Week of Dec. 22, 2008/US$10.00

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Worldwide Report

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Thermal heavy-oil recovery projects succeed in Egypt, Syria
Serbian, Russian accord enhances European gas security

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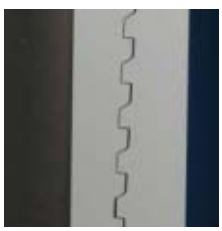

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Dec. 22, 2008
Volume 106.48

WORLDWIDE REPORT

REGULAR FEATURES

COVER

In the foreground, a drilling rig works in the prolific Barnett shale in Texas' Fort Worth basin. In the background is Motiva Enterprises LLC's 285,000-b/cd Port Arthur refinery, which is currently undergoing a $7 billion expansion to 600,000 b/cd, scheduled for completion in 2010. Other expansions completed in 2008 increased global refining capacity nearly 300,000 b/cd. OGJ's Worldwide Report, starting on p. 20, details the latest oil and gas reserves and annual oil production figures by country, followed on p. 46 by an article covering the latest in worldwide refining capacity trends from the refinery survey. Photos from EnCana Corp. and Royal Dutch Shell PLC.

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FOW
Exchange Newcomer of the Year
2008

General Interest

Exploration & Development

Drilling & Production

Processing

Transportation

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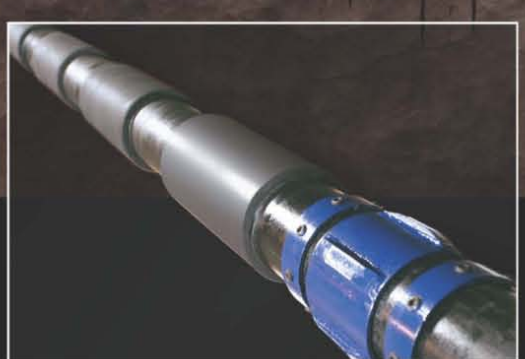

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OGJ Newsletter

Dec. 22, 2008

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General Interest — Quick Takes

Alberta's royalty framework takes effect Jan. 1

New royalty framework rates will become effective in Alberta on Jan. 1, 2009, for production from new natural gas wells and conventional oil wells.

Spurred by then-high commodity prices, Alberta Premier Ed Stelmach announced the "New Royalty Framework" in October 2007, saying it would bring an additional $1.4 billion (Can.) to government coffers in 2010, 20% more than the current royalty regime (OGJ, Nov. 5, 2007, p. 34).

The new royalty structure did not include oil sands, and the Alberta government spent 2008 negotiating with Syncrude and Suncor, large joint-venture projects that had royalty agreements in place through 2016. Syncrude partners were the last to come to terms, announcing their acquiescence on Nov. 18.

The unforeseen drop in natural gas and oil prices and credit restrictions from the global economic crisis, however, have slowed drilling activity and project development in the province.

In response, the Alberta government recently introduced optional, 5-year transitional royalty rates for new wells commenced during Nov. 19 and Dec. 31. Operators now have the option of choosing to pay royalties under the transitional scheme or the new royalty framework scheme.

Alberta Energy announced the transitional royalty rates to the media on Nov. 19, but issued a clarification on Nov. 24: "Companies with oil and gas wells between 1,000 and 3,500 m where staging, preparatory, or initial drilling work has begun during this period will be eligible to make the one-time choice to have the transitional rates applied to production beginning Jan. 1, 2009. Any wells producing oil or gas prior to Jan. 1, 2009, must transition to the new royalty framework.

"Because this clarification will only apply to a nominal number of wells and only on production after Jan. 1, this adjustment is not anticipated to affect the estimated royalty impact of the 5-year program announced on Nov. 19, 2008."

Alberta Energy stressed that the new program is not a "royalty holiday." Operators have a one-time option to select transitional rates or framework rates for new wells. All wells drilled in 2009-13 that pay transitional rates will be required to shift to the new royalty framework on Jan. 1, 2014.

All other existing wells and oil sands projects will move to the new royalty framework Jan. 1, 2009.

Cuba, Venezuela sign new accords on oil, gas

Venezuelan President Hugo Chavez and his Cuban counterpart, Raul Castro, have signed agreements to expand the capacity of two refineries in Cuba and to construct a third one.

Altogether, the expansion plans will see Cuba's refining capacity increased to 350,000 b/d from the current 87,000 b/d, according to a statement from Venezuela's state-owned Petroleos de Venezuela SA (PDVSA).

Under the agreements, the capacity of Cuba's Cienfuegos refinery will be stepped up to 150,000 b/d from the current 65,000 b/d, while the Hermanos Diaz refinery in Santiago will rise to 50,000 b/d from 22,000 b/d.

PDVSA said the proposed refinery in the port city of Matanzas will have a capacity of 150,000 b/d, and is to be managed by Cuvenpetrol SA—a new joint venture of PDVSA and Cuba's state-owned Cupet.

PDVSA did not reveal the respective stakes of the two sides in the joint venture or a schedule for the expansion of the existing refineries or the construction of the new one.

However, the Venezuelan firm said that Cuvenpetrol will control all refining interests in Cuba being pursued by the two countries, including the design and construction of an LNG regasification plant, gas pipelines, and other facilities.

The agreements signed recently mirror earlier ones between the two countries.

In April 2006, PDVSA entered into an agreement with Cupet to establish a joint venture company to refurbish and expand the Soviet-built facility at Cienfuegos that had been neglected since the start of the 1990s, when Soviet assistance to Cuba ended.

Under the earlier Venezuelan-Cuban JV, the refinery's capacity was initially raised to 65,000 b/d. The upgraded Cienfuegos refinery was inaugurated in late 2007 and started operations in January.

The Cienfuegos refinery is expected to close 2008 with production of 20 million bbl of fuel, according to deputy director, Raul Perez, who said the plan for the refinery envisaged output of 19.4 million bbl for the year.

Cuba imports 100,000 b/d from Venezuela in oil and products under special financial conditions that include bartering for Cuban goods or services such as doctors, teachers, and athletic trainers. ✦

Exploration & Development — Quick Takes

Hess discovers oil in Libya Sirte offshore

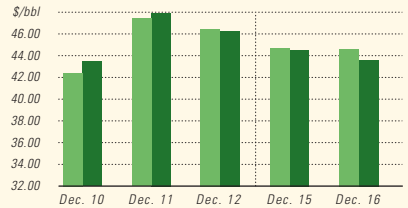
Hess Corp. said an exploratory well has encountered a 500-ft gross hydrocarbon section at various intervals in the offshore extension of Libya's mainstay Sirte basin.

A deepwater exploration well off Egypt found hydrocarbons, while another wildcat off Ghana was unsuccessful while another is planned, the company said.

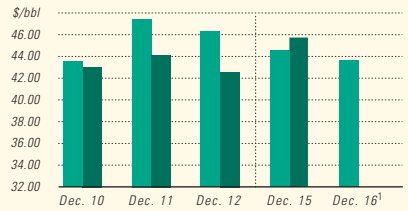
Hess holds 100% interest in Area 54 of Libya, where the

Industry Scoreboard

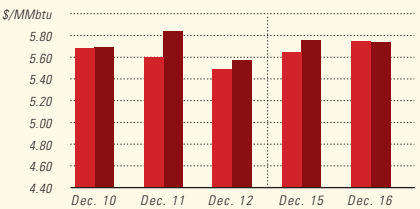
IPE BRENT / NYMEX LIGHT SWEET CRUDE



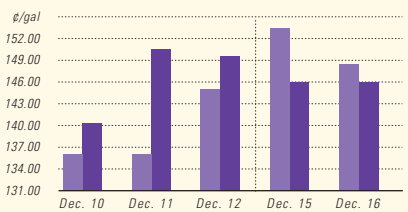
WTI CUSHING / BRENT SPOT



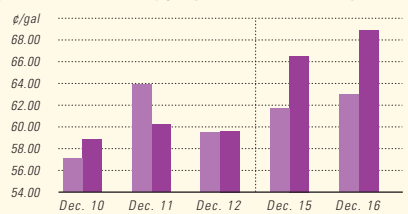
NYMEX NATURAL GAS / SPOT GAS - HENRY HUB



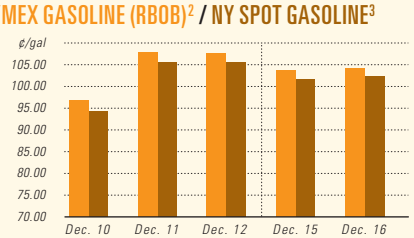
IPE GAS OIL / NYMEX HEATING OIL



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]Nonoxygenated regular unleaded.

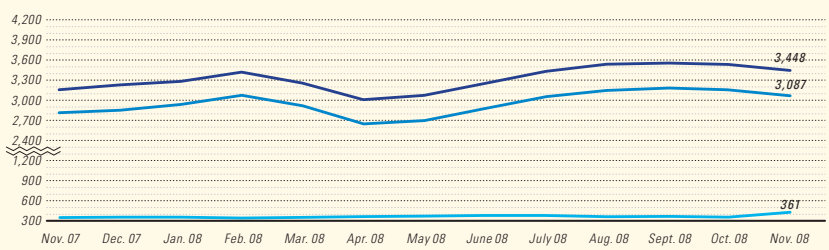
US INDUSTRY SCOREBOARD — 12/22

Latest week 12/5	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	8,939	9,232	–3.2	8,975	9,288	–3.4
Distillate	3,927	4,091	–4.0	3,942	4,196	–6.1
Jet fuel	1,332	1,601	–16.8	1,514	1,624	–6.8
Residual	588	753	–21.9	595	728	–18.3
Other products	4,516	4,884	–7.5	4,623	4,834	–4.4
TOTAL DEMAND	19,302	20,561	–6.1	19,414	20,677	–6.1
Supply, 1,000 b/d						
Crude production	5,055	5,023	0.6	4,949	5,065	–2.3
NGL production[2]	2,392	2,640	–9.4	2,267	2,408	–5.9
Crude imports	10,073	9,964	1.1	9,795	10,039	–2.4
Product imports	2,909	3,163	–8.0	3,117	3,469	–10.1
Other supply[3]	1,221	883	38.3	1,381	1,022	35.1
TOTAL SUPPLY	21,650	21,673	–0.1	21,509	22,003	–2.2
Refining, 1,000 b/d						
Crude runs to stills	14,661	14,849	–1.3	14,661	15,156	–3.3
Input to crude stills	14,917	15,498	–3.8	14,917	15,443	–3.4
% utilization	85.0	88.9	—	85.0	88.5	—

Latest week 12/5	Latest week	Previous week[1]	Change	Same week year ago[1]	Change	Change, %
Stocks, 1,000 bbl						
Crude oil	320,764	320,372	392	304,518	16,246	5.3
Motor gasoline	202,664	198,942	3,722	202,241	423	0.2
Distillate	130,587	124,973	5,614	131,534	–947	–0.7
Jet fuel–kerosine	39,315	38,567	748	39,864	–549	–1.4
Residual	38,037	37,156	881	39,522	–1,485	–3.8
Stock cover (days)[4]			Change, %		Change, %	
Crude	21.8	21.9	–0.5	19.9	9.5	
Motor gasoline	22.7	22.3	1.8	21.8	4.1	
Distillate	33.3	31.3	6.4	30.0	11.0	
Propane	49.9	49.2	1.4	42.5	17.4	
Futures prices[5] **12/12**			**Change**		**Change**	**%**
Light sweet crude ($/bbl)	44.71	45.50	–0.79	88.73	–44.02	–49.6
Natural gas, $/MMbtu	5.58	6.23	–0.64	7.21	–1.63	–22.6

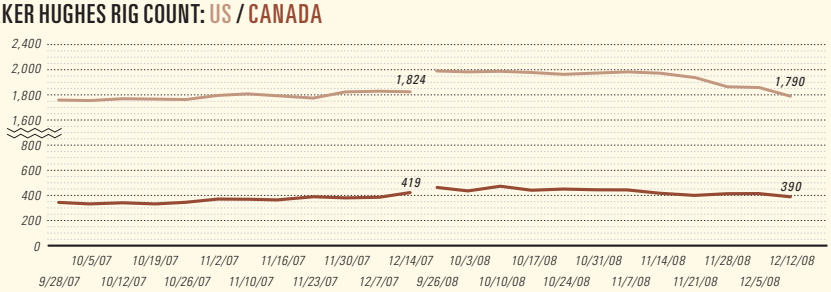
[1]Based on revised figures. [2]Includes adjustments for fuel ethanol and motor gasoline blending components. [3]Includes other hydrocarbons and alcohol, refinery processing gain, and unaccounted for crude oil. [4]Stocks divided by average daily product supplied for the prior 4 weeks. [5]Weekly average 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

$226 Billion

That's how much U.S. oil and natural gas companies spent in 2007 drilling and equipping new wells. But you already knew that because you subscribe to API's Joint Association Survey (JAS) on Drilling Costs. After all, it's the only long-term source of information on detailed U.S. drilling expenditures. So you already figured that in to your big presentation you gave to the Board, right?

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A1-54/01 wildcat 38 miles offshore went to total depth of 11,077 ft in 2,807 ft of water in the Mediterranean Gulf of Sirte.

The Dekhila-1x well in deepwater West Mediterranean (Block 1) 45 miles offshore in Egypt's Nile Delta went to TD 8,881 ft in 3,883 ft of water and found a gross hydrocarbon section of 148 ft at multiple intervals. Results will be incorporated into engineering studies for the wider West Med development.

Hess didn't elaborate on the magnitude of the find, but the Sirte offshore is not as yet a producing province.

Interest are Hess 55%, RWE Dea 35%, and Kuwait Foreign Petroleum Exploration Co. 10%. The 586,000-acre West Med block contained the Abu Sir, El King, El Max, and Al Bahig gas discoveries when Hess acquired its interest in late 2005 on trading its US Permian Basin properties to Apache Corp.

Hess's Ankobra-1 wildcat, on the Deepwater Tano Cape Three Points license and 70 km southeast of the Jubilee oil discovery, went to 13,000 ft in 5,682 ft of water without encountering commercial hydrocarbons. Hess is shooting 625 sq miles of 3D seismic in anticipation of a well to be drilled in the unexplored western half of the license.

China reports northern Xinjiang region gas find

China's National Mineral Resource Committee has reported PetroChina's discovery of a major gas field, claiming proved reserves of 100 billion cu m, in the Xinjiang Uygur Autonomous Region.

Klameli field, in northern Xinjiang's Junggar basin, is said to be PetroChina's largest gas find in the area. The field was discovered in 2006, and more test wells were drilled in 2007 to confirm the size of the reserves.

Chen Xinfa, general manager of PetroChina subsidiary Xinjiang Oil Field Co., said exploitation of Klameli field will alleviate gas shortages in northern Xinjiang.

According to Kuang Lichun, XOFC vice-general manager, Klameli field will produce 3.38 billion cu m of gas this year, about 20% of it to be sold to the cities of Urumqi and Sihezi, with the remainder reserved for the company's own use.

PetroChina expects the field to produce at least 1 billion cu m/year of gas for 50 years or more, Kuang said. Neither official said when the company expects to start production from the field.

No explanation was given for the delay in reporting the discovery.

Saratoga developing Vermilion 16 area

Saratoga Resources Inc., Houston, chasing untapped potential in Vermilion 16 field in state waters off Louisiana, acquired four tracts adjacent to the field and has commissioned a full-field study.

Vermilion 16, discovered in 1961, has produced from 30 stacked sands at 10,500-16,200 ft. Saratoga has identified five existing proved developed nonproducing opportunities in three wellbores and four proved undeveloped opportunities. Only two wells are drilled deeper than 17,000 ft.

Surrounding Vermilion 16 are several fields that each produced more than 3 tcf of gas. The newly acquired tracts either contain extensions to proved reserves or provide access to surface locations for proposed directional development wells.

NuTech Energy Alliance is using 25 sq miles of licensed 3D seismic from Fairfield Industries Inc. to identify unswept areas for infill drilling, identify and confirm directional development drilling opportunities, identify shallower bypassed gas pay, and identify low resistivity bypassed gas pay.

The recompleted S.L. 3762-1 well flowed 1.2 MMcfd of gas and 45 b/d of condensate on a $^{13}/_{64}$-in. choke with 3,050 psi flowing tubing pressure from Rob 54-F sand perforations at 13,004-014 ft, adding 34,000 bbl and 1.1 bcf of net reserves.

This plugback was identified by a pulsed neutron log that was run in the well in June 2007. Enough proved developed nonproducing reserves are recognized on that log to justify an acceleration well, Saratoga said. The data will be used to help accelerate the drilling of over 37 bcf and 400,000 bbl of proved undeveloped reserves.

The state recently approved a voluntary unit covering 600 acres on S.L. 3762 and 3763, which will insure that the lease area covered by these reservoirs is protected.

Saratoga's subsidiary The Harvest Group LLC also acquired 66 acres in Main Pass Block 53 with 100% working interest.

Petromin buys into Papua New Guinea fields

Papua New Guinea's state company Petromin has bought a 20.5% direct interest in onshore Elk-Antelope gas field discovered by InterOil in the country's Gulf province.

Petromin has made an initial cash payment to partially fund its share of field development costs.

InterOil Vice-Pres. Christian Vinson said his company has high hopes for the field based on recent testing. "We believe the discovery has the potential to make a major contribution to the future economic development of the nation," he said.

InterOil says recent testing at Elk-4 appraisal has recorded gas flow rates of 105 MMcfd of gas. Condensate rate is estimated to be 1,890 b/d. The company currently is drilling Antelope-1, about 2.8 km from Elk-4.

Development plans include supply to the proposed $5-7 billion Liquid Niugini LNG project, which is a rival of the ExxonMobil PNG LNG project to produce gas from the Kutubu-Hides group of fields in the country's central highlands region.

The initial phase of the Liquid Niugini gas project includes a pipeline to be built from the Gulf province to Port Moresby, where a gas processing plant will be constructed near InterOil's existing oil refinery. The plan includes a two-train LNG plant producing as much as 9 million tonnes/year of LNG with an on stream date of late 2013 or early 2014.

Liquid Niugini is owned equally by InterOil, Merrill Lynch, and Clarion Finanz. ✦

Drilling & Production — *Quick Takes*

Sakhalin Energy starts oil exports from Aniva Bay

Sakhalin Energy Investment Co. has started exporting oil from Molikpaq platform to the terminal in Aniva Bay in the south of Sakhalin, which will be dedicated to year-round oil deliveries.

The company has commissioned the 800-km TransSakhalin oil and gas pipeline system, which connects the offshore Molikpaq, Piltun-Astokhskoye-B, and Lunskoye platforms in the northeast to the new terminal and Prigorodnoye port in Aniva Bay. Oil was exported through a tanker loading unit 4.5 km offshore in Aniva Bay and connected to the terminal by a subsea pipeline.

The Governor Farkhutdinov giant tanker carrying 100,000 tonnes of oil left the island and set sail for South Korea's Yosu port, according to Russian news reports. At peak, Prigorodnoye will annually serve 160 LNG carriers and 100 Aframax oil tankers.

The milestone represents a major step in commissioning the facilities. The operator also will start LNG processing in the next few weeks. LNG supplies to customers in Japan will start begin in February (OGJ Online, Nov. 28, 2008). The Piltun-Astokhskoye-B platform also will send oil later this month.

The $20 billion Sakhalin-2 project has been unable to export year-round as its offshore facility could work for only 6 months of the ice-free season. "Year-round production and export of the Sakhalin-2 oil will significantly enhance energy security in the Asia Pacific and strengthen Russia's position in the world markets," Sakhalin Energy said.

Sakhalin-2 involves oil and gas production from Piltun-Astokhskoye field, which includes Piltun and Astokh oil and gas areas, and Lunskoye field.

SEIC has produced more than 100 million bbl of the Vityaz crude since 1999. The company is a joint venture of OAO Gazprom 50% plus 1 share, Royal Dutch Shell PLC 27.5%, Mitsui & Co. Ltd. 12.5%, and Mitsubishi Corp. 10%.

Tui field partners consider FPSO expansion

Partners in the development of Tui oil field off New Zealand, led by Sydney-based Australian Worldwide Exploration (AWE), are considering an expansion of the fluid handling capacity of the Umuroa floating production, storage, and offloading vessel to 180,000 b/d. The group has also deferred indefinitely the drilling of a third horizontal well in the field in favor of further exploration within the larger mining licence PMP 38158.

The upgrade of the FPSO will enable more oil to be recovered at a faster rate from the currently producing reservoirs and also provide the flexibility to tie-in any future nearby discoveries.

As expected from the outset, the field is gradually increasing its water cut and this is now limiting the maximum oil recovery rate to about 32,000 b/d.

The field has an estimated proven and probable reserve of around 50 million bbl. At the end of November, total production had reached 19 million bbl.

The Tui group is now confident it can extract the remaining reserves without the extra development well. There are five attractive prospects near the three producing reservoirs which in total could contain another 50 million bbl of oil.

Semisubmersible Kan Tan IV will be used for the 2009 exploration program but no decision has been made about which prospects will be targeted.

The Tui partners are AWE 42.5%, Mitsui Exploration & Production NZ 35%, New Zealand Oil & Gas 12.5%, and Pan Pacific Petroleum 10%. ✦

Processing — *Quick Takes*

Fate of North Pole refinery pondered

Alaska's state government and Flint Hill Resources will begin a joint effort to position the company's refinery at North Pole for long-term success, Gov. Sarah H. Palin announced on Dec. 10.

"The Flint Hills Resources Alaska refinery in North Pole has a significantly positive economic impact throughout our state," Palin said. "The refining operation is a major employer in Alaska and is vital to the operations of Anchorage International Airport, the Port of Anchorage, and the Alaska Railroad," she added.

The move came after Flint Hills' announcement in May that it was reviewing alternatives for the refinery due to financial challenges.

The plant is Alaska's largest refinery with a 240,000 b/d processing capacity. About 60% of its products are destined for the aviation market.

Palin said both the state and Flint Hills would evaluate options aimed at improving the plant's ability to respond to volatile energy costs, varying product demands and volatile refining margins as well as facilitating upgrades to position the installation for long-term success.

The governor said Flint Hills has agreed to provide data to the state's Department of Natural Resources, which has assured that it will remain confidential. The data will let the state agency analyze refinery economics over 3-6 months, Palin said.

The Alaska Railroad and Flint Hills also will review potential opportunities to structure refinery ownership and operations as part of a corporation similar to, or part of, the Alaska Railroad, Palin indicated.

The state will consider impacts on other Alaska refineries in all case, she emphasized.

Dominican Republic buys Shell's refinery share

The Dominican Republic has become the sole owner of the 31,000 b/d Refidomsa refinery at Haina after Shell Petroleum NV completed transferring its 50% stake.

The government paid $110 million for the interest, which Shell said it sold because it was no longer of strategic importance to the company.

The parties agreed to the share purchase on Aug. 5.

The refinery, commissioned in January 1973, is the primary refinery in the Dominican Republic. Along with its import terminal, it supplies most of the fuel requirements in the country. It has a hydroskimming configuration, and in 1992 the refinery commissioned its own power generation plant, which improved the plant's reliability.

Shell said it would remain in the retail, lubricants, and commercial marketing businesses in the Dominican Republic. ✦

Transportation — *Quick Takes*

Equatorial Guinea to set up gas processing hub

Equatorial Guinea plans to establish a gas-gathering company to collect gas in the Gulf of Guinea and direct it to key projects in the nation, according to a senior official from the state owned gas company Sonagas.

Serapio Sima Ntutumu, deputy director general at Sonagas, said at the CWC LNG summit in Barcelona that Equatorial Guinea wants to position itself as a gas processing hub in the region gathering gas from Nigeria, Cameroon, and other sources in Equatorial Guinea that could be fed into its LNG expansion, petrochemicals, LPG plants, and methanol systems.

Sonagas will perform a feasibility study to evaluate its gas options, an initiative crucial to eliminate gas flaring. It hopes to collect at least 800 MMcfd from Nigeria and 200 MMcfd from Cameroon, Ntutumu told OGJ.

"If they have even more, all the better. Noble Energy has discovered gas on Block O & I; ExxonMobil has gas activities. We want to work with them."

The new company would effectively become a hub for gas activity, coordinating work in Equatorial Guinea and offering licenses for gas development.

Equatorial Guinea also is working on a master gas plan to find ways of monetizing its resources. The government will announce further details later, Ntutumu said.

The nation's importance in the oil and gas arena was recognized by Gazprom Neft in October after it signed memorandum of understanding with the nation's energy ministry committing to carry out upstream, downstream, and financial studies. The partnership will strengthen the cooperation between Russia and Equatorial Guinea.

Pakistan plans $1 billion TAPI, IPI gas storage

Pakistan says it will require $1 billion to build underground storage for gas to be imported from Iran and Turkmenistan, according to the country's petroleum ministry and the Asian Development Bank in a joint study with Sui Northern Gas Pipeline Ltd. (SNGPL) and Sui Southern Gas Co. Ltd. (SSGCL).

SNGPL, SSGCL, and Inter-State Gas Systems, which is responsible for building the Turkmenistan-Afghanistan-Pakistan-India (TAPI) and Iran-Pakistan-India (IPI) gas pipelines, would build three to four underground gas storage tanks.

Pakistan plans to import 2.2 bcfd of gas from Iran, of which Pakistani share would be 1.05 bcfd. If India does not participate, Pakistan would take the entire volumes.

From Turkmenistan, Pakistan will import 3.2 bcfd of gas, to be shared equally with India. Pakistan would also need underground storage for gas supplied to different areas of the country.

Pakistan and Iran currently are in a dispute over the gas price, an obstacle to further progress on the IPI gas pipeline project. Pakistani and Iranian officials were expected to meet soon in Tehran to resume negotiations on the price issue.

The steering committee on the TAPI gas pipeline project was scheduled to meet in New Delhi this month, but the meeting was postponed after the recent Mumbai massacre.

Turkmenistan, which has failed to provide the gas reserves certification required by both Pakistan and India, is expected to present the certification when the meeting is rescheduled.

Gazprom to plan gas transport, storage in Europe

Gazprom Vice-Pres. Alexander Medvedev indicated in Paris Dec. 12 that the company is interested in acquiring gas transport and distribution assets in France and other areas of Europe to bolster the company's gas storage capacities. He said Gazprom Marketing & Trading France already has joint gas storage projects.

"We want to ensure distribution in all the countries where we deliver our gas under long-term contracts," he said.

Gazprom signed an agreement in December 2006 extending Gaz de France's long-term contracts to 2030 and, at the same time, the partners agreed that Gazprom could sell as much as 1.5 billion cu m/year in France as direct sales.

Medvedev said he is aiming for these volumes within 2-3 years, up from the current 500 million cu m, which accounts for 1% of the French market for large industries. Gazprom is now aiming for medium-size clients.

Youri Virobian, who heads the new French affiliate, said broadening Gazprom's market share would depend on "the future of regulated prices," which have kept the industrial gas market restricted to 19% for new entrants since the industrial market opened to industry in 2004. Householders, who could access the market since July 2007, only account for 1.9%, he noted.

Medvedev indicated that, due to the financial and economic crises, Russian investments will be prioritized, but he did say the Nordstream and Southstream gas pipelines and the Shtokman gas field projects would proceed.

Gran Tierra defers Colombian pipeline project

Gran Tierra Energy Inc., Calgary, deferred a 100-km pipeline project in Colombia connecting Costayaco field to the Orito gathering facilities. Recent pressure-testing of the existing pipeline system and testing of friction reducers injected into the oil stream show the existing pipeline system can move about 15,000 b/d from Costayaco with new pumps.

Gran Tierra will move an additional 10,000 b/d by truck, allowing it to meet estimated second-half 2009 production of 25,000 b/d. The company reduced expected peak plateau production from 35,000 b/d, but extended the peak's duration to 3 years.

The company estimates a $140 million savings for 2009 from deferring the pipeline project. The company said a WTI price of $61/bbl was needed to keep pipeline construction economical.

Gran Tierra, which discovered Costayaco field in 2007, holds five exploration licenses and a working interest in two technical evaluation areas in Putumayo basin.

Production in Costayaco field is suspended while the existing pipeline remains shut in. Output from other Putumayo assets, the Llanos basin, and the Lower Magdalena basin continues (OGJ Online, Dec. 4, 2008). ✦

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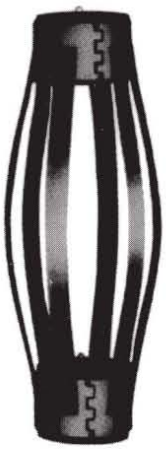

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2009

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.

Expandable Technology Oil & Gas Conference, Abu Dhabi, +44 (0) 1 483 598000, e-mail: sally.marriage@otmnet.com, website: www.expandableforum.com. 14.

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.

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.

CERAWeek, Houston, (617) 966-5992, e-mail: info@cera.com, website: www.cera.com. 9-13.

SPE Unconventional Fields Conference, Margarita Island, Venezuela, (972) 952-9393, (972) 952-9435 (fax), e-mail: spedal@spe.org, website: www.spe.org. 10-12.

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.

EnerCom's The Oil & Services Conference, San Francisco, (303) 296-8834, e-mail: kgrover@enercominc.com, website: www.theoilandservicesconference.com/index.html. 18-19.

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.

ASEG/PESA International Geophysical Conference & Exhibition, Adelaide, +61 8 8352 7099, +61 8 8352 7088 (fax), e-mail: ASEG2009@sapro.com.au, website: www.sapro.com.au/aseg.htm. 22-25.

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.

Nitrogen + Syngas International Conference and Exhibition, Rome, +44 20 7903 2167, +44 20 7903 2432 (fax), e-mail: conferences@crugroup.com, website: http://crugroup.com. 22-25.

CERI Natural Gas Conference, Calgary, (403) 282-1231, (403) 284-4181 (fax), e-mail: conference@ceri.ca, website: www.ceri.ca. 23-24.

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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.

APPEX Prospect and Property Expo, London, (918) 560-2616, (918) 560-2684 (fax), e-mail: convene@aapg.org, website: www.aapg.org. 3-5.

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.

ARTC Annual Meeting, Kuala Lumpur, +44 1737 365100, +44 1737 365101 (fax), e-mail: events@gtforum.com, website: www.gtforum.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.

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.

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.

Purvin & Gertz 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.

ACS Spring National Meeting & Exposition, Salt Lake City, (202) 872-4600, e-mail: service@acs.org, website: www.acs.org. 22-26.

NACE Corrosion Conference & Expo, Atlanta, (281) 228-6200, (281) 228-6300 (fax), website: www.nace.org/c2009. 22-26.

PIRA Understanding Global Oil Markets Seminar, Dubai, 65 6581 4122, e-mail: jay@pira.com, website: www.pira.com. 23-24.

SPE Americas E&P Environmental and Safety Conference, San Antonio, (972) 952-9393, (972) 952-9435 (fax), e-mail: spedal@spe.org, website; www.spe.org. 23-25.

API Spring Petroleum Measurement Standards Meeting, Dallas, (202) 682-8000, (202) 682-8222 (fax), website: www.api.org. 23-26.

Asian Biofuels Roundtable, Kuala Lumpur, +44 (0) 207 067 1800, +44 207 430 0552 (fax), e-mail: a.ward@theenergyexchange.co.uk, website: www.wraconferences.com/FS1/AB1register.html. 24-25.

SPE Western Regional Meeting, San Jose, (972) 952-9393, (972) 952-9435 (fax), e-mail: spedal@spe.org, website; www.spe.org. 24-26.

Offshore Mediterranean Conference & Exhibition (OMC), Ravenna, +39 0544 219418, +39 0544 39347 (fax), e-mail: conference@omc.it, website: www.omc2009.it. 25-27.

NPRA International Petrochemical Conference, San Antonio, (202) 457-0480, (202) 457-0486 (fax), e-mail: info@npra.org, website: www.npra.org. 29-31.

Petroleum Geology Conference, London, +44 (0)20 7434 9944, +44 (0)20 7494 0579 (fax), e-mail: georgina.worrall@geolsoc.org.uk, website: www.geolsoc.org.uk. Mar. 30-Apr. 2.

SPE/ICoTA Coiled Tubing & Well Intervention Conference & Exhibition, The Woodlands, Tex., (972) 952-9393, (972) 952-9435 (fax), e-mail: spedal@spe.org, website: www.spe.org. Mar. 31-Apr. 1.

Offshore Asia/Multiphase Pumping & Technologies Conference & Exhibition, Bangkok, 918) 831-9160, (918) 831-9161 (fax), e-mail: attendingOA@pennwell.com, website: www.offshoreasiaevent.com. Mar. 31-Apr. 2.

APRIL

Georgian International Oil, Gas, Energy and Infrastructure Conference & Showcase (GIOGIE), Tbilisi, +44 (0) 207 596 5233, +44 (0) 207 596 5106 (fax), e-mail: oilgas@ite-exhibitions.com, website: www.oilgas-events.com. 2-3.

SPE Production and Operations Symposium, Oklahoma City, (972) 952-9393, (972) 952-9435 (fax), e-mail: spedal@spe.org, website: www.spe.org. 4-8.

SPE Digital Energy Conference, Houston, (972) 952-9393, (972) 952-9435 (fax), e-mail: spedal@spe.org, website: www.spe.org. 7-8.

ATYRAU Regional Oil & Gas Exhibition & OilTech Kazakhstan Petroleum Technology Conference, Atyrau, +44 (0) 207 596 5233, +44 (0) 207 596 5106 (fax), e-mail: oilgas@ite-exhibitions.com, website: www.oilgas-events.com. 7-9.

Rocky Mountain Unconventional Resources Conference & Exhibition, Denver, (918) 831-9160, (918) 831-9161 (fax), e-mail: registration@pennwell.com, website: www.RMURconference.com. 14-16.

GPA Mid-continent Annual Meeting, Oklahoma City, (918) 493-3872, (918) 493-3875 (fax), website: www.gasprocessors.com. 16.

Middle East Petroleum & Gas Conference, Dubai, 65 62220230, 65 62220121 (fax), e-mail: info@cconnection.org, website: www.cconnection.org. 19-21.

ERTC Coking & Gasification Conference, Budapest, 44 1737 365100, +44 1737 365101 (fax), e-mail: events@gtforum.com, website: www.gtforum.com. 20-22.

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IADC Drilling HSE Middle East Conference & Exhibition, Abu Dhabi, (713) 292-1945, (713) 292-1946 (fax), e-mail: conferences@iadc.org, website: www.iadc.org. 21-22.

API Pipeline Conference, Fort Worth, Tex., (202) 682-8000, (202) 682-8222 (fax), website: www.api.org. 21-22.

Pipeline Transport Conference & Exhibition, Moscow, +43 1 230 85 35 33, website: www.expopipeline.com. 21-23.

Base Oils and Lubricants in Russia & CIS Conference, Moscow, +44 (0) 1242 529 090, +44 (0) 1242 529 060 (fax), e-mail: wra@theenergyexchange.co.uk, website: www.wraconferences.com. 22-23.

