DOCKETED

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Gas Operations Research
Pipeline Integrity and Safety

CEC Natural Gas R&D Workshop
July 7, 2017

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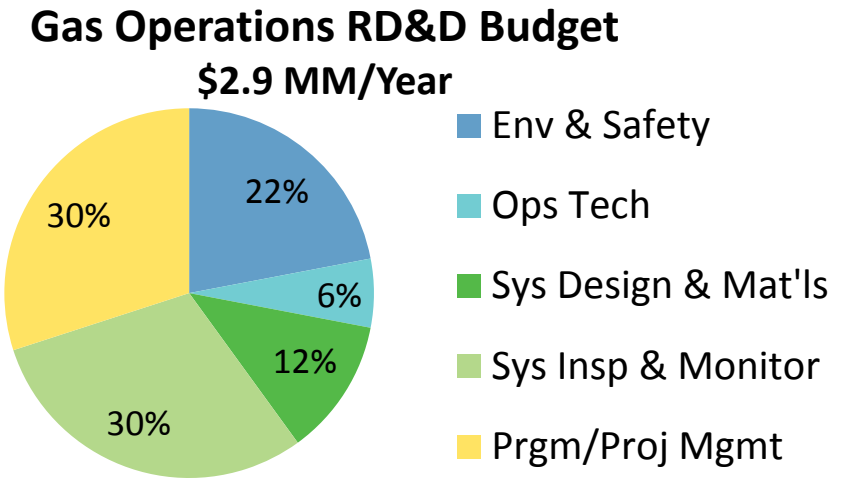
Gas Operations RD&D Program

Sub-Programs

- Environmental & Safety
  - Damage Prevention
  - Methane Emissions – Detection & Quantification
- Operations Technologies
- System Design & Materials
  - Engineering & Design
  - Cathodic Protection
- System Inspection & Monitoring
  - Internal Inspection
  - Right of Way Inspection (UAS)



Operators Perspective - System Threats

Distribution

- Damage Prevention
- Improving Design of Fittings & Joints
- Data & Information Management
- Improving Distribution Risk Models

811 Know what's below. Call before you dig.

Transmission

- Damage Prevention
- Reliable Anomaly Detection & Sizing
- Tools for Difficult-to-Inspect Systems
- Improving Transmission Risk Models

Storage

- Well Integrity
- Reliable Anomaly Detection & Sizing
- Tools for Difficult-to-Inspect Systems
- Improving Storage Risk Models

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Flash Fire Suppression System

Description

Develop an automated, Portable Flash Fire Suppression System (PFFSS) for use in confined spaces and in excavations during gas maintenance and repair operations.

Drivers & Benefits

Flash fires can cause serious burns in short periods of time. Enhance public and worker safety.

Status & Results

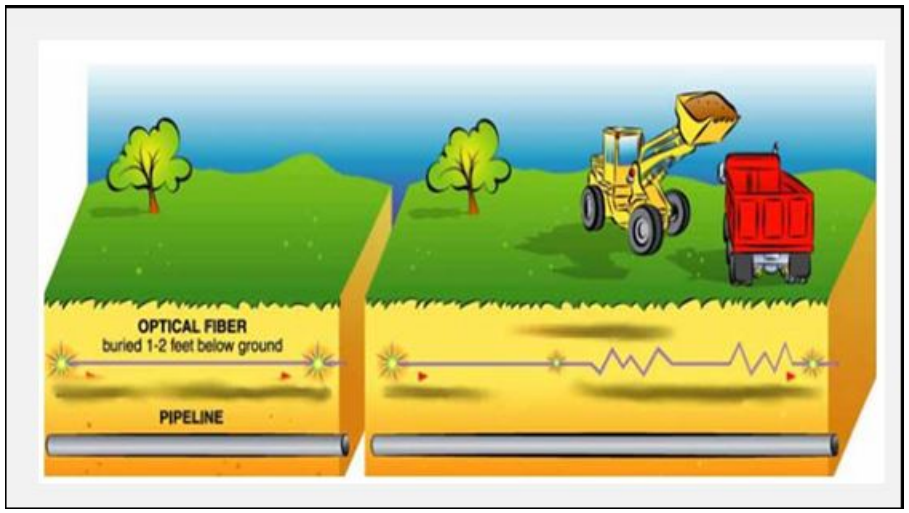
- Prototype PFFSS was developed and tested in a bellhole. It was found to adequately detect and suppress NG flash fires in less than ¼ second.
- License agreement being negotiated with commercial partner.
- Market survey and cost benefit analysis being conducted for commercial partner.

2011 Initiate | Develop | Commercialize | 2018 Deploy

Damage Prevention & Pipeline Integrity

Description

Install and demonstrate technologies focused on ROW monitoring for 3rd party excavation activities, and leakage.



Drivers & Benefits

Enhance pipeline integrity and pubic safety.

Status & Results

- CEC NG Pipeline Safety & Damage Prevention: Field test planned to install discreet sensors on 1,500 ft. of new pipeline at Rio Bravo Station, Bakersfield
- CEC GPS EENS: Co-sponsored with PG&E. Monitoring PG&E fields trials
  - SoCal field test TBD.
- Pilot installation scheduled for Fiber Optic system at Rio Bravo to monitor for leakage and encroachment. Data monitored includes acoustic and temperature.

2015 Initiate | Evaluation | 2017 Field Test/ Deploy | 2018 Deploy

Breakaway Disconnect Fitting

Description

Develop a breakaway shut-off fitting for residential meter assemblies to eliminate the release of gas resulting from outside force damage, such as, vehicular damage.

Drivers & Benefits

A cost-effective method of reducing the risk of a gas leak, fire, property damage, and injury caused by vehicle damages to aboveground facilities.

Status & Results

- Phase 1 – Design optimum break point of the fitting.
- Phase 2 – Enhance overall design (form, fit and function).
- Phase 3 – Pre-commercialization; Perform loading impacts to validate consistent breakaway performance of fitting.
- Phase 4 – Commercialization
  - SoCalGas verification testing and pilot projects prior to deployment

2012 Initiate → Develop → Testing → 2018 Deploy

SB-1371: Natural Gas Leak Abatement Program

SB-1371 Best Practices that allow for RD&D

- BP 17 – Enhanced Methane Detectors
- BP 18 – Stationary Methane Sensors
- BP 16 – Special Leak Surveys
- BP 20b – Geographic Tracking
- BP 20a – Leak Quantification
- BP 22 – Pipe Fitting Specifications
- BP 23 – Minimizing Emissions from Operations, Maintenance and Other Activities
- Refinement of Emission Factors

2015 Initiate → 2016 Develop → 2017 Final Decision (BP's) → Develop & Implement

Improving Methane Emission Estimates for Natural Gas Distribution Companies

Description

Provide technical expertise and field sites for field measurements of fugitive methane emissions from pipelines and aboveground facilities.

Drivers & Benefits

- Update the National emission factors previously developed in a 1996 GRI/EPA study.
- Support Climate Change Reporting Accuracy
- Meet Regulatory Requirements – voluntary & mandatory

Status & Results

- Completed National Studies:
  - OTD/GTI – PE Pipe
  - OTD/GTI – Unprotected Steel Pipe
  - EDF/WSU – PE, Protected & Unprotected Steel Pipe, and Metering & Regulation Stations
- On-Going CARB Studies:
  - Plastic & Unprotected Steel Pipe
- New Studies:
  - CARB Residential Meters
  - DOE Industrial Meters & Vintage PE Pipe

2009 Initiate → Develop → 2010 - 2017 Field Measurements → 2018 Reports

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Thank You

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