GOVERNMENT & INDUSTRY PIPELINE RESEARCH & DEVELOPMENT FORUM
March 22-24, 2005
Houston, Texas
Damage Prevention Technical Track Notes March 23 and 24, 2005

Technical Track Session Objectives:

1. What were the technical gaps and challenges noted from the high-level stakeholder presentations?

2. Were there additional technical gaps and challenges not identified from the high-level stakeholder presentations?

3. What ongoing research & development has been awarded to address these technical gaps and challenges?

4. Which technical gaps and challenges still exist that ongoing research & development will not cover?

5. What should be the priority funding order of this list of remaining technical gaps and challenges?

6. Using the top five prioritized technical gaps and challenges in a basic road mapping exercise, what more can be elaborated upon with ultimate research goals?

Top Five Gaps and Challenges
1) Fund through commercialization
2) MagPipe
3) Directional Drill Sensors (obstacle detection)
4) Vacuum Excavation
5) Affordable Monitoring Technologies (for damage incidents
6) Develop technology to do Real Time As Built for locating and mapping
7) Develop Right of Ways monitoring devices for unauthorized encroachment…must be usable for LDC and transmission
8) Increase awareness of law requiring excavators to notify utility companies when gas lines are exposed (check wrap)
9) MagPipe for all industries (water, sewer, gas, etc.)
10) Excavation sensors / proximity monitors to alarm excavators

Ultimate Goal for each

Solution

Road Mapping

1. Does this technical gap or challenge require a new/revised tool or technology to be developed?
1a. Can any functional and or any performance requirements be identified?
1b. What customers/stakeholders would ultimately be reached or would utilize this research?
1c. Can any road blocks or barriers be identified that may make us unsuccessful?
1d. Can any targets or timeframes be identified to complete this research?

2. Does the need require new or revisions to consensus codes, standards, guidelines or recommend practices?
2a. What type of new consensus codes, standards, guidelines or recommend practices are required?
2b. Which ones by name require updating/revisions to for addressing current regulatory requirements and industry best practices?
2c. What customers/stakeholders would ultimately be reached or would utilize this research output?
2d. Can any targets or timeframes be identified to complete this research?

Presentations

Session has 15 minutes to make this presentation.
Identify the session subject, discussions covered and resulting consensus in a structured question approach.
Keep it high level and list the "Top Five" items.

1. What is the State of Research Today? (Identify the research programs who presented in your session. Provide a high level discussion of the types of ongoing research.)

2. What is the Future Research Required? (Identify your session's top five and discuss on each whether the need fits technology development or strengthening consensus standards. Feel free to mention other aspects of this need as answered for sub-questions 1a-d or 2a-d.)

Overall Challenges

1. Cost-sharing the development of new technologies with the public.
   - Whose perception of sharing cost?
   - What mechanism? Government, research facility, commercialization partner
   - Pipeline companies (operators) cost sharing? Public can be consumers, but operators are included in cost sharing.
   - Who owns the product once complete? Ownership?
     - Depends on the product…if profit generating then private sector investing
     - What is current IP situation from OPS funded research? OPS wants rights, but not ownership
     - IP rights retained, but info becomes public, then patent issue is challenging to get
     - Better value in market for IP, in patent process…which direction is best value?
     - Why would OPS want non-exclusive rights? No answer yet.
     - On DOE side, to use within US Government, they can use inside the US limits (military, federal, etc.)
     - ATP & NSF want nothing to do with rights.
     - Risk versus reward must be considered
     - Why are the OPS paying freight if someone else is getting benefit? OPS should collaborate with other government entities
     - All fines collected (DOT) go to general fund…
     - State alternatives if money can't be funded by OPS.
     - Additional fines revenues?
     - Why would OPS fund projects? Depends on issue…DOT wants to collaborate.

- With perfect data accidents can be avoided…i.e. GPS Mapping to be used by private and government sectors…why would that not be public good and why wouldn't OPS fund?
- ROI must be addressed
- Time is another factor that can be asked for versus money, but time is money and can be dollar figure.

2. Infield testing or benchmarking of technology research.
   - Find someone to test the product.
   - In kind service on infield testing…free services or data
   - Pipeline Operators are willing to allow infield testing, but cost sharing? Benefits must be outlined and weighed. Operator's manpower and time are money also…there are costs on both sides.
   - Will facilities be supplied through OPS for infield testing? Costs should be covered across the participants
   - Will the outcome be accepted by OPS audit? Why do it if not…risks!
   - Maybe the code needs to be revised to allow for public benefited new technologies
   - Regional participation must be standard across all companies, but costs must be considered.
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3. Better integration of standards organizations and research that affects standards.
   - RP0502 is great example of how long it took to write a standard
   - New rule making processes for NACE…incredible number of checks and procedures; amazing that anything gets through…can processes be streamlined without high risks? If you can lock all participants in one room to manage the process, it can be done, but meeting with all stakeholders is challenging.
   - Can OPS co-fund technical writers or facilitators? Easier to write something than edit something…can be included in program
   - Standards committee must identify gaps in order to find best process to mitigate time challenges

4. Using a "threat matrix" approach to prioritize R&D investments.
   - What are largest threats to get the tools needed? 3rd party damage, etc.
   - May not be very practical approach to tackle threats…money may not be allocated appropriately or to address the biggest threat
   - Best practice document to improve practices…but manpower resources must be allocated to accomplish
   - Tool can be used
   - Root Cause Analysis can be used also
   - More resources for state-of-the-art damage prevention needed

