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CALIFORNIA NATURAL GAS PIPELINE ASSESSMENT CEC #500-10-050

GTI Project Joint PAC Meeting July 9, 2012 >Identify Quick "Wins" Commercial Technologies Not is Use That Could/Should Be

or

- >Emerging Technologies That Could Be Moved to Commercial Availability Quicker
- >Leverage and Optimize the Use of the Advanced Metering Infrastructure (AMI)
- >Develop an Implementation Plan

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REVIEW OF TASKS and DELIVERABLES

- > Baseline Technology Assessment for Pipeline Integrity and Monitoring Technology in the State of California
 - Deliverables Review of current state of technologies being used Scheduled Completion Date April 30, 2012 (Completed)
- > Assessment of Currently Available Pipeline Integrity Assessment and Monitoring Technology
 - Deliverables Catalogue of available technologies and gap analysis
 - Scheduled Completion Date July 31, 2012
- Evaluate Emerging Pipeline Integrity Assessment and Monitoring Technology

 Deliverables identification of technologies that could be developed or enhanced in the next 2-4 years with emphasis on integration with the AMI communications backbone
 - Scheduled Completion Date October 31, 2012
- > Implementation Plan to Introduce New Pipeline Integrity Assessment and Monitoring Technologies to the California Pipeline Network
 - Goal to recommend specific technologies and the actions necessary to implement them in a timely and cost effective manner
 - Deliverables
 - > A testing, deployment, and implementation plan for currently available technologies
 - Recommendations for the development of select emerging technologies
 - > Recommendations for the development of new technologies to meet outstanding gaps
 - Scheduled Completion Date February 28, 2013

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Task 3 – Currently Available Assessment – Overview (1)

>Catalogue of Technologies

- Tools, Processes and Systems for Monitoring
 - > 11 Categories
 - Description
 - Strengths
 - Weaknesses
 - Pictures if Applicable
 - Provider if Limited Number
 - Communications Capability
- Bibliography
- List of Acronyms
- Glossary of Terms

Task 3 – Currently Available Assessment – Overview (2)

>Gap Analysis

- Weaknesses
- Communications Capability
- From Interviews During Task 2
 - > Previously Used
 - > Being evaluated for Use
 - > "Wish List"
- Input from SME's
- Pipeline Assessment Technology Workshop

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Task 3 - Pipeline Assessment Technology Workshop

- Purpose to identify the needs and gaps in existing or emerging transmission pipeline assessment and monitoring technologies
- Conducted June 5-6, 2012
- Included
 - > California Pipeline Operators
 - >INGAA Interstate Natural Gas Association of America
 - > GTI Gas Technology Institute
 - > PRCI Pipeline Research Council International

- >Top Three Needs, Gaps, Concerns
- >No Technology with the Capability of Interest
- >Used in Another Industry But Not in Natural Gas
- >Short Comings:
 - Detection Limits
 - Missing Parameters of Interest/Concern
 - Cumbersome or Difficult to Use
- >Information Technology Requirements
- >Database Issues
 - SCADA with GIS, GIS with Stoner

>Communications Limitations

- Proprietary vs Interoperable
- Different Generations
- Varying Ability How Much, How Frequent, What Language, Level of Sensitivity, Accuracy vs Precision, Storage is too Small, Timeliness of Data Refresh – "What is Real Now?" "10,000 Versions of the Truth!"
- None Available for Device of Interest
- One-Way vs Two-Way
- Limited Availability Cellular, RF, Satellite

Pipeline Assessment Technology Workshop - Outcome

- >Ensure Goals/Roadmaps of the 3 Industry R&D Groups are Aligned
- > Commercially Available Not Useful Due to Operational or Regulatory Barriers – "Prove it, Get it Accepted"
 - Need the Three Legs of the Stool Industry, Regulators and Manufacturers
 - > What's Missing
 - > Standard of Acceptance Operator, Regulator
- > Three Areas of Focus For Rapid Deployment
 - 1. ROW Encroachment and Excavation Damage Prevention
 - 2. Alternate Inspection Technologies
 - 3. Education

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ROW Encroachment & Excavation Damage Prevention (1)

>Know When Someone is on the ROW

- >Cost Effective Retrofit for Existing
 - Focus on HCA's
 - Fence Post Approach
- >New Installations
- >Visual or Vibration
- >Date/Time Stamped
- >Record Events for Download

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ROW Encroachment & Excavation Damage Prevention (2)

>Below or at Ground Level

- Wet or Dry
- Acoustics
- Fiber
- Other
 - > Pressure Sensor as a Microphone
 - > Visual Recognition
- >Aerial
 - Fixed Wing
 - Helicopter
 Unmanned
- >Satellite



Alternate Inspection Technologies

- > Focus on Alternative to Hydro Test Piggable and Non-Piggable
 - No Water
 - Leak/Rupture Boundary Threat/Risk, Likely failure Probability/Severity
 - Virtual Records Industry Database Common Threads
 - Guided Wave Address PHMSA's 18 Points
 - <u>http://primis.phmsa.dot.gov/gasimp/docs/GuidedWaveCheckList110107.pdf</u>
 - Non-Piggable Assessment Tools
 - > Robotics
 - > Non-Invasive Data Collection Techniques
 - ILI Decision Matrix/Assessment Tool Guidelines
 - > 30+ ILI Vendors
 - > Multiple Tool(s)/Pig

Education

> Needs

- Primer on Integrity Management Non-Industry Author
 Situational Awareness Emergency Responders and Public
 Real Time Knowledge to the Situation Video Link to Advisor
- Training and Retention of Workforce
 - > Need a Larger Pool Education System with Degree Programs
 - > Documented Process, Training Matrix, Improved Delivery Format – New Generation of Learning Styles
- > Audience
 - Emergency Responders
 - Public
 - Regulators
 - Employees

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Additional Opportunities – 12 Months to Deploy

- > Hand-held devices for field use
- > Integration of field data immediately into a GIS
- > Survey grade GPS w/o post-processing immediately into a GIS
- > Bar coding to optimize and automate field data collection and entry
- > RFID tags to locate facilities and collect and store field data for later processing
- > A lessons learned and technology demonstration workshop
- > An industry database as the first step toward the development of a predictive performance based (proactive) modeling tool

Additional Opportunities – 12 - 24 Months to Deploy (1)

- > Upgraded and integrated GIS with enterprise software available to the field "Make My Pipeline Like My House – Where is my stuff, I want to control it"
- > Accurate measurement of crack length and depth in the ditch with transmittal to the back office
- > Predictive performance based modeling tool integrated with an industry database to supplement man-made decision making
- > Remote, low cost methane detectors in the 100 to 200 ppm range and providing an alarm
- > Tracking and work management software for HCA's as accurate and reliable as "boots on the ground"

- >Low cost, low power technologies at smaller intervals - an accurate "picture" in real-time
- >Requires verification of the AMI and sensor capabilities:
 - AMI has redundancy and security in the areas of sensor deployment
 - Full access to and inter-operability of the AMI system
 - Cost advantage of sensors under development
 - Full inter-operability of the all sensors

>Once verified use the AMI system to provide:

- Redundant two-way communications for data flow
- Data collection, monitoring and system control as new technologies are developed Ex. Right-of-Way (ROW) encroachment and excavation damage prevention, leak detection
- Improved real-time monitoring of flow and pressure
- Improved operation of selected valves
- Instantaneous identification of an issue or failure requiring pipeline shutdown

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QUESTIONS???