

What You Cannot See with the Naked Eye!

Use of Optical Gas Imaging for Compliance
(and other “cool” applications)



July 18, 2013
Rocky Mountain EH&S Peer Group Meeting
Denver, Colorado

Introduction

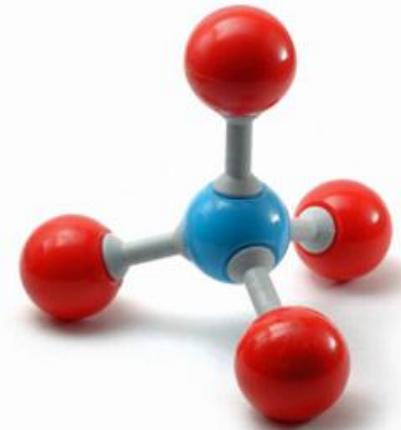
- ◆ Subpart W
- ◆ OGI Certification
- ◆ OGI Methods
- ◆ OGI Camera Basics
- ◆ Best Practices
- ◆ Economic Analysis
- ◆ Other Applications



Subpart W

40 CFR 98.233(q) *Leak*

detection and leaker emission factors.

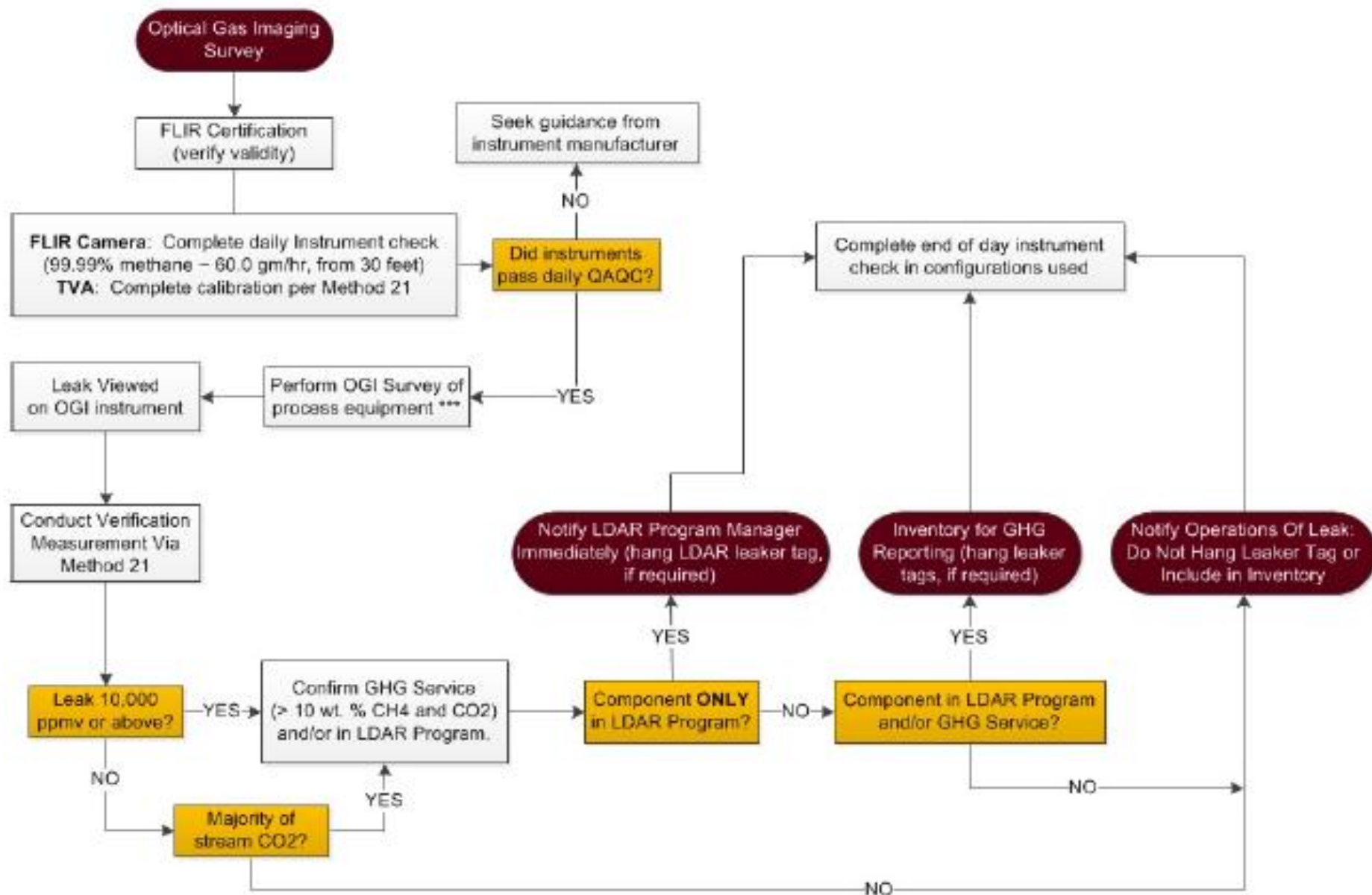


“You must use the methods described in § 98.234(a) to conduct leak detection(s) of equipment leaks applies to component types in streams with gas content greater than 10 percent CH₄ plus CO₂ by weight.....Tubing systems equal to or less than one half inch diameter are exempt.....”