Instrumentation Systems Automation Show & Conference, (ISA), Calgary, Alta., (403) 209-3555, (403) 245-8649 (fax), website: www.petroleumshow.com. 22-23.

CPS/SEG International Geophysical Conference & Exposition, Beijing, (918) 497-5500, (918) 497-5557 (fax), e-mail: semery@seg.org, website: www.seg.org. 24-27.

AIChE Spring National Meeting, Tampa, (203) 702-7660, (203) 775-5177 (fax), website: www.aiche.org. 26-30.

API Spring Refining and Equipment Standards Meeting, Denver, (202) 682-8000, (202) 682-8222 (fax), website: www.api.org. 27-29.

EAGE European Symposium on Improved Oil Recovery, Paris, +31 88 995 5055, +31 30 6343524 (fax), e-mail: eage@eage.org, website: www.eage.org. 27-29.

ENTELEC Conference & Expo, Houston, (972) 929-3169, (972) 915-6040 (fax), e-mail: blaine@entelec.org, website: www.entelec.org. Apr. 29-May 1.

MAY

EAGE International Petroleum Conference & Exhibition, Shiraz, +31 88 995 5055, +31 30 6343524 (fax), e-mail: eage@eage.org, website: www.eage.org. 4-6.

Offshore Technology Conference (OTC), Houston, (972) 952-9494, (972) 952-9435 (fax), e-mail: service@otcnet.org, website: www.otcnet.org. 4-7.

GPA Permian Basin Annual Meeting, Austin, (918) 493-3872, (918) 493-3875 (fax), website: www.gasprocessors.com. 5.

Interstate Oil and Gas Compact Commission Midyear Meeting (IOGCC), Anchorage, (405) 525-3556, (405) 525-3592 (fax), e-mail: iogcc@iogcc.state.ok.us, website: www.iogcc.state.ok.us. 10-12.

ERTC Asset Maximisation Conference, Prague, 44 1737 365100, +44 1737 365101 (fax), e-mail: events@gtforum.com, website: www.gtforum.com. 11-13.

ACHEMA International Exhibition Congress, Frankfurt, +1 5 168690220, +1 5 168690325 (fax), e-mail: amorris77@optonline.net, website: http://achemaworldwide.dechema.de. 11-15.

IADC Environmental Conference & Exhibition, Stavanger, (713) 292-1945, (713) 292-1946 (fax), e-mail: conferences@iadc.org, website: www.iadc.org. 12-13.

North American Unconventional Oil & Gas Conference & Exposition, Denver, (403) 209-3555, (403) 245-8649 (fax), website: www.petroleumshow.com. 12-13.

NPRA National Safety Conference, Grapevine, Tex., (202) 457-0480, (202) 457-0486 (fax), e-mail: info@npra.org, website: www.npra.org. 12-13.

International School of Hydrocarbon Measurement, Norman, Okla., (405) 325-1217, (405) 325-1388 (fax), e-mail: lcrowley@ou.edu. Website: www.ishm.info. 12-14.

Uzbekistan International Oil & Gas Exhibition & Conference, Tashkent, +44 (0) 207 596 5233, +44 (0) 207 596 5106 (fax), e-mail: oilgas@ite-exhibitions.com, website: www.oilgas-events.com. 12-14.

NPRA Reliability & Maintenance Conference, Grapevine, Tex., (202) 457-0480, (202) 457-0486 (fax), e-mail: info@npra.org, website: www.npra.org. 19-22.

IADC Drilling Onshore Conference & Exhibition, Houston, (713) 292-1945, (713) 292-1946 (fax), e-mail: conferences@iadc.org, website: www.iadc.org. 21.

Gastech International Conference & Exhibition, Abu Dhabi, +44 (0) 1737 855000, +44 (0) 1737 855482 (fax), website: www.gastech.co.uk. 25-28.

APPEA Conference & Exhibition, Darwin, +61 7 3802 2208, e-mail: jhood@appea.com.au. website: www.appea2009.com.au. May 31-Jun. 3.

SPE Latin American and Caribbean Petroleum Engineering Conference, Cartagena, (972) 952-9393, (972) 952-9435 (fax), e-mail: spedal@spe.org, website: www.spe.org. May 31-Jun. 3.

JUNE

Caspian International Oil & Gas/Refining & Petrochemicals Exhibition & Conference, Baku, +44 (0) 207 596 5233, +44 (0) 207 596 5106 (fax), e-mail: oilgas@ite-exhibitions.com, website: www.oilgas-events.com. 2-5.

Asia Oil & Gas Conference, Kuala Lumpur, 65 62220230, 65 62220121 (fax), e-mail: info@cconnection.org, website: www.cconnection.org. 7-9.

AAPG Annual Meeting, Denver, (918) 560-2679, (918) 560-2684 (fax), e-mail: convene@aapg.org, website: www.aapg.org. 7-10.

PIRA Scenario Planning Conference, Houston, (212) 686-6808, (212) 686-6628 (fax), e-mail: sales@pira.com, website: www.pira.com. 8.

ILTA Annual International Operating Conference & Trade Show, Houston, (202) 842-9200, (202) 326-8660 (fax), e-mail: info@ilta.org, website: www.ilta.org. 8-10.

International Oil Shale Symposium, Tallinn, Estonia, +372 71 52859, e-mail: Rikki.Hrenko@energia.ee. 8-11.

SPE EUROPEC/EAGE Conference and Exhibition, Amsterdam, (972) 952-9393, (972) 952-9435 (fax), e-mail: spedal@spe.org, website: www.spe.org. 8-11.

PIRA Understanding Global Oil Markets Seminar, Houston, (212) 686-6808, (212) 686-6628 (fax), website: www.pira.com. 9-10.

GO-EXPO Gas and Oil Exposition, Calgary, Alta., (403) 209-3555, (403) 245-8649 (fax), website: www.petroleumshow.com. 9-11.

Petro.t.ex Africa Exhibition & Conference, Johannesburg, +27 21 713 3360, +27 21 713 3366 (fax), website: www.fairconsultants.com. 9-11.

Oil and Gas Asia Exhibition (OGA), Kuala Lumpur, +60 (0) 3 4041 0311, +60 (0) 3 4043 7241 (fax), e-mail: oga@oesallworld.com, website: www.allworldexhibitions.com/oil. 10-12.

ASME Turbo Expo, Orlando, (973) 882-1170, (973) 882-1717 (fax), e-mail: infocentral@asme.org, website: www.asme.org. 13-17.

Society of Petroleum Evaluation Engineers (SPEE) Annual Meeting, Santa Fe, NM, (713) 286-5930, (713) 265-8812 (fax), website: www.spee.org. 14-16.

PIRA London Energy Conference, London, (212) 686-6808, (212) 686-6628 (fax), e-mail: sales@pira.com, website: www.pira.com. 15.

IPAA Midyear Meeting, Dana Point, Calif., (202) 857-4722, (202) 857-4799 (fax), website: www.ipaa.org. 15-17.

PIRA Scenario Planning Conference, London, (212) 686-6808, (212) 686-6628 (fax), e-mail: sales@pira.com, website: www.pira.com. 16.

Atlantic Canada Petroleum Show, St. John's, Newfoundland & Labrador, 403) 209-3555, (403) 245-8649 (fax), website: www.petroleumshow.com. 16-17.

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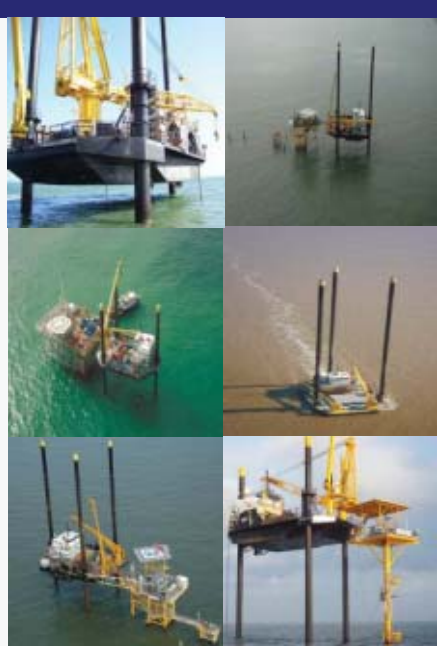

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Commodity prices, field costs

Alan Petzet
Chief Editor-Exploration

Operating companies aren't among the businesses in the US asking for taxpayer dollars to be bailed out due to historic fluctuations in oil and gas prices the past 2 years.

Dry holes are punishment enough, it could be said.

When oil and gas prices crash, overextended economic entities often go away but the hydrocarbons they sought to produce remain in the ground awaiting the next price cycle that enables them to be brought to the surface at a profit.

Oil & Gas Journal's OGJ200 report had 197 public companies listed for calendar year 2000 (OGJ, Oct. 1, 2001, p. 102).

Of those 197 entities, in 2007 about half were no longer in operation under their year 2000 names. About half were, in testament to their management's ability to navigate through commodity price cycles.

Here is how executives of two US exploration and production companies describe the interaction of commodity prices and field operating costs and examples of how they have adjusted their operations to respond.

Incidentally, Gulfport Energy Corp., Oklahoma City, and Southwestern Energy Co., Houston, are two of the OGJ200 companies still around since 2000.

Permian basin 'Wolfberry'

Gulfport Energy scaled back its operations in the Permian basin in late 2008, expecting its drilling and completion costs to drop in correlation with commodity prices.

In the last few days of 2007, Gulfport acquired 50% interest in 8,200 acres from private seller ExL Petroleum LP in the Wolfcamp and Spraberry play, which Gulfport refers to as Wolfberry. Windsor Permian LLC acquired the other 50% interest.

Gulfport and Windsor Permian identified 178 future development locations on the properties and began drilling in 2008. Most of the acreage is in West Bloxom and East Bloxom fields in Upton County in the Midland basin south of Midland.

A 10,200-ft well on 40-acre spacing generally recovers only 3% of the original oil in place, and the companies employ a drilling pattern to facilitate efficient downspacing to 20 acres. About 80% of recovery comes from the Wolfcamp, and total production is 64% oil, 23% natural gas liquids, and 13% gas.

The scaleback came after the companies spudded 29 wells in 2008, James D. Palm, chief executive officer, said in late November.

As commodity prices rose dramatically, wells expected to cost $1.7 million ended up costing more than $2 million. Critical materials such as frac sand became unavailable, and tangibles such as casing and tubing as much as tripled in price.

The companies deferred further drilling into 2009 on the expectation that costs will come down 20-25% in the first half of the year.

"Either commodity prices will go back up, or service costs will come back down," Palm said.

The scaleback is giving the operating team time to integrate new geoscience information, including extensive electric logging suites, a microstem study, and lots of core. Goal is to better understand the reservoir and improve completion practices.

Fayetteville shale

With gas prices on the skids, Southwestern Energy decided against its initial plan to ramp up activity in the Arkoma basin Fayetteville shale play in 2009 and instead hold drilling at about the 2008 rate (see story and map, p. 32).

Harold Korell, chairman and chief executive officer of Southwestern, sees the seeds of a resumption in Fayetteville growth in the decline in the US rig count in recent months.

The $15/Mcf price of gas caused the current oversupply, he said in early December. Some companies paid $10,000-20,000/acre for land, and those in difficult financial circumstances are overextended and are idling rigs and cutting budgets.

Idling those rigs will help bring supply back in line with demand, Korell reasoned, because of an expected 65% decline in first-year production from the shale wells being drilled in numerous US plays.

The same thing happened in 2000-01, he said, when 400 rigs were stacked and production fell dramatically.

"I think we're going to see that happen again in 2009," he said.

Southwestern's Fayetteville play is economic at less than present prices, but many of the other plays are not and they're going to slow down. "They have to," Korell said. ✦

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Editorial

Confusion in a rocky year

A rocky year in the oil market approaches its end with important, if confusing, developments.

On Dec. 17, the Organization of Petroleum Exporting Countries acted with unusual clarity to defend the price of crude oil by cutting production. Many times in the past, the exporters' group has announced cuts but not specified whether the reductions applied to quotas or actual production, which nearly always differ. OPEC's 500,000-b/d September "cut," for example, was an effort to enforce year-old quotas then largely ignored. In October, the group announced a 1.5-million b/d reduction without defining the baseline.

The latest move is less ambiguous. The cut, OPEC announced after a meeting in Oran, Algeria, will amount to 4.2 million b/d and apply to actual September production by the 11 members with quotas: 29.045 million b/d. The new target thus is 24.8 million b/d. That's 1 million b/d below the group quota implied by the September and October reductions. More importantly, it's 3.3 million b/d of crude oil below what the International Energy Agency estimates the OPEC-11 produced in November. If achieved and sustained into the first half of 2009, a production cut that large can reverse a contraseasonal build-up of crude stocks that began in October, about which the group is expressly and legitimately concerned.

Unintended help

OPEC may have received unintended help in its defense of the crude price from the US Federal Reserve. The day before the producers' group acted, the Fed cut its target interest rate for overnight bank lending to an historic 0-0.25%. It also said it would buy government securities from banks to put cash into circulation. These aggressive efforts to stimulate the US economy will tend to weaken the dollar, which in fact plummeted in value after they were announced.

Early this year, unusual dollar weakness correlated with unusual oil-price strength. More recently, other forces, mostly plunging oil demand and grim economic news, have overwhelmed whatever relationship exists between those variables. Indeed, oil prices dropped after the Fed announced its interest-rate cut as traders reacted to other influences. As long as oil is traded in dollars, however, a dollar of diminishing value can only help efforts to shore up dollar-denominated oil prices if the other turbulence subsides.

While potentially related OPEC and Fed maneuvers thus coincided with unpredictable consequences last week, the US Energy Information Administration unveiled a forecast with more-lasting implications—at least for the country that leads the world in oil consumption. In the "early release" version of its 2009 Annual Energy Outlook, EIA sees a flattening of consumption of petroleum liquids through 2030 as use of biofuels grows enough to satisfy modest increases in total liquids use. As a result, net dependence on imports shrinks from 58% of total liquids supply recently to 41% in 2030. Last year, EIA projected import dependency in 2030 of 54%.

Consumption of natural gas, by contrast, grows in the EIA forecast, supported by robust gains in domestic production. The production increase, largely resulting from unconventional reservoirs, squeezes the import share of total supply to 3% in 2030 from 16% at present. Last year EIA forecast 2030 gas import dependency at 14%. With growth in total energy use slowing and the carbon intensity of fuels diminishing, the average increase in energy-related emissions of carbon dioxide falls to 0.3%/year from last year's projection of 0.7%/year without any new policies.

What price?

So OPEC has cut production to strengthen oil prices. If successful, the move would impede economic recovery just as the Fed acts to stimulate recovery with a tactic that also might raise oil prices and thus, to some extent, work against itself. Markets have reason to be confused. Now, though, they're mostly obsessed with economic torpor and swooning oil demand. EIA, meanwhile, sees structural change in the US oil and gas markets. Yet fossil fuels in its projection still represent 79% of US energy supply in 2030, when, because of growing global demand and limits on resource access, the price of crude reaches $130/bbl.

Ah, yes, $130/bbl oil. It seems like only yesterday. ✦

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New estimates boost worldwide oil, gas reserves

Marilyn Radler
Senior Editor-Economics

Larger estimates for Venezuela have increased worldwide oil and gas reserves from previous estimates, according to Oil & Gas Journal's annual survey of proved reserves.

Worldwide oil production declined slightly in 2007. But preliminary estimates indicate that worldwide crude and condensate production increased 1.1% this year, spurred by robust demand in late 2007 and early 2008, and record high oil prices that peaked in July.

New estimates of the world's oil reserves total 1.34 trillion bbl, up 10.5 billion bbl from those reported a year ago (OGJ, Dec. 24, 2007, p. 22). The latest estimates of gas reserves total 6.254 quadrillion cu ft, up 68.67 tcf from those reported a year ago.

The increases in total oil and gas reserves come in large part as a result of higher estimates for Libya and Venezuela, as reported by the Organization of Petroleum Exporting Countries. OPEC also reported larger gas reserves and smaller oil reserves for Iran.

OGJ does not make its own estimates of a country's reserves but rather compiles the estimates of proved reserves from an annual survey of official sources, including government agencies and ministries. Since most countries do not assess their reserves annually, many of the figures in this report are unchanged from a year ago.

Reserves changes

Other than those mentioned above, there were no other large changes in reserve volumes on the country level. Most of the adjustments recorded from a year ago were related to production, but some reevaluations pertained to economics as the price of oil climbed.

The region with the largest changes in reserves is the Western Hemisphere, as was the case in the previous edition of this report. Led by Venezuela, collective oil reserves in North America and Latin America are up 3.6% and gas reserves are 5.6% higher than reported a year ago.

Most of the additions to Venezuela's reserves are the result of additions of extra-heavy oil. The country's reserves at the end of 2007 stood at 99.377 billion bbl, including 58.173 billion bbl of extra-heavy crude, according to PDVSA. This total is up 12.3 billion bbl from that reported a year ago.

Libya's new oil reserve estimates are up 2.2 billion bbl to 43.66 billion bbl. Indonesia, which has been facing declining output for some time and is leaving OPEC in January 2009, holds 3.99 billion bbl in oil reserves, down 9% from previous estimates, although its gas reserves are revised 13% higher at 106 tcf.

Argentina, Brazil, Ecuador, and the US show larger oil reserves, while oil and gas reserves in Canada, Mexico, and Colombia are lower.

Canada's oil reserves include 5.392 billion bbl of conventional crude oil and condensate, according to the Canadian Association of Petroleum Producers, and 172.7 billion bbl of oil sands reserves. The total is down 500 million bbl from previous estimates.

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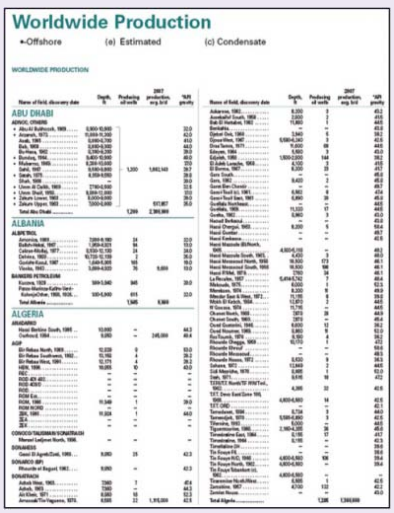

Worldwide Production

•Offshore (e) Estimated (c) Condensate

WORLDWIDE PRODUCTION

ABU DHABI

ALBANIA

ALGERIA

Reported oil reserves declined 4.6% in Western Europe, and gas reserves for this group of countries declined almost 2%. Denmark, France, Germany, and UK each reported lower oil and gas reserves.

US reserves

With proved reserves additions of 46.1 tcf and production of 19.5 tcf, the latest estimate of US natural gas reserves by the US Energy Information Administration is 237.7 tcf, up 13% from the previous estimate.

EIA said that in 2007, discoveries accounted for 63% of reserves additions. Exploratory gas well completions in 2007 rose 21% from a year earlier, and these exploration efforts led to 29 tcf of total discoveries in 2007.

US oil reserves are up much more modestly than gas reserves. Oil production in 2007 totaled 1.7 billion bbl, EIA said, but proved reserves additions were 2 billion bbl. This puts proved US oil reserves at 21.3 billion bbl, a 2% climb from a year earlier.

At 66 million bbl, new field discoveries of crude oil reserves doubled in 2007 over 2006, and 45 million bbl of these discoveries were in Alaska.

Up 7% from a year earlier, Alaska recorded the largest increase in proved oil reserves to 284 million bbl, followed by Texas with a 5% increase in year-end proved reserves to 251 million bbl.

EIA reported that reserves of natural gas liquids climbed 8% in 2007 to 9.14 billion bbl, as operators replaced 181% of production with reserves additions.

A DECADE OF RESERVES CHANGES

Table 1

Jan. 1	World (1,000 bbl)	OPEC (1,000 bbl)	World gas, bcf
2009	1,342,207,320	944,017,000	6,254,363
2008	1,331,698,077	931,999,000	6,185,693
2007	1,317,447,415	902,343,000	6,182,692
2006	1,293,344,534	901,659,000	6,101,158
2005	1,277,701,992	885,188,000	6,040,208
2004	1,265,811,583	869,521,000	6,068,302
2003	1,212,880,852	819,007,000	5,501,424
2002	1,031,100,681	818,842,000	5,451,332
2001	1,028,457,585	814,398,710	5,278,484
2000	1,016,041,221	802,479,710	5,146,207

Source: OGJ Worldwide Production Reports

Oil production

OGJ estimates that 2008 worldwide crude and condensate production will average 73 million b/d. This will be a gain from last year's output.

Worldwide oil production in 2007 averaged 72.16 million b/d, according to OGJ data. That was down 0.7% from a year earlier.

While worldwide production grew this year, Russia recorded its first oil output decline in a decade due to shrinking foreign investment and high crude export taxes. OGJ estimates that 2008 crude and condensate production in Russia will average 9.76 million b/d, down from the 2007 average of 9.83 million b/d.

OPEC oil output grew slightly in 2007 with the inclusion of Angola and Ecuador into the organization. OPEC's output will climb another 4% this year, as worldwide demand growth in the first half of 2008—especially in Asia, Latin America, and the Middle East—spurred the need for more of the organization's oil.

Total Middle East production has increased more than 5% this year over 2007 output, led by strong gains in Iraq, Saudi Arabia, and Kuwait.

Meanwhile, combined 2008 average production in Western Europe has declined 7% from last year. Down 8% each from 2007, production in the UK will average 1.4 million b/d this year, and Denmark's output will average 286,000 b/d. Oil production in Norway this year will decline more than 6% to average 2.125 million b/d.

Oil production in 2008 also will average lower than a year ago in Canada, Mexico, and the US. Early estimates show that production in Canada in 2008 will average 2.57 million b/d, a 1.8% drop from last year. Production of conventional oil in Canada has been trending downward for years.

Mexico's production incurred its 9% year-on-year decline due in part to a continued slide in output from Cantarell field. And US oil production, which has been declining since 1991, will end 2008 with a 3% slump in output from last year.

At the rate of 2007 worldwide production, the world's proved reserves of conventional and nonconventional oil at current estimates would last about 51 years. At the estimated 2008 production rate, these reserves would last about 50 years. ✦

RUSSIAN PRODUCTION

Table 2

	1,000 b/d
2008	9,760*
2007	9,830
2006	9,498
2005	9,190
2004	8,887
2003	8,216
2002	7,405
2001	6,781
2000	6,325
1999	5,930

*Estimate.

WORLDWIDE LOOK AT RESERVES AND PRODUCTION

COUNTRY	ESTIMATED PROVED RESERVES Jan. 1, 2009 Oil (1,000 bbl)	Jan. 1, 2009 Gas (bcf)	Jan. 1, 2008 Oil (1,000 bbl)	Jan. 1, 2008 Gas (bcf)	OIL PRODUCTION Producing oil wells* Dec. 31, 2008	Estimated 2008 (1,000 b/d)	Change from 2007 (%)	Actual 2007 (1,000 b/d)
ASIA-PACIFIC								
Afghanistan	—	1,750.0	—	1,750	—	—	—	—
Australia	1,500,000	30,000	1,500,000	30,000	1,317	453.0	0.4	451.4
Bangladesh	28,000	5,000	28,000	5,000	41	4.0	—	4.0
Brunei	1,100,000	13,800	1,100,000	13,800	779	157.0	–12.3	179.0
China	16,000,000	80,000	16,000,000	80,000	71,542	3,800.0	1.6	3,739.4
China, Taiwan	2,380	220	2,380	220	71	1.0	—	1.0
India	5,624,640	37,960	5,624,640	37,960	3,686	668.0	–2.8	687.3
Indonesia	3,990,000	106,000	4,370,000	93,900	8,331	855.0	1.8	840.0
Japan	44,115	738	44,115	738	145	16.5	–1.8	16.8
Malaysia	4,000,000	83,000	4,000,000	83,000	788	750.0	–1.3	760.0
Myanmar	50,000	10,000	50,000	10,000	450	19.0	46.2	13.0
New Zealand	60,000	1,200	55,000	1,048	72	56.0	37.6	40.7
Pakistan	339,000	31,266	289,202	28,000	204	66.0	–3.5	68.4
Papua New Guinea	88,000	8,000	88,000	8,000	46	41.0	–12.2	46.7
Philippines	138,500	3,480	138,500	3,480	11	15.8	–2.9	16.3
Thailand	441,000	11,198	460,000	11,697	1,180	229.0	7.9	212.2
Vietnam	600,000	6,800	600,000	6,800	28	275.0	–11.3	310.0
Total Asia-Pacific	**34,005,635**	**430,412**	**34,349,837**	**415,393**	**88,691**	**7,406.3**	**0.3**	**7,386.1**
WESTERN EUROPE								
Austria	50,000	570	50,000	570	905	16.0	–8.0	17.4
Denmark	1,060,000	2,165	1,188,000	2,490	232	286.0	–8.2	311.7
France	103,300	245	119,800	257	462	19.8	0.8	19.6
Germany	276,000	6,200	367,000	9,000	1,141	60.0	–12.1	68.3
Greece	10,000	70	10,000	70	12	1.3	–13.3	1.5
Ireland	—	350	—	350	—	—	—	—
Italy	406,500	3,325	406,500	3,325	205	99.0	–8.2	107.9
Netherlands	100,000	50,000	100,000	50,000	203	35.0	–12.7	40.1
Norway	6,680,000	81,680	6,865,325	79,130	801	2,125.0	–6.4	2,271.0
Spain	150,000	90	150,000	90	16	2.6	–10.3	2.9
Turkey	300,000	300	300,000	300	871	41.2	1.6	40.6
United Kingdom	3,410,000	12,110	3,600,000	14,550	1,360	1,400.0	–8.1	1,524.1
Total Western Europe	**12,545,800**	**157,105**	**13,156,625**	**160,132**	**6,208**	**4,085.9**	**–7.2**	**4,405.0**
EASTERN EUROPE and FSU								
Albania	199,140	30	199,140	30	1,945	9.9	3.1	9.6
Azerbaijan	7,000,000	30,000	7,000,000	30,000	62	925.0	11.4	830.0
Belarus	198,000	100	198,000	100	—	35.0	–0.6	35.2
Bulgaria	15,000	200	15,000	200	100	1.0	—	1.0
Croatia	79,300	1,080	79,150	1,008	846	14.8	–6.9	15.9
Czech Republic	15,000	140	15,000	140	—	4.5	—	4.5
Georgia	35,000	300	35,000	300	283	1.0	—	1.0
Hungary	20,180	286	20,180	286	875	14.4	–8.9	15.8
Kazakhstan	30,000,000	85,000	30,000,000	100,000	1,006	1,385.0	25.9	1,100.0
Kyrgyzstan	40,000	200	40,000	200	—	1.0	—	1.0
Lithuania	12,000	—	12,000	—	—	3.0	–3.2	3.1
Poland	96,375	5,820	96,375	5,820	512	16.5	–6.3	17.6
Romania	600,000	2,225	600,000	2,225	6,000	92.5	–5.2	97.6
Russia	60,000,000	1,680,000	60,000,000	1,680,000	100,637	9,760.0	–0.7	9,830.0
Serbia	77,500	1,700	77,500	1,700	646	15.0	—	15.0
Slovakia	9,000	500	9,000	500	—	0.1	—	0.1
Tajikistan	12,000	200	12,000	200	—	—	—	—
Turkmenistan	600,000	94,000	600,000	100,000	2,460	220.0	11.1	198.0
Ukraine	395,000	39,000	395,000	39,000	2,487	75.0	–6.3	80.0
Uzbekistan	594,000	65,000	594,000	65,000	2,190	105.0	–7.9	114.0
Total Eastern Europe and FSU	**99,997,495**	**2,005,781**	**99,997,345**	**2,026,709**	**120,049**	**12,678.7**	**2.5**	**12,369.4**
MIDDLE EAST								
Abu Dhabi	92,200,000	198,500	92,200,000	198,500	1,200	2,450.0	2.9	2,380.0
Bahrain	124,560	3,250	124,560	3,250	496	170.0	0.1	169.9
Dubai	4,000,000	4,000	4,000,000	4,000	200	110.0	10.0	100.0
Iran	136,150,000	991,600	138,400,000	948,200	1,128	3,900.0	–2.0	3,980.0
Iraq	115,000,000	111,940	115,000,000	111,940	1,685	2,365.0	13.2	2,090.0
Israel	1,940	1,075	1,940	1,075	6	—	—	—
Jordan	1,000	213	1,000	213	4	—	—	—
Kuwait	101,500,000	62,860	101,500,000	55,515	790	2,320.0	7.4	2,160.0

COUNTRY	ESTIMATED PROVED RESERVES Jan. 1, 2009 Oil (1,000 bbl)	Jan. 1, 2009 Gas (bcf)	Jan. 1, 2008 Oil (1,000 bbl)	Jan. 1, 2008 Gas (bcf)	OIL PRODUCTION Producing oil wells* Dec. 31, 2008	Estimated 2008 (1,000 b/d)	Change from 2007 (%)	Actual 2007 (1,000 b/d)
Neutral Zone	5,000,000	1,000	5,000,000	1,000	578	570.0	1.8	560.0
Oman	5,500,000	30,000	5,500,000	30,000	2,298	715.0	0.7	710.0
Qatar	15,210,000	891,945	15,207,000	905,300	421	855.0	6.9	800.0
Ras al Khaimah	100,000	1,200	100,000	1,200	7	1.0	42.9	0.7
Saudi Arabia	264,210,000	257,970	264,251,000	252,607	1,560	8,900.0	8.5	8,200.0
Sharjah	1,500,000	10,700	1,500,000	10,700	49	55.0	10.0	50.0
Syria	2,500,000	8,500	2,500,000	8,500	132	385.0	–1.1	389.2
Yemen	3,000,000	16,900	3,000,000	16,900	1,649	305.0	–4.8	320.3
Total Middle East	**745,997,500**	**2,591,653**	**748,285,500**	**2,548,900**	**12,203**	**23,101.1**	**5.4**	**21,910.2**
AFRICA								
Algeria	12,200,000	159,000	12,200,000	159,000	1,285	1,375.0	1.1	1,360.0
Angola	9,040,000	9,530	9,035,000	9,530	1,064	1,870.0	10.1	1,698.2
Benin	8,000	40	8,000	40	8	—	—	—
Cameroon	200,000	4,770	200,000	4,770	255	85.0	–0.2	85.2
Chad	1,500,000	—	1,500,000	—	449	145.0	—	145.0
Congo (former Zaire)	180,000	35	180,000	35	150	25.0	—	25.0
Congo Brazzaville	1,600,000	3,200	1,600,000	3,200	460	240.0	—	240.0
Egypt	3,700,000	58,500	3,700,000	58,500	1,491	680.0	5.4	645.0
Equatorial Guinea	1,100,000	1,300	1,100,000	1,300	67	320.0	—	320.0
Ethiopia	428	880	428	880	—	—	—	—
Gabon	2,000,000	1,000	2,000,000	1,000	395	235.0	2.2	230.0
Ghana	15,000	800	15,000	800	3	6.0	—	6.0
Ivory Coast	100,000	1,000	100,000	1,000	9	30.0	—	30.0
Libya	43,660,000	54,380	41,464,000	50,100	1,543	1,720.0	0.6	1,710.0
Mauritania	100,000	1,000	100,000	1,000	—	—	—	—
Morocco	752	53	836	55	7	0.2	–25.0	0.2
Mozambique	—	4,500	—	4,500	—	—	—	—
Namibia	—	2,200	—	2,200	—	—	—	—
Nigeria	36,220,000	184,160	36,220,000	183,990	2,524	1,940.0	–8.9	2,130.0
Rwanda	—	2,000	—	2,000	—	—	—	—
Somalia	—	200	—	200	—	—	—	—
South Africa	15,000	—	15,000	—	28	14.0	–2.8	14.4
Sudan	5,000,000	3,000	5,000,000	3,000	9	490.0	3.8	472.0
Tanzania	—	230	—	230	—	—	—	—
Tunisia	425,000	2,300	400,000	2,300	237	85.0	–10.1	94.6
Total Africa	**117,064,180**	**494,078**	**114,838,264**	**489,630**	**9,984**	**9,260.2**	**0.6**	**9,205.6**
WESTERN HEMISPHERE								
Argentina	2,616,000	15,600	2,586,750	15,750	18,814	610.0	–2.2	623.5
Barbados	2,171	5	2,200	5	92	0.8	—	0.8
Belize	6,700	—	6,700	—	—	—	—	—
Bolivia	465,000	26,500	465,000	26,500	361	40.0	–9.1	44.0
Brazil	12,623,900	12,890	12,181,620	12,280	11,995	1,815.0	3.8	1,747.8
Canada	178,092,000	57,906	178,592,000	58,200	62,519	2,570.0	–1.8	2,618.1
Chile	150,000	3,460	150,000	3,460	315	2.3	–11.8	2.6
Colombia	1,355,000	3,739	1,506,000	4,342	7,600	578.0	8.9	531.0
Cuba	124,000	2,500	124,000	2,500	251	50.0	—	50.0
Ecuador	4,660,000	315	4,517,000	—	1,296	500.0	—	500.0
Guatemala	83,070	—	83,070	—	20	14.0	–12.5	16.0
Mexico	10,501,200	13,162	11,650,000	13,850	3,052	2,800.0	–9.2	3,082.6
Peru	415,769	11,842	382,866	11,928	5,035	75.0	–3.8	78.0
Suriname	79,600	—	88,000	—	1,177	16.0	7.4	14.9
Trinidad and Tobago	728,300	18,770	728,300	18,770	3,903	113.0	–5.8	120.0
United States	21,317,000	237,726	20,972,000	211,085	498,619	4,900.0	–3.2	5,064.5
Venezuela	99,377,000	170,920	87,035,000	166,260	15,669	2,350.0	–1.7	2,390.0
Total Western Hemisphere	**332,596,710**	**575,335**	**321,070,506**	**544,930**	**630,718**	**16,434.1**	**–2.7**	**16,883.8**
TOTAL WORLD	**1,342,207,320**	**6,254,363**	**1,331,698,077**	**6,185,693**	**867,853**	**72,966.1**	**1.1**	**72,160.0**
Total OPEC	**944,017,000**	**3,216,020**	**931,999,000**	**3,151,742**	**38,034**	**32,136.0**	**3.8**	**30,948.9**

*Does not include shut in, injection, or service wells.

Deloitte: Oil demand growth will outlast ailing economy

Paula Dittrick
Senior Staff Writer

An ailing global economy will stall oil demand growth for a while, but industry must prepare itself to fulfill long-term growing global oil demand, speakers said Dec. 10 at Deloitte LLP's energy conference in The Woodlands, north of Houston.

