid and gas pipelines in October 2010 and August 2011, respectively, seeking comment on whether to require operators to report on federally unregulated gathering pipelines, as well as on whether to establish a new, risk-based regime of safety requirements for large-diameter, high-pressure gas gathering pipelines, including those pipelines in rural locations.¹⁷ PHMSA also noted that enforcement of current requirements has been hampered by the conflicting and ambiguous language of the current regulation that can produce multiple classifications for the same pipeline system, which means that parts of a single pipeline system can be classified as rural gathering pipelines and therefore be federally unregulated, while other parts of the same pipeline with the same characteristics are regulated. In our 2014 report, we recommended that PHMSA move forward with a Notice of Proposed Rulemaking to address gathering pipeline safety that addresses the risks of larger-diameter, higher-pressure federally unregulated gathering pipelines, including subjecting such pipelines to emergency response planning requirements that currently do not apply. DOT generally concurred with the recommendation. In July 2015, PHMSA officials told us the proposed regulations the agency expects to publish in October 2015 will address this recommendation. Specifically, officials said that the gas pipeline proposal will extend certain requirements (including emergency response planning) to previously unregulated gathering pipelines with a diameter greater than 8 inches. PHMSA officials also said that in the hazardous liquid pipeline proposal, they are planning on using the proposed annual report and accident data collection from federally unregulated hazardous liquid gathering pipelines to develop appropriate and relevant regulations for certain hazardous liquid gathering pipelines that are currently unregulated.

Better Guidance on Use of Automated Valves and a Performance-Based Approach to Incident Response Could Improve Operators' Response Times

In our January 2013 report on pipeline operator incident response, we found that numerous variables influence the ability of transmission pipeline operators to respond to incidents.¹⁸ For example, the accuracy of a leak detection system, the location of response personnel, the preparedness of emergency responders, and the use of manual or automated valves can affect the amount of time it takes for operators to respond to incidents, which can range from minutes to days.¹⁹ However, even though the primary advantage of installing automated valves is that operators can respond quickly to isolate the affected pipeline segment and reduce the amount of product released, automated valves can have disadvantages as well. Specifically, accidental closures can lead to loss of service to customers or even cause a rupture.

¹⁶The National Association of Pipeline Safety Representatives, an association representing state pipeline safety officials, produced a compendium of state pipeline regulations showing that most states with delegated authority from PHMSA to conduct intrastate inspections do not have regulations that cover oversight of gathering pipelines. Based on our analysis, we determined that regulations vary by state, but the compendium shows that at least 6 states have some form of gathering-pipeline regulation. National Association of Pipeline Safety Representatives, *Compendium of State Pipeline Safety Requirements & Initiatives Providing Increased Public Safety Levels compared to Code of Federal Regulations*, second edition (Sept. 9, 2013).

¹⁷75 Fed. Reg. 63774 (Oct. 18, 2010) and 76 Fed. Reg. 53086 (Aug. 25, 2011).

¹⁸GAO-13-168.

¹⁹Variables outside of operators' control—such as weather conditions—can also influence incident response time.

Because the advantages and disadvantages of installing an automated valve are closely related to the specifics of the valve's location, it is appropriate that operators decide whether to install automated valves on a case-by-case basis. However, not all operators we spoke with were aware of existing PHMSA guidance designed to assist operators in deciding when to use automated valves. Consequently, we recommended that PHMSA use its existing information-sharing mechanisms to alert all pipeline operators of inspection and enforcement guidance that provides additional information on how to interpret regulations on automated valves. PHMSA officials said they plan to address this recommendation by highlighting existing guidance during public presentations and in other forums pipeline operators attend and through an upcoming rulemaking on rupture detection and valve rules. PHMSA plans to publish a Notice of Proposed Rulemaking on this issue in February 2016.

In our January 2013 report, we concluded that PHMSA has an opportunity to improve incident response times by developing a performance-based approach for pipeline operators to improve incident response times. We have also previously concluded that a performance-based approach—including goals and associated performance measures and targets—can allow those being regulated to determine the most appropriate way to achieve desired outcomes. While PHMSA has established a national goal for pipeline operators to respond to incidents in a “prompt and effective” manner, it has not linked performance measures or targets to this goal.

Defining performance measures and targets for incident response can be challenging, but we identified a potential strategy for PHMSA to move toward a more quantifiable, performance-based approach to improve incident response based on nationwide incident response data. For example, PHMSA could evaluate nationwide data to determine response times for different types of pipeline (based on location, operating pressure, and pipeline diameter, among other factors). First, though, PHMSA must improve the data it collects on incident response times. These data are not reliable both because operators are not required to fill out certain time-related fields in the reporting form and because operators told us they interpret these data fields in different ways. Consequently, we found that some pipeline operators did not consistently report the date and time for when the incident was identified or for when operator resources arrived on the site of the incident. Some operators also did not consistently report whether the incident led to a shutdown of a pipeline or facility. Reliable data would improve PHMSA's ability to measure incident response and assist the agency in exploring the feasibility of developing a performance-based approach for improving operator response to pipeline incidents.

We recommended that PHMSA improve the reliability of incident response data and use these data to evaluate whether to implement a performance-based framework for incident response times. In July 2015, PHMSA officials told us they have taken several steps toward addressing this recommendation, including making changes to its incident reports and requiring that operators report specific pieces of information regarding an incident. Additionally, PHMSA officials said that, later this year, they plan to propose further changes to the report forms to collect additional data that will allow the agency to better track incident response times. PHMSA officials also said they plan to develop a more specific performance-based standard for incident response as part of the upcoming February 2016 rulemaking.

Guidance and More Information Needed for Use of Risk-Based Reassessment Intervals

The current statutory requirement for natural gas transmission pipeline operators to reassess pipeline integrity at least every 7 years provides a safeguard by allowing operators and regulators to identify and address problems on a continual basis, but in our June 2013 report, we found that this requirement is not fully consistent with risk-management practices, which are the basis for PHMSA's integrity management program.²⁰ The primary advantage of the 7-year reassessment requirement is that it is more frequent than the intervals found in industry consensus standards, which specify 10-, 15-, or 20-year intervals depending on the characteristics of individual pipelines.²¹ This conservative approach provides greater assurance that operators are regularly monitoring their pipelines to address threats before leaks or ruptures occur. However, this requirement is not fully consistent with risk-based management practices. Under a risk-based approach, operators could, for example, use information to identify, assess, and prioritize risks so that resources may be allocated

²⁰ GAO-13-577.

²¹ The American Society of Mechanical Engineers developed an industry consensus standard—subsequently approved by the American National Standards Institute—on maximum reassessment intervals for all safety risks (including corrosion damage) that PHMSA incorporated into its regulations. See 49 C.F.R. § 192.939.

to address higher risks first. While operators are currently required to determine an appropriate reassessment interval based on the threats to their pipelines in high-consequence areas, they must reassess those pipelines at least every 7 years regardless of the risks identified. If the operator's risk analysis indicates that reassessments should be done at intervals shorter than 7 years, the operator is required to do so.

Implementing risk-based reassessment intervals that are longer than 7 years for natural gas transmission pipelines would require a statutory change and could exacerbate current workload, staffing, and expertise challenges for operators and regulators. For example, PHMSA officials told us that allowing longer intervals could require inspectors to spend more time and resources than they do currently to verify that operators appropriately assessed risk, and state pipeline safety offices we met with noted potential concerns with staffing and training to effectively evaluate risk-based reassessment intervals. Further, some operators told us that extending reassessment intervals to be longer than 7 years would likely require additional data analyses beyond those currently required. In our June 2013 report, we found that operators we met with varied in the extent to which they calculated reassessment intervals and used the results of data analyses. Further, we found that guidance to calculate reassessment intervals was lacking, and as a result, operators may perform a less rigorous determination of their reassessment intervals. As a result, some operators could be following the 7-year reassessment interval when their pipeline should be reassessed more frequently (*e.g.*, within 5 years). To improve how operators calculate reassessment intervals, we recommended that PHMSA develop guidance for operators to use in determining risks and calculating reassessment intervals. PHMSA officials said the agency has drafted guidance on calculating reassessment intervals that are shorter than 7 years; this guidance is currently under internal review and agency officials anticipate that it will be posted on PHMSA's website by February 2016.

At the request of a congressional committee, in 2008, PHMSA described how it would establish and enforce risk-based criteria for extending the 7-year reassessment interval for natural gas transmission pipelines. At that time, PHMSA proposed retaining the current 7-year reassessment requirement, but also establishing a process by which operators could use risk-based reassessment intervals that are longer than 7 years if they met certain potential criteria, such as demonstrating sound risk analysis. This process would be similar to that used by PHMSA for hazardous liquid pipeline reassessment intervals.²² While we and PHMSA have supported the concept of risk-based reassessment intervals that are longer than 7 years, given the breadth of potential challenges with implementation, more information might help decision-makers better understand the resource requirements and potential safety implications of such a change. For example, PHMSA has used pilot programs to collect such information and study the effects prior to rule changes. To better identify the resource requirements needed to implement risk-based reassessment intervals that are longer than 7 years for gas transmission pipelines, we recommended that PHMSA collect information on the feasibility of addressing the potential challenges of implementing risk-based reassessment intervals that are longer than 7 years, for example by preparing a report or developing a legislative proposal for a pilot program, in consultation with Congress, that studies the impact to regulators and operators of a potential rule change. PHMSA is studying the potential to implement risk-based reassessment intervals that are longer than 7 years for gas transmission pipelines; agency officials plan to complete this research by March 2016.

Chairman Fischer, Ranking Member Booker, and Members of the Subcommittee, this completes my prepared statement. I would be pleased to respond to any questions that you may have at this time.

Senator FISCHER. Thank you, Ms. Fleming.

Next, we have the Honorable Christopher Hart, who is the Chairman of the National Transportation Safety Board, sworn in on March 17, 2015. He was originally sworn in as a member of the Board in 2009 and designated by the President as Vice Chairman a few days after that in 2009.

So, welcome, Mr. Hart.

²² Reassessment interval requirements for hazardous liquid pipelines were established by PHMSA rulemaking rather than through legislation. The gas transmission pipeline reassessment interval requirements were established in the 2002 Pipeline Safety Improvement Act.

**STATEMENT OF HON. CHRISTOPHER A. HART, CHAIRMAN,
NATIONAL TRANSPORTATION SAFETY BOARD**

Mr. HART. Thank you. Good afternoon, Chairman Fischer, Ranking Member Booker, and members of the Subcommittee. And thank you for inviting the National Transportation Safety Board.

Pipelines remain one of the safest and most efficient means of transporting vital commodities that are used to power homes and supply businesses. However, as we have observed during our investigations, the consequences can be tragic when pipeline operators do not follow safe operational practices, have inadequate safety standards, or disregard safety standards. High-pressure natural gas pipeline failures frequently result in explosive releases that, if ignited, become intense jet fires that can cause extensive damage, injuries, and deaths.

Hazardous liquid pipeline incidents, on the other hand, can cause large-scale environmental damage even in the absence of an explosion or fire. For example, in July 2010, an Enbridge 30-inch pipeline released about 844,000 gallons of crude oil into the Kalamazoo River near Marshall, Michigan. To date, cleanup costs have exceeded \$1.2 billion, with a “b.” This is the largest onshore oil spill and most costly cleanup in U.S. history.

As the Nation’s demand for oil and gas grows and pipeline infrastructure ages, we must pay even more attention to the transportation mode that lies buried beneath us. Safe operation of natural gas and hazardous liquid transmission pipelines are a shared responsibility among the operator, government oversight agencies, and local communities.

The NTSB continues to investigate such accidents. In fact, as recently as last week, we launched an investigation team to a pipeline accident in Centreville, Virginia, where a pipeline released an estimated 4,000 gallons of gasoline. Some of the liquid accumulated in a storm water retention pond near the pipeline right away, but fortunately the spill did not result in deaths or injuries. However, the spill made it necessary to ensure that nearby residents were not adversely affected.

As you’re aware, there are three types of pipeline systems through which natural gas is transported from its source to the end users: gathering, transmission, and distribution systems. Gathering lines transport gas from a production facility to a transmission line, and transmission lines transport gas from a gathering line to a distribution facility. There are almost 300,000 miles of onshore natural gas transmission pipelines in the United States. Compared to gas distribution pipelines, transmission pipelines typically have larger diameters and significantly higher operating pressures; therefore, the potential impact of a transmission pipeline accident on its surroundings is very high.

Since 2004, the operators of these pipelines have been required by the Pipeline and Hazardous Materials Safety Administration, PHMSA, to develop and implement integrity management programs to ensure the integrity of their pipelines in high-consequence areas, including populated areas, in order to reduce the risk of injuries and property damage from pipeline failures.

In the last 6 years, we have completed three major gas transmission pipeline accident investigations where we identified defi-

iciencies in the operators' incident management programs and PHMSA oversight. These three accidents, which occurred at—in Palm City, Florida, San Bruno, California, which has already been mentioned, and Sissonville, West Virginia, resulted in eight deaths, more than 50 injuries, 41 homes destroyed, and many more damaged.

Earlier this year, the NTSB Safety Research Division conducted a safety study to build upon the results from the completed investigation, and used additional research to gauge the effectiveness of integrity management programs for gas transmission pipelines in high-consequence areas. As a result of the safety study, we issued 28 new recommendations, including 22 to PHMSA. The recommendations include developing expanded and improved guidance for operators and inspectors for: first, the development of criteria for threat identification and elimination; second, consideration of interactive threats; and finally, increased knowledge of the critical components that are associated with risk assessment approaches. We also recommended that PHMSA evaluate and improve gas transmission pipeline integrity assessment methods, including increasing the use of inline inspection and ensuring that direct assessment is not the sole integrity assessment method.

Since 2000, we have made 77 safety recommendations to PHMSA, with about half in an open status. For only one recommendation have we evaluated PHMSA's actions as unacceptable. The NTSB recognizes the efforts that PHMSA has undertaken, but our study of integrity management in gas transmission pipelines in high-consequence areas showed no evidence of a decline in incidents since 2004, when PHMSA integrity management rule first went into effect. The accidents and incidents that NTSB investigates attest to the fact that additional safety enhancements are still necessary to prevent future pipeline accidents.

Thank you for the opportunity to testify before you today. I'm happy to answer any questions you may have.

[The prepared statement of Mr. Hart follows:]

PREPARED STATEMENT OF HON. CHRISTOPHER A. HART, CHAIRMAN,
NATIONAL TRANSPORTATION SAFETY BOARD

Good afternoon Chairman Fischer, Ranking Member Booker, and Members of the Subcommittee. Thank you for inviting the National Transportation Safety Board (NTSB) to testify before you today.

The NTSB is an independent Federal agency charged by Congress with investigating every civil aviation accident and significant incidents in the United States and significant accidents and incidents in other modes of transportation—railroad, highway, marine and pipeline. We determine the probable cause of accidents and other transportation events and issue safety recommendations aimed at preventing future accidents. In addition, we carry out special studies concerning transportation safety and coordinate the resources of the Federal Government and other organizations to provide assistance to victims and their family members impacted by major transportation disasters.

Since its inception, the NTSB has investigated more than 140,500 aviation accidents and thousands of surface transportation accidents. On call 24 hours a day, 365 days a year, our investigators travel throughout the country and internationally to investigate significant accidents and develop factual records and safety recommendations with one aim—to ensure that similar accidents don't occur in the future. To date, we have issued over 14,000 safety recommendations to nearly 2,300 recipients, including 77 recommendations to the Pipeline and Hazardous Materials

Safety Administration (PHMSA) since 2000.¹ Because we have no formal authority to regulate the transportation industry, our effectiveness depends on our reputation for conducting thorough, accurate, and independent investigations and for producing timely, well-considered recommendations to enhance transportation safety.

Each year, the NTSB releases its Most Wanted List, highlighting safety-critical actions that the U.S. Department of Transportation (DOT), United States Coast Guard, other Federal entities, states, and transportation industry organizations need to take to help prevent transportation accidents and save lives. We base our Most Wanted List, which focuses on our top 10 areas for transportation safety improvements, on safety issues we have identified as a result of our accident investigations. Although the 2015 Most Wanted List did not include a pipeline-specific issue, the 2014 most Wanted List included “Enhance Pipeline Safety.” Safe operation of natural gas and hazardous liquid transmission pipelines is a shared responsibility among the operator, government oversight agencies, and local communities. As we pointed out,

Oversight agencies also play a role, especially when operators are reluctant to initiate safety improvements. Regulators can mandate specific safety program improvements to ensure pipeline operators adopt and improve practices that reduce the risk and consequences of pipeline failures. For example, given the gas industry’s reluctance to expand the use of automatic shutoff valves and remote controlled valves, the Pipeline and Hazardous Materials Safety Administration should require this technology, which can isolate a rupture within minutes and reduce the volume of gas released and the duration of a fire.²

Pipeline safety remains a priority for the NTSB. Just last week we launched an investigative team to a pipeline accident in Centreville, Virginia, in which a pipeline released an estimated 4000 gallons of gasoline. Some of the liquid had accumulated in a stormwater retention pond near the pipeline right-of-way. Fortunately, the spill did not result in fatalities or injuries, and precautions were taken to ensure that nearby residents and businesses were not adversely affected by the released gasoline.

Recent Investigations

Two recent NTSB pipeline investigations involved natural gas explosions. On March 12, 2014, in East Harlem in New York City, two multi-use, five-story buildings were destroyed by a natural gas explosion and subsequent fire. Eight people died, more than 50 people were injured, and more than 100 families were displaced from their homes.

On December 17, 2013, natural gas leaking from a cast iron distribution pipeline resulted in the explosion of a two-story apartment building in Birmingham, Alabama. One person was killed and eight people were injured.

These explosions are a grim reminder that efforts to improve pipeline integrity management practices must continue, particularly for pipelines located in high consequence areas.

The NTSB issued its final accident report on the East Harlem explosion last June,³ and the Birmingham investigation is still underway. The East Harlem accident investigation focused on the following safety issues:

- Adequacy of the Consolidated Edison Company of New York, Inc. (Con Edison) quality assurance and quality control procedures for joining plastic pipes;
- Effectiveness of Con Edison’s public awareness program;
- Adequacy of Con Edison’s gas odor report response;
- Effectiveness of the New York City Department of Environmental Protection sewer integrity program; and
- Effectiveness of Federal and state natural gas pipeline oversight.

The investigation found that a Con Edison contractor had installed a plastic gas main and service “tee joint” in 2011 using a Con Edison heat fusion procedure for plastic pipe. Post-accident examination showed that the surfaces of the service tee and the gas main had not adequately been prepared before the tee was fusion weld-

¹Nine of the recommendations were made to PHMSA’s predecessor, the Research and Special Programs Administration.

²NTSB, 2014 Most Wanted List: Enhance Pipeline Safety (2014), http://www.nts.gov/safety/mwl/Pages/mwl5_2014.aspx.

³NTSB, *Natural Gas-Fueled Building Explosion and Resulting Fire, New York City, New York on March 12, 2014*, Rpt. No. NTSB/PAF-15/01 (June 9, 2015).

ed to the gas main, resulting in a defective joint that contained an area of incomplete fusion.

The investigation also found a large hole in a sewer main in the vicinity of the gas main, which had been identified by the New York City Department of Environmental Protection in 2006 and again in 2011 but was not repaired. The supporting soil under the gas main was washed into the sewer through the sewer wall breach over the course of many years when groundwater accumulated in the area. Consequently, the soil supporting the gas main had washed away in the vicinity of the service tee, which caused the gas main to sag and overstressed the defective service tee fusion joint. A crack opened in the defective joint, allowing natural gas to escape into the subterranean area and migrate into one of the nearby buildings.

Con Edison had conducted an extensive public awareness program that included urging the public and gas customers to call Con Edison in the event of a suspected gas leak. This information was included in customer billings, in newspaper advertisements, and in flyers posted in apartment buildings. However, the investigation found that people smelled gas the day before the accident but had not called Con Edison, the fire department, or 911.

About 25 minutes before the accident, Con Edison received a call from a resident of an adjacent building who reported a gas odor both inside and outside of his residence. The gas was coming from one of the buildings that was later destroyed in the explosion. During the call, the Con Edison customer service representative's computer stopped responding, which delayed the notifications. Although a gas service mechanic was dispatched, the fire department was not notified as required by Con Edison's response procedure.

The NTSB determined that the probable cause of the accident was (1) the failure of the defective fusion joint at the service tee that allowed natural gas to leak from the gas main and migrate into the building where it ignited and (2) a breach in the sewer line that went unrepaired since at least 2006, allowing groundwater and soil to flow into the sewer, leading to a loss of support for the gas main, which caused the line to sag and overstressed the defective fusion joint.

As a result of this investigation, the NTSB made six safety recommendations: one to the New York State Public Service Commission, one to the City of New York, and four to Con Edison.⁴ The safety recommendation to the New York State Public Service Commission called upon that agency to ensure that its 5-year audit plan for pipeline operators effectively addresses all aspects of the state pipeline regulations. The safety recommendation to the City of New York, if acted upon, will result in better reporting of sewer line breaches and better coordination among city agencies to identify and address soil disruption and voids. We recommended that Con Edison better adhere to standard practices for heat fusion joining of polyethylene pipe, promptly notify the New York City Fire Department in the event of a gas emergency, and perform more extensive and appropriate installation of gas main isolation valves.

While the East Harlem accident investigation did not result in our issuing a safety recommendation to PHMSA, the NTSB pointed out in its accident investigation report that PHMSA had failed to identify deficiencies in the New York state pipeline safety regulations. The state pipeline safety program certifications in Title 49 *United States Code* section 60105(a) allow states to inspect and enforce intrastate pipeline safety, provided the state adopts at least the minimum Federal pipeline safety regulations. Our examination of the New York state pipeline safety regulations revealed that they did not meet Federal regulations in two areas: definition of service line and pipeline pressure testing. These deficiencies had not been identified by PHMSA during state program recertifications. In response to the NTSB's investigation findings, the New York State Public Service Commission corrected these deficiencies.

Pipeline Safety: Natural Gas Pipelines

Three types of pipeline systems are used to transport natural gas from the source to end users; gathering, transmission, and distribution systems. Gathering lines transport gas from a production facility to a transmission line, and transmission lines transport gas from a gathering line to a distribution facility.⁵ The United States has approximately 298,000 miles of onshore natural gas transmission pipelines. Compared to gas distribution pipelines, transmission pipelines typically have larger diameters and significantly higher operating pressures. Therefore, the potential impact of a transmission pipeline incident on its surroundings is high.

⁴P-15-33 through -38.

⁵Title 49 *Code of Federal Regulations* (CFR) 192.3.

