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RD&T Program Review

Pipeline and Hazardous Materials Safety Administration

RD&T Program Review Working Group
June 23, 2005

PHMSA Mission

Has public responsibilities for safe and secure movement of hazardous materials to industry and consumers by all transportation modes, including the nation's pipelines.

Pipeline and Hazardous Materials Safety Administration

PHMSA

Office of Pipeline Safety

All Inclusive Process

Office of Pipeline Safety

Relevance - *Prospective*

Office of Pipeline Safety

PHMSA
Pipeline and Hazardous Materials Safety Administration

The RD&T program has defined goals, priorities.

	Program Elements	Program Element Goals
1.	Damage Prevention	Reducing the number of incidents and accidents resulting from excavation damage and outside force
2.	Pipeline Assessment & Leak Detection	Identifying and locating critical pipeline defects using inline inspection, direct assessment and leak detection
3.	Defect Characterization and Mitigation	Improving the capability to characterize the severity of defects in pipeline systems and to mitigate them before they lead to incidents or accidents
4.	Improved Design, Construction, & Materials	Improving the integrity of pipeline facilities through enhanced materials, and techniques for design and construction
5.	Systems for Pipeline Mapping and Information Management	Enhancing the ability to prevent and respond to incidents and accidents through management of information related to pipeline location (mapping) and threats definition
6.	Enhanced Operation Controls and Human Factors Management	Improving the safety of pipeline operations through enhanced controls and human factors management
7.	Risk Management & Communications	Reducing the probability of incidents and accidents, and mitigating the consequences of hazards to pipelines
8.	Safety Issues for Emerging Technologies	Identifying and assessing emerging pipeline system technologies for opportunities to enhancing their safety

Relevance - *Prospective*

Office of Pipeline Safety

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Pipeline and Hazardous Materials Safety Administration

The RD&T program has defined goals, priorities.

Activities	Outputs	Customers Reached	Short –Term Outcomes	Long –Term Impacts
In order to accomplish our intended results, we will conduct the following activities:	**We expect that once completed or underway these activities will produce the following results:**	**We expect that if completed or ongoing these activities will reach or affect the following customers:**	**We expect that if completed or ongoing these activities will lead to the following outcomes in 1-5 years:**	**We expect that the outcomes will lead to the following changes or impacts in 3-10 years:**
1. Damage Prevention	New methods for pipe locating, damage prevention, and corrosion protection; technology for detecting pipeline encroachment	Transmission & distribution companies, pipe vendors, sensor companies; corrosion protection companies, pipeline safety regulators	Proof-of-Concept for new damage prevention and corrosion prevention technologies	Reduction in the number of incidents resulting from unauthorized contact with pipelines, natural forces, and corrosion

Relevance - *Prospective*

Office of Pipeline Safety

The RD&T program has identified the required resources and outputs.

- OPS Blue Ribbon Panel
- Pipeline Safety Improvement Act of 2002 Interagency Coordination Group
- Government/Industry Pipeline R&D Forum
- OPS RD&T Program Logic Model

Relevance - *Prospective*

Office of Pipeline Safety

The RD&T program has aligned with DOT strategic goals.

- OPS RD&T Program Strategic Plan
- Draft OPS RD&T Program Performance Plan
- OPS RD&T Logic Model
- OPS categorizes awarded research for PHMSA and DOT strategic goals

Relevance - *Prospective*

Office of Pipeline Safety

The RD&T program has aligned with DOT strategic goals.

DOT Strategic Goal	Projects since 2002
Safety	58 Projects or 96%
Mobility	0
Global Connectivity	0
Environmental Stewardship	4 Projects or 4%
Security	0
Organizational Excellence	0

Relevance - *Prospective*

Office of Pipeline Safety

The RD&T program has documented the potential benefits.

- OPS RD&T Logic Model
- OPS RD&T Strategic Plan & Draft Program Performance Plan
- Interagency Five-Year R&D Program Plan For Pipeline Safety and Integrity – Submitted to Congress for 12/17/2003 and update report annually after
- Government/Industry Pipeline R&D Forum
- Annual RD&T Program Performance Report (January 2006)
- OPS RD&T Program Website

Relevance - *Prospective*

Office of Pipeline Safety

The RD&T program has a process for obtaining stakeholder input.

