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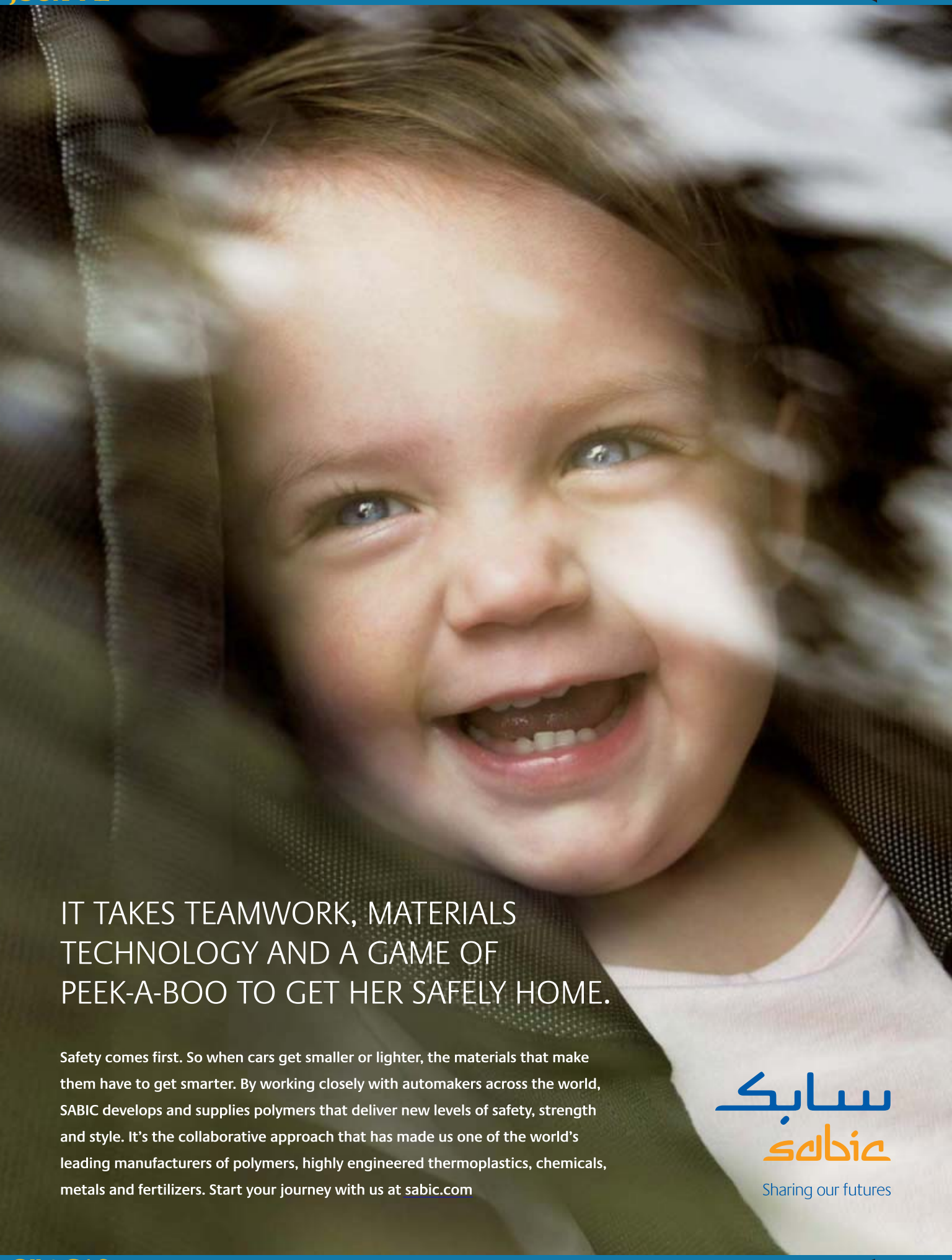
Sept. 1, 2008
Volume 106.33

PIPELINE ECONOMICS

REGULAR FEATURES

COVER

Welders work near Vicksburg, Miss., on Spread 1 of the Southeast Supply Header being constructed for a joint venture of CenterPoint Energy Inc. and Spectra Energy. Work on the pipeline includes laying 105 miles of the 42-in. OD pipe shown here between Delhi, La., and Hazelhurst, Miss. The entire 270 mile, 36-in. and 42-in. pipeline will extend from the Perryville Hub in northeastern Louisiana to the Gulfstream Natural Gas System LLC pipeline system in southern Mobile County, Ala. Oil & Gas Journal's special report on Pipeline Economics, which begins on p. 50, provides more information on similar projects, along with operational and financial data reported to the US Federal Energy Regulatory Commission for 2007-08. Photo from Willbros USA Inc. by Lindy King.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Drilling & Production

Processing

Transportation

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General Interest — Quick Takes

Industry wins $1 billion in California OCS leases suit

The US Court of Appeals upheld the 2006 ruling by the Court of Federal Claims awarding over $1 billion to 11 oil and gas companies that sued the government for its breach of nearly three dozen oil and gas leases off California.

The award by the Court of Federal Claims was likely the largest in that court's 150-year history. In issuing its decision, the Federal Circuit wrote that the government had breached the leases when it, in effect, changed their terms after the leases had been issued.

The leases were sold in the early 1980s by the US Department of the Interior as part of an effort to identify new sources of energy. Through their exploration, the companies had discovered new oil fields on federal lands off California, estimated by the federal government to contain over 1 billion bbl of oil. Under terms of their contracts, the companies were given the right to "explore, develop, and produce" oil and gas in the leased areas. However, production drilling never commenced because subsequent changes in federal law materially interfered with the companies' efforts to develop the reserves.

Covington & Burling LLP represented the 11 oil companies. Partner Steven Rosenbaum, who delivered the oral argument before the Federal Circuit, said, "When any person, company or organization enters into a contractual agreement in this country, they must fulfill the terms or pay damages, even if that entity is the US government."

In 2006, Rosenbaum successfully represented the American Petroleum Institute in a defense against a lawsuit seeking a preliminary injunction to prevent an OCS lease sale in the Western Gulf of Mexico. He currently is representing API in defending a pending challenge to the Department of the Interior's 5-year OCS leasing program.

IPAMS, IER energy ads target voters, conventions

As the US Democratic and Republican national conventions take place, the Independent Petroleum Association of Mountain States in Denver and the Institute for Energy Research (IER) in Washington, DC, are running energy-themed advertising campaigns stressing the need for more US oil and gas production. The ads, targeting officials, delegates, and voters, seek to educate Americans on the role increased domestic production can play in creating jobs and improving the US economy.

"Liberal activists have treated American energy like a four-letter word for decades, even though it's the key to our prosperity and our high standards of living," said IER Pres. Thomas Pyle. "They would have American citizens believe that their country is running out of oil and natural gas, that what does remain cannot be produced safely, and that development would only have a negligible effect on price. These assertions are patently false," Pyle declared. "To meet America's future energy demands, we will need all forms of energy. Natural gas, the cleanest fossil fuel, needs to be a critical component of any national energy policy."

IPAMS is running its ads in Denver during the Democratic National Convention, while IER's radio commercials and newspaper advertisements will run in Arkansas, Minnesota, Montana, Nevada, and North Dakota. ✦

Exploration & Development — Quick Takes

Queensland bans oil shale projects for 2 years

The Queensland government has placed a 2-year moratorium on oil shale projects, paralyzing the proposed Queensland Energy Resources Ltd. (QER) project in the McFarlane deposit about 15 km south of Proserpine on the state's central east coast.

The project would entail bulk sampling and open-cut exploration of about 400,000 tonnes of oil shale material in the area.

Queensland Premier Anna Bligh flew to north Queensland recently to formally block the $14 billion (Aus.) project.

She cited concerns of community and environmental groups who maintain that the Whitsunday region tourism industry and the Great Barrier Reef are at risk if the project proceeded.

The premier widened the ban by imposing the moratorium on all new oil shale projects while it investigates the environmental impacts of shale oil mining.

Only one lease—around the Stuart deposit near Gladstone—is current, and that was granted by the previous government in the 1980s. Bligh declared, "No new shale oil mines will be permitted in the state."

The move has created an outcry by the mining industry, with Queensland Resources Council CEO Michael Roche accusing the government of protecting the marginal Labor Party seat of Whitsunday at an election due later this year.

He added that exploration companies already rank Queensland as the least attractive jurisdiction in Australia, and the latest decision will simply reinforce that view.

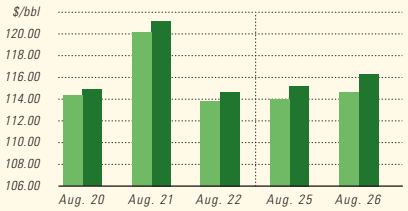
"Sovereign risk is a key consideration with billions of dollars at stake," he added.

For its part QER says the government's move is premature. A company statement said: "The company remains convinced that developing the state's strategically important oil shale resources is in the best long-term interest of both Queensland and Australia."

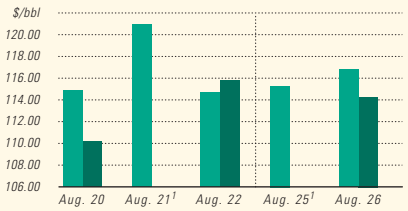
Only 2 weeks ago the company announced it had abandoned the Alberta-Taciuk Processor (ATP) revolving kiln oil-shale process-

Industry Scoreboard

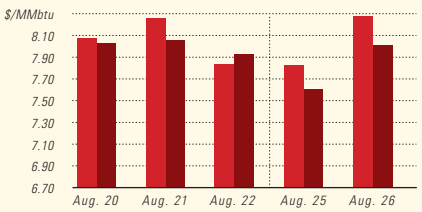
IPE BRENT / NYMEX LIGHT SWEET CRUDE



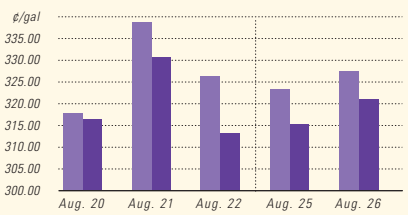
WTI CUSHING / BRENT SPOT



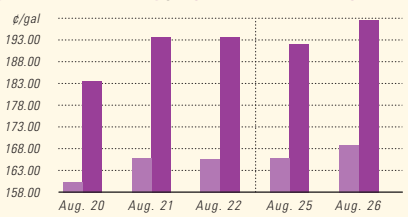
NYMEX NATURAL GAS / SPOT GAS - HENRY HUB



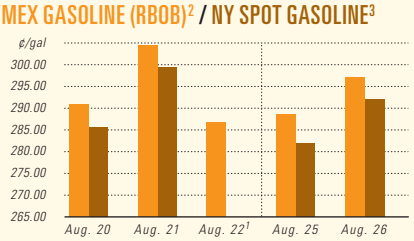
IPE GAS OIL / NYMEX HEATING OIL



PROPANE - MT. BELVIEU / BUTANE - MT. BELVIEU



NYMEX GASOLINE (RBOB)[2] / NY SPOT GASOLINE[3]



[1]Not available [2]Reformulated gasoline blendstock for oxygen blending.
[3]Non-oxygenated regular unleaded.

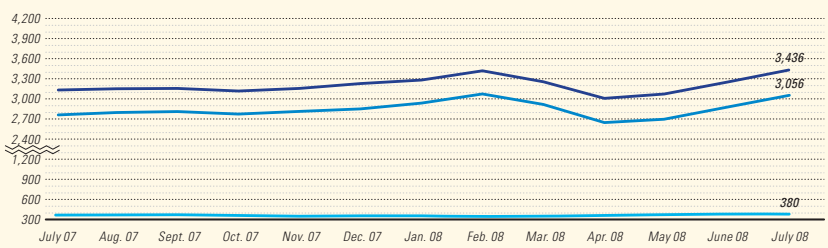
US INDUSTRY SCOREBOARD — 9/1

Latest week 8/15	4 wk. average	4 wk. avg. year ago[1]	Change, %	YTD average[1]	YTD avg. year ago[1]	Change, %
Demand, 1,000 b/d						
Motor gasoline	9,455	9,607	–1.6	9,135	9,287	–1.6
Distillate	4,211	4,077	3.3	4,139	4,219	–1.9
Jet fuel	1,580	1,685	–6.2	1,567	1,632	–4.0
Residual	631	712	–11.4	617	742	–16.8
Other products	4,347	4,779	–9.0	4,742	4,822	–1.7
TOTAL DEMAND	20,224	20,860	–3.0	19,980	20,732	–3.6
Supply, 1,000 b/d						
Crude production	5,137	4,993	2.9	5,130	5,110	0.4
NGL production[2]	2,378	2,442	–2.6	2,245	2,368	–5.2
Crude imports	10,211	10,118	0.9	9,873	10,035	–1.6
Product imports	2,970	3,557	–16.5	3,171	3,581	–11.4
Other supply[3]	1,350	1,037	30.2	1,407	1,059	32.9
TOTAL SUPPLY	22,046	22,147	–0.5	21,826	22,153	–1.5
Refining, 1,000 b/d						
Crude runs to stills	14,902	15,951	–6.6	14,902	15,163	–1.7
Input to crude stills	15,124	15.879	–4.8	15,124	15,449	–2.1
% utilization	86.3	91.0	—	86.3	88.5	—

Latest week 8/15	Latest week	Previous week[1]	Change	Same week year ago[1]	Change	Change, %
Stocks, 1,000 bbl						
Crude oil	305,937	296,547	9,390	337,118	–31,181	–9.2
Motor gasoline	196,620	202,822	–6,202	196,231	389	0.2
Distillate	132,068	131,587	481	129,025	3,043	2.4
Jet fuel–kerosine	40,925	40,786	139	41,918	–993	–2.4
Residual	36,863	36,435	428	36,476	387	1.1
Stock cover (days)[4]			Change, %		Change, %	
Crude	20.5	19.7	4.1	21.2	–3.3	
Motor gasoline	20.8	21.5	–3.3	20.4	2.0	
Distillate	31.4	31.3	0.3	31.0	1.3	
Propane	52.4	48.4	8.3	54.7	–4.2	
Futures prices[5] **8/22**			Change		Change	%
Light sweet crude ($/bbl)	115.63	114.45	1.18	72.17	43.46	60.2
Natural gas, $/MMbtu	8.01	8.27	–0.27	6.90	1.11	16.1

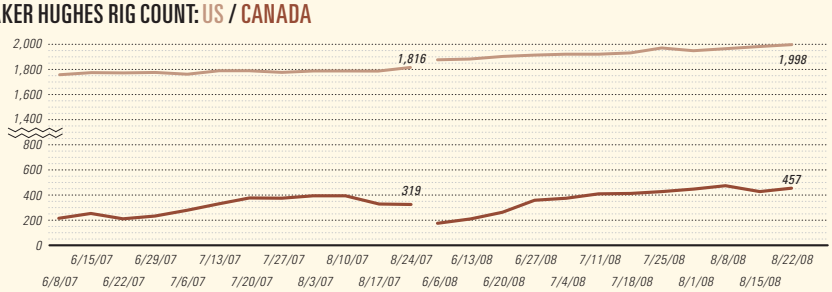
[1]Based on revised figures. [2]Includes adjustments for fuel ethanol and motor gasoline blending components. [3]Includes other hydrocarbons and alcohol, refinery processing gain, and unaccounted for crude oil. [4]Stocks divided by average daily product supplied for the prior 4 weeks. [5]Weekly average of daily closing futures prices.
Sources: Energy Information Administration, Wall Street Journal

BAKER HUGHES INTERNATIONAL RIG COUNT: TOTAL WORLD / TOTAL ONSHORE / TOTAL OFFSHORE



Note: Monthly average count

BAKER HUGHES RIG COUNT: US / CANADA



Note: End of week average count

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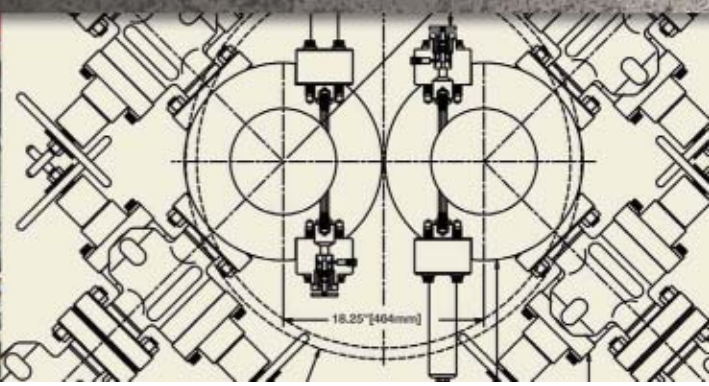

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ing technology in favor of the Paraho II technology to develop its vast oil shale deposits along the east coast of Queensland (OGJ Online, Aug. 14, 2008).

Paraho II technology has already been tested with more than 8,000 tonnes of Queensland oil shale samples.

QER says the deposits have the potential to produce 1.6 billion bbl of shale oil over the next 40 years.

StatoilHydro makes gas find in Barents Sea

StatoilHydro AS discovered natural gas within the Arenaria prospect on Block 7224/6 in the Barents Sea but said it's too early to tell if the gas can be produced because it's from poor quality reservoir rocks of middle Triassic age.

StatoilHydro drilled the exploration well with the Polar Pioneer drilling rig to prove hydrocarbons in sandstone of early Jurassic to late Triassic age. After reaching a vertical depth of 2,315 m below sea level, it did not find any hydrocarbons in its primary target despite there being good reservoir sands.

The gas discovery was its secondary goal. It will now permanently plug and abandon the well.

This well was compulsory under its work program and the first on Exploration License 394, which was awarded in 2006.

"Drilling of exploration well 7224/6-1 was completed by the Polar Pioneer drilling unit at a water depth of 265 m. Polar Pioneer will now start drilling exploration well 7222/11-1 in the Statoil-Hydro-operated Exploration License 228," the company said.

Dong makes oil find on Ipswich prospect

Dong E&P Norge AS has discovered oil on the Ipswich prospect in the southern Norwegian North Sea about 290 km southwest of Stavanger.

If the prospect is commercial, it could be tied back to nearby Oselvar gas-condensate field. Dong plans to submit a development and operation plan to the Norwegian government in first-quarter 2009. Wildcat exploration well 1/3-11 and sidetrack 1/3-11 T2 discovered oil in Paleocene rocks. The oil column is at least 60 m oil with reservoir properties comparable to Oselvar.

Dong and its partners did not test the well, which was drilled by the Maersk Guardian jack up rig in 72 m of water. The main well was drilled to 3,232 m and the sidetrack to 3,465 m subsea, and both finished early Paleocene rocks.

The well will be permanently plugged and abandoned. The Maersk Guardian rig will then move to Production License 289 and drill exploration well 3/7-7 for Dong on the Marsvin prospect. ✦

Drilling & Production — *Quick Takes*

Chevron to develop Hebron heavy oil off Canada

Chevron Canada Ltd. and its coventurers have this summer finalized legal agreements with Newfoundland and Labrador to develop the Hebron heavy oil fields off northeastern Canada.

The complex consists of Hebron, Ben Nevis, and West Ben Nevis fields, which lie in the Jeanne d'Arc basin between the Hibernia and Terra Nova production areas on the Grand Banks (see map, OGJ, Feb. 14, 2005, p. 32). The complex is 210 miles off Newfoundland and Labrador in 300 ft of water. Hebron was discovered in 1981, but the project was put on hold in 2006 when the operator could not reach an agreement with Newfoundland and Labrador.

Recovering 19-21° gravity heavy oil in the area's harsh conditions presents a challenge, and the reservoir characteristics are technically complex and demanding. Chevron Canada, operator of the complex, said the field is "expected to be developed using a gravity-based structure with integrated drilling and production topsides."

The Canada-Newfoundland and Labrador Offshore Petroleum Board (C-NLOPB) in 2006 estimated that the Hebron complex contains 731 million bbl of proved and probable oil resources, about 30 million bbl of natural gas liquids, and 429 bcf of natural gas, based on geologic, petrophysical, and reservoir simulation studies and drilling results (OGJ, June 19, 2006, p. 29) and (July 3, 2006, p. 52). Chevron estimates recoverable oil to be in the 400-700 million bbl range.

Chevron Canada holds a 26.63% working interest in the project. Other partners are ExxonMobil Canada Properties 36.04%, PetroCanada 22.73%, StatoilHydro Canada Oil & Gas Inc. 9.7%, and Oil & Gas Corp. of Newfoundland and Labrador 4.9%.

Chevron Canada holds an ongoing financial interest also in the Hibernia and Terra Nova offshore oil projects, and in exploration in the Orphan basin.

Vanco, Lukoil lease drillship for Ghana deep water

Vanco Ghana Ltd. and partner Lukoil Overseas Ghana Ltd. have completed contractual arrangements with Aban Loyd for use of its Aban Abraham dynamic positioning drillship to drill the Dzata-1 wildcat on deepwater Cape Three Points Block off Ghana. The drillship can drill down to about 19,350 ft.

The vessel is in Sembawang Shipyard in Singapore being retrofitted to enable the unit to drill in as much as 2,000 m of water. When shipyard activities are complete, the Aban Abraham will mobilize to West Africa and drill the Dzata-1 in the fourth quarter.

Cape Three Points Block encompasses 1.25 million acres in 200-3,000 m of water. The Dzata prospect lies 70 miles southeast of Jubilee field, which has estimates of 500 million-1.8 billion bbl of recoverable oil, "confirming an active petroleum system in the Tano basin and heightening the exploration activity in the region," Vanco said. Jubilee is expected to produce about 20,000 b/d of oil (OGJ Online, July 16, 2008). In addition to the Vanco-Lukoil partnership, other companies working off Ghana are Devon Energy, Amerada Hess Corp., Anadarko, Tullow Oil, and Kosmos Energy. The industry plans to drill several wells in the area in the next few months.

On Cape Three Points, Vanco had 2D and 3D seismic surveys shot, which revealed large compressional folds in a newly recognized subbasin. The Dzata (Lion) prospect represents one of nine major structural and stratigraphic prospects on the block.

"Situated in 1,869 m of water, the Dzata prospect is a large an-

ticlinal structure with numerous Lower and Upper Cretaceous potential reservoir horizons and distinct direct hydrocarbon indicators, including flat spots and a gas 'chimney,'" said Vanco. The well will be drilled to 4,900 m TD—3,031 m below the mud line.

Vanco Pres. Gene Van Dyke said the companies had worked for more than a year to secure the Aban Abraham drilling slot in a tightening deepwater rig market, and they intend to secure additional slots for other planned wells in West Africa.

Vanco, which is serving as operator of Cape Three Points Block, holds a 28.34% interest in the property, with Lukoil holding a 56.66% stake. State oil company Ghana National Petroleum Corp. holds a 15% carried interest.

Pemex annual oil output slides 10%; Cantarell 36%

Production from Mexico's Cantarell oil field fell 36% over the past year, reducing the country's overall oil production and creating a sharp decline in its exports.

"New fields aren't coming on line fast enough to replace Cantarell," said Jesus Reyes Heroles, general director of Petroleos Mexicanos (Pemex).

Reyes' remarks coincided with an announcement by Pemex that in the first 7 months of 2008 the state firm produced an average of 2.84 million b/d of oil, down 10% from the same period in 2007.

Pemex confirmed that the decline in production is due mainly to the fall-off in production from Cantarell. It said the giant field produced 1.12 million b/d, a figure 472,000 b/d less than during the same period a year before.

Between January and July of 2008, Pemex exported an average of 1.44 million b/d, or 16.3% less than the same period in 2007. But income from crude exports during January-July totaled $30.08 billion, or 51.8% higher than in 2007, due to the surge in global prices.

Mexico's production of natural gas stood at 6.75 bcfd during the first half, representing a 13% increase compared with the same period in 2007.

The Pemex refinery system produced 1.5 million b/d of gasoline, diesel, and other fuels during the same period, while imports of gasoline averaged 342,500 b/d, up 17.6% over the January-July 2007 period.

Pemex said the total volume of petroleum product imports in January-July rose to 555,100 b/d, on average, or 22.2% greater than such purchases during the January-July 2007 period, at a total cost of $14.08 billion. ✦

Processing — *Quick Takes*

Regulators clear parcels at Marathon refinery

Two portions of Marathon Petroleum Co.'s refinery complex at Garyville, La., have been designated ready for reuse, federal and state environmental regulators jointly announced on Aug. 20.

A 4.5-acre land farm and a 10.2-acre land treatment unit which the Marathon Oil Corp. division used for land treatment of various refinery sludges from 1989 to 1998 received the designation, the US Environmental Protection Agency and the Louisiana Department of Environmental Quality said.

Marathon's successful completion of investigation and risk management activities have made conditions at the sites protective of human health and the environment based on their current and planned uses, officials of the two agencies said during an Aug. 20 ceremony at the plant. The properties adjoin processing and utility facilities, they noted.

"Marathon has demonstrated that a clean environment is important to them. This ceremony is a testament to fine work many people put into cleaning up this land and getting it ready to be put back into commerce," Louisiana DEQ Assistant Secretary Lou Buatt said.

Pakistan refineries protest lower products duties

The Economic Coordination Committee (ECC) of Pakistan has rejected a claim by the country's refineries that they face loss under the reduced "deemed duty" (ad valorem surcharge) that they now are allowed to charge. ECC asked the Ministry of Petroleum and Natural Resources to submit each refinery's financial results separately to determine the impact of the reduced-duty formula on the refineries.

Pakistan's five refineries have a total refining capacity of 267,000 b/d. A sixth is under construction and expected to begin products production for export, in spring 2009. Four of the refineries meet the country's domestic market demand for petroleum products.

A report on refineries' profit considered by ECC in one of its previous meetings contradicted the refiners' claims of facing huge losses, despite an enormous increase in the cost of imported crude oil feedstocks. ECC indicated that each refinery's profit had increased 15-18 times during the last 6 years. This kind of profit is only possible when a section of the economy enjoys protection such as the deemed duty, the committee said.

Following the ECC directive, the ministry will ask the refineries to submit their financial results for the first quarter of the current fiscal year. These financial results will be presented to ECC for its consideration.

The outcome also will affect the new refinery under construction. Indus Refinery Ltd. (IRL) is scheduled to start commercial production of petroleum products in March 2009 from a 100,000 b/d refinery under construction near Karachi. IRL's foreign investors hold 86.7% of the shareholding, while local sponsors hold 13.3%.

IRL CEO Sohail Shamsi said the company's investment was based on the existing formula and would be wasted if the refinery could not make a profit. He said Pakistan's refineries were operating on low fixed margins, contrary to the belief that they made windfall gains.

Because in 2007 gasoline demand in Pakistan was declining, the refinery plans to export its products. The refinery would produce 1 million tonnes/year of kerosene, 1.5 million tonnes of low-sulfur diesel, and 500 tonnes/day of liquefied petroleum gas. It also will produce propane, butane, high quality unleaded gasoline, and aviation fuels.

Oil consumption in Pakistan recorded a growth of 8.3% in the

first half of fiscal year 2008 as total volumes settled at 9.07 million tonnes during this period against 8.38 million tonnes registered in the same period in fiscal year 2007.

Australia's Cityview to buy, relocate African refinery

CityView Corp. Ltd., Perth, plans to purchase a 50,000 b/sd refinery and relocate it on Africa's west coast by first-quarter 2010.

The company will borrow most of the $320 million needed to finance the purchase and relocation. The refinery will produce 1,550 b/sd of LPG, 3,784 b/sd of naphtha, 17,370 b/sd of gasoline, 13,964 b/sd of kerosine and diesel, 4,560 b/sd of asphalt, and 8,772 b/sd of fuel oil.

Financing is being negotiated, "the details of which will be announced later," Cityview said.

The refinery's future location has yet to be decided; the company has operations in Cameroon and Angola. The refinery will be transported in modular form from the US, where it is undergoing refurbishment. Some minor modifications will be required to enable the refinery to treat West African oil feedstock.

The project timetable depends on relevant final governmental approvals and the state of available facilities such as power and water needed to run the refinery and a suitable port nearby. ✦

Transportation — *Quick Takes*

Fitch: Kazakh lines enter 5 years of investment

Kazakhstan's oil and gas pipeline operators, according to Fitch Ratings, are set to embark on intensive investment programs over the next 5 years to capitalize on favorable oil and gas industry fundamentals, as well as increased demand from a rapidly growing Kazakh economy.

"Whilst the credit impact of these programs will be more pronounced in the short-term, it could be limited in the long-run based on the nature of projects funding," the ratings agency said.

KazTransGas (KTG), a national operator of gas pipelines in Kazakhstan, has increased capital expenditure plans with a view to investing more than $8 billion in the construction of three gas pipelines, including the West-South gas pipeline, the China gas pipeline and the By-Caspian gas pipeline.

In turn, Kazakhstan's state-run oil pipeline operator KazTransOil (KTO) intends to invest more than $2 billion in the construction of two new oil pipelines.

The two new lines include the Kenkiyak-Kumkol route, which will connect western Kazakhstan to China, and a link between the Kashagan oil field and a new export terminal on the Caspian Sea.

Moreover, according to Fitch, the consortium operating the Caspian Pipeline Consortium (CPC) pipeline is considering the possibility of pipeline capacity expansion, with the costs estimated at some $2.5 billion.

Angelina Valavina, Director of Fitch's energy, utilities, and regulation team, said that while implementation of the construction and expansion projects unveiled by Kazakh pipeline operators will put pressure on the companies' credit metrics in the short-term, "the impact of escalating capex is likely to be subdued in the medium to long-term due to the flexibility of financing options available to operators."

Fitch noted that nonrecourse financing is emerging as an important financing tool in the region, as demonstrated by KTO's financing of the Kenkiyak-Kumkol route construction. KTG is also currently negotiating for financing of the China gas pipeline to be arranged by its JV counterparty—CNPC—without recourse to KTG.

Fitch also noted that some projects are expected to be partly or fully state-funded given their social and political importance such as the construction of the West-South gas pipeline by KTG.

Enbridge calls open season for Texas gas line

Enbridge Energy Partners LP, Calgary, and Atmos Pipeline & Storage LLC, Dallas, issued a solicitation of interest Aug. 25 for firm transportation service on a proposed 100-mile, 1 bcfd natural gas pipeline in Texas called the Barnett Intrastate Gas (BIG) pipeline.

The BIG pipeline would connect Atmos Energy's Line X in Johnson County, Tex., to Enbridge's Double D and Clarity pipelines at Bethel in Anderson County, Tex.

Bridging the two companies' systems, BIG would provide shippers access to gas from the Waha, Barnett Shale, Bossier sands, and Anadarko basin producing regions. "Delivery points would include multiple market options at the Enbridge Carthage Hub in Panola County, Tex., and the Enbridge Southeast Texas Hub in Orange County," Enbridge said.

Nabucco capacity attracts strong shipper interest

Potential natural gas shippers on the proposed 31 billion cu m/year Nabucco gas pipeline have booked out capacity on a nonbinding basis, suggesting a strong demand in western Europe for new gas supplies from the Caspian and the Middle East.

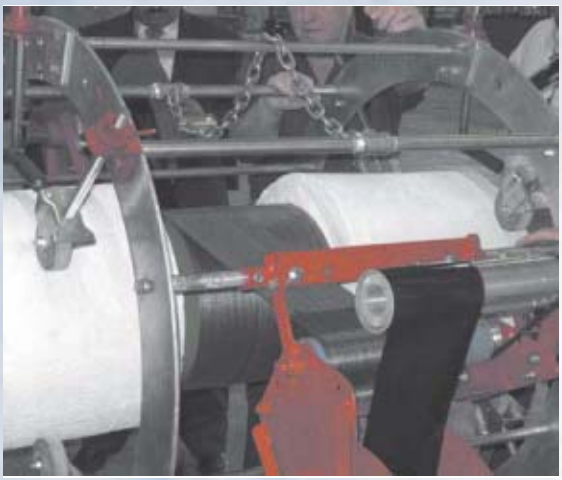
Nabucco, which is behind the €7.9 billion project, carried out a survey to assess market interest. "Nabucco capacities are more than 100% overbooked by potential shippers from day one in 2013 on a long term basis," the company said.

The European Union has given support to the pipeline to reduce the EU's reliance on Russian gas supplies.

Construction of the 3,300-km line, which will extend from the Caspian Sea to Austria via Turkey and the Balkan states, will occur in two phases: The first, which will have an initial capacity of 8 billion cu m/year, is expected to start in 2010 and complete in 2013.

The second construction phase will start in 2013 and complete at yearend 2014. It will extend from the Turkish border through Iran to Georgia. It will carry some 31 billion cu m of gas/year to the European Union from the Middle East and Central Asia (OGJ Online, July 14, 2008). ✦

TWO MINUTE WARNING!



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✦ Denotes new listing or a change in previously published information.

OIL&GAS JOURNAL online

Additional information on upcoming seminars and conferences is available through OGJ Online, Oil & Gas Journal's Internet-based electronic information source at http://www.ogjonline.com.

2008

SEPTEMBER

Annual India Oil & Gas Review Symposium & International Exhibition, Mumbai, (0091-22) 40504900, ext. 225, (0091-22) 26367676 (fax), e-mail: oilasia@vsnl.com, website: www.oilasia.com. 1-2.

China Power, Oil & Gas Conference & Exhibition, Guangzhou, (918) 831-9160, (918) 831-9161 (fax), e-mail: registration@pennwell.com, website: www.chinasenergyfuture.com. 2-4.

✦HGS/PESGB African Conference, Houston, (713) 502-2766, (281) 679-5504 (fax), e-mail: africa08@att.net, website: www.hgs.org/en/cev/887. 8-10.

ECMOR XI-European Mathematics of Oil Recovery Conference, Bergen, (972) 952-9393, (972) 952-9435 (fax), e-mail: spedal@spe.org, website: www.spe.org. 8-11.

Rice Global Engineering & Construction Forum, Houston, (713) 552-1236, ext. 3, (713) 572-3089 (fax), website: www.forum.rice.edu. 9.

IADC Drilling HSE Europe Conference & Exhibition, Amsterdam, (713) 292-1945, (713) 292-1946 (fax); e-mail: conferences@iadc.org, website: www.iadc.org. 9-10.

Rocky Mountain GPA Annual Meeting, Denver, (918) 493-3872, (918) 493-3875 (fax), email: pmirkin@gasprocessors.com, website: www.gasprocessors.com. 10.

API Fall Refining & Equipment Standards Meeting, Los Angeles, (202) 682-8000, (202) 682-8222 (fax), website: www.api.org/events. 15-17.

Rio Oil & Gas Conference & Expo, Rio de Janeiro, 55 21 2112 9078, 55 21 2220 1596 (fax), e-mail: riooil2008@ibp.org.br, website: www.riooilegas.com.br. 15-18.

API/NPRA Fall Operating Practices Symposium, Los Angeles, (202) 682-8000, (202) 682-8222 (fax), website: www.api.org/events. 16.

GEO India South Asia's Geosciences Conference & Exhibition, New Delhi, +44 (0)20 7840 2100, +44 (0)20 7840 2111 (fax), e-mail: geo@oesallworld.com, website: www.geo-india.com. 17-19.

SPE Annual Technical Conference & Exhibition, Denver, (972) 952-9393, (972) 952-9435 (fax), e-mail: spedal@spe.org, website: www.spe.org. 21-24.

Energy Institute Decommissioning Conference, Aberdeen, + 44 (0) 20 7467 7106, + 44 (0) 20 7580 2230 (fax), e-mail: hetheridge@energyinst.org.uk, website: www.energyinst.org.uk/events. 23.

ERTC Petrochemical Conference, Cannes, +44 1737 365100, +44 1737 365101 (fax), e-mail: events@gtforum.com, website: www.gtforum.com. Sept. 29-Oct. 1.

DGMK Future Feedstocks for Fuels & Chemicals Conference, Berlin, 040 639004 0. 040 639004 50 (fax), website: www.dgmk.de. Sept. 29-Oct. 1.

International Pipeline Exposition, Calgary, Alta., 403) 209-3555, (403) 245-8649 (fax), website: www.petroleumshow.com. Sept. 30-Oct. 2.

Unconventional Gas International Conference & Exhibition, Ft.Worth, Tex., (918) 831-9160, (918) 831-9161 (fax), e-mail: registration@pennwell.com, website: www.unconventionalgas.net. Sept. 30-Oct. 2.

OCTOBER

GPA North Texas/NGS East Texas Red River Conference, Tyler, Tex., (713) 222-0852, (713) 222-0858 (fax), e-mail: tom.rommel@accessed.com, website: www.gasprocessors.com. 1-2.

NPRA Q&A Forum, Orlando, Fla., (202) 457-0480, (202) 457-0486 (fax), e-mail: info@npra.org, website: www.npra.org. 5-8.

GPA Houston Annual Meeting, Kingwood, Tex., (918) 493-3872, (918) 493-3875 (fax), e-mail: pmirkin@gasprocessors.com, website: www.gasprocessor.com. 7.

KIOGE Kazakhstan International Oil & Gas Exhibition & Conference, Almaty, + (44) 020 7596 5000, + (44) 020 7596 5111 (fax), e-mail: oilgas@ite-exhibitions.com, website: www.ite-exhibitions.com/og. 7-10.

IADC Drilling West Africa Conference & Exhibition, Lisbon, (713) 292-1945, (713) 292-1946 (fax); e-mail: conferences@iadc.org, website: www.iadc.org. 8-9.

International Gas Union Research Conference, Paris, +31 50 521 30 78, +31 50 521 19 46 (fax), e-mail: igrc2008@gasunie.nl, website: www.igrc2008.com. 8-10.

ERTC Lubes and Additives Conference, Berlin, +44 1737 365100, +44 1737 365101 (fax), e-mail: events@gtforum.com, website: www.gtforum.com. 13-15.

Middle East Plant Maintenance Conference, Abu Dhabi, +44 207 067 1800, +44 207 430 0552 (fax), e-mail: d.michalski@theenergyexchange.co.uk, website: www.theenergyexchange.co.uk. 13-15.

API Fall Petroleum Measurement Standards Meeting, Long Beach, (202) 682-8000, (202) 682-8222 (fax), website: www.api.org/events. 13-17.

Oil Shale Symposium, Golden, Colo., (303) 384-2235, e-mail: jboak@mines.edu, website: www.mines.edu/outreach/cont_ed/oilshale. 13-17.

Central and Eastern European Refining & Petrochemicals Roundtable, Warsaw, +44 207 067 1800, +44 207 430 0552 (fax), e-mail: c.taylor@theenergyexchange.co.uk, website: www.theenergyexchange.co.uk. 14-16.

ISA EXPO, Houston, (919) 549-8411, (919) 549-8288 (fax) website: www.isa.org. 14-16.

