U.S. Department of Transportation

Research and Special Programs Administration

Office of Pipeline Safety

Research and Development

"Blue Ribbon Panel" Meeting

June 10, 2003
Washington, DC

U.S. Department of Transportation

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Opening Remarks

Stacey Gerard
Associate Administrator
Office of Pipeline Safety

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Goals of Pipeline Safety R&D Program

- Reduce number and impact of incidents
- Advance technologies to ensure safe operations of pipelines.
- Bring products to market within 3-5 years
- Promote use of new technologies

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Purpose of Meeting

- Thanks
- Direction of R&D Program and Why
- What Remains to be Worked On
  - Performance Metrics
  - Joint Workshops
  - Fresh priority list

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Agenda

- Review Pipeline Safety R&D Requirements in PSIA of 2002
- Review R&D Program to Date
- Review and Discuss OPS R&D Priorities
- Discuss Program Performance Metrics & Evaluation of Effectiveness of R&D Investment

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Pipeline Safety Improvement Act of 2002

- R&D Requirements
  - Memorandum of Understanding (MOU)
  - Areas of expertise
    - DOT – pipeline inspection, integrity management and damage prevention
    - DOE – system reliability, leak detection and surveillance technologies
    - NIST – materials research and development of consensus standards

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Pipeline Safety Improvement Act of 2002

- R&D Areas in the Act
  - Materials inspection
  - Detection and analysis of internal pipe defects and development of inline detection equipment
  - ILI and leak detection technologies
  - Analyzing content of pipeline throughput
  - Pipeline security, real-time monitoring of ROW, protecting first responders

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Pipeline Safety Improvement Act of 2002

- R&D Areas in the Act (cont'd)
  - Risk assessment methodology
  - Communication, control, and information systems surety
  - Fire safety of pipelines
  - Improved excavation, construction, and repair technologies
  - Other elements considered appropriate by participating agencies

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Pipeline Safety Improvement Act of 2002

- Authorization of Appropriations
  - DOT – $10M/year, 2003 – 2006
    - FY 2003 Appropriated = $8.7M
    - FY 2004 President's Request = $9.2M
  - DOE – $10M/year, 2003 – 2006
    - FY 2003 – Appropriated = $8.99M
    - FY 2004 – President's Request = $0
  - NIST – $5M/year, 2003 – 2006
    - FY 2003 Appropriated = $0
    - FY 2004 President's Request = $0
- OPS Transfer $3M/year, 2003 – 2006, from Oil Spill Liability Trust Fund

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Pipeline Safety Improvement Act of 2002

- R&D Requirements
  - Reporting
    - 5-Year Plan
    - Annual Updates

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Pipeline Safety Improvement Act of 2002

- Path Forward
  - Blue Ribbon Panel Meeting
  - Complete MOU
  - Draft 5-Year Plan & Tech. Advisory Committee Review
  - Issue New BAA's

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R&D Program To-Date

Jeff Wiese
Program Development Director
Office of Pipeline Safety

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R&D Program To-Date

- Framework for Revamped R&D Program (Objectives)
  - Competitive
  - Co-funded
  - Collaborative
  - Communicative
  - Comprehensive

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R&D Program To-Date

- 1st Blue Ribbon Panel Meeting
- November '01 Workshop
- ID'd three primary areas of R&D focus
- Issued BAA #1 and #2; awarded 10 proposals, additional 3 pending
- Issued BAA #3; Committee meets June 17th; awards to be announced Summer '03
- GAO reviewed R&D Program and issued draft report

