



Natural Gas STAR Annual Workshop a Success

Every year the Natural Gas STAR Annual Workshop brings together Natural Gas STAR partners, allows the sharing of innovative technical ideas, and provides recognition for successful methane emission reduction activities. This year's workshop, held October 25–27, 2004, in Houston, Texas, provided an opportunity for the more than 110 Gas STAR partners to share experiences, learn about new methane emission reduction technologies, and hear about the accomplishments of the Gas STAR Program in the past year.

TECHNOLOGY TRANSFER

The Annual Workshop is educational for companies at any stage of implementing their Gas STAR Program—from prospects to seasoned charter partners, even those that haven't been recently involved. One partner noted, "[It was a] very valuable workshop for convincing me that my company needs to reinvigorate its participation in Gas STAR." This year, partners learned about technologies that have helped their peers decrease methane emissions, activities to optimize their efforts, as well as other cutting-edge information related to the oil and gas industry. A summary of the workshop and the corresponding presentations will be posted on

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December 13, 2004

Partner Profile Enbridge Energy Partners, Inc.

Enbridge Energy Partners, Inc. owns the world's longest liquid petroleum pipeline and conducts most of its crude oil, liquid petroleum, and natural gas midstream businesses in the United States. Enbridge's U.S. natural gas businesses consist of gathering, processing, and transmission operations in the Mid-Continent and Gulf Coast area—with more than 5,500 miles of gas gathering pipelines in Texas alone.

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Annual Workshop

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the Natural Gas STAR Web site in the near future. The following is a list of the presentations:

Partner Experiences

- ★ Production: Greg Southworth, Shell Exploration and Production Company
- ★ Processing: Doug Jordan, Gulf Terra Energy Partners L.P.
- ★ Transmission I: Allison Berkowitz, NiSource
- ★ Transmission II: John Cordaway, El Paso Pipeline Group

Facility Optimization

- ★ Mike Pontiff, Newfield Exploration Company
- ★ Milton Heath, Heath Consultants, Inc.
- ★ Shankar Ananthakrishna, Dynegy Midstream Services, L.P.

Dehydration Technologies

- ★ Forrest Heath, Engineered Concepts
- ★ Don Anderson, Western Gas Resources, Inc.

International Issues

- ★ Methane to Markets Initiative: Roger Fernandez, EPA
- ★ Ukraine Success Story: Natalia Novakirska and Olena Mandra, CherkassyTransgaz

Rates Revision

- ★ Roger Cooper, American Gas Association

Vapor Recovery

- ★ Brian Boyer, COMM Engineering
- ★ Larry Richards, Hy-Bon Engineering



Keynote speaker John Richels from Devon Energy Corporation.

Technology Verification

- ★ Greenhouse Gas ETV Center: Tim Hansen, Southern Research Institute

ANNUAL AWARDS LUNCHEON

This year's awards luncheon keynote speaker was the President of Devon Energy Corporation, John Richels. His presentation, "The Challenge of the Energy Policy," focused on oil supply, demand, and production; the current oil industry; investment opportunities; and the future of the industry and what role conservation and the Natural Gas STAR Program have to play. Following the presentation, EPA presented awards for Natural Gas STAR accomplishments in 2003. Below is a list of this year's awards and recognition:

Production Partner of the Year

Shell Exploration and Production Company—Shell joined Natural Gas STAR in 1995 and has reported a total of 11.5 billion cubic feet (Bcf) of methane emissions reductions. The new Gas STAR Implementation Manager, Greg Southworth, has been very active this year by helping co-sponsor the offshore producers workshop and is currently assisting Gas STAR with an upcoming offshore case study. This year, Shell reported the greatest reductions for all production partners, 3.14 Bcf in 2003, providing detailed information on its emission reduction projects in the Gulf of Mexico.

Processing Partner of the Year

GulfTerra Energy Partners L.P. (formerly El Paso Field Services)—This was GulfTerra's first year of reporting since joining the Program in 2000. The company submitted an impressive report which included the highest emissions reductions among processing partners for 2003—165 million cubic feet (MMcf), and a significant amount of past emissions reductions. The company has also implemented more than 10 partner reported opportunities (PROs). GulfTerra has reported methane emissions reductions totalling 2.3 Bcf, making it the second largest processing sector reporter.

