



Technology Spotlight

Aerial Leak Detection Developments A look at the latest way to find and accurately locate pipeline leaks

Find it fast. Fix it fast.” That is DCP Midstream’s motto when it comes to sources of lost and unaccounted for gas within its approximately 60,000 miles of processing pipelines. Recognizing lost gas for what it truly is—lost BTUs and therefore, lost revenue—DCP implements an aggressive state of the art aerial optical imaging leak survey program that quickly and accurately identifies pipeline and equipment leaks, allowing field technicians to rapidly pinpoint the source and repair it.

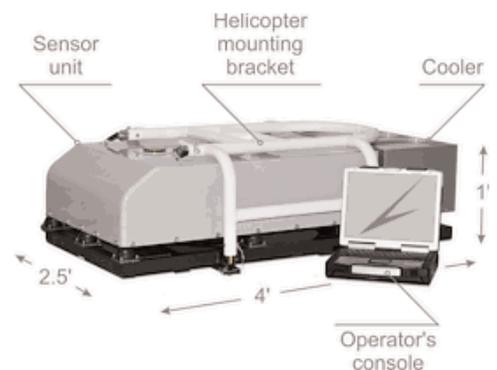
Bob Berry, DCP Midstream BTU Efficiency Manager, explains “Lost gas is not just an equipment integrity or environmental issue; it is also a financial issue. The more gas we process through our system and deliver to our customers, the more profitable we are. Also, our production customers definitely notice when we increase our efficiency because it is immediately apparent in their increased revenue.”

In the past, the responsibility for inventorying lost gas was centered in DCP’s Measurement Group. Reconciling the

differences in the volume of gas that entered and the volume of gas delivered was considered a problem in accurately measuring the volumes of gas vented, flared, or company used gas. In 2002, DCP’s Measurement Group senior director met with other group directors to kickoff an initiative to make “finding” lost gas a priority. As the measurement group perfected its system balances measurements, it became apparent that leaks were a contributing factor to lost gas within DCP’s system. Finding those leaks then became the challenge.

DCP had tried aerial pipeline leak surveys in the past, using airplanes to look

Figure 1. Airborne Lidar Pipeline Inspection System



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Partner Profile

An Ounce of (Damage) Prevention . . .

Oil and natural gas pipelines crisscross the United States. While pipelines are among the most efficient and safest modes of product transportation, they are not immune to damage, especially from third parties such as construction contractors, property owners, or other excavators conducting digging activities. Damage to underground utility facilities (e.g., natural gas pipelines, liquid pipelines, electric lines) can create dangerous conditions for workers (e.g., explosions) and disrupt utility service. Damaged gas pipelines not only pose a safety hazard, but also add to the amount of methane (a potent greenhouse gas and the main component of natural gas) released into the atmosphere. Because of these risks, Laclede Gas Company voluntarily developed its Damage Prevention Program to proactively address these issues.

Laclede is the largest natural gas distribution utility in Missouri, serving approximately 632,000 residential, commercial, and industrial customers in St. Louis City and 10 counties in eastern Missouri. The company also operates an underground natural gas storage field and transports and stores liquid propane. Historically, Laclede averaged four “dig-in” related damages each workday. If Laclede’s frequency of damage is representative of the industry, it’s easy to see why third-party damages

and their environmental impacts are cause for concern.

What is being done?

In 2000, Laclede management made the decision to establish a Damage Prevention Department within its operations organization to address third-party dig-in issues. This step was not required by law and goes beyond regulatory statutes regarding pipeline identification and marking. This department was created with the primary goals to communicate with and educate third parties on the risk of excavating in and around underground facilities, and on safe work practices to minimize risk. Although the Damage Prevention Department works in concert with Laclede’s pipeline locating department, the two groups have different goals and objectives. The Damage Prevention Department is focused on pipeline damage prevention through education and outreach, while the pipeline locating group works on field marking of pipeline locations to preempt third-party damage.

