Dynegy Midstream Services, L.P. Experience with the Natural Gas STAR Program

11th Annual Implementation Workshop
October 25 - 27, 2004
Houston, Texas

Outline

- ★ Background
- ★ Gas Processing Plant’s study
- ★ Pipeline Leak Study
- ★ Monument Gas Plant
- ★ Future Plans.

Background

- Dynegy Midstream Services, L.P.
- Corporate vs. Field staff
- Number of DMS facilities

Gas Plant's Study

- Two DMS facilities in study
- Cost was $ 30 K
- Amount methane saved = 100 MMSCF/yr

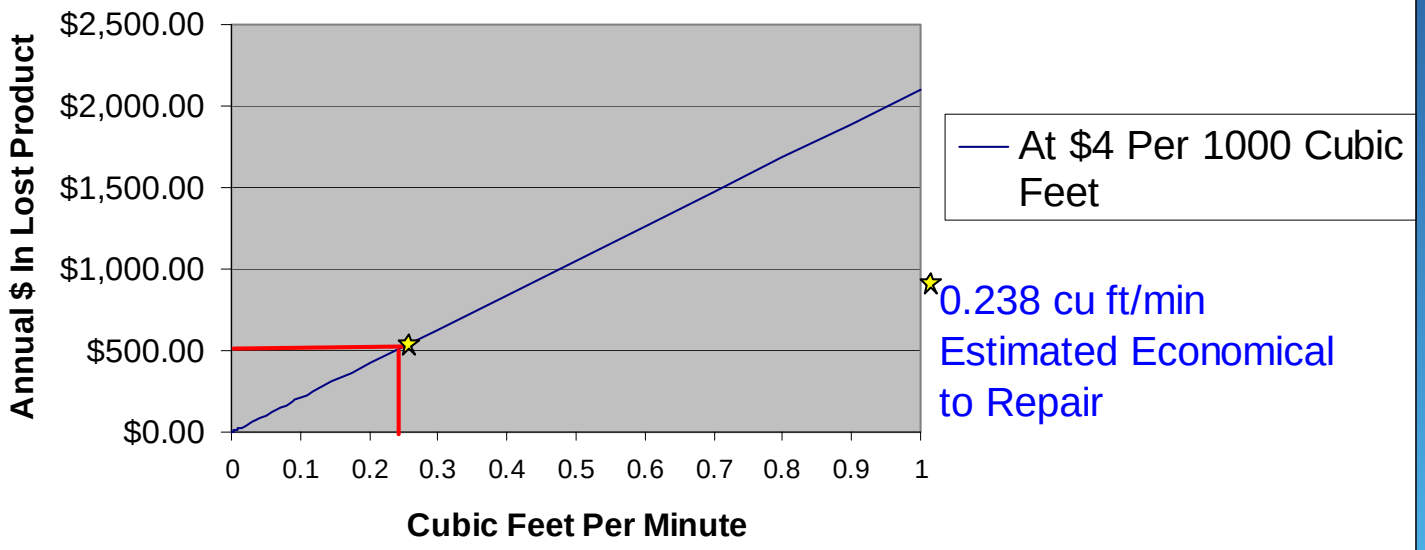
  ($600K @ $6/MSCF)
- Savings Realized within 18 Months – Largest

  Cost-Effective Leaks Repaired

Chico Gas Plant

Economics of LAUF

Lost and Unaccounted For Product
Potential $ Savings
Equating Pure Methane Leak Rate to Dollars