- OPS Blue Ribbon Panel
- Pipeline Safety Improvement Act of 2002 Interagency Coordination Group
- Government/Industry Pipeline R&D Forum
- Pipeline Safety Advisory Committee
- Research & Innovative Technology Administration
- OPS RD&T Program Website

Relevance - *Retrospective*

Office of Pipeline Safety

The RD&T program has regularly scheduled independent evaluations.

- Research & Innovative Technology Administration – Annual Program Review
- OPS Blue Ribbon Panel – Periodic Review
- Pipeline Safety Improvement Act of 2002 Interagency Coordination Group – Quarterly coordination meetings
- Pipeline Safety Advisory Committee – Annual meeting but periodic review

Relevance - *Retrospective*

Office of Pipeline Safety

The RD&T program has a process for addressing findings and recommendations.

- Feedback and Report Back
  - Blue Ribbon Panel
  - R&D Forum
  - RD&T Program Website
  - Peer Review Panel report with PHMSA rebuttal
  - Annual Performance Report (January 2006)
- Pipeline Safety Improvement Act of 2002 Interagency Coordination Group

Quality - *Prospective*

Office of Pipeline Safety

The RD&T program has a competitive, merit based process for awarding funds or some other clearly stated defensible method for allocating funding.

Funds Allocation Process

1. Issue Broad Agency Announcement or other research solicitation in FedBizOps
2. Use Merit Review Panel (7-10 persons from industry, state/federal gov.) to review and rank white papers and proposals
3. Submissions ranked with 7 focused review criteria
4. Merit review panel provides report of recommended proposals for award in priority ranking order
5. Requirement of 50/50 cost sharing with industry partner before award

Quality - *Retrospective*

Office of Pipeline Safety

The RD&T program has regularly scheduled independent assessments to guide future funding decisions.

- Panel Peer Review of projects – Annual Review
- OPS Blue Ribbon Panel – Periodic Review
- Government/Industry Pipeline R&D Forum – Periodic Review
- Pipeline Safety Improvement Act of 2002 Interagency Coordination Group – Quarterly coordination meetings
- Pipeline Safety Advisory Committee – Annual meeting but periodic review
- Research & Innovative Technology Administration – Annual Program Review

Performance - *Prospective*

Office of Pipeline Safety

The RD&T program has defined long-term outcome measures.

- OPS RD&T Logic Model
- Hierarchy of RD&T Program Measures

OPS Mission	To ensure the safe, reliable & environmentally sound operation of the nation's pipeline transportation system.					
Research Program Goals	*"To drive improvements in"* • Pipeline Damage Prevention and Leak Detection • Pipeline Operations, Controls, and Monitoring • Material Performance and Other Pipeline Safety Improvements					
Research Program Objectives	Fostering Development of New Technologies		Strengthening Regulatory Requirements and Consensus Standards		Promoting Knowledge for Decision Makers	
Desired Impact Performance Measures	Number of projects contributing to objectives	21	Number of projects contributing to objectives	28	Number of projects contributing to objectives	49
	Number of projects that have demonstrated new technologies	6	Number of projects contributing to new or revised industry standards	26	Number of final reports publicly available	12
	Number of projects filing for U.S. Patents	8	Number of projects contributing to new or revised OPS regulations	15	Number of conference papers presented	TBD
Process Features	Categorizing projects for mission relevance		Categorizing projects for mission relevance		Categorizing projects for mission relevance	
	Technology transfer process		Consensus standard integration process		Peer review process for qualifying output quality	
	Peer review process for qualifying output quality		OPS regulatory program integration process		Monitoring projects for contractual performance	
	Monitoring projects for contractual performance		Peer review process for qualifying output quality		Contractual requirement for submitting conference papers	
	Contractual requirement for notifying OPS of U.S. patents		Monitoring projects for contractual performance			

Fast Facts:

1. First project award on October 1, 2002
2. Total awards from four Broad Agency Announcements (BAAs): 49 projects
3. Current number of projects completed: 12 projects
4. Total funding distribution for 49 projects: $12,620,021(OPS) $15,412,638 (Industry co-Funding)
5. OPS funded 2 R&D projects outside the four BAAs which also applied for U.S. Patents.
6. Contributing to new or revised standards or regulations is determined when research applicants submit their proposals. Each applicant must answer what their project deliverable will influence and OPS tracks this information once a project is awarded.

