Natural Gas Leakage Technology Forum

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Established in 1933
3rd generation family/woman owned
Over 1,300 employees
Manufacturer of leak detection and locating products
Provide contract field service, leak detection, locating, corrosion and meter services
Personal Monitors

- LEL
- Carbon Monoxide
- Hydrogen Sulfide
- Oxygen
- Single Gas
- Multiple Gas
- Automated Calibration Docking Stations
Combustible Gas Indicators

- Confined Space Monitors
- Volume Gas
- Amplified Catalytic Sensors for PPM
- Semi-conductor for track gas / PPM
- Custom Configurable
- Leak / Odor Investigation tool
- Automated Calibration Docking Stations
Low level PPM capability
Volume Gas
Flame-ionization
Optical Infrared
Laser
Portable
Vehicle Mounted
Field Application

- Bar Hole
- Walking Survey
- Mobile Survey
Field Automation

**Server Application**
- Manages Work
- Reports Status
- Communicates Events

**Internet**

**Mobile Application**
- Tracks Surveys
- Records Leaks, AOC, No Access, etc.
Clicking on facet opens detail view with facilities

Assign facet to technician
Touch the circle and drag it to the place on the image you wish to call attention to.

Each time to select the Add Button you can add and move another circle.
Public confidence that the system is safe

Monitoring for gas leaks between compliance survey
  - Continuous patrol
  - Faster pace
  - Detection of potentially hazardous leaks
  - Low false alarm rate
  - Frost patrol or emergency response

Lower cost than CRDS
Concept

- Methane specific
- High sensitivity
  - .2 to .5 ppm detection level
- 20 mph patrol speed
- Based on proven RMLD technology
- Centralize leak indications real time to analyze high risk pattern of detections and sections of pipe
- Rapidly report actionable leak indications
Mobile System Configuration

- Pump system centrally draws sample
  - RMLD with Herriot optical sample cell
  - Phase 1
- Two side scan lasers
  - Using advanced skew test
  - Phase 2 (Research)
Leak Patrol Analytics

- Graphical maps showing areas of probable and urgent leak indications
- Time lapse growth of leak indications

Illustration only
FAA is working on regulations to allow more use of UAV

- Mostly for security
- Utility surveillance and inspection
- Scientific studies
- Most likely restricted to lower altitudes
- Highly restrictive flight authorizations
- ARPA-E Development Grant
System Features

- Continuous Site Monitoring
- Methane/ethane speciation
- Fully autonomous all-weather operation
- Automated leak detection and reporting algorithms
- Real-time automatic alarm notification via existing wireless means
Portable Standoff Near-IR TDLAS for Leak Survey

- Laser beam illuminates a distant surface
- Senses analyte gas between transceiver and illuminated surface
  - **Standoff range ~100 ft with handheld transceiver**
- Scanning laser beam across plume results in rapidly changing analyte gas measurement
- ~2500 RMLDs™ in use for natural gas leak surveying

Remote Methane Leak Detector (RMLD™)
Commercial product (since 2005)

**CO₂ version demonstrated at CCS test site wellhead during maintenance**

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Open-Path Pipeline Monitors

- Permanent laser-based open-path alarms to detect and mitigate small to potentially explosive leaks
  - Wireless
  - Solar-powered
  - Easy installation & alignment
  - Real-time alarm notification

  - **Operator alert within one minute of urgent leak detection**
  - **Hourly notification of non-urgent leaks, enabling proper operator assessment and response**

- **Enabled by proven, industry-accepted RMLD™ technology**

- CH₄ version demonstrated at PGE Livermore CA Training Center
  - 580’ ft path
  - Months of maintenance-free operation

- CO₂ version tested for more than two years at PSI and Illinois-Basin Decatur Project (IBDP) CCS Site
Test Site and Installation
PGE Training Facility, Livermore CA

Small neighborhood with buried gas distribution pipelines having controlled leaks

Path 1 = 180 ft
Path 2 = 190 ft
Path 3 = 580 ft
Leverage existing proven AMI network technology with enabling sensor technology

- automated
- reliable
- low cost
- mass market
- networked leak detection device
Vision for Gas AMI System
Layered Gas System Monitoring

- Residential
  - One or more sensor modules placed by meter or indoors

- Distribution system
  - High consequence area monitoring
  - Gate stations
  - Valve enclosures

- Light Industrial
  - Sensor module integrated with a volume corrector or data monitor

- Transmission system
  - High consequence area monitoring
## Methane Sensor Monitor

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### Table

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### Graph

2012-02-01 to 2012-04-13

- Level 25
- Level 19
- Level 13
- Level 7
- Level 1
- Level -5
QUESTIONS?