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R&D Program To-Date

- BAA #1 – Awards for Pipeline Damage Prevention and Leak Detection R&D
  - Application of Remote-Field Eddy Current to Inspection of Unpiggable Pipelines ($87,500)
  - Mechanical Damage Inspection Using MFL Technology ($380,000)
  - Feasibility of In-Line Stress Measurement by Continuous Barkausen Method ($80,000)
  - Baseline Study of Alternative In-Line Inspection Vehicles ($40,000)
  - Digital Mapping Of Buried Pipelines With A Dual Array System ($439,000)
  - Pipeline Damage Prevention Through the Use of Locatable Magnetic Plastic Pipe ($95,500)
  - Enhancement of the Long-range Ultrasonic Method for the Detection of Degradation in Buried, Unpiggable Pipelines ($500,000)

http://primis.rspa.dot.gov/rd

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R&D Program To-Date

- BAA #2 – Awards to Enhance Pipeline Operations, Controls, and Monitoring
  - Assessment Criteria for TFI-identified Seam Weld Defects ($70,000)
  - Internal Corrosion Direct Assessment (ICDA) of Gas Transmission, Gathering, and Storage Systems ($260,165)
  - Improvements to the External Corrosion Direct Assessment Methodology by Incorporating Soils Data and Managing the Integrity of Early Transmission Pipelines ($297,000)
  - Additional Awards Pending Negotiation

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R&D Program To-Date

- BAA #3 – Improved Material Performance and Other Pipeline Safety Improvements
  - White Papers - 82
  - Proposals – 16
  - Awards expected – Summer '03

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R&D Program To-Date

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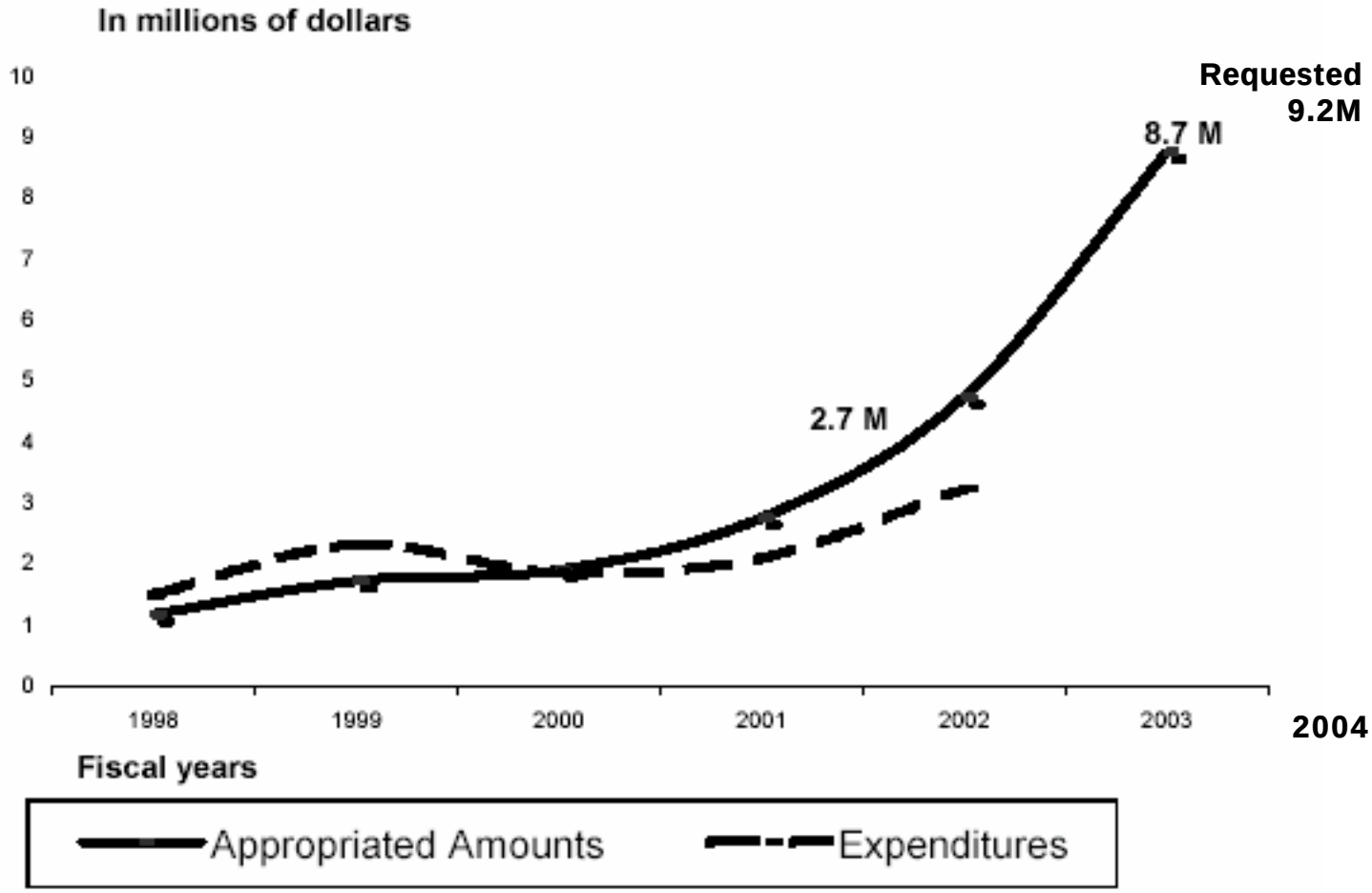
Figure 1: OPS' R&D Funding, Fiscal Years 1998 - 2003



