Company Reported Opportunities Technologies
From Natural Gas STAR Partners

Murphy Exploration & Production,
Gulf Coast Environmental Affairs Group,
American Petroleum Institute and
EPA’s Natural Gas STAR Program

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Reducing Emissions, Increasing Efficiency, Maximizing Profits

Why Are Company Reported Opportunities Important?

- Partners share successes to reduce methane emissions and improve profitability
  - **BMP’s**: the consensus best practices
  - **PRO’s**: Partner Reported Opportunities
  - *Lessons Learned*: expansion on the most advantageous BMP’s and PRO’s
  - All posted on the GAS STAR website: http://www.epa.gov/gasstar
Production Best Management Practices

- BMP 1: Install and Replace High-Bleed Pneumatics
- BMP 2: Install Flash Tank Separators on Glycol Dehydrators
- BMP 3: Partner Reported Opportunities (PRO’s)
Gas STAR PRO Fact Sheets

- PRO Fact Sheets from Annual Reports 1994-2002
  - 54 posted PRO’s
  - 36 PRO’s applicable to production
    - 12 focused on operating practices
    - 24 focused on technology
Lessons Learned

- 14 Lessons Learned on website
- 7 applicable to production
  - 2 focused on operating practices
  - 5 focused on technology
- New Lessons Learned in development
  - Composite Wrap
Technology Focused Lessons Learned

- Convert Gas Pneumatic Controls to Instrument Air
- Installing Plunger Lift Systems in Gas Wells
- Installing Vapor Recovery on Crude Oil Storage Tanks
- Installation of Flash Tank Separators
- Options for Reducing Methane Emissions from Pneumatic Devices in the Natural Gas Industry
More Technology Production Opportunities

- **Piping/Pipelines**
  - Composite Wrap
    - SAVES… 5,400 Mcf/yr
    - PAYOUT… < 1yr

- **Compressors & Engines**
  - Install Electric Compressors
    - SAVES… 6,440 Mcf/yr
    - PAYOUT… > 10 yrs
More Technology Production Opportunities

- **Dehydrators**
  - Reroute Glycol Skimmer Gas
    - SAVES… 7,600 Mcf/yr
    - PAYOUT… < 1 yr
  
  - Reroute Glycol Dehydrator to Vapor Recovery
    - SAVES… 3,300 Mcf/yr
    - PAYOUT… < 1 yr
  
  - Convert Gas Driven Pumps to Air
    - SAVES… 2,500 Mcf/yr
    - PAYOUT… < 1 yr
What is the Problem?

Dehydrators present an excellent place to reduce emissions

- How much methane is emitted?
  - A 20 MMcf/day dehydrator with a vent condenser, no flash tank separator and a circulation rate of 5 gpm can produce 7,600 Mcf/yr of losses

- How can these losses be reduced?
  - Lots of choices.....install a flash tank separator, pipe vent gases to vapor recovery and adjust circulation rates
More Technology Production Opportunities

- Tanks
  - Install Pressurized Storage
    - SAVES… 7,000 Mcf/yr
    - PAYOUT… 1-3 years
And More Technology Production Opportunities

- Wells
  - Capture Casinghead Gas via Compression
    - SAVES…32,850 Mcf/yr
    - PAYOUT… < 1 yr
  - Connect Casing to Vapor Recovery Unit
    - SAVES…7,300 Mcf/yr
    - PAYOUT… < 1 yr
  - Green Completions
    - SAVES… 7000 Mcf/yr
    - PAYOUT… 1-3 yrs
  - Install Velocity Tube Strings
    - SAVES… 4,680 Mcf/yr
    - PAYOUT… 1-3 years
  - Use Foaming Agents
    - SAVES… 2,520 Mcf/yr
    - PAYOUT… 3-10 yrs
What is the Problem?

Production Wells are a large source

- How much methane is emitted?
  - One partner identified 7,300 Mcf/yr from the casing of a single well

- How can these losses be reduced?
  - Routing casinghead gas to a vapor recovery unit or compression facilities
  - “Green Completions”
  - Plunger lifts
  - Down hole separator pumps
  - Foaming agents
Partner Experience

Production Wells are a large source

- One partner reports savings of 32,850 Mcf/yr with a payback < 1 year

  - Savings based on 180 Mcf/day @ 50% methane using a 30HP electric compressor delivering 100 psi sales gas
Discussion Questions

- To what extent are you implementing these opportunities?
- Can you suggest other opportunities?
- How could these opportunities be improved upon or altered for use in your operation?
- What are the barriers (technological, economic, lack of information, regulatory, etc.) that are preventing you from implementing these practices?