Oil & Gas Transportation in the CIS & Caspian Region Conference, Moscow, +44 (0) 207 067 1800, +44 207 430 0552 (fax), e-mail: j.golodnikova@theenergyexchange.co.uk, website: www.theenergyexchange.co.uk/cispipes10register.html. 14-16.

PIRA New York Annual Conference, New York, (212) 686-6808, (212) 686-6628 (fax), e-mail: sales@pira.com, website: www.pira.com. 16-17.

Petchem Arabia Conference, Abu Dhabi, +44 207 067 1800, +44 207 430 0552 (fax), e-mail: c.verma@theenergyexchange.co.uk, website: www.theenergyexchange.co.uk. 20-22.

SPE Asia Pacific Oil & Gas Conference & Exhibition, Perth, (972) 952-9393, (972) 952-9435 (fax), e-mail: spedal@spe.org, website: www.spe.org. 20-22.

Calendar

SPE International Thermal Operations & Heavy Oil Symposium, Calgary, Alta., (972) 952-9393, (972) 952-9435 (fax), e-mail: spedal@spe.org, website: www.spe.org. 20-23.

Permian Basin International Oil Show, Odessa, Tex., (432) 367-1112, (432) 367-1113 (fax), e-mail: pbioilshow@pbioilshow.org, website: www.pbioilshow.org. 21-23.

AAPG International Conference & Exhibition, Cape Town, (918) 560-2679, (918) 560-2684 (fax), e-mail: convene@aapg.org, website: www.aapg.org. 26-29.

✦GPA Houston Midstream Conference, Houston (713) 222-0852, (713) 222-0858 (fax), e-mail: tom.rommel@accessed.com, website: www.gasprocessors.com. 28-29.

Biofuels Conference, Berlin, +44 207 067 1800, +44 207 430 0552 (fax), e-mail: c.taylor@theenergyexchange.co.uk, website: www.theenergyexchange.co.uk. 28-30.

SPE Russian Oil & Gas Technical Conference & Exhibition, Moscow, (972) 952-9393, (972) 952-9435 (fax), e-mail: spedal@spe.org, website: www.spe.org. 28-30.

Arab Oil & Gas Show, Dubai, +971 4 3355001, +971 4 3355141 (fax), e-mail: info@icedxb.com, website: www.ogsonline.com. 28-30.

IADC Contracts & Risk Management Conference, Houston, (713) 292-1945, (713) 292-1946 (fax); e-mail: conferences@iadc.org, website: www.iadc.org. 29-30.

NOVEMBER

ASME International Mechanical Congress & Exposition, Boston, (973) 882-1170, (973) 882-1717 (fax), e-mail: infocentral@asme.org, website: www.asme.org. 2-6.

Abu Dhabi International Petroleum Exhibition & Conference (ADIPEC), Abu Dhabi, +971 (0) 2 4444 909, +971 (0) 2 4444 383 (fax), e-mail: info@adipec.com, website: www.adipec.com. 3-6.

Deepwater Operations Conference & Exhibition, Galveston, Tex., (918) 831-9160, (918) 831-9161 (fax), e-mail: registration@pennwell.com, website: www.deepwateroperations.com. 4-6.

North African Oil and Gas Summit, Vienna, +44 (0) 207 067 1800, +44 207 430 0552 (fax), e-mail: c.brown@theenergyexchange.co.uk, website: www.theenergyexchange.co.uk/nas3register.html. 4-6.

Mangystau International Oil & Gas Exhibition, Aktau, + (44) 020 7596 5000, + (44) 020 7596 5111 (fax), e-mail: oilgas@ite-exhibitions.com, website: www.ite-exhibitions.com/og. 5-7.

GPA North Texas Annual Meeting, Dallas, (918) 493-3872, (918) 493-3875 (fax), email: pmirkin@gasprocessors.com, website: www.gasprocessors.com. 6.

GITA's GIS Annual Oil & Gas Conference, Calgary, (303) 337-0513, (303) 337-1001 (fax), e-mail: info@gita.org, website: www.gita.org/ogca. 6-7.

IADC Annual Meeting, Paradise Valley, Ariz., (713) 292-1945, (713) 292-1946 (fax); e-mail: conferences@iadc.org, website: www.iadc.org. 6-7.

SEG International Exposition and Annual Meeting, Las Vegas, (918) 497-5542, (918) 497-5558 (fax), e-mail: register@seg.org, website: www.seg.org. 9-14.

IPAA Annual Meeting, Houston, (202) 857-4722, (202) 857-4799 (fax), website: www.ipaa.org. 10-12.

Houston Energy Financial Forum, Houston, (918) 831-9160, (918) 831-9161 (fax), e-mail: registration@pennwell.com, website: www.accessanalyst.net. 11-13.

American Institute of Chemical Engineers (AIChE) Annual Meeting, Philadelphia, (212) 591-8100, (212) 591-8888 (fax), website: www.aiche.org. 16-21.

ERTC Annual Meeting, Vienna, +44 1737 365100, +44 1737 365101 (fax), e-mail: events@gtforum.com, website: www.gtforum.com. 17-19.

Annual Houston Energy Financial Forum, Houston, (918) 831-9160, (918) 831-9161 (fax), e-mail: registration@pennwell.com, website: www.accessanalyst.net. 18-20.

IADC Well Control Middle East Conference & Exhibition, Muscat, (713) 292-1945, (713) 292-1946 (fax); e-mail: conferences@iadc.org, website: www.iadc.org. 24-25.

Annual European Autumn Gas Conference (EAGC), Cernobbio, Italy, +44 (0) 1737 855281, +44 (0) 1737 855482 (fax), e-mail: vanessahurrell@dmgworldmedia.com, website: www.theeagc.com. 25-26.

DECEMBER

IADC Well Control Middle East Conference & Exhibition, Muscat, (713) 292-1945, (713) 292-1946 (fax), e-mail: conferences@iadc.org, website: www.iadc.org. 2-3.

Annual Refining & Petrochemicals in Russia and the CIS Countries Roundtable, Prague, +44 207 067 1800, +44 207 430 0552 (fax), e-mail: e.polovinkina@theenergyexchange.co.uk, website: www.theenergyexchange.co.uk. 2-4.

Downstream Asia Refining & Petrochemicals Conference, Singapore, +44 (0) 207 067 1800, +44 207 430 0552 (fax), e-mail: a.ward@theenergyexchange.co.uk, website: www.wraconferences.com/FS1/dalregister.html. 3-4.

IADC Drilling Gulf of Mexico Conference & Exhibition, Galveston, Tex., (713) 292-1945, (713) 292-1946 (fax); e-mail: conferences@iadc.org, website: www.iadc.org. 3-4.

Deep Offshore Technology International Conference & Exhibition, Perth, (918) 831-9160, (918) 831-9161 (fax), e-mail: registration@pennwell.com, website: www.deepoffshoretechnology.com. 3-5.

International Petroleum Technology Conference (IPTC), Kuala Lumpur, +971 (0)4 390 3540, +971 (0)4 366 4648 (fax), e-mail: iptc@iptcnet.org, website: www.iptcnet.org. 3-5.

USAEE/IAEE North American Conference, New Orleans, (216) 464-2785, (216) 464-2768 (fax), website: www.usaee.org. 3-5.

PIRA Natural Gas Markets Conference, New York, (212) 686-6808, (212) 686-6628 (fax), e-mail: sales@pira.com, website: www.pira.com. 8-9.

PIRA Understanding Global Oil Markets Conference, New York, (212) 686-6808,

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(212) 686-6628 (fax), e-mail: sales@pira.com, website: www.pira.com. 10-11.

Seatrade Middle East Maritime Conference & Exhibition, Dubai, +44 1206 545121, +44 1206 545190 (fax), e-mail: events@seatrade-global.com, website: www.seatrade-middleeast.com. 14-16.

AAPG Annual Convention & Exhibition, San Antonio, 1 (888) 945 2274, ext. 617, (918) 560-2684 (fax), e-mail: convene@aapg.org, website: www.aapg.org/sanantonio. 20-23.

SPE Improved Oil Recovery Symposium, Tulsa, (972) 952-9393, (972) 952-9435 (fax), e-mail: spedal@spe.org, website: www.spe.org. 20-23.

XSPE Progressing Cavity Pumps Conference, Houston, (972) 952-9393, (972) 952-9435 (fax), e-mail: spedal@spe.org, website: www.spe.org. 27-29.

2009

JANUARY

✦Petrotech International Oil & Gas Conference & Exhibition, New Delhi, +91 11 2436 4055, +91 11 2436 0872 (fax), e-mail: convenor_petrotech@iocl.co.in, website: www.petrotech2009.org/registration.aspx. 11-15.

✦Oil & Gas Maintenance Technology Conference & Exhibition, Manama, (918) 831-9160, (918) 831-9161 (fax), e-mail: attendingOGMT@pennwell.com, website: www.oilandgas-maintenance.com. 19-21.

✦Pipeline Rehabilitation & Maintenance Conference, Manama, (918) 831-9160, (918) 831-9161 (fax), e-mail: attendingOGMT@pennwell.com, website: www.pipeline-rehab.com. 19-21.

Pipeline Rehabilitation & Maintenance Conference & Exhibition, Manama, (918) 831-9160, (918) 831-9161 (fax), e-mail: registration@pennwell.com, website: www.piipeline-rehab.com. 19-21.

SPE Hydraulic Fracturing Technology Conference, The Woodlands, Tex., (972) 952-9393, (972) 952-9435 (fax), e-mail: spedal@spe.org, website: www.spe.org. 19-21.

World Future Energy Summit, Abu Dhabi, +971 2 444 6011, +971 2 444 3987 (fax), e-mail: sales@turretme.com, website: www.worldfutureenergysummit.com. 19-21.

API Exploration & Production Winter Standards Meeting, San Antonio, (202) 682-8000, (202) 682-8222 (fax), website: www.api.org. 19-23.

API/AGA Oil and Gas Pipeline Welding Practices Conference, San Antonio, (202) 682-8000, (202) 682-8222 (fax), website: www.api.org. 21-23.

International Process Analytical Technology Forum (IFPAC), Baltimore, (847) 543-6800, (847) 548-1811 (fax), e-mail: info@ifpacnet.org, website: www.ifpac.com. 25-28.

Global E&P Summit, Madrid, +44 (0)20 7202 7500, +44 (0)20 7202 7600 (fax), e-mail: info@wtgevents.com, website: www.epsummit.com. 26-28.

✦Offshore West Africa Conference, Abuja, (918) 831-9160, (918) 831-9161 (fax), e-mail: attendOWA@pennwell.com, website: www.offshorewestafrica.com. 27-29.

The European Gas Conference, Vienna, +44 (0) 1242 529 090, +44 (0) 1242 529 060 (fax), e-mail: wra@theenergyexchange.co.uk, website: www.theenergyexchange.co.uk. 27-29.

SIHGAZ International Hydrocarbon & Gas Fair, Hassi Messaoud, + 213 21 21 58 74, + 213 21 21 58 72/76 (fax), e-mail: contact@foirex.com, website: www.sihgaz2009.com. 28-31.

FEBRUARY

SPE Reservoir Simulation Symposium, The Woodlands, Tex., (972) 952-9393, (972) 952-9435 (fax), e-mail: spedal@spe.org, website; www.spe.org. 2-4.

IADC Health, Safety, Environment & Training Conference & Exhibition, Houston, (713) 292-1945, (713) 292-1946 (fax), e-mail: conferences@iadc.org, website: www.iadc.org. 3-4.

Deep Offshore Technology International Conference & Exhibition (DOT), New Orleans, (918) 831-9160, (918) 831-9161 (fax), e-mail: registration@pennwell.com, website: www.dotinternational.net. 3-5.

Global Petrochemicals Conference & Annual Meeting, Cologne, +44 (0) 1242 529 090. +44 (0) 1242 529 060 (fax), e-mail: wra@theenergyexchange.co.uk, website: www.wraconferences.com. 3-5.

Russia Offshore Annual Meeting, Moscow, +44 (0) 1242 529 090, +44 (0) 1242 529 060 (fax), e-mail: wra@theenergyexchange.co.uk, website: www.theenergyexchange.co.uk. 4-6.

NAPE Expo, Houston, (817) 847-7700, (817) 847-7704 (fax), e-mail: info@napeexpo.com, website: www.napeonline.com. 5-6.

Pipeline Pigging & Integrity Management Conference, Houston, (713) 521-5929, (713) 521-9255 (fax), e-mail: clarion@clarion.org, website: www.clarion.org. 9-12.

Pipe Line Contractors Association Annual Conference (PLCA), Carlsbad, Calif., (214) 969-2700, e-mail: plca@plca.org, website: www.plca.org. 11-15.

IADC/SPE Managed Pressure Drilling & Underbalanced Operations Conference & Exhibition, San Antonio, (713) 292-1945, (713) 292-1946 (fax), e-mail: conferences@iadc.org, website: www.iadc.org. 12-13.

International Petrochemicals Technology Conference & Exhibition, London, +44 (0) 20 7357 8394, +44 (0) 20 7357 8395 (fax), e-mail: enquiries@europetro.com, website: www.europetro.com. 16-17.

IP Week, London, +44 (0)20 8561 6030, +44 (0)20 8561-0131 (fax), e-mail: events@energyinst.org.uk, website: www.energyinst.org.uk. 16-19.

International Downstream Technology & Catalyst Conference & Exhibition, London, +44 (0) 20 7357 8394, +44 (0) 20 7357 8395 (fax), e-mail: enquiries@europetro.com, website: www.europetro.com. 18-19.

Laurance Reid Gas Conditioning Conference, Norman, Okla., (405) 325-2248, (405) 325-7164 (fax), e-mail: bettyk@ou.edu, website: www.engr.outreach.ou.edu. 22-25.

ASEG International Conference & Exhibition, Adelaide, +61 8 8352 7099, +61 8 8352 7088 (fax), e-mail: ASEG2009@sapro.com.au. 22-26.

✦International Pump Users Symposium, Houston, (979) 845-7417, (979) 847-9500 (fax), e-mail: inquiry@turbo-lab.tamu.edu, website: http://turbolab.tamu.edu. 23-26.

MARCH

EAGE North African/Mediterranean Petroleum and Geosciences Conference & Exhibition, Tunis, +31 88 995 5055, +31 30 6343524 (fax), e-mail: eage@eage.org, website: www.eage.org. 2-4.

SPE Research & Development Conference, Lisbon, (972) 952-9393, (972) 952-9435 (fax), e-mail: spedal@spe.org, website: www.spe.org. 3-4.

Subsea Tieback Forum & Exhibition, San Antonio, (918) 831-9160, (918) 831-9161 (fax), e-mail: registration@pennwell.com, website: www.subseatiebackforum.com. 3-5.

GPA Annual Convention, San Antonio, (918) 493-3872, (918) 493-3875 (fax), e-mail: pmirkin@gasprocessors.com, website: www.gasprocessors.com. 8-11.

Doha Natural Gas Conference & Exhibition, Doha, e-mail: gascon@qp.com.qa, website: www.dohagascon.com.qa. 9-12.

Turkish International Oil & Gas Conference & Showcase (TUROGE), Ankara, +44 (0) 207 596 5233, +44 (0) 207 596 5106 (fax), e-mail: oilgas@ite-exhibitions.com, website: www.oilgas-events.com. 10-12.

✦European Fuels Conference, Paris, +44 (0) 1242 529 090. +44 (0) 1242 529 060 (fax), e-mail: wra@theenergyexchange.co.uk, website: www.wraconferences.com. 10-12.

Middle East Oil & Gas Show & Conference (MEOS), Manama, +973 17 550033, +973 17 553288 (fax), e-mail: aeminfo@batelco.com.bh, website: www.allworldexhibitions.com/oil. 15-18.

Annual International LPG Seminar, The Woodlands, Tex., (281) 367-9797, website: www.purvingertz.com. 16-19.

Gas Asia, Kuala Lumpur, +44 (0) 1242 529 090, +44 (0) 1242 529 060 (fax), e-mail: wra@theenergyexchange.co.uk, website: www.theenergyexchange.co.uk. 17-18.

SPE/IADC Drilling Conference & Exhibition, Amsterdam, (972) 952-9393, (972) 952-9435 (fax), e-mail: spedal@spe.org, website; www.spe.org. 17-19.

Latin American Meeting on Energy Economics, Santiago, 56 2 3541411, 56 2 5521608 (fax), e-mail: info@elaee.org, website: www.elaee.org. 22-24.

NPRA Annual Meeting, San Antonio, (202) 457-0480, (202) 457-0486 (fax), e-mail: info@npra.org, website: www.npra.org. 22-24.

EXPANDING HORIZONS

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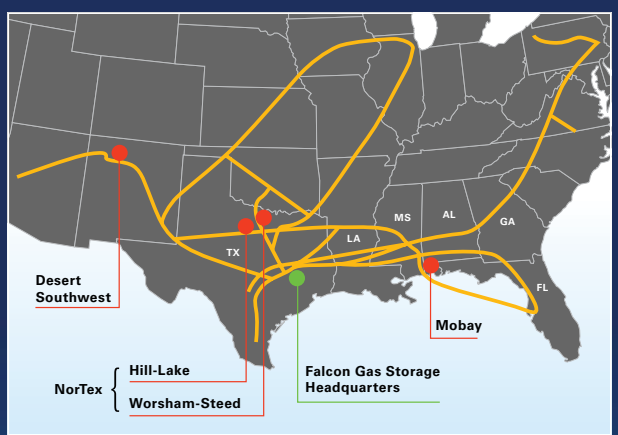

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NorTex MoBAY STORAGE HUB

Journally Speaking

A peek at deepwater life

Nina M. Rach
Drilling Editor

Exploration and development of petroleum resources in deep water requires extreme engineering. Often equated with the technical demands of working in space, the high pressures and low temperatures of the deep ocean's extreme conditions require highly engineered robotics and thermal protection systems.

Images provided by remotely operated vehicles 1-2 miles below the ocean surface give us a glimpse of unusual creatures and ecosystems. ROVs run by Oceaneering International Inc. in the western Gulf of Mexico have repeatedly sighted big fin squid at two locations in the Alaminos Canyon area, examples of a genus named only 10 years ago.

Big fin squid

Mike Vecchione, director of cephalopod biology at the National Systemics Laboratory for National Oceanic and Atmospheric Administration's fisheries service, and Richard Young at the University of Hawaii established the genus Magnapinna in 1998.

Vecchione said two species of big fin squid have been identified from the Gulf of Mexico: Magnapinna atlantica and M. pacifica.

"They're truly bathypelagic animals," he told OGJ; "We've now seen them in a lot of places, always in waters below 1,000 m."

This marks the base of the "twilight zone," defined as the deepest point of detected penetration of natural sunlight, generally coinciding with the bottom of the permanent thermocline and marked by a recognizable faunal change.

Vecchione contributes research to the Census of Marine Life, a 10-year global scientific initiative (www.coml.org).

COML anticipates completing its "World Register of Marine Species" by 2010. The world's first comprehensive list of past and present species, it currently includes about 122,500 validated marine species names—more than half of the estimated 230,000 marine species known to science.

Perdido

The Perdido development, to include the Great White, Silvertip, and Tobago fields, is about 200 miles south of Freeport, Tex., in 7,800-9,300 ft of water.

Shell Exploration & Production Co. is the designated operator, on behalf of partners Chevron USA Inc. and BP Exploration & Production Inc.

Buster Stewart, Shell drilling foreman on the Noble Clyde Boudreaux semisubmersible, told OGJ that Oceaneering has been involved with Perdido operations since June 2007. They often see marine life at depth, he said, but the animals come and go quickly. But he mentioned a large grouper that blocked an ROV in 1993 and shut down operations for several hours.

Clay Groves, an ROV superintendent for Oceaneering, told OGJ he has seen big fin squid seven times at Perdido. The most recent encounter was on Aug. 27 while drilling a Silvertip well in Alaminos Canyon Block 815 in 9,300 ft of water. It was picked up by color camera on the Millennium 33 ROV and the black and white camera on the smaller Hydra Min 7 ROV.

The squid have greenish bodies and red-orange markings, Groves said. The legs are unusually articulate, projecting sideways and then straight down. Overall size appears to be 15 ft.

Groves has seen many different marine creatures at great depths, but he said the Perdido squid are unusual because they've only been sighted at Great White and Silvertip. "We collaborate with the SERPENT project and notify them when we find something odd" (www.serpentproject.com). SERPENT is a "scientific and environmental ROV partnership using existing industrial technology" (OGJ, Nov. 20, 2006, p. 47).

View marine life video clips from ROVs at www.oceaneering.com/coolstuff.asp. ✦

This Magnapinnid species, a "big fin" squid, was sighted in 7,828 ft of water on Alaminos Canyon Block 857 in the Gulf of Mexico. Photos from Clay Groves for Oceaneering International Inc.

The Democrats' wish list

From faulty premises flow illogical conclusions. The energy plank of the Democratic Party's presidential campaign platform starts wrong and ends wrong (see story, p. 28).

The energy plank gets one assertion right when it says about the US, "We know we can't drill our way to energy independence." The country in fact has no way—no matter how much it drills, no matter how much it conserves, and no matter how much it supports renewable energy—to achieve energy independence.

But campaign platforms aren't designed to affirm the granitic truths of physics and economics, and this one is no different. The energy-plank statement uses the futility of energy independence to dismiss oil and gas drilling but retains the goal in service to "renewable energy technologies such as solar, wind, and geothermal as well as technologies to store energy through advanced batteries and [efforts to] clean up our coal plants." All it takes is "our ingenuity and legendary hard work"—and, of course, money.

Classic errors

Even by the standards of campaign platform planks, which are written for elections and not policy-making, this one is loony. It errs in classic ways. For example:

- *It relies on numerical targets set by government while paying little or no regard to economic or physical practicalities.*

The energy plank calls on the US to become 50% more energy-efficient by 2030 than it is now, to double the fuel-efficiency requirements of new vehicles, and to derive 25% of its electricity from renewable energy sources by 2025. Numeric targets imply seriousness of purpose. But the only stated purpose in the Democrats' energy plank is energy independence, which—to repeat—is unattainable.

- *Its execution would require massive public spending.*

In fact, the energy plank is nothing but public spending—for research and development dedicated to cellulosic ethanol and other biofuels, for federal-local partnerships, for federal and military purchasing benefiting upstart energy technologies. Like numeric targets, commitments of money seem to demonstrate seriousness of purpose. Yet governments seldom spend funds they receive from taxpayers the same way taxpayers would spend the money if allowed to keep it. There are good reasons to accommodate this conflict, such as defense, law enforcement, public health and environmental programs, and aid to the poor. But government spending should happen only for good reasons. Support of noncommercial fuels can be such a reason but too often just wastes money.

- *It perpetuates the demonstrable falsehood that the government makes sensible choices about fuels use.*

Historically, the government has made remarkably poor choices about fuel use. Who, other than corn growers, now thinks a large and growing mandate for ethanol in gasoline makes sense? Yet the assumed superiority of government fuel decisions lurks beneath every splinter of the Democratic energy plank.

- *It makes unsupportable economic claims.*

The plank promises "a green energy sector that will create up to 5 million jobs." Ridiculous. The forced use of noncommercial energy creates costs. So do aggressive efforts to cut greenhouse gas emissions, such as the cap-and-trade scheme that the Democrats say will fund their spending on governmental energy. Elevated costs create net employment losses. Yes, some people would move into new jobs at those "green" energy enterprises created by government and supported by taxpayers. But many more people would lose jobs as governmentally mandated and heavily subsidized energy pillaged the economy.

Wish lists

Campaign planks are just wish lists, of course. They're designed to attract votes. The Democrats pointed out that their energy wish list came from 30,000 people attending 1,645 meetings held throughout the US.

The assembly of a wish list designed to attract votes is not the same as serious discussion about energy in an interdependent and competitive world. The US needs such a discussion more than it needs ethanol from cellulose or forests of wind turbines. As long as energy independence remains the motivating premise of Americans in large numbers, serious discussion about energy will remain the biggest wish of all. ✦

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Oil, gas prices boost producers' 2Q earnings

Marilyn Radler
Senior Editor-Economics

Laura Bell
Statistics Editor

US-based oil and gas producers and refiners reported higher second-quarter 2008 earnings as a group, but individual company results were highly varied. The combined earnings of a sample of these firms were up 10% from a year earlier.

Meanwhile, a sample of producers and pipeline companies headquartered in Canada posted a collective 13% increase in net income for the second quarter, and a group of service and supply companies reported a combined earnings increase of nearly 5% from a strong year-earlier period.

High oil prices buoyed the combined second-quarter results of the operators, but downstream earnings were crushed by the high cost of inputs. Natural gas prices were up from the second quarter of last year, too, but many producers reported lower earnings as a result of hedging losses. Companies also incurred higher operating expenses, while higher feedstock costs pinched chemicals earnings.

Prices, margins

Commodity prices rallied in the first half of this year, suppressing demand for some petroleum products, especially motor gasoline in the US.

During the quarter ended June 30, 2008, the front-month futures price of crude on the New York Mercantile Exchange averaged $123.80/bbl, up from $65.02/bbl in the second quarter of 2007.

Weak gasoline demand and high input costs heavily weighed on refining margins in the recent quarter. US East Coast cash refining margins sank 70% from the second quarter of last year to average $3.63/bbl, according to Muse, Stancil & Co.

Also in the second quarter of 2008, such margins declined 56% in the Midwest, 48% on the Gulf Coast, and 40% on the West Coast vs. the 2007 second quarter, according to Muse, Stancil & Co.

Natural gas futures on the NYMEX averaged $11.468/MMbtu in the recent second quarter compared with $7.655/MMbtu a year earlier.

Integrated companies

The large, integrated oil companies in the sample of US-based operators reported stronger earnings as a result of higher oil and gas price realizations compared with those a year earlier, but all of them recorded meager downstream results.

The largest company in the group, ExxonMobil, reported record earnings of $11.68 billion for the second quarter, a 14% increase from a year earlier, as revenues gained 40% to top $138 billion. Downstream and chemicals earnings slumped, but record oil and gas realizations increased earnings by $6.1 billion.

ExxonMobil said that lower sales volumes, higher operating costs, and increased taxes reduced the company's earnings somewhat, as its total production decreased 8% from second-quarter 2007.

With net income of $6 billion, Chevron Corp. posted an 11% earnings increase from the second quarter of last year. The company's revenues climbed 48%, but downstream margins weighed on earnings.

Chevron chairman and CEO Dave O'Reilly said, "The higher cost of crude oil used in the refining process was not fully recovered in the price of gasoline and other refined products." As a result, Chevron's downstream operations incurred a $734 million loss in the recent quarter, with most of the loss taking place in the US.

O'Reilly said the effects of planned refinery downtime in Pascagoula, Miss. also contributed to the US loss in the period. Refined-product sales volumes declined 8% from second-quarter 2007 to 1.38 million b/d, primarily the result of lower gasoline and gasoil sales.

Independent operators

Some of the independent producers reported lower results in the second quarter due to hedging losses, as oil

and gas prices climbed in the second quarter of this year.

Among these producers are Chesapeake Energy Corp. and Petrohawk Energy Corp.

Chesapeake recorded a $1.6 billion loss for the recent quarter, compared with $518 million in net income in the 2007 second quarter, although the company's oil and gas production and sales volumes were up.

The Oklahoma City-based producer

US OIL AND GAS FIRMS' SECOND QUARTER 2008 REVENUES, EARNINGS

	Revenues		Net income		Revenues		Net income	
	2nd quarter				Six months			
	2008	2007	2008	2007	2008	2007	2008	2007
	Million $ (US)							
Anadarko Petroleum Corp.	2,786.0	4,585.0	23.0	1,313.0	5,764.0	9,835.0	310.0	3,035.0
Apache Corp.	3,900.2	2,472.5	1,445.2	633.5	7,087.9	4,475.4	2,466.7	1,126.5
Approach Resources Inc.	24.1	9.7	0.9	3.0	43.2	19.1	3.7	2.4
Atlas America Inc.	350.1	214.9	(7.8)	19.9	836.8	429.8	(1.3)	30.1
ATP Oil & Gas Corp.	192.5	134.7	(11.8)	6.1	420.6	283.1	35.1	33.6
Aurora Oil & Gas Corp.	7.9	7.3	(0.7)	0.2	14.8	13.5	(1.9)	(0.5)
Berry Petroleum Co.	215.4	179.2	49.1	52.0	400.8	296.7	92.2	70.8
Bill Barrett Corp.	157.9	101.2	34.0	9.9	307.6	200.1	64.7	24.0
Brigham Exploration Co.	25.1	36.7	1.5	2.3	50.2	61.9	3.0	4.2
Cabot Oil & Gas Corp.	248.9	175.8	54.6	41.4	468.5	367.4	100.6	89.9
Carrizo Oil & Gas Inc.	67.4	33.0	(12.6)	8.1	121.2	56.0	(17.9)	5.6
Cheniere Energy Inc.	5.7	25.0	(132.3)	(41.1)	16.8	45.3	(182.2)	(75.7)
Chesapeake Energy Corp.	(455.0)	2,105.0	(1,597.0)	518.0	1,156.0	3,694.0	(1,729.0)	776.0
Chevron Corp.	82,989.0	56,094.0	5,975.0	5,380.0	148,935.0	104,321.0	11,143.0	10,095.0
Cimarex Energy Co.	616.4	342.1	229.3	78.7	1,093.5	649.0	379.1	143.3
Clayton Williams Energy Inc.	191.3	92.6	(21.2)	8.8	328.1	165.1	(14.0)	(3.5)
CNX Gas Corp.	205.8	133.7	64.3	41.5	366.4	249.0	114.2	74.5
Comstock Resources Inc.	172.2	83.4	82.6	18.2	300.1	153.4	123.7	30.8
ConocoPhillips	73,353.0	49,397.0	5,439.0	301.0	129,905.0	92,264.0	9,578.0	3,847.0
Continental Resouces Inc.	303.4	145.3	127.3	(142.5)	531.1	266.4	215.3	(88.7)
Credo Petroleum Corp.	5.0	4.9	2.0	2.0	9.6	8.9	3.8	3.3
Delta Petroleum Corp.	72.9	39.3	(22.4)	(95.3)	131.0	76.6	(42.2)	(113.7)
Denbury Resources Inc.	418.0	222.5	114.1	62.6	735.3	396.7	187.1	79.2
Devon Energy Corp.	3,548.0	2,929.0	1,301.0	904.0	6,523.0	5,402.0	2,050.0	1,555.0
Dorchester Minerals LP	29.0	17.6	23.2	12.1	50.3	32.3	38.6	21.2
El Paso Corp.	1,153.0	1,198.0	191.0	169.0	2,422.0	2,220.0	410.0	121.0
Encore Acquisition Co.	357.3	189.6	(35.7)	15.2	630.2	320.2	(4.5)	(14.3)
Energy Partners Ltd.	125.8	122.1	4.0	(6.3)	223.6	230.1	6.3	(2.6)
EOG Resources Inc.	1,032.5	1,068.5	178.2	307.1	2,133.5	1,939.7	419.2	524.7
Equitable Supply	124.9	95.5	74.2	57.9	230.0	183.5	134.5	96.7
Exco Resources Inc.	(204.8)	346.5	(262.9)	82.9	(211.7)	378.7	(425.8)	(4.8)
ExxonMobil Corp.	138,072.0	98,350.0	11,680.0	10,260.0	254,926.0	185,573.0	22,570.0	19,540.0
Fidelity Exploration & Production Co.	123.4	67.9	71.7	35.2	219.4	123.2	122.3	65.8
Forest Oil Corp.	515.2	254.7	(68.0)	76.8	891.7	437.3	(72.8)	83.7
Frontier Oil Corp.	1,767.9	1,441.0	59.3	243.8	2,956.0	2,487.5	105.3	318.5
Helix Energy Solutions Group Inc.	540.5	410.6	91.8	58.6	991.2	806.6	167.0	115.4
Hess Corp.	11,735.0	7,546.0	900.0	557.0	22,455.0	14,920.0	1,659.0	927.0
Holly Corp.	1,743.8	1,217.0	11.5	158.6	3,223.8	2,142.9	20.1	226.2
Kinder Morgan CO_2 Co. LP	308.6	199.5	216.6	128.9	595.0	391.1	416.4	254.3
Marathon Oil Corp.	22,225.0	16,887.0	774.0	1,550.0	40,325.0	29,889.0	1,505.0	2,267.0
Murphy Oil Corp.	8,363.2	4,613.6	627.0	250.2	14,895.9	8,048.5	1,036.0	360.9
Newfield Exploration Co.	691.0	526.0	(244.0)	150.0	1,207.0	966.0	(308.0)	54.0
Noble Energy Inc.	1,205.0	794.0	(144.0)	209.0	2,230.0	1,537.0	71.0	421.0
Occidental Petroleum Corp.	7,220.0	4,776.0	2,297.0	1,412.0	13,294.0	9,387.0	4,143.0	2,624.0
Parallel Petroleum Corp.	56.1	27.4	(29.2)	3.5	100.1	50.6	(31.9)	3.4
Penn Virginia Corp.	361.4	222.9	(3.8)	23.9	612.9	410.6	0.1	28.3
Petrohawk Energy Corp.	304.6	233.5	(92.8)	45.6	519.6	442.7	(148.4)	26.2
PetroQuest Energy Inc.	92.9	66.8	23.1	9.6	169.7	130.8	38.5	20.4
Pioneer Natural Resources Co.	665.7	444.3	158.8	36.5	1,249.9	809.6	288.6	66.1
Plains Exploration & Production Co.	734.4	256.3	202.9	25.3	1,357.4	481.6	366.4	45.9
Quest Resource Inc.	47.2	29.7	5.0	(4.5)	91.5	57.0	(6.7)	(7.8)
Questar Corp.	857.2	556.7	172.6	112.2	1,902.3	1,428.8	358.4	263.3
Quicksilver Resources Inc.	198.0	136.5	52.4	31.7	355.5	253.1	94.6	54.6
Range Resources Corp.	150.1	243.5	(34.6)	64.2	355.4	396.4	(32.8)	137.3
Rosetta Resources Inc.	154.8	87.1	39.3	13.1	283.4	163.9	66.8	27.1
Southwestern Energy Co.	604.4	270.1	136.6	47.6	1,128.5	554.7	245.6	98.6
St. Mary Land & Exploration Co.	357.0	247.3	33.6	59.2	719.2	468.4	129.5	99.2
Stone Energy Corp.	266.4	201.3	82.8	72.0	474.5	374.8	145.1	82.5
Sunoco Inc.	16,084.0	10,764.0	82.0	509.0	28,897.0	20,069.0	23.0	684.0
Swift Energy Co.	262.7	156.4	81.9	31.5	461.6	286.5	130.3	59.1
Tesoro Petroleum Corp.	8,755.0	5,604.0	4.0	443.0	15,285.0	9,480.0	(78.0)	559.0
Ultra Petroleum	298.7	131.2	115.2	49.1	565.5	288.1	216.5	115.7
Unit Corp.	370.1	286.6	94.1	65.6	691.5	563.9	171.2	130.0
VAALCO Energy Inc.	56.2	25.1	13.0	3.7	98.9	55.1	14.8	8.3
Valero Energy Corp.	36.6	24.2	734.0	2,249.0	64.6	43.0	995.0	3,393.0
W&T Offshore Inc.	461.0	272.6	134.6	45.5	817.5	519.1	214.4	58.6
Warren Resources Inc.	34.5	13.9	17.7	2.7	58.4	24.2	27.2	4.2
Whiting Petroleum Corp.	345.8	192.9	80.4	26.5	609.8	352.8	142.8	37.1
Williams Cos. Inc.	3,729.0	2,824.0	437.0	433.0	6,953.0	5,192.0	937.0	567.0
XTO Energy Inc.	1,936.0	1,329.0	575.0	432.0	3,609.0	2,498.0	1,040.0	815.0
Total	**403,749.2**	**284,332.3**	**32,697.7**	**29,683.8**	**736,665.9**	**531,137.6**	**62,242.2**	**56,119.9**

CANADIAN OIL AND GAS FIRMS' SECOND QUARTER 2007 REVENUES, EARNINGS

	Revenues — 2nd quarter		Net income — 2nd quarter		Revenues — Six months		Net income — Six months	
	2008	2007	2008	2007	2008	2007	2008	2007
	Million $ (Canadian)							
Bow Valley Energy Ltd.	32.0	4.5	10.5	6.6	70.0	8.6	12.0	7.6
Canadian Natural Resources Ltd.	5,112.0	3,152.0	(347.0)	841.0	9,079.0	6,270.0	380.0	1,110.0
Enbridge Inc.	3,871.5	2,728.7	659.4	148.2	7,839.3	6,086.9	912.4	376.9
EnCana Corp.	7,456.4	5,716.8	1,243.6	1,472.8	12,897.3	10,234.9	1,338.3	1,978.9
Gentry Resources Ltd.	29.7	17.1	(2.8)	(0.4)	59.0	32.8	(2.5)	(0.2)
Husky Energy Inc.	7,332.2	3,221.5	1,388.2	734.3	12,512.3	6,525.5	2,291.6	1,396.4
Imperial Oil Ltd.	8,859.0	6,339.0	1,148.0	712.0	16,122.0	12,273.0	1,829.0	1,486.0
Ivanhoe Energy Inc.	(2.8)	9.6	(21.7)	(6.6)	8.4	18.8	(30.3)	(13.1)
Nexen Inc.	2,105.0	1,698.0	380.0	368.0	4,197.0	3,086.0	1,010.0	489.0
Pennwest Energy Trust	1.3	0.5	(0.3)	(0.2)	2.2	1.0	(0.2)	(0.1)
Petro-Canada	7,646.0	5,478.0	1,498.0	845.0	14,232.0	10,319.0	2,574.0	1,435.0
Suncor Energy Inc.	7,959.0	4,413.0	829.0	738.0	13,947.0	8,364.0	1,537.0	1,314.0
Talisman Energy Inc.	3,156.0	1,919.0	426.0	550.0	5,272.0	3,801.0	892.0	1,070.0
TransCanada Corp.	2,017.0	2,208.0	324.0	257.0	4,150.0	4,452.0	773.0	522.0
Total	**55,574.3**	**36,905.8**	**7,534.9**	**6,665.7**	**100,387.4**	**71,473.5**	**13,516.3**	**11,172.4**

announced an unrealized noncash, after-tax mark-to-market loss of $2.085 billion from future-period natural gas, oil, and interest rate hedges, mostly as a result of higher oil and gas prices as of June 30, 2008, compared with Mar. 31, 2008.

For the recent second quarter, Petrohawk reported revenues of $305 million, a 31% increase over second-quarter 2007 revenues, but the company incurred a $92.8 million loss for the 3 months ended June 30.

The Houston-based producer's average realized natural gas price for the quarter was $9.48/Mcf, which included a realized loss from natural gas derivatives of $1.51/Mcf. The company's average realized oil price for the quarter was $79.84/bbl, which included a $38.01/bbl realized loss from oil derivatives.