Since 2004, PHMSA has required the operators of these pipelines to develop and implement integrity management (IM) programs to ensure the integrity of their pipelines in populated areas (defined as high consequence areas [HCAs]) to reduce the risk of injuries and property damage from pipeline failures.⁶ An operator's IM program is a management system designed and implemented to ensure the operator's pipeline system is safe and reliable. It consists of multiple components, including procedures and processes for identifying HCAs, determining likely threats to the pipeline within the HCA, evaluating the physical integrity of the pipe within the HCA, and repairing or remediating any pipeline defects found. These procedures and processes are complex and interconnected. Effective implementation of an IM program relies on continual evaluation and data integration. The IM program is an ongoing program that PHMSA and state regulatory agencies should periodically inspect to ensure operator compliance with regulatory requirements.

In the last six years, the NTSB has completed three major gas transmission pipeline accident investigations in which deficiencies with the operators' IM programs and PHMSA oversight were identified as a concern.⁷ These three accidents—located in Palm City, Florida; San Bruno, California; and Sissonville, West Virginia—resulted in eight fatalities, more than 50 injuries, and 41 homes destroyed, with many more damaged. We are also evaluating IM oversight in the ongoing Birmingham investigation.

Earlier this year, the NTSB's Safety Research Division conducted a safety study using the results from the completed investigations and additional research to identify weaknesses in the implementation of gas transmission pipeline integrity management programs in HCAs. The study, *Integrity Management of Gas Transmission Pipelines in High Consequence Areas*, found that, although PHMSA's gas IM requirements have kept the rate of corrosion failures and material failures of pipe or welds low, no evidence exists to show that the overall occurrence of gas transmission pipeline incidents in HCA pipelines has declined.⁸ Rather, the study identified areas where improvements need to be made to further enhance the safety of gas transmission pipelines in HCAs.

We recognize that IM programs are complex and require expert knowledge and integration of multiple technical disciplines including engineering, material science, geographic information systems, data management, probability and statistics, and risk management. This complexity requires pipeline operator personnel and pipeline inspectors to have a high level of practical knowledge and skill to adequately perform their functions. This complexity can make IM program development and implementation, and the evaluation of operators' compliance with IM program requirements, difficult. The study illustrated the need to expand and improve PHMSA resources in guiding both operators and inspectors.

The effectiveness of an IM program depends on many factors, including how well threats are identified and risks are estimated. This information guides the selection of integrity assessment methods that discover pipeline system defects that may need remediation. The study found that aspects of the operators' threat identification and risk assessment processes require improvement. Further, the study found that of the four different integrity assessment methods (pressure test, direct assessment, in-line inspection, and other techniques), in-line inspection yields the highest per-mile discovery of pipe anomalies, and the use of direct assessment as the sole integrity assessment method has numerous limitations. Compared to their interstate counterparts, intrastate pipeline operators rely more on direct assessment and less on in-line inspection.

As a result of the safety study, the NTSB issued 28 new recommendations.⁹ Of these, 22 were issued to PHMSA and one previous recommendation issued to PHMSA was reiterated.¹⁰ The recommendations include developing expanded and improved guidance for operators and inspectors for—

- The development of criteria for threat identification and elimination;
- Consideration of interactive threats; and

⁶ PHMSA's gas transmission IM regulations are found at 49 CFR Part 192, Subpart O.

⁷ NTSB, *Columbia Gas Transmission Corporation Pipeline Rupture Sissonville, West Virginia on December 11, 2012*, Rpt. No. NTSB/PAR-14/01 (February 19, 2014); NTSB, *Rupture of Florida Gas Transmission Pipeline and Release of Natural Gas Near Palm City, Florida*, Accident Brief No. NTSB/PAB-13/01 (August 13, 2013); NTSB, *Pacific Gas and Electric Company Natural Gas Transmission Pipeline Rupture and Fire San Bruno, California on September 9, 2010*, Rpt. No. NTSB/PAR-11/01 (August 30, 2011).

⁸ NTSB, *Integrity Management of Gas Transmission Pipelines in High Consequence Areas*, No. NTSB/SS-15/01 (January 27, 2015).

⁹ P-15-1 through -28.

¹⁰ P-15-1 through -22, reiterated P-11-7.

- Increased knowledge of the critical components associated with risk assessment approaches.

The NTSB also recommended that PHMSA evaluate and improve gas transmission pipeline integrity assessment methods, including increasing the use of inline inspection and ensuring that direct assessment is not the sole integrity assessment method. Other recommendations include evaluating the effectiveness of the approved risk assessment approaches for IM programs; developing minimum professional qualification criteria for all personnel involved in IM programs; and improving data collection and reporting, including geospatial data, to support the development of probabilistic risk assessment models and the evaluation of IM programs by state and Federal regulators.

All of the recommendations to PHMSA resulting from the safety study are classified as open with an acceptable response, with the exception of P-15-14. This recommendation asked PHMSA to revise Title 49 *Code of Federal Regulations* (CFR) 192.915 to require all personnel involved in integrity management programs to meet minimum professional qualification criteria. PHMSA responded that operator personnel involved in integrity management programs receive on-the-job training (OJT) under the supervision of a qualified person and that OJT is an integral component of integrity management training. PHMSA further stated that operators should establish personnel qualification criteria that are applicable to their unique operating environment and managers should have the discretion to determine what minimum qualifications are needed. To address the recommendation, PHMSA proposed to review options for setting qualification criteria based on PHMSA and NTSB evaluations, and to use this information and current regulations to issue an advisory bulletin to clarify and reiterate the importance of the requirements and place renewed emphasis on compliance in future IM inspections. Although PHMSA's intended course of action may constitute an improvement, it falls short of revising the regulations as recommended. Accordingly, we requested that PHMSA reconsider the current plan in order to adequately address the NTSB recommendation.

The Pipeline Safety, Regulatory Certainty, and Job Creation Act of 2011¹¹ (the 2011 Act) requires PHMSA to conduct an evaluation on (1) whether IM should be expanded beyond current HCAs and (2) whether doing so would mitigate the need for class location requirements for gas transmission pipelines. Consequently, PHMSA began a series of rulemaking activities to consider whether IM requirements should be changed, including adding more prescriptive language in some areas, and whether other issues related to system integrity should be addressed by strengthening or expanding non-IM requirements. Among the specific issues PHMSA is considering concerning IM requirements are whether the definition of an HCA should be revised and whether additional restrictions should be placed on the use of specific pipeline assessment methods.¹² The NTSB provided comments and will monitor these rulemakings to ensure that PHMSA has the full benefit of the lessons learned through our investigations and safety study.

Pipeline Safety: Hazardous Liquid Pipelines

As we learned from the July 25, 2010, pipeline rupture in Marshall, Michigan, and the subsequent release of more than 840,000 gallons of crude oil into nearby wetlands, Talmadge Creek, and the Kalamazoo River, ensuring adequate integrity management programs for pipelines transporting hazardous liquids remains critically important. No fatalities were reported from the crude oil spill; however, local residents self-evacuated from their houses and more than 300 people reported symptoms consistent with crude oil exposure.¹³ The Marshall, Michigan, spill is the costliest onshore oil spill ever to occur in the United States, with current cleanup costs exceeding \$1 billion.

The NTSB determined that the probable cause of the pipeline rupture was corrosion fatigue cracks that grew and coalesced from crack and corrosion defects under disbonded polyethylene tape coating, producing a substantial crude oil release that went undetected by Enbridge Incorporated's control center for more than 17 hours. The rupture and prolonged release were made possible by pervasive organizational failures at Enbridge, and PHMSA's weak regulation for assessing and repairing crack indications. Contributing to the accident was PHMSA's ineffective oversight

¹¹Public Law No. 112-90, section 5 (2012).

¹²The two relevant notices are: (1) Pipeline Safety: Safety of Gas Transmission Pipelines -Advance Notice of Proposed Rulemaking, 76 Fed. Reg. 5308 (Aug. 25, 2011); and (2) Pipeline Safety: Safety of Gas Transmission Pipelines -Advance Notice of Proposed Rulemaking; Extension of Comment Period, 76 *Federal Register* 70953 (Nov. 16, 2011).

¹³NTSB, *Enbridge Incorporated Hazardous Liquid Pipeline Rupture and Release Marshall, Michigan on July 25, 2010*, Rpt. No. NTSB/PAR-12/01 (July 10, 2012).

of pipeline integrity management programs, control center procedures, and public awareness. The investigation also determined that contributing factors to the severity of the environmental consequences were (1) Enbridge's failure to identify and ensure the availability of well-trained emergency responders with sufficient response resources, (2) PHMSA's lack of regulatory guidance for pipeline facility response planning, and (3) PHMSA's limited oversight of pipeline emergency preparedness that led to the approval of an inadequate facility response plan.

As a result of this investigation, the NTSB made safety recommendations to the U.S. Secretary of Transportation, PHMSA, Enbridge, the American Petroleum Institute, the Pipeline Research Council International, the International Association of Fire Chiefs, and the National Emergency Number Association.¹⁴ The NTSB also reiterated a previous recommendation to PHMSA.¹⁵ All of the recommendations to PHMSA are currently classified as not yet completed but thus far acceptable.

The NTSB is pleased that PHMSA has made progress in implementing the recommendations from this investigation, including that agency's development of a Notice of Proposed Rulemaking (NPRM) titled *Pipeline Safety: Safety of On-Shore Hazardous Liquid Pipelines*. Among other things, the NPRM proposes to incorporate, by reference, consensus standards governing conduct of assessments of the physical condition of in-service pipelines using inline inspection, internal corrosion direct assessment, and stress corrosion cracking direct assessment.

PHMSA is also considering revisions to the Control Room Management regulations of the Pipeline Safety Regulations to more explicitly require team training, through its NPRM titled *Pipeline Safety: Operator Qualification, Cost Recovery, and Other Proposed Changes*. This NPRM was published on July 10, 2015.¹⁶

In addition, PHMSA issued two advisory bulletins. The first, Advisory Bulletin 2014-01, published on January 28, 2014,¹⁷ notified pipeline operators (1) of the circumstances of the Marshall, Michigan, pipeline accident, and (2) of the need to identify deficiencies in facility response plans and to update these plans as necessary to conform with the non-mandatory guidance for determining and evaluating required response resources as provided in Appendix A of 49 *CFR* Part 194, "Guidelines for the Preparation of Response Plans." The second, Advisory Bulletin 2014-02, published on May 6, 2014,¹⁸ was directed to all hazardous liquid and natural gas pipeline operators, describing the circumstances of the accident in Marshall, Michigan—including the deficiencies observed in Enbridge's integrity management program—and asking them to take appropriate action to eliminate similar deficiencies.

Conclusion

Since 2000, the NTSB has made 77 safety recommendations to PHMSA; only one of these has been closed in an unacceptable status.¹⁹ We recognize the progress PHMSA has made over the past 15 years; yet, there will always be room for improvement, and the accidents and incidents that the NTSB investigates attest to the fact that safety improvements are still necessary to prevent future accidents.

Thank you for inviting me to testify today. I am happy to answer your questions.

Senator FISCHER. Thank you, Chairman Hart.

Next, we have Michael Bellamy, who is the General Manager of PII Pipeline Solutions. Mr. Bellamy has over 23 years experience in sales and marketing of technology solutions to the oil and gas industry.

Welcome.

STATEMENT OF MICHAEL BELLAMY, GENERAL MANAGER, PII PIPELINE SOLUTIONS

Mr. BELLAMY. Thank you very much. That's a good start.

Good afternoon. My name is Michael Bellamy, and I'm the General Manager of PII Pipeline Solutions. PII is part of General Electric's measurement and control business. We inspect oil and gas

¹⁴ P-12-1 through P-12-19.

¹⁵ P-11-8.

¹⁶ 80 Fed. Reg. 39916 (Jul. 10, 2015).

¹⁷ 79 Fed. Reg. 4532 (Jan. 28, 2014).

¹⁸ 79 Fed. Reg. 25990 (May 6, 2014).

¹⁹ P-15-14, discussed above at page 7.

pipelines, and, in the 35 years since the business was founded, have inspected over a million miles of pipelines worldwide. Over 40 percent of that work has been carried out here in the United States.

I appreciate the opportunity to speak to you today about pipeline inspection technology, which is also referred to as inline inspection, carried out using high-technology robotic devices, also called “smart pigs.” These devices travel along the inside of the pipeline at speeds up to 9 miles an hour, propelled by the pressure of the product flowing through the line. Equipped with sensors of various types, “pigs” collect millions of measurements as they travel, covering every inch of both the internal and external surface of the pipe steel, recording the data onboard for subsequent download when recovered at the end of the inspection run.

To help understand the role of inline inspection tools in ensuring pipeline safety, perhaps a medical analogy will help. In human medicine, data provided by MRI scanners, CT scanners, X-Ray machines, and ultrasound devices is used by medical specialists to develop a diagnosis and prescribe a course of treatment. In the same way, pipeline operators use the diagnostic capability afforded by inline inspection tools to design integrity management programs that take into account the age of the line, the way it’s operated, the environment in which it’s situated, all of which determine the potential for threats to pipeline safety.

Moreover, just as medical diagnostic technologies are used to identify medical issues at the earliest stages in our bodies, inline inspection tools can identify potential problems in pipelines early enough to prevent them from developing into a leak or rupture. By means of inline inspection, cracks the size of a matchstick or corrosion half the diameter of a penny can be identified and measured with confidence.

Inline inspection tools were first introduced in the 1970s and have evolved tremendously since. As yet, there is no one tool that can find all threats. Nevertheless, pipeline operators today have access to a range of modern, high-technology tools covering all the major threats to pipeline safety, including dents, corrosion, cracking, and land movement in both gas and liquid pipelines. The inline inspection industry is now deploying its fourth generation of metal-loss tools, its fourth generation of geometry tools, and third generation of crack-detection tools. Our understanding of the physics of these tools continues to evolve, and, coupled with advances in algorithmic search and data manipulation techniques, the inspection tools available today are providing ever improving results.

Once a “smart pig” run is completed, the data recorded, which is equivalent to looking at 70 football fields in grids of one-eighth inch by one-eighth inch, is processed to highlight suspected anomalies. The resulting output is then reviewed by a trained data analyst, who verifies the assessment and compiles a report on the condition of the pipeline to submit to the operator. With this information, and in the context of the PHMSA-approved integrity management program for the pipeline, the pipeline operator can prioritize the issues that need immediate attention.

In this way, inline inspection tools make a material contribution to pipeline safety. For example, corrosion tools have been in use for

more than 45 years. Data gathered in the U.S. continue to show a reduction in corrosion-related incidents by 36 percent over the last 12 years. Crack inspection tools have been around for less time than corrosion tools. Nevertheless, a recent Pipeline Research Council study compared over 40,00 cracks found by inline inspection tools with actual measurements from field excavations. The results gave a clear validation of the published tool specifications.

Additionally, the soon-to-be-published API-1176 industry recommended practice document developed with PHMSA involvement will provide guidance to operators on how to use the results from inline inspection tools as part of a comprehensive crack-management program. We look forward to seeing continued improvement in pipeline safety, vis-à-vis cracks, as this technology continues to mature and becomes more widely adopted by pipeline operators.

We consider ourselves partners with our customers and PHMSA in working to enhance pipeline safety. We support rules that are clear and interpreted in such a way as to encourage competition and innovation. However, the current U.S. rules don't recognize the differences between inline inspection tool technologies or in tool performance, nor do they encourage operators to use the best available technology.

PHMSA has done a great job in stimulating the pipeline industry to use inline inspection tools for dents and general corrosion. The next step is to encourage the use of a broader range of tool technologies capable of finding and characterizing a broader range of pipeline anomalies.

I'd also like to mention risk management and risk models as an accepted approach adopted by pipeline regulators globally. Such models take inline inspection data and combine it with contextual information about the pipeline, its construction and operation, to help operators make better-informed diagnosis concerning the ongoing health of their pipeline. We are encouraged that PHMSA intends to put risk management at the core of its proposed new pipeline integrity rules. We hope that they will consider the kind of goal-setting approaches that we see working effectively in Europe and Canada.

So, in summary, we believe that pipeline safety in the U.S. can be enhanced by regulations that embody the following principles:

Pipeline operators are best positioned to determine the appropriate method to verify the ongoing integrity of their pipeline.

Inline inspection provides the clearest assessment of the condition of a pipeline, and can be used to prioritize those features that need immediate attention and those that require monitoring over time.

Regulation should encourage the development and adoption of new technology that can further enhance pipeline safety.

Regulations should move operators toward a risk-based goal-setting approach.

At PII Pipeline Solutions, we're committed to pipeline safety and will continue to work with PHMSA and our customers to advance the state-of-the-art for inline inspection.

Thank you for your attention.

[The prepared statement of Mr. Bellamy follows:]

PREPARED STATEMENT OF MICHAEL BELLAMY, GENERAL MANAGER,
PII PIPELINE SOLUTIONS

Good afternoon. My name is Michael Bellamy and I am the General Manager of PII Pipeline Solutions. PII is part of General Electric's, Measurement and Control business, headquartered in Billerica, MA. We inspect oil & gas pipelines, and in the 35 years since the business was founded have inspected over 1,000,000 miles of pipelines worldwide. Over 40 percent of that work has been carried out in the United States.

I appreciate the opportunity to speak to you today about pipeline inspection technology, which is also referred to as in-line inspection, carried out using high technology robotic devices, often called "smart pigs". These devices travel along the inside of the pipeline at speeds up to 9 miles per hour, propelled by the pressure of the product flowing through the line. Equipped with sensors of various types, pigs collect millions of measurements of the pipe wall as they travel, covering every inch of both the internal and external surface of the pipe steel, recording the data on board for subsequent download when recovered at the end of the inspection run.

To help understand the role of in-line inspection tools in ensuring pipeline safety, perhaps a medical analogy will help. In human medicine, data provided by MRI scanners, CT scanners, x-ray machines and ultrasound devices is used by medical specialists to develop a diagnosis and prescribe a course of treatment.

In the same way, pipeline operators use the diagnostic capability afforded by in-line inspection tools to design integrity management programs that take into account the age of the line, the way in which it is operated, and the environment in which it is situated, all of which determine the potential for threats to pipeline safety.

Moreover, just as medical diagnostic technologies are used to identify medical issues at their earliest stages in our bodies, in-line inspection tools can identify potential problems in pipelines early enough to prevent them from developing into a leak or rupture.

By means of in-line inspection, cracks the size of a match stick and corrosion $\frac{1}{2}$ the diameter of a penny can be identified and measured with confidence.

In-line inspection tools were first introduced in the 1970s and have evolved tremendously since. As yet there is no one tool that can find all threats. Nevertheless pipeline operators today have access to a range of modern high technology tools covering all the major threats to pipeline safety including dents, corrosion, cracking and land movement, in both gas and liquid pipelines.

The in-line inspection industry is now deploying its 4th generation of metal loss tools, 4th generation of geometry tools and 3rd generation of crack detection tools. Our understanding of the physics of these tools continues to evolve, and coupled with advances in algorithmic search and data manipulation techniques, the inspection tools available today are providing ever improving results.

Once a smart pig run is complete, the data recorded, which is equivalent to looking at 70 football fields in grids of $\frac{1}{8}$ " x $\frac{1}{8}$ ", is processed to highlight suspected anomalies. The resulting output is then reviewed by a trained data analyst, who verifies the assessment and compiles a report on the condition of the pipeline to submit to the operator.

With this information and in the context of the PHMSA approved integrity management program for the pipeline, the pipeline operator can prioritize the issues that need immediate attention.

In this way, in-line inspection tools make a material contribution to pipeline safety.

For example, corrosion tools have been in use for more than 45 years. Data gathered in the U.S. continue show a reduction in corrosion-related incidents by 36 percent over the past 12 years.

Crack inspection tools have been around for less time than corrosion tools. Nevertheless, a recent Pipeline Research Council study compared over 40,000 cracks found by in-line inspection tools with actual measurements from field excavations. The results gave a clear validation of the published tool specifications.

Additionally, the soon to be published API 1176 industry recommended practiced document, developed with PHMSA involvement, will provide guidance to operators on how to use the results from in-line inspection tools as part of a comprehensive crack management program. We look forward to seeing continued improvement in pipeline safety vis a vis cracks as this technology continues to mature and becomes more widely adopted by pipeline operators.

We consider ourselves partners with our customers and PHMSA in working to enhance pipeline safety. We support rules that are clear and interpreted in such a way as to encourage competition and innovation.

However the current U.S. rules don't recognize the differences between in-line inspection tool technologies or in tool performance, nor do they encourage operators to use the best available technology.

PHMSA has done a great job in stimulating the pipeline industry to use in-line inspection tools for dents and general corrosion; the next step is to encourage the use of a broader range of tool technologies capable of finding and characterizing a broader range of pipeline anomalies.

I'd like to also mention risk management and risk models as an accepted approach adopted by pipeline regulators globally. Such models take in-line inspection data and combine it with contextual information about the pipeline, its construction and operation to help operators make a better informed diagnosis concerning the ongoing health of their pipeline. We are encouraged that PHMSA intends to put risk management at the core of its proposed new pipeline integrity rules. We hope that they will consider the kind of goal setting approaches that we see working effectively in Europe and Canada.

Before I conclude, I would like to emphasize that in-line inspection tools are very good at identifying features that they have seen before, but they can't know what they don't know. We can only learn what a specific signal represents by comparing that signal with the real defect.

The creation of a "no-fault" environment, in which operators can share dig verification data with their in-line inspection vendors, without fear of regulatory penalty, would allow the entire industry to grow more effective in identifying threats.

So, in summary, we believe that pipeline safety in the U.S. can be enhanced by regulations that embody the following principles:

- Pipeline operators are best positioned to determine the appropriate method to verify the ongoing integrity of their pipeline
- In-line inspection provides the clearest assessment of the condition of a pipeline and can be used to prioritize those features that need immediate attention and those that require monitoring over time
- Regulations should encourage the development and adoption of new technology that can further enhance pipeline safety
- Finding an effective way to share dig verification data, in a no-fault environment, will enhance tool learning and make in-line inspection even more effective.
- Regulations should move operators toward a risk based, goal setting approach.

At PII Pipeline Solutions we are committed to pipeline safety and will continue to work with PHMSA and our customers to advance the state of the art for in-line inspection.

Thank you for your attention.

Senator FISCHER. Thank you, Mr. Bellamy.

Next, we have Mr. Donald Santa, who is the President and CEO of the Interstate National Gas Association of America, the North American association representing the interstate and interprovincial natural gas pipeline industry.

Welcome.

**STATEMENT OF DONALD F. SANTA, PRESIDENT AND CEO,
INTERSTATE NATURAL GAS ASSOCIATION OF AMERICA**

Mr. SANTA. Thank you. And good afternoon, Chairwoman Fischer, Ranking Member Booker, and members of the Subcommittee. My name is Donald Santa, and I am President and CEO of the Interstate Natural Gas Association of America, or INGAA.