The Deutsche Bank (DB) economics team expects global gross domestic product growth to be nearly zero in 2009 and 2.6% in 2010, said Adam Sieminski, DB chief energy economist. He expects the current economic downturn to be the worst in 50 years.

Consumer demand in major industrial countries will be depressed for about 18 months, Sieminski said. Consequently, oil demand and oil prices are expected to suffer, although he remains optimistic about the long-term fundamentals for fossil fuels.

"By the end of next year, I think we will be out of the worst of this," Sieminski said of the global economic downturn.

DB revised its oil price forecast for 2009 to $47.50/bbl compared with an earlier forecast of $60/bbl.

"This forecast reflects the new, lower economic outlook and subsequent impact on global oil demand, which we see falling by 1% in 2009," Sieminski said. "Our 2010 forecast for an average West Texas Intermediate price of $55/bbl is at the low end of the consensus range. Our $80/bbl estimate for 2011 reflects a view that oil prices will sharply recover once the economy regains its footing."

He foresees support for US natural gas prices. "The US gas rig count is down 10% since the August peak, and we expect it will keep on falling."

OPEC's influence

Sieminski expected little to come out of the Dec. 17 meeting of the Organization of Petroleum Exporting Countries.

"OPEC isn't ahead of the game," Sieminski said Dec. 10. "They are just simply reacting. It will probably take a couple more meetings after this one," before OPEC takes action that would actually change the supply-demand situation.

Luis Giusti, senior advisor of the Center for Strategic and International Studies, expects OPEC to take action to stabilize prices. Noting that Saudi Arabia is building new cities, Giusti said he believes Saudi Arabia would like oil prices to be $60/bbl.

Giusti criticized OPEC's October meeting, calling it "sloppy" and saying nobody believed that OPEC actually was going to reduce production.

Regarding national oil companies and international oil companies, Giusti expects to see renewed partnerships in part because IOCs need access to reserves. He also believes that "a new era of cooperation" between NOCs and IOCs is needed to meet future oil demand.

Amy Myers Jaffe of Rice University's James Baker Institute said NOCs are expected to control a greater portion of future oil production during the next 20 years but they will have difficulty fulfilling this role.

"Many NOCs have stagnant or falling oil production due to civil unrest, government interference, corruption, inefficiency, and diversion of capital to social spending," Jaffe said. She said Middle East oil producers, particularly in Saudi Arabia, want to ensure long-term oil demand growth and therefore desire a shallow, short US recession.

Saudi Arabia figures predominantly in the international financial system, Jaffe said, adding that it's in the Saudis' interest to protect their extensive asset holdings worldwide.

The Saudis also would like to slow down a shift to more fuel-efficient cars because that will reduce oil demand, particularly in the US where robust fuel efficiency measures are expected. Development of the next generation of biofuels also could mean a further decline in US oil demand, Jaffe said. ✦

Deloitte: US needs 50-year energy strategy

Paula Dittrick
Senior Staff Writer

A national energy council should be established in the US to develop a 50-year energy strategy, with the council developing benchmarks to monitor progress and making regular public reports, said economist Joseph Stanislaw.

In a proposal released Dec. 10 by Deloitte LLP at its annual energy conference, Stanislaw said the US must change the way it uses energy if the nation's citizens are to avoid being buffeted in the future by rising and falling energy costs.

"With the historic election of Barack Obama to president, our nation enjoys new opportunities to confront monumental challenges, especially the convergence of energy, climate change, and security," said Stanislaw.

The chief executive offer of JA Stanislaw Group and independent senior advisor to Deloitte, Stanislaw emphasized the difficulty of making and implementing energy choices.

During previous oil price shocks, presidents have pledged to develop

an energy strategy to lessen US dependence on imported oil. Yet, US oil imports have continued to increase.

Stanislaw noted that if the US car fleet had the same average fuel economy as European cars, then the US would import about 3 million b/d less oil, making it less dependent upon oil-producing countries such as Venezuela.

Balancing energy, environment

The Deloitte conference featured a panel discussion on the future of US energy policy that included among its panelists Guy F. Caruso, senior adviser for the Center for Strategic & International Studies.

Caruso said the upcoming Obama administration will be called upon to balance economic recovery with energy policy and environmental policy.

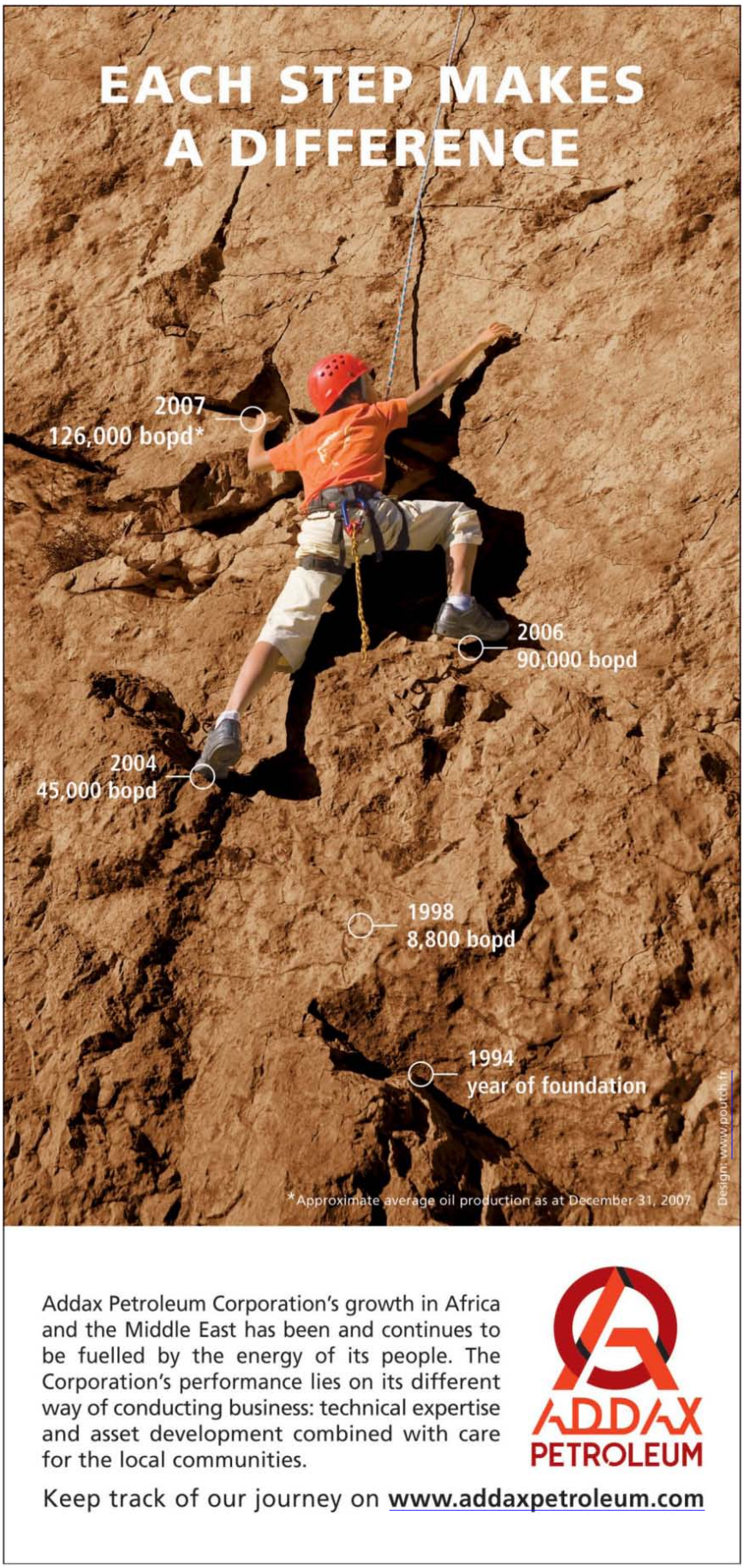
"These policy changes could have long-term impact," Caruso said. "Projected impacts of climate change and carbon constraints are potential game changers."

Other panelists were Michelle Michot Foss, University of Texas chief energy economist; and Vicky A. Bailey, president of Anderson Stratton International LLC energy management consultants. Regarding the status of the global oil market, Caruso listed four key indicators to watch during 2009-12: oil demand in emerging economies, investments in productive capacity, investments in refining capacity, and financial investments in oil futures.

Caruso formerly worked for Paris-based International Energy Agency and for US Energy Information Administration. CSIS serves as a strategic planning partner for the government by conducting research and analysis and developing policy initiatives.

Bailey suggested that after Obama takes office, he might want to do some things quickly that do not involve getting into climate change policy, which is expected to involve lengthy discussions and congressional debate.

A former commissioner on the US Federal Energy Regulatory Commission,



Bailey suggested government might look at helping stimulate jobs in energy. She also advocated an educational focus on engineering and science.

Stanislaw agreed, suggesting educators identify skills that schools can teach to promote a workforce to usher in what he called "a new era of energy and environmental progress—these include more traditional skills, which can be supplied by workers like electricians and welders as well as more advanced engineering skills."

Foss said the Obama administration needs a framework for its first 100 days to filter issues.

"I don't think climate is the right one. Maybe it should be energy investment," Foss said. She also said the public dialogue so far on climate change has not necessarily served the public well, and she advocated more discussion on the issue.

"In earth science, we look at carbon dioxide as a marker or an indicator but not as a cause," Foss said. ✦

Deloitte: Oil executives show support for alternative fuels

Paula Dittrick
Senior Staff Writer

Most senior oil and gas professionals participating in a recent survey said they are thinking increasingly about how their companies can participate in a US transition to renewable energy and alternative fuels.

Deloitte LLP's oil and gas group released the survey results Dec. 10 during the management consultant's energy conference in the Woodlands, just north of Houston.

"More than half of the executives in our study felt that petroleum companies should work toward helping America transition to the use of more renewables and other alternative fuels," Gary Adams, vice-chairman, oil and gas, Deloitte, told reporters at a news conference.

The telephone survey involved more than 50 oil and gas professionals at petroleum companies with annual revenues of $100 million or more. The survey was conducted Nov. 5-7.

Three in four executives in Deloitte's survey believe transitioning away from the nation's reliance on fossil fuels for transportation is an appropriate US goal, and 56% believe this is an appropriate goal for oil and gas companies, Adams said.

Many executives believe hydrocarbon-based energy remains the best source for long-term transportation purposes, and more than half said they expect natural gas to figure more in the future as a transportation fuel.

API responds

American Petroleum Institute Pres. Jack Gerard said the survey findings "underline the oil and natural gas industry's belief in the importance of efficiency and alternatives and are consistent with what our data shows about the significant investment of the nation's oil and natural gas companies in alternatives and other emerging energy technology."

US oil and gas companies invested more than $121 billion during 2000-07 on emerging energy technologies in the North American market, he said.

"This investment represents 65% of the estimated total of $188 billion spent by all US companies and the federal government," on emerging technology, Gerard said. He said oil companies are on "the cutting edge of technology" to provide the energy needed and to help create more jobs.

Energy costs

Adams said 53% of the oil executives interviewed "believe that the US could run out of reasonably priced oil within the next 25 years and 56% think the world will run out of reasonably priced oil in the next 50 years."

He stopped short of listing a figure for what executives considered to be reasonably priced.

In the survey, 71% said oil and gas is today's most affordable energy source, but only 23% forecast that it will remain the cheapest source 25 years from now.

Of oil executives surveyed, 17% believe oil and gas will be the most sustainable source of energy for another 25 years, 54% believe renewable energy will be highly sustainable in the future, and 37% also see renewables as an affordable source of energy in 25 years.

In a separate survey of 1,000 registered voters, Deloitte said the four biggest issues voters believe President-elect Barack Obama and Congress should tackle are: the nation's economy, the wars in Iraq and Afghanistan, health care, and energy.

Adams said he believed energy would have been the top issue if the survey had been done before the economic downturn. The voter survey was done online Nov. 5-12.

Regarding renewable energy, 38% said they would be willing to pay an additional 10% for environmentally friendly energy, and only 16% said oil and gas currently is a cheap energy source. ✦

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House panel chairmen: CWA enforcement has declined

Nick Snow
Washington Editor

Enforcement of the federal Clean Water Act has deteriorated badly under the Bush administration, two US House committee chairman charged on Dec. 16. Violations involving oil spills make up nearly half of the CWA violations which have been detected but not addressed, they added.

Henry A. Waxman (D-Calif.), who chairs the Oversight and Government Reform Committee, and James L. Oberstar (D-Minn.), who chairs the Transportation and Infrastructure Committee, said that new internal documents their committees have received reveal that hundreds of CWA violations have not been pursued with enforcement actions.

A memorandum outlining the results of an investigation by the committees' majority staff said that a June 2006 US Supreme Court ruling in the case—Rapanos vs. United States—and the Bush administration's 2007 implementation of the decision effectively narrowed the CWA's jurisdiction.

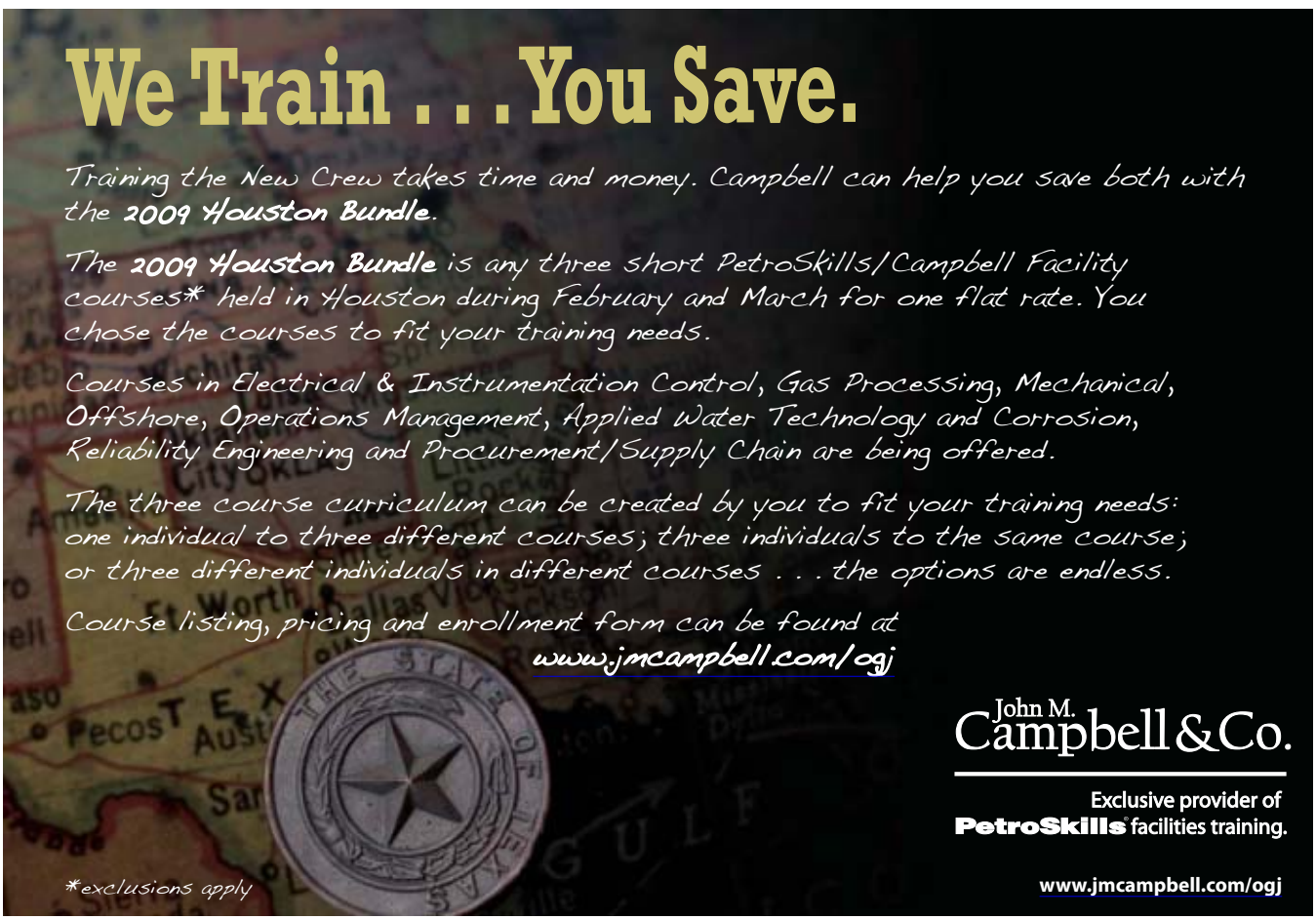
The decision required federal agencies in many cases to go through a time-consuming and resource-intensive process of demonstrating a "significant nexus" to "traditional navigable waters" before they could assert jurisdiction under the CWA, Waxman and Oberstar said in a letter to President-elect Barack H. Obama.

It said that documents obtained by the committees show that multiple US Environmental Protection Agency field offices have reported that their CWA enforcement programs are deteriorating rapidly since that time.

The memorandum cited a Jan. 10, 2008, message to headquarters from EPA's Dallas field office that at least 76 oil spill cases had been confirmed without any follow-up penalties or correction action sought "due to difficulties asserting jurisdiction post-Rapanos."

It said that EPA's Dallas field office further noted that "companies have elected to discontinue [spill prevention, control and counter-measure] protections at multiple locations based on their contention that there is no threat to jurisdictional waterways . . . Certain spill responses that would have merited EPA response action have not been acted upon."

The memorandum also cited an e-mail message to headquarters from EPA's Denver regional office from an



WATCHING GOVERNMENT

Nick Snow, Washington Editor

Blog at www.ogjonline.com

Colorado's new oil and gas rules

Want a glimpse of one of 2009's potentially biggest domestic production issues? Look no further than the new oil and gas regulations Colorado adopted Dec. 11.

The Colorado Oil & Gas Association thinks they're awful. Earthworks, formed to oppose mining practices but expanded its efforts into oil and gas in 1999, thinks they're terrific.

The state's Oil and Gas Conservation Commission unanimously approved changes it said would provide greater protection for Colorado's water, wildlife, and communities. The regulations also apply to private and federal land because they are "grounded in the police powers of the state" to protect the public's safety and welfare, COGCC said.

The commission developed the new rules after Colorado's general assembly adopted House Bills 1341 and 1298 in its 2007 session. COGCC said the process involved public meetings statewide, thousands of comments and testimony, 23 days of hearings and deliberation before final vote. The legislature will review the rules in its 2009 session.

Primary provisions

Key provisions include establishing protection zones around streams that serve public drinking water supplies, requiring producers to keep track of and disclose drilling chemicals they use to state and emergency responders, managing erosion and reducing water pollution around production sites during storms and snow run-off periods, and reducing odors from development near homes and schools.

COGCC said producers also will be required to let the state's health department and wildlife agency consult and offer recommendations, notify nearby landowners and seek public comments on proposed projects. Operators also will have the ability to submit large-scale development plans to expedite or eliminate some permit reviews, the commission said.

"The rules grandfather most existing operations and will be phased in over several months to provide for a smooth implementation," it indicated. COGCC also has received approval to hire new employees and is planning training sessions with producers, it added.

Burdensome

But John Swartout, COGA senior vice-president for policy and government affairs, said Dec. 11 that COGCC's new regulations "create the most expensive, time-consuming and burdensome regulatory environment in the nation, all at a time when Colorado should be fighting to keep jobs." The rules also don't achieve the legislative intent to create a "timely and efficient" drilling permit application process because they add "numerous and burdensome layers… to the already cumbersome process."

Earthworks took the opposite view. "A commission that had been oil and gas industry-dominated for decades now has a balance of representation from the industry, local government, public health, agriculture, and wildlife sectors, with a mandate to protect public health and the environment in the course of oil and gas development," it said on Dec. 12.

Colorado's new rules take effect May 1 on public land within the state and Apr. 1 on all other acreage. ✦

official who warned: "We literally have hundreds of [Oil Pollution Act] cases in our 'no further action' file due to the Rapanos decision, most of which are oil spill cases…. Again, we do have a file with well over 100 cases held due to Rapanos."

The actual problems may be worse than messages from those and other EPA regional offices describe, Waxman and Oberstar said. EPA withheld hundreds of documents from the committees and redacted the identities of every corporation or individual as well as specific affected waters in material that the agency supplied, the two House committee chairmen said.

"As you assemble your new environmental team and develop your agenda for next year, we would like to work with you in a cooperative manner to restore the integrity and effectiveness of a program that is vital to the health and environment of the American people," they told Obama. ✦

EU reaches 'three 20s' energy-climate agreement

The 27-nation European Union reached a unanimous agreement on the climate-energy package at its Dec. 11-12 summit. The agreement means member states must fulfill the "three 20s" target: By 2020 each country must bring down its greenhouse gas emissions by 20% from its 1990 level, bring the share of renewables in the energy mix to 20% from the current 8%, and achieve energy savings of 20%.

Since the targets were set in early 2008, the more recent financial crises have given several countries second thoughts that the free allowances of the Carbon Dioxide Emissions Trading Scheme, which are to become payable from 2013, would strain them too much.

The agreement is expected to bolster Europe's position at the Copenhagen climate conference scheduled at year-end 2009. ✦

COMPANY NEWS

Nippon Oil, Nippon Mining to merge

Japan's leading refiner Nippon Oil Corp. and sixth-ranked Nippon Mining Holdings Inc., faced with sluggish domestic demand for gasoline, plan to merge into a holding company.

Meanwhile, Nippon Oil Exploration is talking with Iraq about $10-20 billion worth of investments that are to include exploration and construction of a 300,000 b/d refinery.

In other recent company news:

- BG Group PLC and BP PLC plan to swap interests in each other's assets in the UK North Sea in a transaction worth £300 million.
- Chaparral Energy Inc. has called off a merger agreement between its subsidiary, Chaparral Exploration LLC, and Edge Petroleum Corp.

Nippon Oil, Nippon Mining

Nippon Oil and Nippon Mining expect the merger to be completed in October 2009.

Based on combined projected group sales for fiscal 2008, the new company will have sales of ¥13.15 trillion/year, surpassing China National Petroleum Corp.

Nippon Oil and Nippon Mining plan to reorganize so that the resulting holding company will have subsidiaries in refining and marketing, field development, and metals.

Nippon Oil Pres. Shinji Nishio emphasize refining, saying: "The new firm will reduce refining capacity by 400,000 bbl, or 20% of the companies' combined capacity, within 2 years."

After the integration, the company is expected to consolidate its 10 existing refineries and domestic network of about 13,000 gas stations, aiming to boost profitability by eliminating excess capacity.

Nippon Oil has a 23.1% share of Japan's gasoline market, with Nippon Mining Holdings unit Japan Energy Corp. commanding 10.3%. The new holding company will hold 33.4%.

Nippon Oil and Iraq

Nippon Oil Exploration is in discussions with Iraq about exploration and refining investments in Iraq.

Ryunosuke Onogi, an executive and general manager at Nippon Oil's subsidiary NOE, said the proposed refinery would cost $5-10 billion.

He estimates the same amount going

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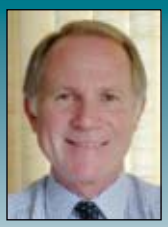

Shell pauses Corrib project

In the oil and gas business there are times when projects come to a standstill or even halt altogether. Something along those lines has happened to Royal Dutch Shell PLC in Ireland.

Readers of this column will not need reminding of Shell's Corrib gas project, and all of the controversy surrounding it over the past several years.

It seems Shell has decided to push the pause button for the time being.

In fact, Ireland's planning board, An Bord Pleanala, last week announced that Shell EP Ireland has withdrawn its planning application for a modified onshore pipeline for the Corrib gas project. Shell did not comment on the decision, but sources close to the project told the Irish Times that a revised application under the fast-tracking legislation would be lodged in the new year.

Additional information sought

An Bord Pleanala had been seeking crucial additional information from the Corrib gas developers on the new pipeline route, which was modified as a result of a recommendation by government mediator Peter Cassells.

Last August, the board gave the developers 6 weeks to provide additional information regarding the development's impact on the stability of ground in the area, on its environmental impact, and the impact of any extension of the life of wellfields.

An Bord Pleanala also sought reports on a post-landslide site at Derrybrien wind farm in Co Galway, as referred to in the company's environmental impact statement.

The proposed 9-km, high-pressure pipeline route extends from a landfall at Glengad under Dooncarton mountain, where there was a series of landslides in September 2003.

Sources close to the company said a combination of factors had influenced the decision to withdraw the current application. Among them is a delay until next year in laying the offshore pipeline, and a recent direction that disposal of peat unearthed in any pipe-laying must be incorporated in any planning application.

No overall delay

Sources said this allowed for time to submit a fresh application, along with the same environmental impact statement. There would be "no overall delay" to the project as a result.

It also is understood that there will be no fundamental change to the modified route, but the Irish Times said there will be some "adjustments," described as "minor," in the new application.

But don't expect the controversy to die down.

To allay public concerns, Shell consultants RPS said that "a revised application will now seek minor realignments to part of the proposed route for the Corrib onshore pipeline, in order to avoid more sensitive habitat, including bog pools, in the Rossport commonage, identified during recent surveys."

That did not satisfy opponents.

In fact, spokesman for community group Pobal Chill Chomain, John Monaghan, questioned how such surveys had been undertaken since there was a District Court order preventing Shell from carrying out such invasive works in the commonage. ✦

PERSONNEL MOVES AND

XTO names president,

XTO Energy Inc. has promoted **Keith A. Hutton** to chief executive officer and **Vaughn O. Vennerberg II** to president. Hutton has served as XTO president since 2005 and was employed by the company in various engineering positions since 1987.

Vennerberg began working at XTO in 1987 as land manager. He has served as senior executive vice-president and chief of staff since 2005.

Other moves

Texas American Resources Co. (TARC) has named **Tim Taylor** as chief operating officer, **Tom Rogers** as vice-president, operations, and **Steve DeVito** as

Taylor

toward exploration.

In November, Iraq approved construction of two refineries, scheduled to have total capacity of 300,000 b/d. Previously, Iraq approved two other new refineries, together totaling 450,000 b/d.

Iraqi Oil Minister Hussan Al-Shahrastani said Iraq needs help from outside companies to stem the decline in oil production and to help develop new fields.

Al-Shahrastani said the next 2 years will be crucial to rebuild the oil sector, with the government hoping to increase production to 4.5 million b/d by 2013 and to 6 million b/d by 2018 from the current 2.4 million b/d.

The discussion between NOE and Baghdad follows efforts by Turkey's state-owned Turkish Petroleum Corp. to form a consortium with Japanese firms to bid for contracts to develop Iraqi oil fields. TPAO Chairman Mehmet Uysal met in October with Mitsubishi Corp., Inpex Corp., Nippon Oil, and Japan

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PROMOTIONS

chief executive officer

Rogers

vice-president, exploration.

Taylor joined the company in August and has 37 years of experience in the oil and gas industry. He has broad knowledge in reservoir engineering and oil and gas production as well as high-level management experience. Taylor has held positions with Gulf Oil Co., Snyder Oil Co., SOCO International, Sipes, and Williamson & Associates. He has also served as founding president and chief executive officer of reservoir engineering firm Taylor, Phelps & Caudle.

DeVito

Rogers has served as vice-president, operations, northern region, and will now oversee all of the operated assets. He joined the company in June 2005 and has held engineering positions with Petro-Hunt and Hyperion Energy.

DeVito has been in the oil and gas industry for 33 years. He held positions with Mobil Oil, Esso, Enserch, and Union Texas Petroleum, and has evaluated numerous basins around the world. In his new position, DeVito will oversee all field exploration activities.

Ithaca Energy Inc. appointed **Lawrence Payne** executive chairman and **Iain McKendrick** chief executive officer and a director of the company.

Payne has been chief executive officer since the company's inception in April 2004.

McKendrick most recently served as vice-president, business development and strategy, in Houston.

Petroleum Exploration Co., as well as government officials.

At the time, Uysal urged major Japanese companies, including Nippon Oil and Mitsubishi, to jointly develop the oil reserves of Iraq's Kurdish region.

Uysal's approach came after the Iraqi government presented details of six major oil fields and two big gas fields in Iraq to 35 international oil companies, among them Inpex, Japex, Mitsubishi, and Nippon Oil.

TPAO was not among the companies invited to the Iraqi government's licensing round presentation in London. As a result, TPAO is looking to enter Iraq via a partnership with one or more Japanese firms ahead of the bidding.

BG, BP swap UK N. Sea stakes

BG will gain BP's equity stake in Everest, Lomond, and Armada fields and part of BP's equity in Erskine field, operated by Chevron.

All fields are in the Central North Sea. In return, BG will transfer all of its equity interests in fields in the Southern North Sea to BP.

BG's interest in Everest, Lomond, and Armada fields will rise to 80% from 60% interest. BG will operate the fields.

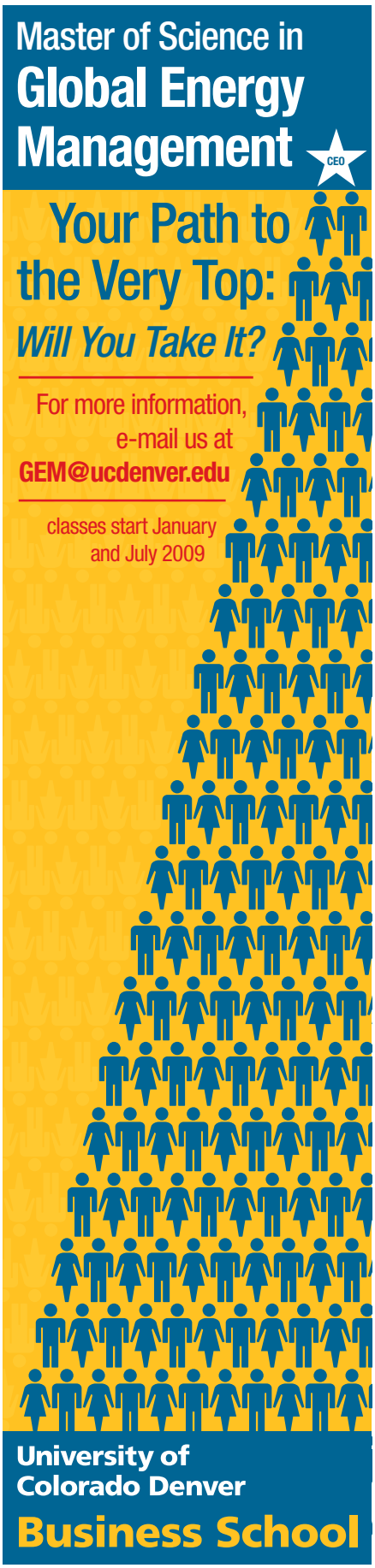
BP, in exchange, will acquire BG's interests in the Southern North Sea for the Easington Catchment Area (ECA) fields (Apollo, Artemis, Mercury, Minerva, and Neptune, which are BG-operated; and Wollaston and Whittle fields), and Amethyst field, which are BP-operated.

"Completion of the exchange is expected towards the middle of next year, subject to regulatory and third-party approvals," BG said.

Chaparral calls merger off

Chaparral, Oklahoma City, had planned to acquire Edge Petroleum of Houston and become a public company.

Chaparral and Edge agreed to terminate the merger following their conclusion that there was no reasonable expectation all closing conditions could be met by Dec. 31. ✦



Southwestern to probe new areas, won't accelerate Fayetteville in '09

Southwestern Energy Co., Houston, which had planned to accelerate its Mississippian Fayetteville shale play in Arkansas in 2009, will instead keep about the same level of activity as in 2008.

The company, however, indicated that it is more immune to weak gas prices than companies in many other shale plays.

The Fayetteville shale is "very economic" at present gas prices, Harold Korell, chairman and chief executive officer, said Dec. 2. With $1.2 billion cash flow in 2008, it is hard to imagine the company's 2009 capital plan being less than it was in 2008, Korell said.

Southwestern is running 20 rigs in the play spread across nine counties (see map). Six small rigs drill the vertical part of each hole, and 14 larger rigs drill the curve and lateral.

The company's Fayetteville production target for 2008 is 190-192 bcf, up about 70% from 2007 and an average of 526 bcfd. Gross production reached 600 MMcfd at the end of September 2008.

Fayetteville progress

Southwestern's land holding is 855,000 net acres and still growing. Of that, 125,400 net acres are held by conventional production on the west side of the play.

Through September, Southwestern had drilled 720 wells, 650 of them horizontal, in the numerous pilot areas marked by red and blue squares on the map.

The company was to have participated in 520 horizontal wells in 2008, 75% of them operated.

"The name of the game is to contact the most rock for the dollar spent," Korell said.

The company has more than doubled the average initial producing rate of its completions in a little over a year by drilling longer laterals, increasing the density of perforations, and hiking the number of fracs along each lateral.

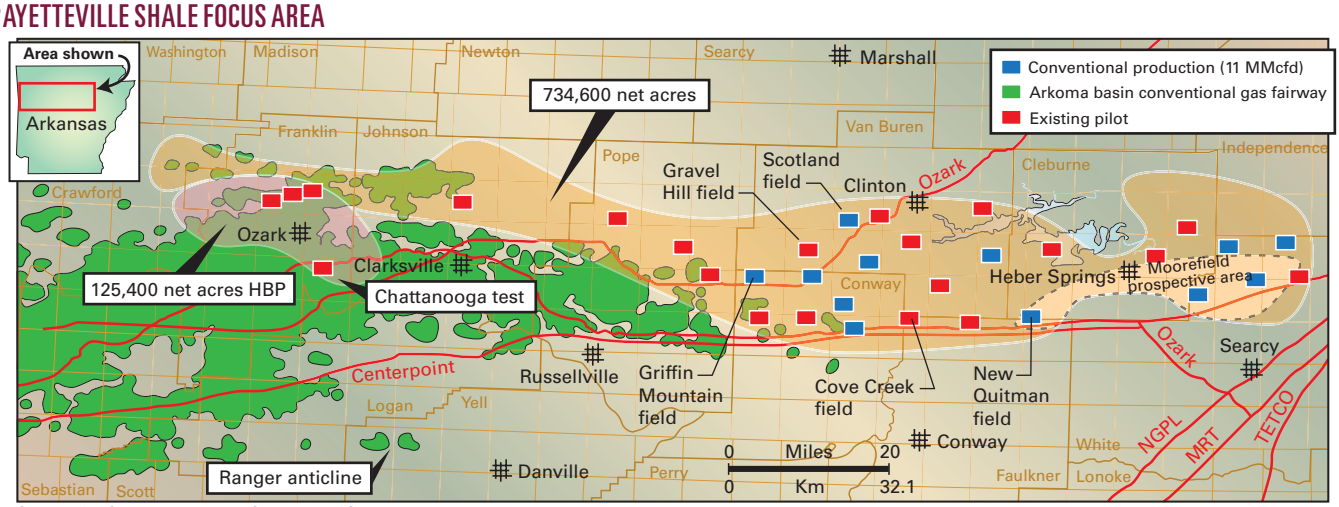
Some of the newer wells have laterals longer than 3,000 ft, and these are recovering new reserves, Korell said, not just accelerating production.

