



THE SECRETARY OF TRANSPORTATION  
WASHINGTON, D.C. 20590

July 25, 2013

The Honorable John D. Rockefeller IV  
Chairman  
Committee on Commerce, Science, and Transportation  
United States Senate  
Washington, DC 20510

Dear Mr. Chairman:

Enclosed is the U.S. Department of Transportation's Pipeline and Hazardous Materials Safety Administration's Five-Year Interagency Research Development and Demonstration Program Plan for Pipeline Safety and Integrity, as required by Section 32 of the Pipeline Safety, Regulatory Certainty, and Job Creation Act of 2011, Public Law No. 112-90.

The Act requires the Secretary of Transportation, in coordination with the Director of the National Institute of Standards and Technology, as appropriate, to prepare a research and development program plan every 5 years and to transmit a report to Congress every 2 years on the status and the results to date of the implementation of the program.

A similar letter has been sent to the Ranking Member of the Senate Committee on Commerce, Science, and Transportation; the Chairman and Ranking Member of the Senate Committee on Energy and Natural Resources; and the Chairmen and Ranking Members of the House Committees on Energy and Commerce, on Transportation and Infrastructure, and on Science, Space, and Technology.

Sincerely,

A handwritten signature in blue ink, appearing to read "Anthony R. Foxx", is written over a large, stylized blue loop.

Anthony R. Foxx

Enclosure



THE SECRETARY OF TRANSPORTATION  
WASHINGTON, D.C. 20590

July 25, 2013

The Honorable John Thune  
Ranking Member  
Committee on Commerce, Science, and Transportation  
United States Senate  
Washington, DC 20510

Dear Senator Thune:

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THE SECRETARY OF TRANSPORTATION  
WASHINGTON, D.C. 20590

July 25, 2013

The Honorable Bill Shuster  
Chairman  
Committee on Transportation and Infrastructure  
U.S. House of Representatives  
Washington, DC 20515

Dear Mr. Chairman:

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THE SECRETARY OF TRANSPORTATION  
WASHINGTON, D.C. 20590

July 25, 2013

The Honorable Nick J. Rahall, II  
Ranking Member  
Committee on Transportation and Infrastructure  
U.S. House of Representatives  
Washington, DC 20515

Dear Congressman Rahall:

Enclosed is the U.S. Department of Transportation's Pipeline and Hazardous Materials Safety Administration's Five-Year Interagency Research Development and Demonstration Program Plan for Pipeline Safety and Integrity, as required by Section 32 of the Pipeline Safety, Regulatory Certainty, and Job Creation Act of 2011, Public Law No. 112-90.

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Anthony R. Foxx

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THE SECRETARY OF TRANSPORTATION  
WASHINGTON, D.C. 20590

July 25, 2013

The Honorable Lamar Smith  
Chairman  
Committee on Science, Space, and Technology  
U.S. House of Representatives  
Washington, DC 20515

Dear Mr. Chairman:

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THE SECRETARY OF TRANSPORTATION  
WASHINGTON, D.C. 20590

July 25, 2013

The Honorable Eddie Bernice Johnson  
Ranking Member  
Committee on Science, Space, and Technology  
U.S. House of Representatives  
Washington, DC 20515

Dear Congresswoman Johnson:

Enclosed is the U.S. Department of Transportation's Pipeline and Hazardous Materials Safety Administration's Five-Year Interagency Research Development and Demonstration Program Plan for Pipeline Safety and Integrity, as required by Section 32 of the Pipeline Safety, Regulatory Certainty, and Job Creation Act of 2011, Public Law No. 112-90.

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THE SECRETARY OF TRANSPORTATION  
WASHINGTON, D.C. 20590

July 25, 2013

The Honorable Ron Wyden  
Chairman  
Committee on Energy and Natural Resources  
United States Senate  
Washington, DC 20510

Dear Mr. Chairman:

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THE SECRETARY OF TRANSPORTATION  
WASHINGTON, D.C. 20590

July 25, 2013

The Honorable Lisa Murkowski  
Ranking Member  
Committee on Energy and Natural Resources  
United States Senate  
Washington, DC 20510

Dear Senator Murkowski:

