

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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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>



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Reducing Emissions, Increasing Efficiency, Maximizing Profits

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)



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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



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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



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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



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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



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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



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More Technology Production Opportunities

□ Tanks

◆ Install Pressurized Storage

- SAVES... 7,000 Mcf/yr
- PAYOUT... 1-3 years



Reducing Emissions, Increasing Efficiency, Maximizing Profits

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



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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



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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?