INGAA represents interstate natural gas transmission pipeline operators in the U.S. and Canada. The pipeline systems operated by INGAA's 25 member companies are analogous to the interstate highway system, transporting natural gas across state and regional boundaries.

In the wake of the natural gas pipeline accident in California in 2010, INGAA's board of directors committed the Association and its

member pipeline companies to the goal of zero pipeline safety incidents. While this is a tough and, some would say, impossible goal to meet, the emphasis is in the right place: a pursuit of excellence.

While progress toward INGAA's goal of zero incidents must continue, whether new regulations are issued, it is important and desirable that there be consistency between the voluntary commitments in the INGAA action plan and the regulations that will implement the 2011 Pipeline Safety Act.

INGAA has engaged in an active dialogue with PHMSA and with other stakeholders over the past 4 years to achieve this goal. This has been constructive, and we have every reason to believe that the comprehensive rule proposed soon will reflect INGAA's input.

Still, these proposed regulations are behind the schedule that Congress prescribed in the 2011 Act. INGAA acknowledges that regulations should be thoughtfully considered and include an analysis of costs and benefits. The practical consequence of delay, however, is to erode the confidence of some pipeline companies that proceeding with the dedication of resources needed to implement the pipeline safety commitments will be consistent with the final rules adopted by PHMSA. This hesitancy is rooted in the perceived risk that the rules ultimately might compel repeating certain steps in the pipeline safety action plan. This is not insignificant. For example, testing pipelines for material strength is both costly and disruptive, because pipelines must be removed from operation to complete the testing. This do-over risk for pipeline operators and their customers creates the risk of more extensive operational disruption that would be needed. This do-over risk should not be permitted to hold us back when we as an industry and our regulators should be moving forward.

Our purpose here is to work collaboratively with PHMSA. Because the regulatory process, indeed, goes beyond what PHMSA can control, INGAA wishes to make the point that it is critical that these natural gas pipeline safety regulations be completed in a workable and timely manner.

It is worth recalling that the title of the most recent law reauthorizing the Pipeline Safety Act makes the point. It is the Pipeline Safety Regulatory Certainty and Job Creation Act of 2011. Regulatory certainty is necessary to move forward.

INGAA does support reauthorization of the Pipeline Safety Program during this Congress. My written statement includes some suggestions for legislation, including providing some more definition for several key natural gas regulations. With further definition from Congress, we believe the proposed rules could be completed in a more timely fashion, and the pipeline industry would have greater certainty about what the future regulations would require. This would allow operators to start working toward those requirements now, as opposed to just waiting until regulations are final at an indeterminate future date.

In addition, INGAA suggests that Congress direct PHMSA to adopt regulations for underground natural gas storage facilities by a date certain. We continue to believe that a reauthorization bill, and the accountability and oversight that comes from that, will help to get PHMSA back on track for meeting the safety mandates required in 2011.

I would be happy to discuss this and other questions subsequently. Thank you for the opportunity to testify today.
[The prepared statement of Mr. Santa follows:]

PREPARED STATEMENT OF DONALD F. SANTA, PRESIDENT AND CEO,
INTERSTATE NATURAL GAS ASSOCIATION OF AMERICA

Good afternoon Chairwoman Fischer, Ranking Member Booker and members of the Subcommittee. My name is Donald F. Santa, and I am President and CEO of the Interstate Natural Gas Association of America, or INGAA. INGAA represents interstate natural gas transmission pipeline operators in the U.S. and Canada. The pipeline systems operated by INGAA's 25 member companies are analogous to the interstate highway system, transporting natural gas across state and regional boundaries. As you can see from the map below, this is an extensive energy infrastructure system.

U.S. Interstate Natural Gas Transmission Pipelines



INGAA and its members' core mission is the safe and reliable transportation of natural gas. Through a variety of initiatives—including best practices and standards development, regulatory compliance and damage-prevention efforts—this association has been committed to the continuous improvement of pipeline safety since its founding in 1944. As part of this commitment, INGAA supported the most recent reauthorization of the Pipeline Safety Act, enacted in 2011. We also support implementation of the new law through regulations.

To date, however, the Pipeline and Hazardous Materials Safety Administration (PHMSA) has not yet implemented several of the key regulatory mandates from the 2011 Act. INGAA hopes PHMSA will release these proposed regulations for public comment soon, so stakeholders can participate in a process that culminates in final rules within the next year. Another important step for pipeline safety is reauthorization of the Pipeline Safety Act during this Congress. Decisive action by Congress and PHMSA will keep pipeline safety moving in the right direction.

INGAA Safety Commitments

As mentioned, INGAA has a long history of engagement to improve pipeline safety. This began with the development of construction and operating standards during the early years of the natural gas transmission pipeline industry. In 1968, Congress enacted the Natural Gas Pipeline Safety Act, formalizing these standards and making them enforceable. In the decades since, Congress has added new requirements

as technology has advanced and the ability to monitor safety performance has improved.

We have long maintained—and regulators agree—that the natural gas pipeline industry operates with a high degree of safety. Accidents are rare, and the number of fatalities and injuries from pipeline accidents is very low. The Department of Transportation states that pipelines are the safest mode of energy transportation.

Still, the pipeline failure in San Bruno, California in 2010 was a wake-up call for our industry. It reinforced for pipeline operators that pipeline safety is not just a matter of regulatory compliance; it is central to the industry's social license to operate. We recognize that safety must be our highest priority.

In the wake of that pipeline failure, INGAA's board of directors committed the association and its member pipeline companies to the goal of zero pipeline safety incidents. INGAA identified the commercial aviation sector as a model of an industry with a similar "zero incident" goal. While this is a tough, and some would say, impossible, goal to meet, the emphasis is in the right place—a pursuit of excellence.

INGAA's overarching goal of zero incidents is anchored by four core principles. These are: (1) commitment to a strong safety culture as a critical dimension of continuous improvement; (2) relentless pursuit of improving by learning; (3) commitment to apply integrity management principles on a system-wide basis; and (4) commitment to engage with stakeholders at all levels.

These core principles provided the basis for a nine-point pipeline safety action plan that the INGAA board endorsed in early 2011. This action plan—known as the INGAA Integrity Management Continuous Improvement (or IMCI) initiative—addresses all of the major issues raised in relevant reports by the National Transportation Safety Board as well as the key natural gas pipeline issues addressed within the Pipeline Safety, Regulatory Certainty and Job Creation Act of 2011 (the 2011 Act). In connection with this, two items deserve specific mention: (1) expanding integrity management beyond High Consequence Areas, and (2) demonstrating that pre-regulation pipelines remain fit for service.

Consistent with our guiding principle of a relentless pursuit of improvement, INGAA's members worked with our peers in the hazardous liquid and gas distribution industries, as well as Federal and state regulators, to develop a standard for pipeline safety management systems, called API 1173. This standard consolidates best practices within the industry and addresses a recommendation made by the National Transportation Safety Board. Our members are now incorporating the safety management system elements established in API 1173.

Recent Pipeline Safety Legislation

The Pipeline Safety Improvement Act of 2002 incorporated a new, risk-based approach to safety for natural gas transmission pipelines in Federal pipeline safety law. The 2002 reauthorization law directed the Secretary of Transportation to develop a regulation on "integrity management" for natural gas transmission pipeline segments located in populated areas. Regulations subsequently required the operators of such pipelines to: (1) identify pipeline segments located in defined, populated areas, known as High Consequence Areas or HCAs; (2) conduct baseline inspection on such segments within 10 years; and (3) re-assess those segments every seven years thereafter.

This integrity management directive emphasized achieving the greatest enhancement to public safety by reducing risks in populated areas. For interstate natural gas transmission pipelines, only about six percent of total pipeline mileage is located in a defined HCA. Still, because the majority of these segments were inspected using in-line inspection tools ("smart pigs"), over 70 percent of INGAA's membership mileage is now being inspected periodically with this enhanced process in order to capture the six percent within HCAs. This has resulted in a 72 percent reduction in leaks attributable to corrosion, material or construction defects.

As part of its pipeline safety action plan, INGAA members committed to the phased expansion of integrity management beyond HCAs. INGAA's plan would cover 90 percent of pipeline segments located near people by 2020, and 100 percent of segments located near people by 2030. We advocate a phased approach in part to minimize delivery service disruptions. Testing some pipeline segments will be challenging because the pipeline must be removed from service for inspection and possible repair and replacement. INGAA's members are on schedule, and to date have inspected segments located in proximity to over 70 percent of the public along pipelines.

The 2011 Act directs PHMSA to examine the expansion of the integrity management program beyond the 2002 requirements, report its findings to Congress and issue any new rules that might be warranted.

The other major issue addressed in the 2011 Act involved whether pipelines constructed before Federal pipeline safety regulations took effect in 1970 remain “fit for service.” Many of the Nation’s natural gas transmission pipelines were constructed before 1970. Industry standards then called for operators to test new pipe to confirm its ability to operate safely at the system’s maximum allowable operating pressure prior to placing such pipe in service. Beginning in 1970, operators were required by Federal regulations to conduct this testing and retain related records for all new pipelines.

The accident in San Bruno highlighted the need for pipeline operators to ensure that they have adequate testing records. INGAA’s members support the validation of testing records, as well as re-testing segments located in populated areas if traceable, verifiable and complete testing records cannot be produced.

The 2011 Act requires regulations on records/testing for pre-1970 pipe in highly populated areas. INGAA members have validated the material strength records for approximately 85 percent of the pipeline in HCAs and are far along in addressing the remaining segments. While these regulations have not yet been proposed, PHMSA engaged in a robust pre-rulemaking dialogue with pipeline safety stakeholders, including INGAA and its members, to develop a process to implement this requirement. We anticipate that PHMSA will address this topic, as well as the proposed expansion of integrity management, in its comprehensive natural gas rule currently under review by the Office of Management and Budget (OMB).

Natural Gas Safety Regulations—Importance of Certainty

INGAA’s members remain committed to the goal of zero incidents, and progress toward that target must continue whether new regulations are issued, or not. Nonetheless, consistency between INGAA’s voluntary commitments and the regulations that will implement the 2011 Act is both important and desirable. INGAA has engaged in an active dialogue with PHMSA (and other stakeholders) over the past four years to achieve this goal. This has been constructive, and we have every reason to believe that PHMSA’s proposed rule will reflect INGAA’s input.

Still, these proposed regulations are behind the schedule prescribed by Congress in 2011. INGAA acknowledges that regulations should be considered thoughtfully and include an analysis of costs and benefits. The practical consequence of this delay, however, is to erode the confidence of some pipeline companies that their voluntary safety commitments will be consistent with the final rules adopted by PHMSA. Therefore, operators may be reluctant to dedicate the enormous resources needed to implement the voluntary pipeline safety commitments. This hesitancy is rooted in the perceived risk that the rules ultimately might compel a repeat of certain steps in the pipeline safety action plan. This is not insignificant. For example, testing pipelines for material strength is both costly and disruptive to service because pipelines are removed from operation to complete the testing. Therefore, progressive pipeline operators are at risk if they act while new regulations are pending.

Our purpose here is not to be critical of, but instead to work collaboratively with, PHMSA. The regulatory process goes far beyond what PHMSA can control, and policymakers should avoid assigning PHMSA too much blame for the delays in implementing the 2011 Act. Indeed, recent press articles have taken the simplistic view that PHMSA can simply draft new regulations and unilaterally bring such regulations into force. This narrative ignores the role of the Department of Transportation and OMB in vetting proposed rules before they can be published for public comment. This process is arduous at best. We need to recognize that reality and work with the agencies to make this difficult regulatory process as efficient as possible.

In the end, we need the regulatory certainty that will come with completion of the regulations implementing the 2011 Act. The title of that legislation makes the point. It is “The Pipeline Safety, *Regulatory Certainty* and Job Creation Act of 2011” (emphasis added). Without certainty, in the form of new safety regulations that clearly define expectations, the path forward on natural gas transmission pipeline safety will be far more disjointed.

Legislative Recommendations

INGAA encourages Congress to reauthorize the Pipeline Safety Act during this Congress. Some have suggested that the upcoming reauthorization should be for a limited term of two years rather than the typical four or five years. INGAA questions the utility of such a limited effort. Congress should gather the information needed and make the legislative changes necessary to have confidence in enacting a four-year reauthorization. PHMSA needs certainty too, and a shortened reauthorization term would deprive the agency of the assurance needed to devote its undivided attention to fulfilling its mission.

Finalize PHMSA Rulemakings Required by 2011 Reauthorization

As mentioned, several major natural gas rulemakings from the 2011 Act are incomplete. INGAA's highest priority for this next reauthorization is providing greater certainty on what those rulemakings will entail, such that industry can continue with confidence its initiatives to fulfill the purposes of the 2011 Act and other guidance even before regulations are finalized. Given how long it has taken to send these proposed rules to OMB for review, and the record of delay in other rulemakings across the executive branch, we have good reason to be apprehensive that it may take several more years to finalize these pipeline safety rules.

INGAA recommends that Congress add further details on expected deadlines, testing levels and performance metrics, for the rulemakings on integrity management expansion and pre-1970 pipeline fitness-for-service. More clearly delineated expectations will provide pipeline operators with the certainty to proceed confidently with and take credit for initiatives to improve pipeline safety before the rules are finalized.

Create Safety Regulations for Underground Natural Gas Storage Facilities

There are approximately 425 underground natural gas storage facilities in the U.S. The facilities use underground geologic formations, such as depleted oil and gas wells, to store natural gas. While PHMSA has the statutory authority to do so, to date it has not promulgated Federal safety regulations for these facilities. In an Advanced Notice of Proposed Rulemaking on gas transmission safety issues in 2011, PHMSA asked whether it should create safety standards and regulation for natural gas storage. INGAA responded in the affirmative, and over the past four years, we have worked with American Gas Association, PHMSA and state officials to develop industry consensus standards that could form the basis for future regulations. These consensus standards, or "recommended practices," were completed this month.

INGAA believes PHMSA should undertake a rulemaking to adopt new regulations for underground natural gas storage, and our hope is that the new recommended practices will help to facilitate the more rapid adoption of such rules. We recommend that Congress require the creation of Federal regulations by a date certain. We also support the appropriate delegation of oversight authority to state entities for intrastate storage facilities, similar to the existing delegation of authority for intrastate pipeline regulation. Finally, INGAA recommends that Congress give PHMSA the authority to collect user fees from storage operators to fund Federal and state oversight of storage facilities. Closing this gap in safety oversight would be an important step forward.

Eliminate Duplicative Requirements

Beginning with the Federal rules promulgated in 1970, natural gas pipeline safety regulations always have prioritized achieving the greatest margin of safety where pipelines are in close proximity to population. At that time, regulators created four classes of pipe, based on the number of buildings in close proximity to the pipeline right-of-way. At one end of the scale are pipeline segments in rural areas; at the other end are segments in urban areas. A pipeline's class location changes if the number of structures along the pipeline increases. This can trigger a requirement that the operator either operate at a lower pressure—which is usually impractical from an operations standpoint—or completely replace pipelines with thicker-walled pipe.

Pipeline inspection technology now has advanced to a point where operators can inspect pipes internally and assess integrity without removing pipelines from service. This was not possible when the class location rules were adopted in the 1970s. As mentioned, regulations now require natural gas transmission pipeline operators to employ integrity management programs designed to increase the margin of safety for pipe segments located in populated areas. These programs include a thorough risk assessment and detailed pipeline inspections on a regular interval. Smart pig internal inspection technology is the principal method that INGAA members use to comply with integrity management regulations.

Consequently, pipeline operators now must comply with redundant regulatory requirements (integrity management and pipe replacement based on class location) that are intended to address the same problem. Today's use of integrity management principles, and associated inspection technology, is a more sophisticated approach to pipeline safety in populated areas. If pipes can be inspected so that their condition is known, there is no reason for replacing pipeline that remains safe to operate. Eliminating unneeded pipeline replacement also would reduce burdens on landowners and significantly reduce methane emissions and service disruptions.

In the 2011 pipeline safety reauthorization, Congress required PHMSA to assess "whether applying the integrity management program requirements, or elements

thereof, to additional areas would mitigate the need for class location requirements.” Congress required a report from PHMSA by January 2014. To our knowledge, PHMSA has not submitted this report. We hope PHMSA and Congress will agree to eliminate the overlap between these two regulations.

Update Outmoded PHMSA User Fee Funding

While not INGAA’s top priority, the PHMSA user fee and funding regime needs to be updated. The law authorizing the user fee, enacted in 1986, has not kept up with the times. PHMSA’s user fees need scrutiny and a legislative update.

As part of the appropriations process, the Department of Transportation recently advocated amending the statutory authority for one of these user fees. To their credit, the House and Senate Appropriations Committees refused to legislate on an appropriations bill. The Senate Appropriations Committee also weighed in on another PHMSA user fee matter, related to the allocation of the Pipeline Safety Fund user fee. The committee’s report on the Transportation/HUD appropriations bill¹ included the following statement:

Pipeline Safety User Fee Allocation.—The pipeline safety program is largely funded through user fees on natural gas transmission pipelines, jurisdictional hazardous liquid pipelines, and liquefied natural gas terminal operators. Recent authorizations have increased the responsibilities for PHMSA and the States with respect to the safety of our Nation’s pipelines. Given this change in scope of the pipeline safety program, the Committee directs PHMSA to review the user fee collection process to determine if it should be modified to more equitably allocate the cost of the pipeline program across the industry segments covered by Federal and State oversight. PHMSA shall submit a report to both the House and Senate Committees on Appropriations within 60 days of enactment of this act, that summarizes the agency’s statutory authority to revise the fee structure, its assessment of the current fee structure, and any recommendations for changes to the fee structure that should be considered by Congress as it considers reauthorization of PHMSA.

INGAA agrees, and urges that this be done in a comprehensive fashion. The existing Pipeline Safety Fund fee is not assessed on all regulated sectors of the natural gas industry, but rather only on gas transmission operators. This gives rise to an important question: If a large block of “users” are not paying the user fee, is it still a “user fee” under budget rules and precedent? The answer to this question has implications for both Congressional committee jurisdiction and whether the dollars raised must be sent to the Treasury rather than reserved to offset PHMSA’s costs.

We respectfully suggest that the authorizing committees review the current state of this user fee, and amend the statute to make this a true user fee assessed on all regulated sectors of the natural gas industry. At the very least, Congress should clarify that PHMSA is authorized to collect user fees from any new industry sectors added to PHMSA oversight either by statute or regulation.

Collaborative Pipeline Safety Research and Development

For many years, the pipeline industry worked in a collaborative fashion with DOT and PHMSA to identify and fund pipeline safety research and development projects. This collaboration worked well in identifying key priorities and avoiding duplication of effort. Many of the pipeline inspection technology successes of the past were the product of this process. In 2011, however, the Secretary of Transportation suspended collaborative R&D efforts due to conflict-of-interest concerns.

We do not believe that such a conflict of interest, in fact, exists here. To the contrary, we contend that the government, public and industry share an identical interest in a robust and successful pipeline safety R&D effort. INGAA, therefore, suggests that PHMSA return to a collaborative R&D effort. For example, the existing pipeline safety advisory committees could serve as a forum for R&D discussion and approval. These advisory committees include equal representation from three different stakeholder groups—government, industry and the public. The pipeline safety advisory committees are a logical choice for establishing pipeline safety R&D priorities in a transparent and inclusive manner.

Conclusion

INGAA urges Congress to pass a pipeline safety reauthorization bill soon. Industry continues to make significant system-wide investments in advancing its goal of zero pipeline incidents. Congress should provide additional clarity to guide PHMSA on its comprehensive natural gas pipeline rule, require action on storage safety, and

¹H.R. 2577, as amended; S.Rpt. 114–75.

address duplicative and outdated provisions that do not contribute to enhancing public safety. Madam Chairwoman, thank you for the opportunity to share our views. I would be happy to answer questions at the appropriate time.

Senator FISCHER. Thank you, Mr. Santa.

Next, we have Terry McCallister. He is the Chairman of the Board and Chief Executive Officer of WGL Holdings, Incorporated, the parent company of Washington Gas. He also serves as Chairman and CEO of the Washington Gas and Natural Gas Utility, serving over 1 million customers in the Washington area and the surrounding region.

Welcome.

STATEMENT OF TERRY McCALLISTER, CHAIRMAN AND CHIEF EXECUTIVE OFFICER, WGL HOLDINGS AND WASHINGTON GAS, ON BEHALF OF THE AMERICAN GAS ASSOCIATION

Mr. McCALLISTER. Thank you very much. Good afternoon, Chairman Fischer and members of the Committee.

My name is Terry McCallister. I'm Chairman and CEO of WGL Holdings and Washington Gas. WGL provides natural gas, electricity, green power, carbon reduction, and energy services. Washington Gas has served the Nation's capital and the surrounding region for more than 165 years. We are committed to our customers, the communities we serve, and the environment. Safety is paramount among our core values. I'm proud of our safety track record. And we continuously strive to enhance safety performance.

I am testifying today on behalf of the American Gas Association, which represents more than 200 local distribution companies, also known as LDCs, serving more than 72 million customers. AGA members operate 2.4 million miles of underground pipeline, safely delivering clean, affordable natural gas to residential, commercial, and industrial customers. LDCs provide that last critical link in the delivery chain, connecting interstate pipelines directly to customers. Our focus every day is to keep the gas flowing safely and reliably.

Most states assume primary responsibility for the safety regulations of LDCs as well as intrastate transmission pipelines. State governments are encouraged to adopt minimum standards promulgated by the U.S. Department of Transportation. Many states also choose to adopt standards that are more stringent than Federal requirements. Our companies are also in close contact with State pipeline safety inspectors, working in a collaborative manner, which results in far more inspections than required by Federal law.

LDCs aren't just compliance-focused. We have cultures of proactive collaborative engagement. We employ trained safety professionals, provide ongoing employee evaluation and safety training, conduct rigorous system inspections, testing, maintenance, repair, and replacement programs, and educate the public on safety. AGA's commitment to enhancing safety, adopted in 2011, provides a summary statement of commitments beyond regulation. The Association has developed numerous pipeline safety initiatives focused on raising the bar on safety and sharing best practices.

Each year, LDCs spend approximately \$19 billion on safety, approximately half on efforts beyond Federal regulation, including pipe replacement. This number continues to escalate as work con-

tinues on newly approved accelerated pipeline replacement programs.

The Pipeline Inspection Protection, Enforcement, and Safety Act of 2006 and the Pipeline Safety Regulatory Certainty and Jobs Creation Act of 2011 created numerous programs to further improve industry safety. AGA member companies have implemented these programs through DOT regulations or voluntarily. Many of these programs are in the early stages, and we encourage Congress to allow them to mature.