Source: GAO analysis of OPS data.

R&D Program To-Date

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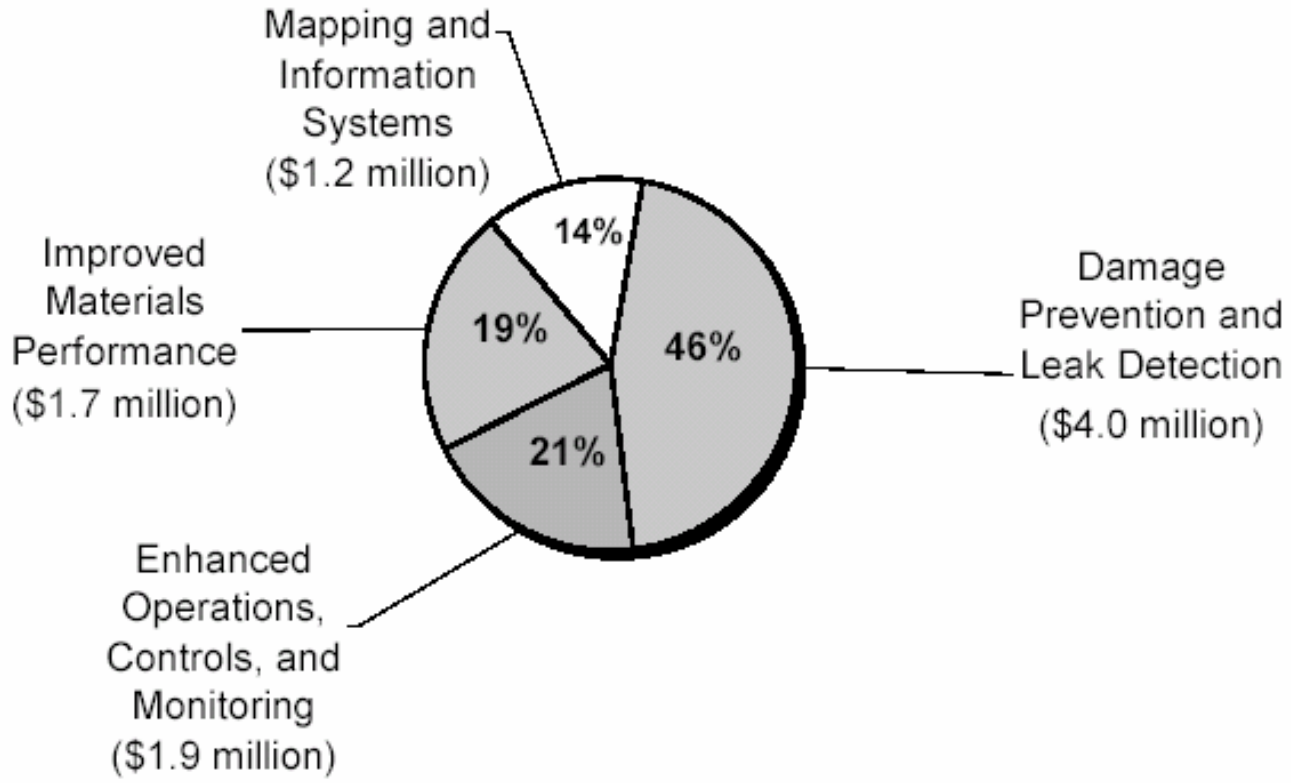
Figure 2: OPS' Planned Allocation of R&D Funding for Fiscal Year 2003