The Damage Prevention Department, which consists of a manager and three damage coordinators, was fully staffed by November 2001. After two months of comprehensive training, the team was investigating, documenting, and analyzing damages on a full-time basis. Their work begins once a dig-in is reported. Damage coordinators investi-



gate reported dig-ins and determine third-party culpability. Dig-in incidents are tracked using an in-house damage database. The database is used to store pertinent information regarding the incident, involved parties, physical damages, and gas loss statistics. After completing its investigation, Laclede typically sends a form letter, or QuickNote, to the involved parties when there are billable damages. The letter provides dig-in details and an opportunity to discuss how the situation could have been avoided.

In response to federal legislation, in 2007 the FCC designated ‘811’ as the national “Know what’s below. Call before you dig.” telephone number to make it simpler for excavators to contact local utilities (via One-Call Centers) prior to beginning excavation work. This process works to prevent third-party damage and its environmental consequences. The Natural Gas STAR Program recognizes the importance of pipeline safety and works with partners and industry experts to identify methane emission reduction technologies and practices that often result in benefits of improved facility and worker safety.

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In the News

Remember the Alamo...and the Annual Implementation Workshop!

Announcing the 15th Annual Natural Gas STAR Implementation Workshop! The Workshop brings together U.S. and international oil and gas companies and industry experts to exchange technical information on the latest technologies and practices to reduce gas losses. More than 160 participants gathered at last year's

workshop and we expect to surpass that level of participation this year. The event will take place November 11–13, 2008, at the Westin Riverwalk in San Antonio, Texas. Partners are encouraged to send ideas for session topics and/or facility tours directly to a Natural Gas STAR Program Manager or STAR Service

Representative. You can find your Natural Gas STAR Program Manager and STAR Service Representative's contact information on the Natural Gas STAR Web site at epa.gov/gasstar/resources/partnerreps.htm. Please visit epa.gov/gasstar/workshops/imp_workshops.htm for additional information.

Are You a STAR in the Making? How to Be in the Running for a Gas STAR Award

Through the Natural Gas STAR Program, EPA recognizes Gas STAR partners who have shown extraordinary originality and dedication in their pursuit to reduce methane emissions. It is through implementation and innovation that the oil and gas industry, working with Gas STAR, has pioneered some of the most widely used, innovative technologies and practices that cost-effectively reduce methane emissions.

One of the ways that EPA measures excellence to determine award recipients is by taking into account the degree to which partners have advanced their Program participation by:

- ★ Increasing emission reductions throughout time
- ★ Implementing new technologies
- ★ Participating in or making presentations at the Annual Implementation Workshop and/or Technology Transfer Workshops

Natural Gas STAR 2008 Awards—Reporting is your first step!

Each year, during the Annual Implementation Workshop, Gas STAR presents awards to various partners to recognize their emission reduction efforts. There are no Program restrictions on eligibility, except that partners should submit annual reports by July 18. Awards are given in the following categories:

- ★ Gathering & Processing Partner of the Year
- ★ Production Partner of the Year
- ★ Transmission Partner of the Year
- ★ Distribution Partner of the Year
- ★ International Partner of the Year
- ★ Rookie of the Year
- ★ Implementation Manager of the Year
- ★ Continuing Excellence

- ★ Participating in the development of articles for the *Partner Update*, *Lessons Learned Studies*, or *PRO Fact Sheets*
- ★ Acting as leaders in the Program by working with other partners and sharing their companies' Gas STAR experiences

Partners are encouraged to include data and/or narratives on their program activities in their annual reports. Please

note that to report these Gas STAR related activities, complete the "Additional Accomplishments" section of the annual reporting form.

If you have questions or would like assistance with your annual report, please contact your STAR Service Representative. You can find your STAR Service Representative's contact information on the Natural Gas STAR Web

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for areas of dead or stressed vegetation as indicators of significant leaks. Because of DCP's "spaghetti system" of pipeline with very few long, straight segments—none more than 5 miles long and many less than a quarter mile—these fixed-wing aerial surveys proved inefficient. Since technicians walking the pipelines with hand detectors can only cover five to 10 miles per week, this was not a viable option for surveying DCP's 60,000 miles of pipeline. DCP needed a new approach.