In the case of the unanimously packed—passed 2011 Act, several required regulations have yet to be finalized. Progress is being made, and we believe it would be premature to make changes to the law at this time. For instance, the industry has experienced significant uncertainty regarding PHMSA's pending changes to transmission integrity management, maximum allowable operating pressure, and implementation of the integrity verification programs. We are prepared to act, but regulatory certainty would serve our customers and the industry alike. Layering on new laws and regulations before pending regulations have been finalized and given time to work creates uncertainty that undermines our shared safety goals.

PHMSA has issued a number of guidance documents, released the results of congressionally mandated study on leak detection, and created a database to track progress in replacing cast iron and bare steel pipelines. Likewise, the industry, NARUC, and State regulators, as well as State legislators, have produced significant pipeline safety improvements in recent years. We should continue to build on this record.

The quantity of cast iron mains continues to steadily decline and now makes up less than 3 percent of total mileage. There are 29,358 miles of cast iron mains still in use, and the industry estimates it'll cost nearly \$83 billion to complete this replacement. Utilities are working with legislators and regulators to accelerate this process. Today, 39 States and the District of Columbia have adopted specific innovative rate mechanisms to accelerate pipeline replacement.

My written testimony expands on the industry's progress and incident notification, data collection, and information-sharing and research and development. I'm pleased to answer any questions you have on this or other topics.

Thank you.

[The prepared statement of Mr. McCallister follows:]

PREPARED STATEMENT OF TERRY MCCALLISTER, CHAIRMAN AND CHIEF EXECUTIVE OFFICER, WGL HOLDINGS AND WASHINGTON GAS ON BEHALF OF THE AMERICAN GAS ASSOCIATION

Good morning, Mr. Chairman and members of the Committee. I am pleased to appear before you today. Pipeline safety is a critically important issue, and I thank you for not only holding this hearing, but for all the work that you and your colleagues have done over the years to help ensure that America has the safest, most reliable pipeline system in the world. My name is Terry McCallister and I am Chairman and Chief Executive Officer of WGL Holdings and of Washington Gas. WGL is a diversified energy business that provides natural gas, electricity, green power, carbon reduction and energy services.

Washington Gas has served the Nation's capital and the surrounding region for more than 165 years. We are committed to our customers, the communities we serve

and the environment. Because of this commitment, safety is paramount among our company's core values. I am proud of our safety track record; we continuously strive to improve safety performance in every aspect of our work at Washington Gas.

I am testifying today on behalf of the American Gas Association (AGA). AGA, founded in 1918, represents more than 200 local energy companies that deliver clean natural gas throughout the United States. There are more than 72 million residential, commercial and industrial natural gas customers in the U.S., of which 94 percent—over 68 million customers—receive their gas from AGA members. Natural gas pipelines, which transport approximately one-fourth of the energy consumed in the United States, are an essential part of the Nation's infrastructure. Indeed, natural gas is delivered to customers through a safe, 2.4-million mile underground pipeline system. This includes 2.1 million miles of local utility distribution pipelines and 300,000 miles of transmission pipelines that stretch across the country, providing service to more than 177 million Americans. The recent development of natural gas shale resources has resulted in abundant supplies of domestic natural gas, which has meant affordable and stable natural gas prices for our customers. America needs clean and abundant energy and America's natural gas provides just that. This has made the safe, reliable and cost-effective operation of the natural gas pipeline infrastructure even more critically important, as it is our job to deliver the natural gas to the customer. Through an effective partnership between America's natural gas utilities, state regulators, Congressional and state legislators, governors and other key stakeholders working together to advance important safety policies, we have been able to both enhance system integrity and support increased access to natural gas service for homes and businesses.¹

Distribution Pipelines

Distribution pipelines are operated by natural gas utilities, sometimes called "local distribution companies" or LDCs. The gas utility's distribution pipes are the last, critical link in the natural gas delivery chain. Gas distribution utilities bring natural gas service to their customers. To most customers, their local utilities are the "face of the industry." Our customers see our name on their bills, our trucks in the streets and our company sponsorship of many civic initiatives. We live in the communities we serve and interact daily with our customers and with the state regulators who oversee pipeline safety. We take very seriously the responsibility of delivering natural gas to our communities safely, reliably, responsibly and affordably.

AGA and its members support the development of reasonable regulations to implement new Federal legislation as well as the recommendations of the National Transportation Safety Board, the U.S. Department of Transportation (DOT) Inspector General, Government Accountability Office, National Association of Pipeline Safety Representatives (NAPSR) and the National Association of Regulatory Utility Commissioners (NARUC). Within this testimony are actions that are being, or will be, implemented by AGA or individual operators to help ensure the safe and reliable operation of the Nation's 2.4 million miles of natural gas pipelines. AGA and its individual operators recognize the significant role that their state regulators or governing body play in supporting and funding these actions to fulfill their commitment to our customers.²

Regulatory Authority

As part of an agreement with the Federal Government, in most states, state pipeline safety authorities have primary responsibility to regulate natural gas utilities as well as intrastate transmission pipeline companies. Under these agreements, state governments adopt as a minimum the Federal safety standards promulgated by the U.S. Department of Transportation.

The states may also choose to adopt standards that are more stringent than the Federal regulations, and many have done so. LDCs are in close contact with state pipeline safety inspectors on a regular basis. As a result of these interactions, distribution operator facilities are subject to more frequent and closer inspections than required by the Federal pipeline safety regulations.³

Commitment to Safety

Our commitment to safety extends beyond government oversight. Indeed, safety is our core value and top priority—a source of pride and a matter of corporate policy for every company in our industry. These policies are carried out in specific and unique ways. Each company employs safety professionals; provides on-going em-

¹ See Attachment 1: "Natural Gas Pipelines across the U.S."

² See Attachment 2: "Natural Gas Delivery System"

³ See Attachment 3: "Regulators and Stakeholders"

ployee safety training; conducts rigorous system inspections, testing, and maintenance, repair and replacement programs; distributes public safety information; and complies with a wide range of Federal and state safety regulations and requirements. Individual company efforts are supplemented by collaborative activities in the safety and technical committees of regional and national trade organizations. Examples of these groups include AGA, the American Public Gas Association and the Interstate Natural Gas Association of America (INGAA).

On October 26, 2011, AGA released its Commitment to Enhancing Safety, which highlights examples of the industry's commitment to safety programs above and beyond regulations. It reflects industry leadership and commitment to continuous improvement of pipeline safety as our number one priority.⁴

Outside of regulation and legislation, AGA members are striving to improve pipeline safety:

- Through AGA's Safety Culture Statement, each AGA member has committed to promoting positive safety cultures among their employees throughout the natural gas distribution industry. All employees as well as contractors and suppliers providing services to AGA members, are expected to place the highest priority on employee, customer, public and pipeline safety.
- In AGA's Commitment to Enhancing Safety, AGA and its member companies state their dedication to the continued enhancement of pipeline safety through their commitment to proactively collaborate with public officials, emergency responders, excavators, consumers, safety advocates and members of the public to continue to improve the industry's longstanding record of providing natural gas safely and effectively to 177 million Americans.
- AGA has also developed numerous pipeline safety initiatives focused on raising the bar throughout the natural gas distribution industry. Two such programs are AGA's Peer Review Program and AGA's Gas Utility Operations Best Practices Program. Both allow subject matter experts from AGA member companies to help improve industry practices through reviewing and sharing individual company policies, procedures and practices.

Natural gas utilities spend an estimated \$19 billion a year in safety-related activities. Approximately half of this money is spent in complying with Federal and state regulations. The other half is spent as part of our industry's voluntary commitment to pipeline system and community safety. Moreover, we are continually refining our safety practices to help improve overall safety and reliability.

Review of Legislation and Regulation

From a regulatory perspective, the past fifteen years have, by far, included more pipeline safety mandates and rulemakings than any other decade since the creation of the Federal pipeline safety code in 1971. I want to assure the Committee that the natural gas distribution industry has worked vigorously to implement those provisions that are related to our sector. It takes considerable time for complicated rules to be proposed, vetted, finalized and then implemented. We are constantly working on ways to better manage the system and improve safety.

The Pipeline Inspection, Protection, Enforcement and Safety Act of 2006 and the Pipeline Safety, Regulatory Certainty and Job Creation Act of 2011 each outlined significant industry-changing pipeline safety programs. While AGA members have implemented aspects of these programs either through DOT regulation or voluntarily, it is important to remember that many of the programs are still in their infancy. AGA encourages Congress to allow these programs to develop and mature in order to realize their full impact. Only after fully implementing new safety programs and regulations, and allowing time for evaluation and conclusive data to be gathered, can we determine what, if any, changes need to be made. In the case of the unanimously passed Pipeline Safety, Regulatory Certainty and Job Creation Act of 2011, many of the required regulations have yet to be completed. Therefore, we believe it would be premature to make changes to the law at this time. The specifics of The Act included substantive changes to the Federal pipeline safety laws, including changes to incident notification timelines; testing of certain gas transmission lines; and requirements for valves, gathering lines, leak detection, integrity management, and class location. The U.S. Department of Transportation Pipeline and Hazardous Materials Safety Administration (PHMSA) is still working on a number of significant final rules that will substantially change the Federal gas pipeline safety regulations. These include expansion of transmission integrity management, additional pressure testing requirements, excavation damage prevention, rupture detec-

⁴ See Attachment 4: "AGA's Commitment to Enhancing Safety"

tion and valves, excess flow valves beyond single family homes, and plastic pipe regulations. We know that PHMSA is diligently working on these regulations and look forward to the certainty that the final rules will bring. PHMSA has issued a number of significant guidance documents, released the results of a congressionally-mandated study on leak detection, and created an online database to track progress in replacing cast iron and bare steel pipelines.

We believe progress is being made to fully address all Congressional mandates. We would respectfully urge that we stay the course in working on existing mandates before layering additional responsibilities that will create regulatory uncertainty and undermine work already underway. Natural gas distribution companies work every day to improve the safety of their systems. It is critical that progress on regulations keep that pace to help ensure that these safety improvements are not negated. The work that PHMSA has completed to date, and the important initiatives taken by industry on its own, combined with the significant actions taken by NAPS, NARUC, individual public utility commissions and state legislatures around the country, have produced significant improvement in pipeline safety over the last several years. Natural gas distribution companies are eager to move forward with other aspects of the 2011 Act, but the industry is concerned about the uncertainty of future DOT regulations that could negate or disrupt current pipeline investments and progress based on the legislation as written. A change of course prompted by DOT regulations that are inconsistent with the legislation would be paid for by natural gas customers and could create significant public disruption and inconvenience. AGA members desire a clear path forward without duplicative actions or additional cost burdens on their customers.

Review of Key Provisions of the Pipeline Safety, Regulatory Certainty and Job Creation Act of 2011 Impacting the Natural Gas Distribution Sector

Pipeline Damage Prevention

Excavation damage represents the single greatest threat to distribution system safety, reliability and integrity. A number of initiatives have helped to prevent excavation damage and resulting incidents. These include a three digit number, "811," for excavators to call before they dig, a nationwide education program promoting 811, "best practices" to reduce excavation damage and regional "Common Ground Alliances" that are focused on preventing excavation damage. Additionally, AGA and other partners established April as National Safe Digging Month, encouraging individuals to dial 811 before embarking on any digging or excavation project. Since the Call 811 campaign was launched, excavation-related incidents have been reduced by approximately a 40 percent. A significant cause for this reduction is the work done by the pipeline industry in promoting the use of 811. Regulators, natural gas operators, and other stakeholders are continually working to improve excavation damage prevention programs. This concerted effort, combined with the effort that states are undertaking to create robust and effective state damage prevention programs, based on the elements contained in the 2006 PIPES Act, is having a positive impact. As always, more can be done. We will remain vigilant and strengthen collaboration with other stakeholders and the public to help ensure the safety of our pipeline systems.

Distribution Integrity Management

The 2006 PIPES Act required DOT to establish a regulation prescribing standards for integrity management programs for distribution pipeline operators. The DOT published the final rule establishing natural gas distribution integrity management program (DIMP) requirements on December 4, 2009. The effective date of the rule was *February 12*, 2010. Operators were given until August 2, 2011 to write and implement their program.

The DIMP final rule is a comprehensive regulation that provides an added layer of protection to the already-strong pipeline safety programs implemented by local distribution companies. It represents the most significant rulemaking affecting natural gas distribution operators since the inception of the Federal pipeline safety code in 1971. It impacted more than 1,300 operators, 2.1 million miles of pipe, and 70 million customers. The final rule effectively took into consideration the wide differences that exist between natural gas distribution operators. It also allows operators to develop a DIMP plan that is appropriate for the operating characteristics of their distribution delivery system and the customers that they serve.

Public Education/Awareness

AGA appreciates DOT's work with the public, emergency responders, and industry to improve the public's awareness of pipelines and natural gas safety. The public awareness initiative has been successful and has effectively improved the public and

emergency responders' awareness of pipeline infrastructure and appropriate actions to be taken in the event of a pipeline emergency. We are eager to work with DOT to identify performance metrics that are critical in assessing program effectiveness. The industry is working to help ensure that 911 operators are identified as an important stakeholder audience and receive all needed pipeline awareness information. AGA and the industry look forward to continuing to work with all regulatory agencies to help improve the methods utilized to educate the public regarding pipeline awareness.

Cast Iron

Natural gas utilities remain ever vigilant and committed to systematically upgrading infrastructure based on enhanced risk-based integrity management programs. Indeed, there is a growing effort underway to accelerate the replacement of pipelines that may no longer be fit for service. This work is facilitated by regulatory and legislative policies that establish innovative rate mechanisms which allow for accelerated replacement and modernization of natural gas pipelines.

The quantity of cast iron main continues to steadily decline. Overall cast iron makes up less than three percent of the distribution mileage and that number is decreasing annually. Today, PHMSA reports that there are 29,358 miles of cast iron pipelines in use. The approximate cost of removing these pipelines is nearly \$83 billion.⁵

The specific costs associated with replacement vary depending on an individual utility's regulatory structure and state. All utilities have an infrastructure replacement program and seek to remove pipelines no longer fit for service as rapidly as they are able through their regulatory construct. Since former Secretary of Transportation Ray LaHood's Call to Action, specific rate mechanisms that facilitate accelerated replacement of pipelines no longer fit for service have improved from 18, to 9 states and the District of Columbia.⁶ Clearly, the overall trend is positive. In 2013, nine states moved to adopt programs and, NJ, MA, PA and DC adopted pipeline safety measures in 2014. In 2015, West Virginia passed legislation while IL, MA, MI, MS, NJ, NY and PA also moved to strengthen their replacement efforts. Likewise, New Mexico's regulatory construct allows for more rapid pipeline replacement. The cumulative result of these important actions is that the industry is replacing cast iron pipe, as well as bare steel, as quickly as possible in a safe, cost-effective manner.

NARUC has always considered pipeline safety a leading priority and has raised the bar by prioritizing the issue of accelerating replacement of pipelines no longer fit for service. We commend NARUC for having passed a resolution at its 2013 summer meeting calling on commissions to explore, examine, and consider adopting alternative rate recovery mechanisms as necessary to accelerate the modernization, replacement and expansion of the Nation's natural gas pipeline systems.⁷ Their leadership on this matter has been an important catalyst for states approving accelerated replacement programs.

MAOP

There is significant uncertainty in the pipeline industry surrounding the method by which PHMSA will implement provisions in the 2011 Act pertaining to Maximum Allowable Operating Pressure (MAOP) and the Integrity Verification Process (IVP). AGA members have conducted a verification of records, as proposed in the legislation, for class 3 and class 4 locations and class 1 and class 2 high consequence areas. However because the MAOP and IVP regulations have not yet been implemented, operators are uncertain if their actions to address missing or incomplete records would be nullified by future DOT rules.

Incident Notification

AGA members are committed to finding new and innovative ways to inform and engage stakeholders, including emergency responders, public officials, excavators, consumers and safety advocates and members of the public living in the vicinity of pipelines. AGA and INGAA sponsored a workshop that was presented by the National Association of State Fire Marshals. The workshop had approximately 60 emergency responders, PHMSA staff and 40 operator personnel in attendance. There are also a number of efforts at the state and local level to engage emergency responders, government officials and the public in pipeline safety efforts.

⁵ See Attachment 5: "Total Cast Iron Main"

⁶ See Attachment 6: "States with Accelerated Infrastructure Replacement Programs"

⁷ See Attachment 7: "NARUC Resolution"

Data Collection and Information Sharing

Collecting accurate data and data analysis are integral to determining areas for potential pipeline safety improvement. AGA and PHMSA co-chair a data quality and analysis team made up of representatives from government, industry and the public. These are similar to the PHMSA technical advisory committees. The team analyzes the data that PHMSA collects and identifies opportunities to improve pipeline safety. The team also works to improve gaps in the data collected by PHMSA and others, data collection methods, and message consistency based on pipeline incident data.

AGA has 16 technical committees and an Operations Managing Committee focusing on a wide range of operations and safety issues. The technical committees develop and share information, including those issues raised by PHMSA, the National Transportation Safety Board, and other pipeline safety stakeholders. In addition, AGA has a Gas Utilities Operations Best Practices Program focused on identifying superior performing companies and innovative work practices that can be shared with others to improve operations and safety. AGA is also the Secretariat for the National Fuel Gas codes, the Gas Piping Technology Committee, and manages the Plastic Pipeline Database which includes more than 45,000 records of plastic material and component failures that have been voluntarily submitted by the industry.

Research and Development

More industry research is necessary to improve in-line inspection tool quality and capabilities, operator use of tool data, direct assessment tools, non-destructive testing and leak detection. Many pipeline companies have direct memberships in research consortiums and contribute towards this type of research. These research consortiums include the Pipeline Research Council International (PRCI), NYSEARCH, Operations Technology Development (OTD), Utilization Technology Development (UTD) and Sustaining Membership Program (SMP). In the last five years, hazardous liquid and gas pipeline operators have contributed more than \$115 million to research and development. However, R&D cannot be successful without cooperative planning between industry and government. As noted above, AGA is committed to improving the transparent collaborative relationship with PHMSA that has historically enhanced pipeline safety R&D.

Summary

The natural gas utility industry has a strong safety record. Recognizing the critical role that natural gas can and should play in meeting our Nation's energy needs, we are committed to working with all stakeholders to consistently make improvements to the safety and reliability of our systems. To that end, we applaud this committee's focus on the common goal: to enhance the safe delivery of this vital energy resource.

Recent pipeline safety reauthorizations contained significant changes to pipeline safety programs. Many of these changes are not yet in Federal regulation and others are in their infancy. PHMSA is working on a number of significant rules that will substantially change the Federal gas pipeline safety regulations and the industry looks forward to the certainty that the final rules will bring.

Natural gas distribution companies are eager to implement aspects of the 2011 Act that DOT has not finalized. However, concern exists that their actions may be nullified if DOT's final regulations are inconsistent with the legislation. These inconsistencies could result in unnecessary cost to customers, repeat work and disruption to the public. AGA members desire a clear path forward so that safety measures can be implemented without risk of duplicative actions and additional cost burdens on their customers.

We would urge that we stay the course in developing comprehensive, risk-based rules to comply with the legislation and provide the regulatory certainty that is essential to ensuring a safe and reliable natural gas distribution system. Many of these rules have only recently been implemented and need time to be evaluated before additional new regulations are created.

Natural gas is a key to our energy future and America's natural gas utilities are upgrading our delivery systems to meet this growing demand. There is a tremendous opportunity for consumers and our Nation as a whole through greater use of natural gas, and we see a future where natural gas is the foundation fuel that heats our homes, runs our vehicles, and supports renewable energy. We are building and continually improving our infrastructure to deliver on this promise.

Attachment 1: Natural Gas Pipelines across the U.S.

Safely
transported
**Across the
Country**

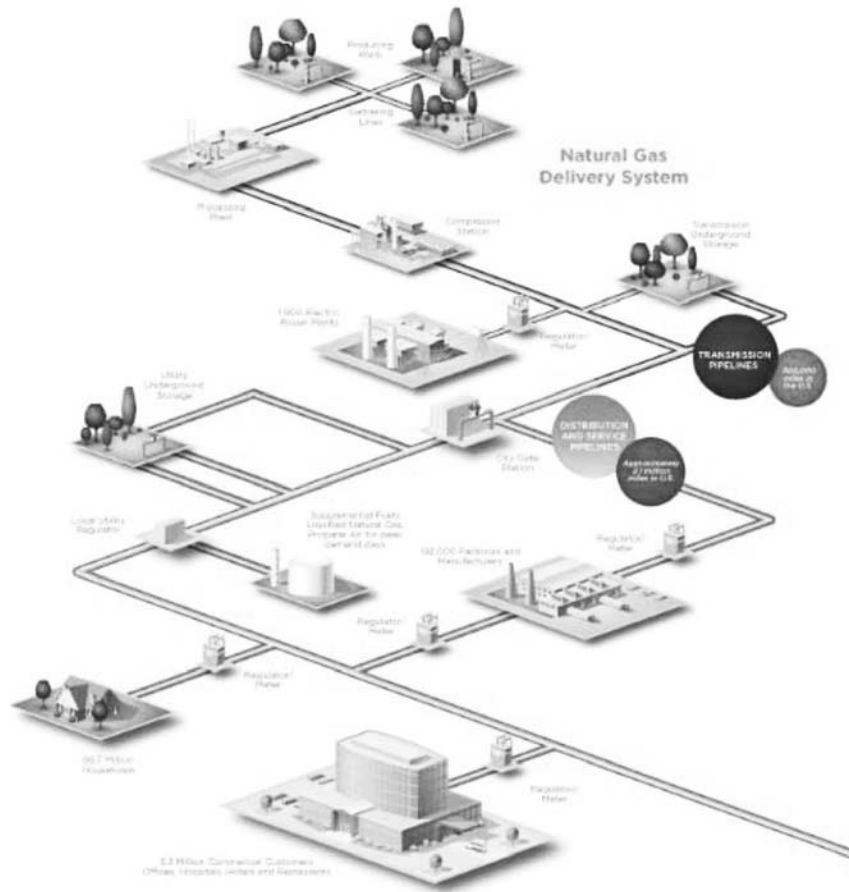
- Natural gas pipelines are an essential part of the nation's infrastructure.
- Natural gas utilities spend more than \$19 billion annually to help enhance the safety of natural gas distribution and transmission systems.



Attachment 2: Natural Gas Delivery System

Natural Gas

**Getting It to Homes and Businesses and
to Work for America**



Attachment 3: Regulators and Stakeholders

Many Regulators and Stakeholders



Attachment 4: AGA's Commitment to Enhancing Safety

Attachment 4: AGA's Commitment to Enhancing Safety



AGA's Commitment to Enhancing Safety

AGA and its members are dedicated to the continued enhancement of pipeline safety. As such, we are committed to proactively collaborating with public officials, emergency responders, excavators, consumers, safety advocates and members of the public to continue to improve the industry's longstanding record of providing natural gas service safely and effectively to 177 million Americans. AGA and its members support the development of reasonable regulations to implement new federal legislation as well as the National Transportation Safety Board safety recommendations.

