

Track Summary – LDAR

Training Classes – February 19 – 21, 2020

OOOOa LDAR

LDAR Auditing – Graham "Buzz" Harris

Surviving an LDAR Audit with Software

LDAR Training (12hr) – Beyond Basics and Underneath the Rules

Breakout Presentations – Thursday February 20, 2020

Understanding Cooled vs Uncooled Optical Gas Imaging

Turnaround LDAR – Jeff Diehl – Think Environmental

Optical Gas Imaging: Examining Detection Limit and the resulting impact to Emissions

EPA AWP Update – Karen Marsh – EPA

Lunch Break in the Exhibit Hall

The Future Technology of LDAR

The Transformation of LDAR: Predictive Leak Management Software

Data Analysis and how it can Improve your LDAR Program

Enhanced LDAR Training; An Unconventional Approach to Training LDAR Technicians

Methods for Enhancing Fugitive Emissions Prevention in Chemical Process Pipelines

Oil and Gas Breakout Presentations – Friday February 21, 2020

Methane Detection using Satellites

MethaneSAT 2021 Satellite Methane Detection Coming Soon

Satellite-based Hyperspectral Analysis for Emissions Detection, Integrity Monitoring and Compliance

Autonomous Mobile Methane Monitoring

Mirage HC OGI / TDLAS Multi-Sensor Aerial OOOOa Inspections

Detailed Agenda Continues on Next Page

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LDAR – Breakout Presentations

Breakout Presentations Room 400 – Thursday February 20, 2020

- **10:30 AM – 11:00 AM**
 - **Understanding Cooled vs Uncooled Optical Gas Imaging – Craig O’Neill – FLIR**
 - For over a decade, FLIR Systems has manufactured infrared cameras to visualize gas leaks of various kinds. These Optical Gas Imaging (OGI) cameras are developed to “see” a variety of gases including hydrocarbons, carbon dioxide, sulfur hexafluoride, refrigerants, carbon monoxide, ammonia and more. These imagers are used to mitigate emissions, increase production efficiency, ensure safe work environments and more by a variety of industries. One great advantage of OGI cameras compared to other inspection technologies is the speed in which the technology can locate leaking components while not interrupting the industrial process. Historically OGI cameras have been designed with cooled infrared detectors that offer several advantages over uncooled thermal detectors but often come with a higher cost. Advancements in the technology of uncooled detectors have allowed the OGI camera manufacturers like FLIR to design and develop lower cost OGI solutions for these industries. While these are often lower in cost, there are some limitations versus imagers with cooled detectors. This paper will explain the differences in the two detector technologies and compare advantages/disadvantages of both.

- **11:00 AM – 11:30 AM**
 - **Turnaround LDAR Best Management Practices – Jeff Diehl – Think Environmental**
 - Abstract Coming Soon.

- **11:30 AM – 12:00 PM**
 - **Optical Gas Imaging: Examining Detection Limit and the resulting impact to Emission Inventory – Jon Morris – Providence Photonics**
 - Optical Gas Imaging (OGI) has been widely used for detecting gas leaks from process equipment. However, the detection limit of an OGI camera has been an elusive performance metric and has not been systematically characterized and quantified. A substantial body of research has been performed that has shed some light on the OGI detection limits and the factors that dictate the detection limits. The OGI detection limit expressed as ppm–m can be calculated at a pixel level as a function of ΔT (differential temperature between the gas plume and the background), the OGI camera type, and the specific gas in question. Furthermore, the OGI detection limit expressed as a minimum mass leak rate (e.g., grams per hour –denoted DLgph) can be calculated based on the ΔT and the distance from the OGI camera to the leak location. With an OGI DLgph expressed as a function of ΔT and distance, an OGI leak survey protocol can be established that will provide operators a flexibility of using the most suitable combination of ΔT and distance in the field to achieve the same minimum detection limit. A numerically defined OGI detection limit will enable establishment of an emission factor for “non–detects” in a Leak Detection And Repair (LDAR) program. The contribution of the non–detects can be a significant contributor to the total fugitive emissions in an emission inventory due to the overwhelming number of components in the non–detect category. If a higher DLgph is adopted

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in a leak survey protocol, the emission factor for the non-detects will be higher, and vice versa. If desired, a DLgph value can be mapped to a “leak definition” in a conventional LDAR program, providing a transition from a Method 21 based LDAR program to an OGI based LDAR program for more efficient management of fugitive emissions.