To perform the aerial surveys, DCP contracted with LaSen, Inc., a laser remote sensing application company. LaSen designed its aerial optical imaging laser system, ALPIS™ (airborne lidar pipeline inspection system) for use on transmission pipelines. DCP was the first to approach LaSen to use their technology on a gathering system. To determine the feasibility of applying this technique to DCP's "spaghetti system," LaSen flew a test run over a section of DCP pipe slated for replacement. DCP had previously walked this section of pipeline and recorded all leaks found. When LaSen delivered its survey report,

Figure 2. ALPIS mounted on helicopter



How the Airborne Lidar Pipeline Inspection System Works

The airborne lidar pipeline inspection system (ALPIS™) system is comprised of an airborne sensor unit and operator's console. The main sensor enclosure weighs 250 pounds and is externally mounted on a Bell Jet Ranger helicopter. It houses the laser, computer, receiver optics and detectors. The laser is a mid-infrared laser that is well suited for the detection of hydrocarbons such as methane, ethane, and volatilized liquid petroleum products. During use, the laser beam is transmitted down from the aircraft to illuminate the area on the ground above and around the buried pipe. If the laser beam passes through a gas plume emanating from a pipeline leak, the received energy will be diminished due to the absorption of laser light in the plume. The light reflected from the ground is collected and the light absorption is measured by a mid-infrared Differential Absorption Lidar (DIAL) chemical sensor. This absorption signature is used to locate the leak and to assess its magnitude. The system operator controls the system using a standard laptop interface and verifies the integrity of the data. In addition, ALPIS is equipped with a high resolution imaging camera and a GPS receiver. The combination of laser, imaging, and GPS data makes it possible to precisely locate leaks.

DCP was extremely pleased with the accuracy of LaSen's survey and surprised that it had found more leaks than DCP had been able to detect. Based on the success of this test flight, DCP entered into an agreement with LaSen to begin surveying larger sections of DCP pipelines.

DCP's biggest challenge to expanding the aerial surveys was providing accurate navigation maps for LaSen's helicopter pilots. To rectify this, DCP developed its own database in XMap (a product of DeLorme) to record GPS coordinates taken by field workers using handheld instruments to generate accurate, usable navigation maps for LaSen's pilots.

To prioritize its aerial surveys, DCP segments its pipeline system and uses systems balancing measurements. Each segment of DCP's pipeline system is equipped with segmentation meters that measure the volume of gas entering and leaving that segment. By measuring and recording the volume of gas

vented, flared, and company used gas within each segment, many DCP systems have real time information on how much gas is unaccounted for due to measurement error or pipeline leaks. By identifying troublesome segments through this system balancing method, DCP knows where to direct LaSen to conduct its surveys or take other corrective measures.

Time is the greatest savings with aerial optical imaging surveys. With its helicopter mounted ALPIS™ system, LaSen can cover 50 to 100 miles of pipeline per day, compared to the 5 to 10 miles per week possible with walking the pipeline rights of way. The helicopters also are able to follow DCP's twisting, turning pipelines system and fly over areas inaccessible on foot. Another advantage ALPIS™ has over traditional handheld or truck mounted flame ionization detectors (FIDs) is its area of coverage. With FIDs the unit must pass directly through a plume to detect a leak. Consequently, being even

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Partner Profile

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In addition to storing data, the department also uses the damage database to track its progress. "Each month we prepare an Excavator Damage Report showing the monthly and year-to-date damage statistics in our system," Department Manager Bo Matisziw said. "This not only allows us to keep track of what happens each month, but also assists us in identifying third parties with whom we need to do more outreach." Over the last six years, the department has achieved several significant successes, including a 33 percent reduction in dig-in damages. Much of the department's success is directly attributable to its use of QuickNote letters and its efforts to educate third parties on Missouri's underground damage prevention statute that requires excavators to call before they dig. Based on this enabling legislation, the Missouri One Call System (MOCS) was activated in 1986. Through Laclede's program, "We spend a lot of time voluntarily educating the excavat-

ing community on the importance of 'Call Before You Dig' and to 'Dig Safely' outside the context of a damage investigation," Matisziw said. "We routinely conduct damage prevention/safety awareness meetings with contractor groups throughout Laclede's service area. And the contractor groups have come to welcome those meetings."