Petrohawk's total loss on derivatives contracts was $277.6 million for the second quarter and $420.3 million for the first half of this year.

Refiners

Independent refiners, including Holly Corp., Valero, and Tesoro, posted weak results due to low refining margins.

Independent refiners' profitability could be further reduced in coming quarters, according to Friedman, Billings, Ramsey & Co. analyst Eitan Bernstein, as a slowdown or contraction of the US and global economies dampens the growth in demand for refined products, lowering sales prices for gasoline, heating oil, diesel fuel, and other products.

Holly Corp. reported that its second-quarter net income declined to $11.5

SERVICE-SUPPLY COMPANIES' SECOND QUARTER 2007 REVENUES, EARNINGS

	Revenues — 2nd quarter		Net income — 2nd quarter		Revenues — Six months		Net income — Six months	
	2008	2007	2008	2007	2008	2007	2008	2007
	Million $ (US)							
Baker Hughes Inc.	2,997.5	2,537.5	379.3	349.6	5,667.9	5,010.3	774.3	724.3
BJ Services Inc.	1,328.2	1,152.5	141.8	168.3	3,896.5	3,523.1	441.3	564.3
Bronco Drilling Co. Inc.	68.5	74.9	4.3	8.7	136.3	154.0	12.5	20.1
Cameron International Corp.	1,480.6	1,139.0	152.0	123.2	2,819.9	2,136.1	278.3	224.2
Diamond Offshore Drilling Inc.	954.4	648.9	416.3	251.9	1,740.5	1,257.1	706.9	476.1
Dril-Quip Inc.	142.5	114.7	27.7	24.1	275.0	232.4	48.2	53.1
Foster Wheeler Ltd.	1,713.2	1,195.8	160.8	71.9	3,519.4	2,353.7	298.8	186.7
Grey Wolf Inc.	218.6	231.1	32.3	41.7	422.7	476.3	63.6	100.3
Gulfmark Offshore Inc.	82.2	75.2	46.8	30.7	165.8	140.0	79.0	55.1
Halliburton Co.	4,496.0	3,771.0	507.0	1,530.0	8,545.0	7,231.0	1,091.0	2,082.0
Hornbeck Offshore Services Inc.	104.7	80.8	25.5	22.6	203.2	154.9	48.5	40.1
Nabors Industries Ltd.	1,303.4	1,128.8	194.4	228.3	2,625.0	2,406.0	424.9	490.5
Noble Corp.	814.5	726.5	375.7	290.0	1,679.1	1,374.1	759.9	540.4
Oceaneering International Inc.	500.2	432.2	52.1	47.9	936.1	776.3	93.4	81.0
Parker Drilling Co.	217.1	152.0	22.6	16.9	390.7	305.0	46.5	46.9
Patterson-UTI Energy Inc.	526.8	523.0	81.4	139.6	1,031.7	1,070.5	158.8	255.4
Pioneer Drilling Co.	152.8	103.6	19.1	13.1	266.7	207.9	31.0	30.3
Pride International Inc.	565.3	530.3	187.7	146.1	1,130.1	1,002.0	428.3	247.8
Rowan Cos. Inc.	588.3	512.5	120.6	128.1	1,077.0	980.2	219.2	214.5
RPC Inc.	214.7	171.0	22.5	23.8	411.9	342.1	37.2	51.9
Schlumberger Ltd.	6,746.1	5,638.8	1,420.0	1,258.5	13,036.0	11,103.2	2,758.3	2,439.3
Smith International Inc.	2,494.9	2,115.3	183.3	153.1	4,866.8	4,223.8	358.3	313.2
Transocean Inc.	3,112.0	1,439.0	1,107.0	549.0	6,235.0	2,772.0	2,296.0	1,102.0
Weatherford International Inc.	2,229.3	1,815.9	371.0	165.3	4,425.1	3,668.2	635.2	446.9
Total	**33,051.8**	**26,310.3**	**6,051.2**	**5,782.4**	**65,503.4**	**52,900.2**	**12,089.4**	**10,786.4**

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million from $158.6 million in the same period of 2007. For the first 6 months of this year, net income was $20.1 million compared with $226.2 million for the first half of 2007.

The refiner's revenues were up for the recent quarter and for the first half due to higher refined product sales prices, but earnings were hit on a couple of fronts. Holly's Navajo refinery in Artesia, NM in May experienced unplanned downtime for repairs to its fluid catalytic cracking unit following an instrument control malfunction, and the company's Woods Cross, Utah refinery operated at reduced rates during the quarter primarily due to multiple power interruptions.

Holly also said that its earnings in the first half decreased due to reduced refined-product margins combined with production declines, lower yields, and higher operating expenses.

Meanwhile, Valero reported a 67% decline in second-quarter earnings to $734 million, and Tesoro's earnings declined 99% from a year earlier to $4 million.

Canadian operators

A sample of oil and gas producers and pipeline operators based in Canada recorded a combined increase in earnings for the second quarter, but four of the 14 companies posted a net loss for the period.

With net income up 345%, Enbridge Inc. announced the largest percentage gain in earnings from the second quarter of 2007. Net income was $659 million (Can.) on revenues of $3.87 billion (Can.).

Enbridge said the increase reflects a $556.1 million after-tax gain on the sale of its interest in Compania Logistica de Hidrocarburos CLH SA, a Spanish pipeline company, and favorable operating performance, partially offset by unrealized fair value losses on derivatives.

Canadian Natural Resources Ltd. posted a $347 million (Can.) loss for the second quarter, which the company attributed primarily to risk management losses. Higher product prices would have otherwise resulted in earnings of $960 million (Can.) for the quarter, despite a nearly 7% production decline from the second quarter of last year.

Service, supply firms

Strong demand for oilfield equipment and services boosted the earnings of a sample of service and supply companies during the second quarter and first half of this year.

The 24 companies in this sample posted a combined 5% increase in earnings for the recent quarter, as their revenues climbed 26%.

Although none of these firms reported a loss for the 3 months, eight of them announced a decline in earnings from the second quarter of last year. Only two of these firms reported a reduction in second-quarter revenues from a year earlier.

Transocean Inc. merged with GlobalSantaFe Corp. in November 2007 and reported that its earnings and revenues for the second quarter and the first half of 2008 were more than double its results from a year earlier.

Halliburton Co. announced its net income in second-quarter 2008 was $507 million, down from $1.5 billion in the second quarter of 2007. Halliburton had completed its separation of KBR Inc. in second quarter 2007 and recorded to discontinued operations a gain of $933 million, accounting for the strong second-quarter 2007 results. ✦

Voters gear up for serious energy talk, official says

Nick Snow
Washington Editor

Judy Clark
Senior Associate Editor

The American public is ready for energy solutions that look beyond traditional positions currently dominating political debate, a US Chamber of Commerce executive suggested at an Aug. 18 Houston energy conference.

"Improving our energy security must be met through the efforts of the private sector, research community, all levels of government, and our society at large," said Fred Smith, president of the national business organization's Institute for 21st Century Energy, at the Energy Capital Solutions Summit sponsored by US Rep. Kevin P. Brady (R-Tex.).

"To succeed, we must reexamine outdated approaches, become better informed about energy and the environment, and move forward to secure our energy future based on facts and scientific evidence," Smith maintained.

He said the institute has received a resounding public response since announcing an energy platform last month in an open letter to the next president and Congress. Thousands of people have signed the group's petition calling for more energy efficiency across all economic sectors; greater use of alternative and renewable fuels in transportation; expanded use of nuclear power, coal, and renewable energy; and more domestic oil and gas production, Smith said.

'Politicized' energy

Speakers at the summit stressed that it was unfortunate that it took high oil prices to get the public's attention and that it will be difficult and costly to put into place the long-term solutions needed to prevent backsliding into energy shortages in the future.

"Short term is considered 10 years," said John D. Hofmeister, former president of Shell Oil Co. and founder and chief executive of Citizens for Afford-

able Energy. He said using less energy and finding more sources go hand in hand. Although Americans have driven 52 billion miles less in the wake of recent high prices, he said, it is important that policymakers enact long-term legislation that will attract investors needed to develop long-term solutions.

"The politicization of energy is harming everyday citizens," he said, because much of the short-term policy enacted is of value only to politicians seeking the next election and does not result in development of needed technology as fast as it should.

Amy Myers Jaffe, the Wallace S. Wilson Energy Studies Fellow at Rice University's James A. Baker III Institute for Public Policy, emphasized how critical the effects of geopolitics are on US national security as well as its energy security. She said developing domestic alternatives to the energy sources that fuel our economy is important to reduce US vulnerability in light of the post-9/11 environment.

"What are the consequences of our being cut off from [oil] sources?" she asked. "Oil producers are using our dependence as political leverage." She added, saying, "Our dependence on foreign sources of oil places constraints on how far we can push regarding managing human rights and other issues."

And although saying a US ally of 30 years, Saudi Arabia, has been like a "prince on a white horse" to the US—increasing production after 9/11 and after the US went into Iraq—she said, "Demand has burgeoned, and Saudi Arabia has not invested [the billions] needed" to continue to provide extra amounts when needed. "No matter how close an alliance is, it is better to squeeze the amount we need from our own resources and efficiencies than to rely on alliances with other producers."

Jaffe urged that Democrats and Republicans compromise to allow new drilling and to use the royalties from it to pay for developing supplementary alternative energy sources. "It's going to take an incredible amount of capital, including public and private funds, in this effort."

Clay Sell, president of Hunt Energy Horizons and a former deputy US Energy secretary, said a national electricity transmission grid is needed to provide access to natural energy from areas of the country "where the sun shines brightest, and the wind blows hardest," but where there currently are too few people to warrant having built such infrastructure. "We need a transmission grid to the marketplace," he said.

Another "great untapped energy source," he said, is greater efficiency in the utility industry, and in new buildings and appliances. "Utility regulators must put in place policy for efficiency," he said, along with investment tax credits so that long-term investments can occur.

The fifth speaker, Stuart C. Strife, vice-president for exploration at Anadarko Petroleum Corp., explained to the nonenergy-industry audience that "Over 50% of [US energy needs] to 2030 and possibly beyond will be provided by oil," and that "we consume about 24% of the oil in the world." Noting also that "US producers provide about 85% of our natural gas needs, importing only 15%," he said we need to "develop technology to take more advantage of natural gas to address our energy needs." ✦

Democrats' platform touts 'comprehensive' energy plan

Nick Snow
Washington Editor

While at their 2008 national convention in Denver, Democrats presented a campaign platform that included an immediate rebate for consumers confronting high gasoline prices and billions of dollars in investments to "establish a green energy sector that will create up to 5 million new jobs."

In the New American Energy plank of the platform's first part, "Renewing the American Dream," it said: "We know we can't drill our way to energy independence and so we must summon all of our ingenuity and legendary hard work, and we must invest in research and development, and deployment of renewable energy technologies such as solar, wind, and geothermal, as well as technologies to store energy through advanced batteries and clean up our coal plants."

It also called on businesses, government, and the public to make the nation 50% more energy-efficient by 2030 "because we know that the most energy-efficient economy will also gain the competitive edge for new manufacturing and jobs that stay here at home." This would be paid for by dedicating some of the revenue from an economy-wide cap-and-trade program which also would dramatically reduce greenhouse gas emissions and encourage billions of dollars in private investments in a new energy economy, it said.

The plank proposed dramatically increasing automotive fuel efficiency requirements and providing assistance to automakers and parts manufacturers to convert their operations and train their employees to build vehicles of the future domestically. It also proposed investing in cellulosic ethanol and other biofuel research and development, tightening oversight of oil market speculators, and providing more funding for low-income heating assistance and home weatherization.

Other provisions

The energy plank would establish a goal for the US to get at least 25% of its electricity from renewable sources by 2025; would create federal-local partnerships to deploy new energy solutions, install a smarter electrical

WATCHING GOVERNMENT

Nick Snow, Washington Editor

Dealing with CSB's 'investigative gap'

The Government Accountability Office has concluded that the US Chemical Safety and Hazard Investigation Board (CSB) could investigate more accidents if it would use its statutory authority to solicit other entities' work in some cases.

The agency, which has operated since 1998, had a fiscal 2006 budget one-eighth the size of the National Transportation Safety Board, on which it was modeled, GAO said in an Aug. 22 report. Yet NTSB investigated 250 times as many accidents because it used other agencies' findings when it could not send investigators to an accident site, the congressional watchdog service said.

It suggested that CSB needs to deal with what GAO called an "investigative gap," the difference between the number of accidents investigated and the number triggering CSB's investigative responsibility.

In fiscal 2007, CSB was notified of 920 accidents, 35 of which involved at least one fatality, "and CSB investigated one of these," according to GAO. It said officials said the agency lacks the resources to investigate more than a small percentage of accidents that meet its statutory criteria.

Limits and pitfalls

In an Aug. 8 response, CSB Chairman John S. Bresland said CSB would consider using other agencies' work but added there are limits and pitfalls. He said that the US Environmental Protection Agency and Occupational Safety and Health Administration frequently investigate major accidents.

"However, they have few inspectors focused and specialized on chemical process safety, and these agencies typically do not prepare narrative reports on what happened and why," Bresland said.

OSHA, EPA, state fire marshals, fire departments, and police also have law enforcement and regulatory responsibilities (unlike CSB) that necessarily focus on rules violations instead of the overall adequacy of existing rules, standards, and industry practices, Bresland said. Such agencies are often reluctant to share the results of their ongoing investigations with CSB, he said.

Companies' investigations

Most companies experiencing significant chemical accidents involving death or injuries become involved in lengthy lawsuits and conduct investigations that legal privilege often protects, Bresland said. Even if CSB was able to obtain and rely on one as a primary source, it could undermine the agency's credibility, he indicated.

GAO also said in its report that CSB needs to improve its accident data, hire more investigators and open regional offices, address accountability and management problems, and have a permanent, independent inspector general.

The day before GAO released its report, CSB announced that it is recruiting new investigators to work out of a regional office it is opening in Denver. The team will be led by Don Holmstrom, who directed CSB's investigation of the 2005 fire and explosion at BP's Texas City, Tex., refinery, the agency said.

"Establishing a presence in the western states potentially will allow CSB to recruit more effectively, to deploy investigators more quickly to accident sites, and to maintain important contacts with stakeholders throughout the country," Bresland said. ✦

grid, and build more energy-efficient buildings; and would use federal and military purchasing programs to encourage promising new markets and technologies.

"This plan will safeguard our economy, our country and the future of our planet," it said. "This plan will create good jobs that pay well and can't be outsourced. With these policies, we will protect our country from the national security threats created by reliance on foreign oil and global insecurity due to climate change. And this is how we'll solve the problem of $4/gal [gasoline]: with a comprehensive plan and investment in clean energy," the plank said.

Officials said the platform was the product of 1,645 meetings attended by 30,000 people in all 50 states, the District of Columbia, Puerto Rico, and the US Virgin Islands from July 15 through Aug. 8. Overseas meetings of Democrats were held in Shanghai, Dublin, Bangkok, and elsewhere, they added.

While the platform's energy proposals included many ideas which Sen. Barack Obama (D-Ill.), the Democrats' 2008 presidential nominee, made part of his campaign, it did not contain a windfall profits tax on major oil companies. It also did not include calls to open more of the US Outer Continental Shelf to oil and gas leasing, which several groups in the Senate and House proposed as the August congressional recess began. A proposed energy rebate was part of another plank aimed at stimulating the economy and providing consumers immediate relief.

Congressional Republicans immediately dismissed the platform's energy plank as a restatement of earlier Democratic proposals. House Minority Leader John Boehner (R-Ohio) said on Aug. 26 that energy independence was "a signature campaign promise" of Speaker Nancy Pelosi (D-Calif.) and other House Democrats in 2006, "yet their chronic negligence in addressing record [gasoline] prices continues to have devastating consequences for working families, small businesses, seniors, and schools."

"Here we are, exactly 600 days from the beginning of this Congress, and only now are Democrat leaders getting around to proposing a so-called 'comprehensive' plan for energy independence. Maybe one of the reasons for this failure of leadership is because, as we have learned in recent days, Speaker Pelosi doesn't even know that natural gas is a fossil fuel or that it will require increased [domestic] exploration to make use of it," added House Republican Conference Chairman Adam Putnam (Fla.). ✦

Senate energy plan's bipartisan support grows

Nick Snow
Washington Editor

Six more US senators have expressed support for a bipartisan energy proposal that includes opening more of the Outer Continental Shelf for leasing.

Sens. Thomas J. Carper (D-Del.), Norm Coleman (R-Minn.), Tim Johnson (D-SD), Ken Salazar (D-Colo.), John E. Sununu (R-NH) and John W. Warner (R-Va.) have joined the so called "Gang of 10," according to its two leaders, Kent Conrad (D-ND) and Saxby Chambliss (R-Ga.).

"We all feel a sense of urgency to help ease fuel prices in the short term while addressing our long-term needs," Conrad said. "This comprehensive, bipartisan framework is now backed by a 'Gang of 16' because it puts every option on the table."

The original group announced their proposal Aug. 1 as Congress headed for its late summer recess (OGJ, Aug. 11, 2008, p. 24). A 48-member US House bipartisan working group unveiled its plan at the same time. Both were designed as proposed compromises in contrast to months of legislative gridlock and strident statements by congressional Democratic and Republican leaders.

"The American people are looking for action on the energy crisis," Chambliss said. "They are not looking for a political issue."

Mary L. Landrieu (D-La.), another of the group's original members, said

NPRA asks House to resist contradictory energy policy

Nick Snow
Washington Editor

Opening limited areas of the Outer Continental Shelf while enacting so-called "Use it or lose it" legislation and other counterproductive measures would be a mistake, said National Petrochemical & Refining Association Pres. Charles T. Drevna on Aug. 22.

"NPRA applauds Congress for initiating a serious dialogue about expanding domestic energy production. Unfortunately, recent statements indicate Congress may soon consider legislation that would only open limited portions of the [OCS] for domestic production and tie that policy to measures which could ultimately counteract the very supply increases our nation is hoping to achieve," he said in a letter to US House Speaker Nancy Pelosi (D-Calif.) and Minority Leader John Boehner (R-Ohio).

"Such contradictory policies have the likely potential to threaten American energy supplies and security," he observed.

In addition to the "Use it or lose it" proposal, which many congressional Democrats say will pressure oil and gas producers to move faster on leases they already hold, Drevna criticized calls to release crude oil from the Strategic Petroleum Reserve to bring prices down, to make oil and gas companies ineligible for the federal tax code Section 199 manufacturing deduction, and to change existing Gulf of Mexico lease contracts.

"Unilaterally changing existing contracts would establish a dangerous precedent regarding confidence in the government to honor its contractual obligations. This could open the door for foreign state-owned companies to gain a foothold on US OCS energy production and cost American jobs," he warned.

He urged the House's Democratic and Republican leaders to fully consider the adverse impacts of such proposals as legislation develops. "Congress should not only open the entire OCS to energy exploration and production with no strings attached, but should also look to open portions of the Arctic National Wildlife Refuge legally singled out for future oil and gas exploration," Drevna said.

"The question of domestic energy production is particularly important considering the fact that nationally-owned foreign oil companies control over 80% of global oil production, with public investor-owned companies in control of only about 13%," he continued.

Drevna's letter followed one that American Petroleum Institute Pres. Red Cavaney wrote US senators on Aug. 13 criticizing a proposal by a bipartisan group of 10 senators to open more of the OCS while imposing at least $30 billion in new taxes on oil and gas producers. Cavaney has said the so-called "Gang of 10's" plan was "light on new production and heavy on new taxes."

the group would work to expand the consensus of senators "from 16 to 60" in the coming weeks.

Senate Majority Leader Harry M. Reid (D-Nev.) also agreed to the original group's request for a day-long energy forum and asked Energy and Natural Resources Committee Chairman Jeff Bingaman (D-NM) to direct it.

Meanwhile, in the House, Speaker Nancy Pelosi (D-Calif.) has not responded to either the working group's proposal, which now has 70 cosponsors, or to one by six other House members. Both call for leasing more of the OCS (see story, this page). Several House Republicans have stayed in Washington for nearly 3 weeks speaking from a shutdown House floor criticizing Pelosi for not bringing the OCS question to a vote before the recess began.

Two oil industry groups, the American Petroleum Institute and the National Petrochemical & Refiners Association, also have criticized the proposal for not opening more of the OCS while imposing billions of dollars in new taxes (see story, p. 31). ✦

US House Speaker Pelosi lists conditions for OCS vote

Nick Snow
Washington Editor

US House Speaker Nancy Pelosi (D-Calif.) endorsed natural gas as a transition to alternative fuels but continued to place conditions on a possible vote to open more of the Outer Continental Shelf for oil and gas leasing.

"You can have a transition with natural gas that is cheap, abundant, and clean compared to fossil fuels.... The supply of natural gas is so big and you do need a transition if you're going from fossil fuels.... These investments in wind, in solar and biofuels, and [a] focus on natural gas are the real alternatives," she said during a weekend interview on NBC-TV's "Meet the Press," Aug. 24.

Pelosi reiterated that more drilling offshore won't reduce prices at the gasoline pump. "But if the president wants to put it on the table and we can revisit the relationship between Big Oil and resources that belong to the American people," she continued, the matter might be discussed.

"We'll put it all on the table . . . offshore drilling, if that is worth it, but renewable resources so that we do not get in this situation again," Pelosi said.

"I don't think [leasing additional OCS areas] is a good alternative, but if they can prove that it is and they want to pay royalties to the taxpayer, let us use those royalties to invest in renewable energy resources, we have something to talk about," she said later in the interview.

But when interviewer Tom Brokaw said much later, "Sounds like we're going to have offshore drilling," Pelosi immediately responded, "No, no, no."

She also said that while Congress does not have a very high public approval rating, it is above those of the Bush administration and the oil industry. Congress successfully pressed the president to quit filling the Strategic Petroleum Reserve when crude oil prices were more than $100/bbl, she noted.

"You know when the Republicans were doing what I call "a war dance of the handmaidens of the oil companies" on the floor of the House a couple of weeks ago? Well, one of those Thursdays was primary day in Tennessee, and one of those Republicans was up for reelection and lost in the primary to a Republican who said that the incumbent was a candidate of Big Oil and offshore drilling," Pelosi said.

"So again, we have to talk to the American people about this. We have to do what is right for the consumer, for the taxpayer and for the environment. And we know how to do that. If they want to put that in the mix . . .have standards and no subsidies, give us royalties, [and] revisit the relationship between the oil that belongs to the American people and the profits of Big Oil, let's have that discussion," she said.

API responds

In response to Pelosi's comments, API issued a statement, saying, "The US oil and natural gas industry paid an estimated total of $8.7 billion in royalties to the Treasury during fiscal year 2007 to produce from federal lands onshore and in federal waters offshore, according to the Interior Department.

"The industry also paid another $6.8 billion in bonus bids to the federal government to acquire leases in the four lease sales held so far in 2008," the organization reported. "These payments represent a significant source of revenue paid to the US Treasury."

API said, "What the country needs is a balanced energy approach that encourages conservation but also production of all forms of energy, including domestic oil and natural gas."

"Increasing access to domestic resources could make us more secure at home, generate more American jobs, and put even more into federal coffers." ✦

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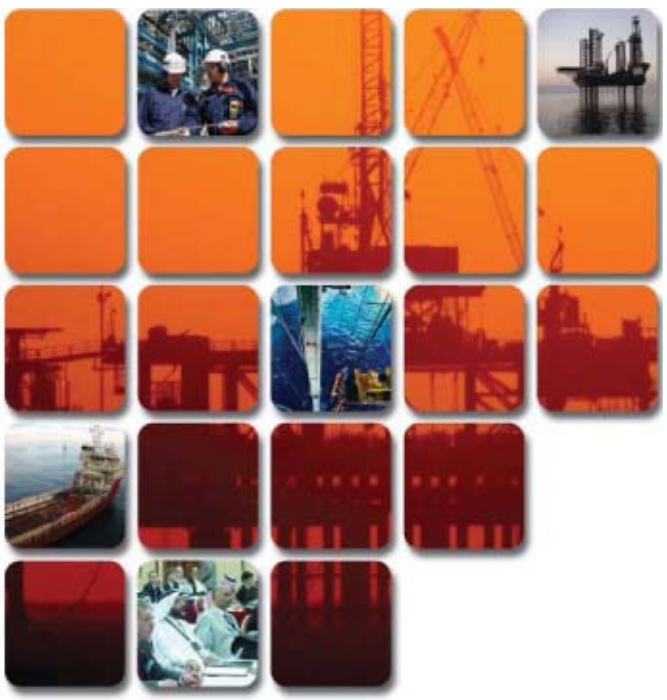

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China's LPG production edges up, imports slide further

Warren R. True
Chief Technology Editor-LNG/Gas Processing

China's 2007 LPG output maintained its steady increase since 2002, while LPG imports continued their 5-year slide, according to a recently released study by FACTS Global Energy (FGE), Honolulu. Urban and rural residential use dominated Chinese demand with little impetus for LPG growth in the chemical market.

The fuel's use in fleet vehicles, however, may grow as Chinese cities try to improve their air quality, FGE disclosed.

Demand

The country produced nearly 615,000 b/d of LPG, up from 2006 by 10.8%, says FGE. Imports were slightly less than 129,000 b/d, off from 2006 by 24.3%. The country exported to other Asian countries some 10,700 b/d.

Total LPG demand in China last year reached more than 732,000 b/d, up 1.8% over 2006. For context, Asian LPG demand in 2007 was the largest of any region in the world, at about 1.97 million b/d (68 million tonnes).

LPG demand for the region—the Indian subcontinent, Southeast Asia, and Northeast Asia—surpassed that for North America at 60 million tonnes (OGJ, June 23, 2008, p. 58). China's demand last year comprised about 38.5% of Asian demand.

FGE noted that Chinese imports of LPG, whose use is dominated by urban residential demand (54%), have declined steadily since 2002, when the country imported 199,000 b/d. Production since 2002, on the other hand, has increased from 567,000 b/d that year.

After urban residential use, industrial use makes up 25% of demand, followed by rural use, 11%. There is a small component of autofuel demand. FGE says this element will likely increase, exemplified by Shanghai's new program for LPG use in taxis.

LPG is not currently in demand as feedstock in chemical production, says the report; less than 0.5% goes for ethylene production where naphtha typically dominates.

Regionally, South China and East China surpass other regions in LPG demand.

Gas competition

China's use of natural gas will grow from increased domestic production in the west, new pipeline supplies from Central Asia, and a growing LNG terminal population.

Currently there is one operating terminal in Guangdong, one is being commissioned in Fujian, and at least three more are under construction—at Shanghai, Jiangsu, and Dalian. And as many as five or six terminals are approved or proposed and likely. Much depends on supply-contract negotiations and whether the terminals' owners want to pay the high prices LNG has been fetching in Asia.

China's overall LPG use, therefore, will grow only slowly. Imports, said FGE, will continue to decline.

Nevertheless, several countries in 2007 exported LPG to China, dominated by Australia at 22.3%. The total of exports from Middle East countries (Iran, Saudi Arabia, Kuwait, UAE, Qatar, Bahrain, and Oman) made up more than 68% of import volumes.

Guangdong Province in the south dominated imports, garnering nearly 72%. Jiangsu (Shanghai) was second with 8.5% of imports. ✦

BP reopens BTC oil pipeline; rail line blasted

Eric Watkins
Senior Correspondent

BP PLC has reopened the Baku-Tbilisi-Ceyhan (BTC) oil pipeline through conflict-stricken Georgia, and normal operations are under way.

The 1-million b/d pipeline, owned by a BP-led consortium of international oil companies, had been closed since Aug. 5 when a fire occurred at a pumping station on its Turkish section. Kurdish rebels claimed responsibility for the blaze.

BP's ability to export oil from the Caspian region had been seriously curtailed by the fire on the BTC line and by Russian military actions in Georgia, which led to the shutdown of other oil and gas export outlets.

The other routes include the 150,000-b/d Western Route Export Pipeline (WREP), the South Caucasus Pipeline for natural gas, and the 50,000-70,000-bd rail link extending from Azerbaijan to Georgia's export terminals on the Black Sea.

BP recently announced the reopening of the SCP, but later said the WREP remains closed with no indication of when it might reopen.

Train blasted

Meanwhile, a railway train loaded with oil products from Azerbaijan, which was bound for the Georgian Black Sea port of Batumi, was hit by an explosion and fire on Aug. 24—possibly caused by Russian forces.

Officials said the train was in the village of Skra, 5 km west of Gori, on the main track of the line linking eastern and western Georgia, a vital trade route for oil exports from Azerbaijan to European markets.

Russian troops left Gori on Aug. 22, after a 10-day occupation. The explosion occurred near an abandoned Georgian military base. Russian troops reportedly mined the base before they left it.

Shota Utiashvili, a spokesman for Georgia's Interior Ministry, said there was no evidence of the train hitting a mine, but that the explosives could have been detonated by a timer or by some-

one watching the train approach.

"I am sure the Russians have left other surprises for us," said Utiashvili, adding, "They want to disrupt our life and our economy as much as possible."

Deliveries to Iran

Reports varied regarding the extent of the damage, but the main result is a decision by the State Oil Co. of the Azerbaijan Republic (SOCAR) to begin exporting Azeri Light crude to Iran in a swap arrangement.

Under the agreement, SOCAR can sell up to 300,000 tonnes via the Persian Gulf over 2 months, shipping oil from the offshore Azeri-Chirag-Guneshli fields across the Caspian Sea to the Iranian port of Neka.

The start of SOCAR deliveries coincided with a halt in supplies of Azeri crude oil via the BTC line as well as the shutdown of the WREP, and the rail line.

SOCAR also increased exports of oil products to Iran above current contract levels because of the rail outage in Georgia, the company said. Georgian ports are SOCAR's outlet for products sales to Europe.

A SOCAR spokesperson said deliveries of Azeri crude to Iran would vary, depending on the availability of the BTC line.

Relief supplies from US

News of SOCAR's use of Iranian outlets coincided with reports that a US naval destroyer delivered relief supplies Aug. 24 at Georgia's Black Sea port of Batumi, the first of three such American vessels due to arrive in the coming days.

The US ships have avoided Georgia's Black Sea port of Poti—60 km north of Batumi—as the Russian army is still occupying it. Even as the ships approached, a Russian general warned of increased tension due to their presence.

"The situation in the Black Sea is tending to become more tense," said Col. Gen. Anatoly Nogovitsyn, deputy head of the Russian general staff.

"NATO countries are building up their naval presence to deliver humanitarian aid.... I do not think that this will contribute to the stabilization of the situation in the region," Nogovitsyn said. ✦

WATCHING THE WORLD

Eric Watkins, Senior Correspondent

Let's not forget Khodorkovsky

The fate of Russian oilman Mikhail Khodorkovsky has been written about before in this space and he has not been forgotten, especially in the heat of recent reports of Russia's attack on Georgia.

Indeed, we have long sensed that his treatment at the hands of the regime of then-President Vladimir Putin, now Russia's prime minister, was a bad sign for the oil and gas industry—whether Russian or international.

Events have borne out our foreboding: Khodorkovsky's arrest, trial, and incarceration in a Siberian prison represented some of the earliest indications of how the Kremlin viewed, and would mistreat, others in the oil and gas industry.

Look how things have fared: China and Japan are still being toyed with over the oil that will pass through the projected East Siberia Pacific Ocean pipeline—to say nothing of the line's length, route, terminus, and start date.

Demands on SEIC

Remember also how Russia's state-run OAO Gazprom acquired a 50%-plus-one share in the Sakhalin Energy Investment Co. for $7.45 billion under an "agreement" with SEIC shareholders (OGJ Online, Apr. 24, 2007).

Lest we forget, SEIC stakeholders—Royal Dutch Shell PLC, Mitsui & Co., and Mitsubishi Corp.—were forced to sell their majority stake to Gazprom after the Russian government halted construction on the project for alleged environmental infractions.

More recently, of course, we have also watched as more Russian henchmen pull various levers of the Kremlin's political machinery—well oiled machinery we might add—in their efforts to oust TNK-BP Chief Executive Robert Dudley.

Of course, there's still more to be expected from the Kremlin, especially in the Caspian region. What's next? Well, consider giant Kashagan oil field in the Kazakh sector of the Caspian Sea, which holds 10 billion bbl of reserves.

Kashagan next

Plans call for Kashagan oil to be transported to international markets via the Baku-Tbilisi-Ceyhan (BTC) pipeline. While ships initially will be used to transport the Kazakh oil to Baku, plans eventually call for a new pipeline under the Caspian.

Will the new monopolist Russian petrostate sit still for such plans? Will the sun rise in the West tomorrow? Will raindrops fly skyward? Will a succession of Kremlin regimes—whether Tzarist, Soviet, or post-Putin—ever learn to rule without abuse of power?

Of course that brings us back to the Ingodinsky Court of Chita, which last week overruled the appeal for conditional release lodged by lawyers of Khodorkovsky, who continues to serve his 8-year sentence in the penal colony near the town of Krasnokamensk in the Chita region.

At the hearing, Chief of Chita Detention Facility Vladimir Klyukin urged the court to reject the appeal, as "Khodorkovsky should remain in the place of detention to reform."

The chief of the Krasnokamensk Colony, where Khodorkovsky had been serving the sentence until December 2006, echoed the words of his Chita colleague. The detention officials even presented a video proving that Khodorkovsky breached regulations. Sure. ✦

Western Siberia's arctic area given 3.66 billion bbl, 651 tcf undiscovered

Nick Snow
Washington Editor

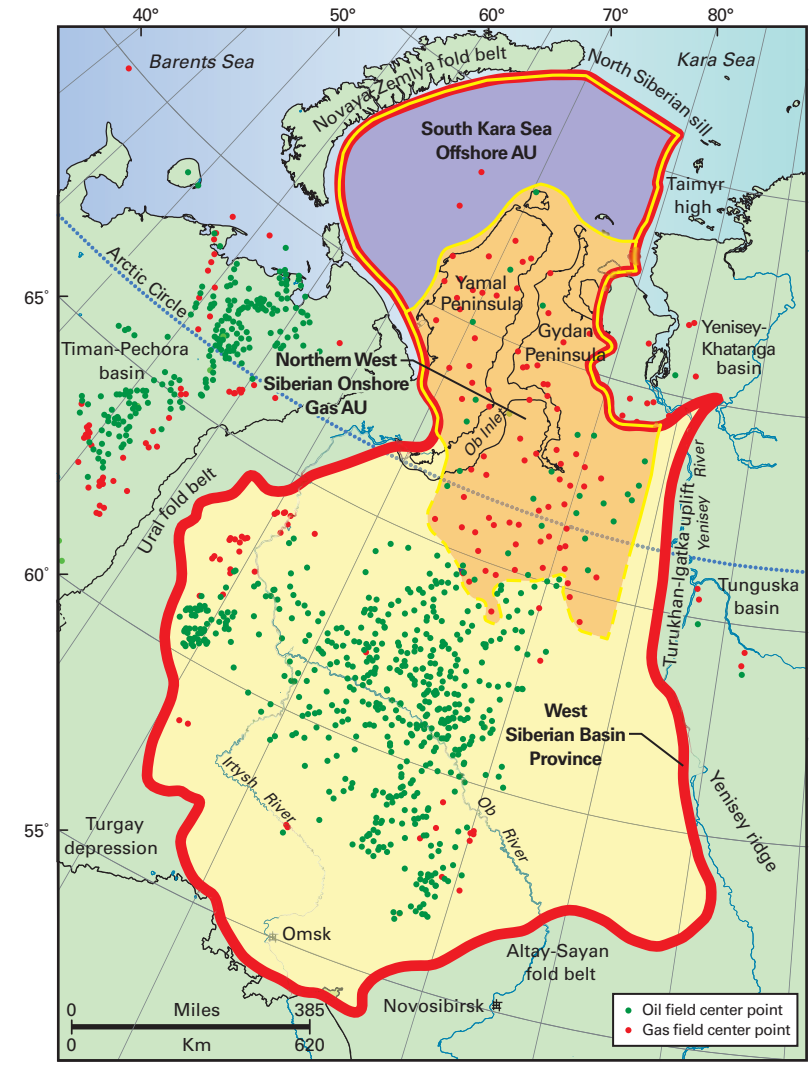
There are an estimated 3.66 billion bbl of undiscovered oil and 651 tcf of natural gas north of the Arctic Circle in Russia's West Siberian Basin Province, the US Geological Survey said in a recent report.

The entire Western Siberian Basin Province is the world's largest petroleum basin with an areal extent of nearly 2.2 million sq km and a total discovered volume of more than 360 billion boe, the US Department of the Interior agency said in the report it prepared as part of its Circum-Arctic Resource Appraisal program.

Exploration has led to the discovery of several giant oil and gas fields, including Urengoi gas field, with more than 3,500 tcf of estimated ultimate recovery, and Samotlor oil field, with EUR of more than 28 billion bbl of oil, the report said. Urengoi field lies at 66° 40' N. Lat., and Samotlor is at 61° 10'.

The USGS evaluated two assessment units in the province's northern part above the Arctic Circle: the Northern West Siberian Onshore Gas AU, which

ASSESSMENT UNITS IN ARCTIC WESTERN SIBERIA, RUSSIA



Source: US Geological Survey

includes primarily Cretaceous sandstone reservoirs in structural traps, and the South Kara Sea Offshore AU, which is considered to be an offshore geologic extension with similar traps and reservoirs.

All of the South Kara Sea AU and about 75% of the Northern West Siberian Onshore AU lie above the Arctic Circle (see map).

The report said there are an estimated 3.659 billion bbl of undiscovered oil (1.152 billion bbl onshore and 2.507 billion bbl offshore), 651,499 bcf of natural gas (29,277 bcf onshore and 622,222 bcf offshore) and 20.329 billion bbl of natural gas liquids (850 million bbl onshore and 19,479 million bbl offshore) in the evaluated area.

The higher offshore gas estimate reflects the fact that the area has not been explored as extensively as the onshore area, USGS said.

The province

The sprawling West Siberian Basin Province is a large rift-sag feature.

It is bounded to the west by the Ural fold belt, to the north by the Novaya Zemlya fold belt and North Siberian sill, to the south by the Turgay depression and Altay-Sayan fold belt, and to the east by the Yenisey ridge, Turukhan-Igarka uplift, Yenisey-Khatanga basin, and Taimyr high.

The USGS previously assessed the entire province in 2000. For the most recent assessment it adopted the total petroleum system and AUs it defined in 2000, but it only assessed those parts of the AUs that lie wholly or partly north of the Arctic Circle. ✦

Appalachian Marcellus, deeper zones eyed

Zone Oil & Gas LLC, Buffalo, NY, signed an exploration and geophysical joint venture deal with Penn Virginia Corp., Radnor, Pa., to explore the Devonian Marcellus shale and Oriskany sandstone and Silurian Tuscarora sand in Pennsylvania.