Below are voluntary actions that are being addressed by AGA or individual operators to help ensure the safe and reliable operation of the nation's 2.4 million miles of pipeline which span all 50 states representing diverse regions and operating conditions. In addressing these actions, AGA and its individual operators recognize the significant role that their state regulators or governing body will play in supporting and funding these actions.

It is the consensus of AGA members that the actions listed below enhance safety and gas utility operations when implemented as an integral part of each operator's system specific safety actions. However, both the need to implement and the timing of any implementation of these actions will vary with each operator. Each operator serves a unique and defined geographic area and their system infrastructures vary widely based on a multitude of factors, including facility condition, past engineering practices and materials. Each operator will need to evaluate the actions in light of system variables, the operator's independent integrity assessment, risk analysis and mitigation strategy and what has been deemed reasonable and prudent by their state regulators. It is recognized that not all of these recommendations will be applicable to all operators due to the unique set of circumstances that are attendant to their specific systems.

Building Pipelines for Safety

Construction

- Expand requirements of the Operator Qualification (OQ) rule to include new construction of distribution and transmission pipelines.
- Review established oversight procedures associated with pipeline construction to ensure adequacy and confirm that operator construction practices and procedures are followed.

Emergency Shutoff Valves

- Support the use of a risk based approach to the installation of automatic and/or remote control sectionalizing block valves where economically, technically and operationally feasible on transmission lines that are being newly constructed or entirely replaced. Develop guidelines for consideration of the use of automatic and/or remote control sectionalizing block valves on transmission lines that are already in service. Work collaboratively with appropriate regulatory agencies and policy makers to develop these criteria.
- Expand the use of excess flow valves to new and fully replaced branch services, small multi-family facilities, and small commercial facilities where economically, technically and operationally feasible.

Operating Pipelines Safely

Integrity Management

- Continue to advance integrity management programs and principles to mitigate system specific risks. This includes operational activities as well as the repair, replacement or rehabilitation of pipelines and associated facilities where it will most improve safety and reliability.
- Collaborate with stakeholders to develop and promote effective cost-recovery mechanisms to support pipeline assessment, repair, rehabilitation, and replacement programs.
- Develop industry guidelines for data management to advance data quality and knowledge related to pipeline integrity.
- Support development of processes and guidelines that enable the tracking and traceability of new pipeline components.

Excavation Damage Prevention

- Support strong enforcement of the 811 – Call Before You Dig program through state damage prevention laws.
- Improve the level of engagement between the operator and excavators working in the immediate vicinity of the operator's pipelines.

Enhancing Pipeline Safety

Safety Knowledge Sharing

- Review programs currently utilized for the sharing of safety information. Identify and implement models that will enhance safety knowledge exchange among operators, contractors, government and the public.

Stakeholder Engagement and Emergency Response

- Evaluate methods to more effectively communicate with public officials, excavators, consumers, safety advocates and members of the public about the presence of pipelines. Implement tested and proven communication methods to enhance those communications.
- Partner with emergency responders to share appropriate information and improve emergency response coordination.

Pipeline Planning Engagement

- Work with a coalition of Pipelines and Informed Planning Alliance (PIPA) Guidance stakeholders to increase awareness of risk based land use options and adopt existing PIPA recommended best practices.

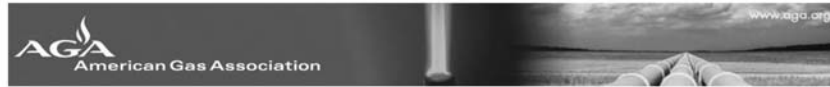
Advancing Technology Development

- Increase investment, continue participation, and support research, development and deployment of technologies to improve safety. Evaluate and appropriately implement new technological advances.

Gas Utility Industry Actions To Be Implemented	Target Dates *
Confirm the established MAOP of transmission pipelines Note: Confirmation of established MAOP utilizes the guidance document developed by AGA, "Industry Guidance on Records Review for Re-affirming Transmission Pipeline MAOPs," October 2011.	On an aggregate basis of AGA member companies, complete > 50% of class 3 & 4 locations + class 1&2 HCAs: 7/3/12 Remaining class 3&4 + 1&2 HCAs, based on PHMSA guidance: 7/3/13 Remaining class 1&2 by 7/3/15
Review and revise as necessary established construction procedures to provide for appropriate (risk-based) oversight of contractor installed pipeline facilities.	Trans: 12/31/12 Dist: 12/31/13
Under DIMP, evaluate risk associated with trenchless pipeline techniques and implement initiatives to mitigate risks	12/31/12
Under DIMP, identify distribution assets where increased leak surveys may be appropriate	12/31/12
Integrate applicable provisions of AGA's emergency response white paper and checklist into emergency response procedures	12/31/12
Extend Operator Qualification program to include tasks related to new main & service line construction	6/30/13
Expand EFV installation beyond single family residential homes	6/30/13
Incorporate an Incident Command System (ICS) type of structure into emergency response protocols	6/30/13
Extend transmission integrity management principles outside of HCAs using a risk-based approach	70% of population within PIR by 2020; 1&2 by 2030
Implement applicable portions of AGA's technical guidance documents: 1) Oversight of new construction tasks to ensure quality; 2) Ways to improve engagement between operators & excavators	Within 1 yr of AGA guidance
Begin risk-based evaluation on the use of ASVs, RCVs or equivalent technology on transmission block valves in HCAs	Within 6 months of Comptroller General study
Implement appropriate meter set protection practices identified through the Best Practices Program	Within 6 months of program results

* Target dates are based on an operator's evaluation of these actions in light of system variables, the operator's independent integrity assessment, risk analysis, and mitigation strategy. Target dates also assume state regulatory approval that action is prudent and reasonable and therefore recoverable in rates.

Gas Utility Industry Actions That Exceed 49 CFR Part 192
Incorporate systems and/or processes to reduce human error to enhance pipeline safety
Advocate programs to accelerate the risk-based repair, rehabilitation and replacement of pipelines
Support development of processes and guidelines that enable tracking and traceability of pipeline components
Encourage participation in One-Call by all underground operators and excavators
Influence and/or support state legislation to strengthen damage prevention programs
Use industry training facilities and evaluate opportunities to expand outreach and education programs to internal and external stakeholders
Support and enhance damage prevention programs through outreach, education, intervention and enforcement
Use a risk-based approach to improve excavation monitoring
Develop, support, enhance and promote CGA initiatives targeted at damage prevention, including data submission and 811
Support public awareness programs targeted at damage prevention
Continue AGA Safety Committee initiatives, such as sharing lessons learned through the Safety Information Resource Center, safety alerts through the AGA Safety Alert System, safety communications with customers and supporting AGA's Safety Culture Statement
Explore ways to educate, engage and provide appropriate information to stakeholders to increase pipeline public awareness
Conduct organizational response drills to improve emergency preparedness
Participate in state, regional and national multi-agency emergency response training exercises
Reach out to emergency responder community in order to enhance emergency response capabilities
Verify participation in a mutual assistance program, if appropriate; integrate into emergency response plans
Collaborate with stakeholders near existing transmission lines to increase awareness/adoption of appropriate PIPA recommended best practices
Promote benefits of R&D funding. Support R&D investment, pilot testing and technology implementation
Support technology development and deployment in critical applications
Collaborate on R&D



AGA's Commitment to Enhancing Safety: AGA Actions

ACTIONS COMPLETED

- ✓ Implement discussion groups to address safety issues including discussion groups for employee technical training, material supply chain issues, DIMP implementation, public awareness, work management and GPS/GIS
- ✓ Participate in 2012 DOT Automatic Shut-off Valve and Remote Control Valve Workshop
- ✓ Develop, with INGAA and API, a public document to explain ratemaking mechanisms used for pipeline infrastructure
- ✓ Create a Safety Information Resources Center for the sharing of safety information
- ✓ Hold regional operations executives' roundtables to discuss safety initiatives
- ✓ Sponsor workshop with INGAA and National Association of State Fire Marshals (NASFM) on emergency response
- ✓ Develop a technical note on industry considerations for emergency response plans
- ✓ Develop Emergency Response Resource center with a streamlined mutual assistance program
- ✓ Develop a task group comprised of AGA staff and members that will work closely with Pipelines and Informed Planning Alliance (PIPA) to ensure AGA member concerns are addressed in joint PIPA initiatives
- ✓ Work with INGAA, research consortiums and other pipeline trade associations to provide the NTSB with a compilation of the progress that has been made in advancing in-line inspection technology
- ✓ Host a roundtable focused on operator experience and lessons learned: 2012 Operations Conference
- ✓ Work with INGAA, API, AOPL, Canadian Gas Association and Canadian Energy Pipeline Association on a comprehensive safety management study that explores initiatives currently utilized by other sectors and the pipeline industry.

ONGOING ACTIONS

- Promote the use of innovative rate mechanisms for faster repair, rehabilitation or replacement.
- Maintain a clearinghouse on effective cost-recovery mechanisms that states have used to fund infrastructure repair, replacement and rehabilitation projects.
- Support legislation that strengthens enforcement of damage prevention programs and 811
- Support the Common Ground Alliance, use of 811 and other programs that address excavation damage
- Continue the work of the AGA Best Practices Programs to identify superior performing companies and innovative work practices that can be shared with others to improve operations and safety.
- Continue the Plastic Pipe Database Committee's work to collect and analyze plastic material failures
- Promote the AGA Safety Culture Statement and a positive safety culture throughout the natural gas industry
- Conduct workshops, teleconferences and other events to share information including pipeline safety reauthorization, DIMP/TIMP, fitness for service, records, in-line inspection, emergency response, and other key safety initiatives
- Hold an annual executive leadership safety summit.
- Recognize statistical top safety performers, promote safety performance and encourage knowledge sharing through AGA Safety Awards
- Support PHMSA and NAPSRS workshops and other events
- Search for new and innovative ways to inform, engage and provide appropriate information to stakeholders, including emergency responders, public officials, excavators, consumers and safety advocates, and members of the public living in the vicinity of pipelines
- Participate in the Pipeline Safety Trust's annual conference to provide information on distribution and intrastate transmission pipelines, AGA and industry initiatives, and receive input
- Work with PHMSA to establish time limits for telephonic or electronic notice of reportable incidents to the National Response Center after the time of confirmed discovery by operator that an incident meets PHMSA incident reporting requirements
- Build an active coalition of AGA member representatives to work with PHMSA and other stakeholders to implement PIPA recommended practices pertaining to encroachment around existing transmission pipelines
- Advocate to state commissioners the inclusion of research funding in rate cases in an effort to increase overall funding for R&D
- Work with PHMSA and other stakeholders on opportunities to increase R&D funding and deployment of technologies
- Advocate acceptance of technologies that can improve safety

AGA's Commitment to Enhancing Safety: AGA Actions Continued

ACTIONS WITH TARGET DATES

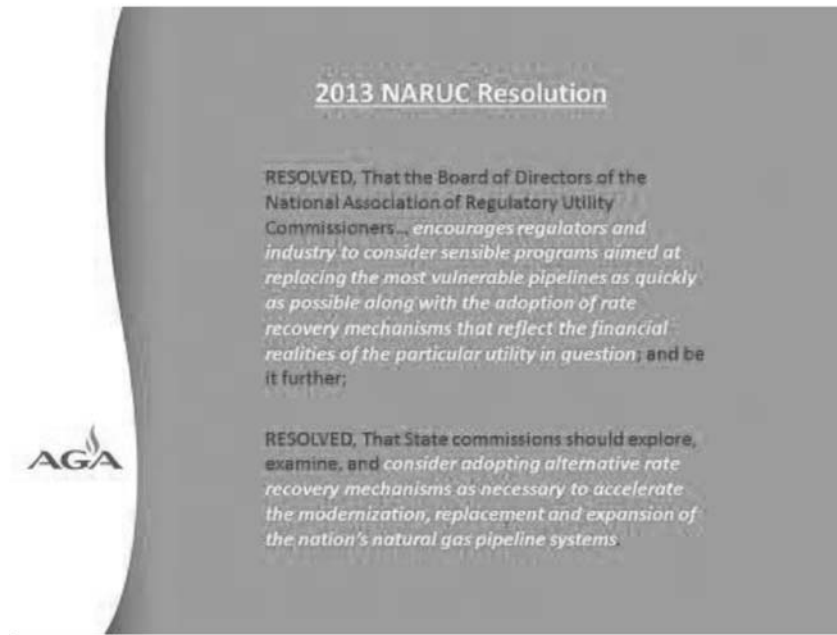
- Develop guidance to determine a distribution or transmission pipeline's fitness for service and MAOP, and the critical records needed for that determination. **(5/30/12)**
- Create a Safety Alert Notification System that will allow AGA or its members to quickly notify other AGA members of safety issues that require immediate attention. **(5/30/12)**
- Develop a more comprehensive technical paper that presents benefits and disadvantages of the installation of ASV/RCV block valves on new, fully replaced and existing transmission pipelines. **(9/30/12)**
- Create technical guidance for oversight of new construction tasks to ensure quality. **(12/31/12)** (Track progress of industry's implementation of guidelines and summarize results annually)
- Utilize DIMP to evaluate the risks associated with trenchless pipeline techniques and implement, where necessary, initiatives to prevent and mitigate those risks. **(12/31/12)**
- Based on the results of the safety management study, identify and begin to implement initiatives that will enhance the appropriate sharing of safety information. **(12/31/12)**
- Include meter protection in 2013 AGA Distribution Best Practices Program with results. **(9/30/13)**

ACTIONS – TARGET DATES NOT APPLICABLE

- Work with PHMSA and distribution operators on ways to address risk to meters from vehicular damage, natural and other outside forces.
- Engage PHMSA and NAPS in discussions on whether TIMP should be expanded beyond HCAs and the benefits and challenges of applying integrity management principles to additional areas.
- Highlight in DOT workshops, NAPS meetings and discussions with Government Accountability Office that: 1) Many AGA members are required to manage DIMP and TIMP programs that overlap. The effectiveness, inefficiencies and duplication of multiple integrity management programs must be explored. 2) Low-stress pipelines operating below 30% SMYS should be treated differently.
- Work with industry and regulators to evaluate how the grandfather clause can be modified to reduce and/or effectively eliminate its use for transmission pipelines.
- Work with other stakeholders to develop potential technological solutions that allow for tracking and traceability of new pipeline components (pipe, valves, fittings and other appurtenances attached to the pipe).
- Develop guidelines that provide for an improved level of engagement between operators and excavators.
- Work with other stakeholders to improve pipeline safety data collection and analysis, convert data into meaningful information, determine opportunities to improve safety based on data analysis, identify gaps in the data collected by PHMSA and others, and communicate consistent messages based on the data.
- Develop publications dedicated to improving safety and operations
- Pilot application of PIPA guidelines with select member utilities.

- *The overall trend is positive*
- *Nine states moved to adopt programs in 2013, alone*
- *NJ, MA, PA & DC adopted pipeline safety measures in 2014*
- *West Virginia recently passed legislation*
- *States address this issue differently*
- *The basis for these decisions is always just and reasonable rates for consumers*

Attachment 7: NARUC Resolution



Senator FISCHER. Thank you very much.

And thank you to all our panel members.

We'll begin our first round of questioning, and I will begin.

Mr. Santa, as I referenced, in my opening statement, we heard that there are often delays between the time of a PHMSA inspection and receiving the report. I would assume that your members face that similar challenge. And, if so, how do they cope with it? What's the impact of that?

Mr. SANTA. I would—Madam Chairman, I'd have to get further data on the extent to which they have delays. However, I think it just contributes to uncertainty. And I think, you know, that's one of the themes here today, is greater regulatory certainty. To the extent that the pipeline operators can have the results of those audits, they'd be in a better position to take whatever steps are necessary to improve pipeline safety based on the results.

Senator FISCHER. And we hear a lot about the uncertainty and the challenges that pipeline operators are facing because of that uncertainty from PHMSA. I guess I would like you to be more specific on the challenges that the operators are facing.

And, Mr. McCallister, if you would like to answer that question, as well.

Mr. SANTA. With regard to the uncertainty, I think one of the concerns that pipeline operators have got is that, while INGAA's members have committed to a voluntary program to improve pipeline safety, when it comes to making major commitments, for example, to test pipelines, they are concerned that they might do that. It's very expensive. It's disruptive. And they're willing to do

it, but, by the same token, they are somewhat concerned about the risk that they may do that, attempt to do the best thing, and then find out that the PHMSA regulation, when it's ultimately adopted, requires them to do something more, which then might cause them to have to repeat that, which, of course, is costly, it would, in most instances, require taking a pipeline out of service, so it disrupts the flow of natural gas. And I think—you know, that's one of the practical consequences of the uncertainty caused by the delay.

Senator FISCHER. Mr. McCallister.

Mr. MCCALLISTER. Yes, I would echo that statement a bit. Our utility companies go, I would say, far beyond just the regulations that we get by PHMSA, but we work closely with PHMSA on—all the stakeholders work together on what these regulations that have yet to be developed, for example, what they could look like, what's practical, what's the reasonable and efficient way in which to go about implementation of these regulations. And many of our companies, including ours, move on forward with what we expect regulations to look like and what the best things are.

Our concern is similar, in that new legislation that may change the direction of the regulation that we expect will cause our companies to have probably undertaken considerable activities that may no longer be valid or may be nullified by the new regulation, and then we'll have, in costs that would have been incurred for not only our companies, but the customers and your constituents.

Senator FISCHER. Thank you.

Mr. Bellamy, you provided some great examples on new technology and how that helps with inline inspections. So, I thank you for that. I think it helps us to understand how pipeline operators are able to manage those risks that they are facing. I would ask you about something that you discussed in your written testimony. You talked about the creation of a no-fault environment to expand the data-sharing. And something that I've worked on and advocated in transportation policy is the implementation of a performance-based regulation so we can focus on, really, the ultimate goal that we all have of safety. So, how would your no-fault information-sharing environment between PHMSA and pipeline stakeholders help to contribute to a—advancing that goal-oriented regulatory regimes that I think we need to get to?

Mr. BELLAMY. I'm glad you asked the question.

Senator FISCHER. Microphone.

Mr. BELLAMY. I'll learn—I'll get the hang of this eventually.

I'm glad you asked the question, because I skipped over that in—under the tyranny of the countdown clock.

Senator FISCHER. Oh, we're not tyrants.

[Laughter.]

Mr. BELLAMY. The issue there really is that “smart pigs” learn as they go, meaning once we've seen a defect for the first time, we can usually then see it again and again and again, and we understand what the interpretation of that signal picked up by the “smart pig” means. The challenge is to see enough defects. And particularly when you're out on the long tail, because there's a distribution of defects in any pipeline, and some of them are extremely rare, the types of morphologies you don't see very often. And occasionally, the very first time you see it is when it fails.

Now, for us to be able to get access to those defects and to be able to study those defects with our tools and learn what those signals—what signals—the signal response to that defect would allow us then to be able, as I say, to find that defect forevermore. And I think the same would go for my competitors. This is just how the industry learns.

Now, we do know that some of our customers are reluctant to declare that they've found something new and bring it forward, for fear of regulatory penalty. So, if there was some way in which there could be a safe environment for these types of issues to be brought forward so that the industry could learn, that's really the kind of scenario that we're referring to.

Senator FISCHER. Thank you very much.

Senator BOOKER.

Senator BOOKER. Thank you, Chairwoman.

So, if there's a leak or some problem, every second absolutely counts in getting it shut off. We had an incident in New Jersey in 1994, when it took hours to get the—to shut off the flow of gas that fed a pretty serious pipeline break. It was—it destroyed a lot of property, apartment buildings and the like. And, due to this accident, the NTSB has recommended the use of automatic remote-control shutoff valves in high-consequence areas. And the last pipeline build required them on certain types of—certain types of pipes.

And so, to Ms. Fleming and Honorable Hart, what are—what is it important that—why is it important that the administration quickly move forward with this requirement? And what factors should the administration consider to ensure the rules—the rule improves safety?

Ms. FLEMING. Sure. As you said, automated valves, you know, have the ability to respond quickly and to isolate an incident. However, you know, we believe that operators should also consider disadvantages. There are some cases where, you know, installing automated valves has led to accidental closures. For instance, if—hazardous liquid operators have told us they're reluctant to use those, because it can over-pressurize the pipeline leading to a accidental closure.

So, we believe that operators should look at their particular pipeline characteristics, the location of the valve, and decide what's the best way to improve incident response. They should look at the accuracy of their leak detection systems, the location of response personnel, what's the relationship like with the local emergency responders, how about their control-room protocol. So, we believe that they should look holistically. In some cases, an operator may decide to install automated valves everywhere; in other cases, they may decide that they need to do a number of things, including looking at their process, procedures, their relationship with some of the responders.

Senator BOOKER. Are there other things that we should be thinking about with this reauthorization, in terms of closing the gap on that response time?

Ms. FLEMING. You know, we really wanted to try to come up with an optimal response time. But, unfortunately, the data is not reliable at PHMSA right now. So, part of the problem is that operators are not required to provide information on when the incident oc-

curred, when response individuals showed up, when they were able to make the area safe.

So, the first thing is to improve the data, which PHMSA says they're working on. And then, the second thing is to then use that data to tease out and to see, based on pipeline characteristics and different pipelines, what is an appropriate metric or target, and to move toward a performance-based approach. So, first line is fix the data, and then move toward a performance-based response time.

Senator BOOKER. So, more reporting—

Ms. FLEMING. Yes.

Senator BOOKER.—by—more reporting.

Ms. FLEMING. And, like, our colleagues here, you know, INGAA kind of took this step and came up with a response time for their industry to kind of get folks to move toward that. So, I think what we're suggesting is that the data would help drive what an appropriate response time would be.

Senator BOOKER. And then, just shifting to general safety and consequences, you know, I'm just really concerned with the most densely populated state in the Nation, lots of populations, any problems, you know, virtually will cause serious consequences. And so, there—are there other safety things that we should be considering that are particular to highly dense areas?

Ms. FLEMING. I think that, you know, with integrity management, it's been over 10 years, and I think it's probably time—we believe that it's time to take a look at, Is this framework working? Does it need to be tweaked in any regards? I think unregulated gathering pipeline is another area that we're concerned—only 90—I mean, only 10 percent of those gathering pipelines are regulated in high-consequence areas.

But, as my statement said, you know, it's—there are some game-changers there. You know, the increased extraction of shale oil and gas has led to much larger, higher-pressure gathering pipelines, almost more like transmission pipelines. And then the other game-changer is that businesses and homes are really moving out to areas that were formerly remote. So, I think unregulated gathering pipelines could pose increased safety risk, because more people could be impacted.

