Methane Reduction from Natural Gas Dehydration

EnCana Oil & Gas (USA) Inc.

2007 Annual Implementation Workshop

EPA's Natural Gas STAR Program
Houston, TX
October 23, 2007

Route Still Vent Emissions to VRU

- Used at large compressor stations and gas plants.
- Generalized process;
  - Route still vent vapors to a condenser
  - Remaining vapors vent to condensate tank headspace
  - VRU routes condensate and dehy emissions to plant inlet
  - Use electric screw compressor
- Closed-loop process.
- Hy-Bon, Inc.

Quantum Leap Technology

- Engineered Concepts, LLC – Quantum Leap Technology
  - Pilot Projects in Wyoming operations
  - Condenses still vent vapors to a stable condensate
  - Remaining vapors are routed to the reboiler fuel system

EnCana Partnership with Vaperma

- Hollow-fiber polymer permeation membrane.
- Water partial pressure differential across membrane allows higher diffusion rate of water over methane.
- Membrane is high temperature and chemical resistant.
- 30% lower energy cost
- 3 year life to the membrane
- BTEX is not permeable

Installing JATCO Venturi systems to reduce methane, VOCs, and BTEX in DJ Basin, CO

Agenda

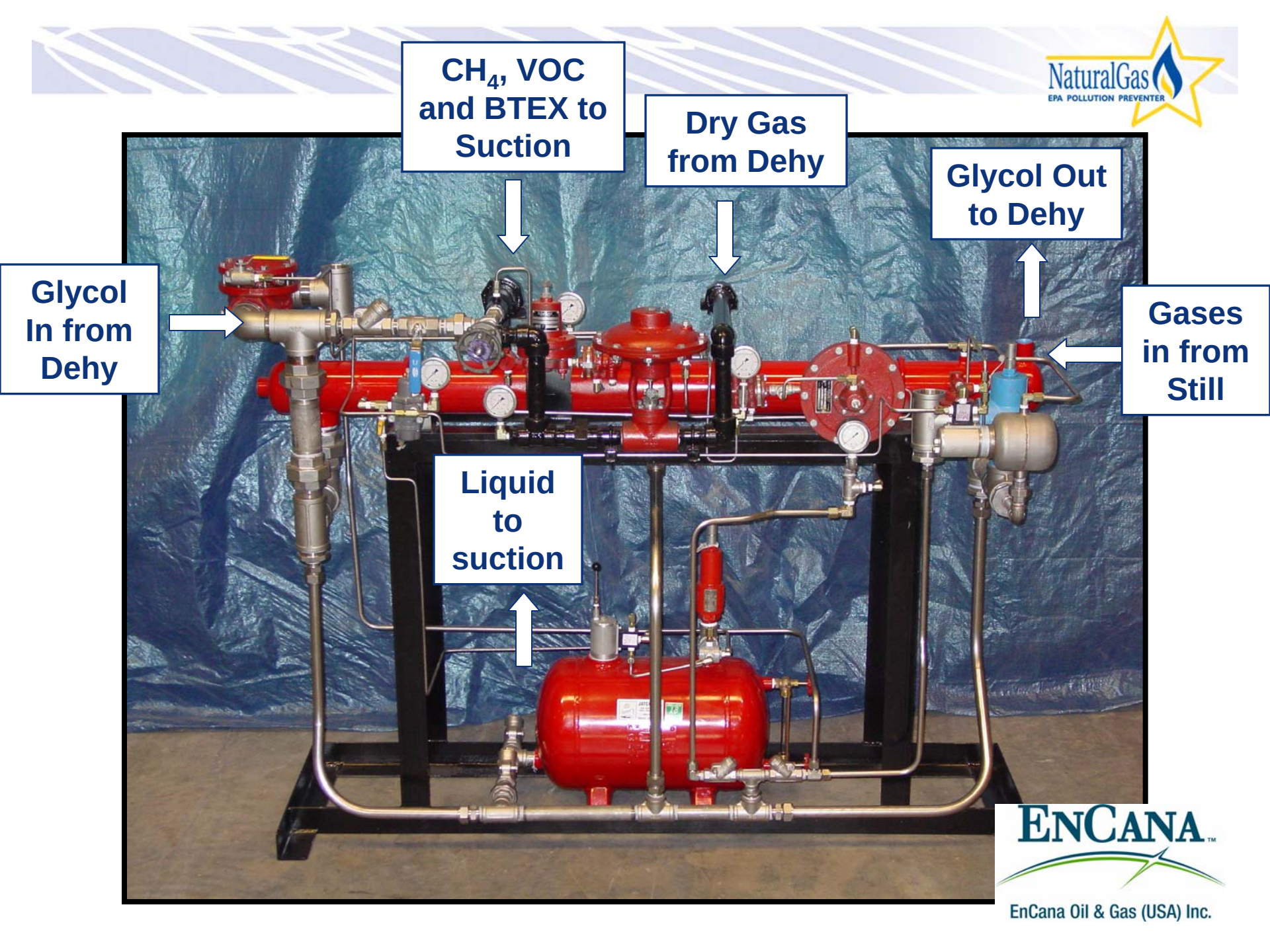
- Emissions savings from Dehydration
- Jatco Venturi Systems
- DJ Basin Installations
- Conclusion