Source: GAO analysis of OPS data.

Note: Shaded areas represent the major pipeline safety R&D areas funded by OPS.

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R&D Program To-Date

Accomplishments Since Nov 2001 Meeting

- Built and Deployed Competitive & Collaborative Process
- Awarded 10 – 13 Co-funded Projects
- R&D website (http://primis.rspa.dot.gov/rd)
  - Available to Public
  - Announcements
  - Meetings
  - Database
  - R&D "Success Stories"
  - Map showing recent R&D awards, with links to Matrix
  - Internal OPS Quarterly R&D Update

R&D Web Site

http://primis.rspa.dot.gov/rd

Back Search Favorites Media

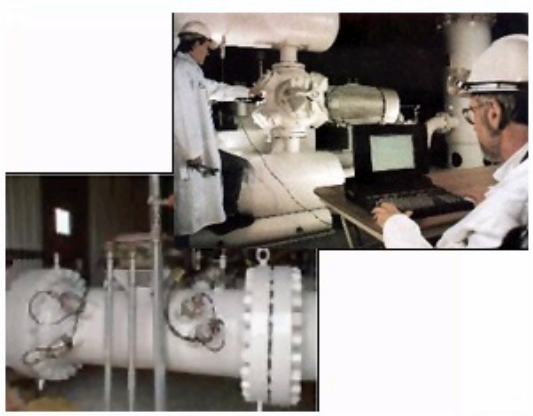
Address http://primis.rspa.dot.gov/rd/index.htm Go Links

R&D Home
Announcements
Recent Projects
Meetings
Success Stories
What's New
Links
Contacts
Feedback
OPS Communications

Research & Development

Welcome to RSPA's Pipeline Safety Research and Development Website.

This site is dedicated to the coordination and dissemination of Research and Development information related to Pipeline Safety.



OPS conducts and supports research to support regulatory and enforcement activity and to provide the technical and analytical foundation necessary for planning, evaluating, and implementing the pipeline safety program. OPS is sponsoring research and development projects focused on providing near-term solutions that will increase the safety, cleanliness, and reliability of the Nation's pipeline system.

Recent R&D projects are centered on leak and damage detection and prevention of the leading causes of pipeline failure. This includes: leak detection; detection of mechanical damage; improved pipeline system controls, monitoring, and operations; and, improvements in pipeline materials. These projects are addressing technological solutions that can quickly be brought to bear to improve pipeline safety.