So, we recommended that the first line is to really gather—believe it or not, states don't even know what they have in their own state. So, trying to get some visibility on what's out there, and then to look whether or not there are some potential safety risks, and then to try to figure out how to address those.

Senator BOOKER. Thank you very much.

Senator FISCHER. Thank you, Senator Booker.

Senator Moran.

STATEMENT OF HON. JERRY MORAN, U.S. SENATOR FROM KANSAS

Senator MORAN. Madam Chairman, thank you very much.

Let me ask a question and then give a little background. I'd like to talk a moment about the issue of underground natural gas storage. And the question I would ask is, Is there a reason for the inspection of under—interstate underground storage facilities, something that the Federal Government should be interested in?

And I would set the stage by a bit of history. Back in January 2001, natural gas migrated into caverns in and around the community of Hutchinson, Kansas. Explosions ultimately occurred. Deaths were a result. And the regulatory environment in which we found ourselves in was that the Kansas Corporation Commission attempted to step in and inspect and, ultimately, regulate that underground storage of natural gas. A Federal court determined there was no jurisdiction on the part of the State. I assume that could be said plural, there is no jurisdiction on the part of States to inspect the storage of natural gas. And so—interstate natural gas—and so, my colleague from Kansas and I have, on several occasions, attempted to amend the law to allow for Federal jurisdiction to prevail, in hopes—let me say that differently—and allow a State jurisdiction to prevail and allow State inspections to occur. And I would say that became important because there hasn't been a Federal inspection.

We also, generally, in my view, is—we're better off with State inspection than Federal, anyway. And so, we're trying to fashion a solution to this that would have the ability for the Federal jurisdiction to apply, but inspections occur by our State or by other States. Not just a Kansas issue, I don't think.

So, my question—as we look at reauthorization of this legislation, it becomes an opportunity for us to pursue a solution. And I would, again, just ask if anyone disagrees with the premise that this is something that's important for the Federal Government to focus on and for us to take a look at as we reauthorize the Act.

Mr. Santa.

Mr. SANTA. Yes. Senator Moran, INGAA, in our testimony, has supported directing PHMSA to adopt Federal regulations for regulating the safety of underground natural gas storage and, in the case of intrastate storage, to delegate that inspection and authority to the states.

PHMSA, back in 2010, put out an Advance Notice of Proposed Rulemaking and asked the question of whether they should regulate underground storage. At that time, we filed comments supporting it. While PHMSA has not acted, the industry has. The industry storage operators, working with States, working with regulators, have come up with standards that were adopted just this last month, put out just this last month by the American Petroleum Institute. We suggested that that would be a good starting place for those regulations.

Senator MORAN. Mr. Santa, when you say that's a "starting point," is it an ending point? Or that then becomes the basis for governmental regulation?

Mr. SANTA. As would happen with any Federal regulation, those would be put out for public—for notice and public comment. And it would be within PHMSA's discretion to—whether or not to adopt those standards, to amend them, to adopt something different. But, we think that there is a very good starting place that hopefully could lead to some expedited action on regulations.

Senator MORAN. Before I ask another question, does anyone else want to join in this conversation?

Mr. MCCALLISTER. Yes, I'll just echo that a little bit, in that the American Gas Association also worked with INGAA on that matter,

and we adopted some recommended practices for the integrity of storage fields. So, I think it's fine that PHMSA would put together a rather broadbased program and that, like most things, they would delegate the actual administration of that to the State. And whether they use those as a pure guideline or whether those are referenced directly, they're more easily updated and upgraded, so to speak, over time if they're a reference document than a direct rule from them. So——

But, I think it's going to work well if you can have PHMSA oversee it.

Senator MORAN. Anyone else?

[No response.]

Senator MORAN. Madam Chairman, thank you very much.

Senator FISCHER. Thank you, Senator Moran.

Senator Peters.

**STATEMENT OF HON. GARY PETERS,
U.S. SENATOR FROM MICHIGAN**

Senator PETERS. Thank you, Madam Chair, for that.

And thank you to our panelists.

I take this issue very seriously, given the fact that we had a major disaster in the state of Michigan—and, Mr. Hart, I appreciate your reference to that—given the fact that we've had the most expensive pipeline break in the history of this country, already spending over a billion dollars in cleanup in Kalamazoo. And there is now increased concern in my State about another pipeline that exists that's run by the same company that had the other pipeline break, that runs underneath the Straits of Mackinac, which connects the upper peninsula to the lower peninsula, over 5 miles of water, freshwater in the Great Lakes, freshwater that provides drinking water to over 40 million people, and also an incredible resource for the whole region. And if there is a pipeline break in that stretch, it would be catastrophic. I think it would—the Kalamazoo incident would be dwarfed by what would happen in the Straits of Mackinac. In fact, a recent study by the University of Michigan says that the Straits of Mackinac is the absolute worst place to have an oil disaster anywhere in the Great Lakes basin, because of the volume of water that goes across the Straits, back and forth. It can change directions almost daily. And my understanding is, the volume of water is equal to ten times Niagara Falls going through there, to put that in perspective of what we're dealing with. So, we're very concerned about that.

So, Ms. Fleming, I want to mention a couple of issues. One is response plans. Obviously, we want to prevent an accident from occurring to begin with, and we'll talk about that. But, you made a big issue in your GAO report about response times. We had a recent exercise—in fact, just completed last week—in Mackinac. One of the principal responders was a Coast Guard cutter that was 400 miles away from the Straits of Mackinac, so it wouldn't be pre-positioned like it is in an exercise; it would have to be called up. If it was wintertime, Lake Superior may be completely frozen. It takes a long time for a cutter, if has icebreaking capacity, to get there. And then we can talk about the ice, as well. But, you talked about an optimal response time. Given the fact that you're operating in

straits that have volumes of water ten times that of Niagara moving very rapidly, is—how do you feel about that, in terms of a response plan that obviously is probably inadequate, given the distances that people have to traverse to even get there?

Ms. FLEMING. It has to be—they obviously have to take that in consideration. And, you know, each location, each operator, each situation is different. And that's why, you know, we think it's very important that the operator, you know, take a look at the accuracy of its leak detection system, you know, really look at where the valves are. Does it make sense to have automated? Where are the personnel located?

We heard from one operator, the reason they went all automatic valves is because they realized that, for their response people, it would take them a minimum of two and a half hours to get there, and 30 minutes to shut down the crank wheel. So, they said, you know, that's just unacceptable. Another operator told us that, you know, their control room had a misunderstanding that they should never shut down a system. They thought that that's just—you know, time is money, you don't do that.

And so, just kind of going through these drills, really having a relationship with the local responders. And, like we said, once PHMSA has some robust data, then they can say, "Well, what makes sense? What is—is an hour sufficient? Is it?"—you know, we have a chart in our report that said, in some cases it's minutes, in other cases it was days. Now, obviously, if it's a slow leak, that's more acceptable than it is if it's, obviously, in a catastrophic particularly deadly issue.

So, we think it's very important that all of these things are taken into account and that PHMSA really take a hard look at the data and to really think about the pipeline, the pressure, the location, the waterways, the environment that's there, to really make sure that the response time is as efficient and effective as possible.

Senator PETERS. Well, thank you.

And, Mr. Hart, if I could ask you a question related to this, too. In the fact that if we did have a disaster in the Straits of Mackinac or anywhere in the Great Lakes, it would be the Coast Guard that would have the primary responsibility for cleaning that up. And one concern—major concern I have is in the wintertime, because the Straits of Mackinac get completely frozen over. It's difficult for a Coast Guard icebreaker to get through there in the winter, and they would have to respond to that. Does it make sense—and you talked about, in your testimony, that we work with other agencies to have some harmonization, some oversight—would it make sense to have the Coast Guard have to sign off on a response plan saying that, "We're the principal agency responsible for cleaning this thing up. Our assets are hundreds of miles away. And, in the wintertime, when we have thick ice that our icebreakers may have a hard time getting through, the ability to even clean up a site—it may be impossible." And, of course, that might lead to a question, if it's impossible to clean up a site, does it even make sense to be operating a pipeline that cannot be cleaned up if something goes wrong?

But, to my question, Mr. Hart, does it make sense to have the Coast Guard having that ability to oversee that and to sign off on it in some way?

Mr. HART. Thank you for the question. We work actively with the Coast Guard on issues that involve maritime aspects. And that—and we've seen that frequently, including in Marshall, Michigan, and in Paulsboro, New Jersey. So, we see—we work well with the Coast Guard and with the EPA, because they're all involved in the response to that.

I would note, though, in response to your question about response time, one of the things that has not yet been mentioned—and also in response to Senator Booker's question—is the importance not only of automatic valves, but sometimes, in a situation where a shutoff can be catastrophic and maybe you're not sure if your automatic software is working right, you also want to have the possibility of having remotely controlled valves. And we have recommended that some way to shorten response time, not necessarily automatic, but look at automatic or remote to help shorten that time before people even know that there's a need to respond. So, we have been looking at a number of those issues.

I would also mention that, in respect to that specific event, our work with Enbridge has been very promising, in the sense that they worked very well with us when we were investigating Marshall, Michigan, they also have been one of the ones that—to voluntarily undertake following the recommended practice that API instituted, 1173 safety management system. So, we've had a very positive experience with them. And also, they're the ones—in Marshall, Michigan, it took them 17 hours to realize that there even was a release. So, that will feed into that learning curve and—to try to figure out how to know that sooner.

So, these aren't direct answers to your question, but I could just say, from our experience, we're—we go where the accidents take us. From our experience, we are confident that we would be able to handle that one as well as anybody could.

Senator PETERS. Even in complete ice cover?

Mr. HART. Well, I mean, under whatever circumstances—when we were investigating Casselton, North Dakota, and it was 30 below, I mean, we go—we do what we have to do.

Senator PETERS. Well, it's beyond—I'm sorry, Madam Chair—but, it's—beyond the cold, it's underwater, as—

Mr. HART. I understand—

Senator PETERS.—well. And, as you mentioned, the spill we had in Michigan was 17 hours. It wasn't the company that discovered it. I think it was a guy driving his pickup truck for a utility company that saw a bunch of oil spilling and said, "You know, I think there's a problem here." If it's happening under water, under this ice, no one's going to see it for a long time. And if the water volumes are equal to ten times Niagara Falls, it's going to spread very rapidly, and you're talking about a resource that provides drinking water for 40 million people. So, we need to have more specific answers to these—given the risk.

Mr. HART. You raise a very good question that requires consideration, as Ms. Fleming said, into the determination of how best to do this.

Senator PETERS. Thank you.

Mr. HART. Thank you.

Senator FISCHER. Thank you, Senator Peters.

Before you begin your questions, Senator Daines, I wanted to thank you again for hosting this subcommittee at a hearing in Billings a couple of weeks ago. I thought we had a very informative panel. We gathered a lot of information. And I thank you personally for the warm welcome that we received from the people of Montana. Thank you very much.

You may begin your questions.

**STATEMENT OF HON. STEVE DAINES,
U.S. SENATOR FROM MONTANA**

Senator DAINES. Well, thanks, Chairman Fischer. And thanks for making the trip to Montana. I—

Senator FISCHER. It was wonderful.

Senator DAINES. It was truly—if you—if you don't believe in field hearings, you ought to go to one. I think it really promoted a better open and back-and-forth dialogue than we often have here in Washington, D.C. So, thanks for making the trip out. Your leadership was very appreciated.

And thank you for holding this hearing, as well as, Chairman Thune, Ranking Member Nelson, for scheduling this important series of hearings on PHMSA and also holding that field hearing that we had a couple of weeks ago in Montana.

You know, at that field hearing, we focused on protecting our pristine natural environment, especially our rivers and our streams. Montana's proactive safety efforts and the local economic impact of pipelines was discussed. PHMSA's administrator testified and was able to hear firsthand from Montana liquid pipeline operators, local safety experts, and local elected officials on how Montana is leading this industry.

PHMSA's jurisdiction covers approximately 2.6 million miles of pipeline across our Nation. Nearly 20,000 miles crisscrosses Montana, delivering natural gas to over 262,000 homes, gasoline and diesel to the pumps, gas and oil to businesses, as well as facilitating exports. In Montana, we produce about 30 million barrels of crude oil, 63 billion cubic feet of natural gas, and 42 million short tons of coal annually. Our 19,000 miles of pipelines play a vital enabling us to export 60 percent of our energy production, and it supports the employment of over 43,000 Montanans in the oil and gas industry. That's about 7 percent of our total employment. Needless to say, it's imperative to Montana that we continue to move these commodities in a safe and environmentally responsible and an efficient manner.

One of the issues that came up during our field hearing in Billings was the inspection turnaround time from PHMSA. What we heard was that the time—from the time that PHMSA's inspectors will inspect a pipeline until a Montana operator receives that inspection is sometimes up to a year. And I don't think that's acceptable. And so, I'm curious—perhaps for Mr. McCallister and Mr. Santa—have your members experienced similar kinds of wait times, delays from the time the inspection occurs until you receive the report and can start working on any kind of corrective actions?

Mr. SANTA. Senator Daines, I would need to check with our members to see what that has been. I'm not aware of any that have

been up to a year. But, again, I would be happy to inquire of our members and provide that to the Committee.

Senator DAINES. OK.

Mr. McCallister?

Mr. MCCALLISTER. Yes, I would give the same answer. I—I'm not aware that it's been that long. PHMSA sits here in our backyard, so maybe we get to them a little quicker from our company. But, I—I'm not aware. We'd have to check—

Senator DAINES. All right.

Mr. MCCALLISTER.—and get back to you.

Senator DAINES. We'll follow up with you on that, because we want to actually get a sense, across the country. I'm sure it probably—mileage varies, depending on, perhaps, inspection workload and inspectors available, so forth. But, we heard quite a range, quite a variation—several months, at a minimum, and up to a year. And that is—that was why it raised a flag for us. We'd love to work with you and see what you're finding out in the field.

For Mr. Bellamy, in your testimony you state regulations should encourage development and adoption of new technology. Increasingly, this committee hears from witnesses that performance and goal-based regulations—other words, regulations that are a means to an end—you know, a safe outcome—are worthwhile, given the proactive safety practices of industry and the rapid evolution of technology. What hurdles does industry face in implementing the best available safety technology? And the second part of that question is, How would performance-based regulations remove some of these obstacles?

Mr. BELLAMY. Thank you. So, today, with respect to pipeline inspection, "smart pigging," the U.S. regulations for both liquids and gas are somewhat prescriptive. When I think about the difference between prescriptive regulations and goal-setting, the story I tend to tell is that of someone trying to protect people from falling off the edge of a cliff. A goal-setting approach would be to put somebody—charge somebody with the goal of protecting or preventing anybody falling off the edge of a cliff. A prescriptive regulation would say, "Build a fence 3 feet high using 2-by-4 wood to stop someone falling off the edge of a cliff." The difference between those two is, one might not be sufficient—the latter may not be sufficient. The prescriptive approach may not be sufficient for preventing people fall off the edge of a cliff. The former puts a lot more emphasis on finding out what's the very best way—what are all of the risks associated with falling off the edge of a cliff, and how do you put in place the measures, whatever they might be, and how do you justify that you've done enough to do that?

Now, around the world, we see different models of pipeline regulation. And so, for example, if I take the example of, perhaps, Canada—Canada has a goal-setting regime. It was an early adopter of crack-detection technology. There is more crack detection done in Canada than anywhere else in the world. Now, you could argue that's partly because Canada has a propensity to—you know, the soil types and so on may be more prone to cracking. But, then, what's the difference between the soil types in southern Alberta and in northern Dakota? Not a lot of difference. And it's also interesting to note that many of the—many of the operators—sorry,

the—much of the crack detection done south of the border is done by Canadian operators. So, there might be a coincidence there, or maybe not. It might be a cause-and-effect. But, I think it's worth PHMSA looking at whether or not a goal-setting approach might make it easier for operators to adopt the best available technology rather than just following a—you know, a prescriptive approach.

Senator DAINES. Thank you.

Thanks, Chairman Fischer.

Senator FISCHER. Thank you, Senator Daines.

Senator Klobuchar.

**STATEMENT OF HON. AMY KLOBUCHAR,
U.S. SENATOR FROM MINNESOTA**

Senator KLOBUCHAR. Thank you very much, Madam Chair.

I want to start with you, Chairman Hart. You noted the U.S. has approximately 298,000 miles of onshore natural gas transmission pipelines. And PHMSA has required the operators to develop and implement these integrity management programs. Do you believe they're effective in reducing incidences? I know you've completed—NTSB has completed three major investigations in some deficiencies of the program. And do you think that they're working?

Mr. HART. Thank you for the question. The reason we did our safety study recently on the integrity management of gas transmission pipelines in high-consequence areas is because we had three major events of that type that showed that things weren't working the way they were supposed to. So, there's clearly significant room for improvement.

Senator KLOBUCHAR. And could you talk a little bit about that improvement? And what do you think the practices should be to reduce these incidences?

Mr. HART. One of the areas that we recommended is eliminating the grandfathering. Until the early 1970s, there was no requirement to test installed—newly installed pipeline. So, when the requirement to test newly installed pipeline came into place, pipeline installed before 1970—for example, San Bruno—was exempt. So, we're—we are—we have recommended to PHMSA that they eliminate the grandfathering—that—the grandfather clause so that pipeline installed before 1970 would not be exempt from pressure testing. That's one of the biggest ones.

Senator KLOBUCHAR. OK. Thank you.

Ms. Fleming, you indicated that in 2012 the GAO found that PHMSA does not collect comprehensive data on safety risks associated with gathering pipelines. Collecting the data could facilitate assessing the safety risks. Why do you believe it's important for PHMSA to collect data from the operators of the unregulated onshore hazardous liquid and gas gathering pipelines?

Ms. FLEMING. I think it's very important that PHMSA have a understanding on the location, makeup, operation to determine the extent of these safety risks. As I said earlier, there has been some changes to gathering pipelines really related to the increased extraction of shale. And the unregulated gathering pipelines are much larger in diameter. In Texas, they told us it could be as large as 36 inches and higher pressure, so more like operating like a transmission line. So, I think it's very important that not only does

PHMSA, but the states have some visibility as to what's out there and what are the potential safety risks.

I think the other important point is that these unregulated gathering pipelines, there is no requirement to have emergency response plans. So, I think that's a very important point, too, is that, for these 90 percent that are unregulated, we need a little bit more visibility. We need them to come in line, in terms of having emergency response plans, because there are some important emerging trends out there that I think are affecting larger populations than in the past.

Senator KLOBUCHAR. Thank you.

Mr. McCallister, I think you know that maintaining a strong relationship with emergency responders—industry and emergency responders is critical for the safety of our communities. What are the protocols in place now for energy companies to alert first responders? And do you think there's something better we could be doing?

Mr. MCCALLISTER. There are a number of regulations. They vary state by state sometimes. There are certain requirements that are required by PHMSA. Many of us exceed those requirements. So, some of the States have more stringent requirements. For example, here in the Nation's capital region, our emergency response requirements are set by what is our strictest jurisdiction, which is Virginia. So, within an hour, we're going to be at any call, and we'll make that 98 percent of the time. So—given traffic in the region—so they're—we work closely with all of our first responders. We do training. For example, we have one of the few facilities in the country, which we call Pipetown, but it's one of the few facilities where we can do live gas demonstrates, live leak detection, how to get into vaults and stuff. And we bring emergency responders in to train them on that.

Senator KLOBUCHAR. Thank you.

I just want to ask one more question to Ms. Fleming. It's kind of related. I know that Senator Booker asked about the automated valve and using that as a tool to get a quick response for the affected segment of the pipeline. Do you think that it's moving fast enough on that recommendation from the GAO? And what other things could be done when there is an incident—to move up the response time?

Ms. FLEMING. PHMSA has told us that they are now—well, they're moving toward requiring some of that important data, which is, you know, when did the incident occur? When did people show up? So, I think having those critical time elements. And then, we really believe that it's important to move toward a performance-based approach, because, you know right now what the requirement is that incident response be in—done “in a prompt and effective manner.” So, that's a little bit squishy for us. So, we think it's more important to really kind of take a look and see what the data shows. Maybe there's a different time, whether it's transmission, depending on if it's high-consequence area. It really needs to look at the data first, and then to decide.

But, they've told us they're moving forward, so we're going to take them on their word.

Senator KLOBUCHAR. Thank you very much.

Senator FISCHER. Thank you, Senator Klobuchar.

Senator Ayotte.

**STATEMENT OF HON. KELLY AYOTTE,
U.S. SENATOR FROM NEW HAMPSHIRE**

Senator AYOTTE. Thank you, Madam Chair.

I wanted to ask Director Fleming—we have a—there is a project that Kinder Morgan has proposed in New Hampshire called the Northeast Energy Direct Natural Gas Transmission Pipeline Project. And many of my constituents have raised safety concerns with the project itself. And one of the questions that our entire delegation has written to FERC about is the question about PHMSA's role. Because if you look at the FERC website, FERC says, right on its website, "The Commission has no jurisdiction over pipeline safety or security, but actively works with other agencies on safety and security responsibility." So, one of the questions that we've asked that we haven't gotten an answer from FERC on, but I wanted to ask if you had done any analysis on, is this issue of the involvement of PHMSA in actually siting pipelines, as opposed to after they're already built and the role that PHMSA could play with FERC, in terms of a safety analysis up front during the pre-siting process. Have you looked at that issue at all?

Ms. FLEMING. I'm not aware that we have looked at it, but a colleague of mine handles the FERC area, and I would like to get back to you with a written response, if that would be OK, or maybe to set up a meeting to—

Senator AYOTTE. I would really appreciate—

Ms. FLEMING. Yes.

Senator AYOTTE.—that. And—because this is a significant issue for my constituents, and understandably so. And one of the concerns they have is, they want safety assessed up front with the siting of it, as opposed to after.

And so, I would ask you, Chairman Hart, with—as the lead Federal agency with pipeline safety oversight, what is PHMSA's role as we look at the actual permitting or siting of a new natural gas pipeline, as opposed to after it's already in existence?

Mr. HART. We go where the accidents are, so I'm not sure we're in a position to prospectively state what the situation might be. But, your question does raise the issue of safety regulators versus economic regulators. This is the only industry we look at where we issue a safety recommendation, and the safety recommendation will—may depend on what some economic regulator does. So, we're struggling—again, that's out of our lane—the economic side is out of our lane, but we're struggling with how to get things done better on the safety side, when the safety response depends on an economic regulator. We don't have a good answer to that, but it's going to take better collaboration, and maybe better collaboration between PHMSA and FERC early on might be a step in that direction. But, that's out of our lane.

Senator AYOTTE. Well, have any of your safety recommendations looked at the issue of requiring PHMSA to work with FERC during the permitting process? Because I think certainly where you site something like this could have a direct impact on safety.

