88th Annual Convention of the Gas Processors Association 2009

2009 GPA Convention –
Enhancing Midstream’s Voice

San Antonio, Texas, USA
8-11 March 2009

Volume 1 of 2
# TABLE OF CONTENTS

Volume 1

## INTERNATIONAL DELEGATES BREAKFAST

**China - Threat Or Opportunity?**

*Colin Woodward*

1

## TECHNICAL SECTION M – OPERATIONS AND MAINTENANCE MEETING & FORUM

**Occidental of Elk Hills Reliability Program Tracking Systems**

*Mike Philpott*

12

**Installation and Operation of Turboexpanders for Improved Reliability**

*Joseph K. Lillard, Behrooz Ershaghi*

17

**Williams Operator and Technician Training Program Develops Employees to Safely and Reliably Operate Its Gas Gathering and Processing Assets**

*Frank Fort*

72

## PIPELINE SAFETY FORUM: COMPLYING WITH DOT, HOMELAND SECURITY, AND STATE REGULATIONS – ISSUES & INDUSTRY PRACTICES

**DHS Pipeline Security Initiatives**

*Jack Fox*

86

**Control Room Management**

*Wallace B. McGaughey Jr.*

112

**In-line Inspection: An Integral Part of Pipeline Integrity Management**

*Bryce Brown*

133

**Evaluating, Customizing and Improving DCP Midstream’s Public Awareness Program**

*Jeannette A. Jones, David L. McAtee*

181

## TECHNICAL SECTION F – TECHNICAL DATA DEVELOPMENT MEETING & FORUM

**Experimental Measurements and Thermodynamic Modeling (Using a Group Contribution Associating Equation of State) of Hydrocarbon + Amine + Water System**

*Amir H. Mohammadi, Salim Mokraoui, Alain Valtz, Christophe Coquelet, Dominique Richon, Francisco A. Sanchez, Selva Pereda, Esteban Brignole*

205

**Modeling Direct Injection of H2S Scavenger in Pipelines: Laboratory Investigations and Improved Computer Model**

*Dennis Leppin, Kevin Fisher, Diana Matonis*

253

**Prediction of BTEX Emissions and Water Content in TEG Dehydration Units**

*James L. Holoboff, Mohammad Khoshkbarchi*

271

**Generalized Graphical Method to Determine the Required MEG and Methanol Injection Rate for Natural-gas Hydrate Inhibition**

*Mahmoud Moshejghian, Roohallah Taraf*

294

"Vapor-liquid" Equilibrium and Partition Coefficients of n-propylmercaptan, n-butylmercaptan and Dimethylsulfide in MDEA / DEA Aqueous Solutions

*Javeed A. Awan, Christophe Coquelet, Dominique Richon, Scott Northrop*

315

**The New GPA Data Bank - Fifth Edition: Providing Electronic Access to All GPA Experimental Thermophysical Property Data**

*Todd J. Willman*

330

## TECHNICAL SECTION A – FACILITIES DESIGN FORUM

**Tray Hydraulic Operating Regimes and Selectivity**

*Ralph H. Weiland*

340
How to Treat Refinery Gases and Make Them Suitable to Recover Valuable Liquids ................................................................. 350
Zaheer I. Malik, John W. Slack

Budget Estimate Capital Cost Curves for Gas Conditioning and Processing - Updated ................................................................. 371
Carter Tannehill

PEMEX Burgos Gas Processing Complex Operating and Design Recommendations ................................................................. 377
Gaby G. Villegas, David A. Jeff, Spencer George, José González Pérez Sandi, Gaspar Dávila González

Low CO2 Slip at a Northern Alberta Gas Sweetening Plant Using MDEA ...................................................................................... 392
Ed Lata, Chris Lata

A Success Story: Extending Molecular Sieve Life by Double ........................................................................................................ 416
Ahmed A. Al-Harbi, Mohammed J. Al-Khamis

LEGISLATIVE, REGULATORY & SAFETY ISSUES FORUM

Washington, DC Update of Legislative and Federal Regulatory Policy .................................................................................................. 423
Mark W. Menezes

Importance of Processing Plant Information .................................................................................................................................. 444
Barbara Mariner-Volpe

81st Texas Legislature Status of the Gas Service Division ................................................................................................................ 463
Bill Geise

Greenhouse Gas Regulatory Issues Related To Operations .............................................................................................................. 475
Dennis J. Champion

NGL MARKETING FORUM

Daniel L. Lippe

Shifting Sands: The Canadian Industry in Transition ....................................................................................................................... 511
Gerry Goobie