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THE SECRETARY OF TRANSPORTATION  
WASHINGTON, D.C. 20590

July 25, 2013

The Honorable Fred Upton  
Chairman  
Committee on Energy and Commerce  
U.S. House of Representatives  
Washington, DC 20515

Dear Mr. Chairman:

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THE SECRETARY OF TRANSPORTATION  
WASHINGTON, D.C. 20590

July 25, 2013

The Honorable Henry A. Waxman  
Ranking Member  
Committee on Energy and Commerce  
U.S. House of Representatives  
Washington, DC 20515

Dear Congressman Waxman:

Enclosed is the U.S. Department of Transportation's Pipeline and Hazardous Materials Safety Administration's Five-Year Interagency Research Development and Demonstration Program Plan for Pipeline Safety and Integrity, as required by Section 32 of the Pipeline Safety, Regulatory Certainty, and Job Creation Act of 2011, Public Law No. 112-90.

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# **Five-Year Interagency Research Development and Demonstration Program Plan**

For Pipeline Safety and Integrity

**Department of Transportation and  
Department of Commerce's  
National Institute of Standards and Technology**

**July 2013**

## **FOREWORD**

The Department of Transportation (DOT) and the Department of Commerce (DOC) were officially named as participating agencies in Section 32 of the Pipeline Safety, Regulatory Certainty, and Job Creation Act of 2011 (PSRCJCA 2011 or the Act), Public Law 112-90. The Department of the Interior (DOI) was invited, by the DOT and DOC, into the interagency activities described in this plan even though the DOI was not officially named as a participating agency.

This plan represents program-level areas or strategies where annual coordination and collaborative activities, in addition to related research funding, will be reported for onshore pipelines, primarily. The update reports will describe the success in implementing this plan and will be transmitted to Congress every two years after the submission of this plan as required by Section 32 of the Act.

The DOT was the only participating agency appropriated directly and officially by PSRCJCA 2011 for the purpose of funding pipeline-related research.

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## List of Acronyms

API	American Petroleum Institute
BSEE	Bureau of Safety and Environmental Enforcement
DOC	Department of Commerce
DOI	Department of the Interior
DOT	Department of Transportation
NIST	National Institute of Standards and Technology
OCS	Outer Continental Shelf
OMB	Office of Management and Budget
PSRCJCA 2011	Pipeline Safety, Regulatory Certainty, and Job Creation Act of 2011
PSIA 2002	Pipeline Safety Improvement Act of 2002
PHMSA	Pipeline and Hazardous Materials Safety Administration
R&D	Research and Development
RD&D	Research Development and Demonstration
TA&R	Technology Assessment and Research

## **Five-Year Interagency Research Development and Demonstration Program Plan for Pipeline Safety and Integrity**

As required by Section 32 of the Pipeline Safety, Regulatory Certainty, and Job Creation Act of 2011<sup>1</sup> (PSRCJCA 2011), the Department of Transportation (DOT), with extensive coordination with the Department of Commerce's (DOC's) National Institute of Standards and Technology (NIST), submits this five-year pipeline safety research development and demonstration program plan to Congress. Future biennial reports to Congress will describe the progress in implementing this plan.

### **Executive Summary**

Our nation uses petroleum energy products such as oil and natural gas to heat and cool homes and businesses, produce electricity, fuel the commercial transportation industry by which virtually all of the commercial products we use are conveyed, and fuel the personal transportation industry that we use for travel. Energy sources also provide raw materials that are manufactured into many industrial and consumer products.

The U.S. pipeline infrastructure of over 2.6 million miles is the primary means of transporting all the natural gas and about two-thirds of all liquid petroleum energy products that are consumed or exported. The importance of energy pipelines to the U.S. economy and standard of living dictates that all stakeholders, including the public, participate in funding pipeline research, to improve safety, supply reliability, productivity, security, and environmental protection.

Recent pipeline tragedies are sharp reminders of the consequences of a failure to effectively manage pipeline integrity. This interagency research program plan is one step toward developing and deploying needed solutions through effective and efficient research coordination.

Section 12 of the Pipeline Safety and Improvement Act of 2002<sup>2</sup> (PSIA 2002) requires that DOT and NIST "carry out a program of research, development, demonstration, and standardization to ensure the integrity of pipeline facilities." Section 32 of the PSRCJCA 2011 requires the DOT and the DOC to develop a Five-Year Interagency Research Development and Demonstration (RD&D) Program Plan to submit to Congress.