Transmission Partner of the Year

Columbia Gas Transmission Company and Columbia Gulf Transmission Company (NiSource companies)—These companies continue to be top reporters in the transmission sector. Columbia Gas reported the largest emissions reductions (3.9 Bcf) among all Gas STAR partners and has achieved the second highest historical reductions among all transmission partners (23 Bcf). Columbia Gulf reported the second highest

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Program Implementation

Automating Operations to Improve Efficiency and Reduce Emissions

Automating operations is an important step that enables companies to maximize production output while minimizing production costs. More often than not, automation enhances efficiencies and improves the company's bottom line. Most natural gas production equipment—pumps, plunger lifts, storage tanks, gas meters, and compressors—can benefit from automation and the related real-time monitoring. For example, automated control panels can be linked to gas compressors to remotely control their starting and stopping or changing the suction pressure control to improve efficiency.

Gas STAR partner ChevronTexaco initiated its REMVue pilot project in March 2001. It was so successful that, as of May 2004, approximately 80 REMVue units have been installed. ChevronTexaco realized numerous benefits from this technology including fuel savings, emissions reductions, increased available horsepower, lower peak burn temperatures and pressures, tighter engine control, and lower occurrence of detonation. The company has saved more than 2 billion cubic feet (Bcf) of natural gas valued at more than \$12 million, and realized a payback period of less than 12 months.

Natural Gas STAR partners have achieved significant fuel savings, as well as emissions reductions, by installing air/fuel ratio control systems to automatically adjust the operating parameters of natural gas-fired internal com-

bustion engines. One such system, developed by REM Technologies (remtechnology.com), provides companies with automated air/fuel ratio control equipment called REMVue, which monitors several engine parameters to correct imbalances and decrease methane emissions. According to the company, "REMVue incorporates unique air-fuel control and optimization, online diagnostics, and safety shut-down controls in a single package. It can be configured either as a stand-alone system or in conjunction with other hardware or software systems. The package offers capabilities to effectively monitor and control key compressor and engine parameters resulting in reduced fuel costs with optimized horsepower, reduced engine emissions and maintenance costs, and increased uptime."

REMVue achieves management and optimization of an engine's fuel and air by:

- ★ Automating manifold pressure control valves with microprocessor based control
- ★ Automating fuel delivery
- ★ Measuring air manifold pressure and fuel flow to calculate air manifold pressure setpoint
- ★ Measuring air manifold temperature for compensation
- ★ Monitoring fuel flow to provide indication of fuel consumption and engine performance

Through the use of automation systems, technicians can receive real-time data that allows them to focus their efforts on the tasks that need it the most and enables them to anticipate future work or maintenance. This predictive maintenance allows technicians to minimize system downtime.

Gas STAR partners have also realized success with gas well "smart" automation systems, which monitor a well's production parameters (i.e., tubing and casing pressures, flow rate, and plunger arrival velocities) allowing for improved well and venting performance. The system optimizes plunger operations and blowdown or shut-in cycles. It reports well problems and high-venting wells and also tracks venting times to allow improved management of natural gas production and venting performance. The implementation of "smart" automa-

BP has achieved significant methane emissions reductions resulting from the installation of "smart" automation system equipment at gas wells. The company installed the systems at more than 2,200 wells and plunger lifts in the San Juan Basin, New Mexico. This effort reduced BP's emissions by 2.3 Bcf per year.

tion systems has led to significant reductions in gas venting volumes and production improvements.

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Annual Workshop

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reductions for 2003 (1.1 Bcf) and has achieved the sixth highest historical reductions in the transmission sector (6.2 Bcf).

Distribution Partner of the Year

NiSource Distribution Operations—The 10 NiSource distribution companies that have partnered with EPA submitted annual reports that together represented 81 percent of the total emissions reductions reported by the Gas STAR distribution sector for 2003. In the last two years, NiSource has been working hard to reinvigorate these companies' Gas STAR activities including quantifying significant past reductions for all the companies. The NiSource distribution companies have collectively reduced methane emissions by 10.4 Bcf since 1993.

Natural Gas STAR Rookie of the Year

Devon Energy Corporation—Since joining the Program in July 2003, Devon has been very active and supportive of Gas STAR by holding a high-profile signing ceremony, assisting in the development of technical documents, contributing to an article in the Gas STAR *Partner Update*, and volunteering its Bridgeport Gas Plant as a location for filming the new Gas STAR Program video. Devon is implementing a significant number of emission reduction activities and will submit its first annual report next year.