Mr. HART. We have not, except to the extent that our—that we look at high-consequence areas. And that—and siting something in

a high-consequence area brings a host of different requirements than siting it in an area that is not high consequence. But, other than that, no, we have not looped at that.

Senator AYOTTE. Well, I think this is something that should be examined. And I would ask you to do that.

I also believe that, as we look at PHMSA's role in the permitting process for pipelines, I think it does make sense to have PHMSA play a role not only after the fact, but in FERC's pre-filing process to ensure the safest—safety when you're thinking about siting and proposing the project.

So, I appreciate—Director Fleming, I look forward to following up with you on this.

And, Chairman Hart, I hope that's something that you will look at, at NTSB, thinking about the whole process, as well, including the siting, when it comes to safety.

Mr. HART. Certainly, if we see that issue arising in an accident investigation that we were doing, we will certainly look at that.

Senator AYOTTE. OK. Thank you.

Mr. HART. Thank you.

Senator FISCHER. Thank you, Senator Ayotte.

Senator Markey.

**STATEMENT OF HON. EDWARD MARKEY,
U.S. SENATOR FROM MASSACHUSETTS**

Senator MARKEY. Thank you, Madam Chair, very much.

Beneath our streets across our country, we're facing a crumbling natural gas pipeline infrastructure. A report released by my staff found that aging and leaking natural gas distribution pipelines are costing consumers money nationally. Consumers have paid at least \$20 billion for natural gas that they likely never received over the last decade. These leaking natural gas pipelines are also harming the environment and contributing to climate change by releasing methane, a powerful greenhouse gas, much more powerful than carbon dioxide.

But, these aging pipelines are also a significant threat to public safety. Over the last decade, there have been almost 800 significant incidents on gas distribution pipelines, including several hundred explosions which killed and injured hundreds of people and caused more than \$800 million in property damage.

The Obama administration's recently released Quadrennial Energy Review also highlighted the safety threat posed by these natural gas pipelines. The Quadrennial report found that, quote, "Aging, leak-prone natural gas distribution pipelines and associated infrastructure prompt safety and environmental concerns." Most safety incidents involving natural gas pipelines occur on natural gas distribution systems. These incidents tend to occur in densely populated areas.

Mr. Fleming, Mr. Bellamy, Mr. Hart, would you agree that the findings of the administration's Quadrennial Energy Review that aging and leaking natural gas distribution pipelines pose a significant threat to public safety and that this is an issue that the Committee should examine?

Ms. Fleming?

Ms. FLEMING. I guess everybody's looking for me.

Senator MARKEY. Ms. Fleming, yes. Ladies first, they're saying. They're very polite.

Ms. FLEMING. We have not looked at this issue, but would be happy to work with the Committee if that's an important issue for us to undertake.

Senator MARKEY. Mr. Hart?

Mr. HART. We've been looking at issues regarding iron pipelines for quite—for several decades. And we know that the—they need to be replaced, and they are being replaced. We go there when there's an accident that results from it. So, that's the best I can say at this point, is, when we see——

Senator MARKEY. Well, it says a lot that you've been looking at it——

Mr. HART. Oh, yes.

Senator MARKEY.—for decades.

Mr. HART. We——

Senator MARKEY. So, you know it's a big issue.

Mr. HART. Yes.

Senator MARKEY. Mr. Bellamy.

Mr. BELLAMY. So, the challenge of inspecting low-pressure distribution systems is quite—has been looked at for many, many years. There are technologies that can allow such systems to be inspected. Those technologies are—there are companies actively investing in such technologies today, and deploying them. And they're being used. It's not as straightforward as inspecting carbon steel. Inspecting cast iron pipelines is a more difficult challenge. But, that's not to say it cannot be done. And there are companies working——

Senator MARKEY. All right, let me just follow up, then. So, the—to the three of you again, if you would, would you agree with the Quadrennial report that more needs to be done to repair and replace our Nation's natural gas infrastructure and to examine these issues that the Pipeline Safety Reauthorization Act would give us an opportunity to do and would be an appropriate place to do so, given the significant safety threat posed by these pipelines?

Ms. Fleming.

Ms. FLEMING. I know you're trying to back me in a corner, here, but we have not looked at this issue. I mean, from what you're saying, obviously it sounds like it's an important issue for folks to get behind. GAO has not looked at this issue. And so, it's hard for me to——

Senator MARKEY. I can't——

Ms. FLEMING.—to validate it. But, obviously, we're willing to work with the Committee if this is something that we can help with.

Senator MARKEY. Mr. Hart.

Mr. HART. Our experience has shown us that cast iron was not such a bad idea, back in the days when natural gas had more moisture content in it. But as we have intentionally removed the moisture content, that's resulted in seals in those pipelines failing, which now has created a huge problem. So, no question there is a serious need for improvement.

Senator MARKEY. Is it—Mr. Bellamy, is it good for us to look at something that saves people money and makes them more safe? Is

that something that we should perhaps take a look at as we're re-authorizing this bill?

Mr. BELLAMY. When you put it that way, how can I refuse?

[Laughter.]

Mr. BELLAMY. How could I—but, the—my role here, we're a provider of technology. What I can talk about with some confidence is what's happening amongst my colleagues and competitors in the industry to provide solutions for (a) replacing pipe—and the replacement by polyethylene pipe is known technology, it's used extensively around the world, not just here in the United States. I think the other issue is for those pipelines—cast iron pipelines that need to be inspected, there are active programs underway, and there are people offering services into the industry today, and they are being used.

Senator MARKEY. Yes, we have these old cities up in Boston that they were installing the stuff 100 years ago—

Mr. BELLAMY. Yes.

Senator MARKEY. —120 years ago. It was a good idea then, but you've got to update the idea once in a while. OK? Especially if you know that the old idea might have a few holes in it and might need some additional, you know, help—replacement. And so, that's kind of where we are. We know it's a problem. We know that the old was great, served well. But, sometimes you just need, you know, to take a look at it. And \$20 billion is a lot of money to be losing in natural gas going up into the—going up out of those holes, and methane, you know, warming the planet, and explosions that are all related to the very same issue. And we know that we can create jobs in America by finding a mechanism by which we encourage the industry to do this work. And we can put, you know, utility workers and steel workers and plumbers and pipefitters and all these people out there doing the work, which we know has to be done. This thing is just growing as a problem as each and every week and year goes by.

And I just hope, Madam Chair, that we can work together on this issue, and especially the older, aging cities in New Jersey, in Connecticut, in Massachusetts. It's just a growing problem. And maybe in the, you know, the newer industrialized cities it hasn't quite reached that same level yet. But, for us, it's a big problem. And I'd just ask that it be put on the table and we'd be able to work together on it.

So, I thank you.

I thank you all for your participation.

Senator FISCHER. Thank you, Senator Markey.

Senator Blumenthal.

**STATEMENT OF HON. RICHARD BLUMENTHAL,
U.S. SENATOR FROM CONNECTICUT**

Senator BLUMENTHAL. Thank you, Madam Chair.

Welcome. Thank you for being here.

Connecticut is expanding its pipeline gas transmission capacity. And so, this hearing is very timely for us. For all the reasons that have been well demonstrated at this hearing, there is a very severe and serious problem with the current system of oversight.

Chairman Hart, you've indicated in your testimony that, since the year 2000, NTSB has made 64 recommendations for safety. Only one has been closed in an unacceptable status. How many have been closed in an acceptable status? How many have been acted upon?

Mr. HART. Approximately half.

Senator BLUMENTHAL. So, that's about—close to 40.

Mr. HART. Correct.

Senator BLUMENTHAL. And are some of those serious?

Mr. HART. Well, I mean, they range the—they fall on the entire spectrum from very serious to not so serious, but the—we have gotten good cooperation, in general, from PHMSA. We've had some situations where pushing them is a little harder in some areas than in others. But, in general, the—we're getting good cooperation from them.

Senator BLUMENTHAL. When you say "good cooperation," they haven't completed them.

Mr. HART. Well, some—

Senator BLUMENTHAL. So, they've been cooperative in giving you excuses, but not in doing the work.

Mr. HART. The reason that we have to recommend them is because we know they're difficult, so, you know, we're working with them to try to get the things done that we need to be done.

Senator BLUMENTHAL. They're difficult, but serious and important.

Mr. HART. Yes.

Senator BLUMENTHAL. They matter to public safety.

Mr. HART. Yes.

Senator BLUMENTHAL. They matter to environmental preservation.

Mr. HART. Yes, but—that's not really our focus. But, I'm sure they do, yes.

Senator BLUMENTHAL. In October 2014, Senator Blunt and I sent a letter to PHMSA inquiring about the agency's oversight of gathering pipelines—I have a copy of it here; I don't know whether you've seen it—inquiring about the agency's oversight of these particular pipelines or pipes that transport oil and gas to refining facilities. And that letter was in response to the GAO's report—you've mentioned it today—where gathering pipelines have traditionally been constructed at about 2 to 12 inches in diameter to handle 800 pounds per square inch of pressure. In recent years, because of the recent gas boom in the United States, those pipelines are now—those kinds of pipelines now being constructed at, I believe, 24 to 36 inches, and operating at approximately 1,400 psi. In other words, to be real blunt, these gathering pipelines are being used well beyond their capacity. That's a serious public safety threat, is it not?

Mr. HART. I'd have to get back to you with respect to whether we've investigated any gathering pipeline accidents. I'm not aware that we have, but I'd have to get back to you if we have. That's—we go where the accidents are, basically.

Senator BLUMENTHAL. If you have, I'd like to know about it.

Mr. HART. Yes.

Senator BLUMENTHAL. If you haven't, I'd like to know whether you consider it something that you should be——

Mr. HART. We'll be glad to get back to you with our—with respect to our accident investigation history on that one.

Senator BLUMENTHAL. These bigger gathering pipelines pose a greater threat because, if they rupture, obviously they can contaminate a larger area. And PHMSA has the authority to regulate those lines, but its oversight has been limited. In fact, in November 2014, I received a response that said, "PHMSA plans a 2015 rulemaking to begin gathering data on operators of gathering pipelines." Has that rule been issued?

Mr. HART. I don't know.

Senator BLUMENTHAL. Well——

Mr. HART. Were you asking me? I'm not aware of whether it has, or not.

Senator BLUMENTHAL. It has not been issued.

Mr. HART. OK.

Senator BLUMENTHAL. To my——

Ms. FLEMING. It has not.

Senator BLUMENTHAL. To my knowledge, the process of rule-making has not begun. I would be glad to be contradicted on that point.

Long and short, as my time is expiring, it seems to me that this agency, basically, is in need of serious reform. Whether it is regulatory capture or lack of resources, lack of determination and will, PHMSA needs an overhaul. Would you agree, or not?

Mr. HART. We haven't done an assessment of how well PHMSA is working. All I can comment on is how well they have worked with us on the accident that we have investigated.

Senator BLUMENTHAL. And this point is not necessarily personal in criticism of anybody there. If it's lack of resources and authority, they should be given both. If there is too much coziness with the industry, there should be an investigation of it, would you agree?

Mr. HART. Again, these are all questions that are not in our lane, because we go where the accidents are. I hate to keep harking back to that answer, but we go where the accidents are. If we see——

Senator BLUMENTHAL. Well, if——

Mr. HART.—more accidents——

Senator BLUMENTHAL.—if anyone else has thoughts about this issue, I would welcome them.

Unfortunately, my time is expired. I'm willing to bet that you could probably fit on the floor of the United States Senate everybody in the United States of America who knows what PHMSA is. And yet, its role in American energy production and transmission is vitally important. We all should be on the same side of safety in gas transmission—natural gas and, in fact, all transmission facilities.

So, I welcome—and I express my thanks to each of you for your participation today in this very important topic.

Thank you.

Senator FISCHER. Thank you, Senator Blumenthal.

The hearing record will remain open for 2 weeks. And, during that time, Senators are asked to submit any questions for the record. I know I'll be submitting some. Mr. McCallister, you'll get

some with regards to what your company and other companies are doing to replace those pipelines that are currently there and need replacing, and maybe to clarify that gathering pipelines are there when we have refineries, as well. So, upon receipt of those questions, I would ask that—the witnesses are requested to submit their written answers to the Committee as soon as possible.

With that, I will conclude the hearing. And I thank all of you on the panel for being here today.

Thank you.

[Whereupon, at 2:30 p.m., the hearing was adjourned.]

A P P E N D I X

RESPONSE TO WRITTEN QUESTION SUBMITTED BY HON. DEB FISCHER TO SUSAN A. FLEMING

Question. Ms. Fleming, in GAO's 2013 report, you found that PHMSA should reassess its requirements that pipeline operators inspect pipeline every seven years. Your report found that a risk-based approach would require, depending on the characteristics of the pipeline, for PHMSA to require inspections on more or less frequent intervals. Can you please elaborate on what a more risk-based system would look like? Would this help PHMSA to provide better allocation of its resources?

Answer. At the request of a congressional committee, in 2008 PHMSA described how it would establish and enforce risk-based criteria for extending the 7-year reassessment interval for natural gas transmission pipelines. PHMSA proposed retaining the current 7-year reassessment requirement, but establishing a process by which operators could use risk-based reassessment intervals longer than 7 years if they met certain potential criteria, such as demonstrating sound risk analysis. This process would be similar to that used by PHMSA for hazardous liquid pipeline reassessment intervals.

It is unclear whether moving toward a more risk-based system for reassessing the integrity of natural gas transmission pipelines would allow PHMSA to better allocate resources. In fact, implementing risk-based reassessment intervals longer than 7 years could exacerbate current workload, staffing, and expertise challenges for regulators and operators. For example, PHMSA officials told us that allowing longer intervals could require inspectors to spend more time and resources than they do currently to verify that operators appropriately assessed risk, and state pipeline safety offices we met with noted potential concerns with staffing and training to effectively evaluate risk-based reassessment intervals. In light of these uncertainties regarding the impact of extending reassessment intervals to be longer than 7 years, we recommended that PHMSA collect information on the resources needed to implement such a change. PHMSA is studying the potential to implement risk-based reassessment intervals that are longer than 7 years for natural gas transmission pipelines; agency officials plan to complete this research by March 2016.

RESPONSE TO WRITTEN QUESTIONS SUBMITTED BY HON. CORY BOOKER TO SUSAN A. FLEMING

Question 1. Technology advancements are changing how business is conducted in virtually every industry across this country and around the globe. That said, I'm troubled by the fact that extremely dangerous materials are travelling through communities every day, yet, in the pipeline industry, we're still spray painting lines on the ground to identify the location of pipelines. And we're also still seeing far too many accidents where pipelines are inadvertently being hit. According to PHMSA, pipeline incidents result in dozens of injuries and more than \$500 million in property damage each year. What are some of the developing ideas and technologies companies should be considering to make pipelines safer? How can we make pipelines more intelligent?

Answer. While our work has not specifically addressed developing ideas and technologies to improve pipeline safety, our January 2013 report recommended that PHMSA improve its guidance to operators on whether to install automated valves (see GAO-13-168). PHMSA plans to publish a Notice of Proposed Rulemaking on this issue in March 2016.

Question 1a. How can the Federal Government help advance the adoption of developing technologies?

Answer. We have not conducted the work necessary to answer this question.

RESPONSE TO WRITTEN QUESTIONS SUBMITTED BY HON. JOE MANCHIN TO
SUSAN A. FLEMING

Question 1. Pipeline safety regulations are designed to protect the public and the environment. Gathering pipelines associated with horizontal wells being drilled in the active shale plays are much larger in diameter and are operating at “transmission pipeline” pressures (in excess of 1000 psig). While many of these large diameter, high pressure gathering lines are built to the safety standards of pipeline regulations, they are not required to be built to these standards. For example, there is a new gathering pipeline being built in central West Virginia that is 30 inches in diameter and operating at 1250 psig. However, because of the current language in the gas pipeline regulations, the majority of the pipeline is unregulated by either the State or Federal Government.

In addition, several pipeline failures resulting in reportable spills in these unregulated gathering pipelines have occurred in West Virginia in 2015. But because these pipelines are unregulated by the Pipeline and Hazardous Materials Safety Administration (PHMSA) or the State, there is no requirement to investigate and determine failure causes or take any corrective actions.

Should PHMSA update their rules and regulations to address the growth of domestic shale production and the increased size and pressures of the gathering lines in use today?

Answer. Yes, we believe that PHMSA should update its rules and regulations to address the growth of domestic shale production and the increased size and pressures of the gathering lines in use today. We have previously recommended actions to improve PHMSA’s ability to identify and address risks posed by gathering pipelines, including moving forward with proposed rulemaking. In 2012, we found that changes in operating environments—including the increased extraction of oil and gas from shale—could increase the safety risks for federally unregulated gathering pipelines (see GAO–12–388). We recommended that PHMSA collect data from operators of federally unregulated onshore hazardous liquid and gas gathering pipelines to better identify the safety risks posed by such pipelines. The data should be comparable to what PHMSA collects annually from operators of regulated gathering pipelines (*e.g.*, fatalities, injuries, property damage, location, mileage, size, operating pressure, maintenance history, and the causes and consequences of incidents). In 2014, we found that construction of larger, higher-pressure gathering pipelines had increased due to the increased production of oil and gas, raising safety concerns because an incident could affect a greater area than an incident from a smaller, lower-pressure pipeline (see GAO–14–667). We recommended that PHMSA move forward with a Notice of Proposed Rulemaking to address gathering pipeline safety that considers the risks of larger-diameter, higher-pressure federally unregulated gathering pipelines, including subjecting such pipelines to emergency response planning requirements that currently do not apply. In July 2015, PHMSA officials told us the proposed regulations the agency expected to publish later in the year would address these recommendations. PHMSA issued a proposed regulation for hazardous liquid pipelines in October 2015 and plans to issue a proposed regulation for gas pipelines in November 2015.

Question 1a. Should the regulations be updated with additional requirements for siting or placement of new pipelines to help protect the public?

Answer. Our 2012 and 2014 recommendations were designed to improve PHMSA’s ability to identify and address risks posed by gathering pipelines, but did not specifically address the siting of new pipelines. Nonetheless, we found in our 2012 report on gathering pipeline safety that, according to responses to our survey of state pipeline safety agencies and interviews with industry officials, increased urbanization has caused rural areas to become more densely populated and, in some cases, developments have encroached on existing pipeline rights-of-way (see GAO–12–388). Additionally, in our 2014 report on oil and gas transportation, we found that a citizens’ awareness group in Pennsylvania had documented construction of several unregulated gathering pipelines with diameters larger than that of traditional gathering pipelines (see GAO–14–667). The group argued that while these gathering pipelines were in rural areas, they were being built unnecessarily close to homes.

RESPONSE TO WRITTEN QUESTIONS SUBMITTED BY HON. GARY PETERS TO
SUSAN A. FLEMING

Question 1. To your knowledge, does DOT/PHMSA have the authority to shut down a pipeline to prevent accidents from an imminent threat, or has that ever happened in the past?

Answer. 49 C.F.R. § 190.233 specifies that, if PHMSA determines that operation of a particular pipeline facility would result in the likelihood of serious harm to life, property, or the environment, PHMSA may require the owner or operator of the facility to suspend or restrict use of the facility until PHMSA determines that the facility is no longer hazardous. We have not conducted the work necessary to determine the extent to which PHMSA has taken this action in the past.

Question 2. Would more transparency of response plans, including the protocols for how PHMSA reviews and approves response plans, or other information help federal, state, and local responders act more effectively in the event of an incident?

Answer. Our prior work on pipeline operator incident response did not address the transparency of response plans. However, in January 2013, we concluded that PHMSA has an opportunity to improve incident response times and recommended that PHMSA improve the reliability of data that could be used to evaluate whether to implement a performance-based incident response framework (see GAO-13-168). In July 2015, PHMSA officials told us they have taken several steps towards addressing this recommendation, including requiring that operators report specific pieces of information regarding an incident. Additionally, PHMSA officials said that, later this year, they plan to propose further changes that will result in the collection of additional data the agency can use to better track incident response times. PHMSA officials also said they plan to develop a more specific performance-based standard for incident response as part of an upcoming rulemaking on rupture detection and valve rules.

Question 3. What studies have been conducted and reports issued (since the U.S. Department of Transportation's "Common Ground Study") regarding the success or shortcomings of "811", "call before you dig", "miss-utility", or "one-call" systems? What recommendations for improvement have been made, particularly with regard to the collection and maintenance of accurate location data?

Answer. Our 2012 report on gathering pipelines found that 16 state agencies we surveyed reported that the unknown or uncertain location of federally unregulated gathering pipelines presents a moderate or high safety risk, and that knowing such information can be useful for "Call Before You Dig" programs (see GAO-12-388). However, our work did not specifically address the success or shortcomings of such programs.

RESPONSE TO WRITTEN QUESTIONS SUBMITTED BY HON. CORY BOOKER TO
HON. CHRISTOPHER A. HART

Question 1. Technology advancements are changing how business is conducted in virtually every industry across this country and around the globe. That said, I'm troubled by the fact that extremely dangerous materials are travelling through communities every day, yet, in the pipeline industry, we're still spray painting lines on the ground to identify the location of pipelines. And we're also still seeing far too many accidents where pipelines are inadvertently being hit. According to PHMSA, pipeline incidents result in dozens of injuries and more than \$500 million in property damage each year. What are some of the developing ideas and technologies companies should be considering to make pipelines safer? How can we make pipelines more intelligent?

Answer. Excavation damage is a leading cause of harm to people. PHMSA regulations include requirements for installing permanent markers along the right-of-way wherever necessary to identify the location of the line or main to reduce the possibility of damage or interference (49 CFR 192.707 and 195.410). Markers warn that a transmission pipeline is located in the area, identify the product transported in the line, and provide the name of the pipeline operator and a telephone number to call in the event of an emergency.

49 CFR 192.616 and 195.440 require operators to have a written program addressing public awareness, including use of a one-call notification system prior to excavation and other damage prevention activities. The regulation incorporates by reference the American Petroleum Institute (API) Recommended Practice API RP 1162 Public Awareness Programs for Pipeline Operators.

Operators use high-technology devices, similar to metal detectors, to accurately locate the buried pipeline. They use spray paint or other suitable indicators only to

identify the buried pipeline. Pipeline hits result when the operator is not notified of the intended work to locate and mark the buried pipelines, and when powered excavating equipment is incorrectly used in the vicinity of marked or unmarked pipelines.

The industry frequently evaluates and adopts improved methods for informing the public of the legal requirements to notify the operator using the national 811 “call before you dig” system to ensure the buried pipeline and other utilities are properly marked.

Question 1a. How can the Federal Government help advance the adoption of developing technologies?

Answer. A full array of technologies continues to be developed that involve acoustical monitoring and other sensing methods, better leak detection, and better pipeline assessment technologies using in-line inspection.