When Laclede joined the Natural Gas STAR Program in 2007, Rick Kottemann, Laclede's Superintendent of Environmental Engineering Services, recognized the connection between damaged gas lines and reduced methane emissions and proposed sharing information on this activity as a partner reported opportunity (PRO). Rick was able to quantify the methane reductions and voluntarily reported these achieved reductions to Gas STAR. Laclede used engineering calculations and information from the extensive Damage Prevention Program tracking database to calculate and report emissions reductions based on the year-to-year change in dig-in rates for years 2002-2007.

Laclede is the first Natural Gas STAR distribution partner to formally report

emission reductions resulting from the implementation of a damage prevention program. In its 2007 Gas STAR Annual Report, Laclede reported emission reductions of 65,246 Mcf as directly attributable to the Damage Prevention Program and related outreach.

According to Matisziw, "Although environmental benefits were not a consideration when setting up Laclede's Damage Prevention Program, the two are now positively linked in my mind, in Rick's mind, and in the minds of Laclede management." Voluntary program participation is a big part of the Laclede culture. In addition to being a Natural Gas STAR partner, Laclede is active in networking with other like-minded organizations, such as the Common Ground Alliance, Missouri Common Ground, Missouri One Call Systems, the Missouri Association of Natural Gas Operators (MANGO), and the St. Louis Joint Utilities Committee; all these organizations, as well as industry organizations such as the American Gas Association (AGA) and the Southern Gas Association (SGA) share best practices amongst partner stakeholders.