Natural Gas STAR Continuing Excellence Awards

BP—BP continues to be a leader in the production sector. The company and its Gas STAR Implementation Manager, Reid Smith, assisted the Program with three PRO fact sheets this year, two articles for the Partner Update, and a case study on offshore activities. Mr. Smith was awarded Implementation Manager of the Year in 2003, and the company has been recognized as the Production Partner of the Year in 2001, 2002, and 2003. This year, the company reported the second highest reductions for 2003 (2.7 Bcf, which was primarily attributable to innovative PROs).

Kerr-McGee Oil & Gas Corporation—Kerr-McGee continues to be a leader in the production sector. The company reported the third highest reductions for 2003 (1.2 Bcf) and has achieved the seventh highest historical reductions (6.6 Bcf) of all production partners. The company was also recognized for its accomplishments in 2000 and 2003. In addition, Kerr-



McGee consistently implements a wide variety of PROs every year.

El Paso Pipeline Group—ANR Pipeline, Tennessee Gas Pipeline, El Paso Natural Gas, Southern Natural Gas, and Colorado Interstate Gas (all making up El Paso Pipeline Group) were all in the top 10 in 2003 reductions, and together totaled 1.8 Bcf of methane emissions reductions. The company's Gas STAR Implementation Manager, John Cordaway, has been very active in the Gas STAR Program by providing substantial insight to various technical issues, contributing to Gas STAR technical support documents, and presenting at several workshops.

Pioneer Natural Resources USA—Pioneer has been one of the most active processing partners since joining the program in 2000. The company has achieved 2.1 Bcf in methane emissions reductions, the third highest of the processing partners. In addition, it has reported an impressive 19 different PROs. In 2002, Pioneer was recognized as the Processing Partner of the Year. This year, the company hosted a workshop, helped EPA develop an implementation case study, and contributed to development of a number of technical documents.

Natural Gas STAR Implementation Manager of the Year

Don Anderson, Western Gas Resources, Inc. (WGR)—Mr. Anderson has been very active since WGR joined the Program and, in fact, last year the company was awarded Processing Partner of the Year. WGR has reported the greatest methane emissions reductions among all processing partners (2.5 Bcf) and has implemented a wide variety of PROs. In 2003, WGR reported the second highest reductions (behind GulfTerra). Mr. Anderson has worked with EPA

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Natural Gas STAR's Program Sponsors: Roger Fernandez (EPA), Karen Ritter (API), Lisa Beal (INGAA), Pat Bruce (GCEAG), Henry Gaplin (GPA), and Kevin Tingley (EPA).

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in developing a new PRO fact sheet on methanol injection and an article for the *Partner Update*. He has also spoken at several Gas STAR meetings.

Natural Gas STAR Program Sponsors—Several Natural Gas STAR Program sponsors were recognized by EPA for their continuing support and gracious donation of their time and resources.

- ★ **AGA (American Gas Association)**—AGA co-sponsored the Natural Gas STAR annual workshop.
- ★ **API (American Petroleum Institute)**—API met its commitment to have 100 percent member participation in Gas STAR. It also co-sponsored a production workshop (Houston, Texas, September 21, 2004), an offshore operations workshop (Houston, Texas, June 8, 2004), and the Natural Gas STAR annual workshop.
- ★ **GCEAG (Gulf Coast Environmental Affairs Group)**—GCEAG announced its endorsement of Gas STAR in April 2004 and co-sponsored an offshore operations workshop (Houston, Texas, June 8, 2004).
- ★ **GPA (Gas Processors Association)**—GPA helped develop the new Gas STAR video and sponsored a processors workshop (Dallas, Texas, September 23, 2004).
- ★ **INGAA (Interstate Natural Gas Association of America)**—INGAA sponsored a transmission workshop (Houston, Texas, September 22, 2004).
- ★ **IPAMS (Independent Producers of American Mountain States)**—IPAMS announced its endorsement of Gas STAR in June 2004. Currently, 17 of IPAMS' 400 members participate in Natural Gas STAR and have collectively reduced their methane emissions by 103 Bcf since 1993.

- ★ **SGA (Southern Gas Association)**—SGA sponsored a producers workshop (Colorado Springs, Colorado, June 29, 2004).

Natural Gas STAR 10-Year Reporting Partners—EPA recognized several partners for their consistent methane emissions reductions reporting during the last 10 years and continuing participation in the Natural Gas STAR Program.

- ★ **Atlanta Gas Light Company**
- ★ **Baltimore Gas and Electric Company**
- ★ **Citizens Gas and Coke Utility**
- ★ **Niagara Mohawk Energy**
- ★ **Northern Indiana Public Service Company (a NiSource company)**
- ★ **Public Service Electric and Gas Company**
- ★ **UGI Utilities, Inc.**
- ★ **Washington Gas**
- ★ **Williams Gas Pipeline-Transco**

New Natural Gas STAR Partners—EPA recognized those partners that joined the Program in the last year.

