Chesapeake Energy – Eastern Division
Natural Gas Gathering Pipeline Surveys & Fugitive Leak Reductions

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Reasoning for Helicopter Based “Sniffer” LDS:

- Approx. 6500 Miles of Active Pipeline
- Vintage range from 1890’s to Present
- Terrain, Canopy (lack of visibility in leaf-cover), Accessibility Issues
Apogee Leak Detection System

An innovative infrared-based method for detecting leaks from hydrocarbon liquids and gas pipelines, production and storage facilities, landfills, and coal-seam seeps.

LDS – 3rd Generation

- High Speed – High Sensitivity Three Gas Detector for Mobile applications
  - Methane
  - Total Hydrocarbons
  - Carbon Dioxide
- GPS with real time mapping system
- Integrated Geographic Information System (GIS)
Truck Mounted LDS

ATV Mounted LDS
Helicopter Mounted LDS

LDS Operating Software
Dry Gas

- Mostly methane, small amount of HC, No CO2
  - Dry Gas leak

Rich Gas

- Methane and HC, No CO2
  - Rich Gas leak
Non-Methane Hydrocarbon Gas

- HC, no methane or CO2
  → Propane or other HC leak

Vehicle Exhaust

- Methane, HC, and CO2
  → Exhaust Gas – Not a leak
**Landfill Gas**

- Methane and CO2, No HC
  - Landfill or Sewer Gas

![Graph](image)

**LDS Database**

- All LDS data is stored in a database file
- Data can be exported into Excel or other format

![Database](image)
Summary of Detections To-Date

- 1st Demo Flight in December 2007
- 812 Detections (Probable, Possible, Doubtful, & Unknown)
- 324 Verified Leaks So Far (Both CHK & Foreign Sources)(Note: Still awaiting feedback from North District)
- 2,229 Miles Flown on 5 Flight Groups
Example of Cost Savings

- Sept. 2008 Flight in SE District was approx. 616 Miles
- To cover the same area with ground patrol:
  - 2 Crews (4 Total men)
  - 6 Hours / Day
  - Average 6 Miles / Day Total
  - Equals 100 days, 3200 man hours, not including 2 vehicles and fuel for these 5 months of detection
  - 299 Tags (CHK, Foreign, Natural (Mine Cracks))
  - Flight time was 64 hours
  - Savings not only in time, but in recovered gas carried over the time frame saved by not using ground patrols.

Additional Benefits of Aerial Patrols

- Manpower Savings
- Time Savings
- Point of Interest Collection (Customizable List)
  - Blasting Near RoW
  - Buried Line Exposed
  - Construction Near RoW
  - Debris
  - Liquid Spill
  - Missing Line Marker
  - Power Line
  - Recent Excavation
  - RoW Needs Cleared
  - Slip
  - Stream Crossing Exposed
  - Structure on RoW (Encroachment)
Possible Future Project Expansion

- Using gyro mounted high-def camera and external drive storage for digital record of patrols (with gps time frame stamp)
- FLIR use in conjunction around compressors and dense facility groups like meter manifolds, multiple valve settings, etc.
- Explore possibility of using this as a method of meeting DOT line patrol requirements
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Q & A