In the past 2 years, the addition of 3D seismic has helped guide wellbores to avoid faults.

It was in 2002 that Southwestern spent 9-10 months mapping the shale and determining where to buy acreage, Korell recalled.

Occasionally Southwestern has discovered productive sands similar to

FAYETTEVILLE SHALE FOCUS AREA



Source: After Southwestern Energy Co. Data as of Sept. 30, 2008

the conventional sands that produce off to the west, as indicated by the blue squares.

Economic factors

A combination of elements leads Southwestern to believe that the Fayetteville is one of the best quality North American shale plays, Korell indicated.

Years from now when we can look back and compare the shale plays, the Fayetteville will have yielded better returns than the core of the Fort Worth Barnett shale, he opined.

Part of this is because of Southwestern's low costs and dominant position with finding and development costs under $2/Mcf, he said. Southwestern's royalty interest averages 15%, low relative to later Fayetteville entrants.

Korell said he has reorganized the company's "idea people" who have been implementing the Fayetteville play into a new "idea generation group" and dedicated some seed money to investigate new opportunities. He did not elaborate.

Meanwhile, the 1.2 bcfd Boardwalk Pipeline Partners LP pipeline from Conway County to White County, expected to begin taking gas in late 2008 or early 2009, will add 800 MMcfd of capacity for Southwestern.

Boardwalk, originally expected to start up in September, is tackling a troublesome 2,300-ft river crossing. Pipeliners are boring through extremely hard rock underneath the Little Red River near the sprawling Greers Ferry Lake.

Reaming had reached 28 in. in early December toward an ultimate borehole size of 36 in.

A second phase from Bald Knob, Ark., to near Greenville, Miss., will provide Fayetteville gas access to northeastern US markets next year. ✦

New Zealand offers Northland, Raukumara blocks

New Zealand Crown Minerals offered six exploration blocks in the Northland basin northwest of Auckland and two off East Cape in the Raukumara basin off the North Island. The bidding round will close in January 2010.

The Northland blocks cover 3,900-11,000 sq km each. Three are on the shelf, and three are adjacent in intermediate to deep water.

The Waka Nui-1 well changed the understanding of the sequences of the region with Jurassic sediments being intersected, while the Karewa-1 well intersected significant, but as yet noncommercial, biogenic methane in the Neogene sediments, Crown Minerals noted. Recent satellite radar imaging highlighted a large number of potential offshore oil seeps indicative of the presence of an active petroleum system.

Numerous potential reservoir facies include transgressive coastal sands and conglomerates of Cretaceous and Paleogene ages and turbidite sands of Neogene age.

Origin Energy Ltd. and OMV AG are exploring in the permitted southern part of the basin and have shot 2D and 3D seismic in the link area to the northern part of the Taranaki basin.

The two Raukumara blocks cover 9,907 and 7,381 sq km. The unexplored Raukumara basin is at the northern end of the East Coast basin.

Satellite radar imaging indicates a number of potential oil seeps, which along with many large high-amplitude direct hydrocarbon indicators on seismic suggest that a petroleum system operates in the basin.

Unlike most of the East Coast, the Raukumara basin is a relatively undeformed depocenter that occupies a marine plain that extends north-northeast from the northern coast of the Raukumara Peninsula. The 25,000 sq km depocenter extends 300 km north and is 100 km wide, bounded to the east by the East Cape subduction ridge and to the west by the Kermadec ridge.

Water is more than 3,000 m deep at the northern end of the basin.

Two recent industry standard seismic surveys reveal more than 11 km of sediment in three megasequences.

As the basin has not been drilled, the stratigraphy has been correlated to the onshore geology. ✦

Busy 2009 seen in western Newfoundland

Vulcan Minerals Inc., St. John's, expects a busy year in several exploration plays in Newfoundland and Labrador in 2009.

Vulcan plans to drill a 3,600-m exploration well, Robinson-1, onshore in the Bay St. George basin that would be the basin's deepest well ever. It is on a seismically defined structure with several prospective reservoirs.

A drill pad is being built for the well, which is the culmination of several years of seismic work and shallow drilling. Vulcan's 50% working interest is to be carried fully by Investcan Energy Corp.

Vulcan plans to drill two other wells 1,500-2,500 m deep onshore in the basin and is reviewing the prospect for completing two 150-m core holes at Flat Bay to sample for natural fracture systems.

Leprechaun Resources Ltd., private Alberta company, has become operator of three onshore permits at Parsons Pond, western Newfoundland, in which Vulcan holds 7.39-18.57% interests. Leprechaun is raising funds.

The Parsons Pond area covers 100,000 acres of Cambrian-Ordovician platformal rocks in an area of numerous oil seeps, and seismically defined drill targets occur as deep as 4,000 m, Vulcan noted.

Vulcan owns 19% of the stock of NWest Energy Inc., which holds 100% working interest in 1.6 million acres off western Newfoundland. The blocks cover a Cambrian-Ordovician-Silurian platform and foreland basin rocks with petroleum potential. NWest is shoot-

ing seismic and seeking partners for drilling.

Meanwhile, Vulcan and Investcan plan to explore 584,466-acre License 1107 off Labrador. The license offsets two undeveloped gas discoveries and has several seismic leads. Investcan's interest is 50%. ✦

More West Texas overthrust exploration set

Cantex Energy Corp., San Antonio, in partnership with Big Canyon Energy, signed an exploration and development agreement with Slawson Exploration Inc., Wichita, covering the Big Canyon prospect in Terrell County, Tex.

Slawson Exploration will earn a 45% working interest in operating the project, which covers an initial 17,151 acres of prospective natural gas lease held by Big Canyon Energy and 7,680 acres of lease option. Beyond the lease and option coverage, the total area of mutual interest between the parties totals 89,929 acres.

Cantex Energy has the right to participate throughout the area of mutual interest based on Cantex's payment of future pro rata drilling and any further lease-option costs. Big Canyon Energy et al. retains a 39.375% working interest, with Cantex Energy holding the remaining 15.625% working interest.

The acreage is in the West Texas overthrust area of the Val Verde basin.

Cantex Energy earned the right to participate in the Big Canyon prospect by funding and deploying a seismic survey in 2004-05. Interpretation suggests the presence of at least five large imbricate fault closures that cover 10 sq miles or more, highly similar to the character of Pinon field in Pecos County 40 miles northwest of and on trend with the prospect (see cross sections, OGJ, Nov. 24, 2008, pp. 34-35).

The Big Canyon prospect is further set up by the presence of potentially commercial quantities of gas as close as 5 miles from the leasehold, and in the AMI, a discovery well drilled in 2004 by SandRidge Energy Inc.'s predecessor Riata Energy Inc., that flowed almost 2 MMcfd on a 16/64-in. choke. This "show" is believed to have occurred in the objective thrusted Pinon field-type Caballos reservoirs.

Pending working interest decisions and actions, the companies expect to participate in exploratory wells on two of the five imbricate closures in 2009. ✦

Indonesia

Pan Orient Energy Corp., Calgary, is shooting 800 line-km of 2D seismic on the Citarum PSC in West Java, Indonesia.

The survey targets several large, surface-expressed leads independent of the target tested at the Pasundan-1 exploration well.

Drilled a year ago by Citarum's former operator, the well cut 500 m of limestone with 21 m of cavernous reservoir in its upper portion. Pan Orient tested the upper zone and found it to be water-bearing. Further exploratory drilling is planned in late 2009 on the block, in which Pan Orient has 69% interest and is operator.

Louisiana

Saratoga Resources Inc., Houston, plans seven through-tubing plugbacks in giant Grand Bay oil and gas-condensate field in Plaquemines Parish, La., in the first quarter of 2009.

The $525,000 program is expected to add 100 b/d of oil and 1.3 MMcfd of gas production. The company is in the midst of full-field studies of Grand Bay and Vermilion 16 fields.

The company said it will consider several development drilling options as the price outlook stabilizes (OGJ Online, Dec. 2, 2008).

Oklahoma

Industry has drilled well over 700 wells to date in the Woodford shale in the Arkoma basin in southeastern Oklahoma, said Newfield Exploration Co., Houston.

State regulators have permitted drilling 400-500 ft closer to the north and south lines of spacing units, allowing longer laterals in the Woodford. The company is also in planning stages for an 8,000-10,000-ft "superextended" lateral in the Woodford.

Newfield expects its entire position of more than 165,000 acres to be held by production by the end of 2009. The current figure is 85%. Newfield is attempting to complete its first horizontal well in fractured Pennsylvanian Wapanucka limestone above the Woodford.

Texas

South

Comstock Resources Inc., Frisco, Tex., said its Leyendecker-10 exploratory well in Fandango gas field, Zapata County, Tex., cut 300 ft of net pay in three zones. Comstock, with 100% working interest, is running production casing and expects to start production in early January 2009. TD is 16,200 ft.

It plans to spud this month Trevino-3 projected to 14,800 ft and Muzza-13 to 16,000 ft, both targeting multiple objectives.

Utah

Newfield Exploration Co., Houston, has boosted oil production from giant Monument Butte field in Utah's Uinta basin to more than 17,000 b/d from 7,500 b/d in 2004 when the company acquired the property.

The company will drill 250 wells at Monument Butte in 2009 as it continues to expand the field to the north.

The field had more than 1,100 producing wells at the end of 2007, and drilling is on 40-acre and 20-acre spacing. Thousands of infill locations remain to be drilled.

Triangle developing shale gas onshore NS

Nina M. Rach
Drilling Editor

Calgary's Triangle Petroleum Corp. is using expertise honed in Texas' Barnett shale and Arkansas' Fayetteville shale to develop shale gas resources in eastern Canada's Maritimes basin.

The company, through its US subsidiary Triangle USA Petroleum Corp., held a 27% working interest in 12,100 gross acres in northeast Hill County, Tex., developing the Barnett shale in the Fort Worth basin, before divesting that interest in July 2007.

Triangle also explored and drilled 20,000 gross acres in a Fayetteville shale joint venture in the Arkoma basin with Houston-based Kerogen Resources Inc. (OGJ, Sept. 17, 2007, p. 59). The company may divest the Arkansas holdings, said Howard Anderson, Triangle's president and chief operating officer.

Triangle's threefold Canadian strategy has been to:

- Acquire an early position in large, contiguous blocks.
- Use expertise gained from previous projects.
- Add joint-venture partners to mitigate risk and accelerate drilling programs.

Windsor Block

Through its Canadian unit, Elmworth Energy, Triangle Petroleum is drilling for shale gas in Nova Scotia's Windsor Block, 25 miles from the Halifax lateral of the Maritimes & Northeast pipeline (M&NE; Fig. 1).

In June 2007, Triangle farmed into 516,000 gross acres (806 sq miles) that Calgary-based Contact Exploration Inc. had acquired from Devon Canada Corp. Triangle took on an $800,000 (Can.) work commitment from Devon-Northstar Energy's 1999 exploration agreement.[1]

Contact Exploration and its joint-venture partners recognized two main play types and divided the block into an eastern block with shallow potential in the Devonian-Mississippian Horton Bluff shales and a western block with Windsor Reef potential below salt. Contact, Oiltec Resources Ltd., and Husky Energy explored and drilled several wells targeting Windsor Reef prospects.

TRIANGLE PETROLEUM'S SHALE GAS BLOCKS

Fig. 1

Precision Rig 176 drilled the Kennetcook No.1 well in the Windsor Block in August-September 2007 (Fig. 2, photo by Brad Affleck, Triangle Petroleum).

Triangle was interested in shale gas; results from the Noel No. 1 well, drilled in 1975, with gas shows in the Cheverie and Horton Bluff formations of the Horton Group, at 350-1,000 m depth. There was no production, but well logs indicated good permeability and porosity.

In 2007, Triangle acquired 30 miles (48 km) of new 2D seismic and 25 sq miles of 3D seismic data over the block, and drilled, cored, and completed two vertical wells in the Kennetcook area of Hants County, about 70 km north of Halifax (Fig. 1).

Precision Rig 176 spud the Kennetcook No. 1 well in August 2007 and drilled to 4,390 ft TD before the rig was released on Sept. 15, 2007 (Fig. 2). Triangle took cores over a 1,150-ft interval of the Horton Bluff shale and sent them to the US for analysis of total organic content, mineralogy, porosity, gas content, and mechanical rock properties (Table 1).

Based on preliminary log analysis, Triangle identified a 350-ft thick primary zone of interest and a 260-ft thick secondary zone.[2]

CORE RESULTS[1]

Table 1

Desorption	8-190 scf/ton
Average TOC[2]	4-10%
Thermal maturity, Ro	1.5-2.5%
Mineralogy	52% silica 42% clays (illite, kaolinite, chlorite)
Mechanical properties	Fall in "frac'able window"
Porosity	2-6%

[1]From two vertical wells, Kennetcook No. 1 and No. 2, drilled during 2007. [2]Total organic carbon; comparable with Barnett shale 3-8% TOC; Fayetteville shale 4-9.5% TOC.

Triangle is using slick-water hydraulic fracturing to stimulate the shales and pumped a two-stage frac. The first stage used 850,000 gal of water and 560,000 lb of sand and the second stage used 660,000 gal of water with 386,000 lb of sand at 82 bbl/min, the company reported on Dec. 3, 2007.

The Kennetcook No. 2 well is a few miles northwest of the first well and was also drilled with Precision Rig 176. After reaching a TD of 6,350 ft, Triangle took cores over a 430-ft interval and released the rig Oct. 13, 2007. The Kennetcook No. 2 well was also fraced in two stages, with 1.3 million gal of water and 540,000 lb/sand at 70-80 bbl/min.

At KC2, Triangle began to produce gas with recovered frac water, up to about 60 mcf/day.

Anderson told OGJ that the company's two wells in 2007 served as a proof of concept, which they further tested this year.

Land tenure

On June 23, 2008, Triangle Petroleum announced that it was partnering with privately held Zodiac Exploration Corp. in the Windsor Block. Calgary-based Zodiac is paying 50% of drilling costs (up to $7.5 million) to earn a 12.5% working interest in the block. Zodiac may use another option to spend $7.5 million to earn an additional 12.5%, which would give it 25% WI and leave Triangle with 45% WI. Contact Exploration retains its 30% interest in the block.

On June 24, Triangle Petroleum, as Elmworth Energy, filed a development plan with Nova Scotia's Department of Energy as part of its application for a

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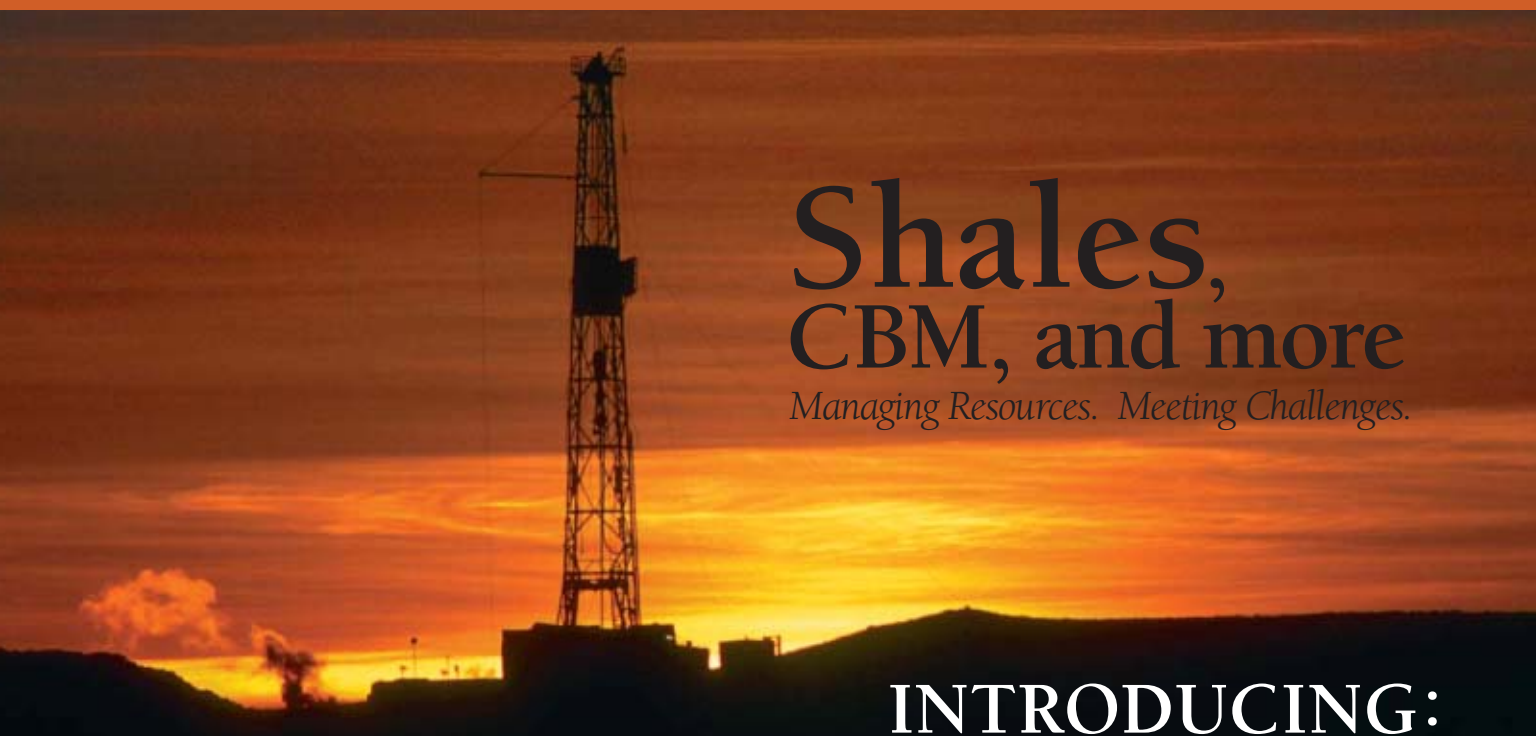

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production agreement.

The public comment period ended Sept. 24 and the Ministry of Energy will make a decision on the application by Dec. 22.[3]

If the application is approved, it will trigger a new 10-year renewable land tenure on the Crown land for Triangle.

2008 wells

Triangle drilled two more vertical wells in the Windsor Block earlier this year with Nabors Rig 4, which has a depth rating of 3,600 m (12,000 ft). These wells are in a new fault block on the north side of the Windsor Block.

The company spud the N-14-A well in July and drilled to 8,500 ft TD. It stepped out 14 miles to the west of N-14-A to spud the second well, O-61-C, in August and reached TD of 9,700 ft (Fig. 3).

The two wells are in different fault blocks.

Nabors Rig 4 was on location to drill the 0-61-C well in the Windsor Block in 2008 (Fig. 3, photo by Anita Livingstone, Triangle Petroleum).

Anderson told OGJ that the company spud a third well on Oct. 22, to test another new fault block. The E-38-A well was to test Horton Bluff shales as well as conventional targets uphole. Due to hole caving problems, the hole only reached 1,700 m and fell short of the expected 2,200 m TD. The well was cased to 1,500 m, and the rig was released Nov. 14.

Triangle fracture-stimulated the N-14-A well in early December, with four 50-tonne fracs in a 100 m interval at about 1,900 m, Anderson told OGJ.

New Brunswick

Triangle is also looking at gas shales in the Moncton-Sackville subbasin in New Brunswick. In 2007, the company announced that it had executed farm-in agreement for 70% working interest and operatorship in the 68,000-gross-acre Beech Hill Block.

Privately held Forent Energy Ltd., based in Calgary, obtained exploration rights to 466,000 acres in the Alton Block, near Antigonish, NS, from EOG Resources in 2007 and assumed EOG's work commitment (www.forentenergy.com).

Halifax-based Corridor Resources Inc. is spending $32 million in 2008-09 to assess the Mississippian Frederick Brook shale. Corridor has 118,000 acres under license near Elgin, NB (OGJ, June 16, 2008, p. 39).

Corridor is also developing the McCully project and there is natural gas production from Stoney Creek field, adjacent to Triangle Petroleum's Beech Hill Block.

Infrastructure

Equipment and services are easier to come by in the Maritime Provinces now that several operators are beginning to form a critical mass, says Anderson. In addition to Triangle and Contact, Stealth Ventures Ltd. is exploring coalbed methane prospects in Nova Scotia, and Calgary's Forent Energy Ltd. has farmed-in an EOG Resources block.[3]

Calgary-based Contact Exploration Inc. is the largest acreage holder in Nova Scotia (OGJ, Aug. 21, 2006, p. 46).

Developing resources in the Maritimes is underpinned by the presence of the M&NE pipeline. With success, Triangle thinks it's possible to tie its expected shale gas production into the pipeline within 2 years.[1]

Triangle reported its third quarter results for fiscal 2009 on Dec. 11, 2008. The company spent $2.2 million to drill the three Windsor Block wells—N-14-A, O-61-C, and E-38-A—during the quarter. ✦

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Thermal heavy-oil recovery projects succeed in Egypt, Syria

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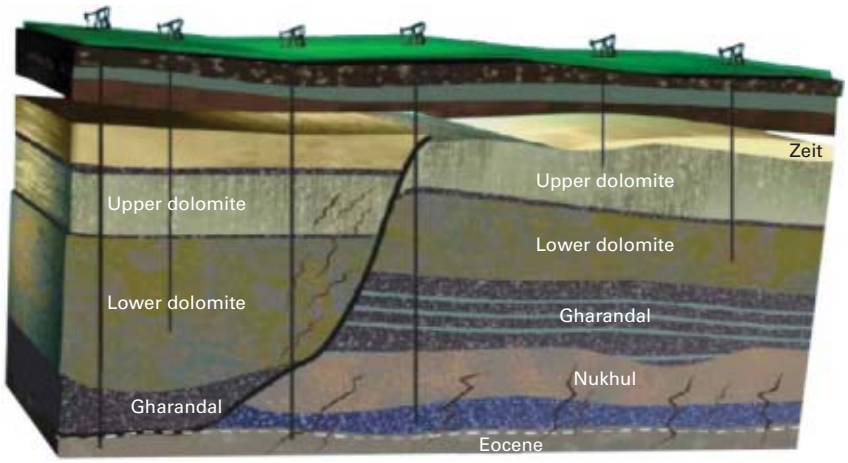
To increase oil recovery from existing fields, operators in both Egypt and Syria have started producing heavy oil with thermal enhanced oil recovery processes.

In Egypt's Issaran oil field, cyclic-steam stimulation has increased oil production to 4,000 b/d from 50 b/d under primary recovery.

In Syria's Oudeh and Tishrine oil fields, pilot cyclic-steam stimulation has increased production to about 850 b/d from 550 b/d in Oudeh and about 2,500 b/d from 750 b/d in Tishrine. Each field's pilot has five 25-MMbtu steam generators. The pilots include 14 wells in Oudeh and 23 wells in Tishrine.

ISSARAN FORMATIONS

Fig. 1



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Enhanced oil recovery

Operators are focusing on redeveloping and improving oil recovery from existing oil reservoirs because of increased exploration costs for new oil fields, higher oil prices, and limited opportunity for discovering major high-quality oil reserves.

The general approach for developing an oil field includes:[1-3]

- Collecting, evaluating, and analyzing geological, reservoir and production data if available.
- Estimating reserves and determining the location of remaining oil.
- Selecting proper techniques for the development plan such as drilling new wells, performing stimulation works, applying secondary or tertiary recovery methods.
- Selecting the best technique for improving the recovery factor.
- Studying the overall economy of the proposed development plan.

Development and depletion strategies depend on the life-cycle of a reservoir. In a new discovery, the plan needs to address how best to develop the field, including well spacing, well trajectory, well planning, configuration, stimulation operations, and recovery scheme. If the reservoir has been depleted by primary means, the plan needs to investigate secondary and tertiary recovery schemes.[4-6]

Secondary recovery typically involves direct oil displacement with injected water into the oil zone or gas injection gas from above the oil zone.

Waterflooding has generated billions of barrels of additional oil. It is inexpensive and simple to use, but the displacement and sweep efficiencies are low. Additional recovery with secondary recovery methods average 3-10% of the oil-in-place.[7]

Substantial oil, as much as 60% of the initial oil in place, may remain after secondary recovery because of capillary forces, interfacial tensions, and partial reservoir sweep by injected fluids. This remaining oil is the target for enhanced oil recovery methods.

These methods extract remaining oil through increasing oil mobility by reducing oil viscosity, reducing water mobility by increasing water viscosity, or reducing capillary forces by reducing interfacial tension between the displacing fluid and oil.

Thermal methods are usually suitable for high viscosity oils, while chemical methods are mostly for low to medium viscosity oils.

Remaining oil saturation is perhaps the most critical criterion in selecting the EOR method. The choice also depends on such considerations as depth, oil viscosity, etc.[8] Thermal EOR methods are often the best for recovering heavy oil. Thermal methods provide a driving force and heat for reducing oil viscosity and improving its mobility.

Thermal processes

The world contains about 10 trillion bbl of heavy oil resources.[9] Egypt has about 3 billion bbl of heavy oil in place with about 40% in the Eastern desert, 3% in the Western desert, 18% in Sinai, and 39% in the Gulf of Suez.[10]

The recovery factors for the world's heavy oil vary from a fraction of a percent to 80%, depending on the oil and the reservoir characteristics, as well as

the technique used. Heavy oil viscosities vary from 100 to 1,000 cp at reservoir temperature. Heavy crudes typically also contain 3 wt % or more sulfur, 10-30% asphaltenes, and as much as 2,000 ppm of vanadium compounds.[9]

Cyclic-steam stimulation is one of the most common thermal processes in use. It involves injecting steam and then producing oil for the same well. It is considered an economic oil recovery method that costs about $20/bbl of oil recovered.

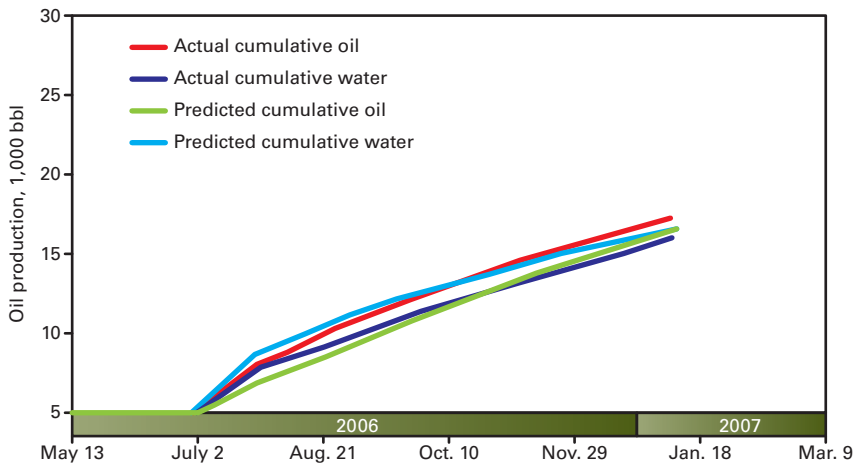
Oil recovery factors for cyclic-steam in Cold Lake, Alta., are more than 25%, while in Venezuela recoveries as high as 40% have been noted.[9]

Continuous steamflooding, much like waterflooding, is a pattern drive, with arrays of injection and production wells. In this case, the recovery factor largely depends on the pattern size, since heat loss to the surrounding rocks can consume a large proportion of the injected heat. Oil recovery factors in California with steam injection are about 55% of the initial oil in place.[9]

Operators seldom employ hot waterflooding because heat losses in surface lines, wellbore, and formation are greater than the heat losses in the other thermal processes. The heat losses reduce the processes effectiveness in

WELL CSS 1 PERFORMANCE, UPPER DOLOMITE

Fig. 2



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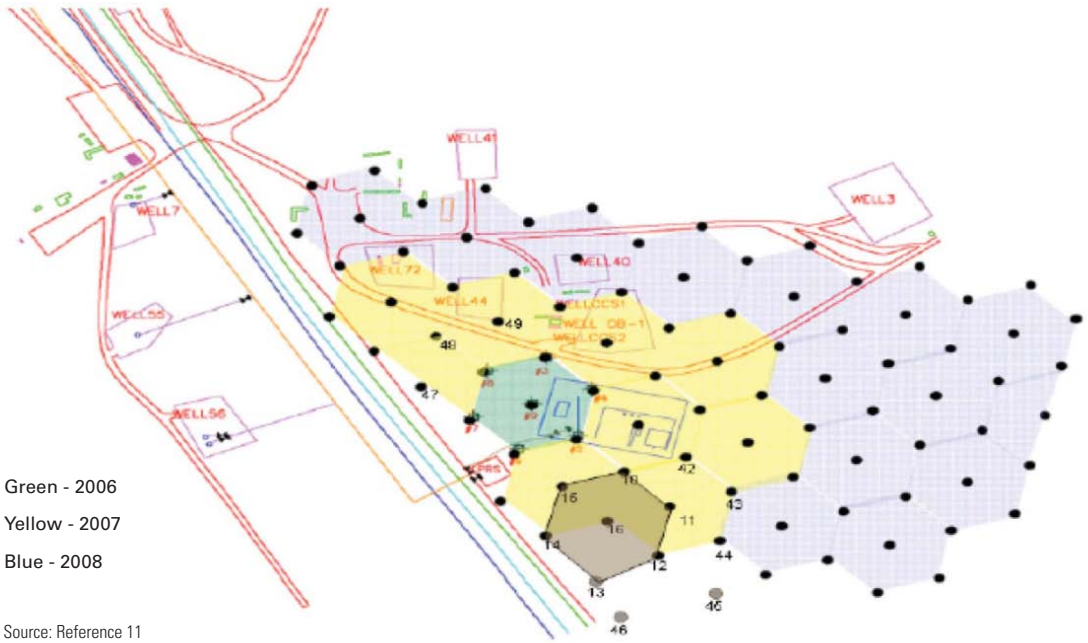
STEAM PILOTS

Fig. 3



Source: Reference 11

decreasing oil viscosity.

In situ combustion oxidizes a portion, about 10%, of the in-place-oil to generate heat. As such, the process has a high thermal efficiency but this process requires more control.

Issaran oil field

A cost-effective development plan with cyclic-steam injection allowed Scimitar Production Egypt Ltd. to improve oil recovery from the Issaran oil field.[11] With the process, production rates increased to 4,000 bo/d November 2007 up from 50 bo/d under primary recovery.

The field is 290 km southeast of Cairo and 3 km inland from the western shore of the Gulf of Suez. The Issaran concession has 20,000 acres. General Petroleum Corp. (GPC) Egypt and Scimitar Production Egypt Ltd. started developing the field in 1999.

As of October 2007, Scimitar had drilled 120 wells on the concession.

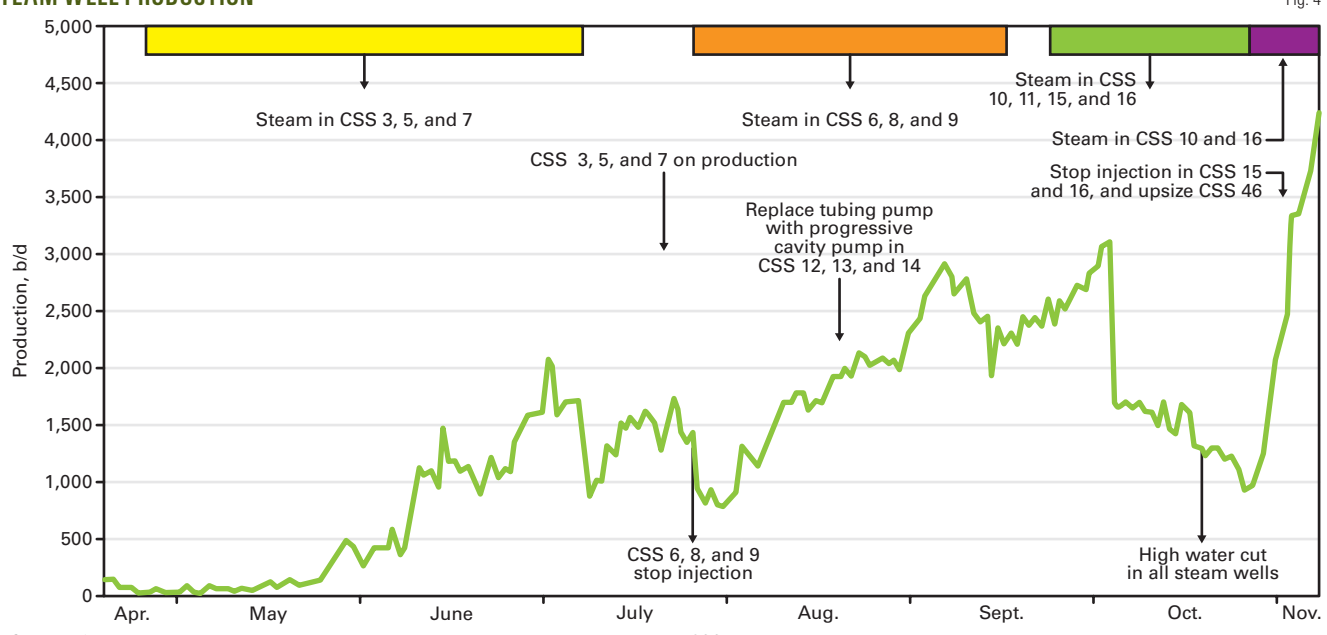
The major heavy-oil accumulations are within shallow Miocene dolomites and limestones (Upper dolomite, Lower dolomite, and Gharandal and Nukhul limestones), and sandstones (Zeit). Fig. 1 shows the formations present.

The formations contain an oil with a gravity of 10-12°.

In 2003, Scimitar initiated a res-

STEAM WELL PRODUCTION

Fig. 4



Source: Reference 11

ervoir engineering study to evaluate enhanced oil recovery (EOR) in the Upper Dolomite of Issaran oil field. It targeted the Upper Dolomite because of its large original oil in place (more than 50% of the concession OOIP) and its low estimated primary recovery of less than 1%.

In 2004, the company conducted a successful cyclic-steam stimulation pilot in well Issaran-44. Initial evaluation indicated that the oil recovery factor from this reservoir could reach 20% compared with about 1% under natural depletion. Fig. 2 compares the simulated and actual results that confirm the pilot's success.

Based on the pilot, the company decided to begin commercial production. Its redevelopment plan included three phases. Two phases finished in 2007 and the third phase will be finalized in 2008.

The phases involve cyclic-steam stimulation along with seven-spot well patterns (Fig 3). The distance between well is 60 m.

Injection rates start at 1,000 b/d of cold-water equivalent and each cycle lasts for 50 days.

Fig. 4 shows the production of the steamed wells. Production rate fluctuates because of changes in the steam cycles among wells and some problems during the project's start-up.