- ★ **Apache Corporation**
- ★ **Enbridge Energy Partners, Inc.**
- ★ **Hunt Oil Co.**
- ★ **New Jersey Natural Gas Co.**
- ★ **Newfield Exploration Company**
- ★ **Nicor Gas**
- ★ **Occidental Oil & Gas Corporation**
- ★ **Pogo Producing Company**
- ★ **The Houston Exploration Company**

EPA's Natural Gas STAR Program congratulates all of its partners for their impressive accomplishments in 2003/2004. Keep up the great work!



Natural Gas STAR's new 2004 partners.



In the News

Methane to Markets Partnership

Natural Gas STAR was recently a major contributor to the first Methane to Markets Ministerial Meeting held in Washington, DC, November 15–17, 2004. Gas STAR partners—along with other private companies, NGOs, trade associations, government representatives, and many others—learned about this new White House initiative during the three-day event. Attendees gathered for technical sessions and organizational meetings. Plus, 14 countries

signed an international commitment, approved by President Bush, to decrease methane emissions and advance the use of methane as a valuable clean energy source. The U.S. intends to commit up to \$53 million during the next five years to facilitate the development and implementation of methane recovery projects (in both developing countries and countries with economies in transition) through a range of activities—including the export of the successful U.S. voluntary programs, data development, institution building,



feasibility assessments, and technology demonstrations. Further information on the meeting and the Methane to Markets Partnership is available at epa.gov/methanetomarkets.

Six New PRO Fact Sheets Available

EPA has developed six new PRO fact sheets for the production, processing, transmission, and distribution industry sectors. PROs (partner reported opportunities) describe strategies and technologies that companies can implement to further reduce methane emissions and increase operational efficiencies. The new documents describe methane emission reduction technologies reported by Natural Gas STAR partners:

- ★ [Gas Well Unloading Time Optimization](#)
- ★ [Automated Air/Fuel Ratio Controls](#)
- ★ [Nitrogen Rejection Unit Optimization](#)
- ★ [Recover Gas from Pipeline Pigging Operations](#)
- ★ [Portable Desiccant Dehydrators](#)
- ★ [Zero Emissions Dehydrators](#)

Gas STAR would like to thank partners ChevronTexaco, BP, GulfTerra Energy Partners, Pioneer Natural Resources, and Kerr-McGee Oil & Gas Corporation for their time and assistance in helping produce these six documents and for sharing their emission reduction activities with their peers. All PRO fact sheets are available online at epa.gov/gasstar/pro/index.htm.

Natural Gas STAR would like to encourage its partners to consider joining the Methane to Markets Project Network. The Project Network will be key to reaching out to and organizing the efforts of the private sector and NGOs. Participants in the Project Network will work with partner governments and other members of the Project Network in identifying and undertaking cooperative activities aimed at overcoming challenges to cost-effective methane recovery and use. A Project Network membership agreement form is available online at epa.gov/methanetomarkets/docs/ppnma.pdf.

Technology Spotlight

Use of Rupture Pin Shutoff Devices to Protect Pipelines

GulfTerra Energy Partners, previously known as El Paso Field Services, recently implemented a new technology—developed through a cooperative effort between its field technicians and one of its equipment suppliers—to replace pipeline relief valves with rupture pin shutdown devices.

Traditionally, relief valves were installed to protect gathering and transmission systems from over-pressurizing when lines became blocked with hydrates. In an instance of hydrate plugging, relief valves would simply open and vent large quantities of methane into the atmosphere and still allow upstream compressors to continue to run. In this scenario, gas emissions could continue for long periods of time until they were detected by maintenance or operations employees, usually by hearing the gas venting through the relief valve.

Rupture pin devices, which replace the common pressure relief valve, simply consist of a pressure sensitive pin that holds the plug of a valve-like device in the open position. When a gas line's pressure reaches the set rupture pressure, the pin deforms and allows a spring-loaded plug to close, shutting off the gas flow and protecting the downstream pipelines. Any upstream compressors continue to operate until reaching the control shutdown pressure level. Since GulfTerra remotely monitors the pressure and flow from each delivery, dispatchers receive an indication of problems instantaneously. This is preferable to allowing the relief valve to vent for unknown periods of time and being discovered randomly, which was commonplace prior to rupture pin installation. The rupture pin is then replaced once the blockage is cleared and is reset to activate at the proper pressure. By utilizing this technology, the design pressure of the system is not jeopardized and no gas is vented into the atmosphere.