This five-year program plan is the result of ongoing collaboration among these agencies. It defines the process for the way the agencies will work together to achieve shared objectives. The first step in working together is to identify focus areas to provide alternatives, avoid the duplication of efforts, and improve communication. This process should result in the ability of agencies to leverage expertise and promote harmonization, as appropriate, in RD&D.

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<sup>1</sup> Pub. L. No. 112-90 (Jan. 3, 2012).

<sup>2</sup> Pub. L. No. 107-355 (Dec. 17, 2002).

Processes described in this plan are designed to help integrate the activities of each participating agency, including collaborative efforts in seeking stakeholder perspectives on critical issues, candidate technologies, and priority areas for RD&D. These processes should serve to maximize the effectiveness of our investment in RD&D. Key methods of collaboration for the participating agencies in the near-term include:

- Periodic interagency meetings to coordinate program activities;
- Attendance and participation in RD&D-related public events that gather stakeholder input on issues, candidate technologies, and development priorities;
- Participation on agency-solicited research merit review panels to identify and recommend complementary research;
- Where appropriate, co-sponsoring research projects that are aimed at developing new technology, that improve current technology, or that relate to national consensus standards;
- Attendance and participation in technology demonstrations involving any co-sponsored or other related key pipeline infrastructure research;
- Participation on agency post-award research peer review panels\*; and
- Ensuring public access to research information, results, and impacts.

*\*Peer review process follows all applicable OMB Guidelines*

In addition, the participating agencies plan to share practices by which the effectiveness of RD&D investments can be monitored and measured.

### **Introduction**

The DOT and the DOC were named as participating agencies in Section 32 of the PSRCJCA of 2011. The Department of the Interior (DOI) was invited by DOT and DOC into the interagency activities described in this plan even though DOI was not officially named as a participating agency. The DOI was invited because of its program expertise in offshore activities. Therefore, DOT, DOC, and DOI are referred to as the “participating agencies”.

Section 32 of PSRCJCA 2011 refers to Section 12, Paragraph 2, of the PSIA 2002 by stating that the consultation guidance must be followed in the preparation of this plan. Specifically, this guidance directs the Secretary of Transportation to “consult with or seek the advice of appropriate representatives of the natural gas, crude oil, and petroleum product pipeline industries, utilities, and manufacturers, institutions of higher learning, Federal agencies, pipeline research institutions, national laboratories, State pipeline safety officials, labor organizations, environmental organizations, pipeline safety advocates, and professional and technical societies.”

The participating agencies have created a Five-Year Interagency RD&D Program Plan that represents program-level areas or strategies where annual coordination, collaborative activities, and related research funding will be reported. The success in implementing this plan will be reported to Congress every two years as required by Section 32.

## 1.0 Interagency Coordination and Collaboration Activities

As stated in PSRCJCA 2011, which incorporates Paragraph 2 of Section 12 of the PSIA 2002, the goal of this Five-Year Interagency RD&D Program Plan is to guide activities needed to carry out a program of research, development, demonstration, and standardization to ensure the integrity of pipeline infrastructure. The attainment of this goal involves recognizing legitimate differences among the priorities of individual agencies and, where conducive, harmonizing these priorities to ensure that critical developmental needs and opportunities are addressed and achieved.

In addition, the participating agencies will take the following joint activities where possible and appropriate to attain the stated goal:

1. *Periodic interagency meetings to coordinate program activities.*
  - a. Each participating agency will periodically schedule and host coordination meetings as needed.
2. *Attendance and participation in RD&D related public events that gather stakeholder input on issues, candidate technologies, and development priorities.*
  - a. Each agency will share public meeting information with the participating agencies on related research meetings in order to provide another agency with time to attend.
  - b. Each agency will review agendas for public or other related research meetings and solicit participating agency involvement where appropriate.
3. *Participate on agency-solicited research merit review panels to identify and recommend complementary research.*
  - a. One representative from each participating agency will be solicited to participate on merit review panels for another agency's pre-award research solicitation.
4. *Where appropriate co-sponsor research projects that are aimed at developing new technologies, that improve current technologies.*
  - a. Agencies will propose opportunities to co-sponsor research projects or other related initiatives where appropriate.
5. *Attend and participate in technology demonstrations involving co-sponsored or other related key pipeline infrastructure research.*
  - a. Each agency will share demonstration information with the participating agencies on related research meetings in order to provide time for another agency to attend.
  - b. In the case where another agency may want to participate, each agency will coordinate any related subject research demonstrations by co-sponsoring or sending related research contractors to participate where appropriate.