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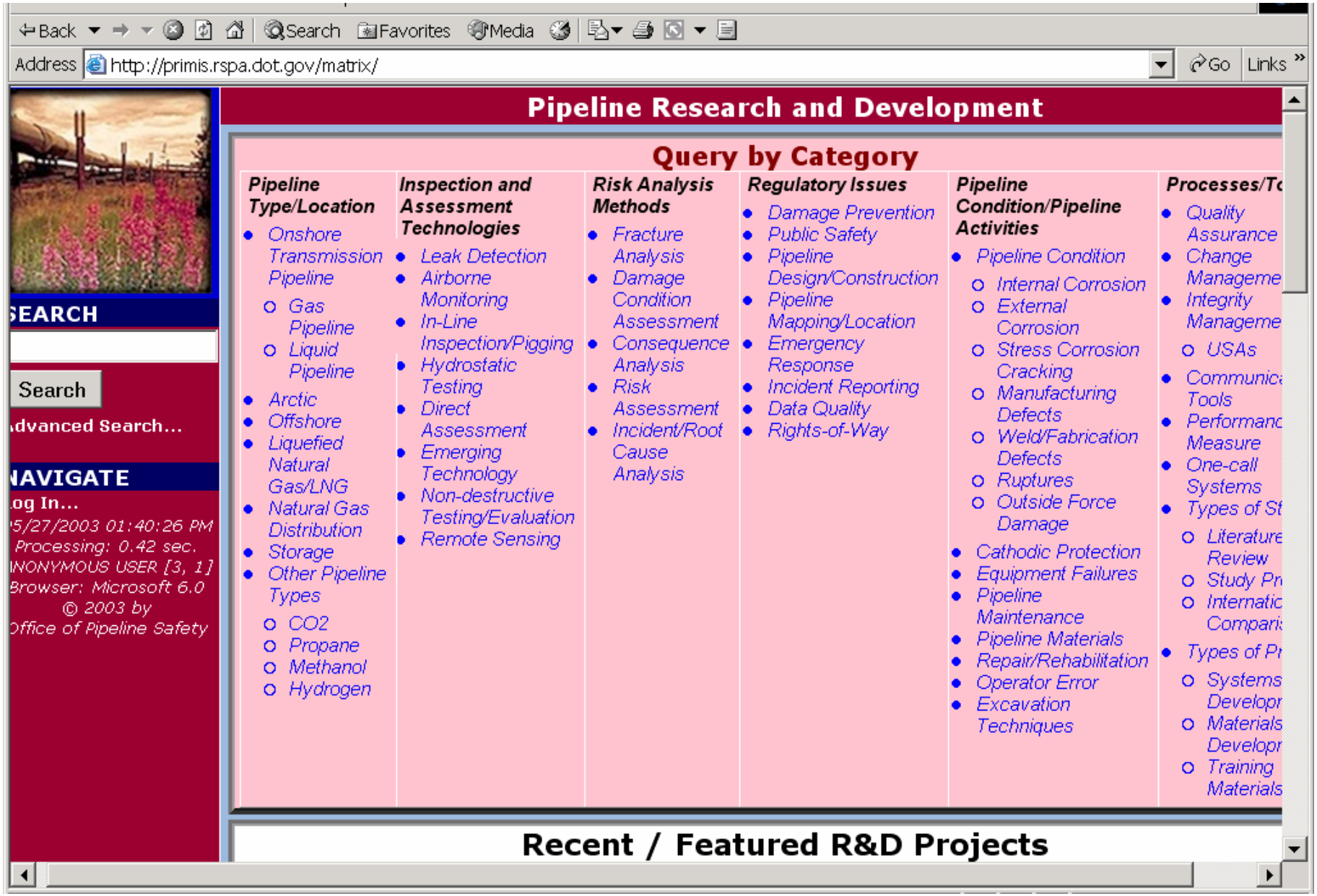
R&D Web Site

http://primis.rspa.dot.gov/rd



R&D Web Site

http://primis.rspa.dot.gov/rd

The dots on the map indicate the locations of research firms conducting projects for the OPS.

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R&D Program Priorities

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Evolution of R&D Priorities (1)

- R&D Blueprint Planning Workshop, Nov '01
  - Gaps
  - Important Funding Areas
- BAA Focus Areas
  - BAA #1
  - BAA #2
  - BAA #3

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Evolution of R&D Priorities (2)

- PRCI Priorities
- PSIA of 2002
- MOU Focus Areas
- GAO Preliminary Findings
  - Priority Ranking – Experts

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Redefining OPS' Program Focus

- **Inputs**
  - Awards made from BAA's
  - Expert-based Review Team evaluations of continuing need
  - Joint workshops - e.g., MMS-OPS 2/03 Workshop in New Orleans
  - PRCI Priority Focusing Workshop - 03/2003
  - Participated with DOE & NIST in solicitations and competitions
  - Industry presentations and discussion: API, AGA, INGAA Foundation
  - Draft MOU between DOT, DOE, and NIST
  - Reconvene the Blue-Ribbon Panel (06/2003) to examine proposed new priorities