FLIR CERTIFICATION



FIGURE 1. TRIHYDRO OPTICAL GAS IMAGING SURVEY APPROACH FLOW DIAGRAM



*** NOTE: If equipment is greater than 30 ft from OGI instrument, perform instrument check at new desired distance.

Document, Report, Keep Records, Repeat



Alternative Work Practice for Monitoring Equipment Leaks

- Instrument checks must be done according to the AWP
- Use 60 grams per hour (gph) of methane
- Instrument check done daily and distance of instrument check noted
- Check should be done in all modes available by the camera



FLIR GF 320 Basics

- Theory
- Cooled, 320x240 Indium Antimonide
- Microcooler
- Cold Filter
- Auto, Manual, and High Sensitivity Modes (HSM)

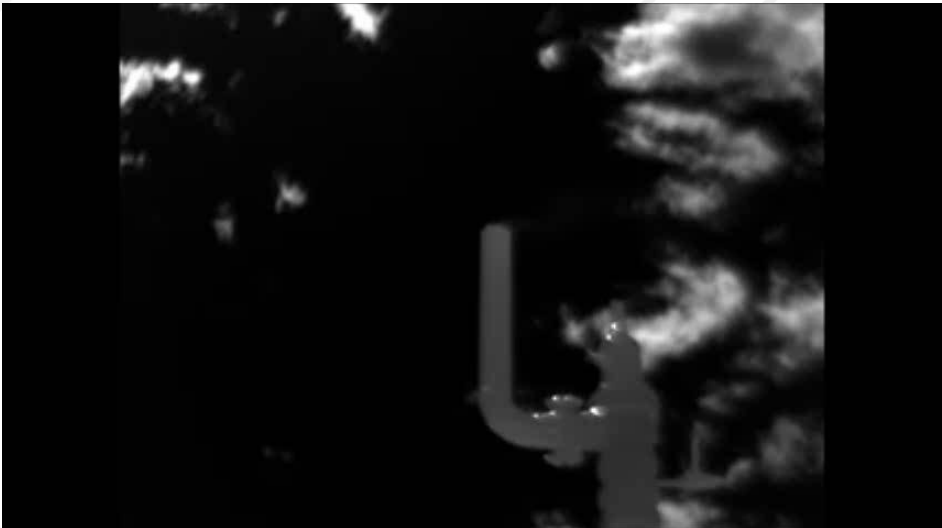
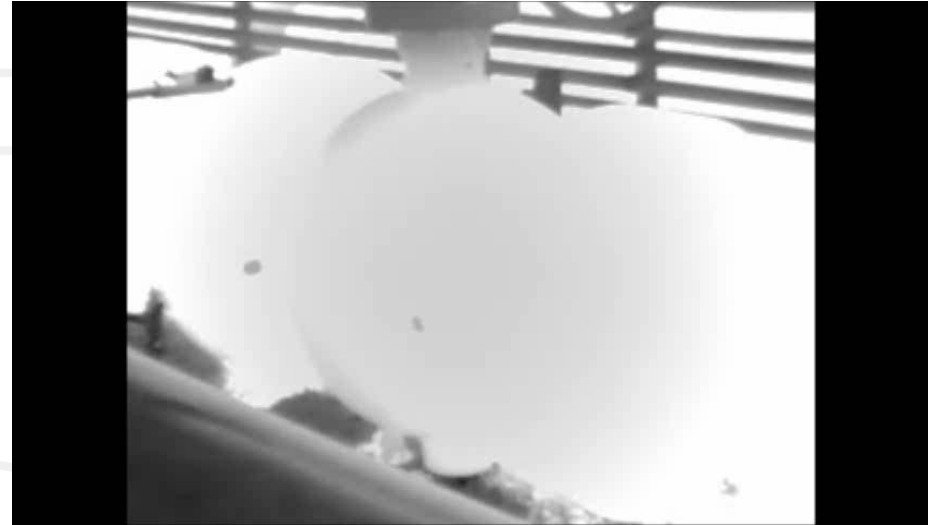