6. *Participation on agency post-award research peer review panels\**; and
  - a. One representative from each participating agency will be solicited to participate on post-award peer review panels for another agency.
7. *Ensure public access to research information, results, and impacts.*
  - a. Each agency will publically post project- and program-related activities, investments, impacts relevant to this program plan, and more.

*\*Peer review process follows all applicable OMB Guidelines*

These seven activities create an environment that supports the goals of the plan.

## 2.0 Programmatic Areas of Responsibility

The individual research mission of each agency identifies areas where funded research can be realized within different programmatic areas. Additional information for each program is provided in the Appendix. Table 1 illustrates how each agency is relevant to these areas for onshore pipelines and pipelines located in the Outer Continental Shelf (OCS).

**Table 1: Research Program Areas with Participating Agency Responsibility**

Programmatic Area	Responsibility					
	DOT		DOC		DOI	
	Onshore (a)	OCS (b)	Onshore (c)	OCS (e)	Onshore	OCS (d)
1. Threat Prevention	X	X				X
2. Leak Detection & Mitigation	X	X				X
3. Anomaly Detection & Characterization	X	X	X	X		X
4. Anomaly Remediation & Repair	X	X				X
5. Design, Materials, & Welding/Joining	X	X	X	X		X
6. Alternative Fuels, Climate Change, & Other	X	X	X	X		X
<b>NOTES:</b>						
a. DOT has primary jurisdiction on onshore transmission pipelines.						
b. DOT has mutual jurisdiction with DOI on OCS transmission pipelines.						
c. DOC was identified as a national expert on materials research via PSIA 2002.						
d. DOI is the primary pipeline regulator in the OCS on flow and gathering lines ( <a href="#">43 U.S.C. 1331</a> et seq).						

Each of the participating agencies has sought the advice of representatives from the natural gas, crude oil, and petroleum product pipeline industries, utilities, and manufacturers; institutions of higher learning; Federal agencies; pipeline research institutions; national laboratories; State pipeline safety officials; labor organizations; environmental organizations; pipeline safety advocates; and various technical societies. This was accomplished by each agency, where possible, through meetings and public events that have provided an open dialogue with the above representatives on the many pipeline challenges that exist. The Pipeline and Hazardous Materials Safety Administration (PHMSA) held the Government and Industry Pipeline Research & Development (R&D) Forum in Arlington, Virginia, on July 18-19, 2012, as a way to generate industry input for the research agenda. Please visit the event webpage at [https://primis.phmsa.dot.gov/rd/mtg\\_071812.htm](https://primis.phmsa.dot.gov/rd/mtg_071812.htm) for more information. Gap analysis and road mapping with stakeholders at events like the forum validate that the following six programmatic areas align to today's known pipeline challenges and provide a framework to demonstrate and communicate the interagency coordination and collaboration activities.

### *1. Threat Prevention*

Damage to pipes by excavation and damage from outside forces during transportation or construction continue to be leading causes of pipeline failure for onshore pipelines<sup>3</sup>. Preventing or reducing these threats and the resulting damage to pipelines might improve pipeline safety. Damage from anchor drop/drag can cause failure for OCS pipelines. Mechanical damage can result from a number of causes, including but not limited to contact with mechanized equipment (mechanical contact), fabrication and handling mishaps (fabrication damage), and pipelines settling on rocks (rock dents).

Research in this area may develop new or improved tools and technologies that should reduce damage to pipelines and may prevent releases to the environment. Related research outputs may include pipeline locating technology; emergency response best practices; Right of Way monitoring technology; best practices for preventing damage at steel mills, during transportation, or in ditch; improved padding or backfill techniques; improved coatings and application practices; and best practices for identifying or mitigating geo-forces.