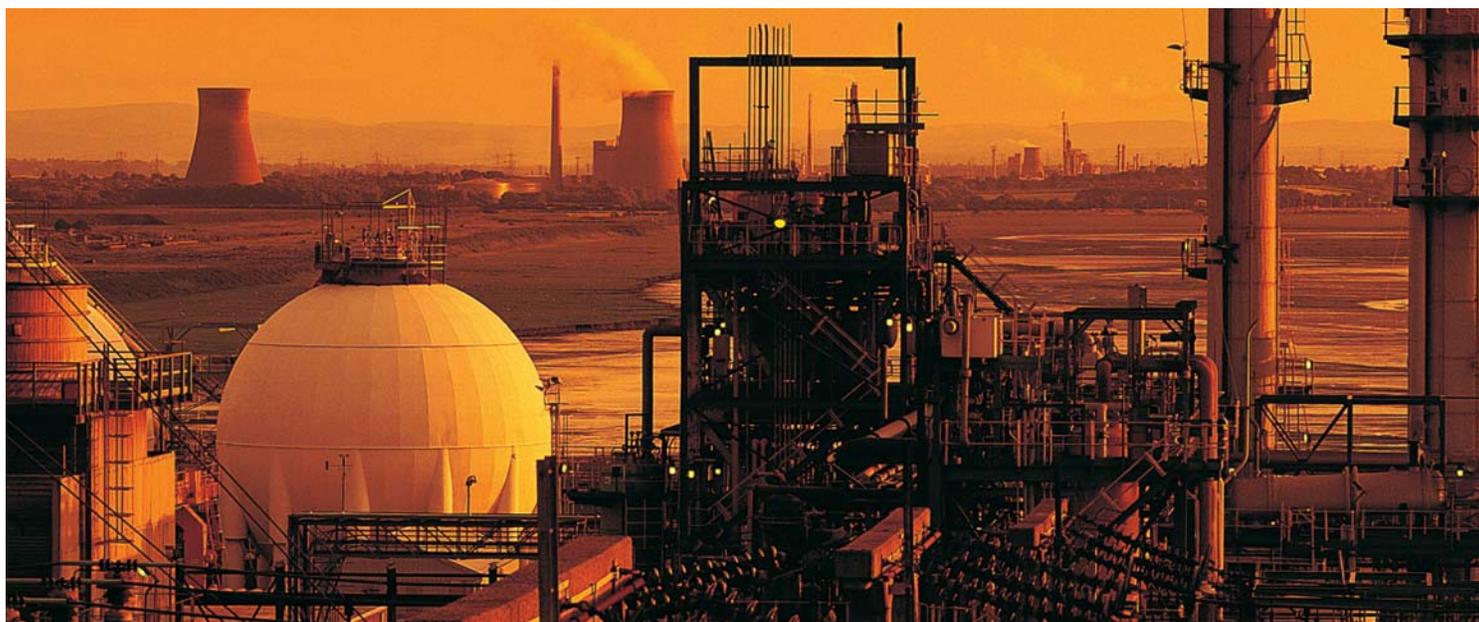


Photo by Getty Images.

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a few feet to the right or left of a plume could result in a leak going undetected. By comparison, ALPIS™'s laser covers an area up to 40 feet wide.

While ALPIS™ locates leaks geographically with great accuracy, one thing it cannot do is determine the elevation of the detected methane. In theory, the detected plume could be located at any height between the ground and the helicopter. At the start of the program, DCP was successfully locating 70 to 80 percent of the leaks LaSen's surveys were finding. While this was good, DCP wanted to do better. At this point, LaSen suggested DCP look into using a remote methane leak detector (RMLD™) to locate the hard to find leaks. RMLDs are handheld methane leak detectors first designed for use on

natural gas distribution systems. Similar to ALPIS™, a RMLD projects a beam of light and measures the reflection/absorption of that beam to detect the presence of methane. With the RMLDs, DCP now finds 97 percent of the leaks identified by LaSen's aerial surveys.

When DCP began the aerial optical imaging program in 2002, 1.5 percent of the gas entering DCP's system was lost and unaccounted for. Since then, DCP has reduced lost and unaccounted for gas by 50 percent. In fact, over the last two years, it has been reduced to less than 0.75 percent of total throughput.

The imaging program is now being applied system-wide, and managing lost and unaccounted for gas is a major component of DCP's Natural Gas STAR Program and its BTU Efficiency Program, which began in 2005 (featured in the Partner Profile in the Fall 2006 issue of the *Partner Update* locat-

ed at <www.epa.gov/gasstar/pdf/ngspartnerup_fall2006.pdf>).

The aerial optical imaging program has been a huge success for DCP, and DCP has no plans to let up. Berry explains, "Optical aerial surveys are but one tool in our toolbox. It is one of our primary tools, and it is very effective. It is so effective because we take the time to determine where and when to use it. Our systems balance inventory of the gas passing through our system allows us to pinpoint problem areas quickly and use our aerial survey tool most effectively. We have done better than I ever anticipated, but we are nowhere near through. There are still more opportunities out there, and we are going after them. This includes continuing our aerial survey program and expanding into other areas. Our next initiative, for example, is increasing the fuel efficiency of our system, to reduce the amount of gas it consumes and continue to increase the BTUs we deliver to our end points."



Photo by Getty Images.

In the News

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site at epa.gov/gasstar/resources/partnerreps.htm. The Online Reporting System is located at: db2.erg.com/

gasstar/login.asp and hard copy forms are at: epa.gov/gasstar/resources/forms.htm

Get recognized as an environmental leader in reducing methane emissions! Remember, the first step is to submit your Natural Gas STAR annual report.



Photo by Getty Images.

