PHMSA Research, Technical and Policy Perspectives

Working Group #2 – Leak Detection/Mitigation

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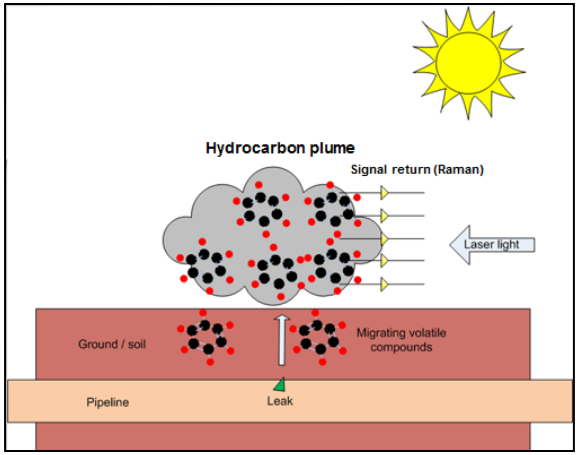
Leak Detection

- Program Objective: Research in this area will develop new or improved tools and technology solutions for reducing the volume of product released into the environment and with identifying leaks before they lead to catastrophic ruptures.
- PHMSA's Research Portfolio:
  - 20 Awarded Projects
  - $10.8M PHMSA + $4.7 Resource Sharing
  - 4 Commercialized Technologies or Products
  - *44% Technology Investment Success Rate in Research to Market
- Success in this area has seen new/improved technology to locate Oil/Gas leaks.

* 4 tech commercializations divided by the sum of 14 total tech projects – 5 active tech projects

Notable Outputs/Impacts

Internal Liq/N-Gas LDS transferred from the water pipeline industry



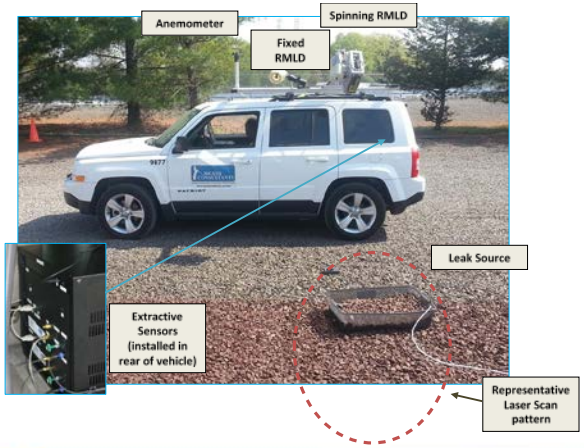
Detection of vapors from liquid petroleum pipeline leaks from a mobile platform with up to three spectroscopic instruments

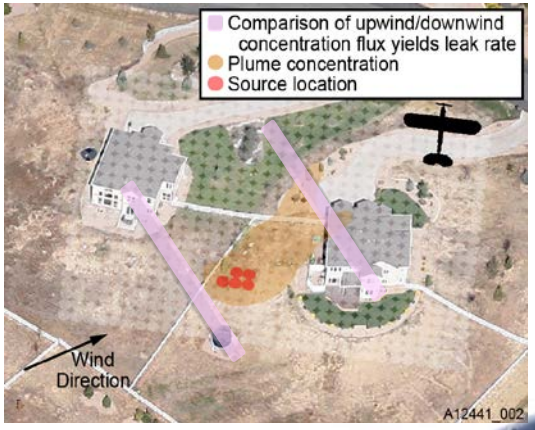
Helicopter based lased systems for methane vapor detection

Fixed wing based laser systems for Liq/N-Gas vapor detection

Current Focus: Small Fugitive Methane Leaks

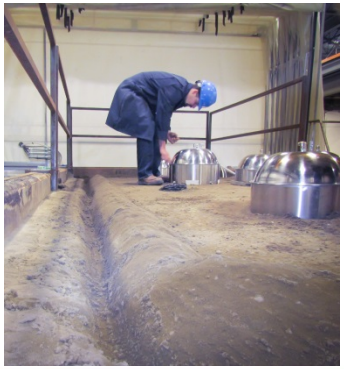
- Three projects investigating the detection and measurement of Grade 3 non-hazardous leaks
  - Results build technology utilization around a remediation plan
- These efforts designed by and coordinated with the industry, NAPSR, DOE, EPA and the EDF