### *2. Leak Detection and Mitigation*

Leak detection continues to present a challenge, especially when small pipeline leaks are involved. Ecological and drinking water resources can be impacted by small, hazardous-liquid pipeline leaks that are not detected quickly. Among the possibilities for improving leak detection are automated monitoring systems that can detect small releases, sensors for small leak detection, technologies for aerial surveillance of airborne chemicals, improvements in the cost and effectiveness of current leak detection systems, and satellite imaging.

Effective leak detection also relies heavily on the environment in which it is installed and operated as well as how well the technology is implemented through people and procedures.

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<sup>3</sup> [http://primis.phmsa.dot.gov/comm/reports/safety/AllPSIDet\\_1993\\_2012\\_US.html?nocache=6212](http://primis.phmsa.dot.gov/comm/reports/safety/AllPSIDet_1993_2012_US.html?nocache=6212)

Research in this area may develop new or improved technology solutions and guidance for reducing the volume of product that is released to the environment.

### *3. Anomaly Detection and Characterization*

Detecting and characterizing anomalies in pipelines requires solutions that use people, processes, and technologies as part of a comprehensive program. The ability to detect anomalies should progress beyond the detection of simple corrosion anomalies and evolve into the detection of complex anomalies that feature dents, gouges, and cracks with possible corrosion characteristics. Solutions for complex defects and interactive threats are key goals in this program element. Detection is the first step in the process of engineering critical assessments; the ability to accurately characterize anomalies requires validated measurement technologies, procedures, and analysis based on referenced standards.

Another emerging concern is the ability of assessment algorithms to correctly calculate the remaining strength of larger anomalies in lower grade steels (under API 5L X70) and various anomalies in higher strength steels (above API 5L X80).

Research in this area may develop new or improved tools, technology, and assessment processes for identifying and locating critical pipeline defects and will improve the capability to characterize the severity of such defects identified in pipeline systems.

### *4. Anomaly/Pipe Remediation and Repair*

Reliable methods to repair damaged coatings and corrosion damage are important to achieving safety goals and promoting continued operation. Research in this area plans to address improving the repair process by bringing automation to market and possibly establishing standards, or best practices for operators and contractors. Composite materials are now more common for pipeline repairs, but further testing is needed to understand their integrity over the long-term while they are exposed to complex loading.

Research in this area may enhance repair materials, techniques or processes, repair tools, and technologies to bring pipeline systems back online quickly.

### *5. Design, Materials, and Welding/Joining*

In some instances, improved pipeline materials and design may mitigate or minimize integrity threats. They can also increase capacity so that pipelines can operate at higher pressures. The welding and joining of these systems may require automation and inspection capabilities that improve the efficiency of construction activities in a safe manner. In addition to an increased demand on material performance in order to realize economic gains, there is a possible need to improve the integrity of the system in remote and harsh environments such as the frontier locations of Alaska and locations offshore. Both environments present unique installation, inspection, maintenance, and performance challenges for the materials. Quality management system guidelines aim to improve construction-related quality, which in turn may reduce the likelihood of girth-weld failures after welding, during the lowering-in (installation) of pipe, during hydrostatic testing, and during the expected service life of the pipeline.

Research in this area may improve the design and construction of safe and long-lasting pipelines that use the most appropriate materials and welding/joining procedures for the operating environment.

*6. Alternative Fuels, Climate Change, and Other*

Reducing integrity threats and sharing new knowledge across the industry on best practices and consensus standards are important actions for promoting the safe pipeline transportation of any alternative fuel. Sometimes, emerging issues for Liquefied Natural Gas, risk, and human factors require broad studies to understand better how they impact the other pipeline safety research activities described in this document. General knowledge research and studies will be conducted as needed when these emerging issues materialize.

Research in this area may identify and remove technical issues that prevent the safe transportation of alternative fuels in pipelines and will address other emerging technological or policy issues of a national scale.

### 3.0 Management Plan

The five-step process depicted in Figure 1 represents an interagency consensus of the appropriate steps for systematically executing this plan. This process facilitates and embodies the desired goals and hallmarks throughout the five steps and captures the philosophy of “continuous improvement” that all private and public research interests embrace.