5. Developing a tech transfer process for both basic and development research.
   - Yes…needs to be there and funding should be there to develop

6. The willingness to "try" new technologies.
   - Not addressed (part of point 2)

7. Managing the ageing infrastructure.
   - Encroachment will incur; how can you get deeper in the right-of-way
   - If opportunity exists during digs when gas pipelines are exposed, should we check wraps, condition of pipeline, etc?
   - National Radio Campaign as an example of an education program to get message communicated…public education will entail cost sharing…more proactive by face to face or more effective communication
   - Better pipe locating…the newer pipelines are easier to locate, but older ones are more difficult

- We need a way for machine to get location and GPS read, then we manage aging infrastructure by pinpointing trouble areas…location validation should be done during opportunities of response calls
- Real time as-built…give valid GPS to map group, then maps updated and we know location can be verified…accuracy not there yet…opportunity for research? More accurate base stations?

8. Overcoming the "not in my backyard" public perception of the industry.
- Disconnect between public knowledge and what really is going on
- 3rd party sensor technologies announcement
- Incentive programs for public announcement of pipeline activity…let public be watchdog

1. Damage Prevention

a) To integrate improved excavation procedures in coordination with one-call centers.
- Not seen as an R&D function but a best practice function

b) Crosscutting technology and knowledge from other industries and applying to prevent damage.
- Sharing is good practice
- Technology transfer sessions during CGA or OPS activities (workshops, CAP sessions)

c) Benchmarking developed technologies on real pipelines.
- Needs to be part of R&D program

d) Increasing awareness and buy-in by excavators and municipalities.
- How do we make the process easier to use so that the benefits are highlighted?
- Convenience locate fee

e) Increasing awareness of contractor and pipeline owner's presence in the field (right of way)
- Public awareness is necessary; however, high consequence areas announcement can add risk to threats due to 911 events
- Installing technologies that sound alarm when activity in high consequence areas
- R&D can come in the power, communication, and hardening of devices…i.e. motion detectors into manageable monitoring
- Cross cutting into existing technology

f) Increase local awareness of pipeline position in high consequence areas.
- See e)

g) Affordable monitoring technology.
- Depends on cycle time of monitoring
- Cost benefit must be taken into consideration
- Current practices also to be explored
- 3rd party damage: It does work on occasion, but lacks effectiveness in knowing when it fails
- Worth it if costs are less than benefits
- Cost per mile estimates needed
- 3rd party damage cost is unknown
- If proposal comes to OPS that reduces 3rd party damage, then numbers can be justified to fund…numbers must be robust in content (R&D, Production costs, benefits, etc.)
- In an R&D program, affordability in the program is a must consideration

h) Unified one-call system nationwide.
- Enforcement must be considered
- More research on root cause…data reporting

i) Appropriate civil penalties with one-call laws to discourage unauthorized digging.
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j) How to better communicate to the public the importance of One Call.

k) Capitalizing on synergies from the entire infrastructure and develop a common message across transmission, distribution, liquids, etc.
   - Don't dig is the message
l) Mitigating hurricane damage on offshore pipelines.
   - Should pipelines be made of different materials, design…
   - Does hurricane damage ever affect the price of gas in NY...if yes, then it should be looked into
   - Why does it matter to everyone versus a few…need to explore
   - Need more offshore representation to fully capture concerns
m) Tracking the loop current in the Gulf of Mexico
   - Need more discussion later…when more representation available
n) A strategy to consider pipeline issues in current land use planning practices.
   - GTI did study regarding sustainability and community sustainability…need to baseline and take best practices on this
   - The more concentrated the areas, the more susceptible the area if targeted by terrorists
   - Research for redundancy lines as not to depend on single routes (1:50,000 view for reroute strategy)
   - Price stability may be a benefit with redundancy
   - Research may have been done; however, not communicated
   - R&D study can prevent damage; PIPA (TRB71)
   - Highway infrastructure may interfere with pipeline infrastructure; look at highway projects so as to coordinate with pipeline industry for expansion or contractual opportunities
o) Studying how human factors issues have led to 3rd party incidents involving human actions.
   - Talked about already
p) Better excavation procedures need to be developed.
   - **Vacuum excavations** may be cheaper than backhoe application; less destructive
   - 3D imaging as soft excavation technology
   - Vacuum technologies can be improved for more effectiveness and efficiency
   - Develop a vacuum cleaner that is technically and economically feasible
   - Procedure to prevent damage (i.e. water) when using vacuum
   - Harmonics technology can be used to cut through rocks and soils to loosen and/or excavate
q) Develop of right of way monitoring devices for unauthorized encroachments.
   - Already addressed
r) Improved technologies to locate damage.
   - Locate damage when it occurs
   - DA or ILI may cover in this topic
   - Research developed to manage the collection of data; data that can be gathered at the same time to assess digs or not
   - Active versus inactive corrosion sensing before digs…does technology exist? Can be **biological solution**…
s) Develop real time sensing and notification of hits by third parties.
   - Already addressed
t) Develop technologies to locate and map buried pipelines.
   - Incorporate GPS in backhoe or excavation activities
u) Improving sensors on directional drilling technologies.
   - 2 projects are underway for GTI (Allen Peterson); radar and acoustic/electromagnetic technology; prototype done and money is spent; project is burdened with high cost; benefit is high for the public; needs OPS support…low cost and low risk…
   - NC State; avoidance technology for backhoes…stuck
   - Electromagnetic trencher technology fell off the face of the earth…no cost sharing benefit found