The joint venture covers 40,000 acres in Tioga, Potter, Somerset, Westmoreland, and Fayette counties in north-central and southwestern Pennsylvania. The program is to shoot at least one 3D seismic survey and drill as many as six wells in 2009, said Thomas H. O'Neill Jr., Zone chairman.

Predecessor entities chaired by O'Neill "recorded solid success in the Oriskany in Pennsylvania and West Virginia over the past 25 years," O'Neill said. "We strongly believe that the Marcellus, Oriskany, Tuscarora, and Trenton Black River formations in the Appalachian basin have tremendous potential for future development."

Zone noted that the Oriskany has been one of the top 10 major producing formations in the Appalachian basin, having yielded 1-2 tcf since 1930. It noted that relatively few wells have penetrated Tuscarora, which occurs at 10,000 ft on the acreage (OGJ, Aug. 7, 2006, Newsletter). Tuscarora typically has produced low-btu gas high in nitrogen. ✦

Conroe field CO_2 flood set as Tinsley responds

Denbury Resources Inc., Dallas, plans to pay $600 million or more to acquire giant Conroe field north of Houston where it intends to begin injecting carbon dioxide within 5 years in a development project itself worth $750 million-1 billion.

Recovery at Conroe from CO_2 injection is estimated at 130 million boe, depending on the ultimate recovery factor, and the properties contain 18.2 million boe of proved conventional reserves. Conroe is producing 2,500 boe/d to the interest to be acquired from an undisclosed private seller, which will retain a 2.8% interest, and unspecified other interest.

Meanwhile, the company booked 29.8 million bbl of proved oil reserves as of June 30 at giant Tinsley field, Yazoo County, Miss., which has responded to CO_2 injection and has become Denbury's highest valued field. This is 75% of the anticipated ultimate tertiary oil expected to be recovered from Tinsley, which averaged 675 b/d in the quarter ended June 30.

Denbury is in final stages of completing a 136 sq mile 3D seismic survey at Jackson Dome in Mississippi to identify more structures that might hold natural CO_2. All but one of 11 structures it has tested so far contain large CO_2 volumes.

Denbury said it might later sell its North Texas Barnett shale properties to finance purchase of the 91.4% interest in Conroe field.

Shipping CO_2 to Conroe in Montgomery County, Tex., will require construction of an 80-mile spur from its planned 314-mile, 24-in. Green pipeline from Donaldsonville, La., to Hastings field south of Houston. Green construction could start by yearend. The spur, cost not yet known, could go in service as early as 2012.

Denbury has signed three offtake agreements to buy as much as 800 MMcfd of CO_2 from proposed gasification plants and seven letters of intent that bring its total potential volumes if all projects were built to 2.5 bcfd. The company believes that enough projects will be built to match or exceed its estimated deliverability of natural CO_2 from Jackson Dome. ✦

Eni, Roc Oil pursue onshore E&D in Angola

Eni SPA has signed a memorandum of understanding with Angola's Sonangol to jointly examine onshore exploration and production opportunities.

Meanwhile, Roc Oil Co. Ltd., Perth, has spud the seventh and final well in an exploration program on the 1,073

sq km Cabinda South onshore block in the Lower Congo basin.

Eni and Sonangol described the plan's principles, objectives, and timing, which are designed to boost Angola's economic, industrial, and social development.

Eni said this approach also would underpin negotiations to promote its proprietary technology and strengthen its partnership with Sonangol. Eni will implement initiatives in energy, social, industrial, and educational fields and will contribute to Angola's national content objectives.

The partners will focus on developing associated gas for power generation and on biofuels production—using surplus agricultural production not used for food. They also will implement educational projects. Other opportunities in the hydrocarbon sector will be examined as well.

Eni operates deepwater Block 15/06 and has current equity production of about 130,000 boe/d in Angola.

Elsewhere onshore in Angola, a group led by Roc Oil spud the Arroz-1 exploration well on Aug. 10 in the eastern part of the Cabinda South block. Like the previous three wells, it is to test a subsalt prospect and is expected to reach total depth in September.

Participating interests in the Cabinda South Block are Roc companies 60% and Force Petroleum Ltd. and Sonangol 20% each.

The group shot 722 line-km of 2D seismic and 618 sq km of 3D seismic on the block in 2005-07, and ran a high-resolution aeromagnetic survey in March 2006 over the whole block. Its first well, Massambala-1, discovered a shallow heavy oil accumulation on the western side, and the group plans to drill as many as six shallow appraisal wells in the second half of 2008.

The second and third wells, Cevada-1 and Soja-1, had good hydrocarbon shows but neither was judged commercial.

Milho-1 encountered a presalt sequence with a thick source rock and had important oil and gas shows but was noncommercial.

Coco-1 produced 26° gravity oil and associated gas to surface on open hole drillstem testing of two presalt intervals and was suspended as an oil discovery.

Sesamo-1 confirmed the existence of presalt target reservoir sands but had no shows. ✦

Albania

Manas Petroleum Corp., Baar, Switzerland, said its DWM Petroleum AG subsidiary launched a 600 line-km 2D seismic survey in the fold and thrust belt in northwestern Albania.

Geological Institute of Israel mobilized five Vibroseis units to a camp near Tirana to acquire 183 line-km on blocks A, B, and E. The crew will then use explosive sources to shoot the rest of the survey on blocks B, D, and E in second quarter 2009.

The purpose is to highgrade eight identified oil prospects.

Kyrgyzstan

Manas Petroleum Corp. said its DWM Petroleum AG subsidiary agreed to permit Santos International Holdings Pty. Ltd. to begin the phase 2 work program before the end of phase 1 in Kyrgyzstan.

If Santos doesn't withdraw within 60 days of the end of the Phase 1 work period, which is yet to occur, then Santos must drill a minimum of two exploration wells. In addition, Santos has the right to elect to withdraw from the farm-in agreement by giving notice to that effect to DWM within 60 days after completing the second exploration well.

Santos is in discussions regarding refurbishment of a drilling rig currently in Kyrgyzstan. Up to four shallow exploration prospects have been identified for drilling by the rig beginning in the fourth quarter of 2008, and four deep prospects are to be drilled in 2009.

Louisiana

Meridian Resource Corp., Houston, reported completion of the Goodrich-Cocke-6 well in Weeks Island field, Iberia Parish, La.

Sidetracked to 8,500 ft measured depth, it logged 100 ft of overall prospective oil pay in Miocene sand and tested at as much as 2,500 b/d of oil. The state allowable is 800 b/d.

Swift Energy Co., Houston, is executing a strategic 3D based South Louisiana exploration program (OGJ, Sept. 24, 2007, p. 34).

The company is drilling, as operator with 50% working interest, an 18,000-ft prospect in the Lake Washington-Bay de Chene area and participating with 25% working interest in a 16,000-ft prospect that is being drilled closer to the High Island area.

Swift intends to drill two other prospects in the third and fourth quarters of 2008. One will be a 12,000-15,000-ft test in the Westside area of Lake Washington, and the other will be a 15,000-ft test in the Bay de Chene area.

The company is designing and planning an 18,000-20,000-ft subsalt test in the Lake Washington area for drilling in first half 2009.

Nevada

Surge Global Energy Inc., Solana Beach, Calif., a formative company, paid Tetuan Resources Corp., Boca Raton, Fla., $500,000 for two leases totaling 2,500 acres in northern Nevada.

Surge Global agreed to drill a test well on the Green Valley prospect before Aug. 1, 2009, to a maximum depth of 4,500 ft. It owns a 100% work interest in the initial well until payout, after which Tetuan will back into a 15% working interest.

Surge Global plans to drill the initial test well within 120-150 days.

The company said Green Valley is on trend with and has geology similar to Grant Canyon oil field in Nye County, Nevada's largest oil field.

DRILLING MARKET FOCUS

Drilling programs support large land rig construction

Nina M. Rach
Drilling Editor

The recovery of the land drilling market is accelerating in North America due to solid natural gas prices and a growing focus on deep shale gas, leading to drilling fleet expansions. New land rigs, offshore rigs, and related equipment, such as marine drilling risers, are under construction worldwide.

US land drilling

In August, Lehman Bros. analyst James C. West said leading-edge rates for land rigs are $18,000-23,500/day in the US, up from $15,000-21,000/day earlier this year, and $14,000-20,000/day in second-half 2007. He expects contractors' profit margins to increase in this strong drilling market.

The new rush toward drilling new, deep shale gas plays will require higher-spec land rigs: 1,500-hp and higher. Table 1 shows the 12 drilling contractors that control most of the higher-spec rigs in the US land drilling fleet. As of June 2008, this includes 374 rigs of 1,500-2,000 hp and 105 rigs of 2,000 hp or more.

The top five US drillers control land fleets with 1,118 rigs, and have a combined market capitalization of nearly $27 billion (Table 2).

In 2007, many industry analysts speculated that building land rigs on spec might be result in a glut and depress day rates, particularly in light of the downturn in Canadian drilling. But Richard Mason, publisher of The Land Rig Newsletter, noted in June, "$12 gas changes things…There is no doubt that existing manufacturing can produce another 50 higher spec rigs."

In July, LeTourneau Technologies Inc. (LTI), a subsidiary of Rowan Cos. Inc., announced two new contracts to build land drilling rigs:

- $90 million contract with Nomac Drilling Inc., a wholly owned subsidiary of Chesapeake Energy Corp., to provide major components for nine new 1,500-hp rigs. LTI will begin delivery fourth-quarter 2008 and will complete the order by mid-2009.
- $74.4 million contract with Weatherford Drilling International (BVI) Ltd. to construct four new 2,000-hp rigs. LTI will deliver the first rig in third-quarter 2008 and the other three by July 2009. LTI will assemble the land rigs at its Jebel Ali, Dubai yard, United Arab Emirates.

H&P

Some contractors build only with fixed contracts in hand. Tulsa, Okla.-based Helmerich & Payne International Drilling Co. announced that it has signed contracts for 18 new FlexRigs since May. The company has announced contracts for 50 newbuilds since October 2007, all with 3-7 year terms. By comparison, H&P announced only 77 new FlexRigs during 2005-07.

H&P has an order backlog for 32 new FlexRigs, scheduled to begin service through late 2009. It plans to deliver new FlexRigs at a rate of 3-4/month and, by late 2009, FlexRigs will represent about 80% of the company's total US land drilling fleet. As of August, H&P had 181 land rigs in the US, 27 international land rigs, and 9 offshore platform rigs.

The leading US driller, Patterson-UTI Drilling Co. LP, has a fleet of 350 land rigs in the US and Canada (Table 2). It recently announced plans to take delivery of 20 new built-for-purpose drilling rigs in 2008-10, to work under 3-year contracts. This follows a 15-rig newbuild program that began in 2006.

Grey Wolf

Houston-based Grey Wolf Drilling Co. LP is the fifth most

TOP 12 US CONTRACTORS, LARGE LAND RIGS[1]

Table 1

Drilling contractor	2007 rank[2]	1,500 hp	2,000 hp	Total
Helmerich & Payne International Drilling Co.	3	136	10	146
Nabors Drilling USA	2	91	21	112
Grey Wolf Drilling Co. LP	5	29	25	54
Unit Drilling Co.	6	28	8	36
Patterson-UTI Drilling Co. LP	1	26	10	36
Rowan Cos.	85	3	24	27
Cactus Drilling Co. LLC	13	16	6	22
Trinidad Drilling LP	10	15	—	15
Pioneer Drilling Co.	8	9	—	9
Cyclone Drilling Inc.	18	8	—	8
Scandrll Inc.	15	7	—	7
Bronco Drilling Co. Inc.	12	6	1	7
Total		**374**	**105**	**479**

[1]Land Rig Newsletter, June 2008. [2]Land Rig Newsletter, May 2008; based on US footage drilled.

active driller in the US, based on footage drilled in 2007 and the size of its US land drilling fleet (120 units). An increasing number of the company's rigs are operating under term contracts, 66 in August, up from 54 in May, according to West. Another 40 rigs are working in the daywork spot market. Grey Wolf has 120 rigs in South Texas (Fig. 1), the US Gulf Coast, Arkansas and Louisiana, and the Rocky Mountains, with two other rigs in Mexico.

In mid-July, Grey Wolf shareholders rejected a plan to merge with Midland, Tex.-based Basic Energy Services Inc., perhaps reopening consideration of an earlier set of offers from Canada's Precision Drilling Trust.

In early August, Basic reported a $4.2 million after-tax charge related to the termination of the Grey Wolf merger. Basic provides contract drilling with nine rigs, as well as well completions, servicing, remediation, and fluids, in Texas, Louisiana, Oklahoma, New Mexico, Arkansas, Kansas, and Rocky Mountain states.

Bronco Drilling

Houston-based Allis-Chalmers Energy Inc., an oil and gas equipment company, offered to acquire Bronco Drilling Co Inc. for $437.8 million, although major stockholder Wexford Capital (about 13%), announced its plans to vote against the merger at a Bronco stockholder meeting on Aug. 14, 2008.

Bronco Drilling is based in Edmond, Okla., and provides contract land drilling and workover services with a fleet of 56 drilling rigs, 59 workover rigs (including 10 under construction), and 70 trucks, according to Bob Jarvis, head of Bronco's investor relations. Six of the rigs are 1,500-hp and one is 2,000-hp,

Bronco operates in South Dakota's Williston basin (Bakken shale, six rigs), Colorado's Piceance basin, the Anadarko and Arkoma basins, and Woodford and Barnett shales of Texas, Oklahoma, and Arkansas, along with Cotton Valley in East Texas. Pemex has contracted for three Bronco rigs through the end of 2009. The rigs were to begin operating in the Chicontepec basin near Poza Rica, Mexico, by the end of August.

In Nov. 2007, Bronco Drilling announced it would acquire a 25% equity interest in Challenger Ltd., a private company organized under the laws of the Isle of Man with its principal operations in Libya, in exchange for 6 drilling rigs (five from the 2007 fleet and one newbuild) and $5 million in cash. Challenger was to purchase four rigs and ancillary equipment from Bronco for $12 million, payable in installments. As of August 2008, eight of the rigs contributed or sold to Challenger were in Libya with three of the rigs currently operating. Challenger is a regular subcontractor to state-owned National Oil Corp. of Libya.

Bronco announced second-quarter 2008 results on Aug. 4. Revenues were $69.8 million, up from $62.3 million in first-quarter 2008 and $74.7 million in second-quarter 2007. Drilling rig utilization for second-quarter 2008 was 82%, up from 69% in the previous quarter and 76% in second-quarter 2007. Net income for second-quarter 2008 was $4.3 million, down significantly from $8.1 million for the previous quarter and $8.7 million in second-quarter 2007. The steep revenue reduction in second-quarter 2008 is related to Broncos equity investment in Challenger Ltd.

A derrick man works pipe stands from the monkey board of Grey Wolf Rig 103, Angelina, Tex. (Fig. 1; photo from Grey Wolf Drilling Co. LP).

Canada, Europe

Calgary-based Ensign Drilling Partnership, a subsidiary of Ensign Energy Services Inc., announced its acquisition of 12 drilling rigs and related equipment from Terracore Specialty Drilling Ltd. All the rigs were built in the last 4 years and are being operated through Ensign's Encore Coring & Drilling division.

Ensign now operates a fleet of 197 drilling and coring rigs in Canada, the second-largest drilling fleet in the Canadian industry.

Trinidad Drilling Ltd. announced it would build seven new 1,500-hp land drilling rigs capable of drilling

US DRILLERS, AUGUST 2008[1]

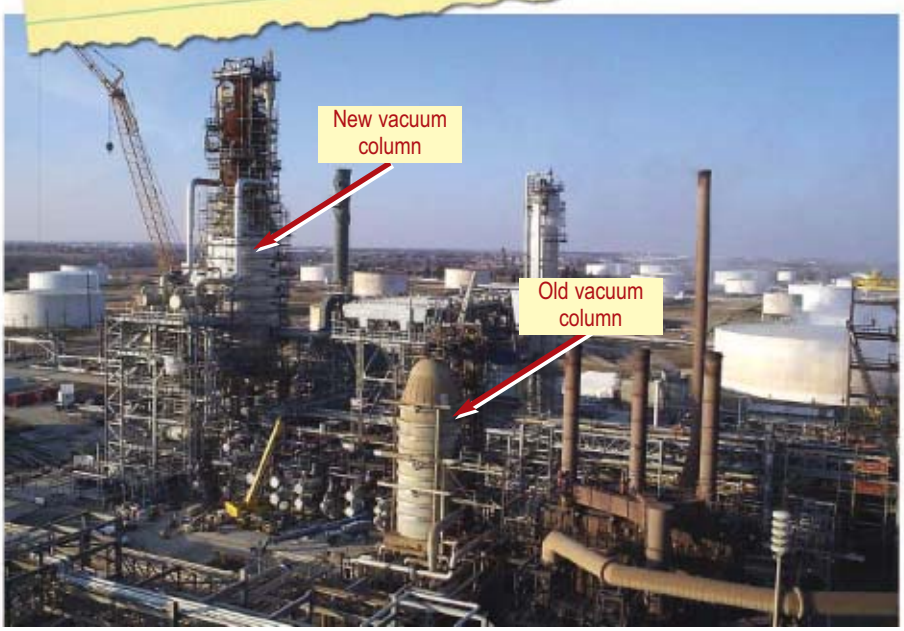
Table 2

Drilling contractor	Market capitalization, $ billion	Debt/ capital, %	Rank[2]	US land fleet
Land				
Patterson-UTI	4.505	0	1	[3]350
Nabors Industries Ltd.	10.702	44	2	336
Helmerich & Payne	6.542	17	3	181
Unit Drilling Co.	[4]3.02		4	131
Grey Wolf Drilling	1.901	27	5	120
Total	**26.67**			**1,118**

Offshore			Fleet size	Rigs under construction
Transocean Inc.	44.173	49	145	10
Diamond Offshore Inc.	16.729	14	47	—
Noble Corp.	14.170	13	64	5
Nabors	10.702	44	73	—
ENSCO International	10.057	6	52	6
Pride International Inc.	6.994	24	47	3
Rowan Cos.	4.484	15	30	9
Hercules Offshore	2.173	36	66	—
Parker Drilling Inc.	0.946	39	18	—
Total	**110.428**		**542**	**33**

[1]Company reports and Lehman Bros. Equity Research, Original Oil Patch Weekly, Aug. 4, 2008. [2]Based on US land footage drilled, 2007. [3]Includes western Canada. [4]For Unit Corp., of which Unit Drilling is a subsidiary.

Process Notes



Why Produce Diesel from the Vacuum Unit?

Look ahead five years. The economy is likely to keep tightening and the rush to control pollution will inevitably be accompanied by demands for greater energy conservation. Consequence? A growing market for diesel which yields more energy per unit volume. Yet many continue to believe that producing diesel from the vacuum unit is poor design—that it should be produced only from the atmospheric column. Hence many refiners feed 20-30% diesel boiling range material to their FCCs or hydrocrackers. But where most motor fuel is diesel, refiners have long known that producing vacuum unit diesel can increase production up to 5 volume percent on whole crude.

Maximum diesel production is simply not possible in the atmospheric column because flash zone temperature would need to be 760°F or higher. Moreover, the inherent reflux rate below the diesel draw results in molar L/V ratio less than 0.15. But in vacuum columns it can be 0.4 or higher. And distillation is driven by L/V!

Also: eliminating diesel from vacuum unit feed cuts vacuum gas oil (VGO) yield because it is more difficult to vaporize the feed in the vacuum column flash zone. If atmospheric diesel recovery is very high, VGO yield is low. As crudes get heavier it is essential to leave some diesel in the vacuum column feed to achieve reasonable VGO cutpoints.

Lastly, if you process Canadian oils sands Dilbit and Synbit, you can't run the atmospheric heater hotter than 680°F resulting in very high diesel boiling range material in the vacuum feed. To obtain reasonable diesel recovery from the whole crude you *must* produce it in the vacuum unit.

For a more involved discussion please request Technical Papers #255 and 261.

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to 18,000 ft, based on long term, take-or-pay contracts with two North American operators. The rigs will be delivered by yearend 2009. This rig construction program is in addition to the nine new drilling rigs and six new service rigs Trinidad announced it would build earlier this year.

Trinidad will build and commission the rigs at its in-house manufacturing facility, Mastco. The rigs will be equipped with AC-driven machinery, monitored and operated by the company's proprietary control systems. Additionally, the rigs will have built-in skidding systems which will allow them the ability to drill multiple-pad or single-pad wellsites.

Germany's Bentec Drilling and Oilfield Systems, a subsidiary of Abbot, announced a $97 million contract to build four 250-tonne HR-4500 cluster-slider land rigs for Russian drilling contractor SSK (Siberian Service Co.). SSK has an option to order up to four more additional rigs under the contract.

This new contract follows the delivery of 12 other cluster slider rigs to KCA DEUTAG, BK Eurasia, and Gazprom. All the rigs are operating in Northern and Western Siberia.

Offshore drilling

High oil and natural gas prices keep the offshore drillers busy worldwide, and many continue to augment the fleets. Nine of the largest, US-based offshore drilling contractors have 33 rigs under construction, a combined fleet of 542 rigs, and a combined market capitalization of more than $110 billion (Table 2).

The Sevan Driller is under construction at COSCO's shipyard, Nantong, China, shown here in November 2007 (a), Feb. 2008 (b), and Apr. 2008 (c). The rig will be able to drill wells to 40,000 ft in water depths of up to 12,500 ft, and offers a variable deckload of more than 15,000 tonnes. The Sevan Driller will work in the US Gulf of Mexico for Petrobras America Inc. under a 6-year contract beginning in 2009 (Fig. 2; photos from Sevan Marine ASA).

As of early August, a total of 177 offshore drilling rigs were under construction worldwide, including 39 drillships, 53 semisubmersibles, 7 drilling tenders, 77 jack ups, and 3 inland barges (Table 3).

National Oilwell Varco reported a growing backlog for land and offshore rig equipment in its second-quarter 2008 results. The company's total backlog for rig equipment grew to $10.8 billion ($9.4 billion for offshore and $1.4 billion for land) from $9.9 billion in the previous quarter. NOV expects to deliver about $3 billion of the current backlog in remainder of 2008, $5 billion in 2009, and $3 billion in 2010 and beyond.

In August, Lehman Bros.' West noted that the Gulf of Mexico jack up market had "improved significantly over the past quarter" and expects leading-edge day rates to move higher. West said jack ups may continue to leave the gulf due to higher contract rates elsewhere. Pemex may tender for 4-6 independent-leg cantilever (IC) jack ups, he said, releasing several mat-supported rigs, shifting its focus to IC jack ups.

Offshore construction

Additional deepwater drilling requires construction of new equipment, including these recently announced contracts:

- *Drillship.* $755 million contract with Daewoo Shipbuilding & Marine Engineering Co., for delivery June 2011.
- *Ultradeepwater drillship.* Transocean signed 20-year capital lease contract with

OFFSHORE DRILLING RIGS UNDER CONSTRUCTION*

Table 3

	Rigs
Drillships	39
Semisubmersibles	53
Drilling tenders	7
Jack ups	77
Inland barges	3
Total	**177**

*As of Aug. 4, 2008.

Petrobras and Mitsui to provide 10 years of contract drilling (extendable for another 10 years), after which Transocean can purchase the ship for $1. The new drillship will cost $750 million and is under construction at Samsung Heavy Industries' Goeje shipyard, South Korea.

• Sevan Marine ASA secured options to build six additional Sevan drilling units with China's COSCO shipyard group. Sevan is currently building the ultradeepwater, dynamically positioned Sevan Driller at COSCO's Nantong shipyard (Fig. 2). Sevan intends to build two other deepwater drilling units for Petrobras SA and ONGC at the same shipyard.

• Multipurpose heavy lift and pipelay vessel for Romanian drilling contractor Grup Servicii Petroliere SA, $131 million contract with Keppel Singmarine Pte Ltd., for delivery third-quarter 2011.

• Fourth deepwater marine drilling riser for Queiroz Galvão Óleo e Gás SA, $55 million contract with Aker Solutions, at new drilling riser manufacturing facility in Rio das Ostras, Brazil, for delivery third-quarter 2010. The other three risers under construction include the Olinda Star, the Gold Star, and the Lone Star, all of which incorporate the new CLIP connector technology.

• Two marine drilling risers for Daewoo Shipbuilding & Marine Engineering, $75 million contract with Aker Kvaerner Subsea to build two 7,500-ft risers for a new drillship and a semisubmersible. The risers are under construction at Aker's new manufacturing center in Malaysia and the buoyancy modules are being manufactured by Aberdeen-based Phoenix Polymers International Ltd. The risers will be delivered in 2010.

Fleet, company changes

In late July, Transocean Inc. announced that it would sell the GSF Arctic II and GSF Arctic IV semisubmersible rigs to Northern Offshore, Ltd. for about $750 million. This is the first major sale since the merger of Transocean and Global Santa Fe last year.

As of July 21, 2008, Ocean Rig ASA was delisted from the Oslo Stock Exchange, following its purchase and privatization by Dry Ships Inc. ✦

New method yields MEG injection rate

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John M. Campbell & Co.
Norman, Okla.

Roohallah Taraf
Pars Oil & Gas Co.
Tehran

This article reports on development of a shortcut method that minimizes the calculation steps for obtaining the inhibitor concentration and injection rate required to depress hydrate formation to a desired temperature.

Several thermodynamics models are also available that yield inhibitor concentration and injection rate, but their calculations may require rigorous computer solutions.

This article presents four diagrams to predict the required weight percent of monoethylene glycol (MEG) in the rich solution and the flow rate for the desired depression of the hydrate formation temperature (HFT) for natural gas streams. These diagrams are generated for a natural gas with relative density of 0.6 at pressures of 3, 5, 7, and 9 MPa and are applicable to wet gas temperatures of 20°, 30°, 40°, and 50° C.

In order to extend the applications of these charts to wider ranges of natural gas mixtures with specific gravities of up to 0.8, the article provides two generalized correction factors. These correction factors are based on rigorous computer simulation. The accuracy of this shortcut compares favorably with rigorous computer simulation results obtained from commercial process simulators; it yields excellent agreement.

Preventing hydrates

Gas hydrates are a well-known problem in natural gas processing and transmission pipelines when natural gas and water exist at specific conditions. This is particularly true at high pressure and low temperature.

Fundamentally, there are four ways to prevent hydrates from forming:

1. Reducing the pressure below the hydrate-formation pressure for the given temperature.
2. Maintaining the temperature of the gas above the hydrate-formation temperature for the given pressure.
3. Reducing the water vapor dewpoint of the gas below the lowest operating temperature (dehydration).
4. Injecting alcohols or glycols into the gas stream to move the hydrate-formation conditions to lower temperatures and higher pressures (inhibition).

The first and second methods may not be practically possible for economic or operational reasons or both. The choice to inhibit hydrate formation, the fourth method, or to dehydrate, the third method, is based on economic and operating parameters that are not addressed here.

The method to be discussed here specifically relates to the inhibition method to prevent formation of hydrates in natural gas streams.

When an inhibitor is used for hydrate depression, there are three possible phases into which the inhibitor may distribute:

1. The aqueous phase, in which the hydrate inhibition occurs.
2. The vapor hydrocarbon phase, in which the inhibitor may be lost.
3. The liquid hydrocarbon phase.

Depending upon the temperature and pressure, all three fluid phases may be present, or either the vapor or liquid hydrocarbon may be missing. No matter the fluid state, the inhibitor in the aqueous phase has the inhibition effect.

The importance of the calculations to determine the required inhibitor concentration in the aqueous phase and inhibitor mass flow rate to achieve the desired HFT depression has prompted development of several thermodynamics models. All of them provide guide-

PROPOSED CHARTS VS. SAMPLE METHODS Table 1

Method	MEG in aqueous phase, wt %	Flow rate of 80 wt % MEG solution, kg/day
Hammer-schmidt Equation[1]	36.5	2,467
HYSYS[2]	35.6	2,593
GCAP[3]	36.4	2,366
This work	35.9	2,660

[1]References 1 and 8. [2]Reference 5. [3]Reference 7.

lines to help users forecast gas-hydrate formation conditions for most systems containing hydrate-forming molecules in the presence of inhibitors.

Hammerschmidt proposed the first empirical equation to find the required concentration of an inhibitor in an aqueous solution for lowering the hydrate formation temperature.[1] Nielsen and Bucklin proposed an improved equation of Hammerschmidt's equation applicable only for methanol solutions, for concentrations up to 0.8 mole fraction methanol in the aqueous phase and temperatures down to 165 K.[2]

To improve the prediction over a larger range, Carroll proposed a modified version of the Nielsen-Bucklin equation to take into account inhibitor concentration by including the water activity coefficient.[3] Moshfeghian and Maddox proposed a correlation to predict the concentration of inhibitors at high pressure and high concentration of inhibitor.[4] This correlation includes the water-activity coefficient and enthalpy of hydrate formation per hydrate number.

Portability and simplicity are advantages of these correlations because they can be solved with a simple calculator. It should be noted that process simulation packages such as HYSYS or gas processing software like GCAP and EzThermo are also available for predicting the effect of inhibitors on hydrate formation.[5-7]

In this work, four graphs predict MEG concentration to prevent hydrate formation. These graphs are based on rigorous computer simulation that used HYSYS. Several simulations determined the effect of MEG concentration in the aqueous phase on the depression of the HFT. These simulations were for gas compositions having relative densities of 0.6, 0.65, 0.7, 0.75, and 0.8 at pressures of 3, 5, 7, and 9 MPa, each saturated with water at temperatures of 20°, 30°, 40°, and 50° C.

Simulations

Fig. 1 shows the process flow for computer simulation used to develop the correlations of hydrate inhibition presented in this study. A feed stream of saturated wet natural gas mixes with a stream of MEG solution. For all of the simulations the injected MEG composition is 80% MEG and 20 wt % water. The mixed stream temperature is decreased with the HYSYS cooler operation to meet the minimum temperature of system studied. The cooled stream is then separated with the three-phase separator operation.

For these simulations, the cooler's outlet temperature is set at −30° C., producing a gas stream leaving the three-phase separator with a hydrocarbon dewpoint of −30° C. This temperature has no effect on the hydrate-formation temperature calculations but may cause a small change in the concentration of MEG in the outlet aqueous phase.

Five natural gases with relative density ranging from 0.6 up to 0.8 in increments of 0.05 were used to develop the required charts.

Obtaining a representative set of operating conditions over which to test the correlation the temperature and pressure of each feed stream involved varying from 20° to 50° C. in 10° C. increments and 3 to 9 MPa in 2 MPa increments, respectively. In all of the simulations, we varied the flow rate of MEG solution to obtain a wide range of MEG concentration in the aqueous phase. Then, for each MEG solution rate, we calculated the MEG concentration in the aqueous phase and the HFT depression.

Base chart

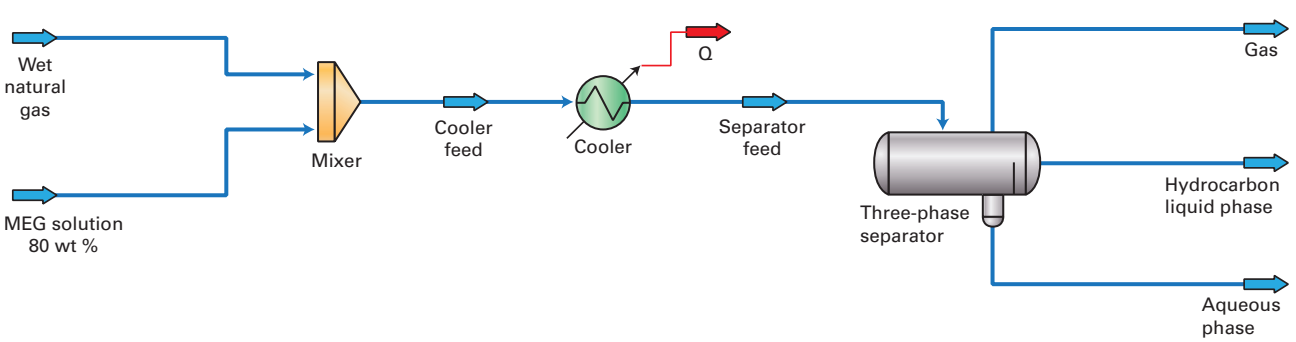
We developed the base charts, using a gas having a relative density of 0.6 with pressure and temperature variations as discussed previously. Fig. 2 plots the simulation results of MEG concentration in aqueous phase (i.e., rich solution), depression of the HFT, and MEG solution mass flow rate for pressures of 3, 5, 7, and 9 MPa, respectively.

These charts can determine the required MEG concentration and flow rate for a desired HFT depression for a gas with a relative density 0.6 at water-saturation temperatures between 20° and 50° C. for pressures ranging from 3 to 9 MPa. For pressures between the curves presented, linear interpolation can be used.

For many natural gas streams, the

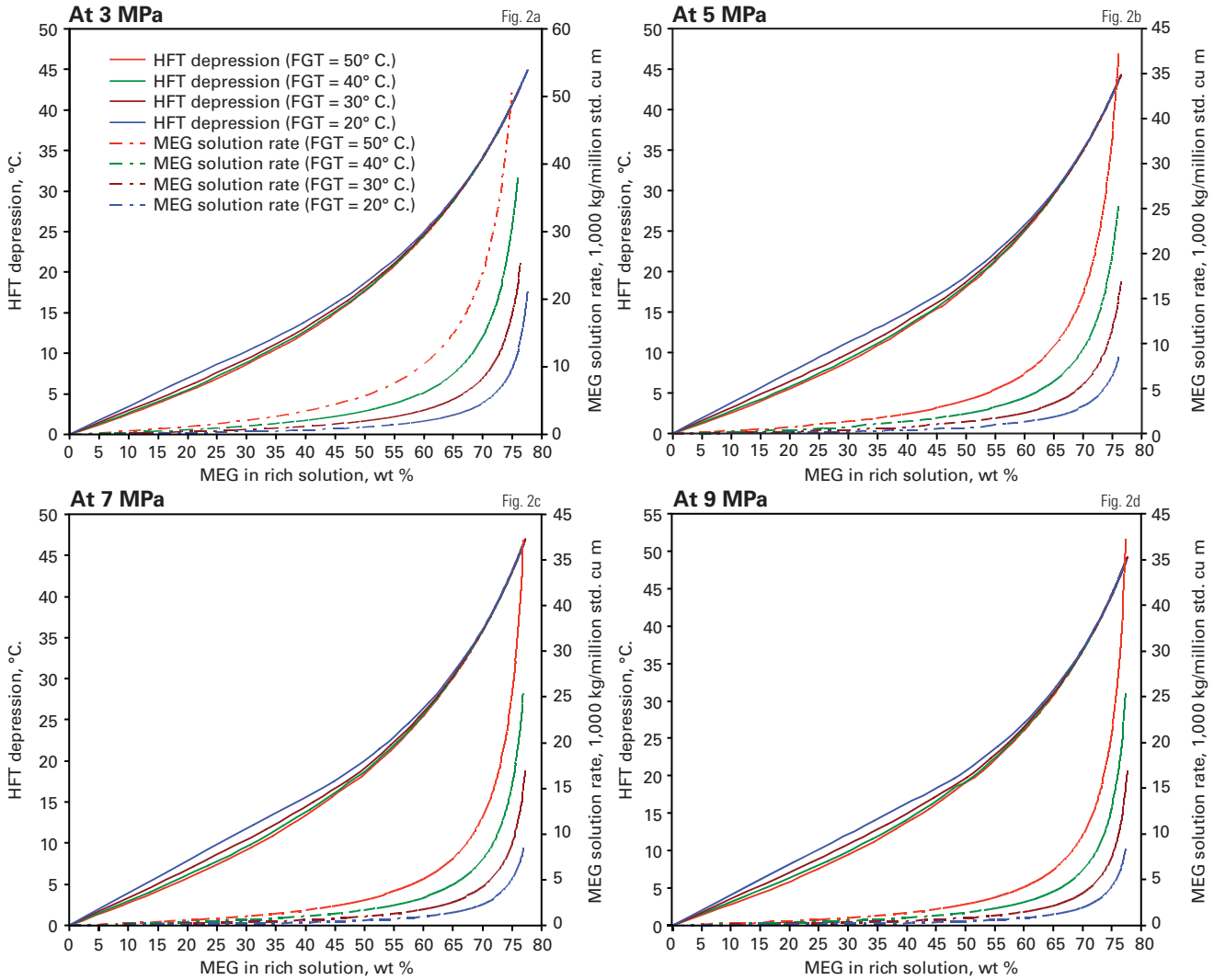
PROCESS FLOW FOR SIMULATION OF MEG HYDRATE INHIBITION

Fig. 1



HFT DEPRESSION, MEG SOLUTION MASS FLOW RATES*

Fig. 2



*Using 80 wt % MEG lean solution.

gas relative density may vary from 0.6 to 0.8. Therefore, the following section presents methods to extend the use of these charts for gases with relative densities up to 0.8.

Generalized charts

Extending the proposed charts (Fig. 2) to other natural gases with relative density of up to 0.8 requires use of two correction factors (see accompanying equation box).

The first one, W_1 (Equation 1), is the correction factor for the MEG concentration in the aqueous phase. This factor takes into account different HFT depressions between the base relative density of 0.6 and the other gas relative densities of 0.65 up to 0.8. Fig. 3 can yield this correction factor for pressures of 3 to 9 MPa.

Note the values of W_1 shown in Fig. 3 are the arithmetic average of correction factors for pressures of 3, 5, 7, and 9 MPa. The 20% error band shown in this diagram reflects the maximum error that is not greater than 0.1 wt % MEG concentration. Equation 1 may be used instead of Fig. 3.

The second correction factor, W_2, corrects the MEG concentration resulting from the difference of MEG concentrations in the aqueous phase at different gas specific gravities. We developed this factor using the five gas

EQUATIONS

$$W_1 = 0.015740 + 0.141099(HFT) - 0.013972(HFT)^2 + 5.807523 \times 10^{-4}(HFT)^3 - 1.087215 \times 10^{-5}(HFT)^4 + 7.672972 \times 10^{-8}(HFT)^5 \quad (1)$$

$$S = [(\text{Specific gravity} - 0.65) \div 0.05] \quad (2)$$

$$W_2 = 0.024975 + 0.6002(S) + -0.05015(S)^2 \quad (3)$$

$$\Delta W = W_1 + W_2 \quad (4)$$

$$Wt_r = Wt_{Fig.2} - \Delta W \quad (5)$$

compositions having relative densities ranging from 0.6 up to 0.8. Obtaining W_2 requires first calculating the factor S with Equation 2.