Optical Remote Leak Detection

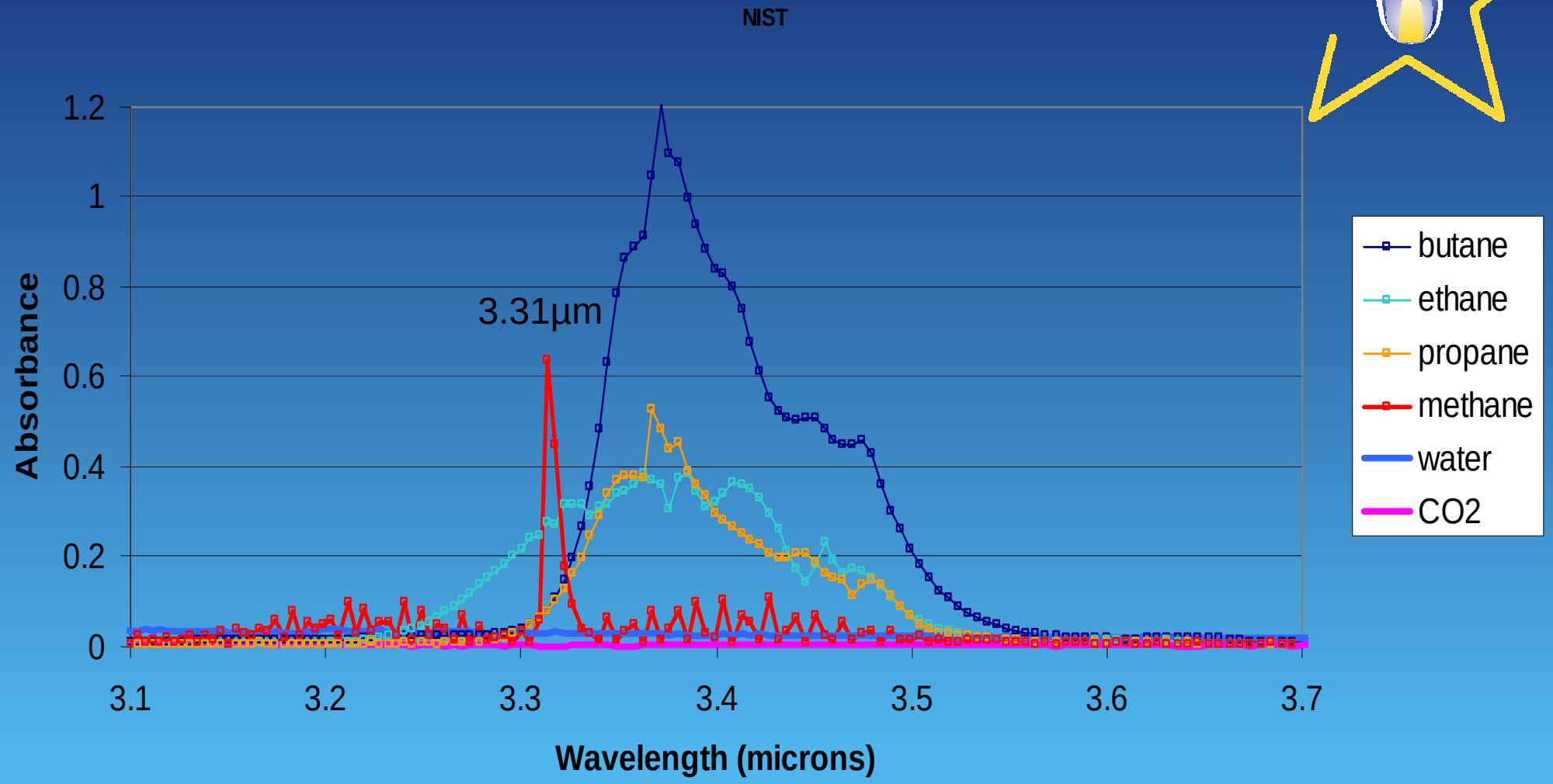
Infrared Differential Absorption

- ★Mid wave Infrared - 3 to 5 µm
- ★Long wave Infrared - 8 to 11 µm
- ★Visible - 0.4 to 1.0 Microns
- ★Near IR -0.9 to 1.6 Microns