The participating agencies may hold public events to address a number of pipeline challenges. These events are key opportunities to generate consensus-driven research topics. Each agency will invite the other participating agencies to those events, if applicable, in order to keep them involved and aware. The participating agencies are also reaching out to the stakeholder types identified in PSIA 2002, Section 12, Paragraph 2 and are sharing the insights that are gathered with each agency. This research plan embodies programmatic priorities at this time as recommended by coordination with stakeholders. Interagency meetings will also discuss other individual investments to prevent duplication of efforts and to validate that moving forward on a given research area creates complimentary opportunities that will increase the likelihood for successful research.

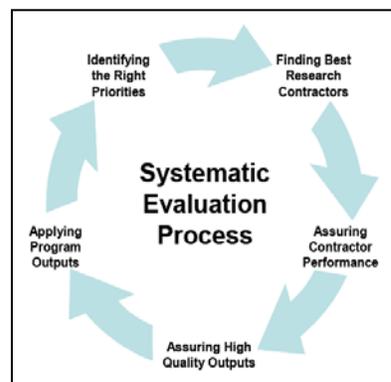


Figure 1

The participating agencies will participate on the merit review panels of each agency’s solicitation to further reduce duplication and leverage expertise. Joint evaluation will recommend the best researchers for the solicited topics. Both the periodic coordination meetings and joint pre-award reviews will identify potential projects for joint funding where appropriate.

Interagency coordination meetings will also share program- and project-level management approaches and best practices with managing awards.

Promoting the quality of results is a recurring activity throughout the life of a research project. Each agency has a formal process for addressing the research considerations for quality coming from the Information Quality Act<sup>4</sup> and policy and procedural information issued by the OMB. The participating agencies, where appropriate, will invite representatives from the participating agencies to the review panels for the post-award peer reviews of their research portfolios. This activity, just like in the pre-award merit review panels, continues the coordination goals of this plan, and more importantly, it improves the quality of the funded research.

Disseminating research results-to-date and applying research outputs to the market reflect the wide range of actions the participating agencies intend to take. Technology demonstrations are a means of evaluating the merit of technologies that are reaching the prototype stage. The participating agencies will utilize and, if possible, jointly organize and fund demonstrations to test real-world operating conditions. Demonstrations also promote the deployment and utilization of new technologies through observations and participation by pipeline operators, equipment vendors, standards organizations, and other pipeline safety officials. Demonstrations

<sup>4</sup> Pub. L. No. 106-554-515(a) (Dec. 21, 2000).

are just one stage in a technology transfer process, but they can be considered a major milestone for achieving an ultimate research goal.

Sharing all research information with the participating agencies is a key action for the management plan. The participating agencies will use all the electronic media and communication tools that are available and appropriate to share joint and individual program- and project-level activities.

Progress updates and additional information about the implementation of this plan will be provided at <https://primis.phmsa.dot.gov/rd/psrcjca.htm>.

#### **4.0 Performance Metrics**

As a part of the Management Plan, the update reports will embody several performance metrics. Some reports will depict the level of progress achieved in conducting the seven coordinated activity goals identified in Section 1, and some reports will summarize the list of outputs and impacts from all participating agencies, where reportable, that is featured below. An individual agency may report more or less than another depending on funding cycles, project durations, and research types (i.e. general knowledge vs. technology development). The information will be relevant to the specific years covered in each update report, and it will be reformatted for better conveyance and easier readability.

##### Quantitative Performance Metrics

- Number/Investment of jointly funded projects by participating agency and by programmatic area (see Section 2, Table 1)
- Number/Investment of individually funded projects by participating agency and by programmatic area (see Section 2, Table 1)
- Number of technology demonstrations held from all awarded research
- Number of U.S. Patent applications resulting from all awarded projects
- Number of commercialized technology improvements
- Number of final reports made publicly available
- Number of conference/journal papers based on awarded research
- Number of Interagency Research Coordination Meetings held
- Number of solicitations issued having Interagency Merit Review Panels
- Number of post award peer review panels having Interagency Involvement
- Number of events having Interagency Participation
- Number of stakeholders reached at public meetings
- Number of website visits to the Interagency Research webpage
- Number of website downloads from the Interagency Research webpage

#### **5.0 Communication of R&D Results/Impacts**

As a part of the Management Plan, the participating agencies have created a publicly accessible interagency webpage (Figure 2) to explain any congressional requirements, to provide general information about individual programs, and where relevant reporting is posted, to track agency activities. DOT is hosting this page for the participating agencies and using it to address

requirements of the Act . This webpage also displays the accomplishments and documentation regarding the completed mandates from the PSIA 2002. Both DOC and DOI will add a navigation link to the interagency webpage from their individual pages. Please visit the interagency webpage at <https://primis.phmsa.dot.gov/rd/psrcjca.htm> for more information.