Once the value of S is calculated, Fig. 3 determines the weight percent correction factor, W_2. Equation 3 may also be used instead of Fig. 3.

For gases with specific gravities ranging from 0.65 up to 0.8, the revised MEG concentration can be obtained as follows:

1. Obtain the base MEG concentration from Fig. 2 ($Wt_{Fig.\ 2}$) using linear interpolation for pressures between those presented in the figures.
2. Determine the correction factors (W_1) from Fig. 3 (or Equation 1) and (W_2) from Fig. 3 (or Equation 3). The revised MEG concentration (Wt_r) is then calculated with Equations 4 and 5.

RESULTS FOR VARIOUS DENSITIES, PRESSURE, FEED TEMPERATURES

Table 2

Pressure, MPa	Relative density, sp gr	HFT depression °C.	Feed-gas temp. °C.	W_1 — (from Fig. 3) —	W_2 — (from Fig. 3) —	ΔW ($W_1 + W_2$)	MEG for gas with sp gr = 0.6 (Wt_{fig2-3}), wt %	Revised MEG wt % ($Wt_r = Wt_{fig2-3} - \Delta W$)
3	0.70	20	20	0.401	0.6	1.001	52.42	51.4
			30	0.401	0.6	1.001	53.22	52.2
			40	0.401	0.6	1.001	53.62	52.6
			50	0.401	0.6	1.001	53.83	52.8
5	0.65	10	20	0.509	0	0.509	26.72	26.2
			30	0.509	0	0.509	30.23	29.7
			40	0.509	0	0.509	31.97	31.5
			50	0.509	0	0.509	32.86	32.4
7	0.8	40	20	0.497	1.4	1.897	73.01	71.1
			30	0.497	1.4	1.897	73.05	71.2
			40	0.497	1.4	1.897	73.07	71.2
			50	0.497	1.4	1.897	73.08	71.2
9	0.75	30	20	0.412	1	1.412	63.49	62.1
			30	0.412	1	1.412	63.91	62.5
			40	0.412	1	1.412	64.13	62.7
			50	0.412	1	1.412	64.23	62.8

Evaluation of method

To demonstrate the application of the proposed charts, consider Example 6.6 in Vol. 1 of Gas Conditioning and Processing.[8]

This example states that 3.5 × 10^6 std. cu m/day of natural gas leaves an offshore platform at 40° C. and 8,000 kPa. The hydrate temperature of the gas is 17° C. The gas arrives ashore at 5° C. and 6,500 kPa.

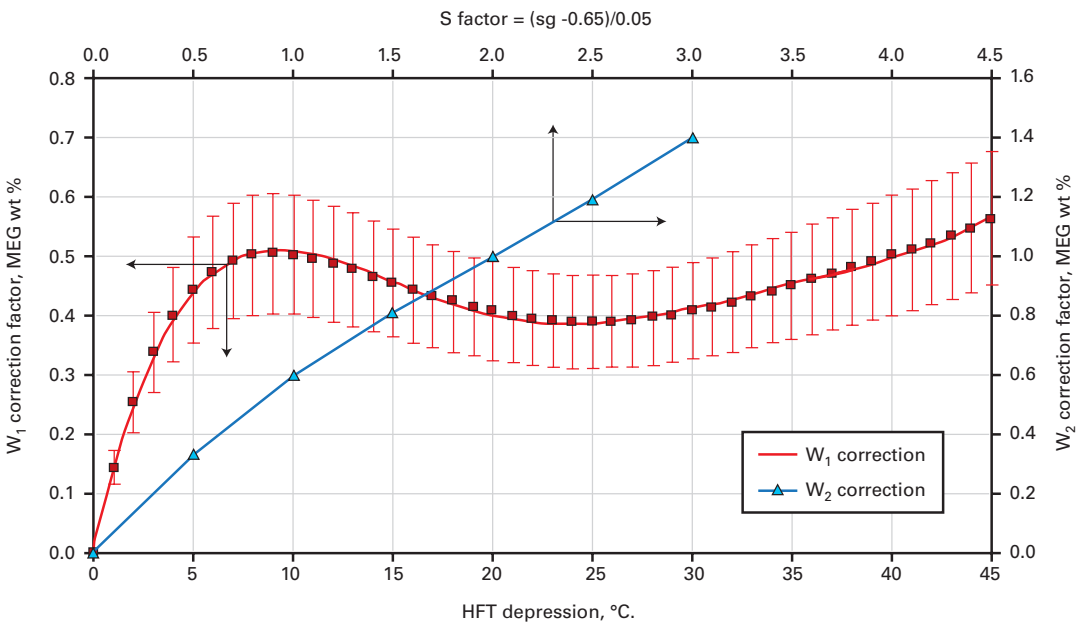
The associated condensate production is 60 cu m/10^6 std. cu m. The amount of 80 wt % MEG inhibitor required to prevent hydrate formation in the pipeline is to be calculated. It should be noted that in this example, the composition (or relative density) of natural gas is not given; therefore, demonstrating the use of these charts requires a relative density of 0.6 be assumed. The feed-gas pressure is 8 MPa; so a linear interpolation between 7 MPa (Fig. 2c) and 9 MPa (Fig. 2d) is applied. Table 1 presents the results.

Table 1 shows a comparison between results of these charts and those based on the Hammerschmidt equation, HYSYS, and GCAP for this example.[1-2 7-8]

For gases with relative densities 0.65 and greater, the required MEG concentrations in the aqueous phase are predicted at different pressures, feed-gas

MEG CORRECTION FACTORS

Fig. 3



PROPOSED METHOD VS. HYSYS

Table 3

Pressure, MPa	Relative density	HFT depression, °C.	Feed-gas temp., °C.	MEG concentration in aqueous phase, wt %: This work	MEG concentration in aqueous phase, wt %: HYSYS	MEG concentration in aqueous phase, wt %: Error, %	Flow rate of 80 wt % MEG solution, kg/10⁶ std. cu m: This work	Flow rate of 80 wt % MEG solution, kg/10⁶ std. cu m: HYSYS	Flow rate of 80 wt % MEG solution, kg/10⁶ std. cu m: Error %
For 0.65-0.8 relative density gases used to develop proposed charts									Table 3a
3	0.7	20	20	51.42	51.20	0.43	1,172.1	1,156.7	1.33
			30	52.22	52.17	0.10	2,221.7	2,222.5	0.04
			40	52.62	52.65	0.06	3,944.3	3,971.3	0.68
			50	52.83	52.89	0.11	6,660.5	6,733.1	1.08
5	0.65	10	20	26.21	25.65	2.18	207.8	200.5	3.64
			30	29.72	29.71	0.03	456.0	454.7	0.29
			40	31.46	31.60	0.44	858.1	870.0	1.37
			50	32.35	32.58	0.71	1,491.3	1,520.4	1.91
7	0.8	40	20	71.11	72.56	2.00	2,678.4	2,914.0	8.09
			30	71.15	71.70	0.77	4,818.3	4,872.2	1.11
			40	71.17	71.74	0.79	8,280.3	8,818.2	6.10
			50	71.18	71.76	0.81	13,678.0	14,739.2	7.20
9	0.75	30	20	62.08	62.41	0.53	993.6	1,005.3	1.16
			30	62.50	62.94	0.70	1,809.4	1,873.6	3.43
			40	62.72	63.21	0.78	3,127.0	3,252.4	3.86
			50	62.82	63.37	0.87	5,333.6	5,396.6	1.17
Error % = (Chart result - HYSYS result)/HYSYS result × 100				Error summation		11.30	Error summation		42.44
				Error average		0.70	Error average		2.65
For four gas mixtures not used to develop proposed charts									Table 3b
3	0.7	20	20	51.42	51.41	0.02	1,172.90	1,169.41	0.30
			30	52.22	52.26	0.08	2,222.81	2,233.08	0.46
			40	52.62	52.71	0.17	3,944.73	3,984.03	0.99
			50	52.83	52.93	0.19	6,661.43	6,745.78	1.25
5	0.65	10	20	26.22	25.24	3.88	209.35	195.81	6.91
			30	29.73	29.48	0.85	457.21	449.15	1.79
			40	31.47	31.46	0.03	859.47	862.78	0.38
			50	32.36	32.50	0.43	1,493.00	1,514.10	1.39
7	0.8	40	20	71.12	71.63	0.71	2,677.32	2,639.10	1.45
			30	71.16	71.70	0.75	4,817.12	5,049.82	4.61
			40	71.18	71.73	0.77	8,280.00	8,860.44	6.55
			50	71.19	71.75	0.78	13,676.48	14,675.78	6.81
9	0.75	30	20	62.08	62.50	0.67	992.47	1,019.26	2.63
			30	62.50	63.00	0.79	1,808.00	1,877.82	3.72
			40	62.72	63.24	0.82	3,126.07	3,254.47	3.95
			50	62.82	63.37	0.87	5,331.79	5,390.28	1.09
Error % = (Chart result - HYSYS result)/HYSYS result × 100				Error summation		11.82	Error summation		44.28
				Error average		0.74	Error average		2.77
Using Fig. 3, for three gas mixtures not used to develop proposed charts									Table 3c
5	0.6798	10	20	25.83	25.38	1.77	206.3	197.5	4.46
			30	29.34	29.53	0.64	446.8	450.4	0.80
			40	31.08	31.45	1.18	839.9	862.8	2.65
			50	31.97	32.47	1.54	1,463.2	1,512.0	3.23
3	0.7282	20	20	51.18	50.91	0.53	1,157.1	1,137.7	1.71
			30	51.98	51.86	0.23	2,194.2	2,184.5	0.44
			40	52.38	52.35	0.06	3,892.6	3,903.7	0.28
			50	52.59	52.59	0.00	6,570.1	6,618.9	0.74
7	0.7718	40	20	71.35	71.74	0.54	2,755.9	2,780.8	0.90
			30	71.39	71.75	0.50	4,965.0	5,193.6	4.40
			40	71.41	71.77	0.50	8,528.6	8,940.8	4.61
			50	71.42	71.79	0.52	14,077.8	14,790.0	4.82
Error % = (Chart result - HYSYS result)/HYSYS result × 100				Error summation		8.01	Error summation		29.03
				Error average		0.67	Error average		2.42

temperatures (FGT), and specified HFT depression.

Specified conditions and the predicted correction factors W_1, W_2 and accordingly the required MEG concentrations in the aqueous phase appear in Table 2 for these gases. Application of these corrected MEG concentrations predicts the required MEG flow rates (Table 3a). Table 3a also shows a comparison between the results of this proposed shortcut method and HYSYS.

To demonstrate the accuracy of the proposed method further, we have changed gas compositions from those used to generate these charts. These new gas compositions predict the required MEG concentration and flow rate. Tables 3b-3c show the charts results and their comparisons with results of HYSYS.

In all of these cases, the charts give good agreement with those predicted by HYSYS. The analysis of the results obtained indicates that the required MEG weight percent in the aqueous phase will decrease by increasing the gas relative density. The MEG weight percent obtained for gas with relative density 0.6 can therefore be used for gases with higher relative density if a more conservative estimation is required.

Acknowledgment

The authors thank Frank W. Jarrett for his helpful editing of the article. ✦

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NELSON-FARRAR COST INDEXES

Refinery construction (1946 Basis)

(Explained on p.145 of the Dec. 30, 1985, issue)

	1962	1980	2005	2006	2007	May 2007	Apr. 2008	May 2008
Pumps, compressors, etc.	222.5	777.3	1,685.5	1,758.2	1,844.4	1,840.8	1,922.1	1,923.0
Electrical machinery	189.5	394.7	513.6	520.2	517.3	515.0	515.5	515.0
Internal-comb. engines	183.4	512.6	931.1	959.7	974.6	973.9	984.6	980.8
Instruments	214.8	587.3	1,108.0	1,166.0	1,267.9	1,261.3	1,330.5	1,338.2
Heat exchangers	183.6	618.7	1,072.3	1,162.7	1,342.2	1,374.7	1,374.7	1,374.7
Misc. equip. average	198.8	578.1	1,062.1	1,113.3	1,189.3	1,193.1	1,225.5	1,226.4
Materials component	205.9	629.2	1,179.8	1,273.5	1,364.8	1,385.5	1,558.9	1,669.1
Labor component	258.8	951.9	2,411.6	2,497.8	2,601.4	2,576.2	2,665.5	2,669.4
Refinery (Inflation) Index	237.6	822.8	1,918.8	2,008.1	2,106.7	2,099.9	2,222.9	2,269.3

Refinery operating (1956 Basis)

(Explained on p.145 of the Dec. 30, 1985, issue)

	1962	1980	2005	2006	2007	May 2007	Apr. 2008	May 2008
Fuel cost	100.9	810.5	1,360.2	1,569.0	1,530.7	1,627.5	2,107.2	2,435.3
Labor cost	93.9	200.5	201.9	204.2	215.8	216.5	220.7	221.1
Wages	123.9	439.9	1,007.4	1,015.4	1,042.8	1,047.3	1,035.1	1,065.9
Productivity	131.8	226.3	501.1	497.5	483.4	483.7	468.9	482.1
Invest., maint., etc.	121.7	324.8	716.0	743.7	777.4	774.9	820.2	837.4
Chemical costs	96.7	229.2	310.5	365.4	385.9	380.9	454.4	478.0
Operating indexes								
Refinery	103.7	312.7	542.1	579.0	596.5	604.0	675.3	714.7
*Process units**	103.6	457.5	787.2	870.7	872.6	905.8	1,090.8	1,211.8

**Add separate index(es) for chemicals, if any are used. See current Quarterly Costimating, first issue, months of January, April, July, and October.*

These indexes are published in the first issue of each month. They are compiled by Gary Farrar, Journal Contributing Editor.

Indexes of selected individual items of equipment and materials are also published on the Costimating page in the first issue of the months of January, April, July, and October.

Natural gas pipeline profits surge; oil flat

Christopher E. Smith
Pipeline Editor

Natural gas pipeline operators saw their net profits surge nearly 19% in 2007 to $4.8 billion. US oil pipeline operators' profits, meanwhile, were nearly unchanged, despite a more than 5.6% increase in operating revenues. Much of the extra revenue may have been applied to growth or acquisitions, with more than $4 billion of oil carrier property changes reported in 2007, a greater than 115% increase from the prior year.

Operators, however, began to rein in plans to expand capacity. Both the number of formal construction plans brought before the US Federal Energy Regulatory Commission for new or expanded pipeline and compression and planned expenditure fell for the 12 months ending June 30, 2008.

Proposed mileage fell by more than 50%. Compression plans followed a similar pattern, with just four of 18 projects calling for new or additional compression of 20,000 hp or greater and none calling for more than 40,000 hp.

The decreased scale of the proposed projects reflects surging costs in both material and labor. Estimated $/mile pipeline costs rose nearly 22% to more than $3.38 million/mile, while $/hp cost estimates rose 12.4%.

Pipeline labor prices maintained their premium to material and miscellaneous costs as the single most expensive per-mile item. All three categories saw increases, but labor costs rose nearly $300,000/mile.

Higher-cost labor also affected the balance between estimated and actual costs for both pipeline and compressor projects completed in the 12 months ending June 30, 2007. Actual pipeline costs exceed projected

IN THIS REPORT . . .

- Pipeline revenues, incomes—2007
- US pipeline costs—land and offshore
- US pipeline costs: estimated vs. actual
- US compressor construction costs
- US compressor costs: estimated vs. actual
- US interstate mileage
- Investment in US oil pipelines
- 10 years of land construction costs
- Top 10 interstate oil lines
- Top 10 interstate gas lines
- Oil pipeline companies
- Gas pipeline companies

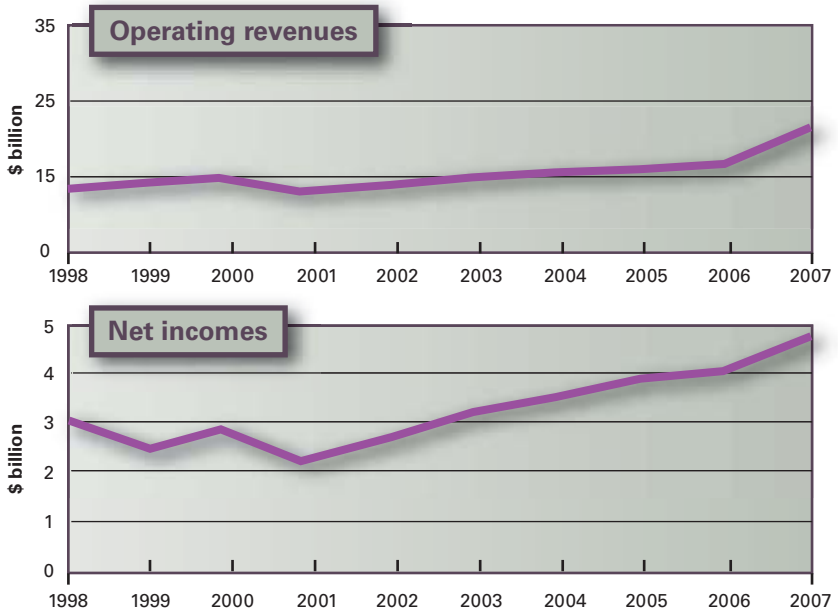
costs by nearly $373,000/mile, with labor costs making up nearly $215,000/mile of this difference.

Higher-than-anticipated labor costs also contributed almost the entire difference between estimated and actual compressor costs, with projects completed by June 30, 2008, running $40/hp more expensive than had been predicted, and actual costs for both material and miscellaneous expenses lower than estimated costs.

The difference between estimated and actual costs was even sharper for offshore projects, with actual costs running more than $4.2 million/mile higher than estimates. Companies active in the US Gulf of Mexico attributed the difference to delays and damage caused by Hurricanes Katrina and Rita in 2005.

NATURAL GAS PIPELINE PERFORMANCE TRENDS

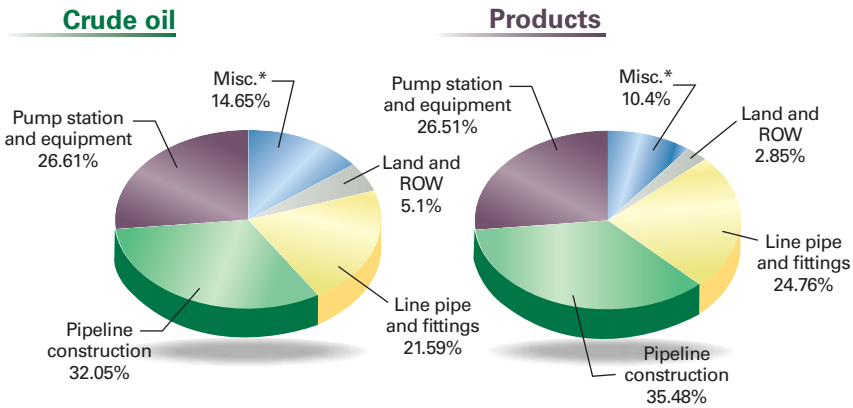
Fig. 1



Source: US FERC Forms 2 and 2A, gas pipeline company reports

OIL PIPELINE INVESTMENT

Fig. 2



*Generally includes delivery systems, communications, office furniture and equipment, vehicles and other work equipment, and other property.
Source: US oil pipeline company annual reports (Form 6) to FERC for 2007

US pipeline data

At the end of this article, two large tables (beginning on p. 65) offer a variety of data for US oil and gas pipeline companies: revenue, income, volumes transported, miles operated, and investments in physical plants. These data are gathered from annual reports filed with FERC by regulated oil and natural gas pipeline companies for the previous calendar year.

Data is also gathered from periodic filings with FERC by those regulated natural gas pipeline companies seeking FERC approval to expand capacity. OGJ keeps a record of these filings for each 12-month period ending June 30.

Combined, these data enable an analysis of the US regulated interstate pipeline system.

• *Annual reports.* Companies that, in FERC's determination , are involved in the interstate movement of oil or natural gas for a fee are jurisdictional to FERC, must apply to FERC for approval of transportation rates, and therefore must file a FERC annual report: Form 2 or 2A, respectively, for major or nonmajor natural gas pipelines; Form 6 for oil (crude or product) pipelines.

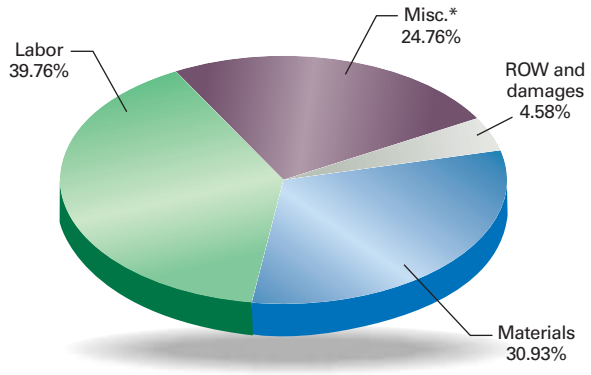
The distinction between "major" and "nonmajor" appears as a note at the end of the table listing all FERC-regulated natural gas pipeline companies for 2007 at the end of this article (p. 68).

The deadline to file these reports each year is Apr. 1. For a variety of reasons, many companies miss that deadline and apply for extensions, but eventually file an annual report. That deadline and the numerous delayed filings explain why publication of this OGJ report on pipeline economics occurs in the third quarter of each year. Earlier publication would exclude many companies' information.

• *Periodic reports.* When a FERC-regulated natural gas pipeline company wants to modify its system, it must apply for a "certificate of public convenience and necessity." This filing must explain in detail the planned construction, justify it, and—except in certain instances—specify what the company estimates construction will cost.

PIPELINE CONSTRUCTION COSTS—ESTIMATED

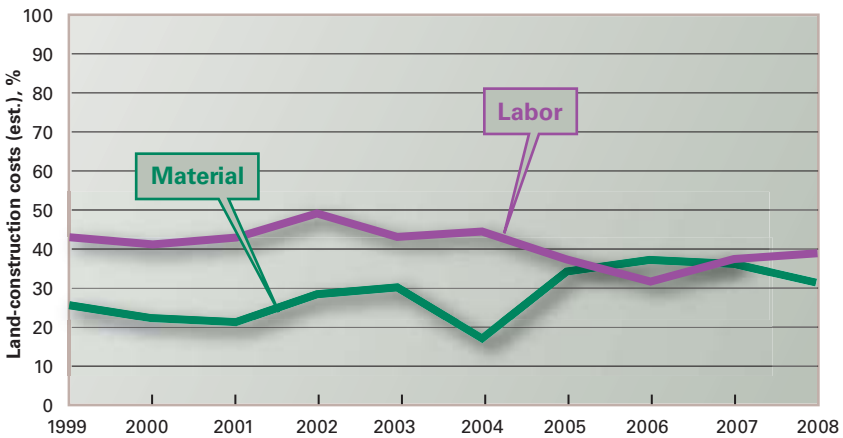
Fig. 3



*Generally includes surveying, engineering, supervision, administration and overhead, interest, contingencies and allowances for funds used during construction (AFUDC), and regulatory filing fees.
Source: US FERC construction-permit filings July 1, 2007, to June 30, 2008

MAJOR COST COMPONENTS—10 YEARS

Fig. 4



Source: US FERC

Not all applications are approved. Not all that are approved are built. But, assuming a company receives its certificate and builds its facilities, it must—again, with some exceptions—report back to FERC how its original cost estimates compared with what it actually spent.

OGJ spends the year July 1 to June 30 monitoring these filings, collecting them, and analyzing their numbers.

OGJ's exclusive, annual Pipeline Economics Report began tracking volumes of gas transported for a fee by major interstate pipelines for 1987 (OGJ, Nov. 28, 1988, p. 33) as pipelines moved gradually after 1984 from owning the gas they moved to mostly providing transportation services.

Volumes of natural gas sold by pipelines have been steadily declining, so that, beginning with 2001 data in the 2002 report, the table only lists volumes transported for others.

The company tables also reflect asset consolidation and merger activity among companies in their efforts to improve transportation efficiencies and bottom lines.

Reporting changes

The number of companies required to file annual reports with FERC may

US INTERSTATE PIPELINE MILEAGE

Table 1

Year	Miles Gas[1,2]	Miles Oil	Miles Total[1]
1998	190,250	157,234	347,484
1999	180,489	155,904	336,393
2000	186,151	152,823	338,974
2001	180,961	154,877	335,838
2002	190,899	149,619	340,518
2003	188,178	139,901	328,079
2004	190,117	142,200	332,317
2005	188,847	131,334	320,181
2006	189,012	140,407	329,419
2007	192,189	147,235	339,424

[1]FERC-defined major gas pipelines only; transmission mileage. See GAS COMPANIES table for definition of major and nonmajor companies and details of companies reporting mileage for 2006. [2]Totals revised from initial publication.
Source: US FERC annual reports: Form 6, oil pipelines; Forms 2 & 2A, gas pipelines

TOP 10 US INTERSTATE OIL PIPELINE COMPANIES—2007

	Company	Mileage	Company	Trunkline traffic, million bbl-miles	Company	Income, $1,000
1	Magellan Pipeline Co. LP	8,564	Colonial Pipeline Co.	708,334	Kinder Morgan Operating LP "A"	393,994
2	Plains Pipeline LP	8,387	Enbridge Energy LP	408,038	BP Pipelines North America Inc.	271,959
3	Mid-America Pipeline Co.	7,833	Marathon Pipeline LLC	169,388	ExxonMobil Pipeline Co.	259,971
4	ConocoPhillips Pipe Line Co.	6,693	Explorer Pipeline Co.	153,386	Shell Pipeline Co. LP	241,089
5	Colonial Pipeline Co.	5,591	TE Products Pipeline Co. LP	122,108	Colonial Pipeline Co.	222,024
6	Sunoco Pipeline LP	5,432	Plantation Pipe Line Co.	115,445	Magellan Pipeline Co. LP	191,591
7	TE Products Pipeline Co. LP	4,676	Plains Pipeline LP	110,222	Marathon Pipeline LLC	175,994
8	ExxonMobil Pipeline Co.	4,559	Laclede Pipeline Co.	93,586	TE Products Pipeline Co. LP	128,201
9	TEPPCO Crude Pipeline LP	3,967	Mid-America Pipeline Co. LLC	91,562	Whiting Oil & Gas Corp.	124,147
10	NuStar Logistics LP	3,746	ConocoPhillips Transportation Alaska Inc.	86,751	Enbridge Energy LP	122,491
	Top 10 total—2007	**59,448**		**2,058,820**		**$2,131,461**
	Part of all companies	**40.38%**		**59.52%**		**56.74%**
	Top 10 total—2006	60,447		2,001,551		$2,087,825

Source: US FERC Form 6: Annual Report of Oil Pipeline Companies, Dec. 31, 2007

Construction, other cost increases hit home

Expanded drilling of various natural gas supply basins, particularly new large shale plays, and construction of new LNG import facilities has helped create a historic pipeline infrastructure buildup in North America. One result, however, has been a sharp increase in labor and materials costs.

Wilson's "Market Conditions Update 2008" reported 2008 price increases announced as of July 1 for electric resistance weld line pipe totaling $1,025/ton and $1,325/ton from Tenaris and US Steel respectively. Further upstream in the steel process, steel scrap now costs more than what hot roll coil did as recently as late 2004.

Effect on plans

This cost run-up has begun to affect expansion plans for US oil and gas pipeline systems, with the number of applications for new construction sliding (p. 64) and cost overruns directly attributable to higher labor and material costs seen in a number of completed projects. Examples of these overruns and comments from some large system operators regarding approaches for addressing these moving forward follow.

Rendezvous Pipeline Co. LLC saw line pipe costs for its 21 mile, 20-in. OD project in Wyoming rise by nearly 41%. The company attributed this discrepancy directly to the number of projects being constructed at the same time, which forced it to pay premium prices to obtain the pipe it needed. What Rendezvous described as severe labor shortages also saw it pay premium prices for workers, with actual costs exceeding estimates by nearly 69%.

Other companies, such as Midwestern Gas Transmission Co., were forced to retain manpower and equipment on a stand-by basis—even prior to final construction authorization—to avoid losing the contractor or its personnel to other projects. This approach, combined with the already tight marker for labor and materials, saw Midwestern's material costs for a 16 in. OD, 31-mile line in Tennessee jump more than 29%, while labor costs more than quadrupled.

Columbia Gas Transmission Corp. estimated the cost of 20-in. OD steel pipe at $25.38/ft for a project it completed in 2007, but actually paid $38.13/ft.

Availability of equipment and labor has also been limited in the offshore segment, particularly in the wake of Hurricanes Katrina and Rita. Tennessee Gas Pipeline Co. invited several contractors to bid on work in March 2006, but a shortage of labor, boats, and other equipment forced the company to negotiate a day-rate priced construction schedule with the only bidder able to do the work. The contractor subsequently had difficulty finding qualified welders, forcing additional delays and expenses. Construction costs on the project were almost four times higher than estimated.

What's being said

Looking at these factors, Brian O'Higgins, who manages expansion projects in the Northeast US (where cost changes often have their greatest effect) for Williams, commented that beyond the industry-standard 5% contingency included in cost estimates, Williams now includes cost escalations for forward years on a line-item basis for items such as engineering, land, materials, and construction, which it updates quarterly. O'Higgins also said Williams is spending more time in a project's planning stages getting engineers and contractors in the field to help develop cost estimates on a segment-by-segment basis.

The net effect to Williams for projects already underway has been a lower internal rate of return.

ONEOK Inc., meanwhile, has attempted to lock in material costs when possible by actions such as extending pipe orders with mills already producing pipe for the company. ONEOK says that, though construction costs have increased, volume growth prospects have so far kept pace, resulting in continued favorable economics for its projects.

Enbridge, meanwhile, has acquired enough of its material in advance that it has successfully moved material from one project to another when delays are encountered. Denise Hamsher, Enbridge's director of federal, regulatory, and public affairs for the company's major US projects, also says that, though North American steel suppliers have so far been very competitive, the company would be looking further afield for new requirements moving forward.

Hamsher remarked that labor costs have been particularly hard felt on mainline construction projects, but that Enbridge had so far managed to keep its costs in line by coordinating with its contractors.

Jack Crawford, president and CEO of Altex Energy, which plans to build a crude oil line from Alberta to the US Gulf Coast, noted the importance of keeping the overall economic picture in mind when looking at the effects of costs, stating that all of Altex' competitors were being affected in the same way.

Labor concerns haven't affected Altex's plans yet, the pipeline currently being set for completion in 2012-14, and Crawford believes that job losses suffered in other skilled areas (the automotive industry for example) could create a new potential labor pool for the pipeline industry. Crawford also noted that high prices for steel and labor could eventually lead to demand erosion, reducing costs, and that the high cost of transportation could well make continental options for line pipe more appealing than overseas alternatives.

change from year-to-year, with some companies becoming jurisdictional, others nonjurisdictional, and still others merging or being consolidated out of existence.

Such changes require that care be taken in comparing annual US petroleum and natural gas pipeline statistics.

Institution by FERC of the two-tiered (2 and 2A) classification system for natural gas pipeline companies after 1984 further complicated comparisons (OGJ, Nov. 25, 1985, p. 55).

Only major gas pipelines are required to file miles operated in a given year. The other companies may indicate miles operated, but are not specifically required to do so.

For several years after 1984, many nonmajors did not describe their systems. But filing descriptions of their systems has become standard, and most provide miles operated.

Reports for 2007 show an increase in FERC-defined major gas pipeline companies: 77 companies of 121 filing for 2007, up from 73 of 118 for 2006.

FERC made an additional change to reporting requirements for 1995 for both crude oil and petroleum products pipelines.

Exempt from requirements to prepare and file a Form 6 were those pipelines with operating revenues at or less than $350,000 for each the 3 preceding calendar years.

These companies must now file only an "Annual Cost of Service Based Analysis Schedule," which provides only total annual cost of service, actual operating revenues, and total throughput in both deliveries and barrel-miles.

In 1996 major natural gas pipeline companies were no longer required to report miles of gathering and storage systems separately from transmission. Thus, total miles operated for gas pipelines consist almost entirely of transmission mileage.

FERC-regulated major natural pipeline mileage increased in 2007, reaching its highest level since 1995 (Table 1). Final data show an increase of more than 3,000 miles, or nearly 1.7%.

Rankings, activity

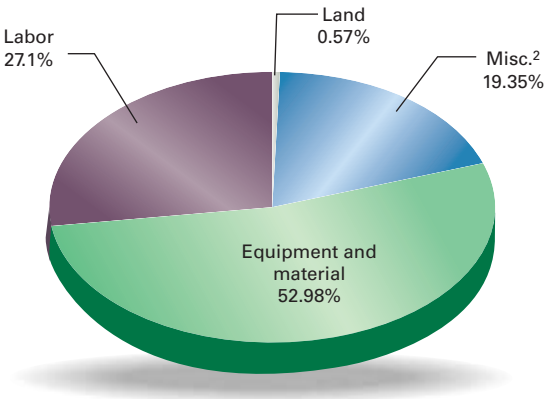
Natural gas pipeline companies in 2007 saw operating revenues increase by more than $4.6 billion or nearly 27% from 2006, outstripping the gains seen in net income and leading to the lowest earnings as a percent of revenue (21.93%) since 2003.

Oil pipelines saw much the same dynamic at work, with earnings nearly flat despite the 5.63% increase in revenues.

Liquids deliveries for 2007 via pipeline rose more than 1.2 billion bbl or 9.4%, led by a more than 13% rise in products deliveries. Throughput measured in million bbl-miles (bbl-mile: 1 bbl moving 1 mile), however, fell roughly 2%, by nearly 77 billion bbl-miles, with a crude throughput drop

COMPRESSOR CONSTRUCTION COSTS—ESTIMATED[1]

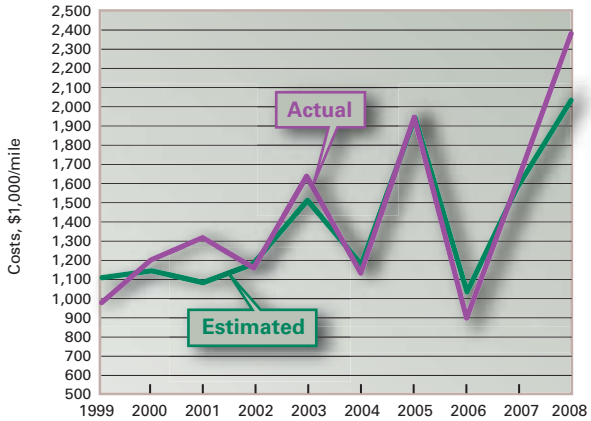
Fig. 5



[1]Land only. [2]Generally includes surveying, engineering, supervision, administration and overhead, interest, contingencies, allowances for funds used during construction (AFUDC), and regulatory filing fees.
Source: US FERC construction-permit filings, July 1, 2007, to June 30, 2008

ESTIMATED, ACTUAL COST TRENDS—10 YEARS*

Fig. 6



*Land and offshore pipeline construction as of June 30 of each year for the previous 12 months.
Source: US FERC

of more than 127 billion bbl-miles, or 8.1%, more than erasing gains in product throughput.

OGJ uses the FERC annual report data to rank the top 10 pipeline companies in three categories (miles operated, trunkline traffic, and operating income) for oil pipeline companies and three categories (miles operated, gas transported for others, and net income) for natural gas pipeline companies.

Positions in these rankings shift year to year, reflecting normal fluctuations in companies' activities and fortunes. But additionally, because these companies comprise such a large portion of their respective groups, the listings provide snapshots of overall industry trends and events.

Company financial data for all companies, not just the majors in both types of pipeline service, provide a view of the ongoing condition of these industries (Fig. 1; Table 2).

PIPELINE COMPANY REVENUES, INCOMES

Table 2

	Gas		Oil	
	Operating revenues, $1,000	Net income, $1,000	Operating revenues, $1,000	Net income, $1,000
1998	13,584,783	3,010,821	6,890,083	2,050,982
1999	14,616,949	2,545,043	7,219,500	2,928,460
2000	14,980,925	2,910,835	7,483,100	2,705,463
2001	14,407,467	2,246,109	7,729,972	3,006,898
2002	14,015,308	2,734,182	7,811,951	3,408,753
2003	15,082,011	3,260,797	7,703,998	3,469,996
2004	15,781,445	3,588,344	8,019,554	3,322,738
2005	16,375,921	3,863,331	7,917,176	3,076,476
2006	$17,122,586	$4,015,253	$8,516,563	$3,743,115
2007	$21,736,725	$4,765,815	$8,996,329	$3,756,749

Source: US FERC annual reports (Forms 2, 2A, and 6) by regulated interstate natural gas and oil pipeline companies

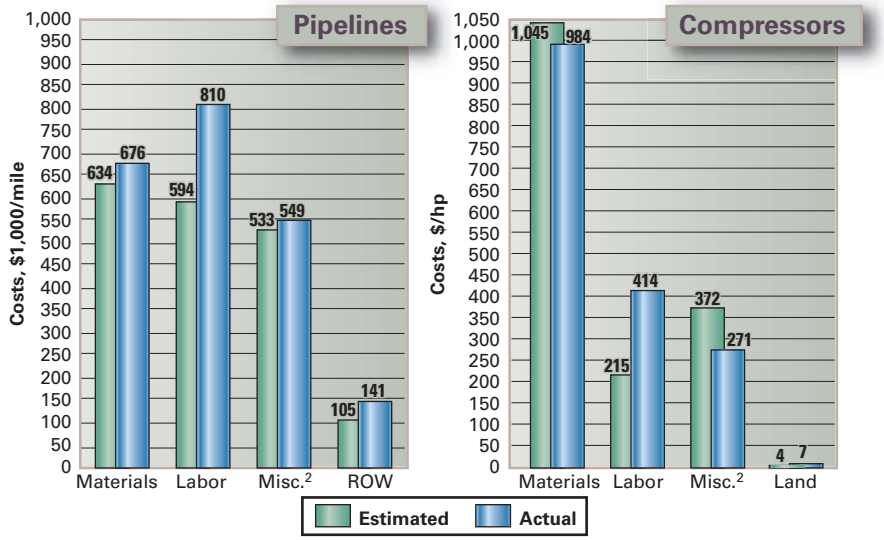
TOP 10 US INTERSTATE GAS PIPELINE COMPANIES—2007

	Company*	Transmission mileage	Company*	Volumes moved for fee, MMcf	Company*	Net income, $1,000
1	Northern Natural Gas Co.	15,487	Transcontinental Gas Pipe Line Corp.	2,669,937	Natural Gas Pipeline Co. of America	309,104
2	Tennessee Gas Pipeline Co.	14,463	ANR Pipeline Co.	2,043,743	Texas Eastern Transmission Corp.	266,984
3	Columbia Gas Transmission Corp.	10,339	Columbia Gas Transmission Corp.	1,849,756	Duke Energy Ohio Inc.	263,544
4	Transcontinental Gas Pipe Line Corp.	10,325	Tennessee Gas Pipeline Co.	1,801,283	Distrigas of Massachusetts LLC	215,092
5	El Paso Natural Gas Co.	10,240	Natural Gas Pipeline Co. of America	1,783,189	Southern Natural Gas Co.	208,736
6	ANR Pipeline Co.	9,587	El Paso Natural Gas Co.	1,673,647	Transcontinental Gas Pipe Line Co.	193,989
7	Texas Eastern Transmission LP	9,115	Texas Eastern Transmission Corp.	1,438,099	Columbia Gas Transmission Corp.	190,394
8	Natural Gas Pipeline Co. of America	9,045	Columbia Gulf Tranmission Co.	1,112,959	Tennessee Gas Pipeline Co.	174,639
9	Southern Natural Gas Co.	7,636	Northern Natural Gas Co.	1,055,067	Dominion Transmission Inc.	163,778
10	Gulf South Pipeline Co. LP	6,499	CenterPoint Energy Gas Transmission Co.	959,905	Northern Natural Gas Co.	161,088
	Total—2007	**102,736**	**Total—2007**	**16,387,585**	**Total—2007**	**$2,147,348**
	Part of majors	**53.46%**		**44.94%**		**46.09%**
	Part of all companies	**51.80%**		**44.13%**		**45.06%**
	Total—2006 top 10	102,810		15,710,325		$1,862,092

*All FERC-classified as "major."
Source: US FERC Forms 2 & 2A: annual reports for natural gas companies, Dec. 31, 2007

COMPONENT COSTS: ESTIMATED VS. ACTUAL[1]

Fig. 7



[1]Land only. For construction cost filings made before July 1, 2008. [2]Generally includes surveying, engineering, supervision, administration and overhead, interest, contingencies, allowances for funds used during construction (AFUDC), and regulatory filing fees.
Source: US FERC

For all natural gas pipeline companies, for example, net income as a portion of operating revenues fell in 2007 to 21.93%, continuing the downward trend started in 2006. Income as a portion of operating revenues stood at 23.59% in 2005.