That is one “cool” camera



Art vs. Technique

- ◆ HSM
- ◆ Thermal Tuning
- ◆ General Monitoring Techniques



Need to thermally tune



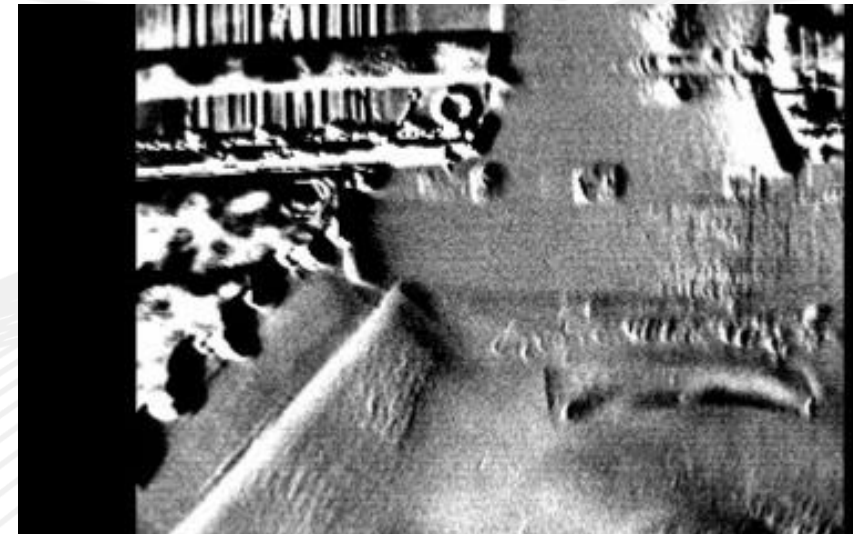
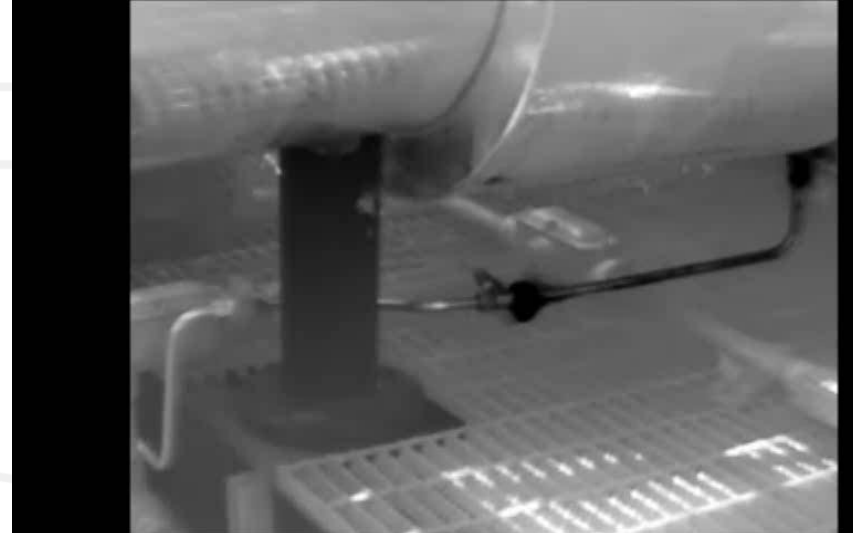
Compare and Contrast

- ◆ 60 gph methane

- ◆ Leaks at Gas Plants



And For Your Viewing Pleasure.....