Federal agencies can provide funding to research and development (R&D) programs and incentivize the private industry, which owns the bulk of the 2.6 million miles of pipelines in the United States, to ramp up investment in R&D.

PHMSA must continue to work closely with independent organizations, such as the API and other industry stakeholders, to advance technology related to safe pipeline operations.

RESPONSE TO WRITTEN QUESTIONS SUBMITTED BY HON. JOE MANCHIN TO
HON. CHRISTOPHER A. HART

Question 1. Pipeline safety regulations are designed to protect the public and the environment. Gathering pipelines associated with horizontal wells being drilled in the active shale plays are much larger in diameter and are operating at “transmission pipeline” pressures (in excess of 1000 psig). While many of these large diameter, high pressure gathering lines are built to the safety standards of pipeline regulations, they are not required to be built to these standards. For example, there is a new gathering pipeline being built in central West Virginia that is 30 inches in diameter and operating at 1250 psig. However, because of the current language in the gas pipeline regulations, the majority of the pipeline is unregulated by either the State or Federal Government.

In addition, several pipeline failures resulting in reportable spills in these unregulated gathering pipelines have occurred in West Virginia in 2015. But because these pipelines are unregulated by the Pipeline and Hazardous Materials Safety Administration (PHMSA) or the State, there is no requirement to investigate and determine failure causes or take any corrective actions.

Should PHMSA update their rules and regulations to address the growth of domestic shale production and the increased size and pressures of the gathering lines in use today?

Answer. The NTSB has not investigated accidents involving gathering lines and, therefore, has not issued any recommendations regarding PHMSA’s regulations regarding gathering lines. These accidents typically occur in more rural areas and have not involved the injuries or fatalities that would meet NTSB accident launch criteria.

The criteria for determining those onshore natural gas gathering pipelines regulated by PHMSA are contained in 49 CFR 192.8 and vary based on pipeline material, operating stress, and class location. PHMSA is also collecting data to help it assess whether to expand the regulations to gathering lines not currently regulated.

As with any rulemaking undertaken by agencies such as PHMSA, the ultimate success or expansion of the regulations will largely be determined by the ability to justify safety improvements against the cost burden on the operator.

Question 1a. Should the regulations be updated with additional requirements for siting or placement of new pipelines to help protect the public?

Answer. The Federal Energy Regulatory Commission (FERC) oversees new pipeline routing for interstate natural gas pipelines. State and local agencies oversee intrastate pipeline and hazardous liquid inter/intrastate pipeline routing. NTSB has not issued any recommendations to the FERC or the states regarding pipeline routing because we have not investigated accidents in which routing was a factor.

In January 2015, PHMSA and FEMA released a new hazard mitigation guidance document prepared by the Pipelines and Informed Planning Alliance (PIPA) Communication Team. *Hazard Mitigation Planning: Practices for Land Use Planning and Development near Pipelines* outlines best practices for communities to reduce risks from pipeline incidents, including those caused by natural hazards.

RESPONSE TO WRITTEN QUESTIONS SUBMITTED BY HON. GARY PETERS TO
HON. CHRISTOPHER A. HART

Question 1. Has NTSB looked at improvements in PHMSA spill response criteria, and if so, do you see a need for elevated criteria in demonstrating an effective response plan?

Answer. Yes, the NTSB closely examines operator spill response plans and actions, as well as the local, state, and Federal actions involved in a hazardous liquid accident. For example, the NTSB identified numerous shortcomings in the Enbridge Marshal, Michigan, crude oil accident spill response. Our investigation also identified shortcomings in the PHMSA facility response plan regulations and the PHMSA response plan review process. The Board issued recommendations to the U.S. Department of Transportation, PHMSA, and Enbridge addressing spill response (NTSB PAR-12/01).

Question 2. What has been NTSB's recent actions regarding location issues, with regard to how surveying and mapping, or "as-built" drawings and records, and infrastructure location can enhance public safety, environmental protection and the economy by strengthening the accurate location (surveying and mapping) of such pipelines and other forms of underground utility infrastructure?

Answer. In January 2015, the NTSB released a Safety Study, entitled *Integrity Management of Gas Transmission Pipelines in High Consequence Areas* (SS-15-01). The study findings discussed improving data collection and reporting, including geospatial data. The Board issued recommendations to PHMSA addressing the National Pipeline Mapping System, improving standards addressing the use of geospatial data, and the process for identifying high consequence areas.

RESPONSE TO WRITTEN QUESTIONS SUBMITTED BY HON. CORY BOOKER TO
MICHAEL BELLAMY

Question 1. Technology advancements are changing how business is conducted in virtually every industry across this country and around the globe. That said, I'm troubled by the fact that extremely dangerous materials are travelling through communities every day, yet, in the pipeline industry, we're still spray painting lines on the ground to identify the location of pipelines. And we're also still seeing far too many accidents where pipelines are inadvertently being hit. According to PHMSA, pipeline incidents result in dozens of injuries and more than \$500 million in property damage each year.

The pipeline industry shares the Senator's concern regarding what is referred to as "third-party" damage and the industry has gone to great lengths to work with state and local officials to prevent this damage. Rights-of-way for the interstate lines are clearly marked.

This problem extends to water and electric lines as well as gas and oil transmission lines and the "One-Call" system has been adopted to notify officials with "one call" when excavation is to take place so that the location of the lines on that particular piece of property can be marked.

The problem isn't that the operators don't know where the lines are, rather it lies with those persons who start to dig without first determining the pipeline's location.

The pipeline operators between them spend millions of dollars on education programs, but if someone installing a septic system or a farmer digging a pond doesn't use the "One-Call" system to have underground utilities marked, tragedy can occur.

New technology in the form of surveillance data use from multiple sensing systems both static and dynamic are being developed, utilizing new imagery techniques to prevent encroachment of unauthorized excavations. These need FAA approval as well as landowners permitting to install the static sensors, which legislation could assist with.

What are some of the developing ideas and technologies companies should be considering to make pipelines safer? How can we make pipelines more intelligent?

Answer. The first step in making pipelines more intelligent is to understand, assess and use the data collected over years of operation and integrate it with current technology-driven data to understand how the past can help make the future safer; moving towards a "predictive" approach to safety. GE's Intelligent Pipeline Solutions program is a model of what can be done.

Our technology feeds critical data into an integrated solution so operators have the data they need to safely manage their assets, manage potential issues before they become an incident, and enhance stakeholder communications. The technology integrates operational data with external sources of data such as weather, seismic and repair information, and combines them into one solution that delivers a digital

reference of all the assets in the pipeline network, plus insight into the threat factors impacting performance. This current information allows an organization to run dynamic modeling on threat factors and mitigation strategies, with the outcome of optimizing production while minimizing maintenance spend and risk exposure. It provides a critical foundation for addressing enterprise data organization and management, streamlining regulatory preparedness and supports a proactive approach to pipeline safety management.

For example, advances in technology, such as ground motion sensors, listening sensors, and unmanned aerial vehicles with high resolution cameras and odor detection enable new surveillance methods that improve security along and within the Right of Way (ROW). This provides a “view” of potential unauthorized or illegal digging activities on the ROW.

Question 1a. How can the Federal Government help advance the adoption of developing technologies?

Answer. API’s recently published Recommended Practice 1173 provides guidance for the industry to move to an Intelligent Pipeline System platform. Incorporation of API1173 into regulations by reference will encourage migration to more contemporary data management approaches.

Comparing the adoption of technologies between countries with goal-based approaches to pipeline regulation that allow alternative ways of achieving compliance, and those countries that have a more prescriptive approach in that they specify the means of achieving compliance, GE notes that those with a goal-based approach tend to have faster rates of new technology adoption.

The encouragement of pipeline owners and operators to allow developing technology to be tested on live systems (tariff or other types of incentives of some kind) will help further advance progress. Government grants for R&D to assist in the funding of such programs will also add to the opportunity for partnerships with industry. For many years, PHMSA was a funding participant in public-private partnerships to develop advanced safety technology, but this practice does not continue today. It should be reinstated. Deploying computerized safety measures or operating intelligent pipeline principals wherever practical should be used to drive the industry forward. Perhaps commitments to use new technology could be used as mitigants to operational risks or to optimize inspection intervals. Operators should be encouraged to participate in pilot programs to experiment with new technology approaches in a controlled and safe manner.

RESPONSE TO WRITTEN QUESTIONS SUBMITTED BY HON. JOE MANCHIN TO
MICHAEL BELLAMY

Question 1. Pipeline safety regulations are designed to protect the public and the environment. Gathering pipelines associated with horizontal wells being drilled in the active shale plays are much larger in diameter and are operating at “transmission pipeline” pressures (in excess of 1000 psig). While many of these large diameter, high pressure gathering lines are built to the safety standards of pipeline regulations, they are not required to be built to these standards. For example, there is a new gathering pipeline being built in central West Virginia that is 30 inches in diameter and operating at 1250 psig. However, because of the current language in the gas pipeline regulations, the majority of the pipeline is unregulated by either the State or Federal Government.

In addition, several pipeline failures resulting in reportable spills in these unregulated gathering pipelines have occurred in West Virginia in 2015. But because these pipelines are unregulated by the Pipeline and Hazardous Materials Safety Administration (PHMSA) or the State, there is no requirement to investigate and determine failure causes or take any corrective actions.

Should PHMSA update their rules and regulations to address the growth of domestic shale production and the increased size and pressures of the gathering lines in use today?

Answer. The advent of the shale gas revolution in the U.S. has precipitated the need for expanding gathering line systems. These systems can be large and are generally under regulation by a state agency.

While state regulatory frameworks vary, it is safe to say that there is no significant move to make these gathering systems ILI capable. Because the shale reserves are sometimes near communities and other high consequence areas, a case can be made that some gathering lines should require inspections using the best available technology. PII is willing to work with any state jurisdiction interested in understanding ILI technology and the nature of pipeline specifications that will allow its use.

Question 1a. Should the regulations be updated with additional requirements for siting or placement of new pipelines to help protect the public?

Answer. The siting or placement of new pipelines is outside of the scope of interest of GE Pipelines Solutions, we would therefore defer to “no comment” on this question.

RESPONSE TO WRITTEN QUESTION SUBMITTED BY HON. GARY PETERS TO
MICHAEL BELLAMY

Question. Are there many pipelines that can’t be inspected using the best technology available, and for those pipelines that can’t be inspected using best available technology, do you think those pipelines (and the surrounding area) should have a higher burden of proof when it comes to safety?

Answer. Interstate gas and oil transmission lines are regulated by PHMSA. Industry consensus estimates suggest that approximately 40 percent are unsuitable for inspection using currently available smart pig technology for a variety of reasons. The vast majority of new pipelines are constructed to be compatible with ILI tools, and many pipeline operators continue to upgrade their pipelines so as to make them ILI compatible, and thus benefit from application of the most advanced technology as it continues to develop.

PHMSA supports using the best available technology in high consequence areas; that is we support inspecting those lines with In Line Inspection (smart pig) equipment. Obviously, our first choice for difficult to ILI pipelines in high consequence areas would be to make those lines ILI compatible. Where that is not possible, on occasion we might be able to modify the ILI tools to allow them to be used in pipelines which were previously incompatible for ILI.

But, to the extent that pipelines cannot be made physically compatible for ILI, a number of other less comprehensive inspection methodologies are available. For example, operators can choose Direct Assessment inspection and/or hydrostatic testing, and there may be other operational opportunities to reduce risk. Further, some of the data technology being developed by GE in regard to “intelligent pipeline solutions” may be useful to monitor pipelines in high consequence areas.

RESPONSE TO WRITTEN QUESTIONS SUBMITTED BY HON. CORY BOOKER TO
DONALD F. SANTA

Question 1. Technology advancements are changing how business is conducted in virtually every industry across this country and around the globe. That said, I’m troubled by the fact that extremely dangerous materials are travelling through communities every day, yet, in the pipeline industry, we’re still spray painting lines on the ground to identify the location of pipelines. And we’re also still seeing far too many accidents where pipelines are inadvertently being hit. According to PHMSA, pipeline incidents result in dozens of injuries and more than \$500 million in property damage each year. What are some of the developing ideas and technologies companies should be considering to make pipelines safer? How can we make pipelines more intelligent?

Answer. Natural gas pipelines are safer today as a result of a number of technological advances over the last 40 years. While there have been advances in materials and equipment, perhaps the most important advance has been the development of in-line inspection technologies. These tools, commonly called “smart pigs,” have developed from rudimentary devices 30 years ago, to much more sophisticated tools today. This is partly a byproduct of the computer and sensor technology advances that have occurred across the entire economy, but also the result of pipeline industry focus on inspection technology.

These technologies will continue to advance and will remain an essential element of further improvements in pipeline safety. For example, the current method for testing the material strength of a pipeline is hydrostatic test—essentially, filling the pipeline with water at high pressures to see if the pipe breaks. This type of testing is expensive, disruptive to service, and actually may damage the pipeline. Developing a non-destructive alternative that can test for material strength is a current focus of pipeline safety research and development.

Question 1a. How can the Federal Government help advance the adoption of developing technologies?

Answer. As mentioned in our written testimony, INGAA supports re-establishing collaborative pipeline safety research and development involving PHMSA and pipeline industry groups. This was the practice until a previous Secretary of Transporta-

tation changed the policy about four years ago. Given the limited resources available within both government and industry, a collaborative effort will help to avoid duplication and will contribute to the more effective development and deployment of new technologies to improve pipeline safety.

RESPONSE TO WRITTEN QUESTIONS SUBMITTED BY HON. JOE MANCHIN TO
DONALD F. SANTA

Question 1. Pipeline safety regulations are designed to protect the public and the environment. Gathering pipelines associated with horizontal wells being drilled in the active shale plays are much larger in diameter and are operating at “transmission pipeline” pressures (in excess of 1000 psig). While many of these large diameter, high pressure gathering lines are built to the safety standards of pipeline regulations, they are not required to be built to these standards. For example, there is a new gathering pipeline being built in central West Virginia that is 30 inches in diameter and operating at 1250 psig. However, because of the current language in the gas pipeline regulations, the majority of the pipeline is unregulated by either the State or Federal Government.

In addition, several pipeline failures resulting in reportable spills in these unregulated gathering pipelines have occurred in West Virginia in 2015. But because these pipelines are unregulated by the Pipeline and Hazardous Materials Safety Administration (PHMSA) or the State, there is no requirement to investigate and determine failure causes or take any corrective actions.

Should PHMSA update their rules and regulations to address the growth of domestic shale production and the increased size and pressures of the gathering lines in use today?

Answer. INGAA represents interstate natural gas transmission pipeline operators. These pipelines have been subject to safety regulation by the U.S. Department of Transportation since 1970. INGAA does not represent gathering line owner/operators, and therefore has no position on gathering line regulation. It is our understanding, however, that the upcoming comprehensive natural gas pipeline rule that PHMSA is preparing will include some policy changes affecting gathering lines.

Question 1a. Should the regulations be updated with additional requirements for siting or placement of new pipelines to help protect the public?

See above.

RESPONSE TO WRITTEN QUESTION SUBMITTED BY HON. GARY PETERS TO
DONALD F. SANTA

Question. Despite a recent boost in appropriations for PHMSA inspectors, it has been noted that it is extremely difficult to recruit and retain quality engineers and professionals to carry out inspections and other PHMSA program work. How can the oil and gas industry assist in making sure we quality individuals that can work together with companies to improve safety for everyone?

Answer. It is our understanding that PHMSA on several occasions has sought “direct hiring authority” from Congress. This authority would enable PHMSA to hire qualified personnel directly, without going through the lengthy Office of Personnel Management process. Removing this impediment would make it easier for PHMSA to hire qualified individuals on a timely basis.

Another possible solution might be contract personnel. Given the highly competitive market for engineers and other skilled professionals, the salary and job location limitations for PHMSA remain significant obstacles to hiring qualified individuals. The appropriate use of private contractors might help to compensate for those limitations.

RESPONSE TO WRITTEN QUESTIONS SUBMITTED BY HON. CORY BOOKER TO
TERRY MCCALLISTER

Question 1. Technology advancements are changing how business is conducted in virtually every industry across this country and around the globe. That said, I’m troubled by the fact that extremely dangerous materials are travelling through communities every day, yet, in the pipeline industry, we’re still spray painting lines on the ground to identify the location of pipelines. And we’re also still seeing far too many accidents where pipelines are inadvertently being hit. According to PHMSA, pipeline incidents result in dozens of injuries and more than \$500 million in property damage each year. What are some of the developing ideas and technologies

companies should be considering to make pipelines safer? How can we make pipelines more intelligent?

Answer. Although significant improvements have been made, excavation damage continues to be a leading threat to the safe operation of pipelines. And most of this damage is due to excavators not calling before they dig, not due to a lack of technology. The industry takes the threat of excavation damage very seriously. PHMSA has collaborated with pipeline operators, other underground utilities, excavators and other stakeholders to form the Common Ground Alliance (CGA), which helped to launch the national 811 Call Before You Dig. The creation of a national and regional CGAs, a national Call Before You Dig number, and public awareness efforts have had a dramatic impact on improving awareness around the importance of calling to get utility lines marked prior to any excavation. In addition, CGA publishes a list of best practices that can help reduce to risk of excavation damage.

As far as new technologies, the industry has several forums that are intended to develop new tools and instruments which can improve the accuracy of pipe locating, enhance the communication of pipe location to the excavator, and provide notification of excavation activity that is occurring in the vicinity of a major pipeline. Included in these forums is PHMSA's annual R&D forum for pipeline safety: <http://phmsa.dot.gov/pipeline/research-development>, the CGA Technology Committee, forums held by the industry research consortiums, and AGA's technical committees and Operations Conference & Exhibition.

In summary, the industry and other stakeholders have worked, and continue to work, diligently to reduce the threat of excavation damages. New technologies can help, but I do not believe technology is always the solution. Enforcement of state laws which will force excavators to call 811 before they dig, and firming up state excavation damage laws, will reduce excavation damages more than technology improvements. Consistent and effective enforcement will result in improved digging practices, particularly for the professional excavators who utilize mechanized equipment.

Question 1a. How can the Federal Government help advance the adoption of developing technologies?

Answer. There are several ways that Federal Government can help to advance the adoption of developing technologies. The first is the continued funding of PHMSA's R&D program and its partnership with industry research consortiums, academia and independent research groups. The second is quicker adoption of new or unconventional technologies. Currently, operators must apply for a special permit to use an alternative technology. PHMSA should be encouraged to review the special permit requests in a timely manner, and encourage more special permits to be filed in order to confirm new technologies meet expectations. As a particular technology becomes more mature, PHMSA should be encouraged to allow its usage so that special permits and applications are no longer required from pipeline operators.

RESPONSE TO WRITTEN QUESTIONS SUBMITTED BY HON. JOE MANCHIN TO
TERRY MCCALLISTER

Question 1. Pipeline safety regulations are designed to protect the public and the environment. Gathering pipelines associated with horizontal wells being drilled in the active shale plays are much larger in diameter and are operating at "transmission pipeline" pressures (in excess of 1000 psig). While many of these large diameter, high pressure gathering lines are built to the safety standards of pipeline regulations, they are not required to be built to these standards. For example, there is a new gathering pipeline being built in central West Virginia that is 30 inches in diameter and operating at 1250 psig. However, because of the current language in the gas pipeline regulations, the majority of the pipeline is unregulated by either the State or Federal Government.

In addition, several pipeline failures resulting in reportable spills in these unregulated gathering pipelines have occurred in West Virginia in 2015. But because these pipelines are unregulated by the Pipeline and Hazardous Materials Safety Administration (PHMSA) or the State, there is no requirement to investigate and determine failure causes or take any corrective actions.

Should PHMSA update their rules and regulations to address the growth of domestic shale production and the increased size and pressures of the gathering lines in use today?

Answer. The members of the American Gas Association deliver natural gas to homes and businesses. Gathering lines are far upstream of these local delivery lines. Therefore, we defer this question to other panel members.

Question 1a. Should the regulations be updated with additional requirements for siting or placement of new pipelines to help protect the public?

Answer. PHMSA's current jurisdiction does not include siting or placement of new pipelines. They have provided assistance to communities building around existing pipelines.

RESPONSE TO WRITTEN QUESTION SUBMITTED BY HON. GARY PETERS TO
TERRY MCCALLISTER

Question. Despite a recent boost in appropriations for PHMSA inspectors, it has been noted that it is extremely difficult to recruit and retain quality engineers and professionals to carry out inspections and other PHMSA program work. How can the oil and gas industry assist in making sure we quality individuals that can work together with companies to improve safety for everyone?

Answer. The American Gas Association believe PHMSA inspectors and state inspectors play a critical role in pipeline safety. AGA was pleased to see Congress provide additional resources for PHMSA in the prior Pipeline Safety reauthorization.

There are a number of initiatives on both the government side and the industry side that are helping to create qualified inspectors, engineers, and energy industry professionals that can work together to improve safety:

- Federal and state pipeline safety inspectors currently receive training on pipeline safety regulations, compliance requirements, inspection techniques, and enforcement procedures. This includes classroom training at the PHMSA Pipeline Safety Training Center in Oklahoma City, OK, and General Pipeline Safety Awareness Course at Leak City in Athens, AL. Federal and state inspectors also have opportunities to participate in state and regional seminars and industry workshops.

What could improve this training is additional hands on experience of pipe materials, components, welding and joining procedures, operations and maintenance activities, and emergency response in both the classroom and the field.

In addition, many operators are willing to assist in educating newer inspectors through field visits, participation in manufacturer demonstrations and even participation in company training programs. These educational opportunities should be outside of an inspector's audit.

Industry has a number of initiatives underway pertaining to workforce development. This includes the creation of a number of company training facilities, new employee training programs, natural gas boot camps, partnerships with technical schools and universities, the Center for Energy Workforce Development, participation in the Utilities Workforce Advisory Council, industry technical committees, AGA's Operations Conference & Exhibition, industry workshops, and even programs on diversity and inclusion. Several of these initiatives actively encourage government's involvement and participation. This includes partnerships with technical schools and universities, participation in the Center for Energy Workforce Development, participation in the Utilities Workforce Advisory Council, participation in AGA's Operations Conference & Exhibition, and participation in many industry workshops.

It should be noted that a number of individuals trained by pipeline operators leave the natural gas company to work for state or Federal Government and the knowledge they gain while working for a utility is transferred to their government position.

There are additional opportunity for industry and government to work together to create qualified individuals that can work together to improve pipeline safety. Several of these opportunities are based on a trust that information will not be used to fine or penalize an operator. For example, as an operator identifies an issue, there is an opportunity for the operator to openly share this information with their Federal or state inspector. These are learning opportunities on both the issue and how an issue is addressed. Operators are unwilling to share these opportunities if they result in a fine or penalty.

This page intentionally left blank.