EnCana Oil & Gas (USA) Inc.

Emissions savings from Dehydration

- Technology used to route vapors back to the suction of the facility
- At EnCana, in the DJ Basin, we use Jatco BTEX condensers and Venturi valves
- All vapors post condenser are routed to the inlet via a venturi valve
- Creates a closed loop system

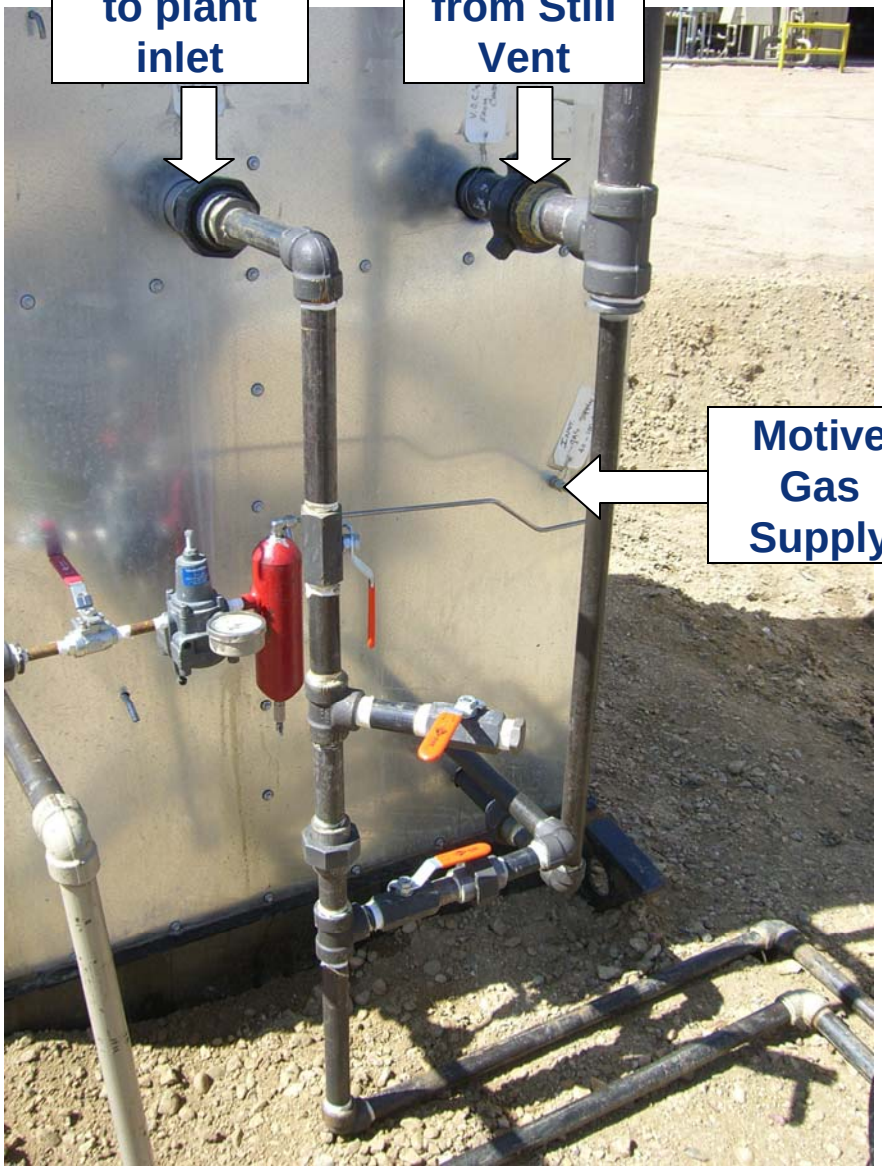
EnCana Oil & Gas (USA) Inc.