Syria fields

Tanganyika Oil Co. Ltd. has implemented cyclic-steam pilots in two giant heavy oil fields, Oudeh and Tishrine, in Syria.[12]

These fields are in northeast Syria (Fig. 5). Oudeh and Tishrine have an area of 47,500 and 101,000 acres, respectively. The accompanying table shows the reservoir rock and fluid characteristics in these fields.

Development of these fields started in 2004. Initially, a simple sector model evaluated the feasibility of implementing steam injection in the fields. The model considered vertical and high-angle wells.

This model indicated that steam injection would succeed. It showed good results for small 10-acre or less drainage areas and recovery factors of about double of those for cold recovery.

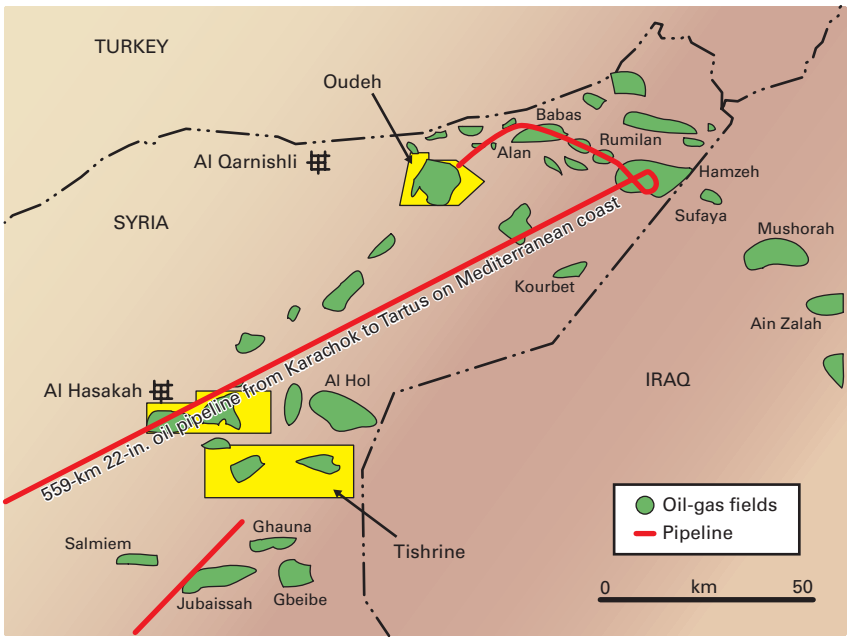
Later, the operator used a more sophisticated sector model to design the pilot project in Oudeh and Tishrine. The black-oil model included a geocellular model for each formation that history matched associated production and pressure data.

All prediction runs considered steam injection at 350° C., 80% steam quality, 1,260 bw/d injection, and maximum 2,030 psia wellhead pressure. The model's objectives were to:

- Estimate maximum steam injection rates and corresponding heat loss down

OUDEH, TISHRINE OIL FIELDS

Fig. 5



the wellbore.

- Optimize steam slug size, injection period, and soak time.
- Predict production rates and production cycle length.
- Estimate the optimal well spacing for cyclic steam injection.
- Evaluate the use of horizontal or vertical wells in steamflooding.
- Evaluate the effect of horizontal well length.

Key results indicated a recovery factor of at least double because of the steam, 30-40 days injection cycle yielding the highest recovery factor, 1-3 days soak period, and 120-day production cycle.

By yearend 2005, the company started preparation for the initial pilot plan for cyclic steam stimulation. This pilot placed a 25-MMbtu steam generator in each field and involved two wells in each field. The pilot alternated steam injection and production between the two wells.

Steam injection started in Oudeh in September 2006 and in Tishrine in October 2006. After 4 months of operation in Oudeh, steam injection had to stop for 8 months (February to September 2007) due to excess H_2S in the fuel gas.

The pilot projects have expanded with time. Currently, they involve five 25-MMbtu steam generators in each field and 14 wells in Oudeh and 23 wells in Tishrine. Initially, the operator injected steam through the annulus in the first 3 wells of each pilot. Now, all injection goes through vacuum insulated tubing.

Figs. 6 and 7 show the performance of the pilots.

In June 2008, the cyclic steam injection increased production to 850 b/d from about 550 bbl/d in Oudeh and to 2,500 b/d from about 750 bbl/d in Tishrine. Lack of steam injection from February to September 2007 affected Oudeh production.

The steam/oil ratio in this pilot ranges from 1 in the very good wells to 20 in the poorer wells.

ROCK, FLUID CHARACTERISTICS

Table 1

	Oudeh Shiranish B	Tishrine Chilou A	Tishrine Chilou B	Tishrine Jaddala
Reservoir pressure, psia	2,000-2,300	1,337	1,337	1,337
Reservoir temperature, °C.	48-50	43	45	45
Average reservoir depth, m	1,600	950	1,070	1,070
Reservoir gross thickness, m	20-120	10-40	80-250	60-160
Average porosity, %	20	27	24	25
Average water saturation, %	23	40	48	50
Average permeability, md	40-150	1-200	1-16	1-25
Oil gravity, °API	8-18	13	11-19	13-20
Solution GOR, scf/stb	150-300	100-150	100-150	100-150
Bubblepoint pressure, psia	2,000-2,300	470-600	470-600	470-600
Oil formation volume factor, rb/stb	1.11-1.17	1.05-1.15	1.05-1.15	1.05-1.15
Oil viscosity, cp	40-3,000	800-1,800	100-1,500	100-15,000
Asphaltene content, wt %	10-20	12-16	12-22	12-24
Wax content, wt %	5-10	3-6	10-26	2-24

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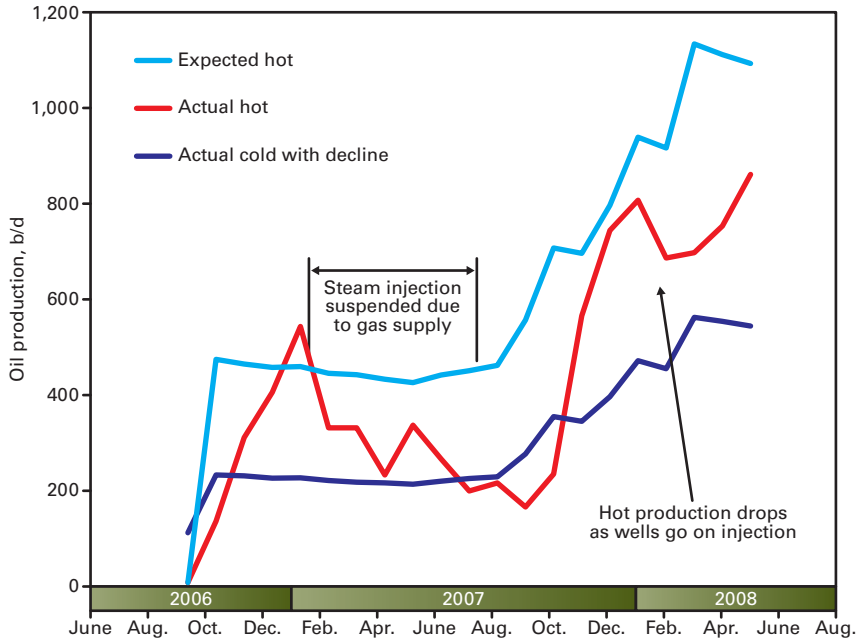
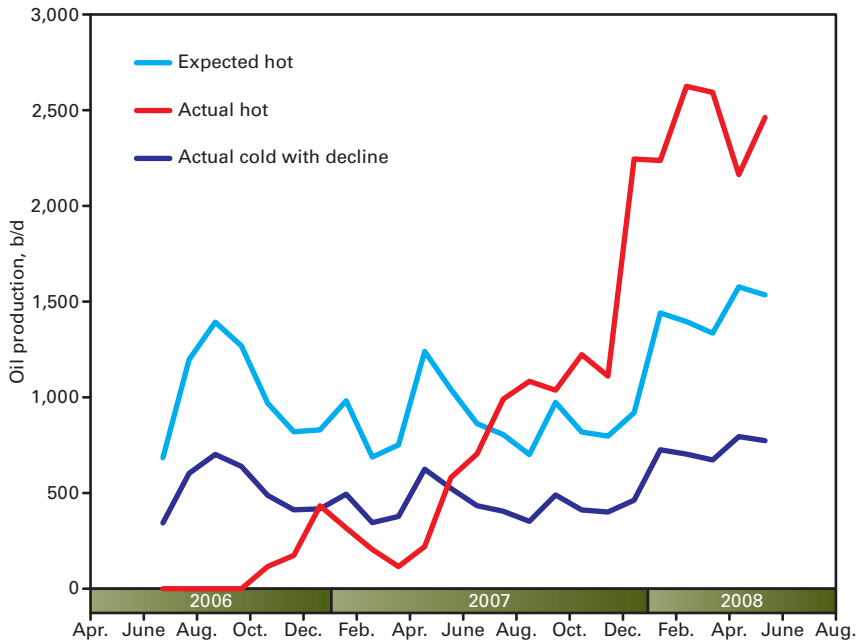
OUDEH FIELD PERFORMANCE

Fig. 6



TISHRINE FIELD PERFORMANCE

Fig. 7



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Worldwide refining capacity growth rises again in 2008

David Nakamura
Refining/Petrochemical Editor

In 2008, growth in crude distillation capacity continued to build on momentum of past years; refiners added more capacity than the past 2 years, according to the latest OGJ Refinery Survey. For the seventh year running, worldwide capacity is at a record level.

Last year's refinery survey listed a global capacity of 85.309 million b/cd in 657 refineries as of Jan. 1, 2008. This year's OGJ survey shows a total capacity of 85.603 million b/cd in 655 refineries, an increase of nearly 300,000 b/cd.

This year's capacity growth is greater than the growth in 2007 and 2006 of 130,000 b/cd and 52,000 b/cd, respectively. The number of refineries, on the other hand, has been on a steady decrease. In the past 10 years, the global refining industry has shut down more than 100 refineries, mostly smaller, less-efficient plants.

Fig. 1 shows the trend in operable refineries and worldwide capacity.

A new refinery start-up in China, expansions in other refineries, and capacity creep that offset losses were the main reasons for the capacity increases in the latest survey.

Asia experienced the largest increase in the amount of refining capacity, up about 269,000 b/cd, or 1.2%. Western Europe added about 34,000 b/cd, or 0.2%.

North America showed a slight net decrease of 7,500 b/cd.

Other regions experienced no net gain or loss in stated capacity.

New crude capacity

This year's survey lists one new refinery. All other increases in refining capacity occurred in existing facilities.

In mid June, China Petroleum & Chemical Corp. (Sinopec) started up a $1.8-billion refinery in Qingdao, China. The company reported that the 200,000-b/cd refinery will produce transportation fuels that will meet Euro III emission standards as well as petrochemical products.

The largest single-facility increase occurred in Valero Energy Corp.'s Jean Gaulin refinery in Quebec. The company reported a capacity of 260,000 b/cd, up from 215,000 b/cd, which was the capacity listed in last year's survey.

Two refineries in Asia experienced 30,000-b/cd increases. LG-Caltex reported an increase to 680,000 b/cd, up from 650,000 b/cd in its Yosu, South Korea, refinery. In addition, Nippon Oil Co. Ltd. reported an increase to 160,000 b/cd from 130,000 b/cd in its Oita, Japan, refinery that it

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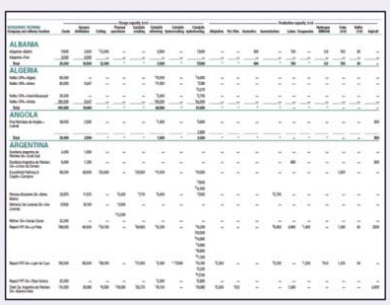


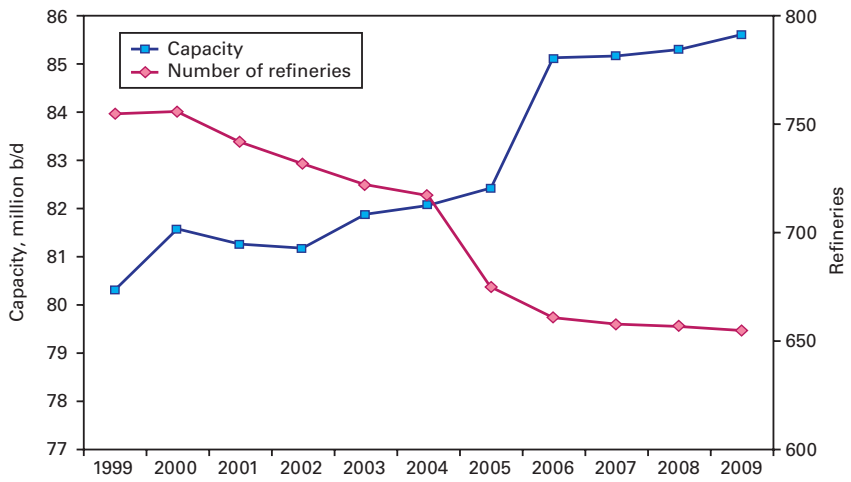
acquired from Kyushu Oil Co. Ltd. this year.

In the US, the largest reported capacity increase occurred in Frontier Oil Corp.'s El Dorado, Kan., refinery. Frontier reported a 16,000-b/cd increase, growing to 126,000 b/cd in this year's survey from 110,000 b/cd reported in last year's survey.

Another major increase in reported capacity occurred in LyondellBasell's Berre l'Etang, France, refinery, which it acquired from Royal Dutch Shell Group in 2008. The refinery increased capacity to 105,000 b/cd from 78,000 b/cd reported in last year's survey.

Worldwide refining

Fig. 1



How the world's largest refiners rank

Table 1

Rank Jan. 1, 2009	Rank Jan. 1, 2008	Company	Crude capacity, b/cd[1]
1	1	ExxonMobil Corp.	5,632,000
2	2	Royal Dutch Shell PLC	4,599,000
3	3	Sinopec	3,811,000
4	4	BP PLC	3,328,000
5	6	ConocoPhillips	2,696,000
6	7	Petroleos de Venezuela SA	2,678,000
7	5	Total SA	2,655,000
8	8	Valero Energy Corp.	2,596,000
9	9	China National Petroleum Corp.	2,440,000
10	10	Saudi Aramco	2,433,000
11	12	Petroleo Brasileiro SA	1,997,000
12	11	Chevron Corp.[2]	1,981,000
13	13	Petroleos Mexicanos	1,703,000
14	14	National Iranian Oil Co.	1,451,000
15	17	Nippon Oil Co. Ltd.	1,317,000
16	15	Rosneft	1,293,000
17	16	OAO Lukoil	1,217,000
18	18	Repsol YPF SA	1,105,000
19	19	Kuwait National Petroleum Co.	1,085,000
20	21	Marathon Oil Corp.	1,016,000
21	20	Pertamina	993,000
22	22	Agip Petroli SPA	904,000
23	23	Sunoco Inc.	880,000
24	24	Flint Hills Resources	817,000
25	25	SK Corp.	817,000

[1]Includes partial interests in refineries not wholly owned by the company. [2]Includes holdings in Caltex.

Refinery closures, delistings

As in 2007, no refineries shut down in 2008, mainly due to high refining margins early in the year that made the vast majority of refineries profitable.

The removals of refineries from this year's survey include MOL Hungarian Oil & Gas Co.'s Tiszaujvaros, Hungary, and Koramo Kolin's Czech Republic refineries. The plants were removed from the survey because they process no raw crude.

In addition, the Suncor Energy Inc., Denver, refinery was removed from the survey. The company reported that the Denver and Commerce City refineries are operating as a single, integrated plant.

Other refineries lost capacity as owners restated and updated the survey numbers.

Largest refining companies

Table 1 lists the top 25 refining companies that own most worldwide capacity. Table 2 lists companies with more

COMPANIES WITH 200,000+ B/CD REFINING CAPACITY IN ASIA, THE US, WESTERN EUROPE

Table 2

Rank	Company	No. of refineries	Crude capacity, b/cd[1]
Asia[2]			
1	Sinopec	27	3,811,000
2	China National Petroleum Corp.	24	2,425,000
3	ExxonMobil Corp.	10	1,337,507
4	Nippon Oil Co. Ltd.	7	1,317,000
5	Royal Dutch Shell PLC	13	1,271,875
6	Pertamina	8	992,745
7	SK Corp.	1	817,000
8	Indian Oil Co. Ltd.	10	787,290
9	Chinese Petroleum Corp.	3	770,000
10	LG-Caltex Corp.	1	[3]680,000
11	Chevron Corp.	6	668,667
12	Reliance Petroleum Ltd.	1	660,000
13	Tonen/General Sekiyu Seisei KK	4	[4]633,750
14	Idemitsu Kosan Co. Ltd.	4	608,000
15	Hyundai Oil Refinery Co.	3	589,500
16	Cosmo Oil Co. Ltd.	4	565,250
17	S-Oil Corp.	1	[5]520,000
17	Formosa Petrochemical Co.	1	520,000
19	BP PLC	4	348,254
20	Saudi Aramco	6	327,652
21	Hindustan Petroleum Corp. Ltd.	2	296,250
22	Showa Yokkaichi Sekiyu Co. Ltd.	1	[6]205,010
US			
1	Valero Energy Corp.	13	2,065,660
2	ConocoPhillips	13	2,000,200
3	ExxonMobil Corp.	7	1,965,750
4	BP PLC	6	1,401,525
5	Marathon Oil Corp.	7	1,016,000
6	Royal Dutch Shell PLC	8	[7]979,250
7	Chevron Corp.	5	914,000
8	Sunoco Inc.	5	880,000
9	Petroleos de Venezuela SA	4	[8]849,400
10	Flint Hills Resources (Koch Industries)	3	817,475
11	Motiva Enterprises LLC[9]	3	730,000
12	Tesoro Corp.	7	658,000
13	Saudi Aramco	3	[10]370,000
14	LyondellBasell	1	268,000
15	Husky Energy Inc.	2	237,500
16	Total SA	1	231,452
17	EnCana Corp.	2	226,000
18	Alon USA	3	206,000
Western Europe[11]			
1	Total SA	15	2,267,116
2	ExxonMobil Corp.	9	1,636,856
3	Royal Dutch Shell PLC	11	1,551,801
4	BP PLC	8	900,736
5	AgipPetroli SPA	10	876,117
6	Petroplus International NV	7	792,000
7	Repsol YPF SA	5	709,200
8	Turkish Petroleum Refineries Corp.	4	613,275
9	ConocoPhillips	4	610,125
10	Compania Espanola de Petroles SA (CEPSA)	3	427,000
11	Ineos Group Holdings Inc.	2	402,800
12	OMV AG	3	398,635
13	ERG Group	4	396,214
14	Preem Raffinaderi AB	2	316,000
15	Hellenic Petroleum SA	3	313,000
16	Neste Oil	6	[12]306,100
17	Statoil AS	3	304,210
18	Galp Energia SA	2	304,172
19	Saras SPA	1	300,000
20	Petroleos de Venezuela SA	8	294,550
21	Chevron Corp.	1	210,000

[1]Includes partial interest in refineries not wholly owned by the company. [2]Asia includes Australia, Bangladesh, Brunei, China (and Taiwan), India, Indonesia, Japan, Malaysia, Myanmar, New Zealand, North Korea, Pakistan, Papua New Guinea, the Philippines, Singapore, South Korea, Sri Lanka, and Thailand. [3]Includes Caltex's 50% stake. [4]Includes ExxonMobil Corp.'s 50% stake. [5]Includes Saudi Aramco's 35% stake. [6]Includes Royal Dutch Shell's 50% stake. [7]Includes Shell's stakes in Motiva and its 50% stake in the Deer Park, Tex., refinery. [8]Consists of PDVSA's ownership of Citgo and its 50% stake in the ExxonMobil Chalmette, La., refinery. [9]50/50 joint venture between Shell and Saudi Aramco. [10]Consists of 50% stake in Motiva. [11]Western Europe includes Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, Turkey, and the UK. [12]Includes 50% stake in AB Nynas refineries.

than 200,000 b/cd of capacity in Asia, the US, and Western Europe. Capacities from Tables 1 and 2 include partial interests in refineries that the companies do not wholly own.

Significant changes from last year involve Total SA, Chevron Corp., Nippon Oil, Marathon Oil Corp., Valero, BP PLC, and Alon USA.

On Aug. 30, 2007, Murco Petroleum Ltd., a UK subsidiary of Murphy Oil Corp., agreed to purchase Total's 70% interest in the Milford Haven, Wales, UK, refinery for $250 million. This year's survey reflects the ownership change for the 108,000-b/cd refinery. Murco previously held a 30% interest and now owns the entire plant.

This transaction was sufficient to move Total down two spots in Table 1. Last year's survey lists the company with 2.719 million b/cd of capacity. This year's survey shows that the company owns 2.655 million b/cd of capacity.

Similar to 2007, Petroplus acquired two European refineries. The company purchased the Petit Couronne and Reichstett Vendenheim refineries in France from Shell.

The Petit Couronne refinery has a capacity of 154,000 b/cd and the Reichstett Vendenheim refinery has a capacity of 85,000 b/cd.

The acquisition, completed on Apr. 1, 2008, was first announced on Aug. 2, 2007, and had to go through the European Commission's approval process. The net purchase price, including estimated inventory and other adjustments, was about $785 million.

Petroplus now has 792,000 b/cd of refining capacity, up from 552,000 b/cd at yearend 2007 and 300,000 b/cd in 2006.

On Oct. 1, 2008, Nippon Oil acquired Kyushu Oil, which increased its refining capacity to 1.3 million b/cd from 1.16 million b/cd as listed in last year's survey. In addition, Nippon reported that the refinery has a capacity of 160,000 b/cd.

The acquisition moved Nippon Oil from 17 to 15 in Table 1. Nippon also

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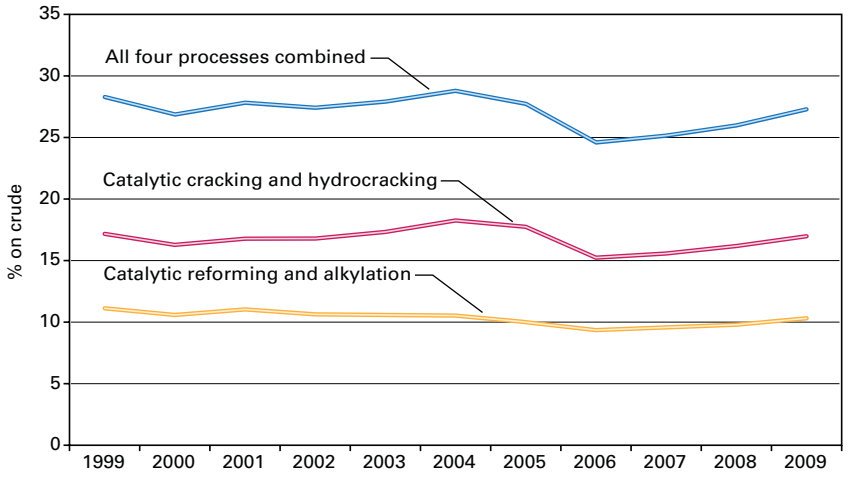
ASIA PROCESSING CAPABILITY

Fig. 2



WORLD'S LARGEST REFINERIES

Table 3

	Company	Location	Crude capacity, b/cd
1	Paraguana Refining Center	Cardon/Judibana, Falcon, Venezuela	940,000
2	SK Corp.	Ulsan, South Korea	817,000
3	LG-Caltex	Yosu, South Korea	680,000
4	Reliance Industries Ltd.	Jamnagar, India	660,000
5	ExxonMobil Refining & Supply Co.	Jurong/Pulau Ayer Chawan, Singapore	605,000
6	ExxonMobil Refining & Supply Co.	Baytown, Tex.	572,500
7	Saudi Arabian Oil Co. (Saudi Aramco)	Ras Tanura, Saudi Arabia	550,000
8	Formosa Petrochemical Co.	Mailiao, Taiwan	520,000
8	S-Oil Corp.	Onsan, South Korea	520,000
10	ExxonMobil Refining & Supply Co.	Baton Rouge, La.	503,000
11	Hovensa LLC	St. Croix, Virgin Islands	500,000
12	BP PLC	Texas City, Tex.	451,250
13	Shell Eastern Petroleum (Pte.) Ltd.	Pulau Bukom, Singapore	449,000
14	Kuwait National Petroleum Co.	Mina Al-Ahmadi, Kuwait	442,700
15	Citgo Petroleum Corp.	Lake Charles, La.	440,000
16	Shell Nederland Raffinaderij BV	Pernis, Netherlands	406,000
17	Sinopec	Zhenhai, China	403,000
18	Saudi Arabian Oil Co. (Saudi Aramco)	Rabigh, Saudi Arabia	400,000
19	Saudi Aramco-Mobil	Yanbu, Saudi Arabia	400,000

moved up to fourth in Table 2, up from fifth last year.

In the largest US transaction, Alon USA purchased the Krotz Springs, La., refinery from Valero on July 7, 2008. The purchase price for the 83,000-b/cd refinery was $333 million in cash plus about $140 million for working capital, including inventories.

Alon now appears in Table 2 as the 18th-largest refiner in the US.

Also new to the US section of Table 2 is Husky Energy Inc. The company entered into an oil sands joint venture with BP in December 2007 in which Husky acquired 50% of BP's 152,000-b/cd Toledo refinery (OGJ, Dec. 10, 2007, p. 32).

Husky now operates 237,500 b/cd of refining capacity, which also includes the Lima, Ohio, refinery it purchased from Valero in 2007.

As reported in last year's article (OGJ, Dec. 24, 2007, p. 50), Basell announced it was merging with Lyondell Chemical Co. for about $12 billion, which includes the 268,000-b/cd Houston refinery. The new company, LyondellBasell Industries, is now the 14th-largest refiner in the US.

On Apr. 1, 2008, LyondellBasell announced that it had purchased the Shell refinery and associated infrastructure at the Berre l'Etang petrochemical complex in France. The refinery, with production capacity of 105,000 b/cd, is adjacent to a LyondellBasell polyolefins complex.

In Table 2, Shell fell from second to third due to the loss of three refineries in Western Europe.

Other changes in capacity that appear in Tables 1 and 2 are due to adjustments in declared capacity. In Table 2, LG-Caltex moved to 10 from 12 in Asia, Marathon moved to 5 from 6 in the US.

Largest refineries

Table 3 lists the world's largest refineries with a minimum capacity of 400,000 b/cd.

As previously mentioned, LG-Caltex increased capacity at its Yosu refinery, which was sufficient to move it up to third largest refinery in the world. It surpassed the Jamnagar refinery, which should move up to largest refinery in the world in next year's report when its massive 580,000-b/cd expansion officially starts up in early 2009.

The ExxonMobil Corp. Baytown, Tex., refinery increased capacity to 572,500 b/cd from 567,000 b/cd, but the increase was not sufficient to move it up a spot in Table 3. Likewise, BP's Texas City refinery restated its capacity a bit lower, but not enough to move it down in the list.

BP's Whiting, Ind., refinery, however, fell off the list when the company restated its capacity as 384,750 b/cd, down from 405,000 b/cd as listed in last year's survey.

Regional crude capacities

Table 4 lists regional process capabilities as of Jan. 1, 2009. As previously mentioned, the largest increase in crude capacity occurred in Asia due to the new Sinopec refinery and expansions in other refineries there.

Western Europe increased crude distillation capacity and North America lost capacity.

Table 4 also shows that Asia significantly increased conversion capacity in 2008. Catalytic reforming rose to 2.15

Regional look at worldwide refining operations

Table 4

Region	No. of refineries	Crude distillation	Vacuum distillation	Catalytic cracking	Catalytic reforming	Catalytic hydrocracking	Catalytic hydrotreating	Coke, tonnes/day
		b/cd						
Africa	45	3,278,382	507,904	205,765	458,427	61,754	830,876	1,841
Asia	157	22,482,913	4,388,751	2,799,675	2,140,776	1,017,535	9,386,913	20,110
Eastern Europe	89	10,343,580	3,903,261	877,089	1,474,382	330,392	4,273,893	12,570
Middle East	42	7,036,215	1,983,905	364,450	652,897	602,021	2,043,563	3,300
North America	154	20,949,112	9,140,631	6,669,034	4,175,803	1,827,780	16,080,695	128,763
South America	66	6,602,903	2,845,885	1,309,507	402,195	132,400	1,904,061	24,640
Western Europe	102	14,910,507	5,785,898	2,191,672	2,183,338	1,172,716	9,879,931	11,534
Total	**655**	**85,603,612**	**28,557,235**	**14,417,192**	**11,487,818**	**5,144,598**	**44,399,932**	**202,758**

million b/cd from 2.0 million b/cd, an increase of 7%. Catalytic hydrocracking increased to 1.0 million b/cd from 806,628 b/cd, an increase of 26%.

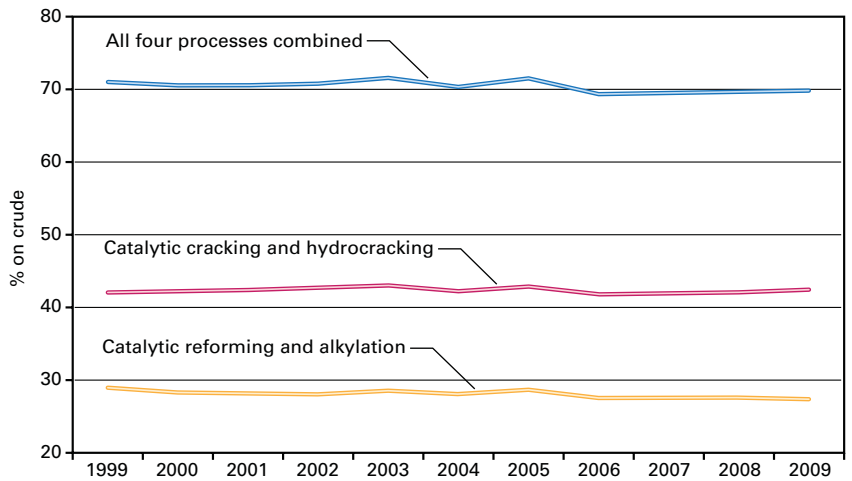
Processing capabilities

Figs. 2-4 show the processing capabilities of Asia, the European Union (EU), and the US for the past 10 years. Processing capabilities are defined as conversion capacity (catalytic cracking and hydrocracking) and fuels-producing processes (catalytic reforming and alkylation) divided by crude distillation capacity (% on crude).

Countries in the EU include Belgium, Denmark, France, Germany, Greece, Ireland, Italy, the Netherlands, Portugal, Spain, and the UK. ✦

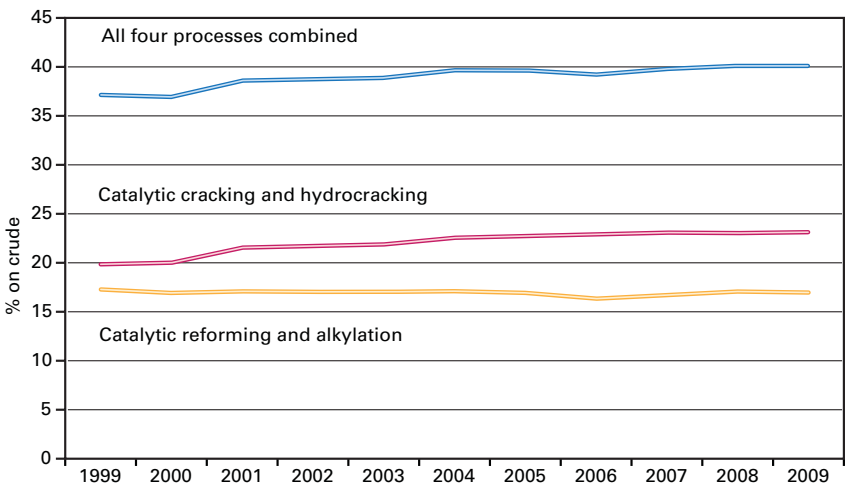
US processing capability

Fig. 3



EU processing capability

Fig. 4



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Serbian, Russian pipeline accord enhances European gas security

Dejan Brkic
Ministry of Science and Technological Development
Belgrade

Energy agreements reached earlier in 2008 between Serbia and Russia enhance the security of European natural gas supply, despite perceived competition between the South Stream pipeline (included in these agreements) and the Nabucco pipeline. This article offers an overview of the context of these agreements.

Background

On Sept. 9, 2008, Serbia's parliament ratified two documents—the Stabilization and Association Agreement (SAA) with the EU and an energy agreement with Russia. Natural gas is the fastest growing primary energy source in Serbia. The oil and gas agreement with Russia changes Serbia from being a purely importing country to a transit country for Russian gas. Russia moves 124.4 billion cu m/year (about 4.4 tcf/year) of natural gas to the EU.[1]

The South Stream pipeline (Fig. 1), with a planned capacity of 30 billion cu m/year starting in 2013, will transport one quarter of the entire export of Russian natural gas to the EU, with the planned branch through Serbia carrying 10-18 billion cu m/year of this total (OGJ, May 3, 2008, p. 31). Serbia expects to earn roughly $200 million/year from transit taxes.

Serbia expects natural gas to become the primary substitute for electricity-based heating through both distribution grids in densely populated areas and individual boilers in the rest of the country. The country wants private investors to steer the expansion of its gas distribution networks, which it recognizes as important to both its energy and environmental programs.

Environmental concerns have prevented broad use of domestic coal in district heating systems, combining with the need to provide heat as efficiently as possible to lead Serbia to expanded use of natural gas.[2]

MAJOR EUROPEAN GAS PIPELINE PROJECTS

Fig. 1

South Stream

Italian ENI and Russian Gazprom signed a memorandum of understanding regarding construction of the South Stream pipeline June 23, 2007. The line will run from Russia across the bottom of the Black Sea to Bulgaria, splitting there with one arm heading westward via Greece to Italy and another arm flowing northward to Serbia with possible continuation into Central Europe.

From Varna, Bulgaria, the southwestern route will continue through Greece, crossing the Ionian Sea to southern Italy. The northwestern pipeline will run through Serbia, Hungary, and Slovenia to Austria, ending at Baumgarten gas storage. Another option would run the northwestern route through Slovenia to northern Italy instead.

Russia and Bulgaria signed the agreement governing Bulgaria's participation in the project Jan. 18, 2008. Before Serbia joined Russia in South Stream, Gazprom and Serbia's state-owned gas company Srbijagas (Serbian Gas Co.) agreed to study building a gas pipeline from Bulgaria through Serbia. By Feb. 25, 2008, the two companies had formed a joint venture to build the Serbian section of the South Stream and a large gas storage facility near Banatski Dvor, Serbia.

Russia and Hungary agreed to set up an equally owned joint company to build and operate the Hungarian section of the pipeline on the same day. Hungary is a shareholder in the EU-backed Nabucco pipeline, aimed at bringing gas from Central Asia to Europe while bypassing Russia. Its agreement with Russia on South Stream prompted US concerns Budapest may sideline the EU project, aimed at reducing Europe's energy reliance on Moscow.