Collaboration Leads to Gas STAR Success

Imagine the success your company might achieve if different divisions collaborated and worked together to implement Gas STAR. Today, many companies work in this manner by utilizing multidiscipline cross-functional teams (CFTs) that include members from a variety of organizational levels and functional areas of a company. CFTs are often credited with positioning companies to make strategic decisions more quickly, giving them a crucial competitive advantage in today's fast-paced marketplace.

An important component of Gas STAR is garnering support from all organizational levels and functional areas of a company

—from management to facility operations personnel—to identify and implement emission reduction technologies and practices. By forming a CFT to implement and lead your Gas STAR projects, not only will more people learn about Gas STAR, they will also have a wider range of knowledge on which to base evaluations of new technologies and practices. This collaboration can often lead to greater Gas STAR success because more staff members engage and take an active stake in the effort.

As EnCana Oil and Gas formalize its Gas STAR CFT, it is actively involving a variety of staff, including air quality specialists,

production superintendents, operations staff, and representatives from its community relations and government affairs departments. The company understands the importance of coordination among these groups to set, implement, and meet its Gas STAR success goals.

Shell Exploration & Production (E&P) has also come to understand the value of a CFT after developing its energy management plans. In developing these plans, Shell E&P utilized the services of Shell Global Solutions (SGS) (the research and development division of Shell which provides technological solutions for the company) and tapped into its wide range of technical knowledge. Coordination between environmental engineering staff, facility operations staff, and SGS resulted in detailed energy management assessments that are helping Shell E&P to find new opportunities for reducing its methane emissions and to achieve Gas STAR success while saving energy.

Shell's Kristi Trail, Environmental Team Lead, Offshore-EP Americas, says, "Shell E&P has been able to identify ways of improving operations and inspections more quickly by putting to use technologies that have been successful elsewhere in Shell's portfolio of businesses. Many such benefits have come through working with SGS. SGS has



Photo by Getty Images.

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brought lots of knowledge and experience to Shell E&P, and is able to provide a communication and technical

link between our upstream and downstream operations.”

As more and more companies move toward a “bottom-up” approach for managing day-to-day operations, cross-functional teams will play a greater role in the successful implementation of critical projects.



Photo by Getty Images.

International Workshop on Methane Emissions Reduction Technologies in the Oil and Gas Industry

The China University of Petroleum (Qingdao Campus), U.S. Environmental Protection Agency, and RTI International jointly organized a two-day workshop to focus on methane emissions from the production, processing, transmission, and distribution of oil and natural gas. The workshop was organized specifically to demonstrate how methane emission reductions can benefit private companies, local economies, and the environment. The workshop was held April 17–18, 2008 and was well attended by representatives from China’s oil and gas companies, as

well as local and foreign technology vendors and representatives from the Petroleum University. Workshop presenters were both Chinese and foreign experts. Their presentations included a review of all of the Natural Gas Star *Lessons Learned Studies* and other technical documents to evaluate their applicability to oil and gas systems in China and to rank them in order of priority for the industry. The presenters shared information regarding their emissions identification and management practices and overall program successes.

The workshop concluded with attendees participating in a group discussion on existing barriers and possible next steps for future collaborations. While attendees were familiar with many of the technologies being used in western countries, they identified access to and quality of locally available products as an issue. Particular interest was shown in learning about the more advanced technologies used in the West. Reducing associated gas venting and flaring at oil production facilities was identified as a key area for potential improvement.

Update: Mandatory Reporting of Greenhouse Gas Emissions

The 2008 Omnibus Appropriations Bill (HR 2764) was signed into law last December and authorizes EPA to develop and publish a draft rule requiring mandatory reporting of greenhouse gases above appropriate thresholds in all sectors of the economy. In order to collect and provide data that will inform and support the development of mandatory reporting rule, EPA is encouraging stakeholder input and is reaching out to various

industry associations and groups through information sharing sessions.

The proposed draft rule is expected by September 2008, with the final expected by June 2009. EPA will consider and build on existing reporting approaches while continuing to engage stakeholders throughout the process to answer key technical issues and craft a viable proposed and final rule.