Performance - *Prospective*

Office of Pipeline Safety

The RD&T program has annual targets linked to long-term goals.

The OPS RD&T Program does not have annual targets linked to long-term goals for the following reasons:

1. There are different phases of research
2. Projects have different designed outcomes
3. RD&T Program needs further guidance to refine use of case studies

Practicality and realistic data requirements was considered during the design of the RD&T Program Hierarchy of Goals

Performance - *Prospective*

Office of Pipeline Safety

The RD&T program has planned deliverables, schedules and estimated budgets.

Other Transaction Agreements

Main Agreement
Attachment 1 - Project Team Activities
Attachment 2 - Project Team Deliverables
Attachment 3 - Technical and Deliverable Milestone Schedule

A ***Management Information System (MIS)*** was developed and deployed to provides the necessary oversight so specific contractual milestones and accounting are systematically followed as prescribed in the award documents.

Performance - *Retrospective*

Office of Pipeline Safety

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The RD&T program has annual documentation of performance.

- Annual RD&T Program Performance Report (January 2006)
- Interagency Five-Year R&D Program Plan For Pipeline Safety and Integrity – Submitted to Congress for 12/17/2003 and update report annually after
- Draft OPS RD&T Program Performance Plan – Periodic update

Performance - *Retrospective*

Office of Pipeline Safety

The RD&T program has assessments of customer satisfaction.

- RD&T Program Webpage
- Feedback and Report Back
  - Blue Ribbon Panel
  - R&D Forum
  - Peer Review Panel report with PHMSA rebuttal
  - Annual RD&T Program Performance Report (January 2006)

Leveraging Research Accomplishments, Ideas For Improvement And Cross-Modal Research

Office of Pipeline Safety

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Describe one or two recent RD&T accomplishments that may benefit other OAs.

Digital Mapping of Buried Pipelines with a Dual Array System (DTRS56-02-T-0005)
Witten Technologies Inc.

- This technology could assist any OA with interest of mapping subsurface obstructions accurately to depths of 8-10 feet.

Right Priority

R&D Forum identified consensus priority to develop subsurface Mapping for damage prevention of pipelines.

Best Contractor

The Merit Review Panel recommended Witten for award. ConEdison supported the award with cost-share.

Good Performance

The MIS documents Milestone submission and the COTR reinforces the contract goals.

Quality Outputs

Witten's work was Peer Reviewed at R&D Forums and other events and will receive formal review in January 2006.

Applying Results

Witten demonstrated the technology, and applied for Patent after a dissemination Meeting with many end users.

Marketplace

Witten has commercialized tool and is using in NY & FL with success.

Leveraging Research Accomplishments, Ideas For Improvement And Cross-Modal Research

Office of Pipeline Safety

Where would you like input, discussion or brainstorming from the participants of the review.

Measuring Program Performance – How do you do it?

Research case studies?

How do you factor and plan for them?
How much do they cost?
Do you conduct them on all projects?
How do regulators do this?...Paperwork Reductions Act

Has your research pointed to new areas of cross-modal inquiry? If so, what are they?

Generally No – The OPS RD&T Program provides for desired outputs and impacts identified as consensus priorities from the pipeline safety stakeholders. Research is "Development" in type and is usually past proof of concept.

A currently funded project on Human Factors and Hydrogen Effects on Steel may provide some grounds for cross-modal inquiry.

Best estimate is that only basic research on improved materials may provide some grounds for cross-modal inquiry.

Pipeline and Hazardous Materials Safety Administration

PHMSA

Office of Hazardous Materials Safety

Relevance - *Prospective*

Office Hazardous Materials Safety

The RD&T program has defined goals, priorities.

- Primary goal is to improve hazardous materials transportation safety and security.

The RD&T program has identified the required resources and outputs.

- The FY2006 OHMS budget for research and analysis and research and development is $2.4 million.

Relevance - *Prospective*

Office Hazardous Materials Safety

PHMSA
Pipeline and Hazardous Materials Safety Administration

The RD&T program has defined goals, priorities.