The percentage of income in operating revenues for oil pipelines retreated in 2007 after rebounding strongly in 2006, falling to 41.76% from nearly 44%.

Net income as a portion of gas-plant investment countered the slight decline seen in income as a portion of revenue for natural gas pipelines, moving to 4.99% after having slipped 4.55% in 2006 and eclipsing the 4.7% level last seen in 1998.

For oil pipelines, net income as a portion of investment in carrier property in 2007 eased slightly, falling to 11.45% after having risen to 11.5%

INVESTMENT IN OIL PIPELINES—2007

Table 3

	Company and investment, $						
	A	B	C	D	E	Total, $	%
CRUDE PIPELINES							
Land	5,649,934	141,938	292,544	2,553,587	5,001,716	13,639,719	0.43
Right of way	127,072,575	955,277	316,592	8,728,483	12,972,227	150,045,154	4.68
Line pipe	493,771,621	23,386,168	11,353,060	36,091,605	49,553,093	614,155,547	19.15
Line pipe fittings	32,340,387	1,241,348	5,882,827	21,150,056	17,759,160	78,373,778	2.44
Pipeline construction	711,624,709	30,509,605	20,591,873	92,117,222	172,751,677	1,027,595,086	32.05
Buildings	89,722,374	4,002,648	3,608,637	9,473,094	11,792,563	118,599,316	3.70
Boilers	—	—	—	—	—	—	0.00
Pumping equipment	68,443,520	4,814,520	10,011,613	16,940,007	15,338,200	115,547,860	3.60
Machine tools and machinery	—	—	—	32,353	—	32,353	0.00
Other station equipment	388,511,281	22,796,715	11,723,840	102,320,572	37,150,365	562,502,773	17.54
Oil tanks	100,942,607	5,485,893	9,820,824	23,587,331	35,492,993	175,329,648	5.47
Delivery facilities	—	14,454	22,596,660	334,329	—	22,945,443	0.72
Communication systems	5,740,397	1,756,825	16,773	1,817,876	1,325,901	10,657,772	0.33
Office furniture and equipment	16,938,365	674,672	1,343,404	684,658	249,206	19,890,305	0.62
Vehicles and other work equip.	22,300,003	848,935	629,589	2,054,563	—	25,833,090	0.81
Other property	11,468,508	2,247,971	—	254,305,559	3,454,243	271,476,281	8.47
Total investment—2007	**$2,074,526,281**	**$98,876,969**	**$98,188,236**	**$572,191,295**	**$362,841,344**	**$3,206,624,125**	**100.00**
Total carrier property—2007	**$3,263,946,096**	**$100,068,328**	**$99,583,903**	**$620,396,642**	**$459,133,188**		
Total investment—2006	**$1,989,058,752**	**$97,214,242**	**$95,219,669**	**$536,139,778**	**$448,777,134**	**$3,166,409,573**	
PRODUCT PIPELINES							
Land	6,024,547	5,879,812	869,766	4,374,305	7,361,776	24,510,206	0.41
Right of way	—	21,898,235	28,233,032	11,701,291	84,700,052	146,532,610	2.44
Line pipe	398,880,323	81,816,217	487,312,680	92,554,942	180,840,129	1,241,404,291	20.65
Line pipe fittings	123,863,272	57,987,823	35,089,488	4,316,650	26,019,344	247,276,577	4.11
Pipeline construction	1,035,158,017	192,545,614	397,234,024	131,988,456	376,757,791	2,133,683,902	35.48
Buildings	38,307,423	15,545,101	7,729,352	19,742,427	35,954,597	117,278,900	1.95
Boilers	—	—	—	—	—	—	0.00
Pumping equipment	81,588,117	39,846,116	69,739,605	41,106,737	47,522,929	279,803,504	4.65
Machine tools and machinery	—	—	—	—	—	—	0.00
Other station equipment	279,313,958	149,939,359	115,534,763	105,102,199	239,587,361	889,477,640	14.79
Oil tanks	172,808,966	86,817,318	7,725,875	37,925,263	119,741,556	425,018,978	7.07
Delivery facilities	—	—	12,048,283	32,647,884	124,629,470	169,325,637	2.82
Communication systems	9,008,531	1,586,923	3,400,029	15,632,293	21,426,073	51,053,849	0.85
Office furniture and equipment	49,841,222	1,973,503	34,471,799	7,123,437	3,736,813	97,146,774	1.62
Vehicles and other work equip.	20,980,492	3,327,664	11,216,106	15,820,756	3,236,778	54,581,796	0.91
Other property	104,789,653	—	29,155,751	—	1,904,725	135,850,129	2.26
Total investment—2007	**$2,320,564,521**	**$659,163,685**	**$1,239,760,553**	**$520,036,640**	**$1,273,419,394**	**$6,012,944,793**	**100.00**
Total carrier property—2007	**$2,364,092,442**	**$674,256,329**	**$1,278,473,995**	**$520,450,073**	**$1,310,037,389**		
Total investment—2006	**$2,265,394,821**	**$464,793,474**	**$894,882,643**	**$510,856,614**	**$1,413,737,385**	**$5,549,664,937**	

Sources: US FERC Forms 6, Annual Report of Oil Pipeline Companies, Dec. 31, 2006, and 2007

US PIPELINE COSTS, ESTIMATED

Table 4

Size, in.	Location[1]	Length, miles	$ Material	Labor	Misc.[2]	ROW & damages	Total	$/mile
LAND PIPELINES								
8	North Dakota (lat.)	1.21	458,225	241,204	138,686	21,100	859,215	710,095
12	Arizona (lat.)	3.30	1,004,500	2,329,050	805,816	2,243,725	6,383,091	1,934,270
12	Massachusetts (lat.)	5.15	923,173	5,288,505	2,576,840	1,948,212	10,736,730	2,084,802
12	Connecticut	11.00	4,088,000	19,055,000	16,719,000	6,191,000	46,053,000	4,186,636
12	Colorado (lat.)	41.40	5,874,776	7,780,310	8,264,143	494,400	22,413,629	541,392
16	Louisiana (lat.)	0.50	591,333	844,996	676,271	210,742	2,323,342	4,646,684
20	New Mexico	7.30	6,345,000	6,870,000	3,591,100	169,500	16,975,600	2,325,425
30	Oklahoma-Texas	41.00	21,235,217	26,779,069	15,342,144	5,706,461	69,062,891	1,684,461
30	Oklahoma	50.00	78,059,190	5,666,000	27,635,148	1,848,000	113,208,338	2,264,167
36	Massachusetts	7.50	11,097,000	26,052,000	24,817,000	8,403,000	70,369,000	9,382,533
36	New York-Connecticut (L)	8.40	55,732,000	54,086,000	52,208,000	1,746,000	163,772,000	19,496,667
36	Massachusetts	12.90	27,298,000	72,487,000	68,514,000	33,538,000	201,837,000	15,646,279
36	Louisiana-Alabama	196.00	163,597,596	164,984,531	57,861,523	28,301,764	414,745,414	2,116,048
36	Oregon	230.00	282,148,000	504,924,000	328,609,000	—	1,115,681,000	4,850,787
42	Pennsylvania (L)	4.00	6,947,842	9,700,548	4,894,039	341,374	21,883,803	5,470,951
42	Pennsylvania (R)	7.00	11,645,551	29,185,695	16,486,003	5,778,006	63,095,255	9,013,608
42	Pennsylvania-New Jersey (L)	7.00	11,421,295	25,024,605	11,904,745	5,322,388	53,673,033	7,667,576
42	Texas	93.00	89,014,814	87,406,112	39,568,939	13,032,692	229,022,557	2,462,608
42	Texas-Louisiana	172.00	162,378,672	159,444,116	71,925,922	23,773,921	417,522,631	2,427,457
Total projects—land		**898.66**	**$939,860,184**	**$1,208,148,741**	**$752,399,633**	**$139,049,185**	**$3,038,758,314**	**$3,381,433**
Total land—2007 report		2,031.64	$2,054,945,437	$2,138,622,522	$1,209,947,343	$234,977,537	$5,638,492,839	$2,775,341
TOTAL—ALL PROJECTS		**898.66**	**$939,860,184**	**$1,208,148,741**	**$752,399,633**	**$139,049,185**	**$3,038,758,314**	**$3,381,433**
2007—report total, all projects		2,049.38	$2,065,435,053	$2,170,986,861	$1,220,967,651	$237,352,297	$5,694,741,862	$2,778,763

[1]L = loop; lat. = lateral; R = replacement. [2]Generally includes surveys, engineering, supervision, interest, administration, overheads, contingencies, allowances for funds used during construction (AFUDC), and FERC fees.
Source: US FERC construction-permit applications, July 1, 2007, to June 30, 2008

in 2006. Income as part of investment in carrier property in 2004 stood at 11.4%, having risen steadily toward that level from 6.8% in 1998.

Major and nonmajor natural gas pipelines in 2007 reported an industry gas-plant investment of more than $95.5 billion, the highest level ever, up from nearly $88.3 billion in 2006, $84 billion in 2005, more than $83 billion in 2004, nearly $78 billion in 2003, $74.2 billion in 2002, almost $71 billion in 2001, $68 billion in 2000, and nearly $66 billion in 1999.

Investment in oil pipeline carrier property also continued to rise in 2007, reaching almost $35.9 billion after rebounding to $32.7 billion in 2006 from the lowest level seen since at least 1997, 2005's $29.5 billion.

OGJ for several years has tracked carrier-property investment by five crude oil pipeline and five products pipeline companies chosen as representative in terms of physical systems and expenditures (Table 3). In 2003, we added the base carrier-property investment to allow for comparisons among the anonymous companies.

The five crude oil pipeline companies in 2007 increased their overall investment in carrier property by more than $40.2 million, or nearly 1.3%; the same grouping of companies increased overall investment in carrier property in 2006 by more than $38.4 million, or 1.2%. The increases of the group overall have come despite one of the five having lowered its investment in carrier property for the past 3 years.

The five products pipeline companies increased overall investment in carrier property in 2007 by $463 million, or 8.35%, following a more modest 2006 increase of $182 million, or 3.39%. These increases came despite a roughly $140 million reduction in investment by one of the five.

Comparisons of data in Table 2 with previous years must be done with caution: in 2004, a major crude oil pipeline company listed their sold significant assets, making comparisons with previous years' data difficult.

Investment by the five product pipeline companies in 2007 was more than $6 million, continuing a return to growth started in 2003 when investment of more than $4.7 billion was up from 2002's $4.5 billion level.

Fig. 2 illustrates the investment split in the crude oil and products pipeline companies.

Construction wavers

Applications to FERC by regulated interstate natural gas pipeline companies to modify certain systems must, except in certain instances, provide estimated costs of these modifications in varying degrees of details.

Tracking the mileage and compression horsepower applied for, and the estimated costs can indicate levels of construction activity over 2-4 years. OGJ has been doing that since this report began more than 50 years ago.

Tables 4 and 5 show companies' estimates during the period July 1, 2007, to June 30, 2008, for what it will cost to construct a pipeline or install new or

additional compression.

These tables cover a variety of locations, pipeline sizes, and compressor-horsepower ratings.

Not all projects that are proposed are approved. And not all projects that are approved are eventually built.

Applications filed in the 12 months ending June 30, 2008, fell sharply following 3 years of sustained strength:

- Roughly 900 miles of pipeline were proposed for land construction, and no new offshore work. The land level is down from the nearly 2,050 miles proposed in 2007, the 1,450 miles proposed in 2006, and the 1,700 miles proposed in 2005.
- New or additional compression proposed by the end of June 2008 measured 238,500 hp, down substantially from the 713,000 hp reached in 2007 and 583,000 hp seen in 2006, but still more than the 175,000 hp envisioned by the pipelines in 2005 (Table 5).

Putting the downturn in US gas pipeline construction in even starker perspective, Table 4 lists 19 land-pipeline "spreads," or mileage segments, and no marine projects, compared with:

- 25 land and 1 marine project (OGJ, Sept. 3, 2007, p. 51)
- 42 land and 1 marine project (OGJ, Sept. 11, 2006, p. 46).
- 56 land and 4 marine projects (OGJ, Sept. 12, 2005, p. 50).
- 15 land and 0 marine projects (OGJ, Aug. 23, 2004, p. 60).
- 37 land and 3 marine projects (OGJ, Sept. 8, 2003, p. 60).
- 83 land and 3 marine projects (OGJ, Sept. 16, 2002, p. 52).
- 49 land and 2 marine projects (OGJ, Sept. 3, 2001, p. 66).
- 115 land and 6 marine projects (OGJ, Sept. 4, 2000, p. 68).

Further, of the 19 projects applied for, only 8 are for pipelines of 50 miles or more in length, with just three of these being for projects over 100 miles long (and 2 of the 8 of 42-in. OD).

For the 12 months ending June 30, 2008, the 19 land projects would cost just more than $3 billion as compared with the $5.6 billion planned for 25 projects a year earlier. The smaller number and scale of these filings indicates a potential pause in addressing the infrastructural needs associated with US natural gas demand growth.

Projects' cost projections indicate much about where companies believe unit construction costs ($/mile) are headed. It is telling that even with the scale diminished, estimated $/mile costs for the new projects continued to rise.

For proposed US gas pipeline projects in 2007-08, the average land cost was $3.381 million/mile; in 2006-07, the average land cost was $2.775 million/mile; for 2005-06, the average land cost was $1.95 million/mile; for 2004-05 the average land cost was $2.2 million/mile; and for 2003-04 the average land cost was $1.7 million/mile.

US COMPRESSOR-CONSTRUCTION COSTS, ESTIMATED

Table 5

Location	Horsepower	$ Equipment material	Labor	Land	Misc.[1]	Total	$/hp
North Dakota[2]	1,590	1,903,000	714,100	—	267,095	2,884,195	1,814
North Dakota	1,750	2,386,084	809,340	100,000	368,383	3,663,807	2,094
New York	2,250	3,090,000	2,185,000	—	1,106,023	6,381,023	2,836
Illinois	3,550	3,865,143	7,334,124	—	3,333,041	14,532,308	4,094
Illinois	4,630	5,040,718	9,564,781	—	4,346,784	18,952,283	4,093
Louisiana	7,700	7,925,252	3,152,658	414,353	5,338,762	16,831,025	2,186
Arizona	8,290	11,837,400	7,096,600	310,000	4,655,700	23,899,700	2,883
West Virginia	9,470	12,942,563	13,983,594	22,500	13,115,343	40,064,000	4,231
Louisiana	10,310	8,963,647	3,482,628	7,645	5,312,423	17,766,343	1,723
Texas	12,270	14,837,347	4,982,430	156,596	4,078,225	24,054,598	1,960
Arkansas	15,000	12,982,707	7,308,398	158,220	5,808,719	26,258,044	1,751
Michigan	15,000	17,391,000	7,787,000	330,000	5,025,000	30,533,000	2,036
New Mexico	15,600	12,657,800	5,500,800	200,000	5,710,200	24,068,800	1,543
Mississippi	18,405	22,256,021	7,473,645	234,894	6,117,338	36,081,898	1,960
Wyoming[2]	20,500	16,514,000	11,279,000	—	5,867,000	33,660,000	1,642
Oregon	20,610	22,874,000	9,092,000	—	72,000	32,038,000	1,554
Louisiana	32,720	28,217,546	11,447,328	395,000	7,724,565	47,784,439	1,460
Texas	38,855	34,217,425	9,518,540	257,425	9,371,618	53,365,008	1,373
Total, land projects	**238,500**	**$239,901,653**	**$122,711,966**	**$2,586,633**	**$87,618,219**	**$452,818,471**	**$1,899**
2007—report total, land projects	713,033	$608,149,964	$215,431,276	$8,593,382	$233,094,060	$1,065,268,682	$1,689
TOTAL, ALL PROJECTS	**238,500**	**$239,901,653**	**$122,711,966**	**$2,586,633**	**$87,618,219**	**$452,818,471**	**$1,899**
2007—report total, all projects	713,033	$608,149,964	$215,431,276	$8,593,382	$233,094,060	$1,065,268,682	$1,689

[1]Generally includes surveys, engineering, supervision, interest, administration, freight, taxes, overheads, contingencies, allowances for funds used during construction (AFUDC), and FERC fees. [2]Addition.
Source: US FERC construction-permit applications, July 1, 2007, to June 30, 2008

Cost components

Variations over time in the four major categories of pipeline construction costs—material, labor, miscellaneous, and right-of-way (ROW)—can also suggest trends within each group.

Materials can include line pipe, pipe coating, and cathodic protection.

"Miscellaneous" costs generally cover surveying, engineering, supervision, contingencies, telecommunications equipment, freight, taxes, allowances for funds used during construction (AFUDC), administration and overheads, and regulatory filing fees.

ROW costs include obtaining rights-of-way and allowing for damages.

For the 19 land spreads filed for in 2007-08, costs-per-mile projections for the four categories all showed increases, with miscellaneous charges showing a particularly sharp jump:

- Material—$1,045,846/mile, up from $1,011,471/mile for 2006-07.
- Labor—$1,344,389/mile, up from $1,052,658 for 2006-07.
- Miscellaneous—$837,246/mile, up from $595,552/mile for 2006-07.
- ROW and damages—$154,729/mile, up from $115,659/mile for 2006-07.

Table 4 lists proposed pipeline in order of increasing size (OD) and increasing lengths within each size.

The average cost-per-mile for the projects rarely shows clear-cut trends related to either length or geographic area. In general, however, the cost-per-mile within a given diameter indicates that the longer the pipeline, the lower the unit (per-mile) cost for construction. And lines built nearer populated areas tend to have higher unit costs.

Additionally, road, highway, river, or channel crossings and marshy or rocky terrain each strongly affects pipeline construction costs.

Fig. 3, derived from Table 4, shows the major cost-component splits for pipeline construction costs.

Despite increases in other categories, labor remained the single largest portion of land construction costs. Labor's portion of estimated costs for land pipelines moved to 39.76% in 2008, from 37.93% in 2007 and 32.35% in 2006. Material costs for land pipelines continued to rise in absolute terms even while slipping as a percentage of total costs in 2008 to 30.93% from 36.44% in 2007 and 38.17% in 2006.

Fig. 4 shows a 10-year comparison of land-construction unit costs for the two major components: material and labor.

Fig. 5 shows the cost split for land compressor stations based on data in Table 5.

Table 6 lists 10 years of unit land-construction costs for natural gas pipelines with diameters of 8-36 in. The table's data consist of estimated costs filed under CP dockets with FERC, the same data shown in Tables 4 and 5.

10 YEARS OF LAND CONSTRUCTION COSTS[1]

Table 6

Size	Year	Average cost, $/mile ROW	Material	Labor	Misc.	Total	Range, $/mile Low	High
8 in.	2008	17,438	378,698	199,342	114,617	[2]710,095	—	—
	2007	—	—	—	—	—	—	—
	2006	—	—	—	—	—	—	—
	2005	—	—	—	—	—	—	—
	2004	239,860	84,651	599,280	591,276	1,515,068	1,507,694	1,518,017
	2003	206,313	72,270	280,847	207,362	766,793	390,870	10,712,500
	2002	25,302	31,809	88,400	81,165	[2]206,675	—	—
	2001	21,910	39,548	59,400	47,676	[2]168,533	—	—
	2000	20,099	51,065	385,845	137,789	594,797	909,727	4,003,300
	1999	—	—	—	—	—	—	—
12 in.	2008	178,757	195,406	566,193	466,159	1,406,515	541,392	4,186,636
	2007	—	—	—	—	—	—	—
	2006	45,944	160,618	243,104	174,207	623,873	515,091	1,159,683
	2005	—	—	—	—	—	—	—
	2004	559,684	212,495	1,740,003	691,419	3,203,601	222,012	4,628,800
	2003	10,941	119,813	196,100	75,363	402,217	158,194	646,240
	2002	15,470	88,398	180,110	39,168	323,146	160,116	524,417
	2001	88,592	83,940	481,060	267,073	920,665	820,179	925,452
	2000	30,721	83,069	264,461	163,653	541,894	190,731	885,051
	1999	28,786	380,886	1,331,040	827,938	2,568,651	2,280,685	[3]3,639,364
16 in.	2008	421,484	1,182,666	1,689,992	1,552,542	[2]4,646,684	—	—
	2007	—	—	—	—	—	—	—
	2006	181,184	192,998	398,048	111,888	884,118	601,274	948,857
	2005	88,312	144,768	238,056	181,419	652,555	396,660	1,728,247
	2004	246,628	141,315	849,567	386,050	1,623,560	353,528	2,529,399
	2003	24,549	93,299	172,599	73,049	363,497	210,023	1,377,297
	2002	11,756	88,358	135,606	71,383	307,104	201,614	1,796,507
	2001	30,964	146,191	592,557	464,233	1,233,953	822,866	3,619,607
	2000	132,500	121,675	374,154	359,815	988,143	241,877	3,612,208
	1999	127,078	237,824	442,903	275,440	1,083,245	325,082	4,373,200
20 in.	2008	23,219	869,178	941,096	491932	[2]2,325,425	—	—
	2007	—	—	—	—	—	—	—
	2006	99,125	233,125	796,688	478,406	[2]1,607,344	—	—
	2005	28,999	191,553	385,889	187,486	793,927	502,795	1,254,420
	2004	17,254	134,986	999,273	295,479	1,446,991	1,016,598	1,942,989
	2003	68,940	215,322	448,600	193,029	925,890	626,622	4,077,000
	2002	129,877	177,985	460,622	348,899	1,117,383	537,001	1,701,544
	2001	71,108	169,648	509,417	183,938	934,111	371,817	1,492,528
	2000	175,788	227,202	506,423	318,035	1,227,447	548,727	1,928,926
	1999	13,043	159,411	247,845	131,931	552,230	441,634	658,440
24 in.	2008	—	—	—	—	—	—	—
	2007	25,467	351,083	324,023	453,737	1,155,030	830,872	4,301,932
	2006	126,822	263,200	584,428	577,136	1,551,586	1,248,916	4,883,022
	2005	99,492	324,099	553,603	289,991	1,267,185	701,664	8,153,531
	2004	1,554,828	409,165	2,913,257	1,165,957	[2]6,043,208	—	—
	2003	197,476	323,116	1,124,623	728,855	2,374,070	923,400	9,236,061
	2002	43,494	233,583	641,094	305,899	1,224,069	754,046	7,021,087
	2001	130,504	241,517	540,604	281,141	1,193,767	532,645	5,029,640
	2000	119,147	238,555	461,141	327,696	1,146,538	402,515	2,168,000
	1999	27,662	187,217	239,619	109,016	563,515	457,266	1,145,345
30 in.	2008	83,016	1,091,147	356,539	472,278	2,002,981	1,684,461	2,264,167
	2007	156,303	1,371,819	1,328,831	922,647	3,779,600	1,546,833	4,715,909
	2006	135,337	589,703	960,760	650,255	2,336,055	1,131,419	6,791,954
	2005	108,418	580,031	1,296,166	639,103	2,623,718	1,333,438	4,082,365
	2004	150,549	448,125	634,490	371,734	1,604,899	1,447,235	2,264,492
	2003	40,472	389,806	476,194	205,405	1,111,877	732,468	[3]36,333,333
	2002	51,157	385,485	613,322	298,134	1,348,098	952,210	2,559,292
	2001	203,491	354,127	797,432	565,989	1,921,040	1,360,178	5,008,770
	2000	138,324	389,249	639,270	463,670	1,630,514	985,036	4,457,536
	1999	81,542	330,925	553,334	377,925	1,343,726	[3]646,407	3,990,476
36 in.	2008	170,489	994,375	1,098,096	511,589	2,774,549	2,427,457	9,013,608
	2007	97,746	869,995	628,204	893,293	2,489,238	1,857,468	4,056,369
	2006	233,258	844,583	1,141,388	1,349,079	3,568,308	1,900,376	8,066,157
	2005	161,665	819,178	929,436	633,630	2,543,909	1,424,610	4,798,806
	2004	150,070	426,999	352,594	565,474	[2]1,495,137	—	—
	2003	137,857	716,743	696,259	547,675	[2]2,098,532	—	—
	2002	53,571	475,832	762,214	212,008	1,503,625	1,127,089	3,616,470
	2001	58,344	420,420	491,155	323,870	1,293,789	966,841	3,217,182
	2000	195,848	454,764	779,527	442,122	1,874,260	1,256,079	10,708,278
	1999	177,714	458,936	831,128	441,646	1,909,424	1,348,224	2,530,873

[1]Estimates; based on FERC and construction-permit applications for a 12-month period ending June 30 of each year. [2]Only one project proposed during this period for this diameter. [3]Involves river, stream, or channel crossing.

Table 6 shows that the average cost per mile for any given diameter may fluctuate year to year as projects' costs are affected by geographic location, terrain, population density, or other factors.

Completed projects' costs

In most instances, a natural gas pipeline company must file with FERC what

US PIPELINE COSTS: ESTIMATED VS. ACTUAL, 2007-08[1]

Table 7

Size, in.	Location[1]	Length, miles	$ Materials	Labor	Misc.[2]	ROW & damages	Total	$/mile
Land pipelines								
16	Tennessee	30.90						
	Estimated		4,760,000	9,563,000	7,521,000	2,975,000	24,819,000	803,204
	Actual		6,160,000	41,064,000	14,508,000	7,373,000	69,105,000	2,236,408
18	Massachusetts	3.50						
	Estimated		1,297,531	4,374,660	4,337,636	3,433,392	13,443,219	3,840,920
	Actual		1,721,705	5,382,413	4,585,048	1,647,218	13,336,384	3,810,395
20	Pennsylvania	43.40						
	Estimated		6,538,461	58,537,524	18,600,676	1,007,638	84,684,299	1,951,251
	Actual		9,356,497	70,731,658	16,684,367	1,075,930	97,848,452	2,254,573
20	Wyoming	20.80						
	Estimated		3,379,190	4,681,280	2,635,135	520,000	11,215,605	539,212
	Actual		4,753,640	7,895,870	2,272,131	343,411	15,265,052	733,897
24	Georgia-Florida	166.63						
	Estimated		33,343,000	97,500,000	80,184,000	25,356,000	236,383,000	1,418,610
	Actual		38,287,000	116,300,000	69,705,000	24,692,000	248,984,000	1,494,233
24	Utah	58.60						
	Estimated		21,476,000	3,422,000	72,727,000	1,028,000	98,653,000	1,683,498
	Actual		21,472,250	1,512,967	74,110,942	399,027	97,495,186	1,663,740
24	Alabama (L, R)	6.83						
	Estimated		2,432,500	6,668,500	2,512,429	174,000	11,787,429	1,725,831
	Actual		2,565,233	6,295,509	2,039,083	105,831	11,005,656	1,611,370
24	Oklahoma	4.30						
	Estimated		1,617,573	2,092,845	1,497,517	172,500	5,380,435	1,251,264
	Actual		1,256,915	1,963,078	589,967	92,510	3,902,470	907,551
30	Pennsylvania (L)	4.00						
	Estimated		2,140,331	5,016,594	3,644,773	445,484	11,247,182	2,811,796
	Actual		2,028,143	5,218,437	2,278,968	484,862	10,010,410	2,502,603
30	Pennsylvania (L)	2.00						
	Estimated		1,192,313	2,267,982	1,887,174	188,560	5,536,029	2,768,015
	Actual		1,410,915	2,129,582	1,323,556	186,098	5,050,151	2,525,076
36	Wyoming	77.20						
	Estimated		59,229,045	4,444,000	77,238,000	1,114,000	142,025,045	1,839,703
	Actual		65,932,146	998,075	72,495,460	1,266,566	140,692,247	1,822,438
36	Texas-Louisiana (L, lat.)	58.50						
	Estimated		52,290,118	59,531,465	77,237,799	9,888,623	198,948,005	3,400,821
	Actual		61,896,962	115,020,879	67,130,790	9,284,901	253,333,532	4,330,488
36	Pennsylvania	10.35						
	Estimated		9,685,726	20,664,997	12,567,214	11,346,691	54,264,628	5,242,959
	Actual		7,556,647	36,405,858	12,369,529	6,671,961	63,003,995	6,087,343
36	Pennsylvania	6.44						
	Estimated		4,585,516	8,104,224	4,650,334	675,721	18,015,795	2,797,484
	Actual		7,170,025	12,477,826	4,144,521	931,093	24,723,465	3,839,047
36	Pennsylvania	4.85						
	Estimated		3,504,767	6,744,642	3,892,888	653,861	14,796,158	3,050,754
	Actual		2,493,273	10,022,267	3,044,117	987,046	16,546,703	3,411,691
36, 42	Wyoming-Colorado	327.00						
	Estimated		280,249,000	151,536,000	109,620,000	33,575,000	574,980,000	1,758,349
	Actual		288,430,000	171,206,000	152,409,000	64,445,000	676,490,000	2,068,777
42	Texas-Louisiana	172.00						
	Estimated		144,870,234	147,587,267	50,998,996	11,670,624	355,127,121	2,064,693
	Actual		151,625,539	203,362,430	47,630,250	20,562,519	423,180,738	2,460,353
Subtotal land, miles		**997.30**						
Estimated			**632,591,305**	**592,736,980**	**531,752,571**	**104,225,094**	**1,861,305,950**	**$1,866,345**
Actual			**674,116,890**	**807,986,849**	**547,320,729**	**140,548,973**	**2,169,973,441**	**$2,175,848**
Offshore pipelines								
24	Massachusetts	16.10						
	Estimated		12,460,800	99,760,400	60,250,000	2,428,700	174,899,900	10,863,348
	Actual		13,849,897	141,887,834	35,916,210	237,470	191,891,411	11,918,721
24	Louisiana	6.23						
	Estimated		7,175,832	8,909,058	5,878,710	--	21,963,600	3,525,457
	Actual		8,044,390	34,978,088	9,311,822	--	52,334,300	8,400,369
Subtotal offshore, miles		**22.33**						
Estimated			**$19,636,632**	**$108,669,458**	**$66,128,710**	**$2,428,700**	**$174,899,900**	**$10,863,348**
Actual			**$21,894,287**	**$176,865,922**	**$45,228,032**	**$237,470**	**$244,225,711**	**$15,169,299**
Total land and offshore, miles		**1,019.73**						
Estimated			**$652,227,937**	**$701,406,438**	**$597,881,281**	**$106,653,794**	**$2,036,205,850**	**$2,009,281**
Actual			**$696,011,177**	**$984,852,771**	**$592,548,761**	**$140,786,443**	**$2,414,199,152**	**$2,382,277**

[1]Actual cost data must be filed within 6 months following final hydrostatic test of pipeline. Not all projects proposed (estimated costs) are built (actual costs). L = loop; lat. = lateral; C = crossing. [2]Generally includes surveys, engr., supervision, interest, administration and overheads, contingencies, allowances for funds used during construction (AFUDC), and regulatory fees.
Source: US FERC; for completed-project costs filed between July 1, 2007, and June 30, 2008, under CFR Section 157.20(c)(4)

it has actually spent on an approved and built project. This filing must occur within 6 months after the pipeline's successful hydrostatic testing or the compressor's being put in service.

Fig. 6 shows 10 years of estimated vs.

US COMPRESSOR-STATION COSTS: ESTIMATED VS. ACTUAL, 2007-08[1]

Table 8

Location		Size, hp	Cost, $ Materials	Labor	Misc.[2]	Land	Total	$/hp
Pennsylvania[3]		2,200						
	Estimated		2,514,608	2,181,744	3,166,936	—	7,863,288	3,574
	Actual		3,088,848	4,461,589	2,054,921	10,514	9,615,872	4,371
New Jersey[3]		2,442						
	Estimated		455,202	464,739	345,064	—	1,265,005	518
	Actual		722,553	479,173	302,527	1,797	1,506,050	617
Pennsylvania[3]		7,070						
	Estimated		4,251,616	1,496,124	2,220,346	—	7,968,086	1,127
	Actual		3,053,251	2,809,281	2,213,217	3,696	8,079,445	1,143
Oklahoma		8,285						
	Estimated		6,431,885	2,334,684	2,691,196	18,000	11,475,765	1,385
	Actual		7,683,939	3,811,674	2,945,789	375	14,441,777	1,743
Illinois[3]		15,000						
	Estimated		14,022,000	6,506,000	4,078,000	24,000	24,630,000	1,642
	Actual		11,560,000	14,433,000	1,871,000	25,000	27,889,000	1,859
Wyoming		15,000						
	Estimated		11,680,000	1,145,000	9,340,000	35,000	22,200,000	1,480
	Actual		9,722,887	693,429	10,993,087	3,894	21,413,297	1,428
Pennsylvania		16,000						
	Estimated		11,382,232	9,657,550	8,408,305	195,467	29,643,554	1,853
	Actual		12,101,249	13,005,844	8,213,041	583,350	33,903,484	2,119
Wyoming		26,400						
	Estimated		16,000,000	1,300,000	15,265,000	35,000	32,600,000	1,235
	Actual		16,967,332	650,000	11,968,993	3,606	29,589,931	1,121
Michigan[3]		30,000						
	Estimated		27,715,000	9,677,000	8,098,000	311,000	45,801,000	1,527
	Actual		24,041,000	24,298,000	3,558,000	392,000	52,289,000	1,743
Texas-Louisiana[3]		30,000						
	Estimated		26,944,212	7,448,800	13,887,228	90,000	48,370,240	1,612
	Actual		32,424,917	16,598,113	7,225,406	325,396	56,573,832	1,886
Colorado-Wyoming		43,720						
	Estimated		83,621,000	—	5,425,000	—	89,046,000	2,037
	Actual		71,598,000	—	1,837,000	—	73,435,000	1,680
Total		**196,117**						
	Estimated		**$205,017,755**	**$42,211,641**	**$72,925,075**	**$708,467**	**$320,862,938**	**$1,636**
	Actual		**$192,963,976**	**$81,240,103**	**$53,182,981**	**$1,349,628**	**$328,736,688**	**$1,676**

[1]Actual cost data must be filed within 6 months following commissioning of installed compression equipment. Not all projects proposed (estimated costs) are built (actual costs). [2]Generally includes surveys, engr., supervision, interest, administration and overheads, contingencies, allowances for funds used during construction (afudc), and FERC fees. [3]Addition.
Source: US FERC; for completed-project costs filed between July 1, 2007, and June 30, 2008, under CFR Section 157.20(c)(4)

actual costs on cost-per-mile bases for project totals.

Tables 7 and 8 show such actual costs for pipeline and compressor projects reported to FERC during the 12 months ending June 30, 2008. Fig. 7, for the same period, depicts how total actual costs ($/mile) for each category compare with estimated costs.

Per-mile pipeline construction costs for completed projects rose by nearly 51%, after jumping more than 86% a year earlier. After leading the price surge last year, labor posted the smallest per-mile increase of the cost categories for completed projects in the 12 months ending June 30, 2008.

Even so, actual costs were 18.6% higher than projected costs for the 12 months ending June 30, 2008, with the price of labor running 40.4% higher than had been anticipated. Some of these projects may have been proposed and even approved much earlier than the 1-year survey period. Other may have been filed for, approved, and built during the survey period.

If a project was reported in construction spreads in its initial filing, that's how projects are broken out in Table 4. Completed projects' cost data, however, are usually reported to FERC for an entire filing, usually but not always separating pipeline from compressor-station (or metering site) costs and lumping several diameters together.

The 12 months ending June 30 saw more than 196,000 hp of new or additional compression completed, reversing recent declines that saw more than 96,000 hp completed in 2007, 106,000 hp completed in 2006, and 153,000 hp of new or additional compression completed in 2005 vs. 468,000 hp in 2004.

More than half of the 2007-08 horsepower came from three projects.