Alfred Wussler, a PSM Safety Coordinator with Enterprise Products (which recently purchased GulfTerra), stated that the use of rupture pins was originally designed to remedy the frequent problem of hydrate blocking in the San Juan Basin and that the practice would be effective for any location where a

flow blockage results in relief valve activation for overpressure protection.

Wussler also stated that the use of rupture pins requires that any compressor upstream of a rupture pin device must be equipped with a standard high discharge pressure shutdown so the compressors shut down when a rupture pin activates. It is also very beneficial, but not required, that any measured gas flow be monitored, and that an alarm sounds when the gas flow stops. This ensures prompt detection of a closed rupture pin device.

Costs and Benefits for Rupture Pin Device Installation

Capital Costs (including installation): \$1,000-\$10,000

Operating and Maintenance Costs (Annual): \$100-\$1,000

Methane Savings: 205 Mcf per valve per event

Payback (Years): 0-1

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Use of Rupture Pin Shutoff Devices

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Methane Emissions Reductions

The conversion to rupture pin devices reduces gas previously lost through open relief valves. GulfTerra estimated its emission reductions by calculating the flow rate of an equivalent 2" x 3" relief valve flowing at the system design (set) pressure. At 250 psig, this is about 3,421 standard cubic feet per minute (scfm) x 60 minutes = 205,260 scf saved per event. This estimate is conservative because it is highly likely that the relief valve would vent for longer than one hour before it is detected. At \$5 per Mcf a company could realize more than \$1,000 in gas savings per event, achieving a payback on the investment the first time the device activates. Actual savings will depend upon the size and set pressure of the equivalent relief valve replaced with a rupture pin device.



MMS Inventories and Data Recently Released

The Minerals Management Service (MMS) recently released three large inventory and data collection publications and software programs.

- ★ The 2000 Gulfwide emissions inventory files and report
- ★ The 2000-2001 Breton Area emissions inventory files and report
- ★ The 2005 Gulfwide Offshore Activity Data System (GOADS) reporting software and user's guide

All of these documents are available online at gomr.mms.gov/homepg/regulate/environ/requirements.html#Air%20Quality.

The installation of rupture pins is an important element of GulfTerra's daily operations because rupture pins shut-in the system's gas flow rather than allowing the gas to vent, which reduces equipment shutdowns (requiring staff time and causing a loss of revenue). In addition to the use of rupture pin devices, associated control systems can be used to discover equipment shutdowns much more quickly, thus leading to more focused, quicker responses to system problems. In addition, normal operations are resumed more quickly and lost revenue caused by downtime is reduced.

Economic benefits go beyond gas savings. For example, rupture pin devices do not require operational or maintenance costs unless the rupture pin engages; typical relief valves require annual valve checks during routine maintenance.

Automating Operations

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It is important to note that just because a company automates its equipment, it does not mean that it will experience success immediately. In addition to expending the capital to pay for the automation equipment, companies must also train their staff in using this new automation equipment to reap its benefits. Operators must be computer literate and receive training for properly using automation systems to diagnose system problems.

For more information on automated air/fuel ratio controls for engines and compressors, see the new Gas STAR PRO Fact Sheet, *Automated Air/Fuel Ratio Controls*. And for additional information on automated well production systems, see the PRO Fact Sheet titled, *Gas Well "Smart" Automation System*. These are both available online at epa.gov/gasstar/pro/index.htm.

Information for this article was derived from the following sources: "Automation Reshapes Field Operations" by Kathy Shirley in the *American Oil & Gas Reporter*, August 2003. "Results of Managing Compression Assets," presented by ChevronTexaco, May 2004.

Calendar

2005 GAS STAR TECHNOLOGY TRANSFER WORKSHOPS

- ★ Will be announced in early 2005.

2005 GAS STAR ANNUAL MEETING

- ★ Will be announced in early 2005.

MISCELLANEOUS NATURAL GAS-RELATED EVENTS

- ★ **GTI Natural Gas Technologies 2005**
January 30–February 2, 2005
Orlando, Florida
Wyndham Palace Resort
Further information is available at gastechnology.org.
- ★ **Society of Petroleum Engineers Exploration and Production Environmental Conference**
March 7–9, 2005
Galveston, Texas
Marriott Rivercenter Hotel
Further information is available at spe.org.
- ★ **Gas Processors Association 84th Annual Convention**
March 12–16, 2005
San Antonio, Texas
Marriott Rivercenter Hotel
Further information is available at gasprocessors.com.
- ★ **Southeast Regional Gas Conference and Expo**
March 22–25, 2005
Charlotte, North Carolina
Adams Mark Hotel
Further information is available at sgalink.org.



