ITRC PROJECT PROPOSAL

Evaluation of Innovative Methane Detection Technologies

PROPOSAL DATE:

11/2/15

Proposal Contact

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Proposals Topical Area

Remediation-Plus: Development of a methodology for state and federal environmental regulators to evaluate technologies that detect and quantify methane emissions from natural gas production, transmission and distribution for compliance with existing and or forthcoming methane gas leak regulations in the oil and gas industries.

Proposal Summary

- Several states have recently passed or are considering regulations of methane emissions related to natural gas production and distribution. Moreover, EPA and DOI have released proposed regulations for methane leaks at new sources and on BLM lands.
- Historically, gas detection technologies used to regulate emissions in the oil and gas sector had to be approved under EPA's Method 21 Requirements. More recently, with the advent of optical gas imaging technologies, an alternative work practice (AWP) was established to allow inclusion of infrared cameras, which must be manually operated and visually illustrate gas plume when a leak is present in most environmental conditions. EPA's draft regulations include Method 21 and optical gas imaging technologies as approved compliance methods.
- Going forward, there is a lot of activity and resources going into developing technologies to detect and quantify methane leaks that go beyond "sniffer" (Method 21 approved) and optical gas imaging technologies. For example, ARPA-E MONITOR program is developing a wide range of optical and chemical sensing technologies with extremely low sensitivities and low cost. Moreover, these technologies will incorporate state-of-the-art dispersion modeling techniques to pinpoint and quantify the leak source. Many of these technologies will also have the ability to monitor site remotely and/or continuously. ***But, there is currently no standard methodology for state or federal lawmakers to evaluate equivalency or superiority of new technologies compared with those already approved.***

- Therefore, the goal of this project will be to be to develop an accessible methodology that can be used by state and federal lawmakers to evaluate the viability of new detection technologies for regulatory compliance. Developing such a methodology would require incorporation of real-world data and a range of simulation technologies. Rather than require states to come up with individual, one-off methodologies, this project would pool resources and data to ensure a robust evaluation process. Plus, evaluating new technologies is important because more competition among compliance technologies will foster better capabilities and lower compliance costs.
- This project will begin in early 2016 and run for two to three years, and will include the production of a technical regulatory document within two years.

Proposed Personnel

States/Local Governments/Team Leaders: TBD; Colorado has already expressed great interest in the project and potential co-Team Leadership. Other states grappling with methane emissions from natural gas extraction as well as leaks from transmission and distribution will be solicited. Local governments particularly interested in detection of leaks from distribution lines within their jurisdictions will also be contacted.

Federal Agencies:

EPA (especially Office of Air and Radiation) participation as lead Federal regulator of methane emissions;

Department of the Interior (DOI), particularly the Bureau of Land Management (BLM) as a regulator of methane emissions from activities on BLM lands;

Department of Energy (DOE), particularly the Advanced Research Projects Agency for Energy (ARPA-E) as developer of optical and chemical sensing technologies and associated dispersion models.

Industry: Interest among petroleum companies, technology developers/vendors, consulting groups interested to learn more about available approaches and regulatory issues, transmission companies, and gas utilities.

Stakeholders/Academics: Likely interest among environmental and civic associations; potential tribal interest; and academic research institutions.

Summary of Deliverables (primary project product(s))

Web-based Technical and Regulatory Guidance Document establishing, if possible, a national consensus for evaluating the effectiveness of methane-detection and characterization technologies based on a review of the state-of-the-art of methane detection technologies and assessment of regulatory barriers to the use of a standardized evaluation methodology. Training will be provided dependent on demand and available funding in the third year.

Targeted Users (who will use products generated by this project?)

- Regulatory, technical staff and managers from all state environmental programs
- Regulatory, technical staff and managers from local government authorities
- Regulatory, technical staff and managers from Federal environmental, land management and energy programs
- Technology developers and vendors
- Oil and gas producers, transmission companies, distribution utilities, municipalities, and large facilities (e.g., refineries) with interest in detecting and managing methane releases
- Tribal, environmental, community and other interested stakeholders
- Academics involved in researching, developing or evaluating methane-detection technologies

Funding Source

The Department of Energy, Advanced Research Projects Agency-Energy (ARPA-E) will provide the funding for approximately $140,000 per year for two or three years (dependent on training needs) to facilitate fast-tracking this project to start in early 2016.