

*the Energy to Lead*

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

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GTI Project Joint PAC Meeting

July 9, 2012

## Project Goals - Summary

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- > 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**

# REVIEW OF TASKS and DELIVERABLES

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- > **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

# Task 3 – Currently Available Assessment – Overview (1)

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## > 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)

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### > 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

## Task 3 - Pipeline Assessment Technology Workshop

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- 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

## Food For Thought - 1

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- > 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

## Food For Thought - 2

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### > 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

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- > 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

# ROW Encroachment & Excavation Damage Prevention (1)

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- > 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

# ROW Encroachment & Excavation Damage Prevention (2)

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- > 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

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- > 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
    - > <http://primis.phmsa.dot.gov/gasimp/docs/GuidedWaveCheckList110107.pdf>
  - Non-Piggable Assessment Tools
    - > Robotics
    - > Non-Invasive Data Collection Techniques
  - ILI Decision Matrix/Assessment Tool Guidelines
    - > 30+ ILI Vendors
    - > Multiple Tool(s)/Pig

# Education

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## > 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

## Additional Opportunities – 12 Months to Deploy

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- > 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)

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- > 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”

## Additional Opportunities – 12 - 24 Months to Deploy (2)

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- > 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



## Additional Opportunities – 12 - 24 Months to Deploy (3)

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- > 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???

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