WORLDWIDE DEVELOPMENTS FORUM

Nitrogen Removal from Natural Gas with the Molecular Gate™ Adsorption Process .............................................................................. 544
Michael Mitariten

Design, Fabrication and Startup of an Offshore Membrane CO2 Removal System ........................................................................... 556
William Echt, Peter Meister

The Challenges of Establishing and Managing an Office in Angola .................................................................................................. 571
Derek K. Hansen

Marrying Two Facilities Engineering Cultures ................................................................................................................................. 578
George Cheriyan, William Mera, Yan Shevinskiy, Vasiliy Malitsky, Alexander Elaev, Andrey Medvedev

Sulfinol-X – Leveraging the Advantages of Well-proven and Established Technologies in a Single Acid Gas Removal Process .................................................................................................................. 590
Craig Taylor, Gerard Van Der Zwet, Mark Claessen, Renze Wijntje, Prashant Patil, Armin Schneider

COMPUTER TECHNOLOGY FORUM

Applications of Dynamic Simulation for Brownfield Engineering Design .......................................................................................... 601
Adam W. Wood

Best Simulation Practices for LNG Terminals ................................................................................................................................. 613
Eric Kowalewski, Peter Henderson, Sylvain Castonguay

Asset Optimization - Getting the Most from Your Production Facilities - the BP Trinidad Field Optimizer Case ..................................................................................................................................................... 622
Annessa Randial, Natasha Hudson, Juan Carlos Rodriguez, Sergi Sama, Mike Strathman
Integrating GIS with Pipeline Simulation Software ................................................................. 636
Clay Noble, Michael L. Istre

LGN TECHNOLOGY FORUM

Floating LNG Plants - Scale-up of Familiar Technology ......................................................... 660
Adrian J. Finn

Simple and Versatile Methods for Modeling LNG-related Systems ........................................ 706
Stanley Huang, Nancy Tsai, Scott Oliver

LNG Conceptual Design Strategies ......................................................................................... 717
Arif Habibullah, Peter Lardi, Matthew Passmore

Liquid Expanders Based on the Radial Inflow Turbine Technology ....................................... 733
Roger Dambach, Josef Pozivil

Producing High Purity LNG for UK Markets ........................................................................ 746
Shawn Hoffart, Randal Winkler, Dominic Feenan

MAINTENANCE FORUM

The Last 20 Years ...................................................................................................................... 768
Fred G. Van Orsdol

Best Practices for the Design, Operation and Maintenance of Natural Gas Compression ....... 775
Kevin A. Lawlor, Don O’Neal

What is a Safety Instrumented System? .................................................................................. 790
Gregory A. Rogers

Static Electricity in the Propane Industry ................................................................................ 822
Ron J. Zezulka

Hunting for Fugitive Emissions - Optical Infrared Leak Detection and Measurement ............. 840
Terence Trefiak

TECHNOLOGY TO IMPROVE OPERATIONS FORUM

What Tools Are Available to Help Maintain a Code Compliant Maop for a Highly Complex and
Changing Gas Pipeline System? .............................................................................................. 879
Larry C. Decker

Use of Modeling to Optimize Severe Duty Natural Gas Dehydrators ..................................... 895
Henry Rastelli, Julie Stillmer Shadden

Advanced Leak Detection and Measurement Technologies .................................................. 907
Milton W. Heath III

Improved Production Efficiency and Water Conservation Using Closed-loop, Evaporative Cooling
Systems .................................................................................................................................... 929
Peter G. Demakos

Lean Burn Engine Technologies Meet Gas Compression Emissions Challenge ..................... 937
Victor L. Sheldon Jr.

TECHNOLOGY DEVELOPMENTS IN GAS PROCESSING FORUMS

Processing Technologies for CO₂ Rich Gas ............................................................................ 958
Jane L. V. Nichols, Barry M. Friedman, Allison L. Nold, Shawn McCutcheon, Al Goethe

Hydrate Gas Separation - a New Technology for Removing Nitrogen from Natural Gas ......... 983
Arthur Johnson, John P. Osegovic, Michael D. Max

Contaminant Removal from Natural Gas Using Dual Hollow Fiber Membrane Contactors .... 989
Jingjing Cai, Kelly Hawboldt, Majid A. Abdi

Strategic Technology Options for Recovery and Monetization of Flared Associated Gas ......... 1000
Praveen Gunaseelan, Mark Landrum

Continuous Measurement of Rich and Lean Loading for Improved Amine Plant Operation ..... 1041
Hongqi Yuan, Allan Chambers, John Woolley, Dean Richardson

Advances in Renewable Energy ............................................................................................... 1067
Ed Bowles

Author Index