Russia and Greece signed an intergovernmental agreement covering construction and operation of the Greek section of South Stream on Apr. 29, 2008.

Russia's agreement with Serbia provided Gazprom with extremely favorable terms for work in Serbia, while also providing great opportunities to Serbia. Gazprom may acquire state NIS (Serbian Oil Co.) at low cost and received incentives regarding construction of the South Stream gas pipeline, while Serbia heightened the long-term security of its energy supplies.

South Stream would set back the energy security objectives of the European Union and the US on two major counts:

- It would preempt markets targeted by the Nabucco project, cementing a Russian monopoly on some of them and breaking into new ones, while increasing overall European dependence on Russian-delivered gas.
- It would carry gas from Central Asia via Russia, preempting Turkmen and other gas volumes and strengthening Russia's monopoly on Central Asian gas, despite Western intentions to the contrary.

Serbia

Russia is trying to capture Serbia's entire energy sector at once. The Russian government and Gazprom propose three Russian-controlled joint companies—one for oil and two for gas—inside Serbia, with ramifications stretching into the Republic of Srpska in Bosnia and Herzegovina.

Another document still awaiting ratification is sale of 51% in the Serbian national oil company to Russian Gazpromneft for €400 million (OGJ, Jan. 28, 2008, p. 5). Even after ratification, however, Serbian oil and gas fields (Fig. 2) will remain Serbian property. The ratification was initially scheduled for May, but internal Serbian political problems have repeatedly postponed ratification.

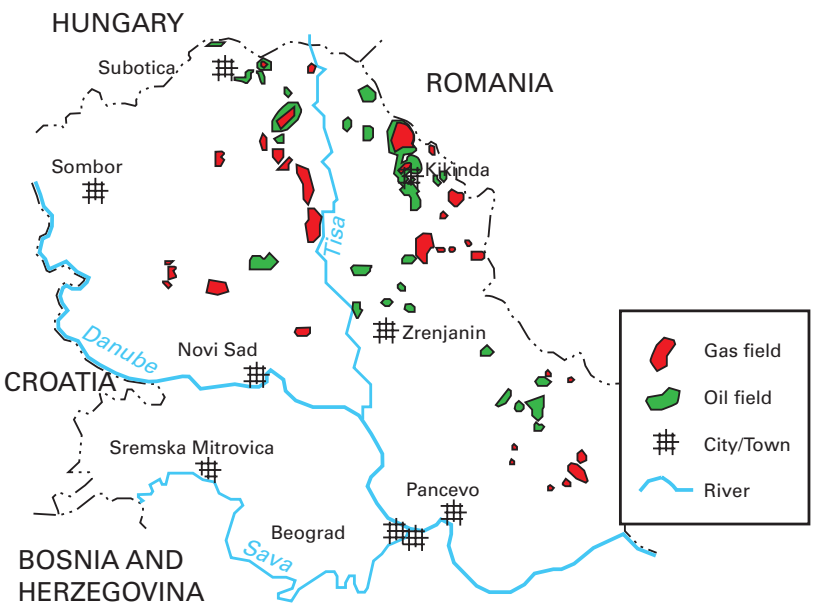
EU gas demand will rise to roughly 800 billion cu m/year by 2030 from current levels of 540 billion cu m/year.[3]

With more than 50% of European gas imports originating from Russia, some EU members have expressed fears the Kremlin could use energy resources as a foreign policy tool. Despite widely discussed transit friction between Gazprom and the Ukraine and Belarus, however, sufficient export transportation capacity to Europe should not pose a problem for the next decade.

Russia's energy strategy through 2020 estimates total exports to Europe by 2015 as somewhat lower than 160 billion cu m/year.[4] Already existing export pipelines through Ukraine and the Yamal-Europe corridor through Belarus

SERBIAN OIL, GAS FIELDS

Fig. 2



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The webcast will be based on the annual Forecast and Review special report appearing this year in the January 19th issue of Oil & Gas Journal. The Forecast and Review projects oil and gas demand worldwide and in the US for the new year. The US forecast analyzes demand by petroleum product (such as gasoline, diesel, jet fuel, and so forth). The Forecast and Review includes forecasts for US and Canadian drilling activity.

In addition to the 2009 forecast, the webcast will include past predictions compared with actual performance and industry trends for the previous four years. Bob Tippee, Editor, will make the presentation, with Marilyn Radler, Senior Editor-Economics, and G. Alan Petzet, Chief Editor-Exploration, on hand for questions. Marilyn assembles the numbers and writes copy for the supply-demand portions of the Forecast and Review. Alan does the drilling forecast.

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can carry 168 billion cu m/year of Russian gas to Europe.[4] A partial overlap of South Stream and Nabucco does not, therefore, create a redundancy or possible oversupply but actually improves Europe's security of supply. ✦

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The author

Dejan Brkic (dejanrgf@tesla.rcub.bg.ac.rs) is a PhD candidate at the University of Belgrade, school of mining and geology, Serbia, with his PhD research supported by the Ministry of Science and Technological Development of the Republic of Serbia. He holds an MS (2002) in petroleum engineering and an MS (2005) in the treatment and transport of fluids, both from the school of mining and geology. Brkic also has postgraduate education in environmental protection. His research interests includes design of natural gas distribution networks and implementation of natural gas heating systems in urban areas.

Camera has UL/CSA certification

The MIC1-440 PTZ camera is now Underwriter Laboratories/Canadian Standards Association certified, allowing the unit to fulfill an added level of explosion-protected qualification and meet regional requirements for hazardous locations such as oil and gas fields, chemical processing plants, and refineries.

Its 320° tilt enables viewing above and below the camera for comprehensive site surveillance, while IP68/NEMA 4X ratings help ensure high performance imaging in harsh environmental conditions, the company says.

Source: **Extreme CCTV Inc.,** 3021 Underhill Ave., Burnaby, BC V5A 3C2.

New well test separator

The new CleanPhase well test separator system enables optimum retention of fluids, allowing for cleaner phases and better measurements.

The firm says its system is a rejuvenated approach to phase isolation during the separation process. The new generation well test separator allows flow-back activities to be conducted through increasing safety, reducing manual intervention, and providing seamless operations.

The firm notes that an operator in North Africa tested 22 wells using the separator, which accurately measured flow rates from wells producing gas, condensate, and water.

The separator has SmartWeir technology that uses radar unobtrusively to monitor liquid levels and adjust the weir to accommodate well effluents. It also allows on line separation for the entire job, from the beginning of cleanup until the end of the well test.

The first reservoir fluids are identified sooner than with traditional methods, allowing the well testing to begin earlier, the company points out. It allows fast cleanups by flowing the well to a higher-pressure vessel than is possible with conventional setups, which require flowing to a low-pressure surge tank. This eliminates the need for and risk of pressurized storage tanks, the company says.

The separator handles high water cut and fluctuating flow rates without slowing down the process, which leads to the isolation and measurement of purer single-phase fluids. The separator provides high-quality and high-capacity phase separation for fast cleanups, better measurements, and increased certainty, according to the company.

It can operate as a stand-alone unit or in combination with the PhaseTester multiphase flowmeter.

Source: **Schlumberger Technology Corp.,** 300 Schlumberger Drive, Sugarland, TX 77478.

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PAS,

Houston, has appointed Chris Lyden president. Previously, he was vice-president of global marketing at Invensys Process Systems. Prior to that, Lyden had spent 26 years at Honeywell Inc., holding several executive positions, including vice-president of sales for Honeywell HiSpec Solutions and vice-president and general manager. In addition, he held leadership positions in several key industry segments at Honeywell, including power generation, hydrocarbon processing, upstream oil and gas, and chemicals.


Lyden

PAS is a leading supplier of software products and consulting services to the process industries worldwide since 1993, with solutions including alarm management, automation configuration management, control loop performance monitoring, real-time performance metrics management, and knowledge management.

Object Reservoir Inc.,

Houston, has named Joel Walls vice-president and chief petrophysicist. He will lead the company's collaborative exploitation projects for major shale gas plays and will lead development of innovative workflows for integrating petrophysical and geomechanical analysis with Object Reservoir's signature high-definition reservoir modeling software, Resolve. Walls is a geophysicist and entrepreneur with extensive experience in the research, development, launch, and sale of leading-edge petrophysical software and advanced technology services for oil and gas exploration and production. While completing his doctoral work with the Stanford Rock Physics Project in 1982, he cofounded Petrophysical Services Inc., which was acquired by Litton Core Laboratories in 1984. He served as director of the Dallas Advanced Technology Center for Core Lab until 1990, when he formed the software company PetroSoft Inc., in San Jose, Calif. PetroSoft merged with two other software companies to form Rock Solid Images (RSI) in 1998. Walls served in several executive positions at RSI, including vice-president of business development and vice-president, technology. RSI was acquired by Offshore Hydrocarbon Mapping in 2007.

Walls holds a master's and a PhD in geophysics from Stanford University and a BS in physics from Texas A&M University at Commerce, Tex. He is a cofounder and the first president of the Society of Core Analysts and is a member of the Society of Exploration Geophysicists, Society of Petroleum Engineers, and Society of Petrophysicists & Well Log Analysts. He is the author of many publications in various geophysical and petrophysical journals and holds a US patent in the field of seismic reservoir characterization.

Object Reservoir is a technology and services company for the global E&P industry.

KBC Advanced Technologies PLC,

London and Houston, has appointed John Dosher senior vice-president of strategic consulting. Dosher, formerly president of Pace Consultants Inc. (now Jacobs Consultancy Inc.), is a widely recognized expert in the economics of technical planning and management of refining, petrochemicals, raw materials, and natural gas operations. He has served as an expert technical witness before several regulatory and arbitration panels, including the US Senate committee on Environment and Public Works (2004), where he evaluated the current state of US refining capacity. Dosher has an MBA from the University of Houston and a BS in chemical engineering from Texas A&M University. He is also a registered professional engineer in the state of Texas.

KBC, a leading independent consulting, process engineering, and software group, delivers improved operating performance to the oil refining, petrochemical, and other process industries worldwide.

Aker Solutions,

Oslo, and Arkema, Colombes, France, have signed a memorandum of understanding for global cooperation on marketing of Arkema's proprietary polyvinyl chloride (PVC) technology. Under the terms of this proposed cooperation, Arkema will provide its proprietary PVC technology and start-up technical services, while Aker Solutions will supply process design, engineering, and construction services. The terms of the cooperation agreement include technical support to help potential licensees optimize Arkema's PVC technology. Aker Process BV is Aker Solutions' legal entity entering into the MOU with Arkema.

Aker Solutions is a unit of Aker Solutions ASA, a leading global provider of engineering and construction services, technology products, and integrated solutions to the oil and gas, refining and chemicals, mining and metals, and power generation industries.

Arkema, a global chemical company and France's leading chemicals producer, consists of three strategically related businesses: vinyl products, industrial chemicals, and performance products.

ABS,

Houston, has received the Best Classification Society award by the MASTECH Techno Maritime Committee. The award was given at MASTECH's Silver Jubilee conference and dinner in Dubai. MASTECH is an international maritime conference organized by MAST (Middle-East Alumni of Ship Technology), from the Department of Ship Technology at Cochin University of Science and Technology. Award recipients were recognized for their "outstanding contributions towards the maritime industry." ABS was particularly cited for its contributions to the UAE maritime industry. ABS has maintained a network of regional and port offices throughout the Middle East area for more than 30 years, with regional administrative headquarters in Doha and operational headquarters in Dubai. Nearly 40 senior technical representatives from the Middle East shipping, oil and gas, and offshore support sectors are members of the ABS Middle East Technical Committee, established to strengthen industry ties in the region.

ABS is a leading international classification society devoted to promoting the security of life, property, and the marine environment through the development and

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verification of standards for the design, construction, and operational maintenance of marine-related facilities.

Fugro Gravity & Magnetic Services,

Houston, the business development arm of Fugro Airborne Surveys and Fugro Ground Geophysics, has named its business development team for the Europe-Africa-Middle East region. Raffaela Heinbockel will direct efforts in the Middle East, and Stewart Walter will lead in Europe and Africa.


Heinbockel

Heinbockel, head of geophysical services in the Middle East for Fugro Gravity & Magnetic Services, has more than 12 years' experience in geophysics and has a PhD in geophysics from the University of Hamburg. She is a member of the European Association of Geoscientists and Engineers and has experience working all over the world.


Walter

Walter, international business development coordinator in Europe and Africa for Fugro Multi-Client Services and Fugro Gravity & Magnetic Services, has more than 20 years' experience in the oil, gas, and minerals exploration industry. He has a master's in geophysics from Imperial College at the University of London and a bachelor's in mathematics and physics from the University of Leeds.

Fugro Gravity & Magnetic Services is part of Fugro, which provides advanced surveying, seismic, oceanographic, meteorological, and positioning services. Fugro interprets and processes data collected at sea, on land, and from the air.

Gulf Fleet Management,

Lafayette, La., has selected ABS Nautical Systems LLC's fleet management software as the foundation for its future operations. Opting for a near sweep of the Nautical Systems' NS 5 software suite, GFM will use the tool for the maintenance, purchase, inventory, quality, and voyage management of its fleet of 15 offshore supply vessels, fast support vessels, and seismic support vessels operating worldwide.

GFM owns and operates marine vessels providing logistics and specialty services to the offshore oil and natural gas industry, primarily in the US Gulf of Mexico and select international markets.

ABS Nautical Systems, part of Houston-based ABS, is one of the leading providers of integrated fleet management software packages available to the marine and offshore industries. It offers a fully integrated, modular approach to managing all the principal operational expenses associated with a vessel or offshore rig, ranging from maintenance and repair, to regulatory requirements, purchasing and inventory, and crew management and payroll.

ABS is a leading international classification society devoted to promoting the security of life, property, and the marine environment through the development and verification of standards for the design, construction, and operational maintenance of marine-related facilities.

Subsea 7 Inc.,

Westhill, UK, has announced that its i-Tech division's ROV team onboard the Ocean Bounty semisubmersible has received Chevron Australia's Outstanding Contractor award at the operator's Contractor Health, Environment, and Safety Management Forum. I-Tech was recognized for the successful planning and execution of incident- and injury-free ROV operations on Chevron's 2008 Ocean Bounty rig campaign for its Wheatstone natural gas field development off Western Australia. This award follows i-Tech's Asia-Pacific business having recently achieved a milestone of 4 years without a lost-time incident across all onshore and offshore operations.

I-Tech is the world's second largest provider of ROV support services to the exploration and production industry, operating out of four regional centers: Europe and Africa, Asia-Pacific, North America, and Brazil.

Subsea 7 is one of the world's leading subsea engineering and construction companies, offering all the expertise and assets that make subsea, umbilical, riser, and flowline field development possible. Subsea 7's global offshore operations are supported out of the North Sea, Africa, Brazil, North America, and Asia-Pacific regions. Subsea 7 has a fleet of industry-leading, dynamically positioned ships capable of reeled and flexible pipelay, subsea construction, and saturation diving and a portfolio of pipeline construction yards worldwide.

Wood Group Pressure Control,

Houston, has appointed Marcus A. Smedley vice-president of engineering. He will be responsible for managing the day-to-day operations of WGPC's engineering activities. In addition, he will be responsible for developing new product lines and will assist WGPC with expanding its capabilities into new markets. Smedley has 20 years of experience in the oil and gas industry, spending most of his career with FMC Technologies. There he gained experience as an engineer, project manager, product manager, sales manager, and business development manager. Smedley has a degree in mechanical engineering from Texas A&M University and an MBA from Southern Methodist University. He is a member of the Society of Petroleum Engineers and the American Petroleum Institute. Smedley is a co-author and industry presenter of topics relating to top tensioned riser installation and analysis, surface wellhead technology, and subsea systems technology. He is also co-inventor of five US patents for oil and gas industry products.


Smedley

WGPC, part of international energy services company John Wood Group PLC, designs and manufactures wellhead systems, gate valves, chokes, and actuators that control formation pressures and product flow from initial drilling through production for oil companies around the

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world. Also offered are repair, maintenance, and remanufacturing services for wellhead systems, gate valves, and flow control products.

Wood Group is an international energy services company with three businesses—engineering and production facilities, well support, and gas turbine services—providing a range of engineering, production support, maintenance management, and industrial gas turbine overhaul and repair services to the oil and gas and power generation industries worldwide.

Weatherford International Ltd.,

Houston, has announced that its chairman, president, and CEO, Bernard J. Duroc-Danner, was named Ernst & Young's Entrepreneur of the Year in the category of energy, chemicals, and mining. Now in its 22nd year, the awards recognize leaders and visionaries who demonstrate innovation, financial success, and personal commitment as they create and build world-class businesses. Duroc-Danner was recognized for taking a small private company and turning it into one of the largest diversified upstream oil field service companies in the world. Duroc-Danner was honored during the Ernst & Young Strategic Growth Forum in Palm Springs, Calif.

Weatherford International Ltd. offers one of the industry's broadest portfolios of services and products including drilling, evaluation, completion, production and intervention.

Ernst & Young is a global leader in assurance, tax, transaction and advisory services.

Geoservices Group,

Les Blanc-Mesnil, France, has acquired Wireline Service & Manufacturing SRL, Villaromagnano, Italy. Miguel Gil, general manager of WS&M, has joined the Geoservices Group and reports to Anna Albano, South Europe area manager.

Geoservices provides a range of oil field services that help evaluate hydrocarbon reservoirs and optimize field exploration, development, and production. Its offerings include mud logging, well intervention, and field surveillance.

WS&M offers slickline services with 14 slickline units in Italy, Spain, Croatia, and Tunisia.

IDM Group,

Houston, has completed its acquisition of Louisiana Electric Rig Service Inc., Rosenberg, Tex., along with the latter's field support services for the global offshore drilling industry and the simultaneous merger of IDM's existing AC electrical systems and controls business into Louisiana Electric. The combined company will operate as Louisiana Electric Rig Service. Combining Louisiana Electric Rig Service with IDM's company of AC, variable frequency drives, controls, systems, and field services creates a company with a complete lineup of electrical systems and controls for the global land and offshore drilling industry. In addition, the company's substantial scale and resources will enable it to deliver industry-leading products and services that address the rapidly expanding need for both new AC and SCR drive systems, the upgrade of existing drilling equipment, and field service of existing installations provided by most competing manufacturers.

IDM manufactures drilling rigs, integrated drilling systems, and comprehensive fluid-end pump parts from its two Houston facilities.

Louisiana Electric provides SCR drives, generator controls, top drive controls, and custom-engineered products.

Roxar ASA,

Stavanger, has named Tone Krakenes product manager for its flagship reservoir modeling solution, IRAP RMS. She will be tasked with bringing RMS2009 to market in early 2009, which will allow for the local updating of both the structural model and geological model, resulting in significant reservoir management and productivity enhancements. Krakenes will also work closely with Roxar's development and regional sales groups to further bolster the company's reservoir interpretation and reservoir modeling portfolio. IRAP RMS integrates a wide range of reservoir data across the characterization workflow, while also quantifying uncertainty for improving reservoir management decision-making. RMS2009 comprises 18 fully integrated software modules, including next-generation structural modeling, mapping, fracture modeling, well planning, and uncertainty management tools.


Krakenes

Krakenes has worked at Roxar since 2005 and has been responsible for providing presales support and training on IRAP RMS. Previous roles outside Roxar include senior geologist positions at ConocoPhillips, where she was responsible for subsurface evaluation on a number of North Sea assets; and Hydro (now StatoilHydro), where she worked on mapping, well planning, and 3D modeling solutions for Snorre field.

Roxar creates value for its customers through its reservoir interpretation, reservoir modeling, reservoir simulation, well and completion, production, and process solutions and consultancy services.

Frigstad Offshore Pte. Ltd.,

Singapore, has appointed Stein Diesen chief operating officer, effective Mar. 1, 2009. Previously, he served as senior vice-president, deepwater units at Seadrill, responsible for the successful execution of Seadrill's extensive ultradeepwater rig construction projects entailing 11 semisubmersibles and drillships being built in South Korea and Singapore since 2005. From 2002 to 2005, Diesen was managing director for Smedvig Offshore's fleet of mobile offshore rigs. Prior to that, he held various senior management positions in projects, operations, procurement, and business development with Smedvig, Statoil, and Aker in Norway and internationally. He has 34 years of experience in the offshore and petroleum industries. Diesen holds a BS in electrical engineering and an MBA from BI Norwegian School of Management.

Established in 1989, Frigstad is an independent drilling contractor offering a complete range of rig- and project-management services to the offshore drilling industry. The company is managed from Singapore, with branch offices in Norway and China.

Imports of crude and products

	Districts 1–4		District 5		Total US		
	12-5 2008	11-28 2008	12-5 2008	11-28 2008	12-5 2008	11-28 2008	*12-7 2007
	1,000 b/d						
Total motor gasoline	1,106	884	0	0	1,106	884	985
Mo. gas. blending comp.	940	784	0	0	940	784	564
Distillate	99	112	4	4	103	116	176
Residual	312	417	0	159	312	576	336
Jet fuel–kerosine	21	26	5	19	26	45	146
Propane–propylene	207	185	15	15	222	200	230
Other	103	456	2	52	105	508	1,001
Total products	**2,788**	**2,864**	**26**	**249**	**2,814**	**3,113**	**3,438**
Total crude	**8,787**	**8,664**	**1,172**	**840**	**9,959**	**9,504**	**10,063**
Total imports	**11,575**	**11,528**	**1,198**	**1,089**	**12,773**	**12,617**	**13,501**

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

Purvin & Gertz LNG netbacks—Dec. 12, 2008

Receiving terminal	Liquefaction plant					
	Algeria	Malaysia	Nigeria	Austr. NW Shelf	Qatar	Trinidad
	$/MMbtu					
Barcelona	11.84	10.05	11.29	9.95	10.61	11.22
Everett	5.07	3.27	4.76	3.38	3.72	5.31
Isle of Grain	6.92	5.04	6.37	4.95	5.52	6.39
Lake Charles	3.25	1.72	3.07	1.85	1.98	3.75
Sodegaura	9.09	11.19	9.36	10.91	10.25	8.49
Zeebrugge	11.41	9.28	10.80	9.04	9.85	10.80

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	13,867	55,539	32,024	9,635	52,493	13,969	3,861
PADD 2	71,102	47,288	18,002	7,244	26,546	1,191	21,345
PADD 3	168,520	64,359	33,176	11,858	33,942	17,511	33,458
PADD 4	14,264	7,100	2,418	574	3,223	251	[1]2,775
PADD 5	53,011	28,378	23,554	10,004	14,383	5,115	—
Dec. 5, 2008	**320,764**	**202,664**	**109,174**	**39,315**	**130,587**	**38,037**	**61,439**
Nov. 28, 2008	**320,372**	**198,942**	**105,529**	**38,567**	**124,973**	**37,156**	**60,329**
Dec. 7, 2007[2]	**304,518**	**202,241**	**96,154**	**39,864**	**131,534**	**39,522**	**59,578**

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

Refinery report—Dec. 5, 2008

District	Refinery operations		Refinery output				
	Gross inputs	Crude oil inputs	Total motor gasoline	Jet fuel, kerosine	Fuel oils: Distillate	Fuel oils: Residual	Propane–propylene
	1,000 b/d						
PADD 1	1,339	1,344	2,181	92	447	105	66
PADD 2	3,390	3,357	2,368	191	1,144	45	235
PADD 3	7,321	7,133	2,675	615	2,319	292	678
PADD 4	566	562	309	29	210	12	[1]223
PADD 5	2,782	2,571	1,466	464	534	119	—
Dec. 5, 2008	**15,398**	**14,967**	**8,999**	**1,391**	**4,654**	**573**	**1,202**
Nov. 28, 2008	**14,852**	**14,580**	**8,716**	**1,411**	**4,314**	**552**	**1,046**
Dec. 7, 2007[2]	**15,476**	**15,278**	**9,155**	**1,552**	**4,234**	**689**	**1,219**
	17,610 Operable capacity		**87.4% utilization rate**				

[1]Includes PADD 5. [2]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.

OGJ crack spread

	*12–12–08	*12–14–07	Change $/bbl	Change, %
SPOT PRICES				
Product value	48.57	101.36	–52.78	–52.1
Brent crude	42.10	92.02	–49.92	–54.3
Crack spread	6.48	6.03	0.44	7.4
FUTURES MARKET PRICES				
One month				
Product value	49.95	102.05	–52.10	–51.1
Light sweet crude	44.71	91.16	–46.45	–51.0
Crack spread	5.23	10.89	–5.66	–51.9
Six month				
Product value	59.77	104.56	–44.79	–42.8
Light sweet crude	53.35	90.11	–36.76	–40.8
Crack spread	6.41	14.45	–8.04	–55.6

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

OGJ GASOLINE PRICES

	Price ex tax 12-10-08	Pump price* 12-10-08	Pump price 12-12-07
	¢/gal		
(Approx. prices for self–service unleaded gasoline)			
Atlanta	131.1	177.6	305.2
Baltimore	125.9	167.8	300.1
Boston	130.7	172.6	297.9
Buffalo	112.3	173.2	315.3
Miami	125.0	176.6	315.4
Newark	145.6	178.2	287.9
New York	122.4	183.3	301.1
Norfolk	134.8	173.2	292.9
Philadelphia	131.6	182.3	303.1
Pittsburgh	136.6	187.3	304.1
Wash., DC	153.9	192.3	302.6
PAD I avg	131.8	178.6	302.3
Chicago	114.7	179.1	325.6
Cleveland	113.1	159.5	300.7
Des Moines	123.3	163.7	291.9
Detroit	111.5	170.9	304.3
Indianapolis	109.7	169.1	299.0
Kansas City	121.9	157.9	284.0
Louisville	124.0	164.9	293.4
Memphis	119.0	158.8	293.8
Milwaukee	112.9	164.2	296.2
Minn.–St. Paul	119.1	163.1	293.4
Oklahoma City	119.4	154.8	284.0
Omaha	111.2	156.5	286.4
St. Louis	133.2	169.2	293.1
Tulsa	122.7	158.1	280.3
Wichita	115.9	159.3	286.6
PAD II avg	118.1	163.3	294.2
Albuquerque	137.5	173.9	295.7
Birmingham	129.3	168.6	291.9
Dallas–Fort Worth	126.2	164.6	286.7
Houston	117.4	155.8	284.4
Little Rock	125.6	165.8	293.9
New Orleans	133.6	172.0	293.2
San Antonio	136.5	174.9	281.2
PAD III avg	129.4	167.9	289.6
Cheyenne	128.4	160.8	290.6
Denver	131.9	172.3	300.9
Salt Lake City	121.9	164.8	300.9
PAD IV avg	127.4	165.9	297.5
Los Angeles	118.8	185.9	328.9
Phoenix	139.1	176.5	292.2
Portland	148.1	191.5	313.6
San Diego	129.4	196.5	337.4
San Francisco	125.2	192.3	352.8
Seattle	130.6	186.5	321.9
PAD V avg	131.9	188.2	324.5
Week's avg.	**126.2**	**171.8**	**300.1**
Nov. avg.	**169.9**	**215.5**	**307.6**
Oct. avg.	**272.3**	**317.6**	**280.9**
2008 to date	**288.3**	**332.6**	—
2007 to date	**234.3**	**277.9**	—

*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

	12-5-08 ¢/gal		12-5-08 ¢/gal
Spot market product prices			
Motor gasoline (Conventional–regular)		Heating oil No. 2	
New York Harbor	90.80	New York Harbor	140.47
Gulf Coast	83.30	Gulf Coast	127.22
Los Angeles	77.55	Gas oil	
Amsterdam–Rotterdam–Antwerp (ARA)	100.14	ARA	138.57
Singapore	81.21	Singapore	135.71
Motor gasoline (Reformulated–regular)		Residual fuel oil	
New York Harbor	87.18	New York Harbor	74.12
Gulf Coast	82.30	Gulf Coast	82.21
Los Angeles	83.55	Los Angeles	103.65
		ARA	77.24
		Singapore	80.09

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

BAKER HUGHES RIG COUNT

	12-12-08	12-14-07
Alabama	4	4
Alaska	13	10
Arkansas	52	46
California	38	39
Land	38	37
Offshore	0	2
Colorado	103	113
Florida	1	0
Illinois	0	0
Indiana	2	2
Kansas	15	15
Kentucky	10	8
Louisiana	169	160
N. Land	86	58
S. Inland waters	21	27
S. Land	9	27
Offshore	53	48
Maryland	0	1
Michigan	0	1
Mississippi	20	10
Montana	11	12
Nebraska	0	0
New Mexico	68	77
New York	5	5
North Dakota	83	51
Ohio	12	13
Oklahoma	168	196
Pennsylvania	24	19
South Dakota	1	0
Texas	828	885
Offshore	7	11
Inland waters	0	2
Dist. 1	20	19
Dist. 2	36	36
Dist. 3	63	74
Dist. 4	77	84
Dist. 5	167	185
Dist. 6	125	123
Dist. 7B	25	38
Dist. 7C	61	57
Dist. 8	108	115
Dist. 8A	29	25
Dist. 9	45	43
Dist. 10	65	73
Utah	38	38
West Virginia	30	36
Wyoming	78	70
Others—NV–8; TN–4; VA–4; WA–1	17	13
Total US	**1,790**	**1,824**
Total Canada	**390**	**419**
Grand total	**2,180**	**2,243**
Oil rigs	401	342
Gas rigs	1,379	1,477
Total offshore	65	61
Total cum. avg. YTD	**1,885**	**1,767**

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	12-5–08 Percent footage*	Rig count	12-7–07 Percent footage*
0–2,500	95	3.1	61	6.5
2,501–5,000	127	50.3	116	60.3
5,001–7,500	244	12.2	219	23.7
7,501–10,000	424	2.5	460	1.3
10,001–12,500	409	1.9	438	4.1
12,501–15,000	343	0.2	268	—
15,001–17,500	160	—	122	—
17,501–20,000	78	—	66	—
20,001–over	31	—	34	—
Total	**1,911**	**6.1**	**1,784**	**8.4**
INLAND	27		34	
LAND	1,838		1,700	
OFFSHORE	46		50	

*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]12-12-08	[2]12-14-07
	1,000 b/d	
(Crude oil and lease condensate)		
Alabama	20	21
Alaska	702	741
California	657	660
Colorado	62	64
Florida	6	6
Illinois	28	25
Kansas	107	98
Louisiana	1,150	1,190
Michigan	14	14
Mississippi	59	60
Montana	97	92
New Mexico	165	162
North Dakota	180	133
Oklahoma	180	170
Texas	1,315	1,329
Utah	54	53
Wyoming	150	148
All others	64	71
Total	**5,010**	**5,037**

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

US CRUDE PRICES

	12-12-08 $/bbl*
Alaska–North Slope 27°	68.18
South Louisiana Sweet	44.75
California–Kern River 13°	31.25
Lost Hills 30°	40.05
Wyoming Sweet	31.28
East Texas Sweet	42.25
West Texas Sour 34°	35.00
West Texas Intermediate	42.75
Oklahoma Sweet	42.75
Texas Upper Gulf Coast	38.25
Michigan Sour	35.75
Kansas Common	41.75
North Dakota Sweet	26.75

*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]	12-5-08
United Kingdom–Brent 38°	45.15
Russia–Urals 32°	42.91
Saudi Light 34°	43.67
Dubai Fateh 32°	44.13
Algeria Saharan 44°	46.40
Nigeria–Bonny Light 37°	48.48
Indonesia–Minas 34°	46.56
Venezuela–Tia Juana Light 31°	40.68
Mexico–Isthmus 33°	40.57
OPEC basket	44.36
Total OPEC[2]	43.68
Total non–OPEC[2]	42.44
Total world[2]	43.12
US imports[3]	41.07

[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]

	12-5-08	11-28-08	12-5-07	Change, %
	bcf			
Producing region	955	963	1,020	–6.4
Consuming region east	1,871	1,929	1,860	0.6
Consuming region west	465	466	456	2.0
Total US	**3,291**	**3,358**	**3,336**	**–1.3**
	Sept. 08	**Sept. 07**	**Change, %**	
Total US[2]	**3,163**	**3,316**	**–4.6**	

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

Statistics

World oil balance

	2008 2nd qtr.	2008 1st qtr.	2007 4th qtr.	2007 3rd qtr.	2007 2nd qtr.	2007 1st qtr.
	Million b/d					
DEMAND						
OECD						
US & Territories	19.96	20.15	20.90	21.06	20.95	21.09
Canada	2.25	2.37	2.39	2.40	2.29	2.38
Mexico	2.16	2.10	2.16	2.06	2.14	2.12
Japan	4.59	5.41	5.25	4.70	4.64	5.43
South Korea	2.09	2.33	2.31	2.06	2.12	2.35
France	1.92	1.98	2.02	1.94	1.86	1.98
Italy	1.61	1.62	1.75	1.65	1.69	1.72
United Kingdom	1.72	1.72	1.73	1.75	1.78	1.80
Germany	2.41	2.47	2.54	2.55	2.37	2.37
Other OECD Europe	7.23	7.41	7.60	7.52	7.25	7.35
Australia & New Zealand	1.14	1.13	1.15	1.12	1.10	1.12
Total OECD	**47.08**	**48.69**	**49.80**	**48.81**	**48.19**	**49.71**
NON–OECD						
China	7.94	7.72	7.87	7.59	7.52	7.33
FSU	4.49	4.34	4.32	4.22	4.32	4.25
Non–OECD Europe	0.80	0.86	0.79	0.73	0.78	0.85
Other Asia	8.97	8.91	8.93	8.64	8.83	8.74
Other non–OECD	15.94	15.52	15.25	15.54	15.22	14.93
Total non–OECD	**38.14**	**37.35**	**37.16**	**36.72**	**36.67**	**36.10**
TOTAL DEMAND	**85.22**	**86.04**	**86.96**	**85.53**	**84.86**	**85.81**
SUPPLY						
OECD						
US	8.75	8.64	8.58	8.36	8.50	8.38
Canada	3.26	3.35	3.40	3.48	3.37	3.45
Mexico	3.20	3.30	3.35	3.46	3.61	3.59
North Sea	4.33	4.46	4.57	4.28	4.49	4.80
Other OECD	1.59	1.54	1.57	1.56	1.54	1.50
Total OECD	**21.13**	**21.29**	**21.47**	**21.14**	**21.51**	**21.72**
NON–OECD						
FSU	12.60	12.60	12.66	12.55	12.60	12.61
China	3.99	3.93	3.86	3.87	3.96	3.92
Other non–OECD	11.07	10.83	11.13	11.21	11.04	10.70
Total non–OECD, non–OPEC	**27.66**	**27.36**	**27.65**	**27.63**	**27.60**	**27.23**
OPEC*	**36.86**	**36.69**	**36.18**	**35.44**	**35.07**	**35.98**
TOTAL SUPPLY	**85.65**	**85.34**	**85.30**	**84.21**	**84.18**	**84.93**
Stock change	**0.43**	**–0.70**	**–1.66**	**–1.32**	**–0.68**	**–0.88**

*Includes Angola.
Source: DOE International Petroleum Monthly
Data available in OGJ Online Research Center.