Actual compression costs ran within $40/hp of estimates, with declines in material costs and miscellaneous expenses countering higher than expected prices of labor (Table 8). ✦

Oil pipelines

Company	Miles of pipeline — Gathering	Miles of pipeline — Trunk — Crude	Miles of pipeline — Trunk — Products	Miles of pipeline — Total	Deliveries, 1,000 bbl — Crude	Deliveries, 1,000 bbl — Products	Deliveries, 1,000 bbl — Total	Total trunkline traffic, million bbl-miles — Crude	Total trunkline traffic, million bbl-miles — Products	Total trunkline traffic, million bbl-miles — Total	Fiscal data, $1,000 — Carrier property	Fiscal data, $1,000 — Property change	Fiscal data, $1,000 — Operating revenue	Fiscal data, $1,000 — Income
Alpine Transportation Co.	—	—	—	—	45,485	—	45,485	45	—	45	101,217	–5,964	28,561	13,627
Amoco Capline Pipeline Co.	—	667	—	667	21,225	—	21,225	9,066	—	9,066	—	—	9,393	2,903
Apache GOM Pipeline Inc.	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Arrowhead Louisiana Gathering LLC (new)	16	—	—	16	440	—	440	—	—	—	2,232	1,827	606	378
Baton Rouge Pipeline LLC	30	—	—	30	—	16,359	16,359	—	491	491	14,900	—	1,718	390
Belle Fourche Pipeline Co.	597	161	80	838	3,187	614	3,801	472	47	519	40,206	2,755	11,012	2,375
Belle Rose NGL Pipeline LLC	—	—	48	48	—	1,872	1,872	—	90	90	29,837	2	469	–1,048
Bengal Pipeline Co.	—	—	158	158	—	176,327	176,327	—	10,007	10,007	159,724	5,349	38,139	13,112
Black Lake Pipeline Co.	—	—	312	312	—	6,014	6,014	—	1,181	1,181	33,543	1,450	5,775	617
Blue Dolphin Pipe Line Co.	—	—	—	—	—	—	—	—	—	—	—	—	—	—
BP Oil Pipeline Co.	—	311	—	311	26,190	—	26,190	16,122	—	16,122	12,286	–3,755	18,486	40,937
BP Pipelines (Alaska) Inc.*	—	800	—	800	88,334	—	88,334	69,816	—	69,816	—	—	415,446	–17,476
BP Pipelines North America Inc.	—	2,252	1,233	3,485	148,033	61,761	209,794	42,089	3,927	46,016	459,133	–122,819	114,157	271,959
BP Transportation (Alaska) Inc.	—	42	—	42	14,111	—	14,111	243	—	243	152,817	1,200	29,430	11,979
Bridger Pipeline LLC	263	271	—	534	8,287	—	8,287	710	—	710	38,051	2,952	11,417	7,027
Buckeye NGL Pipe Lines LLC	440	—	—	440	—	7,465	7,465	—	2,746	2,746	87,039	203	12,510	2,497
Buckeye Pipe Line Co. LP	—	—	2,649	2,649	—	326,101	326,101	—	39,443	39,443	683,300	12,284	228,093	68,875
Buckeye Pipe Line Transportation LLC	—	—	571	571	—	26,582	26,582	—	3,959	3,959	156,910	5,452	24,664	10,673
Burlington Resources Trading Inc.	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Butte Pipe Line Co.	—	373	—	373	31,092	—	31,092	8,373	—	8,373	25,228	189	17,038	5,131
Caillou Boca Gathering LLC (new)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Calnev Pipe Line Co.	—	—	558	558	—	48,688	48,688	—	10,878	10,878	293,788	32,369	56,752	40,585
CCPS Transportation LLC.	—	658	—	658	37,754	—	37,754	24,467	—	24,467	210,252	19,258	46,341	15,190
Cenex Pipeline LLC	—	—	703	703	—	11,387	11,387	—	3,003	3,003	65,175	371	13,686	3,995
Centennial Pipeline LLC	—	—	797	797	—	45,958	45,958	—	31,359	31,359	300,358	693	49,824	843
Centurion Pipeline LP	1,276	2,317	—	3,593	70,191	—	70,191	6,841	—	6,841	353,724	178,788	56,908	15,923
Chaparral Pipeline Co. LLC (formerly LP)	—	—	845	845	—	8,129	8,129	—	4,808	4,808	119,268	3,313	33,040	13,893
Chevron Pipe Line Co.	157	1,941	1,476	3,574	189,528	45,342	234,870	9,424	7,666	17,090	709,131	68,522	153,733	–19,140
Chicap Pipe Line Co.	—	234	—	234	51,155	—	51,155	5,510	—	5,510	57,742	2,084	10,770	272
Chisholm Pipeline Co.	—	—	185	185	—	8,691	8,691	—	1,604	1,604	21,064	–27	3,821	1,767
Chunchula Pipeline Co. LLC	—	—	144	144	—	1,041	1,041	—	150	150	18,021	38	1,206	–673
Citgo Pipeline Co.	5	128	—	133	136,140	8,062	144,202	1,704	8	1,712	32,052	–663	10,823	2,423
Citgo Products Pipeline Co.	—	—	358	358	—	18,868	18,868	—	2,762	2,762	41,542	–22,570	18,027	100,622
Clear Fork Pipeline Co. (final)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Coffeyville Resources Crude Transportation LLC	102	334	—	436	6,787	—	6,787	752	—	752	13,266	110	6,451	3,540
Collins Pipeline Co.	—	—	124	124	—	47,257	47,257	—	5,884	5,884	21,490	553	10,511	182
Colonial Pipeline Co.	—	—	5,591	5,591	—	868,112	868,112	—	708,334	708,334	2,364,092	73,471	796,108	222,024
Conoco Offshore Pipe Line Co.	184	—	—	184	3,576	—	3,576	354	—	354	—	—	2,271	1,416
ConocoPhillips Pipe Line Co.	543	2,248	3,902	6,693	233,552	252,569	486,121	24,831	38,349	63,180	994,772	25,159	279,339	106,578
ConocoPhillips Transportation Alaska Inc.*	—	818	—	818	110,436	—	110,436	86,751	—	86,751	3,110,938	10,346	63,153	–230,893
Cottonwood Creek Inc.(new)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Cypress Pipe Line Co. LLC	—	57	—	57	10,395	—	10,395	593	—	593	11,636	—	6,139	2,882
Devon Energy Offshore Pipeline Co.	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Devon Energy Petroleum Pipeline Co.	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Dixie Pipeline Co.	—	—	1,371	1,371	—	37,176	37,176	—	18,182	18,182	115,846	12,452	49,788	7,636
Dome Pipeline Corp.	—	—	—	—	—	5,528	5,528	—	341	341	28,073	—	3,520	10,392
DryTrails Midstream Energy LLC.	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Ellwood Pipeline Inc.	11	26	—	37	3,690	—	3,690	4	—	4	1,863	608	5,193	5,761
Enbridge Energy LP	—	3,340	—	3,340	584,583	—	584,583	408,038	—	408,038	3,263,946	1,112,973	441,754	122,491
Enbridge Pipelines (North Dakota) LLC	307	623	—	930	33,531	—	33,531	13,310	—	13,310	148,566	61,021	37,140	13,933
Enbridge Pipelines (Ozark) LLC	—	480	—	480	85,961	—	85,961	30,553	—	30,553	121,181	35,327	44,145	25,949
Enbridge Pipelines (Patoka) LLC (new)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Enbridge Pipelines (Toledo) Inc.	—	151	—	151	19,468	—	19,468	1,606	—	1,606	54,679	206	14,763	1,588
Encore Clear Fork Pipeline LLC (formerly Clear Fork Pipline Co.)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Endicott Pipeline Co.	—	26	—	26	17,064	—	17,064	444	—	444	60,569	94	5,271	–1,988
Energy Development Corp. (HIPS) Inc	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Enterprise Lou-Tex NGL Pipeline LP	—	—	205	205	—	10,533	10,533	—	2,149	2,149	100,147	5,176	15,675	7,658
EPL Pipeline LLC (new)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Explorer Pipeline Co.	—	—	1,885	1,885	—	213,345	213,345	—	153,386	153,386	674,256	194,522	285,298	77,140
Express Pipeline LLC.	—	513	—	513	77,919	—	77,919	37,084	—	37,084	405,921	1,584	82,168	32,017
ExxonMobil Pipeline Co.*	605	1,049	2,905	4,559	390,975	326,720	717,695	65,155	9,547	74,702	586,492	10,999	408,398	259,971
Frontier Pipeline Co.	—	290	—	290	14,467	—	14,467	4,205	—	4,205	69,557	3,571	10,357	6,201
Genesis Pipeline USA LP	131	228	—	359	12,457	—	12,457	736	—	736	53,298	844	18,204	7,060
Heartland Pipeline Co.	—	—	36	36	—	9,128	9,128	—	2,897	2,897	12,199	210	7,676	4,888
Holly Energy Partners—Operating LP	—	—	1,481	1,481	—	46,580	46,580	—	10,000	10,000	38,010	6,993	33,991	54,582

OIL PIPELINES (CONTINUED)

Company	Miles of pipeline: Gathering	Miles of pipeline: Trunk: Crude	Miles of pipeline: Trunk: Products	Miles of pipeline: Total	Deliveries, 1,000 bbl: Crude	Deliveries, 1,000 bbl: Products	Deliveries, 1,000 bbl: Total	Total trunkline traffic, million bbl-miles: Crude	Total trunkline traffic, million bbl-miles: Products	Total trunkline traffic, million bbl-miles: Total	Fiscal data, $1,000: Carrier property	Fiscal data, $1,000: Property change	Fiscal data, $1,000: Operating revenue	Fiscal data, $1,000: Income
Inland Corp.	—	—	610	610	—	44,545	44,545	—	3,126	3,126	34,388	174	20,533	2,660
Interstate Storage & Pipe Line Corp.	—	—	—	—	2,132	—	2,132	—	—	—	5,023	—	2,109	–296
IMTT-Pipeline	—	—	10	10	—	28,917	28,917	—	205	205	21,397	239	1,814	–1,561
Jayhawk Pipeline LLC	4	724	—	728	30,395	—	30,395	2,854	—	2,854	63,718	2,471	22,712	7,504
Kaneb Pipe Line Operating Partnership LP	—	—	2,330	2,330	—	73,336	73,336	—	20,494	20,494	539,431	9,020	102,272	82,568
Kenai Pipe Line Co.	—	—	23	23	15,846	12,257	28,103	364	282	646	34,859	6,321	9,167	2,884
Keystone Pipeline Co. LLC	—	—	—	—	—	2,989	2,989	—	694	694	—	—	2,973	19
Kiantone Pipeline Corp.	—	78	—	78	21,044	—	21,044	—	—	—	15,485	3,993	4,419	653
Kinder Morgan Cochin LLC (formerly Cochin Pipeline System)	—	—	1,236	1,236	14,415	—	14,415	10,825	—	10,825	175,369	30,726	40,350	3,017
Kinder Morgan Operating LP "A"	—	—	104	104	—	15,543	15,543	—	1,622	1,622	39,744	–191,476	6,803	393,994
Kinder Morgan Wink Pipeline LLC (formerly LP)	9	425	—	434	44,692	—	44,692	10,960	—	10,960	91,026	1,334	32,671	20,237
Koch Alaska Pipeline Co. LLC*	—	819	—	819	11,076	—	11,076	5,896	—	5,896	—	—	20,846	–6,282
Koch Pipeline Co. LP	—	591	11	602	14,613	3,624	18,237	7,884	39	7,923	190,540	94	26,336	30,118
Kuparuk Transportation Co.	—	—	—	—	114,797	—	114,797	57	—	57	135,625	–1,180	23,025	9,820
Laclede Pipeline Co.	—	—	40	40	—	4,396	4,396	—	93,586	93,586	6,213	127	1,513	550
LDH Energy Hastings LLC (new)	—	—	36	36	—	350,489	350,489	—	10	10	18,495	18,495	3,631	1,487
LOCAP LLC	—	57	—	57	362,160	—	362,160	20,665	—	20,665	150,266	808	28,861	8,240
Longhorn Partners Pipeline LP	—	—	761	761	—	18,386	18,386	—	12,596	12,596	516,628	13,437	64,056	6,924
Magellan Pipeline Co. LP	—	—	8,564	8,564	—	308,089	308,089	—	80,305	80,305	1,310,037	40,455	394,630	191,591
Marathon Offshore Pipeline LLC	—	295	—	295	7,533	—	7,533	879	—	879	30,943	–187	10,235	6,188
Marathon Pipe Line LLC	—	1,813	1,277	3,090	529,564	337,255	866,819	147,181	22,207	169,388	620,397	52,335	321,954	175,994
MarkWest Michigan Pipeline Co. LLC	85	152	—	237	5,099	—	5,099	774	—	774	22,150	15	5,046	124
Mars Oil Pipeline Co.	—	121	—	121	—	—	—	—	—	—	147,000	–471	121,361	71,046
Mid-America Pipeline Co. LLC	2,030	—	5,803	7,833	—	266,338	266,338	—	91,562	91,562	1,278,474	516,197	269,418	53,851
Mid-Valley Pipeline Co.	—	1,087	—	1,087	108,241	—	108,241	13	—	13	100,068	4,060	63,789	18,165
Milne Point Pipeline LLC	—	11	10	21	12,254	—	12,254	135	—	135	54,404	—	12,011	–3,305
Minnesota Pipe Line Co.	—	675	—	675	99,996	—	99,996	25,599	—	25,599	373,906	224,191	45,722	7,864
Mobil Eugene Island Pipeline Co.	—	—	—	—	4,620	—	4,620	314	—	314	21,328	323	7,109	5,765
Mobil Pipe Line Co.	94	999	689	1,782	149,060	78,218	227,278	15,764	7,383	23,147	171,821	3,785	55,417	44,079
MOEM Pipeline LLC	—	56	—	56	23,505	—	23,505	1,327	—	1,327	25,335	8,368	6,337	2,612
Muskegon Pipeline LLC	—	—	170	170	—	12,124	12,124	—	2,057	2,057	28,145	95	6,366	3,617
Mustang Pipe Line LLC	—	211	—	211	33,329	—	33,329	6,848	—	6,848	58,760	251	28,527	19,771
Navajo Nation Oil & Gas Co. Inc. (new)	—	—	—	–	—	—	—	5	—	5	2,784	—	3,514	758
Navajo Pipeline Co.	500	326	—	826	15,368	—	15,368	613	—	613	19,190	801	11,453	6,900
NORCO Pipe Line Co. LLC	—	—	419	419	—	14,978	14,978	—	1,226	1,226	73,257	972	6,942	–6,461
Nova Chemicals Inc.	—	—	—	—	—	—	—	—	—	—	—	—	—	—
NuStar Logistics LP (new)	—	814	2,932	3,746	142,598	146,073	288,671	11,364	23,199	34,563	562,567	11,169	151,014	66,322
NW Pipeline Inc.	—	—	—	—	1,035	—	1,035	109	—	109	6,402	44	871	–401
Ohio Oil Gathering Corp. II	137	—	—	137	1,526	—	1,526	—	—	—	9,877	–121	5,118	–63
Ohio River Pipe Line LLC	—	—	549	549	—	45,804	45,804	—	3,386	3,386	200,113	2,397	38,218	20,285
Olympic Pipe Line Co.	—	—	408	408	—	104,230	104,230	—	18,298	18,298	214,519	7,407	80,369	15,425
ONEOK NGL Pipeline LLC (formerly LP)	—	—	2,444	2,444	—	110,419	110,419	—	30,908	30,908	520,403	79,667	76,566	40,816
ONEOK North System LLC (new)	—	—	1,630	1,630	—	83,833	83,833	—	6,801	6,801	278,293	278,293	47,641	25,591
Osage Pipe Line Co. LLC	—	135	—	135	44,213	—	44,213	5,969	—	5,969	21,133	1,203	13,240	9,377
Phillips Texas Pipeline Co. Ltd.	491	607	1,043	2,141	60,350	99,580	159,930	11,337	7,862	19,199	184,517	4,765	100,414	75,666
Pioneer Natural Resources USA Inc.	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Pioneer Pipe Line Co.	—	—	346	346	—	27,045	27,045	—	5,894	5,894	89,875	1,293	26,344	9,262
Plains LPG Services LP (new)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Plains Pipeline LP	2,047	6,084	256	8,387	746,868	17,722	764,590	107,767	2,455	110,222	961,846	25,582	301,329	113,823
Plantation Pipe Line Co.	—	—	3,123	3,123	—	195,520	195,520	—	115,445	115,445	520,450	4,920	189,325	35,593
Platte Pipe Line Co.	—	936	—	936	94,541	—	94,541	44,038	—	44,038	248,383	2,175	57,175	5,503
PMI Services North America Inc. (new)	—	—	—	—	—	4,178	4,178	—	4	4	15,401	1,470	5,776	1,242
Point Arguello Pipeline Co.	—	—	—	—	3,028	—	3,028	—	—	—	288,816	1,019	5,368	–15,167
Point Arguello Terminal Co.	—	—	—	—	—	—	—	—	—	—	—	—	—	–595
Pogo Offshore Pipeline Co. (last)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Portland Pipe Line Corp.	10	332	—	342	130,154	—	130,154	21,606	—	21,606	99,584	5,125	62,508	11,809
Premcor Pipeline Co.	—	124	117	241	74,249	134,714	208,963	2,215	836	3,051	52,423	5,611	30,666	–17,113
Razorback LLC	67	—	—	67	—	3,591	3,591	—	240	240	21,903	6,188	1,880	3,375
Red Butte Pipe Line Co.	67	736	—	803	14,793	—	14,793	1,494	—	1,494	20,262	4,228	14,066	4,175
Regency Liquids Pipeline LLC	—	—	40	40	—	1,686	1,686	—	67	67	5,571	43	1,071	120
Rio Grande Pipeline Co.	—	—	223	223	—	5,916	5,916	—	1,322	1,322	46,196	1,401	9,217	3,556
Rocky Mountain Pipeline System LLC	328	1,794	545	2,667	74,306	27,225	101,531	10,527	2,665	13,192	490,866	147,539	72,275	14,997
Salmon Resources Ltd.	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sanders Pipeline Co.	—	—	9	9	—	3,357	3,357	—	31	31	1,934	—	2,659	–292
San Pedro Bay Pipeline Co.	18	—	—	18	758	—	758	—	—	—	4,195	4,195	914	–1,851

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Oil pipelines (continued)

Company	Miles of pipeline — Gathering	Trunk — Crude	Trunk — Products	Total	Deliveries, 1,000 bbl — Crude	Products	Total	Total trunkline traffic, million bbl-miles — Crude	Products	Total	Fiscal data, $1,000 — Carrier property	Property change	Operating revenue	Income
Seaway Crude Pipeline Co.	—	—	—	—	138,847	—	138,847	24,852	—	24,852	334,015	8,362	53,456	21,589
Seaway Products Pipeline Co.	—	—	520	520	—	4,266	4,266	—	2,031	2,031	68,857	–115	2,326	–9,955
Seminole Pipeline Co.	97	—	1,229	1,326	—	105,178	105,178	—	59,124	59,124	419,182	21,502	78,281	13,833
SemPipe LP	—	—	—	—	—	—	—	—	—	—	—	—	—	—
SFPP LP	—	—	2,615	2,615	—	434,143	434,143	—	68,585	68,585	1,890,986	237,767	275,161	–20,448
Shamrock Pipe Line Corp.	198	25	—	223	6,061	—	6,061	6	—	6	4,022	800	1,244	–641
Shell Pipeline Co. LP	10	1,600	414	2,024	587,375	142,678	730,053	39,221	789	40,010	572,947	10,997	206,958	241,089
Ship Shoal Pipeline Co.	—	121	—	121	84,045	—	84,045	3,719	—	3,719	42,649	246	18,258	10,123
Sinclair Pipeline Co. LLC	—	—	491	491	—	10,808	10,808	—	—	—	3,701	—	7,188	1,943
Skelly-Belvieu Pipeline Co.LLC	—	—	571	571	—	8,622	8,622	—	4,927	4,927	69,834	1,717	10,691	1,312
Sorrento Pipeline Co LLC	—	—	446	446	—	14,413	14,413	—	641	641	122,746	13,065	7,640	7,183
Southcap Pipe Line Co.	—	638	—	638	26,774	—	26,774	12,369	—	12,369	—	—	15,954	434
SouthTex 66 Pipeline Co. Ltd.	—	—	738	738	—	71,866	71,866	—	14,000	14,000	170,927	4,847	69,630	34,155
St. Louis Pipeline Corp.	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Suburban Pipeline LLC	—	—	—	—	—	21	21	—	—	—	—	–4,073	423	–333
Suncor Energy (USA) Pipeline Co.	—	313	—	313	30,717	—	30,717	4,386	—	4,386	41,136	5,675	19,976	7,209
Sunoco Pipeline LP	3,629	123	1,680	5,432	241,754	92,837	334,591	65	141	206	902,667	101,348	211,643	75,375
Targa NGL Pipeline Co. LLC	—	—	155	155	—	—	—	—	832	832	31,226	2,295	4,024	–499
TE Products Pipeline Co. LP	—	—	4,676	4,676	—	204,475	204,475	—	122,108	122,108	1,329,617	370,046	294,349	128,201
TEPPCO Crude Pipeline LLC (formerly LP)	—	3,967	—	3,967	152,018	—	152,018	7,880	—	7,880	420,866	130,109	84,558	10,777
Tesoro High Plains Pipeline Co.	228	547	—	775	20,525	—	20,525	4,871	—	4,871	93,816	1,776	21,989	5,630
Total Petrochemicals Pipeline USA Inc.	—	14	—	14	—	—	—	25	—	25	361	—	1,606	1,565
TransMontaigne Product Services Inc. (new)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Trans Mountain Pipeline (Puget Sound) LLC (new)	—	64	—	64	39,353	—	39,353	1,223	—	1,223	23,658	6,794	11,806	10,367
Tri-States NGL Pipeline LLC	—	—	165	165	—	20,326	20,326	—	3,069	3,069	90,416	1,085	17,599	8,291
Unocal Pipeline Co.*	93	1,179	—	1,272	6,419	—	6,419	3,226	—	3,226	21,081	1,772	14,867	–6,371
Valero Logistics Operations LP	36	404	2,324	2,764	83,420	82,071	165,491	4,454	15,273	19,727	557,753	37,250	164,104	81,542
Valero Terminaling and Distribution Co.	—	—	113	113	—	1,446	1,446	—	126	126	1,355	–54	558	–4,357
West Shore Pipe Line Co.	—	3	649	652	34,528	139,570	174,098	119	14,101	14,220	84,161	422	56,544	14,223
WestTex 66 Pipeline Co.	—	—	707	707	—	12,340	12,340	—	2,829	2,829	26,067	1,283	6,697	14,046
West Texas Gulf Pipe Line Co.	—	579	—	579	99,430	—	99,430	114	—	114	56,876	3,110	27,316	9,585
West Texas LPG Pipeline LP	—	—	2,341	2,341	—	79,608	79,608	—	34,442	34,442	140,790	6,734	57,164	13,065
Whiting Oil & Gas Corp.	66	13	—	79	2,646	—	2,646	34	—	34	5,326	20	2,013	124,147
WILPRISE Pipeline Co. LLC	—	—	30	30	—	13,381	13,381	—	401	401	24,468	56	3,285	1,148
Wolverine Pipe Line Co.	—	—	742	742	—	117,793	117,793	—	12,899	12,899	151,754	337	55,330	9,731
Wood River Pipe Lines LLC	—	—	995	995	—	85,571	85,571	—	14,703	14,703	387,109	15,379	44,007	15,509
Yellowstone Pipe Line Co.	—	—	690	690	—	35,724	35,724	—	7,016	7,016	61,392	656	22,580	4,067
2007 total	**14,911**	**46,658**	**85,666**	**147,235**	**7,038,083**	**6,895,723**	**13,933,806**	**1,451,245**	**2,008,042**	**3,459,287**	**$35,862,833**	**$4,062,114**	**$8,996,329**	**$3,756,749**
2006 total	12,141	47,617	81,103	140,861	6,667,739	6,100,515	12,732,265	1,578,403	1,957,805	3,536,208	$32,686,026	$1,883,606	$8,516,563	$3,743,115

*Crude and total mileages represent 818 miles of Trans-Alaska Pipeline, operated by Alyeska Pipeline Service Co., Anchorage. This figure is included in column total only once to avoid duplication. NR = not reported.
Source: US FERC Form No. 6: Annual Report of Oil Pipelines, Dec. 31, 2007

Gas pipelines

Company	Transmission system, miles	Total compression stations — Transmission	Other	Total	Volumes trans. for others, MMcf	Fiscal data, $1,000 — Gas plant	Additions	Operating & maintenance expenses	Operating revenue	Net income
Algonquin Gas Transmission LLC*	1,115	6	—	6	365,913	1,442,393	206,552	41,008	157,315	28,265
Alliance Pipeline LP*	886	7	—	7	632,197	1,868,233	16,677	45,179	279,762	81,948
ANR Pipeline Co.*	9,587	47	24	71	2,043,743	3,644,747	105,423	342,818	601,839	79,218
ANR Storage Co.*	24	—	3	3	—	139,599	943	7,602	29,443	25,688
Bear Creek Storage Co.*	—	—	1	1	—	160,964	636	8,050	38,248	15,850
Black Marlin Pipeline Co.	67	—	—	—	1,198	26,604	2,213	1,843	710	–1,766
Blue Lake Gas Storage Co.	—	—	1	1	—	103,186	99	3,250	24,756	9,548
Canyon Creek Compression Co.	—	1	—	1	9,017	24,068	1,023	1,597	1,808	–500
Carolina Gas Transmission Corp.*	1,484	3	—	3	108,666	272,682	7,684	19,380	49,135	13,637
CenterPoint Energy Gas Transmissiion Co.*	6,320	55	3	58	959,905	1,830,135	611,722	153,584	408,279	116,796
CenterPoint Energy Mississippi River Transmission Corp.*	1,641	14	2	16	357,798	548,179	17,996	66,661	103,955	11,373
Centra Pipelines Minnesota Inc.	66	—	—	—	12,865	4,793	40	832	933	–52
Central Kentucky Transmission	29	—	—	—	5,297	742	—	73	173	46
Central New York Oil and Gas Co. LLC (new)	—	—	—	—	—	—	—	—	—	—
Chandeleur Pipe Line Co.*	117	—	—	—	34,903	46,423	721	2,768	6,858	783
Cheyenne Plains Gas Pipeline Co. LLC*	413	2	—	2	268,344	409,786	6,847	18,207	99,690	28,598
Clear Creek Storage Co. LLC	15	—	2	2	—	20,452	268	1,109	1,263	–541
Colorado Interstate Gas Co.*	3,931	32	6	38	853,826	1,287,819	52,072	114,214	319,254	135,180
Columbia Gas Transmission Corp.*	10,339	71	25	96	1,849,756	3,887,778	163,360	283,976	728,384	190,394
Columbia Gulf Transmission Co.*	4,122	15	—	15	1,112,959	1,171,444	53,029	57,582	134,337	27,953
Crossroads Pipeline Co.	202	1	—	1	36,864	37,706	104	2,156	4,458	324
Dauphin Island Gathering Partners*	120	—	—	—	76,444	128,077	16,878	8,025	15,198	–12,148
Destin Pipeline Co. LLC*	271	2	—	2	313,197	504,151	115	16,286	98,746	35,287
Discovery Gas Transmission LLC*	190	—	—	—	259,313	209,592	8,362	9,995	16,708	–15,102
Distrigas of Massachusetts LLC*	—	—	—	—	—	296,007	3,833	1,352,901	1,525,912	215,092
Dominion Cove Point LNG LP*	90	2	—	2	181,143	419,349	39,325	26,780	91,732	24,618
Dominion South Pipeline Co. LP	—	—	—	—	16,339	2,113	—	61	774	330
Dominion Transmission Inc.*	3,344	59	43	102	621,396	2,920,181	106,912	358,379	799,040	163,778
Duke Energy Kentucky Inc.*	—	—	—	—	6,673	319,464	24,589	121,682	490,611	33,469
Duke Energy Ohio Inc.* (new)	—	—	—	—	—	1,127,375	86,390	459,966	3,416,396	263,544
East Tennessee Natural Gas LLC*	1,438	22		22	204,345	811,511	30,282	18,790	100,168	30,153
Eastern Shore Natural Gas Co.	308	—	—	—	20,072	122,754	6,033	7,296	22,079	4,505
El Paso Natural Gas Co.*	10,240	56	1	57	1,637,647	3,118,400	111,538	214,619	550,972	136,948
Enbridge Offshore Pipelines (UTOS) LLC*	30	—	—	—	70,464	63,210	—	4,415	3,010	–645
Enbridge Pipelines (AlaTenn) LLC	295	2	—	2	15,490	27,973	—	5,823	2,526	–2,505
Enbridge Pipelines (MidLa) LLC	412	1	—	1	42,285	43,515	—	3,011	5,790	577
Energy West Development	46	—	1	1	—	756	—	161	337	62
Equitrans LP*	2,386	4	26	30	53,514	404,630	39,968	28,816	68,820	14,403
Florida Gas Transmission Co. LLC*	4,882	26	1	27	750,621	2,952,842	127,992	91,204	511,082	150,253
Freebird Gas Storage LLC	—	—	—	—	2,001	—	—	—	—	—
Garden Banks Gas Pipeline LLC*	50	—	—	—	100,097	100,468	—	3,920	9,459	–779
Gas Transmission Northwest Corp.*	1,356	13	—	13	837,903	1,707,493	18,267	78,501	237,810	65,598
Granite State Gas Transmission Inc.	87	—	—	—	32,320	34,211	845	1,563	3,049	–179
Great Lakes Gas Transmission LP*	2,115	14	—	14	832,745	2,037,395	18,897	42,125	282,826	82,267
Guardian Pipeline LLC*	143	1	—	1	49,722	288,757	1,288	7,622	34,012	7,040
Gulf South Pipeline Co. LP*	6,499	30	—	30	675,530	1,862,460	533,040	152,292	340,498	98,052
Gulfstream Natural Gas System LLC*	690	1	—	1	271,341	1,705,121	4,339	10,107	185,369	61,331
Hampshire Gas Co.	18	—	1	1	—	23,372	410	1,652	4,390	920
Hardy Storage Co.* (new)	—	—	—	—	—	169,643	169,643	698	17,859	6,657
High Island Offshore System LLC*	212	1	—	1	157,032	392,240	3,291	25,426	32,153	3,033
Honeoye Storage Corp.	11	—	1	1	—	12,417	215	1,687	5,008	1,989
Horizon Pipeline Co. LLC	28	1	—	1	63,649	91,813	32	3,248	12,383	1,954
Iroquois Gas Transmission Systems LP (IPOC agent)*	414	5	—	5	399,488	1,103,503	5,990	25,850	160,066	31,679
Jackson Prairie Underground Storage Project	—	—	—	—	—	58,127	850	2,151	—	–2,151
Kern River Gas Transmission Co.*	1,680	12	—	12	793,533	2,357,270	20,758	37,600	404,193	128,339
KeySpan LNG LP	—	—	—	—	—	47,838	1,013	3,523	7,948	2,494
Kinder Morgan Illinois Pipeline LLC (new)	3	—	—	—	400	18,220	18,220	45	106	214
Kinder Morgan Interstate Gas Transmission LLC*	5,211	25	2	27	236,803	708,261	12,623	94,694	201,344	57,493
KO Transmission Co.	92	—	—	—	44,805	16,655	101	512	1,648	614
Liberty Gas Storage LLC	—	—	—	—	139	—	—	—	—	—
Maritimes & Northeast Pipeline LLC*	341	2	—	2	170,275	873,504	3,552	–2,980	116,649	42,986
MarkWest New Mexico LP*	5	—	—	—	17,832	2,969	30	118	826	331
Midwestern Gas Transmission Co.*	367	7	—	7	159,863	134,567	2,421	11,346	24,196	7,914
MIGC Inc.*	264	5	—	5	51,985	50,448	4,841	5,045	19,235	6,906

GAS PIPELINES (CONTINUED)

Company	Transmission system, miles	Total compression stations — Transmission	Other	Total	Volumes trans. for others, MMcf	Fiscal data, $1,000 — Gas plant	Additions	Operating & maintenance expenses	Operating revenue	Net income
Mississippi Canyon Gas Pipeline LLC*	45	—	—	—	194,759	56,885	23	3,467	18,810	7,362
Mojave Pipeline Co.*	444	1	—	1	167,151	247,374	187	7,701	26,399	20,389
National Fuel Gas Supply Corp.*	1,481	15	3	18	306,995	780,188	22,017	67,720	178,045	40,328
Natural Gas Pipeline Co. of America*	9,045	41	13	54	1,783,189	3,512,044	201,600	516,789	1,180,395	309,104
Nautilus Pipeline Co. LLC*	101	—	—	—	64,012	120,553	48	2,642	4,837	–2,653
NGO Transmission Inc.	—	—	—	—	9,485	20,025	464	2,589	3,716	–587
North Baja Pipeline LLC*	80	1	—	1	92,093	156,532	467	3,492	22,620	3,901
Northern Border Pipeline Co.*	1,399	17	—	17	886,022	2,480,729	10,279	54,972	309,376	76,536
Northern Natural Gas Co.*	15,487	83	6	89	1,055,067	3,045,135	287,694	255,594	674,199	161,088
Northwest Pipeline GP*	3,880	43	1	44	811,633	2,689,966	191,257	132,236	421,807	118,983
Oktex Pipeline Co.	109	1	—	1	46,035	7,321	–106	537	1,529	511
ONEOK Gas Transportation LLC* (new)	2,516	4	—	4	288,720	308,728	1,738	36,968	74,090	16,943
Ozark Gas Transmission LLC	566	3	—	3	120,044	214,359	626	5,990	43,658	29,256
Paiute Pipeline Co.	859	6	—	6	40,944	170,188	11,855	12,063	30,144	6,752
Panhandle Eastern Pipe Line Co. LP*	6,215	24	—	24	661,707	1,382,019	162,669	172,534	325,953	157,766
Panther Interstate Pipeline Energy LLC	56	1	—	1	12,579	23,012	—	554	1,765	1,104
Petal Gas Storage LLC*	59	1	2	3	119,363	220,375	7,194	10,042	39,343	13,166
Pine Needle LNG Co. LLC	—	—	—	—	—	108,767	156	3,814	18,649	5,216
Point Arguello Natural Gas Line Co.	—	—	—	—	368	141,915	261	1,498	13,792	11,759
Portland Natural Gas Transmission System*	296	—	—	—	57,672	492,721	58	22,617	74,261	18,071
Quest Pipelines (KPC) (formerly Enbridge Pipelines (KPC))	1,121	3	—	3	7,718	79,748	900	8,974	19,753	3,839
Questar Overthrust Pipeline Co.*	137	—	—	—	133,944	125,927	2,192	1,478	10,364	2,405
Questar Pipeline Co.*	1,746	25	5	30	407,706	836,209	116,001	55,997	158,393	45,011
Questar Southern Trails Pipeline Co.	488	4	—	4	27,898	117,243	8,743	7,416	13,158	–3,567
Raton Gas Transmission Co. Inc.	23	—	—	—	1,193	1,022	31	1,215	1,305	52
Rockies Express Pipeline LLC* (new)	328	—	—	—	142,912	670,454	670,428	2,840	31,978	–15,683
Sabine Pipe Line LLC*	152	5	—	5	265,875	62,803	10,940	15,609	16,406	416
Saltville Gas Storage Co. LLC	7	—	1	1	—	87,607	718	5,224	12,268	3,300
SCG Pipeline Inc. (final)	18	—	—	—	14,703	31,331	7	756	5,988	2,369
Sea Robin Pipeline Co. LLC*	483	2	—	2	144,484	323,163	22,486	9,731	12,063	–1,211
Southern LNG Inc.*	—	—	—	—	—	388,586	4,263	24,577	68,588	23,045
Southern Natural Gas Co.*	7,636	42	—	42	867,787	3,210,514	370,878	157,937	484,985	208,736
Southern Star Central Gas Pipeline Inc.*	5,701	33	7	40	318,397	1,104,344	54,055	80,226	188,081	32,466
Southwest Gas Storage Co.	—	—	4	4	—	155,735	2,981	19,923	45,939	10,734
Southwest Gas Transmission Co. LP	8	—	—	—	31,097	1,795	—	119	458	141
Steuben Gas Storage Co.	15	—	1	1	—	31,618	36	2,180	6,703	1,232
Stingray Pipeline Co. LLC*	379	—	2	2	154,719	331,653	19,396	10,657	16,832	1,878
Tennessee Gas Pipeline Co.*	14,463	72	1	73	1,801,283	6,294,195	407,591	305,814	829,567	174,639
Texas Eastern Transmission LP*	9,115	72	—	72	1,438,099	5,571,512	252,535	329,907	910,263	266,984
Texas Gas Transmission LLC.*	5,599	25	7	32	784,212	1,661,752	67,657	104,964	282,588	97,508
Trailblazer Pipeline Co.*	439	3	—	3	319,078	332,966	1,940	23,630	72,044	24,100
TransColorado Gas Transmission Co.*	305	6	—	6	259,792	354,905	2,695	5,836	50,994	21,779
Transcontinental Gas Pipe Line Corp.*	10,325	47	18	65	2,669,937	7,402,701	420,099	587,546	1,201,603	193,889
Transwestern Pipeline Co. LLC*	2,362	29	—	29	645,728	1,136,454	12,263	70,485	235,661	55,053
Trunkline Gas Co. LLC*	4,182	19	1	20	647,723	1,512,722	218,563	80,278	180,577	56,810
Trunkline LNG Co. LLC* (new)	—	—	—	—	—	742,242	5,290	30,485	135,567	58,652
Tuscarora Gas Transmission Co.	240	2	1	3	28,841	182,623	1,523	3,717	27,153	7,487
Valero Natural Gas Pipeline Co.	3	—	—	—	7,358	1,157	—	228	298	–17
Vector Pipeline LP*	333	4	—	4	384,027	788,965	73,914	8,802	86,748	18,967
Venice Gathering System LLC*	247	—	—	—	41,679	92,996	20,029	9,619	3,480	–10,323
Viking Gas Transmission Co.*	674	8	—	8	137,482	175,647	1,064	14,190	30,775	6,259
West Texas Gas Inc.	650	—	—	—	8,292	137,303	43,620	98,071	100,288	8,039
Western Gas Interstate Co.	264	—	—	—	3,816	13,218	12	718	1,877	1,473
WestGas InterState Inc.	12	—	—	—	3,415	667	—	60	180	72
Williston Basin Interstate Pipeline Co.*	3,369	20	10	30	140,762	400,803	21,681	39,881	99,246	22,443
Wyoming Interstate Co. Ltd.*	849	8	—	8	755,956	756,377	146,782	22,604	111,306	40,419
Young Gas Storage Co. Ltd.	11	1	—	1	—	46,356	134	2,970	8,332	1,361
2007 total—majors (77)	**192,189**	**1,189**	**213**	**1,402**	**36,466,881**	**$93,250,209**	**$6,446,799**	**$7,645,118**	**$21,279,633**	**$4,659,406**
2006 total—majors (73)	189,012	1,195	223	1,418	33,457,917	$85,680,615	$3,788,124	$6,855,914	$16,571,607	$3,898,405
2007 total—all	**198,318**	**1,216**	**226**	**1,442**	**37,133,408**	**$95,540,534**	**$6,550,226**	**$7,865,327**	**$21,736,725**	**$4,765,815**
2006 total—all	195,489	1,233	236	1,469	34,309,239	$88,327,869	$3,905,797	$7,097,752	$17,122,586	$4,015,253

*Major natural gas pipeline companies as defined below (and in FERC Accounting and Reporting Requirements for Natural Gas Companies, para. 20-011, effective Feb. 2, 1985, beginning with 1984 reporting year). Beginning with 1996, major companies were required to file mileage for transmission systems only.