CH_4, VOC and BTEX to Suction
Dry Gas from Dehy
Glycol Out to Dehy
Glycol In from Dehy
Gases in from Still
Liquid to suction
NaturalGas
EPA POLLUTION PREVENTER
ENCANA
EnCana Oil & Gas (USA) Inc.

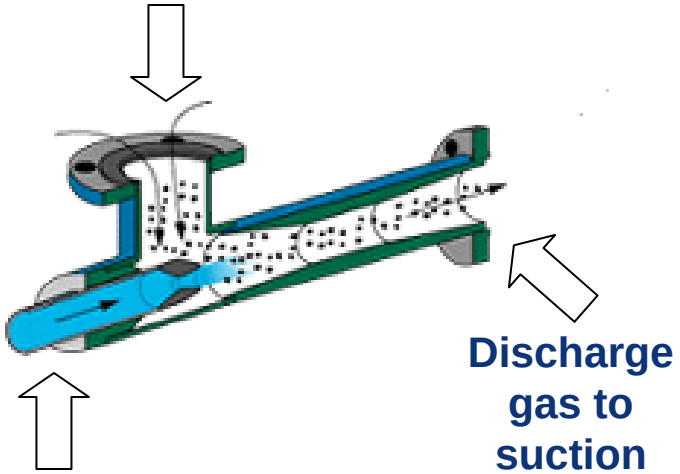
Jatco - Operation

- Shell and tube exchanger and venturi valve
  - Rich glycol comes in from the dehy skid to the tube side of the condenser
  - Methane, VOC and BTEX gases off of the still vent come into shell side of the condenser
  - Glycol and gases exchange heat dropping out any entrained liquids in the gases
  - Glycol exits the Jatco back to the dehy skid
  - Liquids accumulate in a small pressure tank, and dump to inlet when full
  - Gases are sent back to suction of compressor station via the venturi valve

EnCana Oil & Gas (USA) Inc.



Venturi Valve



EnCana Oil & Gas (USA) Inc.

JATCO Venturi - Application

- Must have high pressure motive gas
- Motive gas can be from a compressor or dry gas from the dehydrator
- Must have low suction pressures, or low pressure gas stream
- EnCana's DJ Basin operations are applicable because we have suctions pressures of 25 – 30 psi

EnCana Oil & Gas (USA) Inc.

DJ Basin Installations

- Installations on 5 dehydrators in the DJ and will have ALL dehydrators in DJ Basin controlled by end 2007.

EnCana Oil & Gas (USA) Inc.

DJ Basin Installations

A Balon valve was installed. When closed, no gases go to the Jatco. Allows for maintenance to be performed and prevents air from entering the system

Check valve installed to prevent liquids and gases leaving unit from re-entering

EnCana Oil & Gas (USA) Inc.

Costs of Installation

- Average unit cost ~ $12,000
- Average piping cost ~ $1,300
- Average installation ~ $6,500
- Total Cost ~ $19,800

- Technology allows for large emissions savings. Quantity of methane captured is small and will vary by site.
- Eliminates the need for a combustor

EnCana Oil & Gas (USA) Inc.

Jatco System Summary

- Jatco systems with venturi valve create a closed loop system for glycol dehydrators
- Reduces methane, VOC, and BTEX emissions
- Must have a high pressure “motive” gas to boost low pressure gas stream through the venturi valve.
- Must have low pressure stream to accept the vapors
- Great technology to reduce emissions and eliminate the need for combustion or incineration of vapors

EnCana Oil & Gas (USA) Inc.