Leaking Gas = \$\$\$

How much are you losing?

- A leak at 60 gph methane equates to about \$134.00 per leak per year
- Average 100 leaks per facility and each leak is 10 times the rate of 60 gph the total money lost in gas is \$133,567.00 per year



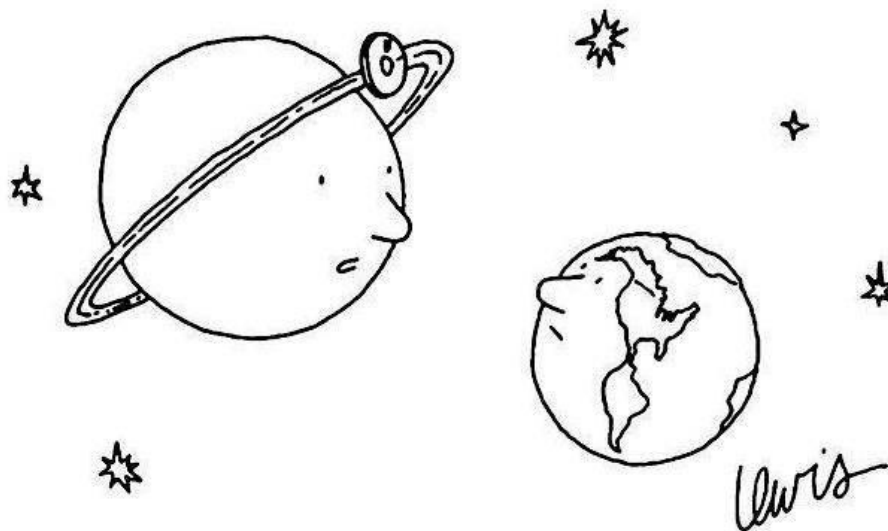
Where are OGI requirements happening now?



- ◆ Air Permits – Wyoming
- ◆ Inspections – Colorado, Wyoming
- ◆ Consent Decrees/Settlements
- ◆ GHG Reporting – Subpart W

What do we think EPA intends to look for regarding OGI programs?

- EPA's March 2012 Uniform Standards proposal gives us some ideas
- EPA intends to propose an OGI Protocol (40 CFR Part 60, Appendix K; this does not yet exist):
 - ◆ Training requirements
 - ◆ Daily instrument checks (60 gph)



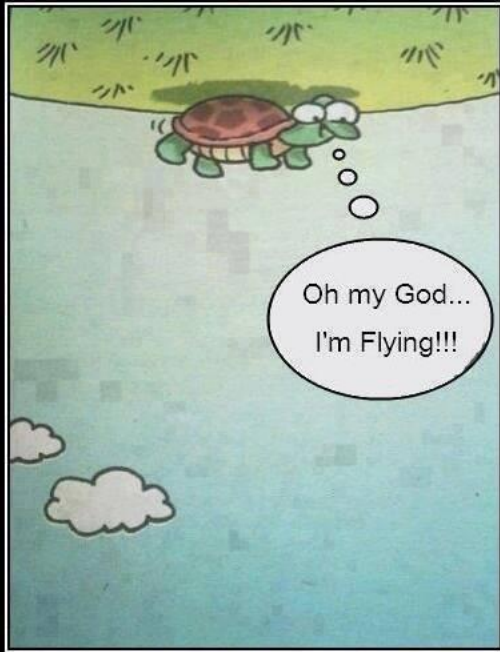
“I’m afraid you have humans.”

What else do the proposed Uniform Standards tell us?

- See an imaged leak → repair → eliminate imaged leak
- Use of OGI as an option for evaluating storage tank leaks at initial fill and annual inspections
 - IFRs – can replace visual “through the hatch”
 - EFRs – can replace annual seal gap inspections
 - Pressure vessels – Alternative to Method 21 for newly required pressure vessel inspections.



Other examples where Optical Gas Imaging is being pursued



Optimism is the best
Way to see life

- Colorado's proposed changes to Regulation 7
- Voluntary OGI inspections can be performed prior to the regulators, allowing for proactive maintenance.
- OGI inspections during facility startups can discover leaks early, potentially averting catastrophic consequences.



“If you ask me anything I don’t know, I’m not going to answer”.

-Yogi Berra



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