Figure 2: Interagency Webpage

## Appendix

### Program Summary for the Participating Agencies

#### **Department of Transportation, Pipeline and Hazardous Materials Safety Administration (PHMSA)**

PHMSA's mission is to protect people and the environment from the risks inherent in transportation of hazardous materials by pipeline and other modes of transportation. PHMSA's authority primarily covers regulations for 2.6 million miles of onshore pipelines but it also covers some OCS pipelines that DOI regulates.

The mission of PHMSA's Pipeline Safety Research Program is to sponsor research and development projects focused on providing near-term solutions that will improve the safety and reliability of the Nation's pipeline transportation system and will reduce environmental impact.

This program is transparent with documented, time-tested procedures to leverage investment, maximize benefit, and measure impact. Please visit our program website at <http://primis.phmsa.dot.gov/rd/> for more information.

#### **Department of Commerce, National Institute of Standards and Technology (NIST)**

NIST's mission is to develop and promote measurement, standards, and technologies to enhance productivity, facilitate trade, and improve quality of life. According to PSIA 2002, NIST's responsibilities shall reflect its expertise in materials research and assist in the development of consensus technical standards.

NIST's Pipeline Safety Project goal is to provide standard test methods and critical data to the pipeline industry and standard development organizations to improve safety and reliability. Current key program foci include the fatigue and fracture testing of high-strength pipeline steels, the development of reference standards for pipeline inspection technologies, and *in situ* fatigue and fracture testing in corrosive operating environments such as supercritical CO<sub>2</sub>, fuel, and high-pressure hydrogen.

NIST's Pipeline Safety Project is managed by staff in the Structural Materials Group of the Applied Chemical and Materials Division, which is in the Material Measurement Laboratory, a major operating unit of NIST. Please visit the following two program pages as they relate to pipelines:

Pipeline Safety

[http://www.nist.gov/mml/acmd/structural\\_materials/pipeline-safety.cfm#](http://www.nist.gov/mml/acmd/structural_materials/pipeline-safety.cfm#)

Hydrogen Pipeline Safety

[http://www.nist.gov/mml/acmd/structural\\_materials/hydrogen-pipeline-safety.cfm](http://www.nist.gov/mml/acmd/structural_materials/hydrogen-pipeline-safety.cfm)

## **Department of the Interior, Bureau of Safety and Environmental Enforcement (BSEE)**

BSEE works to promote safety, protect the environment, and conserve resources offshore through vigorous regulatory oversight and enforcement. BSEE's Technology Assessment & Research (TA&R) program supports research regarding operational safety and pollution prevention related to offshore oil and natural gas and renewable energy exploration and development, and is an important part of BSEE's safety program. BSEE jurisdiction covers offshore not onshore pipelines and flowlines. Jurisdiction over some offshore pipelines is shared with DOT.

TA&R's primary objectives include:

- *Technology Assessment:* Investigating and assessing industry applications of technological innovations to enable BSEE to promote the use of Best Available and Safest Technologies through regulations, rules, and operational guidelines.
- *Research Catalyst:* Promoting leadership in the fields of operational safety and pollution prevention associated with offshore energy development activities.
- *Technical Support:* Providing technical engineering support to BSEE's decision makers in evaluating industry operational proposals and related technical issues, and ensuring that these proposals comply with all applicable regulations, rules, operational guidelines, and standards.
- *International Regulatory Cooperation:* Providing support for international research and development initiatives to enhance the safety of offshore energy development activities and the development of appropriate regulatory program elements worldwide.

BSEE TA&R Program

<http://www.bsee.gov/Research-and-Training/Technology-Assessment-and-Research.aspx>

BSEE Pipeline Research

<http://www.bsee.gov/Research-and-Training/Technology-Assessment-and-Research/tarprojectcategories/Pipeline-Research.aspx>