Q: How much unburned methane is contained in the exhaust of a rich-burn reciprocating, internal combustion engine burning natural gas?

A: For a rich burn engine the range of unburned methane emitted is approximately 0.6 to 1.6 standard cubic feet of per horsepower-hour. For a lean burn engine, the amount of methane emitted is approximately 0.2 standard cubic feet of per horsepower-hour.

Natural Gas STAR partners have found that they can reduce methane emissions significantly by optimizing their natural gas burning engines. For further information on technologies please see this issue's article on automated controls (page 3) and the PRO fact sheet titled, *Automated Air/Fuel Ratio Controls*.

Have a question for the next issue of the Natural Gas STAR Partner Update?
Contact Roger Fernandez at fernandez.roger@epa.gov.



Enbridge Energy Partners, Inc.

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The Value of a Gas STAR Mentor

In early 2003, EPA contacted Enbridge to gauge the company's interest in joining the Gas STAR Program. During initial discussions, the Environmental Health and Safety (EH&S) Specialist Fred Whitted expressed a desire to learn more about Gas STAR and what a partnership would entail before making a commitment. He attended the 2003 Gas STAR Implementation Workshop in Houston, Texas, where he learned about cost-effective emission reduction activities that his peers had implemented. During this time, he also met John Cordaway, an engineer and Natural Gas STAR Implementation Manager for El Paso Pipeline Group, who would prove to be a valuable resource.

Whitted recently began working as the Transmission Operations Manager for Enbridge so Brady Dodson continued Enbridge's evaluation of the Gas STAR Program. Fortunately, since Whitted was still involved with the company, he shared information on the Gas STAR

efforts. Dodson also learned about El Paso's Gas STAR successes through discussions with Cordaway, who took on a mentoring role—a valuable process through which partners can help their peers get involved with the Natural Gas STAR Program. Both were eager to build this new relationship and communicated on a regular basis. Dodson and Whitted shared what they learned—from the Gas STAR workshop and from Cordaway—with their management and convinced the company of the Gas STAR Program's value. Whitted then contacted Roger Fernandez of EPA in December 2003 to confirm Enbridge's desire to join the Natural Gas STAR Program. One month later, Enbridge officially joined the Program, and Brady Dodson was named Enbridge's Gas STAR Implementation Manager.

Dodson continues to learn from his mentor at El Paso and believes that Cordaway's mentoring was an integral part of Enbridge's efforts to implement its Natural Gas STAR Program. Based on his mentor's advice, Dodson began his efforts by presenting Gas STAR

information to the company's operations employees at different locations. His goal was to educate them on how to identify methane emissions reductions opportunities and which specific initiatives to explore first. He also learned that one of his most important ongoing tasks is to continue to keep operations staff and upper management involved with Gas STAR activities and accomplishments through constant communications.

Detecting Leaks with Aerial Infrared Imaging

Shortly after Enbridge became a Natural Gas STAR partner, conversations began with EPA regarding interests in aerial infrared imaging as a way to identify pipeline methane leaks. Through the Gas STAR Program, Dodson learned of Leak Survey Inc.'s (LSI) Web site (leaksurveysinc.com) as a

“John Cordaway, with El Paso Pipeline Group, was extremely influential in Enbridge's implementation of the Gas STAR program. The Gas STAR message shared by an industry peer was heard loud and clear by Enbridge.”

—Brady Dodson, Environmental Health and Safety Specialist

source for more information on aerial leak surveys. Although Dodson planned to discuss imaging with management, he was concerned with the expenses associated with hiring an aerial leak surveyor. Then he learned that one of Enbridge's operations managers want-

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ed to begin a pilot project to test the effectiveness of aerial imaging. The pilot project took two days, during which LSI surveyed 160 miles of pipeline and discovered 22 leaks that would otherwise have been undetected. Enbridge immediately repaired all of these leaks, allowing the company to reduce methane emissions by 1.38 million cubic feet (MMcf) per day.

After the pilot project was complete, Dodson shared the impressive results with senior managers and requested that the company invest in additional surveying efforts. They agreed that it would be a worthwhile project and contracted LSI's services for three additional surveys—totaling more than 443 miles of pipeline surveyed—that resulted in a total of 30 leaks discovered and repaired through the three efforts.

