

LEAK DETECTION LESSONS LEARNED

DOT/PHMSA R&D FORUM

NOVEMBER 16, 2016

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PACIFIC GAS & ELECTRIC

CURRENT STATE OF LEAK DETECTION AND EMISSIONS

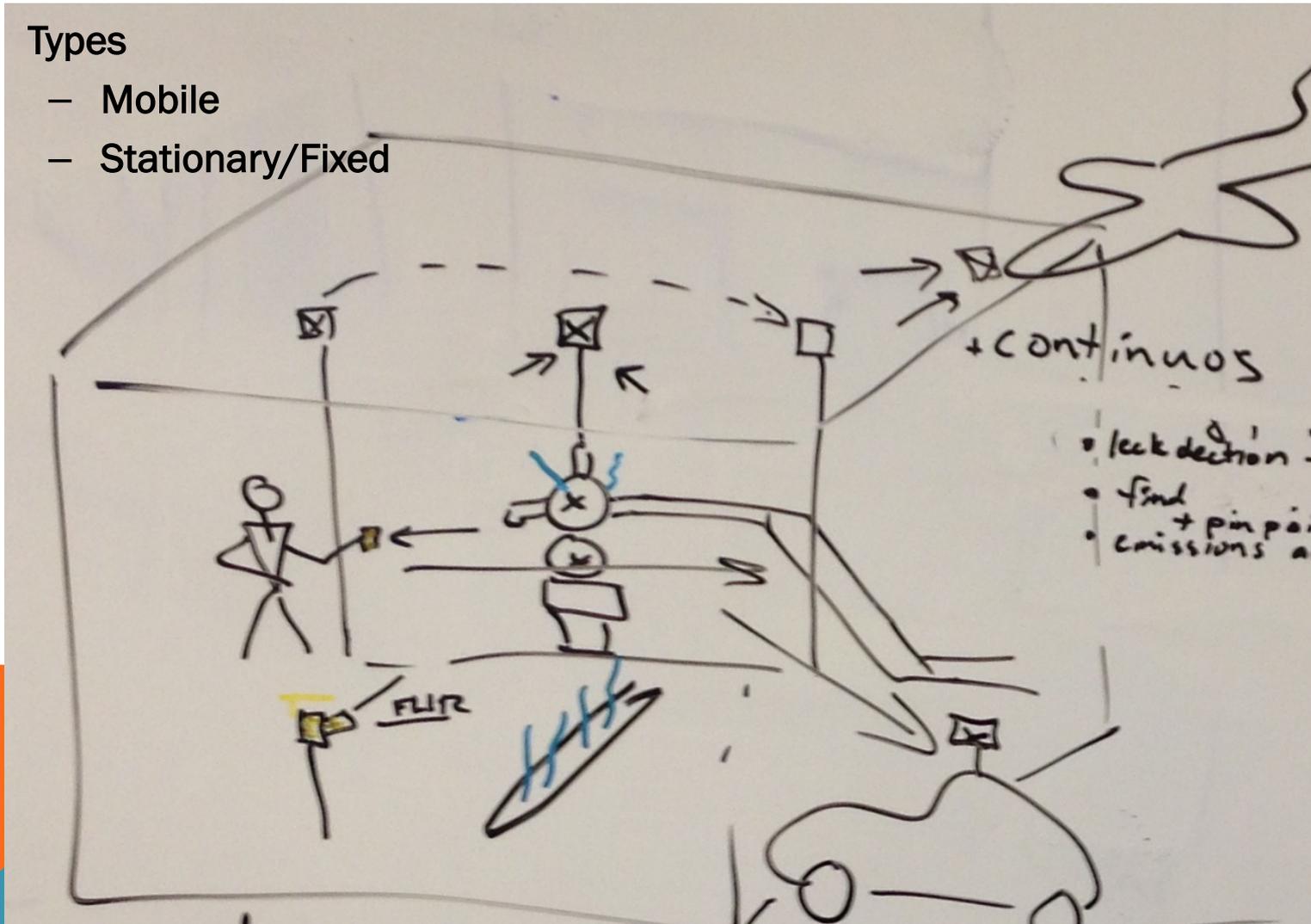
Implemented daily inspection and leak survey in February 2016

- Use of Detecto Pak-Infrared (DP-IR™) and Remote Methane Leak Detector (RMLD)
- Identified and repaired over 800 flange, fitting, and stem valve
- Maybe contributing to overall methane levels based on flyovers



TECHNOLOGY REVIEW

- Types
 - Mobile
 - Stationary/Fixed



TECHNOLOGY REVIEW

No.	Developing Institution(s)	Product Name
1	Quanta3	Soterias Methane Sensing System
2	IBM, Princeton, Harvard, SWN (Southwestern Energy)	AIMS (An Intelligent Multi-modal Methane Measurement System)
3	LI-COR Biosciences, Colorado State	Novel Laser Spectroscopic Methane Sensor
4	PARC	SPHINCS (System of Printed Hybrid Intelligent Nano-Chemical Sensors)
5	THORLABS & Maxion Technologies	Tunable Laser for Methane Detection
6	Aeris Technologies, Los Alamos National Lab, Rice University	(MIRA) Ultra Series, MIRA PICO Series
7	UC Merced Mesa lab and JPL	UAS-mounted Open Path Laser Spectrometer
8	GE and Virginia Tech	Hollow Core Fiber for Mid-IR Methane Measurements
9	Duke University and RTI International	Coded Aperture Miniature Mass Spectrometer For Environmental Sensing: CAMMS-ES

TECHNOLOGY REVIEW

No.	Developing Institution(s)	Product Name
10	Heath Consultants and PSI	REM (Remote Emissions Monitor)
11	Pergam Technical Services	LMS Remote
12	Acutect	Acutect FP-30
13	University of Colorado, NIST	Frequency Comb Based Methane Detection Network
14	Physical Sciences Inc.	RMLD-Sentry
15	Bridger Photonics, Inc. MIT Lincoln Laboratory	Mobile LiDAR Sensor
16	FLIR Systems	FLIR GF320 / G300a
17	Opgal	EyeCGas
18	Rebellion Photonics	GCI
19	Rebellion Photonics	goGCI

LESSONS LEARNED

Can Do

- Currently it can provide continuous monitoring of concentrations
- Identify emissions on connections and valves
- Currently capable of providing snap shots (bag and tag or total flow readers)

Can Not Do

- Does not detect casing leak in a well
- Continuous monitoring of volume

Maintenance can reduce emissions – flyover and leak repair

Labor intensive to reduce emissions (pin point)

- Technology needs to mature/develop to identify location of emission
- It needs to develop to determine volumes (continually) in order to prioritize emission reduction maintenance activity