Source: FERC Forms 2 and 2A for major and nonmajor natural gas pipeline companies. Under criteria established for the 1984 reporting year (OGJ, Nov. 25, 1985, p. 80), major pipeline companies are those whose combined gas sold for resale and gas transported for a fee exceeded 50 bcf at 14.73 psi (60° F.) in each of the 3 previous calendar years. Nonmajors are natural gas pipeline companies not classified as majors and whose total gas sales of volume transactions exceeded 200 MMcf at 14.73 psi (60° F.) in each of the 3 previous calendar years

Updated cost management program available

An updated cost management solution—version 2.1 of Kildrummy CostManager—is on the market.

The software is suited for use by companies and government agencies to control expenditure on megaprojects and project programs.

The firm says its program adds value by enabling managers to base their cost forecasts on compelling evidence. Forecasting final cost early, quickly, and accurately requires speedy access to well-organized information, the company points out.

Version 2.1 is designed to harness subtle aspects of technological change to better deliver information. The firm notes that users find it more useful to display and manipulate complex reports rather than simply print them out.

Source: **Kildrummy Inc.,** 10375 Richmond Ave., Suite 1100, Houston, TX 77042.

New flowmeter useful for bulk measurement

Here's the Optimass 2000, a large diameter Coriolis mass flowmeter that promises accurate and repeatable measurement for bulk fluids operations.

Available in three sizes—4, 6, and 10 in.—its wetted parts are constructed of NACE compliant duplex stainless steel (ANS 31803), and the meter is available with flange ratings up to 1,500 lb and flange sizes of 4-12 in.

It can handle process pressures to 2,200 psig (150 bar) with a stainless steel outer cylinder that can handle burst pressures in excess of 1,500 psi (100 bar). The company says flow rates of 250-4,400 lb/min are easily handled by the unit with a measuring accuracy of 0.1%.

The unit's lower rate of flow prevents buildup of static in hydrocarbons without affecting measurement accuracy. The low flow rate capability is also desirable for custody transfer applications.

The flowmeter features the MFC300 converter and is available in a compact or remote version. All signal processing is carried out by the MFC300, which converts the meter output to a MODBUS RTU communications signal. The split architecture of the MFC300 secures all calibration data in redundant memory. The meter can also be supplied with direct digital communications where the application doesn't require a converter.

Source: **Khrone Inc.,** 7 Dearborn Rd., Peabody, MA 01960.

Acorn Energy Inc.,

Montchanin, Del., has acquired Coreworx Inc. (formerly Software Innovation Inc.), Kitchener, Ont. The acquisition is a strategic move by Acorn Energy to participate in relieving a major pinchpoint in the ongoing global energy infrastructure boom. Coreworx provides a leading software tool for capital project information management and collaboration, mainly to help manage the construction of major capital projects, including offshore oil production, refineries, mining operations, and power plants around the world. Its flagship product, Coreworx, is a construction collaboration system that supports the entire lifecycle of large capital projects, infusing the resulting asset with intelligence and memory. This integrated solution is designed to dramatically reduce costs and timelines of construction and mitigates legal and financial risks. At the same time, it paves the way for more automated and intelligent plant operations.

Acorn Energy is a publicly traded holding company focused on improving the efficiency of the energy grid and reducing the environmental impact of the energy sector. Acorn's strategy is to take primarily controlling positions in companies and add value by supporting those companies with marketing, strategy, and business development. Acorn Energy has equity interests in CoaLogix, Comverge, Coreworx, DSIT, Gridsense, Local Power, and Paketeria.

Cascade Controls Inc.,

Tinley Park, Ill., has changed its corporate identity to Cascade Solutions.

Cascade Solutions provides expertise in integrated process, electrical, and automation engineering, as well as data management and IT services for multinational manufacturing companies. The company generally targets highly regulated process industries that are intensive in their documentation and data requirements, such as chemicals, specialty chemicals, and life sciences.

Aggreko,

Houston, has acquired Power Plus Rentals & Sales, Edmonton. The expansion supports Aggreko's strategy of growing its core business in rental power and temperature control to serve Western Canada, particularly the booming oil sands industry. The acquisition provides Aggreko with access to skills and experience in designing and operating equipment in extremely cold environments, including remote camp sites, and strengthens its ability to serve oil and gas and refining customers. The acquisition will bring 34 Power Plus employees into Aggreko's Western Canada business. David Lassu, proprietor of the Power Plus business, has agreed to work with Aggreko as a consultant over the next 2 years.

Aggreko is a global leader in temporary power, temperature control, and oil-free compressed air solutions.

Power Plus provides specialized rental power solutions to businesses in the Athabasca oil sands in Alberta and Saskatchewan.

China Gengsheng Minerals Inc.,

Gongyi, China, has signed a fracture proppants supply contract with Huabei Oil Management Co. in Renqiu, Hebei Province, China. Gengsheng will start shipping a total of 1,000 tons of high-density, bauxite-based fracture proppants immediately through July 31, 2009. During first half 2008, China Gengsheng signed a total of $5.3 million in contracts to supply fracture proppants to major Chinese oil companies, including China National Petroleum Corp., China National Offshore Oil Corp., and China Petroleum & Chemical Corp.

China Gengsheng develops, manufactures, and markets a broad range of high-tech industrial material products, including monolithic refractories, industrial ceramics, and fracture proppants.

Synthesis Energy Systems Inc.,

Houston, has announced that its 95%-owned joint venture project with Shandong Hai Hua Coal & Chemical Co. Ltd. (SHHCCC) obtained key Chinese government approvals for the Phase II expansion of its Hai Hua project in Zaozhuang City, Shandong Province, China. The Hai Hua plant is using SES' U-GAS technology to convert local low-rank coal, with roughly 40% ash content, into high-grade syngas. The Phase II expansion will boost production capacity by 17,000 standard cu m/hr of high-grade syngas to 45,000 scm/hr to support production of 100,000 tonnes/year of methanol as well as other syngas needs at Xuecheng Industrial Park. Project approvals were issued by divisions of the State Environmental Protection Administration and the National Development and Reform Commission. SES is currently negotiating agreements, including ownership in the methanol facility, with SHHCCC as well as other customers for the additional syngas capacity. SES expects to finalize project terms and begin work on the Phase II expansion later this year.

SES is an energy and technology company that builds, owns, and operates coal gasification plants that utilize its proprietary U-GAS fluidized bed gasification technology to convert low-rank coal and coal wastes into higher-value energy products, such as transportation fuel and ammonia. SES licenses the U-technology from the Gas Technology Institute.

ION Geophysical Corp.,

Houston, has announced the retirement from its board of Sam K. Smith. A director since 1999, Smith served as the company's CEO from 1999 to 2000. He has also served on the ION board compensation committee since 2005. The ION board now consists of six nonemployee directors and CEO Bob Peebler, and a new board member will be appointed to replace Smith during the next few months.


Smith

ION also recently announced a definitive agreement to acquire all of the outstanding shares of ARAM Systems Ltd., a Canadian-based provider of cable-based land seismic recording systems, and its affiliate company, Canadian Seismic Rentals Inc., for $350 million (Can.) in cash and ION common stock.

ION, formerly Input/Output, is a leading provider of geophysical technology, services, and solutions for the global oil and gas industry. ION's offerings allow E&P operators to obtain higher-resolution images of the subsurface to reduce the risk of exploration and reservoir development and enable seismic contractors to acquire geophysical data more efficiently.

Endicott Biofuels II LLC (EBF),

Houston, has named David M. Robinson to the newly created position of chief executive officer. He brings to Endicott more than 25 years of experience in petroleum refining, petrochemicals, and toll chemical manufacturing, refining, and technology. Of special note is his experience with both specialty fuels and intellectual property rights, which aligns well with EBF's portfolio of biofuels patents and its unique approach to the production of biodiesel. Previously, Robinson served as vice-president of engineering and production for Carbon Nanotechnologies Inc./Unidym, where he led all aspects of carbon nanotube process development and production. He also served as president and chief operating officer for Howell Hydrocarbons and Chemicals/Specified Fuels and Chemicals/Haltermann, where he led the specialty refining and toll chemical manufacturing company. In addition, he has worked as an independent consultant with clients in petroleum refined products, specialty petroleum solvents, and recycled industrial oils, and served as president of Howell Hydrocarbons, which produced and marketed a full line of refined petroleum products. Robinson has a BS in chemical engineering from Princeton University.

EBF is a diversified biofuels technology company that is developing exclusive, second-generation biodiesel technology. It 11 patents pending for biofuel production and application.

Curtiss-Wright Corp.,

Roseland, NJ, has secured a contract from Global Supplies, Dubai, for 10 top and bottom DeltaGuard automated coke drum unheading systems for installation at the 21,000 b/d Essar Oil Vadinar refinery at Gujarat, India, by October 2009. The DeltaGuard device safely opens the top or bottom of a coke drum during the delayed coking process, which generates extreme temperature and pressure conditions. Unlike other unheading systems, the remotely operated DeltaGuard system creates a totally enclosed coking system, eliminating safety risks to personnel during the unheading process. With the Essar installation, the total number of installed DeltaGuard systems will rise to 254, representing nearly 34% of the worldwide market.

Curtiss-Wright designs, manufactures, and overhauls products for motion control and flow control applications and provides specialized metal treatment services.

Global Supplies is the international procurement arm of Essar Global Ltd., a diversified corporation with a portfolio of assets in a variety of manufacturing and services sectors, including Essar Oil Ltd., a fully integrated oil company in the corporation's energy sector.

Acteon companies

Claxton Engineering, 2H Offshore, and Subsea Riser Products have received an order from Venture Production PLC to provide an ultrahigh-pressure riser for use during a high-pressure, high-temperature (HPHT) drilling campaign in the North Sea, which is scheduled for fourth quarter 2009. The riser will be the world's first full-bore access (18¾-in.) riser capable of working at pressures in excess of 12,000 psi. Linked to this, the flanges used to connect the individual pipe sections will be attached using a shrink-fit process—the first time this technology has been used in this application. The riser will enable Venture to drill and complete HPHT subsea wells from a jack up employing a surface blowout preventer (BOP), which will provide significant cost benefits and operational efficiencies. Venture has already contracted Noble Drilling's Scott Marks jack up, which is currently under construction in China, for the HPHT campaign. As well as acting as the lead contractor, equipment integrator, and offshore service supplier, Claxton will provide a range of ancillary equipment, including an umbilical, wellhead and BOP connectors, a tensioning ring, and a hydraulic power and control system. A team from Claxton will be responsible for running and pulling the riser on the rig, and for its inspection and maintenance. 2H carried out the initial riser design and analysis work, and SRP has led the development of the new shrink-fit technology. SRP is ultimately responsible for supplying the riser, which has 13 main sections plus fatigue-critical, tapered stress and tension joints. Forging the main pipe sections has already commenced at two plants in France and Italy. The flanges will be forged once the main pipes are finished, and then extensive machining will be required before the flanges are shrink-fitted. Once the riser is complete, a detailed testing program will be carried out before delivery to Venture in September 2009. Venture expects to begin using the riser immediately thereafter to drill HPHT development and appraisal wells in several of its Central North Sea assets in water depths to 120 m.

Acteon is a group of specialist engineering companies serving the global offshore oil and gas industry. It focuses on technology that has applications in the vital region between the seabed and the surface production facilities.

Industrial Rubber Products Inc.,

Hibbing, Minn., has entered into a definitive merger agreement with affiliates of Lime Rock Partners, Westport, Conn., and Thompson Street Capital Partners, St. Louis, that provides for the acquisition of Industrial Rubber for $16.50/share in cash. The deal is expected to close in September 2008.

Industrial Rubber is a leading designer, producer, and applicator of protective coatings to pipeline and industrial markets. Since 2006, the company's revenue has almost doubled, driven in large part by the success of the IRACORE Pipe Systems, which has broad applications to the oil sands and other industries.

Lime Rock is a private equity firm focused on the global energy industry.

Thompson is a private equity firm focused on the manufacturing, distribution, and services industries.

Austin Ventures,

Austin, Tex., has acquired Delta Rigging & Tools, Lake Jackson, Tex. Financial terms were not disclosed. Austin Ventures investment professionals Joe Aragona and Scott Donaldson will join Delta's board of directors. Delta is the largest one-stop provider of lifting products and services within the large and fragmented domestic lifting equipment and rigging industry. Delta offers a complete portfolio of lifting solutions, including hoists, winches, wire rope, synthetic slings, accessory parts, and hardware as well as testing, inspection, and field services. Delta serves a national footprint of customers and end markets with particular strength in various energy applications throughout the Gulf Coast of Texas and Louisiana.

Austin Ventures is a private equity firm focused on business services, information services, and information technology businesses.

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Imports of crude and products

	Districts 1-4		District 5		Total US		
	8-15 2008	8-8 2008	8-15 2008	8-8 2008	8-15 2008	8-8 2008	*8-17 2007
	1,000 b/d						
Total motor gasoline	693	785	101	0	794	785	927
Mo. gas. blending comp.	633	675	52	0	685	675	601
Distillate	73	136	0	0	73	136	428
Residual	355	311	146	0	501	311	247
Jet fuel-kerosine	90	69	5	5	95	74	283
Propane-propylene	111	158	10	8	121	166	186
Other	648	443	9	12	657	455	511
Total products	**2,603**	**2,577**	**323**	**25**	**2,926**	**2,602**	**3,183**
Total crude	**9,770**	**8,262**	**1,221**	**1,393**	**10,991**	**9,655**	**10,815**
Total imports	**12,373**	**10,839**	**1,544**	**1,418**	**13,917**	**12,257**	**13,998**

*Revised.
Source: US Energy Information Administration
Data available in OGJ Online Research Center.

Additional analysis of market trends is available through **OGJ Online**, *Oil & Gas Journal's* electronic information source, at http://www.ogjonline.com.

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OGJ crack spread

	*8-22-08	*8-24-07	Change	Change, %
	$/bbl			
SPOT PRICES				
Product value	123.18	81.25	41.93	51.6
Brent crude	110.11	68.05	42.06	61.8
Crack spread	13.07	13.19	–0.12	–0.9
FUTURES MARKET PRICES				
One month				
Product value	126.20	81.41	44.78	55.0
Light sweet crude	115.63	70.01	45.62	65.2
Crack spread	10.57	11.40	–0.83	–7.3
Six month				
Product value	127.73	81.05	46.68	57.6
Light sweet crude	117.48	68.83	48.65	70.7
Crack spread	10.25	12.22	–1.97	–16.2

*Average for week ending.
Source: Oil & Gas Journal
Data available in OGJ Online Research Center.

Purvin & Gertz LNG netbacks—Aug. 22, 2008

Receiving terminal	Liquefaction plant					
	Algeria	Malaysia	Nigeria	Austr. NW Shelf	Qatar	Trinidad
	$/MMbtu					
Barcelona	9.74	7.20	8.71	7.06	7.95	8.61
Everett	6.93	4.54	6.48	4.58	5.18	7.29
Isle of Grain	8.00	8.17	7.74	8.30	7.69	7.67
Lake Charles	5.05	2.89	4.81	3.10	3.48	5.73
Sodegaura	8.89	11.36	9.13	10.97	10.07	8.41
Zeebrugge	10.79	8.54	10.06	8.37	9.07	10.06

Definitions, see OGJ Apr. 9, 2007, p. 57.
Source: Purvin & Gertz Inc.
Data available in OGJ Online Research Center.

Crude and product stocks

District	Crude oil	Motor gasoline		Jet fuel, kerosine	Fuel oils		Propane-propylene
		Total	Blending comp.[1]		Distillate	Residual	
	1,000 bbl						
PADD 1	13,606	55,332	31,898	10,588	49,568	13,461	4,099
PADD 2	63,928	47,678	17,172	6,501	28,992	1,329	21,410
PADD 3	159,380	61,786	30,447	14,237	37,459	17,232	23,097
PADD 4	14,191	6,073	1,822	537	2,922	242	[1]2,149
PADD 5	54,832	25,751	19,579	9,062	13,127	4,599	—
Aug. 15, 2008	**305,937**	**196,620**	**100,918**	**40,925**	**132,068**	**36,863**	**50,755**
Aug. 8, 2008	**296,547**	**202,822**	**104,495**	**40,786**	**131,587**	**36,435**	**49,186**
Aug. 17, 2007[2]	**337,118**	**196,231**	**88,163**	**41,918**	**129,025**	**36,476**	**53,370**

[1]Includes PADD 5. [2]Revised.
Source: US Energy Information Administration
Data available in OGJ Online Research Center.

Refinery report—Aug. 15, 2008

District	REFINERY OPERATIONS		REFINERY OUTPUT				
	Gross inputs	Crude oil inputs	Total motor gasoline	Jet fuel, kerosine	Fuel oils		Propane-propylene
					Distillate	Residual	
	1,000 b/d						
PADD 1	1,400	1,405	2,252	108	509	72	60
PADD 2	3,095	3,057	2,321	220	951	52	193
PADD 3	7,253	7,099	2,829	735	2,187	259	673
PADD 4	536	535	255	23	172	8	[1]129
PADD 5	2,805	2,715	1,408	497	586	152	—
Aug. 15, 2008	**15,089**	**14,811**	**9,065**	**1,583**	**4,405**	**543**	**1,055**
Aug. 8, 2008	**15,124**	**14,823**	**8,852**	**1,561**	**4,341**	**585**	**1,025**
Aug. 17, 2007[2]	**15,987**	**15,727**	**9,287**	**1,457**	**4,206**	**666**	**1,044**
	17,606 Operable capacity		**85.7 utilization rate**				

[1]Includes PADD 5. [2]Revised.
Source: US Energy Information Administration
Data available in OGJ Online Research Center.

OGJ GASOLINE PRICES

	Price ex tax 8-20-08	Pump price* 8-20-08	Pump price 8-22-07
	¢/gal		
(Approx. prices for self-service unleaded gasoline)			
Atlanta	330.0	374.4	277.5
Baltimore	333.6	375.5	268.6
Boston	332.9	374.8	265.7
Buffalo	310.8	370.4	281.7
Miami	319.7	371.3	286.6
Newark	331.0	363.9	263.4
New York	313.2	372.8	281.7
Norfolk	330.1	368.1	261.5
Philadelphia	324.8	375.5	280.6
Pittsburgh	321.5	372.2	277.3
Wash., DC	334.2	372.6	280.5
PAD I avg	325.6	371.9	275.0
Chicago	343.7	401.6	293.9
Cleveland	320.3	366.7	275.9
Des Moines	320.6	360.7	283.8
Detroit	322.3	376.7	284.8
Indianapolis	316.6	366.7	284.8
Kansas City	324.6	360.6	274.8
Louisville	333.8	370.7	292.2
Memphis	319.9	359.7	287.9
Milwaukee	324.4	375.7	286.7
Minn.-St. Paul	327.3	367.7	270.6
Oklahoma City	320.1	355.5	263.3
Omaha	328.2	370.5	281.7
St. Louis	325.7	361.7	289.7
Tulsa	318.2	353.6	261.8
Wichita	313.2	356.6	282.3
PAD II avg	323.9	367.0	280.9
Albuquerque	323.5	359.9	275.3
Birmingham	323.5	362.1	266.4
Dallas-Fort Worth	314.7	353.1	264.4
Houston	311.9	350.3	270.2
Little Rock	321.2	361.4	266.3
New Orleans	325.0	363.4	270.2
San Antonio	322.0	360.4	264.4
PAD III avg	320.3	358.7	268.2
Cheyenne	338.1	370.5	277.3
Denver	358.0	398.4	286.7
Salt Lake City	354.4	397.3	288.5
PAD IV avg	350.1	388.7	284.2
Los Angeles	346.0	409.9	281.1
Phoenix	339.5	376.9	282.6
Portland	341.5	384.9	281.0
San Diego	344.0	407.9	294.0
San Francisco	354.9	418.8	291.0
Seattle	339.5	393.9	276.8
PAD V avg	344.2	398.7	284.4
Week's avg.	**328.5**	**373.0**	**278.0**
July avg.	**361.3**	**405.7**	**295.2**
June avg.	**360.2**	**404.2**	**309.4**
2008 to date	**308.6**	**352.4**	—
2007 to date	**228.4**	**271.9**	—

*Includes state and federal motor fuel taxes and state sales tax. Local governments may impose additional taxes.
Source: Oil & Gas Journal.
Data available in OGJ Online Research Center.

REFINED PRODUCT PRICES

	8-15-08 ¢/gal		8-15-08 ¢/gal
Spot market product prices			
Motor gasoline (Conventional-regular)		Heating oil No. 2	
New York Harbor	287.40	New York Harbor	309.35
Gulf Coast	283.15	Gulf Coast	309.85
Los Angeles	298.90	Gas oil	
Amsterdam-Rotterdam-Antwerp (ARA)	272.23	ARA	323.14
Singapore	267.02	Singapore	302.62
Motor gasoline (Reformulated-regular)		Residual fuel oil	
New York Harbor	288.15	New York Harbor	219.12
Gulf Coast	289.15	Gulf Coast	234.45
Los Angeles	303.90	Los Angeles	271.38
		ARA	247.47
		Singapore	237.32

Source: DOE Weekly Petroleum Status Report.
Data available in OGJ Online Research Center.

BAKER HUGHES RIG COUNT

	8-22-08	8-24-07
Alabama	8	4
Alaska	9	4
Arkansas	59	50
California	51	37
Land	49	35
Offshore	2	2
Colorado	117	118
Florida	2	1
Illinois	1	1
Indiana	2	4
Kansas	10	13
Kentucky	11	8
Louisiana	193	173
N. Land	86	58
S. Inland waters	25	22
S. Land	31	31
Offshore	51	62
Maryland	0	1
Michigan	2	3
Mississippi	12	13
Montana	14	18
Nebraska	1	0
New Mexico	83	89
New York	7	6
North Dakota	74	41
Ohio	11	14
Oklahoma	212	194
Pennsylvania	25	17
South Dakota	2	1
Texas	931	851
Offshore	9	6
Inland waters	1	1
Dist. 1	27	25
Dist. 2	39	32
Dist. 3	61	55
Dist. 4	95	85
Dist. 5	185	190
Dist. 6	125	135
Dist. 7B	25	35
Dist. 7C	72	58
Dist. 8	133	115
Dist. 8A	33	19
Dist. 9	41	31
Dist. 10	85	64
Utah	50	39
West Virginia	27	33
Wyoming	74	73
Others—OR-1; TN-2; VA-6; WA-1	10	10
Total US	**1,998**	**1,816**
Total Canada	**457**	**319**
Grand total	**2,455**	**2,135**
Oil rigs	395	310
Gas rigs	1,594	1,500
Total offshore	68	71
Total cum. avg. YTD	**1,849**	**1,755**

Rotary rigs from spudding in to total depth.
Definitions, see OGJ Sept. 18, 2006, p. 42.

Source: Baker Hughes Inc.
Data available in OGJ Online Research Center.

SMITH RIG COUNT

Proposed depth, ft	Rig count	8-22-08 Percent footage*	Rig count	8-24-07 Percent footage*
0-2,500	86	3.4	57	10.5
2,501-5,000	137	50.3	109	53.2
5,001-7,500	240	15.8	230	23.9
7,501-10,000	459	2.8	432	4.1
10,001-12,500	491	1.8	447	0.8
12,501-15,000	345	—	274	0.3
15,001-17,500	150	—	108	—
17,501-20,000	92	—	72	—
20,001-over	33	—	32	—
Total	**2,033**	**6.4**	**1,761**	**8.0**
INLAND	33		42	
LAND	1,942		1,655	
OFFSHORE	58		64	

*Rigs employed under footage contracts.
Definitions, see OGJ Sept. 18, 2006, p. 42.

Source: Smith International Inc.
Data available in OGJ Online Research Center.

OGJ PRODUCTION REPORT

	[1]8-22-08	[2]8-24-07
	1,000 b/d	
(Crude oil and lease condensate)		
Alabama	15	21
Alaska	709	631
California	650	657
Colorado	55	59
Florida	5	5
Illinois	27	27
Kansas	98	106
Louisiana	1,320	1,220
Michigan	15	15
Mississippi	55	57
Montana	94	94
New Mexico	162	160
North Dakota	123	125
Oklahoma	169	170
Texas	1,338	1,328
Utah	48	54
Wyoming	148	149
All others	62	79
Total	**5,093**	**4,957**

[1]OGJ estimate. [2]Revised.
Source: Oil & Gas Journal.
Data available in OGJ Online Research Center.

US CRUDE PRICES

	8-22-08 $/bbl*
Alaska-North Slope 27°	127.45
South Louisiana Sweet	117.50
California-Kern River 13°	101.65
Lost Hills 30°	110.50
Wyoming Sweet	100.59
East Texas Sweet	110.50
West Texas Sour 34°	103.50
West Texas Intermediate	111.00
Oklahoma Sweet	111.00
Texas Upper Gulf Coast	107.50
Michigan Sour	104.00
Kansas Common	110.00
North Dakota Sweet	102.25

*Current major refiner's posted prices except North Slope lags 2 months. 40° gravity crude unless differing gravity is shown.
Source: Oil & Gas Journal.
Data available in OGJ Online Research Center.

WORLD CRUDE PRICES

$/bbl[1]	8-15-08
United Kingdom-Brent 38°	114.01
Russia-Urals 32°	111.43
Saudi Light 34°	107.94
Dubai Fateh 32°	111.81
Algeria Saharan 44°	112.88
Nigeria-Bonny Light 37°	114.31
Indonesia-Minas 34°	117.15
Venezuela-Tia Juana Light 31°	110.80
Mexico-Isthmus 33°	110.69
OPEC basket	112.23
Total OPEC[2]	109.72
Total non-OPEC[2]	111.36
Total world[2]	110.45
US imports[3]	108.11

[1]Estimated contract prices. [2]Average price (FOB) weighted by estimated export volume. [3]Average price (FOB) weighted by estimated import volume.
Source: DOE Weekly Petroleum Status Report.
Data available in OGJ Online Research Center.

US NATURAL GAS STORAGE[1]

	8-15-08	8-8-08	8-15-07	Change, %
	bcf			
Producing region	752	736	908	–17.2
Consuming region east	1,540	1,473	1,602	–3.9
Consuming region west	363	358	410	–11.5
Total US	**2,655**	**2,567**	**2,920**	**–9.1**
	May 08	**May 07**	**Change, %**	
Total US[2]	**1,836**	**2,179**	**–15.7**	

[1]Working gas. [2]At end of period.
Source: Energy Information Administration
Data available in OGJ Online Research Center.

PACE REFINING MARGINS

	June 2008	July 2008	Aug. 2008	Aug. 2007	2008 vs. 2007 Change	2008 vs. 2007 Change, %
	$/bbl					
US Gulf Coast						
West Texas Sour	14.07	10.56	8.41	14.45	–6.04	–41.8
Composite US Gulf Refinery	13.69	14.73	10.56	12.91	–2.36	–18.2
Arabian Light	12.48	7.44	8.13	9.74	–1.61	–16.5
Bonny Light	3.71	0.95	4.80	6.69	–1.89	–28.3
US PADD II						
Chicago (WTI)	11.86	8.68	10.16	20.15	–9.99	–49.6
US East Coast						
NY Harbor (Arab Med)	13.80	12.41	11.97	4.88	7.09	145.5
East Coast Comp–RFG	11.98	8.26	12.05	7.13	4.93	69.1
US West Coast						
Los Angeles (ANS)	15.84	7.31	10.46	8.73	1.73	19.9
NW Europe						
Rotterdam (Brent)	2.02	2.17	1.40	5.51	–4.11	–74.5
Mediterranean						
Italy (Urals)	14.14	3.66	2.55	4.37	–1.83	–41.8
Far East						
Singapore (Dubai)	6.77	2.26	–0.87	2.70	–3.57	–132.3

Source: Jacobs Consultancy Inc.
Data available in OGJ Online Research Center.

US NATURAL GAS BALANCE DEMAND/SUPPLY SCOREBOARD

	May 2008	Apr. 2008	May 2007	May 2008–2007 change	Total YTD 2008	Total YTD 2007	YTD 2008–2007 change
	bcf						
DEMAND							
Consumption	1,639	1,837	1,553	86	10,919	10,474	445
Addition to storage	458	295	498	–40	1,008	1,100	–92
Exports	66	76	63	3	467	316	151
Canada	35	46	35	0	281	195	86
Mexico	26	26	24	2	168	99	69
LNG	5	4	4	1	18	22	–4
Total demand	**2,163**	**2,208**	**2,114**	**49**	**12,394**	**11,890**	**504**
SUPPLY							
Production (dry gas)	1,736	1,679	1,608	128	8,496	7,806	690
Supplemental gas	4	5	4	0	20	27	–7
Storage withdrawal	56	106	39	17	2,053	1,984	69
Imports	326	319	380	–54	1,729	1,932	–203
Canada	294	286	283	11	1,589	1,525	64
Mexico	NA	1	3	–3	NA	30	–30
LNG	32	32	94	–62	140	377	–237
Total supply	**2,122**	**2,109**	**2,031**	**91**	**12,298**	**11,749**	**549**

NATURAL GAS IN UNDERGROUND STORAGE

	May 2008	Apr. 2008	Mar. 2008	May 2007	Change
	bcf				
Base gas	4,226	4,223	4,221	4,251	–25
Working gas	1,836	1,436	1,247	2,179	–343
Total gas	**6,062**	**5,659**	**5,468**	**6,430**	**–368**

Source: DOE Monthly Energy Review.
Data available in OGJ Online Research Center.

NOTE: No new data at presstime.

WORLDWIDE NGL PRODUCTION

	May 2008	Apr. 2008	5 month average Production 2008	5 month average Production 2007	Change vs. previous year Volume	Change vs. previous year %
	1,000 b/d					
Brazil	86	87	87	84	3	3.3
Canada	635	662	678	713	–35	–4.9
Mexico	371	370	368	413	–44	–10.8
United States	1,908	1,880	1,850	1,736	114	6.6
Venezuela	200	200	200	200	—	—
Other Western Hemisphere	199	200	199	208	–9	–4.3
Western Hemisphere	**3,399**	**3,399**	**3,381**	**3,353**	**28**	**0.8**
Norway	304	278	296	300	–4	–1.4
United Kingdom	175	168	178	161	18	11.0
Other Western Europe	10	11	11	10	—	2.5
Western Europe	**489**	**457**	**485**	**471**	**14**	**2.9**
Russia	419	418	420	426	–6	–1.5
Other FSU	150	150	150	160	–10	–6.3
Other Eastern Europe	15	15	16	15	—	1.1
Eastern Europe	**584**	**583**	**585**	**602**	**–16**	**–2.7**
Algeria	356	355	353	340	13	3.8
Egypt	70	70	70	70	—	—
Libya	80	80	80	80	—	—
Other Africa	126	126	131	126	5	3.9
Africa	**632**	**631**	**634**	**616**	**18**	**2.9**
Saudi Arabia	1,440	1,440	1,440	1,440	—	—
United Arab Emirates	250	250	250	250	—	—
Other Middle East	880	880	876	870	6	0.7
Middle East	**2,570**	**2,570**	**2,566**	**2,560**	**6**	**0.2**
Australia	68	68	62	72	–10	–14.5
China	180	180	180	180	—	—
India	—	—	—	8	–8	–100.0
Other Asia-Pacific	178	179	180	181	–1	–0.5
Asia-Pacific	**425**	**427**	**422**	**441**	**–19**	**–4.3**
TOTAL WORLD	**8,099**	**8,067**	**8,074**	**8,043**	**31**	**0.4**

Totals may not add due to rounding.
Source: Oil & Gas Journal.
Data available in OGJ Online Research Center.

OXYGENATES

	June 2008	May 2008	Change	YTD 2008	YTD 2007	Change
	1,000 bbl					
Fuel ethanol						
Production	17,544	18,543	–999	101,185	71,150	30,035
Stocks	12,304	12,044	260	12,304	9,067	3,237
MTBE						
Production	1,501	1,639	–138	9,498	11,551	–2,053
Stocks	1,456	1,956	–500	1,456	1,344	112

Source: DOE Petroleum Supply Monthly.
Data available in OGJ Online Research Center.

US COOLING DEGREE-DAYS

	July 2008	July 2007	Normal	2008 % change from normal	Total degree-days Jan. 1 through July 31 2008	2007	Normal	% change from normal
New England	230	183	180	27.8	355	311	249	42.6
Middle Atlantic	291	245	247	17.8	496	462	387	28.2
East North Central	238	214	245	-2.9	416	474	443	-6.1
West North Central	290	309	308	-5.8	500	621	574	-12.9
South Atlantic	421	414	425	-0.9	1,207	1,162	1,105	9.2
East South Central	414	384	412	0.5	964	1,003	901	7.0
West South Central	549	464	545	0.7	1,527	1,337	1,404	8.8
Mountain	376	428	341	10.3	748	890	715	4.6
Pacific	247	256	188	31.4	452	401	344	31.4
US average*	**339**	**319**	**321**	**5.6**	**762**	**747**	**697**	**9.3**

*Excludes Alaska and Hawaii.
Source: DOE Monthly Energy Review.
Data available in OGJ Online Research Center.

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Europe's diesel preference gets lift from France

A French effort to reduce vehicular emissions of carbon dioxide might ease market-based problems of the European program known as dieselization.

Many countries in Europe encourage the use of diesel in cars and trucks, with taxes favoring the distillate fuel over gasoline.

France is one of those countries. Early this year, the French government added a program aimed at discouraging the purchase of large cars. The purpose is to reduce emissions of CO_2.

As described in the Aug. 12 Oil Market Report of the International Energy Agency, the program adjusts prices of vehicles with discounts and surcharges according to estimated emissions of CO_2 per distance driven.

A vehicle emitting more than 160 g/km, for example, incurs a surcharge as high as €2,600. A car emitting less than 120 g/km receives a discount of as much as €1,000.

The French fight against carbon amounts to an extra boost for diesel vehicles. Diesel-powered cars emit less CO_2 than gasoline counterparts of equivalent horsepower, IEA points out. They're also about one-third more fuel-efficient.

Under the new French program, small diesel engines enjoy steep discounts. A car with a 90 hp diesel engine emitting 120 g/km receives a €200 discount. A gasoline car of the same horsepower emits 150 g/km and gets no discount.

While diesel-powered cars use less fuel and emit less CO_2 than gasoline-fueled vehicles, they cost more to buy and maintain.

The popularity of diesel vehicles in Europe thus has resulted mostly from the historic price discount of diesel relative to gasoline, IEA notes.

Until recently, the fuel-price difference could offset the purchase-price penalty of a diesel vehicle fairly quickly. Now, however, elevated prices of oil and distillates have made diesel and gasoline prices converge in most countries—and diesel to pull ahead in some.

The new price relationship makes diesel vehicles less appealing than before to average motorists, IEA says. Only those who drive great distances may see a cost benefit in diesel vehicles.

IEA adds, "This could augur a renewed interest in gasoline engines, thus partly reversing Europe's dieselization trend—unless other countries emulate France's policy."

(Online Aug. 23, 2008; author's e-mail: bobt@ogjonline.com)

The Editor's Perspective

by Bob Tippee, Editor

Market Journal

by Sam Fletcher, Senior Writer

'Cold War' heats oil market

Crude futures soared above $120/bbl Aug. 21 on the New York market for the first time in 2 weeks as both the US dollar and US-Russian relations deteriorated. In the Houston office of Raymond James & Associates Inc., analysts suggested "a new Cold War" might be "heating up the oil market" apparently due to US opposition to Russia's incursion into nearby Georgia.

That same day at Petromatrix in Zug, Switzerland, Oliver Jakob noted "Ten days ago, the Baku-Tbilisi-Ceyhan oil pipeline was on fire, bombs were falling on Georgia, the US [crude] stocks were reported lower than expected, but the price of oil was moving down. Today the BTC pipeline is repaired, no shots are fired in Georgia, the US stocks are reported higher than expected, but the price of oil is moving up. The difference between then and now is of course the directional move of the Dollar Index and assets allocation linked to it." BP PLC, operator, said shipments of Azeri crude would resume via the BTC pipeline by the end of August.

Moreover, Jakob said, "We do not buy the argument that explains yesterday's [price] move by 'geopolitical concerns.' Russia has taken care not to bomb the BTC pipe in its Georgian intrusion, and it has enough leveraged arguments to use against the West (northern access to Afghanistan, veto on 'Iranium') not to have to use the oil tool." He added, "The US envoy to the North Atlantic Treaty Organization claims that on the eve of the Georgian assault on Ossetia, [western officials] were again telling them not to do it as they would fall into a Russian trap. Georgia apparently did not listen, and despite all the current face saving, not all NATO nations are extremely happy to have been thrown in the trap and put their relations with Moscow at risk of this uncontrolled adventure." Meanwhile, Russia suspended military cooperation with NATO due to the dispute over its incursion into Georgia.

OPEC output cut?

That same week, Paul Horsnell, Barclays Capital Inc., London, warned that the Organization of Petroleum Exporting Countries "is now heading for an output cut, and potentially a very large one" at its Sept. 9 meeting. "Only a price rally back to well above $120/bbl is likely to be able to halt a substantial removal of OPEC crude output from the market," he said.

While rising in euro terms, the value of the OPEC basket in late August sank to the lowest dollar figure since early May. "Given the speed of recent falls," Horsnell said, "a move below $100/bbl for the value of the OPEC basket would represent a matter for major concern for most of the key ministers, and a move below $90/bbl would be likely to be considered as something of a crisis. Indeed, at current price levels or lower, we would see it as inevitable that OPEC will seek to reduce its output and its target ceiling at the September meeting."

The August oil market report from the OPEC Secretariat "states that the risks to the outlook are on the downside, that non-OPEC output is about to surge, that OPEC is already producing well above the call on its crude, that the demand outlook is worsening, that the global economic situation is deteriorating rapidly, and that speculators are now short," said Horsnell. "We think the secretariat is being a little pessimistic about demand and, most importantly, is factoring in a wave of non-OPEC supply growth that is likely in reality to disappoint. However, that does not detract from the view that the cautious strategy of least regret for OPEC is to cut, and possibly to cut very hard."

Should crude futures prices stabilize around $120/bbl, Horsnell said, "then a cut is less likely." Should prices linger lower, he said, "then a cut in actual output is fairly certain, and should prices fall further, then the target ceiling and actual output are both likely to come down sharply, in our view. However, whatever the price dynamics in the coming weeks, at this point another meeting in October or at the latest November now looks to be fairly likely."

Meanwhile, he said, "The US market continues to trim both its products surplus and its crude deficit, and indeed looks likely to flip into the reverse pattern. Gasoline demand has held above 9.4 million b/d for a fourth week, and is lower year-over-year by a mild 1.5% for August to date."

(Online Aug. 25, 2008; author's e-mail: samf@ogjonline.com)

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