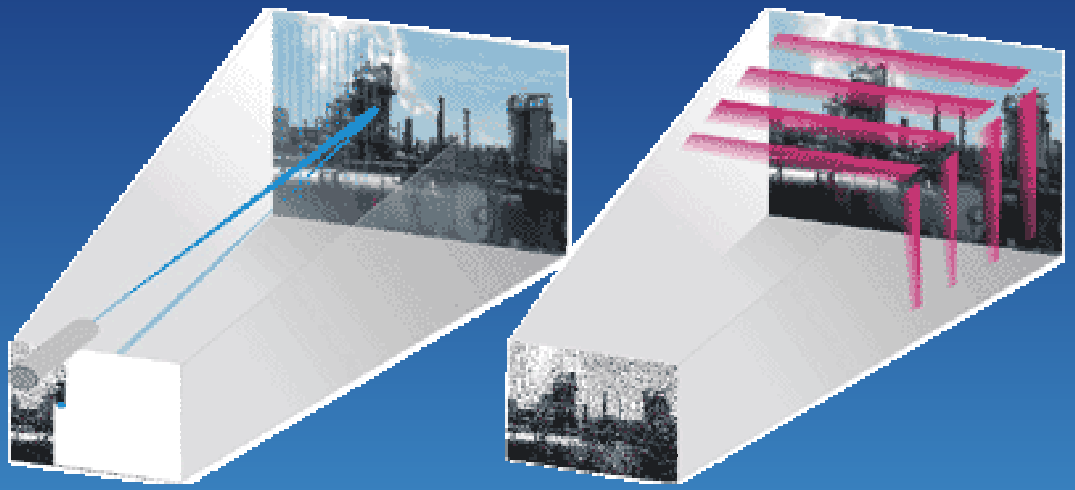
Remote sensing is the science and art of obtaining information about an object, area, or phenomenon through the analysis of data acquired by a device that is not in contact with the object, area, or phenomenon under investigation.

From Remote Sensing and Image Interpretation, Lilles and and Kiefer, 1987

Similar to Gas Chromatography



Active vs. Passive Imaging



- Active techniques employ an artificial radiation source (e.g. a microwave transmitter, a laser, a thermal heater, etc.) for illumination of the target area
- Passive techniques utilize the naturally occurring ambient radiation

Passive Remote Optical Infrared Leak Detection, Quantification, and Speciation

LSI

PAT

LSI Camera Visualizes Gasoline Vapor

- ★ Field Portable
- ★ Rugged
- ★ Reliable
- ★ Repeatable
- ★ Sensitivity
- ★ Ease of Use - Doesn't Require Frequent Adjustment
- ★ Capable of Identifying "Inaccessible" Leaks

LSI Leak Surveys Video Imagery

Flange Leak

Buried Pipeline Leak

Pipeline Leak Study

- Driving – visible signs (e.g. vegetation stress)
- Driving with sniffer trucks twice a year
- 25 – 40 miles per day

Pipeline Leak Study

- ★ Mass Balance Discrepancy Identified Need for Survey
- ★ Infrared Remote Sensing from helicopter
- ★ 200-400 miles per day
- ★ Amount of methane estimated at ~146 MM SCF /yr or (0.5 MMSCFD)

Monument Gas Plant

Monument Gas Plant

- Original plant built in 1936
- Modifications in 1963 & 1976
- 31 engines for combined 25, 000 hp

Monument Gas Plant

- ★26 engines to be replaced with integral electric compression
- ★18, 500 HP Replaced
- ★Amount of fuel saved is 1.5 BCF/yr and Corresponding CO2 Reductions

Monument Gas Plant

Monument Gas Plant

Monument Gas Plant

- ★Cost of this project $ 7 MM
- ★Amount of fugitive methane losses saved is ~41 MMSCF/yr
- ★Ancillary Benefit - Criteria (e.g. NOx) and HAPs pollutant reduction

Monument Gas Plant

- Infrared survey conducted to identify sources of leakage
- ~200 leaking sources identified
- Largest opportunities - blow down vents and valve packing
- Amount of methane saved is ~146 MMSCF/yr $876K @ $6/MSCF

Future Plans

- ★ Study at least two additional gas plants and upstream compressor stations within 12 months
- ★ Evaluate gathering system opportunities
- ★ Apply the information from previous studies to other facilities
- ★ Plan to implement DI&M surveys every two years at gas plants/compressor stations

Future Plans (contd.)

- ★ Coordinated Efforts for Sharing BMPs with Field Operations and Maintenance Personnel in 2005.
- ★ Increase management commitment through awareness of cost effective opportunities
- ★ Involve the Company media relation’s more effectively

Acknowledgement

- David Harris

  Team Advisor

  Monument Gas Plant

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