For additional information see EPA’s greenhouse gas rulemaking page, part of the Agency’s climate change Web site, at: epa.gov/climatechange/emissions/ghgrulemaking.html



Photo by Getty Images.

New Partners

EPA is excited to announce the addition of the following new partners to the Natural Gas STAR Program:

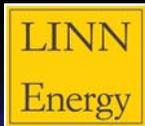
Kansas Gas Services (a ONEOK Distribution Company)



Kansas Gas Service is a division of Tulsa-based ONEOK, Inc. Kansas Gas Service is the largest natural gas distribution company in Kansas, providing natural gas to more than 642,000 customers in 341 communities, which accounts for around two-thirds of the state. The company has 19,073 miles of pipeline and more than 1,000 employees.

Linn Energy, LLC

Linn Energy is an independent oil and gas company focused on the development and acquisition of long life properties which complement its asset profile in producing basins within the United States. The company was founded in March 2003 by Michael C. Linn, Chairman and Chief Executive Officer. Linn Energy operates in the Mid-Continent (Texas Panhandle and Oklahoma), Appalachian Basin (West Virginia and Pennsylvania) and Western (Brea Olinda Field of the Los Angeles Basin) regions.



Oklahoma Natural Gas (a ONEOK Distribution Company)



Oklahoma Natural Gas, founded in 1906, is the cornerstone of one of the oldest corporations in Oklahoma. Oklahoma Natural Gas serves approximately 800,047 residential, commercial, and industrial customers in Oklahoma.

Oklahoma Natural Gas has 16,978 miles of distribution mains and services and 1,273 employees. The company has affiliates that operate transmission and gathering operations in Oklahoma that include 2,348 miles of pipeline and five strategically-located underground storage facilities, also located in the state.

ROC Gas Company (a wholly owned subsidiary of SandRidge Energy)



Discovering Beneath | Exploring Beyond™

ROC Gas Company, a wholly owned subsidiary of SandRidge Energy is located in Fort Stockton, Texas. ROC Gas Company is a gathering and processing division of SandRidge Energy.

SandRidge Energy



Discovering Beneath | Exploring Beyond™

SandRidge Energy, Inc., an independent natural gas and oil company, is headquartered in Oklahoma City, Oklahoma. The company concentrates in exploration, development, and production activities. SandRidge Energy is focusing on expanding reserves and production in the West Texas Overthrust (WTO), an area located in Pecos and Terrell counties in West Texas, which includes the Piñon Field prospect. SandRidge also has operated leasehold positions in the Cotton Valley Trend in East Texas, the Gulf Coast area, the Piceance Basin, as well as other smaller operating areas.

Source Gas LLC



Source Gas LLC is an independent natural gas company with regional offices throughout Nebraska, Wyoming, and Colorado. The company focuses on providing a reliable natural gas supply to its residential, commercial, and agricultural clients in the communities it serves.

Texas Gas Services (a ONEOK Distribution Company)



Texas Gas Services, founded as Texas Gas Service Company in Wink, Texas, in 1929, was purchased by ONEOK in January 2003 and renamed Texas Gas Service Company (TGS). TGS operates 13,114 miles of distribution mains and services and serves approximately 550,000 residential, commercial, and industrial customers in Texas. The company's largest service areas are Austin, El Paso, and the Rio Grande Valley. In addition, TGS provides service to customers in Galveston, Port Arthur, Mineral Wells, Lockhart, and several communities in the Permian Basin and the Texas panhandle.

Calendar 2008 UPCOMING EVENTS

GAS STAR TECHNOLOGY TRANSFER WORKSHOPS

- ★ **Transmission Technology Transfer Workshop**
Charlotte, North Carolina
June 25, 2008
Sponsored by: Southern Gas Association
- ★ **Distribution Technology Transfer Workshop—Webcast**
July 16, 2008
- ★ **Producers and Processors Technology Transfer Workshop**
Midland, Texas
July 23, 2008
Sponsored by: Chevron Corporation

These are events that the Natural Gas STAR Program is currently planning. For updates and further information, please check epa.gov/gasstar/workshops.htm or contact Jerome Blackman at blackman.jerome@epa.gov or (202) 343-9630.