The survey was a joint effort between LSI and Enbridge. While LSI was in the air performing the survey, Enbridge's maintenance staff was waiting on the ground for leak notification from the helicopter observation team. Once a leak was detected, the field staff traveled to the site of the leak, estimated the volume of gas being emitted, and began repairs (including clock spring repair) immediately. Enbridge realized a return on investment in less than one month for the four aerial surveys.

Aerial infrared imaging provides Natural Gas STAR partners with a new opportunity to locate and resolve methane leaks in their pipeline systems that would otherwise go undetected. David Furry of LSI stated that the company has worked with other Natural Gas STAR partners, including Dynegy Midstream Services, L.P.; Western Gas Resources, Inc. (which was highlighted



“Aerial infrared imaging proved to be extremely valuable for Enbridge, both in terms of Gas STAR success and cost savings generated from fixing leaks found utilizing this technology.”

—Brady Dodson, Environmental Health and Safety Specialist

in the Summer 2004 *Partner Update*); and Duke Energy Field Services. Plus, many others have contacted him expressing interests in performing aerial surveys of their own.

Implementation Continues

Enbridge has 22 gas processing plants and 7,800 miles of associated pipelines currently participating in Gas STAR with hopes of expanding the Program throughout its transmission operations in 2005.

Currently, the focus of Enbridge's Gas STAR program is on implementing as many partner reported opportunities (PROs) and best management practices (BMPs) as possible through its gathering and processing facilities to have a strong start as a successful Gas

STAR partner. As part of this effort, Enbridge has established a direct inspection and maintenance (DI&M) program at many of its facilities and is currently rolling out various directives, such as redesigning blowdown systems, altering emergency shutdown practices, and converting gas powered pneumatic controls to mechanical controls at numerous locations. These efforts and their successes are shared with the transmission group to gain further interest and support for their future Natural Gas STAR commitment.

Highlights from Recent Technology Transfer Workshops

This fall, Natural Gas STAR conducted three Technology Transfer Workshops—for the production, transmission, and the processing sectors. These workshops focused on cost-effective technologies and practices to help Gas STAR partners improve their operational efficiencies and reduce their methane emissions.

Producers Workshop

The first workshop, developed for the production sector, took place on September 21, 2004, in Houston, Texas, at the ExxonMobil Production Company Building. The meeting was co-sponsored by EPA, ExxonMobil Production Company, and the American Petroleum Institute (API).

Highlights include:

- ★ A presentation by Jacqueline Kaiser, of ExxonMobil, and Mike Pontiff, of Newfield Exploration, on their experiences in implementing cost-effective methane emissions mitigation activities. Included in the discussions were successes and challenges in achieving methane emissions reductions and insight for obtaining operational and managerial support for such efforts.
- ★ Presentations on green completions, smart automation well venting, and other partner reported opportunities (PROs) including directed inspection and maintenance (DI&M), infrared gas imaging technology, and pressurized storage of condensate.

Full meeting proceedings and complete presentations from this workshop are available online at epa.gov/gasstar/workshops/houston-sept21.html.

Transmission Workshop

The second workshop, conducted for the transmission sector, was held on September 22, 2004, in Houston, Texas, at

the Duke Energy Building. The event was co-sponsored by EPA, Duke Energy Gas Transmission, and the Interstate Natural Gas Association of America (INGAA). Highlights include:

- ★ A presentation by David Felcman, of Duke Energy, on the company's approach to implementing methane emissions reduction technologies and practices. Mr. Felcman also shared Duke Energy's lessons learned from their experiences.
- ★ Hasan Imran, from TransCanada, presented information on the company's successes and obstacles in reducing its methane emissions from a non-U.S. point of view. Mr. Imran also shared information on technologies and practices that have worked well for TransCanada.
- ★ Presentations on reducing emissions from compressor seals, composite wrap for non-leaking pipeline defects, using hot taps for pipeline pump-downs, and reducing emissions when taking compressors offline.

Full meeting proceedings and complete presentations from this workshop are available online at epa.gov/gasstar/workshops/houston-sept22.html.