US petroleum imports from source country

	Aug. 2008	July 2008	Average YTD 2008	Average YTD 2007	Chg. vs. previous year Volume	Chg. vs. previous year %
	1,000 b/d					
Algeria	530	456	525	736	–211	–28.7
Angola	495	652	523	536	–13	–2.4
Kuwait	203	122	207	192	15	7.8
Nigeria	1,166	822	1,067	1,076	–9	–0.8
Saudi Arabia	1,573	1,675	1,560	1,443	117	8.1
Venezuela	1,305	1,340	1,210	1,357	–147	–10.8
Other OPEC	1,118	1,054	1,032	640	392	61.3
Total OPEC	**6,390**	**6,121**	**6,124**	**5,980**	**144**	**2.4**
Canada	2,199	2,390	2,427	2,467	–40	–1.6
Mexico	1,400	1,290	1,315	1,578	–263	–16.7
Norway	84	94	111	161	–50	–31.1
United Kingdom	222	187	218	300	–82	–27.3
Virgin Islands	298	294	326	326	0	0.0
Other non–OPEC	2,466	2,688	2,511	2,807	–296	–10.5
Total non–OPEC	**6,669**	**6,943**	**6,908**	**7,639**	**–731**	**–9.6**
TOTAL IMPORTS	**13,059**	**13,064**	**13,032**	**13,619**	**–587**	**–4.3**

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

OECD total net oil imports

	Aug. 2008	July 2008	June 2008	Aug. 2007	Chg. vs. previous year Volume	Chg. vs. previous year %
	Million b/d					
Canada	–1,511	–1,054	–1,073	–1,251	–260	20.8
US	10,992	10,995	11,202	12,151	–1,159	–9.5
Mexico	–1,183	–1,007	–978	–1,406	223	–15.9
France	1,701	1,841	1,653	1,814	–113	–6.2
Germany	2,437	2,425	1,980	2,264	173	7.6
Italy	1,214	1,491	1,498	1,593	–379	–23.8
Netherlands	931	1,057	1,042	1,034	–103	–10.0
Spain	1,483	1,524	1,473	1,674	–191	–11.4
Other importers	3,992	3,940	3,798	3,932	60	1.5
Norway	–2,102	–1,387	–1,899	–2,333	231	–9.9
United Kingdom	389	20	48	464	–75	–16.2
Total OECD Europe	**10,045**	**10,911**	**9,593**	**10,442**	**–397**	**–3.8**
Japan	4,867	4,793	4,578	4,933	–66	–1.3
South Korea	196	2,167	1,891	1,848	–1,652	–89.4
Other OECD	869	939	798	768	101	13.2
Total OECD	**24,275**	**27,744**	**26,011**	**27,485**	**–3,210**	**–11.7**

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

OECD* total gross imports from OPEC

	Aug. 2008	July 2008	June 2008	Aug. 2007	Chg. vs. previous year Volume	Chg. vs. previous year %
	Million b/d					
Canada	287	455	428	509	–222	–43.6
US	6,390	6,121	6,084	6,355	35	0.6
Mexico	21	45	45	35	–14	–40.0
France	891	864	779	844	47	5.6
Germany	442	560	399	500	–58	–11.6
Italy	1,235	1,157	1,213	1,350	–115	–8.5
Netherlands	664	516	661	644	20	3.1
Spain	777	594	788	667	110	16.5
Other importers	1,360	1,327	1,333	1,262	98	7.8
United Kingdom	379	289	391	404	–25	–6.2
Total OECD Europe	**5,748**	**5,307**	**5,564**	**5,671**	**77**	**1.4**
Japan	4,208	4,456	3,606	4,229	–21	–0.5
South Korea	2,352	2,605	2,347	2,116	236	11.2
Other OECD	627	629	688	846	–219	–25.9
Total OECD	**19,633**	**19,618**	**18,762**	**19,761**	**–128**	**–0.6**

*Organization for Economic Cooperation and Development.
Source: DOE International Petroleum Monthly
Data available in OGJ Online Research Center.

Oil stocks in OECD countries*

	Aug. 2008	July 2008	June 2008	Aug. 2007	Chg. vs. previous year Volume	Chg. vs. previous year %
	Million bbl					
France	176	179	177	175	1	0.6
Germany	274	275	273	280	–6	–2.1
Italy	131	135	137	132	–1	–0.8
United Kingdom	95	95	99	102	–7	–6.9
Other OECD Europe	700	701	684	676	24	3.6
Total OECD Europe	**1,376**	**1,385**	**1,370**	**1,365**	**11**	**0.8**
Canada	197	203	195	192	5	2.6
US	1,710	1,699	1,686	1,733	–23	–1.3
Japan	643	627	619	632	11	1.7
South Korea	150	153	147	165	–15	–9.1
Other OECD	104	104	108	108	–4	–3.7
Total OECD	**4,180**	**4,171**	**4,125**	**4,195**	**–15**	**–0.4**

*End of period.
Source: DOE International Petroleum Monthly Report
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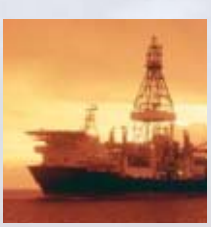

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Smelly political, financial reports gag Democrats

Not that Republicans haven't exploded their share of stink bombs in recent years, but the week ending Dec. 12 was especially malodorous for Democrats.

Most attention went to the Dec. 9 arrest of Democratic Illinois Gov. Rod Blagojevich on suspicion he abused his office for personal gain.

Among numerous outrages in federal charges against him is his alleged intent

The Editor's Perspective

by Bob Tippee, Editor

to sell the Senate seat of President-elect Barack Obama.

Prosecutors stressed that charges against the governor don't implicate Obama, for whom the news nevertheless can be no minor cause for worry.

The Chicago scandal provides a reminder of the sweetheart deal on a Chicago house made for Obama in 2005 by political supporter Tony Rezko, a Blagojevich aide convicted in June on corruption charges.

That mess mostly obscured disclosure, also on Dec. 9, of the expansion of what Democrats hoped would be a quickly finished and forgotten ethics investigation of Charles Rangel (D-NY), chairman of the House Ways and Means Committee.

Rangel in September requested that the House Committee on Standards of Official Conduct examine his personal finances after questions arose about his control of rent-stabilized apartments in Harlem, unpaid taxes, and use of congressional stationery in fund raising for the Rangel Center for Public Service at the City College of New York.

The investigation now will deal also with a New York Times report that Rangel supported a tax measure favorable to Nabors Industries Ltd. on the same day he met with Nabors Chairman and Chief Executive Eugene Isenberg about a $1 million contribution to the Rangel Center.

Rangel and Isenberg deny any link exists between the tax issue and donation.

Ultimately worse for Democrats might be the arrest on Dec. 11 of New York stock broker and former Nasdaq Stock Market Chairman Bernard Madoff on federal fraud complaints. Madoff is accused of swindling investors out of $50 billion.

The scandal will exacerbate public skepticism about Wall Street and complicate efforts by a newly Democratic government to solve US economic problems.

And one way Madoff used his allegedly ill-gotten riches was to contribute generously to political campaigns, almost all of them Democratic.

(Online Dec. 12, 2008; author's e-mail: bobt@ogjonline.com)

Market Journal

by Sam Fletcher, Senior Writer

Another year without Santa

With the Christmas holidays approaching, members of the oil and gas industry are anticipating stockings full of rocks from the new Santa-elect in Washington, DC, while other industries' wishes for bundles of cash will come true.

"We are seeing trillions of dollars spent by governments around the world to 'bail out' all types of businesses that are 'too big to fail.' Where were these guys when energy businesses were failing in the mid 1980s?" complained analysts in the Houston office of Raymond James & Associates Inc.

They then answered their own question: "Energy is considered a necessary evil by most politicians and consumers. The reality is that rising energy prices are generally bad for most developed countries (especially the US) and falling energy prices are good for most of the world."

Low energy prices are so good, in fact, that it will provide consumers with a 2009 "dividend" that will rival the size of all the announced bailout plans around the globe, said Raymond James analysts. "Based upon our 2009 estimated energy prices, a rough estimate of the potential beneficial impact of lower energy prices for global consumers next year is about $1.7 trillion or 3.2% of global gross national product," they reported. That includes lower prices for oil, gas, and coal.

Political influences

It's true, however, that some industries are too big—both in numbers of employees and political clout—to be allowed to go under. The Bureau of Labor Statistics reported 850,100 people employed in the US manufacture of motor vehicles and parts in September. That jumps to 1,572,200 workers if manufacture of all transportation equipment is included, from cars to garbage trucks and recreational vehicles.

Energy prices fell Dec. 12 as Democrat and Republican Senators split along party lines on a proposed $14 billion bailout of General Motors and Chrysler. The companies eventually will be rescued, however; campaigning Democrats promised to put US voters back to work and therefore can not add thousands of auto workers to the unemployment lines. Both the number of unemployed persons (10.3 million) and the unemployment rate (6.7%) continued to increase in November. Since the start of the recession in December 2007, the number of unemployed workers increased by 2.7 million, and the unemployment rate rose by 1.7 percentage points.

As for the petroleum industry, US Department of Labor statistics list 9,320 workers employed in oil and gas extraction in September; 1,760 in pipeline transportation of crude; another 2,090 in "other pipeline transportation;" and 22,390 in "petroleum and coal products manufacturing." Even if the oil and gas industry could claim all of those employees, that totals 355,500 workers. Not only does it fall far short of the numbers making autos and parts, it's even less than the 379,000 people working in motion picture and sound recording; 428,000 employed in performing arts and spectator sports; and 867,000 in publishing (excluding the internet). What's more, a greater percentage of workers in the four other industries are likely members of unions that have political influence with the incoming administration.

Even among major oil producing states, oil industry workers are a minority accounting for 41.7% of total employment in Alaska; 31.5% in Louisiana, 17.9% in Wyoming, 13.1% in Texas, and 12.5% in Oklahoma, according to DOL. Of those, only Texas is among those states with the biggest populations, and it has sided with the Republicans more than the Democrats in recent years.

One out of five auto manufacture jobs are at Big Three facilities in the Detroit area, but 61% of all automotive workers make vehicle parts in Michigan, Ohio, Indiana, Tennessee, Illinois, Kentucky, New York, California, Pennsylvania, and North Carolina, several of which are key states in presidential primaries.

It's no wonder then that only oil workers and some representatives of producing states are dismayed when oil prices plunge. But as Raymond James analysts previously pointed out, low oil prices are their own best cure.

The "material savings" from lower fuel prices "should facilitate a gradual recovery in oil demand, though the timing of this process will largely depend on the pace of macroeconomic recovery," the analysts said, adding, "While macrovisibility is still minimal, we believe that our current working assumption of a 2% decline in 2009 global oil demand will probably prove overly aggressive. Once oil demand begins to rebound within the context of broader global economic recovery, it should support a sustained rise in oil prices, hence our gradually rising price forecast beyond the lows of the first quarter of 2009."

(Online Dec. 15, 2008; author's e-mail: samf@ogjonline.com)

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Units: coiled tubing, pumping, nitrogen
1 Accumulators
2 BOP hose reel
3 Control cabin
4 Cryogenic nitrogen tank
5 CT string
6 Displacement tanks
7 Hydraulic power unit
8 Injector transport rack
9 Injector-power hose reel
10 Injector-control hose reel
11 Levelwind
12 Low-pressure charge pump systems
13 Reel counter
14 Tubing reel
15 Interconnect hose bundle

Control cabin console 16
17 BOP controls
18 Chain tension
19 Chain traction
20 Circulation pressure
21 Data acquisition system
22 Injector direction control
23 Reel controls
24 Stripper controls
25 Tubing weight
26 Wellhead pressure

CT injector head 27
28 Chain
29 Conterbalance valve
30 Filter
31 Gearbox
32 Gooseneck (guide arch)
33 Insert (rides on tubing)
34 Lubricator joints
35 Motors
36 Stripper

Wellsite
37 Blowout preventers
38 Crane
39 Fluid tanks
40 Wellhead

Fluid Pumping Unit

Coiled-tubing well operations

Employing a coiled-tubing (CT) unit for well intervention is highly effective in stimulating oil and gas production. Advantages include the ability to work in wells under pressure (eliminating the need to kill the well to service it), faster tripping in and out of the hole (compared with conventional jointed pipe), and cost-effective operations with minimal impact on the well site.

Conventional CT unit operations include:
- Wellbore cleaning (removal of sand, scale, and other buildup)
- Nitrogen injection for unloading the well
- Setting packers and other downhole tools
- Operating downhole tools
- Conveying logging and perforating equipment
- Spot acidizing and cementing
- Drilling

Fit-for-purpose units provide:
- Through-tubing fracturing
- Drilling

Components, operation

Coiled-tubing operations employ a **fluid pumping unit** and/or nitrogen vaporizing **and pumping unit**. The fluid pumping unit draws fluids at pressures that can exceed 10,000 psi from **tanks** 39 to the CT reel rotating union and into the **CT string** 5. Support systems include **low-pressure charge pump systems** 12 and **displacement tanks** 6.

The nitrogen unit takes liquid nitrogen from the **cryogenic tank** 4, pressurizes it with a positive-displacement pump, then heats it to above freezing to prevent damage to piping and tubulars before the nitrogen reaches the CT string. Using nitrogen foam reduces the wellbore fluid column hydrostatic head and improves cleaning efficiency.

Power

The **hydraulic power unit on the CT unit** 7 powers all components. Pressure-compensated hydraulic pumps and closed-loop-injector drive systems ensure efficiency. An **accumulator bank** 1 stores hydraulic power to actuate the **blowout preventers** 37 in case of engine or component failure.

Control

All primary injector, BOP, stripper, reel, and engine functions are controlled from a central **control cabin** 3. Many units include a **data acquisition system** 21 for recording data and real-time monitoring of job parameters and tubing fatigue life. Critical parameters measured and recorded during operation include **wellbore pressure** 26, **tubing weight** 25, **circulating pressure** 20, **tubing speed**, and individual settings for systems that apply gripping force and movement to the **CT string**.

CT string

The CT string is stored and transported on the **CT reel** 14. Reel drums vary in size to accommodate varying lengths and diameters of CT strings. A **levelwind assembly** 11

Coiled Tubin

guides tubing onto and off the consistent wraps of tubing onto t depth counter to measure and recor being spooled off the reel.

A rotating union with a hollow bore in the reel s pumped into the CT string while the reel is rotating. piping operate at pressures up to 15,000 psi to accommo pressure pumping operations.

Tubing spooled off the reel is fed over a "**gooseneck**" or **guide arc head** 27, which controls the injection or retraction of tubing in heads on conventional units transmit a pull force up to 100,00 force up to 40,000 lb to the tubing.

Injector head operating speeds can reach 200 fpm in some and push force is applied to the CT string by two **counter-rot insert blocks** 33 that contact the tubing. The **insert blocks** a

Industry Proven Coiled Tubing
DESIGN | MANUFACTURE | SERVICE
Coiled Tubing Units
Coiled Tubing Drilling Units
Cementing Units
Pumping Units
Pressure Control Equipment
Downhole Tools
Downhole Motors
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Data Acquisition Systems
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tubing by a series of **hydraulic cylinders** acting on rollers located behind the chains. During operations, the injector head is supported by a **crane** 39, mast, or other superstructure.

Below the injector head is the **stripper** 30, which provides a seal between the wellbore and the outside of the tubing. The stripper contains wellbore pressure up to 15,000 psi while allowing the CT string to move in and out of the wellbore without leaking. **Lubricator joints** 34 below the stripper allow the operator to install downhole tools on the end of the CT string and retract them into the **lubricator joint** to seal the connection to the wellhead.

A typical **BOP** 37, mounted to the **wellhead** 40, includes four sets of hydraulically powered rams. Pipe rams maintain well control in an emergency by sealing the outside of the tubing from the wellbore below; slip rams hold the tubing in place; shear rams cut the tubing; blind rams seal off the wellbore from all components above the BOP.

The **bottomhole assembly** on the end of the CT string consists of various tools required to complete the operation.

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PennWell

INSIDE

INSIGHT

WINTER 2008

DEFINING REFINING

A LOOK AT THE REFINING INDUSTRY

Created by energy API | Supplement to OIL&GAS JOURNAL

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IMPROVING ASSET PERFORMANCE: *A HOLISTIC APPROACH*

In challenging economic times, upper management pushes hard to protect their shareholders' return on net assets. For the people who manage those assets daily, that typically means doing more with less. But how?

Improving asset performance requires a systematic focus of your efforts: What are the real issues that contribute to unreliable performance? What are the underlying reasons (not just the symptoms) when your facility experiences performance problems?

UNDERSTANDING YOUR NEEDS

Unreliable performance can be the result of equipment failure, human error, or a combination of both. The General Reliability Model (Fig. 1) shows that weaknesses in the management system and culture issues are the underlying reasons for most equipment failures and human errors.

As a facilities manager, you can make initial improvements by solving the causes of specific equipment failures and human errors. The benefits, however, will last much longer if you also address any weaknesses in the management system and cultural issues that may have contributed to the asset performance problems.

ABS Consulting has an improvement strategy that addresses these issues and provides a framework for the sustained improvement of asset performance:

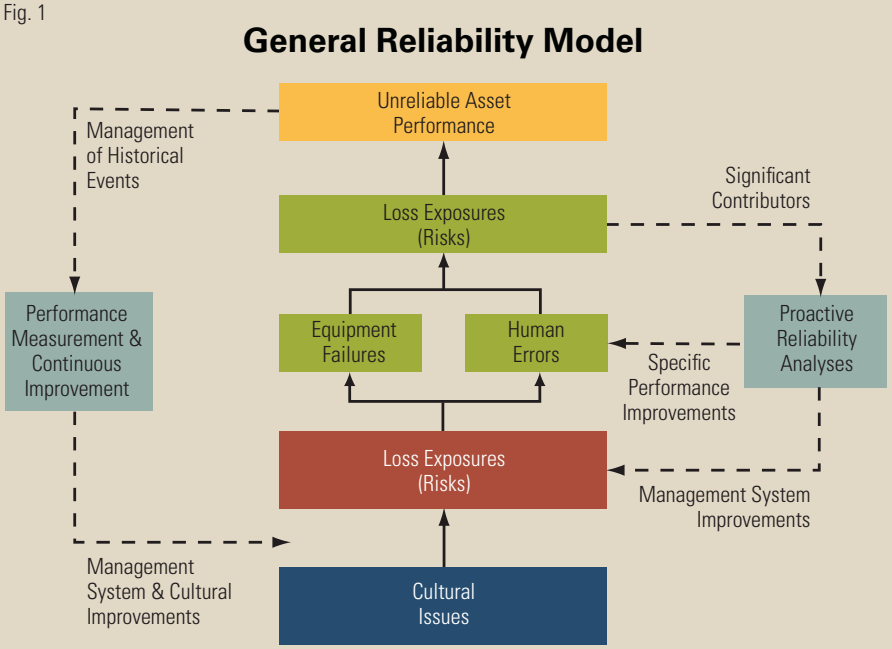
- Eliminating the causes of equipment failures – including human error – that affect system performance
- Creating a culture and management system to sustain improvement
- Establishing effective and efficient methods to monitor system performance and drive continuous improvement

IMPROVEMENT TOOLS

There are many tools for improving reliability and quality, but few of them address all the issues. ABS Consulting has found that selecting and applying an appropriate mix of the various tools in combination is more likely to help organizations achieve and sustain improved asset performance:

- Screening tools, such as Pareto analysis, for determining which asset performance problems are the most significant contributors
- Detailed performance-analysis tools, including Reliability-Centered Maintenance (RCM), Failure Modes and Effects Analysis (FMEA), error-proofing, and Weibull statistical analysis
- Management system auditing, benchmarking and development tools
- Performance measurement systems, such as Overall Equipment Effectiveness (OEE) and Enterprise Risk Management (ERM)

Fig. 1



A SUCCESSFUL TEAM

For some organizations, assembling a team with the skills, abilities and time to implement a successful improvement strategy is a challenge. ABS Consulting's Reliability and Maintenance Management experts can provide the services you need and assist with all phases of your improvement program.

Contact an ABS Consulting representative soon to find out how we can:

- Help you develop an effective asset-improvement strategy
- Help your facilities personnel identify the most significant contributors to unreliable asset performance
- Help your organization assess, improve, and implement more effective management systems
- Help you establish appropriate performance measurement tools and continuous improvement systems
- Help you establish a "reliability culture"

ABS Consulting also offers coaching and training that will give your personnel the skills and confidence they need to execute your performance improvement plan. The solution you've been looking for may be just a phone call away.

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INSIGHT

INSIDE | WINTER 2008

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DEFINING REFINING

U.S. refiners are investing billions of dollars to continue providing Americans with the energy they need while facing demands to produce higher-quality fuels.

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the Heart *of a* Home

Jody Becker won't let you feel sorry for her. Her sunny disposition, bright smile and humor dare anyone to describe her life as anything but beautiful and blessed.

REBUILDING TOGETHER | By Juan R. Palomo

Photos By Juan R. Palomo

Rebuilding Together was founded 30 years ago to improve the homes and lives of low-income homeowners. In 2005, it launched the Energy-Efficient Homes Initiative (EEHI) in partnership with API to introduce an energy-saving component to some projects. With employee volunteers, API has sponsored some 100 projects, donating $5,000 to $10,000 for each home's energy-efficient windows, appliances and other energy-saving components. This is the story about a few families they helped, as told by API staffer Juan R. Palomo, who has worked on houses around the country.

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You cannot call Jody Becker's recent life a hard-luck story. And you can't feel sorry for her, despite the fact her last year has had one tragic occurrence after another.

Her sunny disposition – her bright smile, her optimism and her humor – dare anyone to describe her life as anything but good.

"I don't know if it's a blessing or a curse," she says, "but I've always been able to look at the positive side of things."

Becker is a single mother in Billings, Montana. Last November, a few months after the death in a car accident of his mother, Becker's husband took his own life. And just this summer her husband's grandmother died, meaning that within a year's time, her four children – ages 8, 6, 3 and 1½ – lost their father, their grandmother, and a great-grandmother with whom they were very close.

Her husband's death left Becker with Social Security as her only steady income. She has supplemented that with money she earns cleaning newly-built houses and entering data into a computer for a drug company, which she does out of her living room. However, with the arrival of winter, there won't be very many new houses built and the data-entry work is not that steady.

On top of this, until a few months ago, Becker was facing the prospect of spending yet another harsh Montana winter in her drafty, cold house. Her husband had started a number of projects around the house intended to make it more energy efficient, and had made plans for others. But with his death, work on those projects stopped as Becker concentrated on trying to provide their children a home life with some semblance of normalcy. She tried to make some of the repairs herself, but there was only so much she could do.

Her tribulations notwithstanding, Becker has remained philosophical. "Sometimes life throws us some interesting blows," she says.

That's about as far as she seems willing to go to concede that things have been rough. But even that is quickly followed with that optimism that seems to be deeply ingrained in her life view.

"I hope it makes me a better person in the long run," she says. "I feel that there's a lot one can learn during trying times."

One thing Becker has learned is what it means to be a part of a community. On a drizzly early-September Saturday morning, about 20 volunteers from across Billings invaded her house and yard and began tearing down the old, the broken and the rotting – windows, floorboards, siding – and installing new, energy efficient components.

The Power of People. Volunteers from Rebuilding Together's Billings, Montana, affiliate tear down Jody Becker's old broken and rotting windows, floorboards and siding and install new, energy efficient components.

The volunteers belong to the Billings affiliate of Rebuilding Together. Besides its own employees, API has drawn the support of volunteers from affiliate State Petroleum Councils across the country. And member companies have also sponsored numerous projects with company employees volunteering their time to improve homes, primarily in communities where the companies have facilities. In fact, 15 employees of the large ConocoPhillips refinery in Billings were scheduled to work on another house rebuilding project the weekend after Becker's house was rebuilt. The company donated $20,000 to the project, says Steve Steach, the refinery's manager, who was working on the Becker home that September Saturday morning.

"This is very important to us," Steach explained, as he worked on the Becker home exterior.

ConocoPhillips is committed to reducing energy use by 10 percent by 2012 at its refinery operations, he explained.

"This is tied directly to that effort," he added. "It allows us to be good neighbors." »

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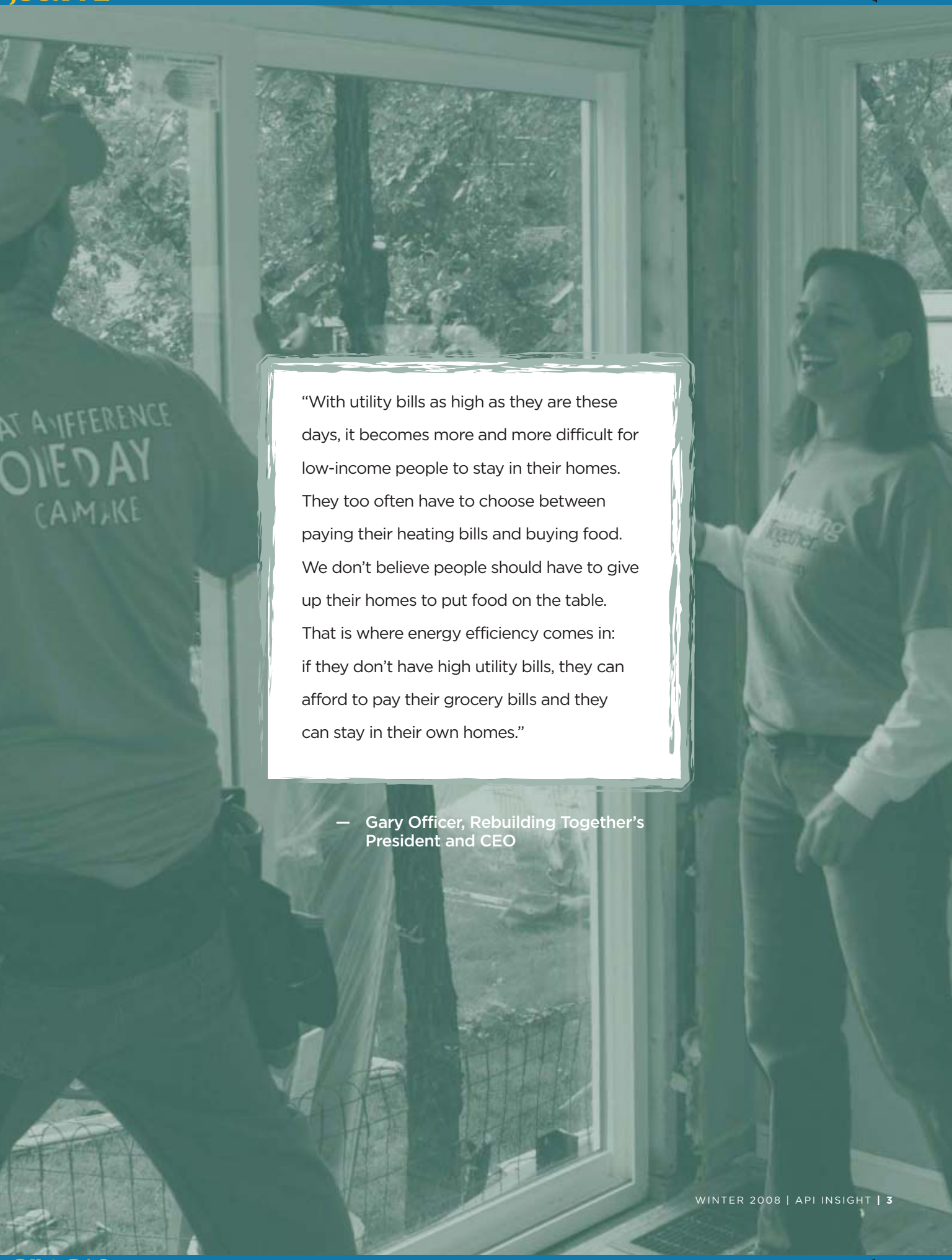

"With utility bills as high as they are these days, it becomes more and more difficult for low-income people to stay in their homes. They too often have to choose between paying their heating bills and buying food. We don't believe people should have to give up their homes to put food on the table. That is where energy efficiency comes in: if they don't have high utility bills, they can afford to pay their grocery bills and they can stay in their own homes."

— **Gary Officer, Rebuilding Together's President and CEO**

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Ultimately, explains Gary Officer, Rebuilding Together's president and CEO, the organization's aim is to preserve affordable home ownership. Each year, more than 270,000 Rebuilding Together volunteers help refurbish and revitalize nearly 10,000 houses for diverse families.

"With utility bills as high as they are these days, it becomes more and more difficult for low-income people to stay in their homes," he says. "They too often have to choose between paying their heating bills and buying food. We don't believe people should have to give up their homes to put food on the table. That is where energy efficiency comes in: if they don't have high utility bills, they can afford to pay their grocery bills and they can stay in their own homes."

Officer says that 19 percent of American families have incomes of under $15,000 a year. With utility bills rising by 10 percent a year, it's becoming increasingly more difficult for these families to pay those bills.

"API has been a wonderful supporter, as have a number of its member companies," Officer says. "It has been a catalyst for us, to allow us to incorporate energy efficiency more into our projects. API has not only provided us with funds needed for such projects, it has generated hundreds of volunteers for these projects."

API's Rebecca Dobbins, EEHI coordinator, says the cost of energy is one of the most discussed topics in the country and that the EEHI is an oil and natural gas industry effort to demonstrate its concern regarding energy costs and its impact on low-income homeowners.

Low-income families spend an average of 14 percent of their annual income on energy bills, Dobbins explains. Working with Rebuilding Together, EEHI helps lower that burden for some of them.

"It's now more important than ever, during these tough economic times, that we equip homeowners with the knowledge and capability to improve energy efficiency in their homes and save money on their monthly bills," says Dobbins. "It's gratifying to partner with Rebuilding Together on a project like this and to be making such a positive difference in people's lives across the country."

API has sponsored other rebuilding projects in Billings. Two years ago, it was involved in the rebuilding of Laura Harris' house, a concrete-block structure in dire need of repairs.

Recently, the 81-year-old Harris stood proudly in front of her home, recounting what the rebuilding had meant to her, emotionally and financially.

Industry Involvement. Steve Steach, Manager of ConocoPhillips' Billings refinery, assisted in rebuilding Jody Becker's home. ConocoPhillips has donated $20,000 to the Rebuilding Together effort and says the company is committed to reducing energy use by 10 percent by 2012 at its refinery.

"My home is now warm in every room and in every corner," she says. "It makes no difference if the wind is blowing, the snow is falling and the temperature is below freezing."

As an example of how much money she is able to save with her energy-efficient home, she displayed two natural gas bills. The first, from before the rebuilding, showed a total bill of $68.22. The second, a year later, showed a total of $29.16, even though the average temperature that month had been 11 degrees lower than the previous year.

"It's really meant a great deal for me," she says. "It's kept me warm and it's so much more pleasant."

Last year, API sponsored a rebuilding project in New Orleans' Holy Cross neighborhood, one of the areas hardest hit by Hurricane Katrina, allowing Leona Ford to return to the small structure that had been home to her until the hurricane drove her away. About a dozen API volunteers worked for three days in New Orleans' sweltering humidity to complete the project.

Recently, Dobbins received a hand-written note from Ford, expressing her appreciation.

"I didn't know who to thank," she wrote, "Tell the people who helped and gave me back my home, 'Thanks.'"

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Often, the homeowners whose homes have been rehabilitated are so grateful that they become volunteers themselves. One such person is Reva Popelka, also of Billings, whose home was rebuilt last year and who this year was volunteering at another Billings project that was taking place the same weekend as Becker's.

"They are wonderful people," she says, referring to Rebuilding Together." I can't believe there are people like this in the world."

At 84, she says she cannot do a lot of physical labor, "but I just do what I can do. I register people. I help serve lunch."

Earlier this year Becker heard from neighbors about the Billings affiliate of the national volunteer home rebuilding association, and about its annual partnership with API's Energy Efficiency Initiative, and decided to apply.

Becker's home was chosen. Her letter to the Billings affiliate made a convincing case:

"As a contractor, my husband had the skills to do the work in our home, but time and other more pressing obligations meant that we had many projects that remained unfinished," she wrote. "I have the motivation, but I lack a lot of the skills needed to complete them.

"Since Troy's death, I have made great efforts to pay off all our debts so that I can afford to keep our children in the only home they know," she continues. "I have used the little bit of savings we had to do this. I have a few assets yet to sell, but more debts to pay. I am hoping I will be able to accomplish that soon. I worry that I will not be able to afford to pay a hired hand to finish the critical projects."

She went on to describe the house's condition: a leaking roof, rotting or missing cedar siding, rotting door frames, broken windows, old single-paned windows with broken seals, holes in some interior walls, rotting flooring in a bathroom.

Paying it Forward. At 84, Reva Popelka, whose home was rebuilt last year, now volunteers for the Billings Rebuilding Together affiliate. Even though she can't do much physical labor, she helps register new volunteers and serves lunch to the workers.

Becker had managed to insulate the ceiling and basement herself, but the house remained extremely cold in the winter.

In an interview, she joked that the upside of this was that she always knew where her children were in the wintertime: in the living room around the wood-burning stove.

"That's the only place they can keep warm," she explained. "They hover around it."

As work on her home progressed and the volunteers paused for a lunch of sandwiches and soft drinks – like everything else, donated by a local merchant – Becker found time to step back and stand in awe at the amount of work that had already been done on her house.

"There's no way I could have done this on my own," she says. "Everything costs so much, and the cost of labor is just unbelievable."

With Rebuilding Together involved, Becker could now take a more passive role, as volunteers, using material donated by local businesses or purchased with funds provided by API, began to methodically rebuild her home.

Passivity, however, is another term that is not part of Becker's vocabulary. In fact, interviewing her proved difficult because she kept going from one task to another, making certain that her children were not getting in the volunteers' way, consulting with the project leader, and granting interviews to local TV stations.

And then there was that urge to constantly show her appreciation to the volunteers. Because of them, and because of the funds donated by API and local merchants, she and her children will be able to remain in their home – their warm, comfortable home – as they struggle to adjust to life as a single-parent household.

"I just want to hug everybody," she says.

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Will Congress turn back the clock on energy?

Congress recently heard the voices of a strong majority of Americans and lifted the federal ban on offshore drilling that has kept a good deal of our country's oil and natural gas resources off-limits.

At a time when tight supplies and volatile energy costs are hitting Americans hard, that's great news for the future. Developing domestic energy resources will also help boost our economy by creating jobs, attracting investment to our country and pumping billions of dollars into federal and state budgets.