METHANE TO MARKETS WORKSHOP

- ★ **Flaring and Venting Reduction & Natural Gas Utilization Forum**
Amsterdam, The Netherlands
December 3–5, 2008
NH Grand Hotel Krasnapolsky

For more information please contact: Roger Fernandez at fernandez.roger@epa.gov or (202) 343-9386.

GAS STAR ANNUAL IMPLEMENTATION WORKSHOP

- ★ **15th Annual Natural Gas STAR Implementation Workshop**
San Antonio, Texas
November 11–13, 2008
Westin Riverwalk Hotel—San Antonio, Texas

For more information please visit epa.gov/gasstar/workshops/imp_workshops.htm

OTHER INDUSTRY RELATED EVENTS

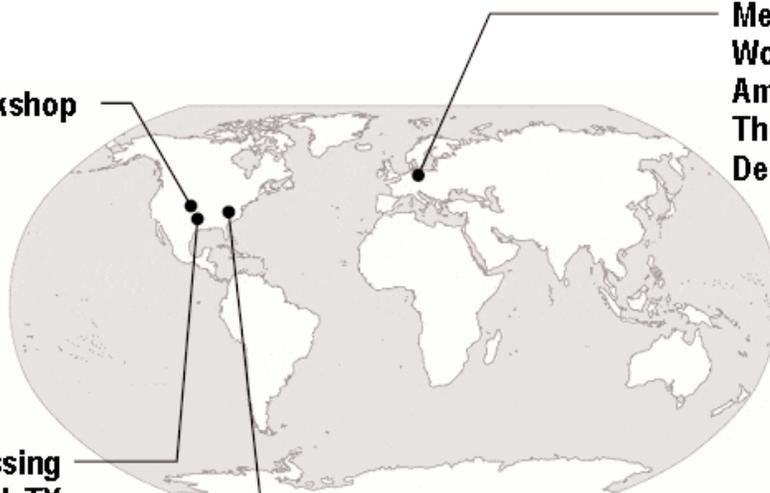
- ★ **Independent Petroleum Association of Mountain States Annual Meeting & Summer Conference**
Vail, Colorado
June 12–14, 2008
For more information visit: ipams.org/meetings/calendar.php
- ★ **Independent Petroleum Association of America (IPAA) 2008 Mid-Year Meeting**
Colorado Springs, Colorado
June 19–21, 2008
For more information visit: ipaa.org/meetings/Default.asp?Meeting=2008-06MidyearMeeting

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Gas STAR and Methane to Markets Workshops

Gas STAR Annual Workshop
San Antonio, TX
Nov 11-13, 2008

Production & Processing
Midland, TX
July 23, 2008



Transmission
Charlotte, NC
June 25, 2008

Methane to Markets Workshop
Amsterdam,
The Netherlands
Dec 3-5, 2008

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OTHER INDUSTRY RELATED EVENTS

★ **The Air & Waste Management Association (A&WMA) 101st Annual Conference and Exhibition**
Portland, Oregon
June 24–27, 2008

For more information visit:
awma.org/ACE2008

★ **Petroleum Association of Wyoming Annual Meeting and Tradeshow**
Casper, Wyoming
August 19–20, 2008

For more information visit:
pawyo.org/annual_meeting.html

★ **PennWell Corporation Unconventional Gas International Conference & Exhibition**
Fort Worth, Texas
September 30–October 2, 2008

For more information visit:
ug08.events.pennnet.com/fl/index.cfm

Are you a Gas STAR Endorser and have an event you would like listed here? Please e-mail pertinent event information to gasstar@erg.com



Photo by Getty Images.

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For additional information on topics
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