Redefining OPS' Program Focus

Summary of Perspectives on R&D Priorities (Applicable to OPS Scope)

Candidate Priorities	A	B	C	D	E	F	G (*)	H	I
Integrity Management Tools & Practices for Distribution Operators	•	•						•	•
Improved Wide-Range Leak Detection and Mitigation Technologies	•	•		•	•	•		•	•
Technologies to Assess Pipelines Unable to Use ILI	•	•		•	•	•		•	•
Real-Time Monitoring of Parameters Influencing Pipeline Integrity	•	•		•		•		•	•
Improved ILI Techniques	•	•		•	•	•		•	•
Real-Time Detection of Incipient Third-Party Damage	•	•		•		•		•	•
Improved Methods for Integrating Risk Factor Data	•	•		•					•
Improved External Corrosion Assessment Techniques	•	•		•	•	•		•	•
Damage Prevention and Leak Detection (BAA 1)	•		•			•	1	•	•
Enhanced Pipeline Operations, Control & Monitoring (BAA 2)	•		•	•		•	2	•	•
Improved Pipeline Materials & Other Safety Measures (BAA 3)	•		•	•		•	3	•	•
Mapping & Information Integration	•		•						•
Design, Construction & Operation	•			•		•		•	
Pipeline Security					•				•
Risk Assessment Methods	•				•			•	•
Fire Safety					•				•
Excavation, Construction & Repair Technologies	•				•	•		•	•
Arctic & Offshore Technologies						•	4	•	
Evaluation of the Significance of Incident Data				•		•			•
Enhanced Deployment of New Technologies				•	•				•

Redefining OPS' Program Focus

Summary of Perspectives on R&D Priorities (Applicable to OPS Scope)

(*) The numbers represent priorities established by survey of experts

Priorities Source:

A. OPS Plan for OMB
B. R&D Blueprint Planning Workshop (11/21/01) – Gaps & Important Funding Areas
C. BAA Focus Areas
D. PRCI Priorities – Prelim Rank, 2004 Programs, PRCI Board, April 2003
E. Pipeline Safety Improvement Act of 2002 (12/17/02)
F. MMS-OPS International PL Offshore Workshop (2/28/03)
G. GAO Preliminary Findings (Based on Expert Survey)
H. Areas in Which Projects have been Funded
I. Candidate Priorities for 5 Year Plan

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Current OPS R&D Priorities (1)

- Develop & Enhance Integrity Management Tools and Practices for Existing Transmission Pipelines
- Develop & Enhance Integrity Management Tools and Practices for Existing Distribution Pipelines
- Improve Pipeline Materials, Coatings, and Manufacturing & Construction Techniques

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Current OPS R&D Priorities (2)

- Improve Methods and Technologies for Pipeline Mapping and Data Integration
- Improve Pipeline Security Technologies & Practices
- Improve Risk Assessment Methodologies
- Improve Techniques for Pipeline Incident and Accident Analysis

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OPS R&D Priority Identification
The path forward…

- Complete BAA's 1, 2, & 3
- Complete MOU & 5-Year Plan process
- Compete and award BAA #4
- Winter 2003-2004 workshop
- Continuously Refine R&D Program Focus

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Potential Complementary R&D Activities

- Universities, National Laboratories, Non-Profits
- Co-fund Work with DOE/NETL, DOI/MMS, DOC/NIST
- Standards writing based on new R&D technology (NACE)
- Hydrogen near-term R&D on supply/demand modeling (e.g., use of natural gas pipelines to transport hydrogen)

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Performance Metrics: Evaluating the Effectiveness of R&D Investment

James Merritt
R&D Program Manager
Office of Pipeline Safety

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Performance Metrics

Evaluating the Effectiveness of R&D Investment

- GAO
  - Asked: "What is OPS's process for evaluating the outcomes of the pipeline safety R&D it funds?"
  - Identified best practices for evaluating the outcomes of federal R&D through a review of relevant literature
  - Compared OPS's existing and planned processes with these best practices.