	Program Elements	Program Objectives
1.	Emergency response	Provide a scientific basis for and easy use (human factors) of the Emergency Response Guidebook. Development of AEGLs is associated with this program objective.
2.	Incident database design and analysis	Hazardous material incident reporting provides a foundation for understanding how the system is operating. Examination of trends, costs, and root-cause analysis provide a basis for regulatory changes.
3.	Packaging design	Ensure that packaging design conforms to hazards and risks. Development of nondestructive testing techniques and failure analysis help fulfill this objective.
4.	Performance packaging testing	Demonstrates that performance packaging requirements are being adhered to as part of the enforcement function.
5.	Hazard identification	Promote understanding of transportation hazards, e.g., lithium battery (primary and secondary) testing.
6.	Risk Assessment / Risk Management	Identify and quantify risks inherent in hazardous materials transportation and point to ways to control and minimize these risks. Examination of procedures for selecting routes for spent nuclear fuel is an example of the latter. Risk characterization and risk communication are important aspects of this program objective.
7.	Consequence Modeling	Allow for better understanding of potential impact of incidents.
8.	Security	Assess hazardous materials transportation security vulnerabilities and measures to mitigate security risks. Develop tools for this evolving area.

Relevance - *Prospective*

Office Hazardous Materials Safety

The RD&T program has identified the required resources and outputs.

- The FY2006 OHMS budget for research and analysis and research and development is $2.4 million.

Relevance - *Prospective*

Office of Hazardous Material Safety

The RD&T program has aligned with DOT strategic goals.

DOT Strategic Goal	Projects in the Category
Safety	X
Mobility	
Global Connectivity	X
Environmental Stewardship	X
Security	X
Organizational Excellence	

Relevance - *Prospective*

Office of Hazardous Material Safety

The RD&T program has documented the potential benefits.

- Value of projects reflected in rulemakings.

The RD&T program has a process for obtaining stake holder input.

- Input is sought on specific projects.
- Overall program is outlined in public forums, such as the TRB hazardous materials committee.
- Looking at using the web as a portal to better describe program.

Relevance - *Retrospective*

Office of Hazardous Material Safety

The RD&T program has regularly scheduled independent evaluations.

Not to date.

The RD&T program has a process for addressing findings and recommendations.

N/A

Quality - *Prospective*

Office of Hazardous Material Safety

The RD&T program has a competitive, merit based process for awarding funds or some other clearly stated defensible method for allocating funding.

- Competitive contracting is used to the extent possible.
- Internal reviews are used to prioritize and select from competing projects for funding.

Quality - *Retrospective*

Office of Hazardous Material Safety

The RD&T program has regularly scheduled independent assessments to guide future funding decisions.

- Not to date.

The RD&T program has defined long-term outcome measures.

- RD&T measures are in line with basic program measure of reducing the number of serious incidents.

Performance - *Prospective*

Office of Hazardous Material Safety

The RD&T program has annual targets linked to long-term goals.

- Targets relate to individual projects. RD&T long term program goals are linked to basic long term OHMS goals.

The RD&T program has planned deliverables, schedules and estimated budgets.

- Yes, as applied to projects.

Performance - *Retrospective*

Office of Hazardous Material Safety

The RD&T program has annual documentation of performance.

- Performance is tracked for individual projects.

The RD&T program has assessments of customer satisfaction.

- Feedback relates to individual projects.
- Informal input is obtained relative to the overall program.

Leveraging Research Accomplishments, Ideas For Improvement And Cross-Modal Research

Office of Hazardous Material Safety

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Describe one or two recent RD&T accomplishments that may benefit other OAs.

Right Priority

National Transportation Risk Assessment for Selected Hazardous Materials in transportation

Risk Management Self-Evaluation Framework

Best Contractor

Argonne National Laboratory

ICF Consulting

Good Performance

Peer Review

Industry Panel

Quality Outputs

Pioneering Study

Tool and Case Studies

Applying Results

Q/D Requirements at Ports

Analysis required in Security Plan Development

Leveraging Research Accomplishments, Ideas For Improvement And Cross-Modal Research

Office of Hazardous Material Safety

Where would you like input, discussion or brainstorming from the participants of the review.

- How do we better coordinate our program with that of the modal administrations?
- Do we need a more formalized structure for program review?

Leveraging Research Accomplishments, Ideas For Improvement And Cross-Modal Research

Office of Hazardous Material Safety

Has your research pointed to new areas of cross-modal inquiry? If so, what are they?

- Cooperative Hazardous Materials Transportation Research Program
- Transition to a Hydrogen Economy
- Security
- Incident Trend Analysis and Root-Cause Analysis
- Consequence Modeling