Processors Workshop

The final Technology Transfer Workshop for the year was held on September 23, 2004, for the processing sector at the Dallas Marriott Las Colinas in Dallas, Texas. The workshop was co-sponsored by EPA, Pioneer Natural Resources, and the Gas Processors Association (GPA). Highlights include:

- ★ A presentation by James Meier, of Pioneer Natural Resources, on the company's experience in methane emissions mitigation efforts. Mr. Meier discussed Pioneer's approach and experience in implementing cost-effective technologies and practices to reduce methane emissions. Mr. Meier also discussed successes and obstacles that were realized in obtaining methane emissions reductions.
- ★ Presentations and discussions on directed inspection and maintenance (DI&M) at gas processing plants, acid gas removal options for minimizing methane emissions, and installing vapor recovery units to reduce methane losses.

Full meeting proceedings and complete presentations from this workshop are available online at epa.gov/gasstar/workshops/dallas-sept23.html.



EPA's ETV Program Verifies Emission Reduction Technologies for the Oil and Gas Industry

The U.S. Environmental Protection Agency's Office of Research and Development (EPA-ORD) operates the Environmental Technology Verification (ETV) program to facilitate the deployment of innovative technologies through performance verification and information dissemination. The goal of ETV is to further environmental protection by substantially accelerating the acceptance and use of environmental technologies by providing credible third-party performance data. With this data, technology buyers, financiers, and permittees in the United States and abroad will be better equipped to make informed decisions regarding environmental technology purchase and use.

The Greenhouse Gas Technology Center (GHG Center), one of six verification organizations operating under the ETV program, is managed by EPA's partner verification organization, the Southern Research Institute. The GHG Center conducts verification testing of promising GHG mitigation and monitoring technologies. The Center's verification process consists of developing verification protocols, conducting field tests, collecting and interpreting field and

other data, obtaining independent peer-review input, and reporting findings. Performance evaluations are conducted according to externally reviewed test and quality assurance plans and established protocols for quality assurance.

The GHG Center's Oil and Natural Gas Stakeholder Group has identified a need for independent third-party verification of cost-effective methane and carbon dioxide emissions reductions in the industry. As a result, the GHG Center has conducted several verifications applicable to the oil and natural gas production, processing, and transmission sectors. Two of the most recent oil and gas industry technologies that have been verified are the Ejector Vapor Recovery Unit (EVRU), developed by COMM Engineering, and the Quantum Leap Natural Gas Dehydrator, developed by Engineered Concepts. For more information on these technologies, see the [Fall 2002](#) and the [Winter 2003](#) editions of the *Partner Update*.

Although both technologies provide significant emissions reductions, they also provide an economic incentive in the form of captured product that can be returned to the gas stream and sold, and by limiting the use of gas product during processing. Test plans and verification reports for both technologies and others applicable to the oil and gas industry are available at sri-rtp.com/oil_gas.htm.



The GHG Center is currently soliciting oil and gas production technology vendors for independent performance verification testing on the following: 1) devices that capture and utilize or minimize releases of waste gas from natural gas and crude oil production processes and 2) advanced natural gas dehydration systems that produce little or no off-gas for flaring or emission to the atmosphere.

For more information regarding verification testing, the GHG Center, and the ETV program, please visit the center's Web site at sri-rtp.com and the ETV program Web site at epa.gov/etv. You may also contact Tim Hansen at the Southern Research Institute at (919) 806-3456 or hansen@sri.org.





Natural Gas STAR is pleased to welcome three new partners this quarter:



Nicor Gas: Nicor Gas, operated by Nicor Inc., is one of the largest gas distribution companies in the United States. Nicor Gas has provided natural gas services for 50 years and serves more than 2 million customers in a service territory that encompasses most of the northern third of Illinois, excluding Chicago. Visit the company's Web site at nicor.com.



EnCana Oil & Gas (USA) Inc.: EnCana runs U.S. operations for its Canadian parent, EnCana Corporation, previously known as AEC Oil & Gas (USA) and PanCanadian Energy. The U.S. operating arm performs exploration and production activities mainly in the Rocky Mountains and the Gulf of Mexico. Its parent company is the largest independent natural gas producer in North America (averaging 2.6 Bcf per day in 2003) and operates the largest independent natural gas storage network in North America (134 Bcf of storage capacity). Visit the company's Web site at encana.com.



Occidental Oil and Gas Corporation: Occidental, also referred to as Oxy, is a world leader in oil and natural gas exploration and production and a major North American chemical manufacturer. Its core oil and gas operations are in the United States, Middle East, and Latin America. In the United States, Occidental is the largest oil producer in Texas and the largest natural gas producer in California, and also has production operations in Kansas, Oklahoma, New Mexico, Colorado, and in the Gulf of Mexico. Visit the company's Web site at oxy.com.



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