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Performance Metrics

Evaluating the Effectiveness of R&D Investment

- GAO identified best practices
  - Setting clear, quantifiable goals and measuring progress toward these goals
  - Using expert review to evaluate the quality of research outcomes
  - Gathering input of potential users of the results of the research regarding its actual usefulness
  - Reporting periodically on evaluation results

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Performance Metrics

Evaluating the Effectiveness of R&D Investment

- Performance Metrics – Issues
  - OPS considering ways to improve evaluation
  - No previous program to evaluate, indicators
  - R&D will help achieve safety goals, difficult to show
  - MOU calls for participating agency collaboration in resolving evaluation processes
  - Looking for stakeholder input

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Performance Metrics

Evaluating the Effectiveness of R&D Investment

- Performance Metrics – OPS Approach
  - OPS involving experts in planning for R&D
  - OPS using peer review in deciding which proposals to fund
  - OPS will use expert review of outcome of R&D projects
  - OPS making strides in communicating R&D information

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Performance Metrics

Evaluating the Effectiveness of R&D Investment

- Candidate R&D Program Metrics (1)
  - Evaluating Deployment of New Technology Through Oversight
  - Fraction of R&D Funding Tied to NTSB Issues
  - Fraction of Total R&D Funds Represented by Federal Funds
  - Fraction of Total R&D Funds Linked to Strengthening National Consensus Standard or New Rulemaking
  - (R&D $)/(Unfunded Industry Participants Supporting Program)

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Performance Metrics

Evaluating the Effectiveness of R&D Investment

- Candidate R&D Program Metrics (2)
  - Person-Days of Industry Participation in R&D-Related Workshops
  - Extent of Inter-Agency Cooperation in Funding Decisions
  - Fraction of Project Milestones Met
  - Fraction of Project Performance Measures Met

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Performance Metrics

Evaluating the Effectiveness of R&D Investment

- Candidate R&D Program Metrics (3)
  - (Dollars Expended to Achieve Project Objectives)/(Dollars Budgeted)
  - Number of Web Site Hits
  - Person-Days Participation in Communication Forums
  - Number of Success Stories Submitted and Documented