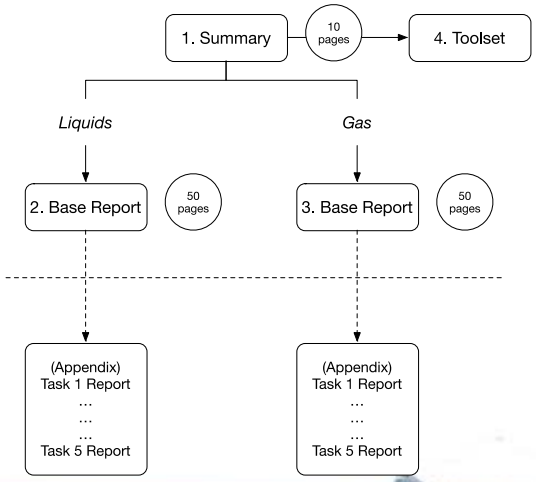




Current Focus: Standardization & Comparison

- Leak Detection Evaluation Framework for verifying and validating leak detection technologies. The framework will include standardized methods to assess the performance of technologies intended to detect small release events (i.e. leaks) and quantitative criteria to rank the performance of these systems over a range of release scenarios
- Developing recommendations, expert guidance and draft procedures to standardize designing LDS for all pipelines, including smaller ones, without costly front-end engineering





Issues/Challenges

- LDS vendor claims don't always perform as advertised even after testing and fine tuning within a system
- Users don't always have true handle on capabilities and limitations
- Limited use of external systems as part of the overall umbrella of technologies in the toolbox
- Cultural and perception issues
  - Changing mindset from "it can't be a leak, prove to me it is" to "it may be a leak, prove to me it's not"
  - Public awareness and perception – goes both ways
  - Watch excessive marketing or PR spin: is real time, state-of-the-art really real-time, state-of-the-art?

Rupture Detection System

- Should sensors, perhaps at valves be connected to SCADA or be stand alone systems?
- Should they be tied to automatic valve closure if sensors are highly reliable, very dependable
  - How should false indications be handled?
- Personnel Roles – training of remote SCADA personnel and field responders

Mandates

- 2016 PSA Section 28 - The Comptroller General of the United States shall submit a report to Congress on the feasibility, costs, benefits, and affects of odorizing all combustible gas in pipeline transportation.

PHMSA Rulemakings

- **Hazardous Liquid Rule (Final Rule Pending)**
  - Would require all lines , including in non-HCAs, implement leak detection systems, but does not give specific performance metrics
- **OQ Rule (Final Rule Pending) – Team Training and Roles and Responsibilities**
  - team training for both controllers and others who would reasonably be expected to interact with controllers (control room personnel) during normal, abnormal or emergency situations
  - roles, responsibilities, qualifications of others who have the authority to direct or supersede technical actions of the controller
- **Rupture Detection Rule (NPRM Pending)**
  - Considering proposing performance metrics for response to ruptures and requirements for installation of automatic shutoff valves, remote controlled valves, or equivalent technology
  - The overall intent is that rupture detection metrics will be integrated with valve placement with the objective of improving overall incident response

Update to 2012 Kiefner Study?

- **PHMSA is considering an update to the 2012 study, focusing on the technology and practicality aspects**
  - anything that is more widely used today vs. 2012
  - assessment of the most cutting edge, innovative technologies that show some promise for leak detection in general but not widely used
  - update on efforts in both standards development and R&D that might tie into improving leak detection system design and management overall

Standards Development

- API RP 1168 (Control Room Management)
- API RP 1175 (Leak Detection Program Management)
- API RP 1130 (Computational Pipeline Monitoring)
- API TR 1149 (Pipeline Variable Uncertainties and Their Effects on Leak Detectability)
- Gas – are we aware of any?
- External Sensors - are we aware of any?

Thank You!/R&D Program Contacts

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