- **12:00 PM – 12:30 PM**
 - **EPA AWP Update – Karen Marsh – EPA**
 - Abstract Coming Soon.
- **12:30 PM – 1:30 PM Lunch Break in the Exhibit Hall**
- **1:30 PM – 2:00 PM**
 - **The Future Technology of LDAR – Joshua Pinter – CNTRAL Inc.**
 - In this presentation we will go over the current state of LDAR technology, including both hardware and software, and showcase emerging technologies that will dramatically shape the future workflows and efficiencies of the LDAR industry. From new mobile devices that allow for far more functionality than past generations to brand new technology that is still 2 – 5 years away from reaching mainstream, such as augmented reality. This presentation is aimed to not only get people prepared for the future and how our workflows will change but also to get people excited about the future of LDAR and the advancements that are coming, including heads up displays so you can have both hands free to monitor.
- **2:00 PM – 2:30 PM**
 - **The Transformation of LDAR: Predictive Leak Management Software – Brian Whitley – Emission Monitoring Service, Inc. (EMSI)**
 - Abstract Coming Soon.
- **2:30 PM – 3:00 PM**
 - **Data Analysis and how it can Improve your LDAR Program – Derrick Mauk – Bureau Veritas**
 1. What data can be analyzed? – A discussion of all LDAR data that is collected and what can be mined.
 2. What data should be analyzed? – A discussion of what LDAR data should we be looking and paying attention to.
 3. How do you perform data analysis? – Methods of how to mine through the Hundreds of Thousands of LDAR Data points.
 4. Proactive Data Mining for Compliance. – How proactive data mining can prevent compliance issues?
 5. Data Analysis to improve productivity. – How to insure good productivity. How to prevent bad productivity.
 6. How can proactive data analysis can improve Inventory Projects? – Discussion on how performing data analysis on inventory projects can provide more accurate data."

LDAR – Breakout Presentations

- **3:00 PM – 3:30 PM Break to Enjoy the Exhibit Hall Refreshments**
- **3:30 PM – 4:00 PM**
 - **Enhanced LDAR Training; An Unconventional Approach to Training LDAR Technicians – Todd Morrison – Insight Environmental**
 - Is your LDAR training up to date with modern technology? This presentation will detail the process of incorporating technology such as 3D modeling and virtual and augmented reality into your LDAR training.
- **4:00 PM – 4:30 PM**
 - **Opening up the opportunities for performance verification and reliability enhancement of valves. – Dave Anderson – Score Valve**
 - This paper examines the currently adopted technique of in-line testing and compares it directly to a safer, cheaper and faster reliability assurance testing method, which delivers an improved confidence limit in its reported results, making it highly attractive for immediate adoption. Two current case studies will highlight how an alternative testing method has been proven and deployed, which has opened up further reliability testing opportunities on a much larger population of critical and medium criticality process isolation valves, delivering a significant step change in reliability assurance moving forward.
- **4:30 PM – 5:00 PM**
 - **Methods for Enhancing Fugitive Emissions Prevention in Chemical Process Pipelines – Dale Rice – VSP Technologies**
 - Most fugitive emission reduction / elimination efforts in the industrial community, especially at chemical and refining facilities have been focused on component monitoring with the implementation of LDAR (Leak Detection and Repair) programs. USEPA studies have shown that the vast majority (between 80 and 90%) of fugitive emissions are associated with valve and connector leaks . While necessary, LDAR programs are, by definition, concerned with fixing leaks when they are encountered, not preventing them. Further, it could be argued that the greatest contribution to lowering fugitive emission rates from connectors and valves is through the use of consistent time-tested assembly and maintenance procedures, and the selection of the best available technology in terms of lowest emission valve packings, gaskets, torquing equipment, and other equipment. An overview of best practices for achieving lowest fugitive emission rates for bolted flange connectors and valves including a fugitive emissions model for gasketed connectors will be presented.

LDAR – Breakout Presentations

Oil & Gas Fugitive Emission Monitoring, Inspection and Detection Technologies – Room 616A – Friday February 21, 2020

- **8:00 AM – 8:30 AM**
 - David Furry, Leaks Surveys, Inc, Quadcopter Drones, Fixed Wing Drone, Helicopters, or Fixed Wing Plane?
- **8:30 AM – 9:00 AM**
 - Methane Detection using Satellites – Stephane Germain – GHGSat
- **9:00 AM – 09:30 AM**
 - MethaneSAT 2021 Satellite Methane Detection Coming Soon – Tom Ingersol – EDF
- **9:30 AM – 10:00 AM Break to Enjoy the Exhibit Hall Refreshments**
- **10:00 AM – 10:30 AM**
 - Space-based Infrastructure of Hyperspectral Sensors to provide Monitoring Services via our Spectral Intelligence Platform. – Tushar Prabhakar – Orbital Sidekick
- **10:30 AM – 11:00 AM**
 - Airborne LIDAR Pipeline Inspection Systems (Helicopter) – Tim Goolsby – Lasen
- **11:00 AM – 11:30 AM**
 - Autonomous Mobile Methane Monitoring – Brendan Smith – SeekOps
- **11:30 AM – 12:00 AM**
 - Mirage HC OGI / TDLAS Multi-Sensor Aerial OOOOa Inspections – Roy Massengale – Enrud
- **12:00 PM – 01:00 PM Break for Lunch in the Exhibit Hall**

Track Summary – LDAR

Training Classes – Wednesday February 19, 2020

- **Room 400 1:00 PM – 5:00 PM**
 - LDAR Training (12hr) – Beyond Basics and Underneath the Rules – EMSI
- **Room 408 8:00 AM – 12:00 PM**
 - LDAR Auditing – Graham "Buzz" Harris
- **Room 415 AB 8:00 AM – 12:00 PM**
 - OOOOa LDAR – Think Environmental

Training Classes – Friday February 21, 2020

- **Room 400 8:00 AM – 5:00 PM**
 - LDAR Training (12hr) – Beyond Basics and Underneath the Rules – EMSI
- **Room 415A 1:00 – 5:00 PM**
 - Surviving an LDAR Audit with Software – Guideware Systems

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