CONCEPT

Methane Emissions Management in Oil and Gas: Measurement, LDAR and Mitigation



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Introduction:

Methane emissions management in oil and gas breaks down when a facility reports vented, fugitive and flared volumes from generic factors that no survey has ever tested, while leaks, unlit flares and bleeding pneumatic controllers keep releasing gas that could be sold. Buyers, investors and reporting programmes now ask for measured, reconciled figures. This Core Concept course trains engineers to map methane sources, quantify them at source and site level, run LDAR and optical gas imaging surveys, report against OGMP 2.0 and choose cost-ranked abatement. Participants build a Facility Methane Inventory and Reduction Roadmap.

Course Objectives:

- Map methane emission sources across production, processing, transmission and storage assets by venting, flaring, fugitive, pneumatic and tank category
- Quantify facility methane with emission factors, engineering calculations and direct measurement, and reconcile source-level totals with site-level measurements
- Design an LDAR programme with component inventories, survey frequencies, detection thresholds, repair deadlines and record keeping
- Plan and conduct optical gas imaging surveys and select drone, aircraft, satellite or continuous monitoring for the right detection task
- Prepare methane reporting to OGMP 2.0 reporting levels and gather the evidence a certification audit such as MiQ grading expects
- Rank abatement options such as flare gas recovery, vapour recovery units and zero-bleed pneumatics in a costed methane reduction roadmap

Target Audience:

- Environmental engineering staff who compile facility emission inventories and methane reports
- Operations and production engineering staff who run wells, separators, compressors, tanks and flares
- Emissions and LDAR programme staff who schedule surveys, track leaks and verify repairs
- Mechanical, instrumentation and integrity staff who maintain valves, seals, pneumatic controllers and vapour recovery equipment
- Field technicians and survey contractors who carry out optical gas imaging and leak quantification work

Course Outline:

Day 1: Methane Sources Across the Oil and Gas Value Chain

- Methane Properties, Global Warming Potential Horizons and Why Short-Lived Emissions Matter
- Value Chain Source Map: Wellsites, Gathering, Gas Plants, Compression, Transmission and LNG
- Venting, Incomplete Flare Combustion, Fugitive Leaks, Pneumatic Controllers and Storage Tank Flash Gas
- Super-Emitter Events: Stuck Dump Valves, Unlit Flares and Open Thief Hatches
- Facility Methane Source Register Template and Current-State Gap Check

Day 2: Quantification Methods and Reporting Frameworks

- Emission Factor, Engineering Calculation and Direct Measurement Approaches Compared
- Source-Level Measurement Tools: Hi-Flow Samplers, Calibrated Bagging and Flow Meters on Vents
- Site-Level Measurement: Mobile Downwind Surveys, Aircraft Mass Balance and Top-Down Estimates
- OGMP 2.0 Reporting Levels From Generic Factors to Reconciled Source and Site Data
- MiQ Certification Grading, Methane Intensity and Independent Audit Evidence

Day 3: LDAR Programme Design and Optical Gas Imaging Practice

- LDAR Component Inventory: Valves, Connectors, Flanges, Compressor Seals and Open-Ended Lines
- Survey Frequency, Detection Threshold and Risk-Based Site Prioritisation Matrix
- Optical Gas Imaging Camera Operation: Delta-T, Wind, Viewing Distance and Background
- OGI Survey Route Planning, Video Evidence Capture and Leak Tagging Procedure
- Repair Deadlines, Delay-of-Repair Justification and Post-Repair Verification Records

Day 4: Advanced Detection, Data Reconciliation and Abatement Engineering

- Drone, Aircraft and Satellite Methane Detection: Coverage, Detection Limits and Revisit Time
- Continuous Fixed-Point Sensors and Alert Triage Workflows
- Reconciling Inventory Totals With Measured Site Data and Explaining Gaps
- Flare Gas Recovery, Vapour Recovery Units and Routine Flaring Elimination Options
- Zero-Bleed and Electric Pneumatics, Compressor Seal Gas Capture and Blowdown Reduction

Day 5: Modelling Build: Facility Methane Inventory and Reduction Roadmap

- Onshore Production Case: Building a Source-Level Methane Inventory Model
- Gas Compression Station Case: OGI Survey Results and Leak Repair Prioritisation
- Methane Abatement Cost Curve Using Recovered Gas Value and Capital Cost
- Methane Intensity Target, Milestones and Monitoring Plan Drafting
- Facility Methane Inventory and Reduction Roadmap Peer Challenge

Skills You Will Gain:

- Methane Source Identification
- Leak Rate Quantification
- LDAR Programme Planning
- Optical Gas Imaging Survey Technique
- Measurement Data Reconciliation
- Methane Reporting Preparation
- Abatement Option Screening
- Methane Intensity Tracking

Why Attend This Course:

- Return with a Facility Methane Inventory and Reduction Roadmap built from realistic production and compression station data
- Stop relying on untested emission factors by knowing which measurement method fits each source and site
- Find and fix the few large leaks and unlit flares that drive most of a facility's methane before an aerial or satellite survey does
- Compare leak survey and abatement practice with engineers from upstream, midstream, gas processing and LNG operations

Conclusion:

Methane falls only when a facility knows where its gas escapes, how much leaves each source and which fix pays back first. The one week move from source mapping across the value chain, through emission factors, source-level and site-level measurement and OGMP 2.0 reporting, to LDAR design, optical gas imaging practice, aerial and satellite detection and abatement engineering. The final day turns this into a Facility Methane Inventory and Reduction Roadmap that participants can apply at their own sites.