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Performance Metrics

Evaluating the Effectiveness of R&D Investment

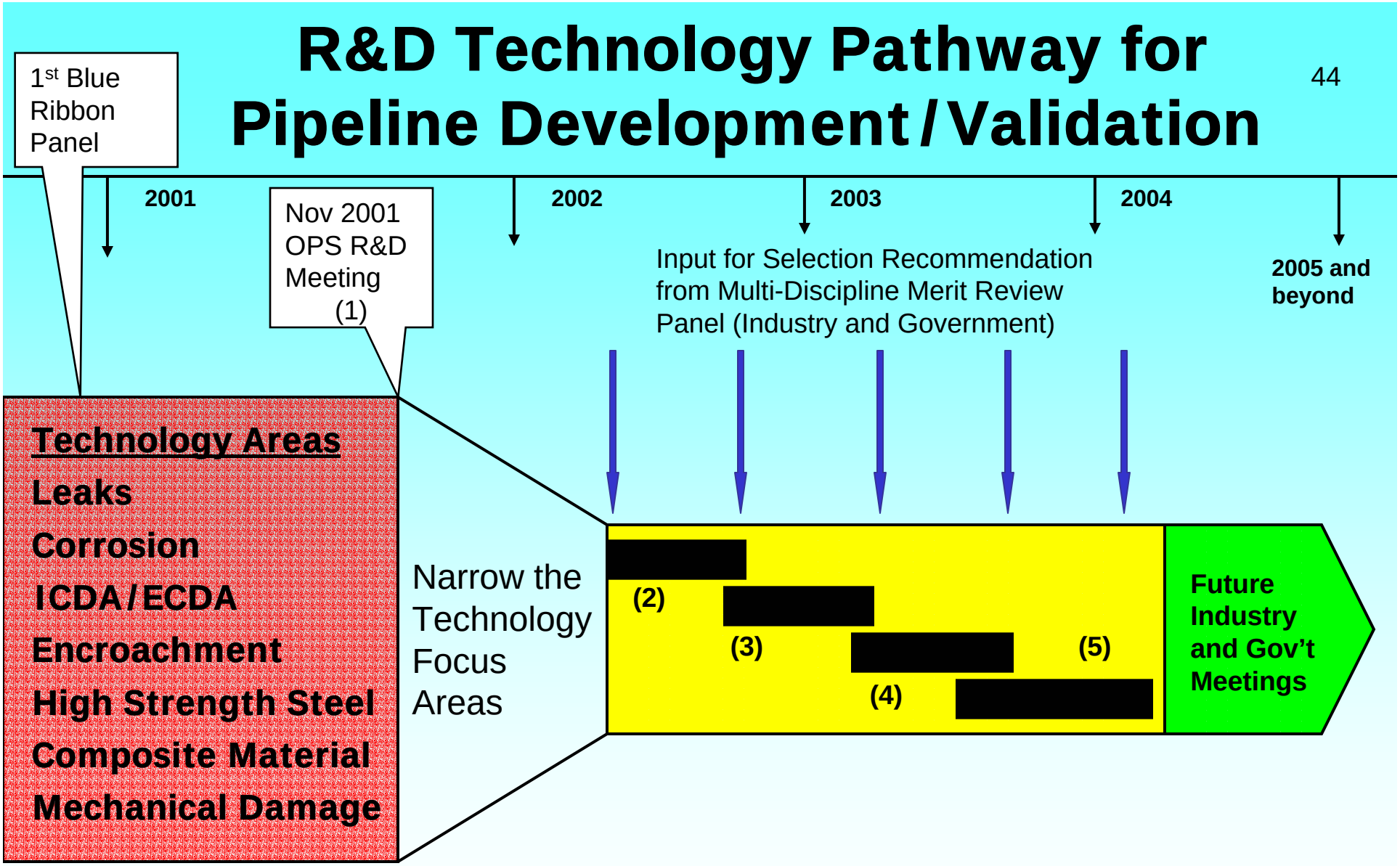
- Candidate R&D Program Metrics (4)
  - Fraction of R&D Competitively Funded
  - OPS Participant (FTE)/OPS R&D Program Staff (FTE)
  - R&D Funding ($) / OPS R&D Staff Participation (FTE)
  - New Patents
  - Number of Standards Build on or Validated by R&D Projects (Fraction of R&D $)

Performance Metrics

Evaluating the Effectiveness of R&D Investment

Goals	Processes	Metrics
Understand diverse R&D needs of industry	Active participation in workshops and working group meeting	Workshop recommendations & working group future needs
Prioritize R&D areas of effort	11/02, 4/8/03 meetings	Industry drivers, MOU with DOE,DOC, DOI
Seek diverse perspectives on key issues	Diverse merit Review Panels	BAA 1, 2, & 3 merit panel results
Leverage R&D funding	Co-funded R&D activities by industry partnership	% of R&D projects funded by partnership
Relevance of R&D effort	Establish annual industry review process	Increase in Congressional funding levels
Promote rapid deployment	Out-reach activities, success stories, report to Congress	Track # of patents resulting from R&D efforts, rollout of new technologies
Improve Safety & Integrity of pipelines	R&D efforts feed into IMP issues	Lessons learned, NTSB black list
Manage increased funding with modest staff	Develop and leverage expertise within OPS; collaborate with industry research-partners and use their project management resources	

R&D Technology Pathway for Pipeline Development / Validation



(1) Industry/OPS Meeting to Prioritize Areas of Interest, (2) BAA#1: Leak Detection/Corrosion,

(3) BAA#2, Control & Monitoring, (4) BAA#3: Material, Human Factors, (5) Future BAA –under discussion

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Wrap-up

- Additional Questions/Comments
- Review Action Items
- Follow-up Communications

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