But some in Congress want to turn the clock back and restore the ban after the election. Americans can't let that happen.

The next Congress and new president need to listen to the American people. It's time to work together and develop the full range of America's energy resources for the benefit and security of Americans.

Tell Congress: move forward on increasing domestic energy supplies.

EnergyTomorrow.org

THE *people* OF AMERICA'S OIL AND NATURAL GAS INDUSTRY

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HURRICANES | By Cathy Landry

AFTER THE STORMS

Assessing the aftermath of Hurricanes Gustav and Ike and the lessons learned from Hurricanes Katrina and Rita.

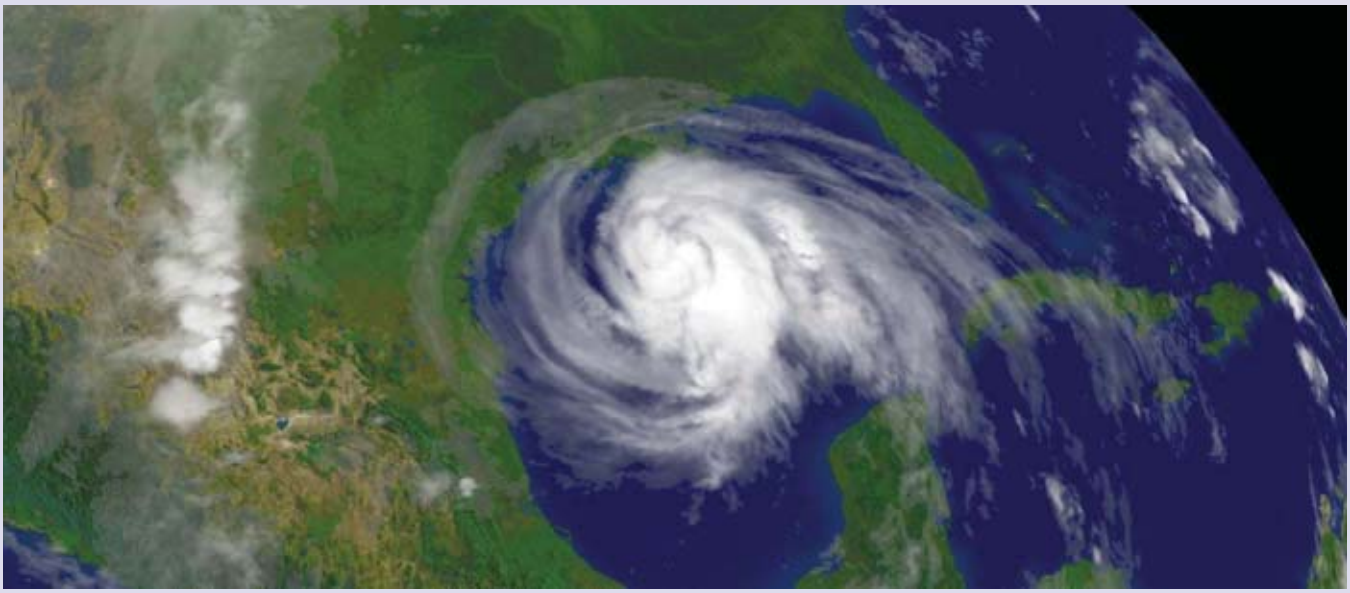

Photo courtesy of NOAA

Packing a Punch. Hurricane Ike gathers strength over the Gulf before making landfall in Texas.

The U.S. oil and natural gas industry was dealt a walloping blow in September, sustaining a one-two punch inflicted to the midsection of the nation's energy infrastructure by hurricanes Gustav and Ike. Just like the hugely powerful back-to-back hurricanes of 2005 – Katrina and Rita – the 2008 storms plowed into the Gulf Coast region, leaving destruction in their wakes.

All of the storms left families displaced and property destroyed, damaged or flooded. But for the oil and natural gas industry, thanks in large part to years of preparations, improvements and the learning of lessons taught during the previous storms, the most recent hurricanes were far less destructive.

Comparing the effects of Gustav and Ike versus Katrina and Rita is a difficult proposition since each storm had its own unique set of features, including different storm paths and intensities. Katrina left in its wake death and destruction after the levees broke in New Orleans, while Ike was known for its enormous storm surge, which all but leveled the city of Galveston. Gustav brought pouring rain and whipping winds to a broad swath of the Gulf region, while Rita, which registered as a category-five hurricane while it was out in the Gulf of Mexico, flooded refineries and low-lying areas of the Louisiana/Texas coast.

So, while the hurricanes were unique in character, and it still will be some time before a final assessment is concluded on the industry's handling of Gustav and Ike, reports indicate that many of the changes the industry put in place during the past three years worked. Improvements were seen across the spectrum – from the stability of drilling rigs and platforms, improved power restoration at refineries, better fuel distribution in the evacuation regions and better communication with federal, state and local emergency officials.

"The key to success in recovery efforts is established in the dialog before the event even occurs," says Robin Rorick, API's director of Marine and Security. "That's why the industry and the government worked so hard in the post-Katrina and Rita years." »

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Photo courtesy of the U.S. Coast Guard

A Quick Response. Coast Guard HH-65C rescue helicopters conducted overflight search and rescue operations following the landfall of Hurricane Gustav in Louisiana.

Greater cooperation and communication between government and industry led to the improvements seen in the oil and natural gas industry's emergency-response efforts this hurricane season, Rorick says. "During Katrina and Rita, the government understood oil and natural gas were important, but not how and why. We worked with them over the past three years to explain the how and the why."

The key issue to understand, is the interdependency of the nation's critical industries, and specifically the importance of the energy industry to relief efforts and the national economy. "Just think about it: If you don't have fuel for generators, the ice in storage meant to help those left homeless or evacuated from the storm melts," Rorick explains. "If you don't have fuel, you can't move the relief trucks to where they need to be. If you don't have electricity, you can't pump gas or run a refinery, which means you don't have the fuel to allow evacuated citizens to return home."

Communications between the government and the industry broke down during Katrina and Rita, which led to difficulties in getting workers back to their jobs and returning operations to normal. During Katrina and Rita, some workers and contractors were unable to access their work sites because they were not allowed entry by state or local officials. Following the 2005 hurricanes, the industry explained this problem to public officials and showed them why access was so vital to rapid recovery of petroleum facilities. Public officials responded and implemented better communication and new credentialing procedures that virtually eliminated the problem during the 2008 storms, Rorick says.

Another example of how industry-government cooperation worked better was during flyovers, which allow the industry to make crucial initial assessments of damage to facilities and to the areas nearby. During Katrina and Rita, it took days – even weeks – to conduct flyovers of key oil and natural gas infrastructure, including refineries, platforms, processing plants and pipelines. Each company needed to hire its own services, creating an enormous backlog on a limited resource.

"Close communications between the U.S. Minerals Management Service, the U.S. Coast Guard and the offshore industry provided a far better preliminary assessment of the damage," says Tim Sampson, API's hurricane team leader and manager of exploration and production.

"During the 2005 hurricanes, the industry had difficulty getting over-flight imagery of their facilities in a timely fashion," Rorick says. "In the lessons learned process subsequent to Katrina and Rita the issue was identified and discussed in detail. By the time the 2008 hurricanes occurred, a process and system were set into place where companies could actually request flyovers of their facilities and get pictures to conduct their preliminary assessments."

On the retail side, the industry worked primarily with state and local officials. For example, Texas worked with the industry to ensure that fuel would be available to facilitate the evacuation and recovery effort. Three years ago, southeast Texas ran out of gasoline as Rita approached and residents in coastal communities and in Houston rushed to leave the area. Determined not to let that happen again, Texas state emergency officials worked with oil companies, fuel distributors, terminal operators, truckers and gasoline stations to coordinate detailed plans to ensure fuel supplies were adequate for evacuation.

Electronic signs were posted along freeways urging motorists to fill up their tanks early. Some companies and independent retailers filled storage tanks along evacuation routes to at least 65 percent to handle increased demand. Texas and the companies also stationed tanker trucks and generators along the re-entry routes to restock the pumps once the storm passed. In addition, they prewired a number of gasoline stations to handle generators so the pumps could still dispense fuel even if the hurricane caused widespread power outages – which it did.

"Certainly, the communications between government and industry were streamlined and worked better, but the problems were not entirely solved. It's better, but there's still work to be done," says Rorick. "Just as the industry and the government did after the 2005 hurricanes, we'll have to identify and analyze those areas that need improvement subsequent

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to the 2008 hurricane system. The most efficient response is one that continues to evolve and improve."

On the exploration and production side, API issued a series of new standards in 2006 and 2007, drawing on lessons learned from the 2005 hurricanes. The standards, which sprung from newly revised wind, wave and water current measurement data, included: higher deck heights to account for hurricane wave crests; site assessment for improving the installation of jack-up rigs on stable areas of the seafloor; the use of transponders to provide operators with exact locations and identify movement of an unmanned mobile rig; guidance on tie-downs of offshore facilities to better secure platform equipment; and improved anchoring systems to reduce damage to other facilities, such as pipelines, if a rig breaks loose.

Platform destruction during Gustav and Ike, at least based on early estimates from the U.S. Minerals Management Service, was less than half that of the damage sustained during Katrina and Rita, when 115 platforms were destroyed.

Preliminary assessments of the damage indicate offshore facilities performed well considering the magnitude of the two storms," Sampson says. "More importantly, personnel were evacuated without injuries and, according to USCG, there were no significant spills from our facilities."

No "significant spills" related to Hurricane Ike have been reported by federal agencies. The National Oceanic and Atmospheric Administration's emergency response division deems a spill "significant" only if it poses a threat to the environment or the economy.

Federal authorities still are investigating 154 Ike-related oil spills. Thus far, none of these spills has been determined to be "significant."

In general, the greatest volume of spilled oil results from "land-based spills," caused by such things as runoff, while the second greatest amount comes from recreational marine vessels, according to the National Academies of Science.

On the refining side, recovery efforts were hampered by loss of electrical power just as in Katrina and Rita. But this year refiners received greater prioritization from utilities, which enabled damage assessments to be initiated more quickly, says Cindy Schild, API refining issues manager.

While there was less damage to refineries after Ike and Gustav than in 2005's Hurricane Rita, the 2008 storms hit the heart of the industry's refining sector. According to Schild, lessons learned during Katrina and Rita showed their value – from having redundant forms of communication in place to better pre-positioning supplies and generators. Refiners also applied the lessons they learned to foster safe and secure shutdowns and restarts, she says. And, after the storm, "the ability for employees to more easily get back to the refineries in order to conduct the assessments and begin making repairs was a major help in getting operations restarted."

For many months, the oil and natural gas industry will be dealing with lingering effects from the storm – including restocking inventories and fixing platforms and rigs. And it also will evaluate its performance during the latest hurricanes to ensure that emergency preparedness and response improves again before another major hurricane blasts into the Gulf of Mexico. "It's a process. No response is perfect, and every response, no matter how good, can be improved," Rorick says. "We always can learn new lessons and make more improvements."

No "significant spills" related to Hurricane Ike have been reported by federal agencies. The National Oceanic and Atmospheric Administration's emergency response division deems a spill "significant" only if it poses a threat to the environment or the economy.

The Aftermath. A crewman aboard a U.S. Coast Guard vessel assesses the damage incurred in the Gulf Intracoastal Waterways after the arrival of Hurricane Ike.

Photo courtesy of the U.S. Coast Guard

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STATISTICS REPORT | By Robert Dodge

Hurricane Hurdles

The effects Gustav and Ike had on the oil and natural gas industry show up in recent statistics.

U.S. petroleum deliveries, a measure of demand, are continuing to decline for 2008. Deliveries fell substantially during September, adding to the ongoing 2008 pattern, as Hurricanes Gustav and Ike cut domestic oil and gas production and interrupted Gulf Coast refinery activity.

"Hurricanes Gustav and Ike hurled some significant challenges at the industry," says Ron Planting, API Statistics Manager.

Planting notes that the combined effects of the two hurricanes resulted in shutting in about 32 million barrels of crude oil and 164 billion cubic feet of natural gas. And about 4 million barrels per day of U.S. refinery capacity were affected.

As October got underway, the upstream and downstream segments showed a strong recovery from the hurricanes. Even so, this year's trend so far reveals lower demand for most products than was recorded in 2007, reflecting lower consumption by consumers and businesses. Analysts attribute lower demand to higher prices earlier in the year, as well as declines in economic activity as the meltdown in financial markets took their toll.

"It is a pretty simple equation. When businesses and individuals are working less, they use less energy," says Planting, adding that the hurricanes socked a substantial punch to product output during September. "The effects of Gustav and Ike on the refining sector were extraordinary."

Hurricane disruptions also hindered the delivery of foreign crude to Gulf Coast ports. Oil imports in September fell nearly 13 percent from a year ago to less than nine million barrels a day. Product imports also fell in September, dropping 12 percent from a year ago to 12 million barrels a day. Results affected by the hurricanes included:

- Gasoline deliveries for September were down 3.8 percent from a year ago, adding to an overall decline for the third quarter of 4.0 percent. Third-quarter deliveries averaged 9.12 million barrels a day, the lowest August-to-September level in six years.
- Deliveries of distillate fuel oil for the month fell 11.8 percent to 3.7 million barrels a day, the largest year-over-year decline since February 2002. The drop reflected a big decline in low-sulfur diesel deliveries.
- September's deliveries of kerosene jet fuel were essentially flat when compared to September 2007. But they fell from August, when jet fuel deliveries were at their second-highest level in 24 months, and fell 159,000 barrels a day to just over 1.53 million barrels of daily deliveries. Substantial effects on refining, with total deliveries of crude oil to distillation units falling to their lowest levels since February 1992, down 14.2 percent from August and down 15.9 percent from September 2007.

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REFINING | By Karen Matusic

DEFINING REFINING

U.S. refiners are investing billions of dollars to continue providing Americans with the energy they need while facing demands to produce higher-quality fuels.

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Today's refinery is not your grandfather's refinery. U.S. refiners are investing billions of dollars to continue providing Americans with the energy they need while facing demands to produce higher-quality fuels using crude oil that is more difficult to refine into gasoline and diesel because it is heavy, often acidic and high in sulfur.

Even though a new U.S. refinery has not been built from the ground up in more than 30 years, existing refineries are continually being upgraded and reworked to improve efficiency and flexibility. Existing U.S. refining capacity continues to grow, having expanded from 15.7 million barrels per day in 1998 to 17.6 million barrels a day today. This expansion is the equivalent of nearly 10 new 200,000 barrels-a-day capacity refineries or one each year.

According to the federal Energy Information Administration, domestic refiners currently plan to add between 800,000 and one million barrels per day in refining capacity of gasoline, diesel and other fuels by 2010. That is the equivalent of adding five new medium-sized refineries through the expansion of existing refineries.

Economic conditions have prompted some companies to delay projects. Even so, long-term global diesel fuel demand growth is forecast to continue, giving some companies incentive to stick with their plans.

U.S. refiners have been pushed to retool their plants and maximize production of diesel fuel, analysts say, due to rising demand for diesel and the prospect of future lower gasoline use. Federally-mandated higher vehicle corporate average fuel economy (CAFÉ) standards enacted in 2007 place higher demand for fuel-efficiency in vehicles and a federal requirement to increase the amount of ethanol in the gasoline pool has also been a factor.

The year-to-date strong demand for diesel versus weakening demand for gasoline is a key factor in diesel prices, which have been higher than gasoline prices in the United States. U.S. diesel demand has been primarily in the industrial and commercial sector, rather than for consumers. This, however, is likely to change, as acceptance of Ultra Low Sulfur Diesel (ULSD) fuel grows and as more diesel passenger vehicles are introduced. U.S. demand for highway diesel now accounts for more than one-fifth of all U.S. highway fuel demand.

Senior staff consultant Joseph Jacobs of KBC Advanced Technologies, Inc., says oil companies have leaned toward adding diesel production when they have announced new refinery projects. Announced projects are focusing on expanding hydrocracking and coking capacity, which allows refiners to produce high-value products like gasoline and diesel from heavier crude oil. "This bias is in response to the expected softening in gasoline demand in the foreseeable future due to increasing ethanol mandates and fuel efficiency standards," Jacobs says. "Diesel margins have been strong since 2006 and show no signs of retreating. Diesel demand is expected to continue the growth in demand above fossil fuel based gasoline."

> Many oil companies have announced refinery expansion and adjustment plans to increase the amount of diesel fuel produced.

Based on publically-announced refinery expansion plans as of March 2008, the U.S. will add about 550,000 barrels per day of incremental coking capacity and more than 200,000 barrels a day of hydrocracking capacity, Jacobs says. He cautions that several of these projects "could be delayed or canceled due to recent economic events which have affected the availability of capital and have eroded short-term demand." Diesel-fueled vehicles have made up less than five percent of the U.S. light-duty vehicle market. As a result, U.S. refineries have been configured to produce more gasoline than diesel. But, with diesel demand increasing, U.S. refineries are making huge investments to increase diesel production. Many oil companies have announced refinery expansion and adjustment plans to increase the amount of diesel fuel produced.

"Over the past five years, U.S. diesel demand has been roughly triple the growth rate of gasoline – three percent per year, compared with gasoline's one percent annually," notes API refining issues manager Cindy Schild. While there has been a reduction in demand for gasoline so far this year, this has not been the case with diesel."

Schild also points out that increased use of diesel as a transportation fuel in Europe, where more than half of the cars run on diesel, has resulted in less European diesel available for import into the U.S. At the same time, record-high pump prices earlier this year led to the first ever decline in gasoline-fueled vehicle miles traveled in the U.S. and the first year-on-year decline in U.S. gasoline demand in 15 years.

A refinery's ability to process heavier, higher-sulfur crudes is governed by its complexity.

The simplest refining technique is distillation – crude oil is heated and various products are stripped off as they reach their boiling points. More expensive and complex units, like cokers and hydrotreaters, can squeeze out a greater volume of cleaner and higher valued products. U.S. refiners »

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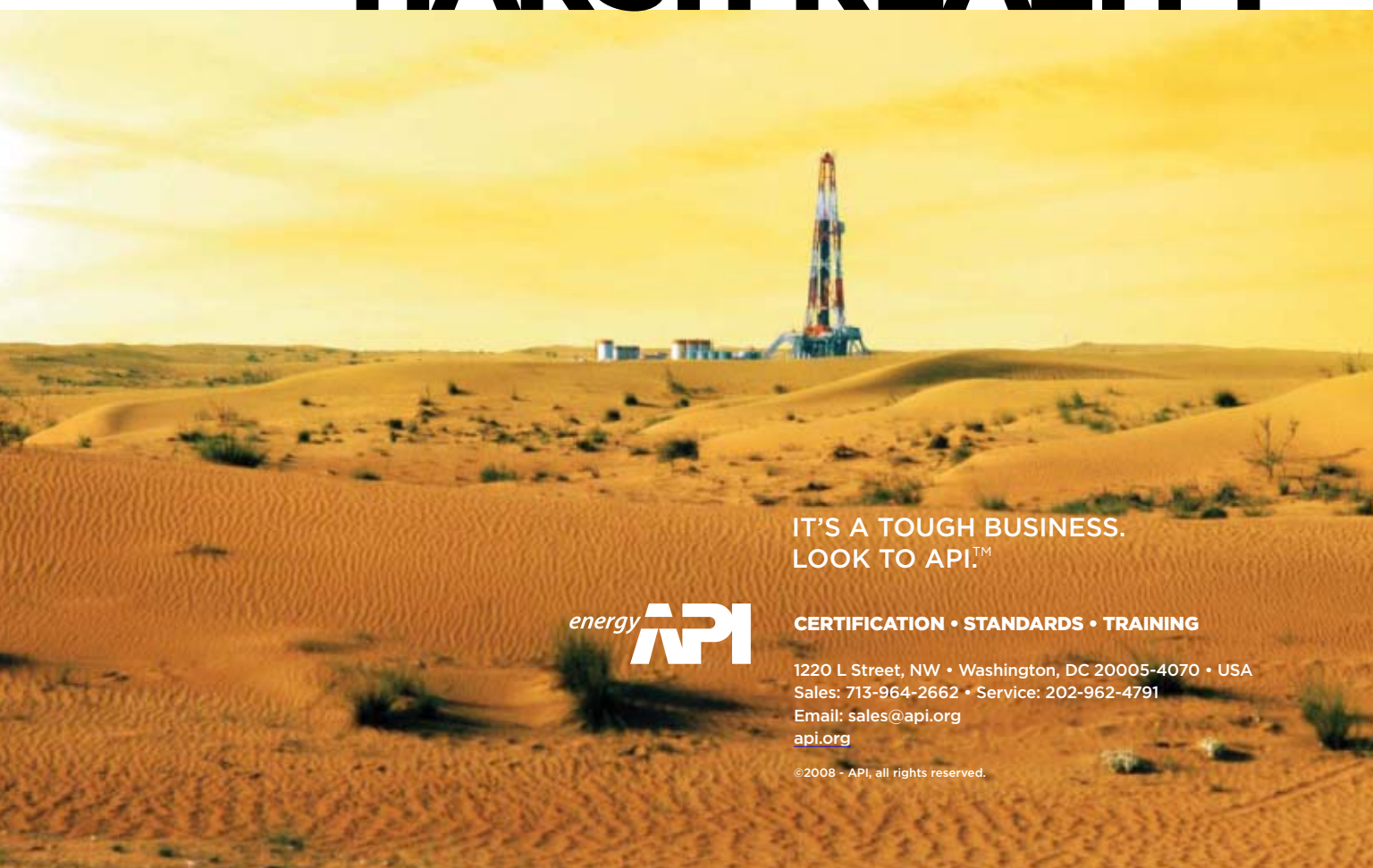
HARSH REALITY



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have invested heavily in such units to comply with federal clean-air legislation, leaving them better placed than their counterparts around the world to run heavier, higher-sulfur crude. Heavier, or higher density, grades of crude oil account for about 25 percent of daily global supply, but some analysts predict that figure could rise to more than 50 percent by 2030.

"The nature of the crude slate being processed by U.S. refineries continues to become heavier and heavier. Technological advances enable us to obtain and process heavier crude slates which was not feasible years ago. U.S. refineries are some of the most complex in the world and have the capability to process heavy crudes," API's Schild says.

This technology also enables U.S. refiners to maximize their use of nearby Canadian oil reserves. U.S. refiners and pipeline operators in the Midwest and beyond are investing huge sums to expand and upgrade refineries to make refined products from oil derived from Canadian oil sands and build new infrastructure to transport more Canadian oil into the United States. According to consulting company Wood Mackenzie, pipeline companies and refiners plan to spend $31 billion from 2008 through 2015 to expand their capacity to refine and distribute Canadian oil sands products in the United States.

Several of the announced projects are joint ventures with Canadian interests to share the risks and rewards of an operation from recovery to retail. KBC's Jacobs says, "the Canadian sources are a strategic feedstock source for the U.S. refining industry. Most crude oil sources are located in areas of the world that historically have seen periods of political instability, presenting a real supply risk to the large capital investments required to expand refining capacity."

Even before the planned expansions are completed, U.S. refiners are producing record amounts of diesel to meet growing demand and capitalize on high diesel margins. Since 2005, diesel prices have been higher than gasoline prices. According to the EIA, U.S. refiners increased their yields of diesel fuel to the highest levels since the agency began keeping records in 1993. EIA analyst Joanne Shore says this summer's performance underlined the industry's determination to crank out more diesel.

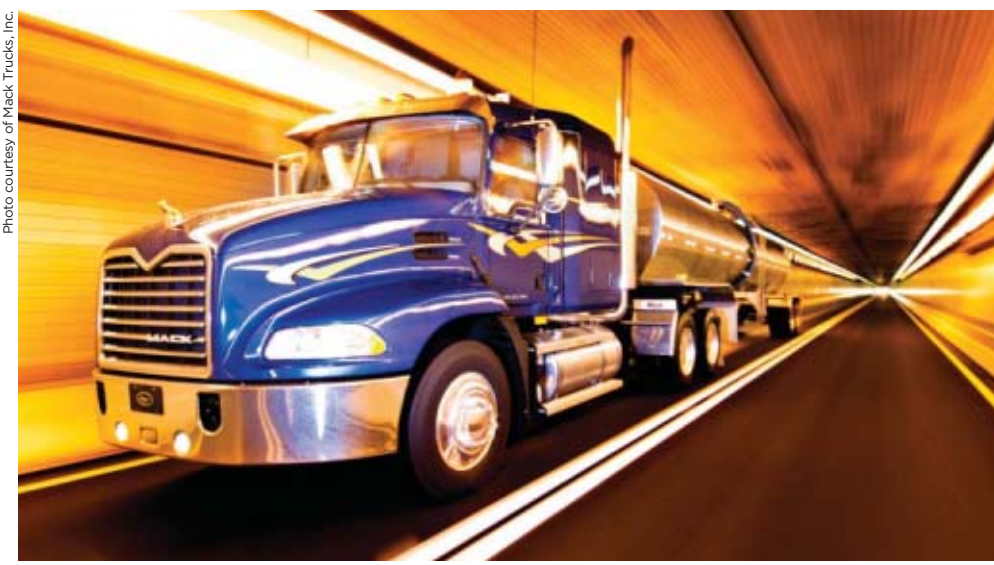
"High distillate margins in the summer of 2008 provided refiners with incentives to increase distillate production. Gasoline margins were sometimes negative, but distillate margins were very high. Once it became evident that this high-margin distillate picture was going to last some time, refiners began focusing on shifting to higher distillate yields at the expense of gasoline, which was in surplus supply," Shore says.

"With the planned hydrocracking capacity, the U.S. refiners might not need to do much more to satisfy U.S. distillate needs and even increase exports of distillate."

Shore says the longer-term fundamental picture seems to justify refiners taking steps to increase distillate production versus gasoline but the level of investment that will achieve a favorable return is less clear. She says the EIA sees a significant shift in demand for petroleum-based gasoline versus distillate over the next 15 years because of recent U.S. legislation.

"While still not the shift that Europe has seen, U.S. refiners will be facing a significant change in product mix from the refinery that will impact investments," Shore says. She noted that the EIA is predicting that overall oil demand is not expected to grow much over the next 30 years – perhaps less than one-half percent per year on an annual average while distillate demand may still grow fairly strongly as gasoline demand declines.

Photo courtesy of Mack Trucks, Inc.



Keep on Truckin'. U.S. demand for highway diesel now accounts for more than one-fifth of all U.S. highway fuel demand.

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A DAY IN THE LIFE | By Robert Dodge

THE MARATH

Meet Richard Bedell, a 30-year oil and natural gas industry veteran running one of the largest refinery expansions in the country.

Richard Bedell, just in from a refinery tour, quickly removes his hard hat, goggles and blue Marathon jumpsuit so he can read from the white piece of paper he clutches in one hand. It's the latest forecast on Hurricane Gustav. As he reads, Bedell frowns a bit, realizing the pleasant day outside with its blue sky and puffy white clouds will soon be swept away.

"Well, there goes the Labor Day weekend," he says with a chuckle.

Bedell, age 53, has been here before. Hurricanes have become a way of life for the manager of Marathon's Garyville Refinery. In the last three years he has led his 700 employees through Hurricanes Katrina and Gustav and watched nervously as Rita and Ike veered into nearby Texas.

Weathering hurricanes is challenging, but it is just one part of Bedell's job. As Garyville's manager, he also oversees the refinery's daily processing of 256,000 barrels of crude »

Photo by Robert Dodge

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ION RUNNER

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A Vast Expansion. A large refining tower shipped up the Mississippi River to Garyville will be installed at the expanded refinery.

oil. And, if that were not enough, his refinery is in the midst of a historic $3.0 billion expansion that will make Garyville the fourth-largest refinery in the nation.

Bedell started his career in the oil and natural gas industry at Garyville in 1979, less than three years after the facility opened. He has worked there four times during a 30-year career that also has included managing roles at three other Marathon refineries. All these experiences added up to make him the logical man to lead Marathon's largest-ever refinery project.

"This is a fantastic time to be working at the Garyville refinery," Bedell says. "This major expansion is a project of historic size for Marathon and I have the privilege of working in the middle of it all. Requiring an unprecedented level of coordination, organization and teamwork, it has been a once in a lifetime opportunity."

But right now, Hurricane Gustav is knocking on the door. It's the Wednesday before the Labor Day weekend and thoughts about outdoor barbeques and fishing are replaced with more urgent hurricane preparations. The forecasts continue to worsen, and by Saturday afternoon, Gustav is expected to bring sustained winds of more than 60 miles per hour and gusts of more than 100 – with conditions expected to last about 10 hours.

"At noon Saturday, we began shutting down all the units and by noon on Sunday we were down cold," Bedell says. A final check of the refinery was made early Monday morning and all of Marathon's on-site employees were sheltered by 7 a.m. to ride out the storm. "We do not have to worry about a storm surge here, but we do have to worry about the wind and whether you can have people working safely outside."

When the winds subsided, the only damage was to some insulation and some cooling tower damage.

But it would still take until the next Sunday to complete the restart of the refinery because of widespread power outages. It also took about five days to account for all of Garyville's employees, who also were trying to cope with no electric power and limited fuel supplies needed to get to work.

Putting Employees First

Just as it did after Katrina, Bedell says Marathon came to the aid of its employees, providing fuel for commuting and home generators, as well as hot meals at the refinery. "We served 6,000 hot meals, cooked and prepared on site," Bedell says. "We made sure that we had a hot meal for everyone who worked days or nights."

Bedell says Katrina reinforced the value of supporting employees so they can do their jobs. "We have a very

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detailed hurricane plan and it is phased in as the storm approaches," Bedell says. By June of each year, the refinery is stocked with food and water supplies, and on-site crews have been designated to ride out the storms.

Even so, there was no way to be fully prepared for Katrina. When the skies cleared, 40 employees had lost their homes. Marathon quickly rented 30 apartments that were barely finished, found some rental homes and furniture. "We could not recover the plant until we first took care of our employees," Bedell says. "It was a good thing that the company did. It was one of those things we had to do on the fly, but we knew it was the right thing to do."

The Facts of Expansion

With hurricane season over, Bedell has spent the last quarter of the year focused on the refinery expansion.The refinery is located on a 3,500 acre site that was once the San Francisco Plantation founded in 1856. Not far from the refinery, the plantation home sits among a stand of live oak trees and retains much of its original splendor, having been restored by Marathon. The house, which has numerous antiques, and its adjacent grounds are a National Historic Landmark and host to daily tours, weddings, concerts, festivals, auto shows and gumbo cook-offs.

The plantation grounds may be next door but seem a world away from the refinery.

In fact, the expansion is so large that the existing refinery is almost visually lost to some visitors. The scale of construction appears as if a new city is underway with its steel superstructure, high cranes, traffic jams of trucks and mobile equipment, as well as thousands of workers.

The stats help illustrate the story: Ten miles of new paved roads, two miles of structural steel pipe racks, 17,700 piles, 92,000 cubic yards of concrete, 21,000 tons of structural steel, 300 miles of pipe and 1,000 miles of wire and cable, just to name some of the materials needed to complete the expansion.

When the expansion is fully online, it will employ 200 new workers and up to 80 new full-time contract employees. The added capacity will allow the plant to process an additional 180,000 barrels of crude oil and increase the refinery's capacity to produce low-sulfur diesel.

Indeed, Bedell can spew those facts and figures like gunfire. He appears as conversant as a construction manager. And he has to be. When the expanded facility comes online, which is scheduled for December 2009, the old and new facilities will be fully integrated, which required Bedell and his colleagues to be involved since before groundbreaking.

"It's my responsibility to make sure we have the people, the systems and we are ready to run this thing as a seamless operation," Bedell says. "We have one organization that has run the existing refinery and another organization that is building the new refinery. By next year, it will be one organization that fits together."

As construction activities reach their peak, Bedell says there are more than 5,000 temporary workers on site. And that figure reveals only part of the manpower needs. "As the construction moves through different phases we are bringing in different craftsmen. By the time the project is finished we will bring over 10,000 different people through the site," Bedell says. "We are always doing different crafts at different times. We have to make sure that they are working safely and to our standards. It is an enormous effort because we are moving new people in all the time."

The expansion is so large that the existing refinery is almost visually lost to some visitors. The scale of construction appears as if a new city is underway with its steel superstructure, high cranes, traffic jams of trucks and mobile equipment, as well as thousands of workers.

The Great Shift Change

The refinery is being built and will come online at a time when many Baby Boom generation workers are retiring. Known in the industry as the "great shift change," the exodus threatens to drain facilities like Garyville of their best and most-experienced workers – an unwelcome trend anytime but worse during a major expansion.

Bedell says he has hired 160 new workers during the last year, most of whom were under age 30.

"Over the next few years we have a huge group of people retiring," says Bedell, noting that many workers have 30 years of experience. He says the refinery got an early start on hiring new workers, allowing enough time for them to be trained at the existing facility and to be ready when the expansion comes online.

"The refinery has been tasked with building the workforce that will run the expansion and integrate it into our existing refinery," he says.

Safety is Key

Throughout the process, safety is key. Bedell is proud of Garyville's safety record and status as an OSHA VPP Star refinery – the highest honor given to recognize the most effective industrial safety and health programs by »

Photo courtesy of Marathon Oil Corporation

Outward and Upward. The new refinery will merge with the existing facility and is scheduled to come online in December of 2009.

the Occupational Safety and Health Administration.

And, he says, maintaining high safety standards is key to having a successful operation. "The drive for continuous improvement and excellence in our safety performance carries through our work culture into everything we do. That attitude, or culture, also drives us to excellence in environmental performance and operational performance. I don't think you will find a refinery that does one of these things well but not the others. It all fits together."

Back to His Roots

It would seem that Bedell, who returned to Garyville in 2001, has been preparing to lead the refinery through the expansion throughout his career. Even so, he did not start in the oil and natural gas industry.

After graduating from Lehigh University in 1977 with a degree in chemical engineering, Bedell went to work in product development for a Philadelphia chemical company. He soon discovered he would rather have a hands-on job as a process engineer and also wanted to get back to the Gulf Coast where he grew up.

That's when Bedell's father, who worked for ExxonMobil for 41 years, offered to help. "He said, 'Give me some of your resumes and I will give them to some of the people that I know,'" Bedell recalls. The resume made its way to Marathon and Bedell was hired to work at Garyville just as the company was bringing online its first expansion of the three-year-old facility.

From there, Bedell spent the next 15 years moving up the ranks at Marathon's refineries in Texas City, Robinson, Illinois, and Detroit. He also spent a short time as a crude oil trader, and in 1984, earned a master's degree in petroleum engineering.

He moved often, working at some of the refineries more than once, including Garyville where he is on his fourth tour.

"It was kind of nuts," he says, remembering he once moved three times in one year. "You get all your boxes unpacked and it's time to pack again. And (state) income taxes are always fun when you do that. But the opportunities came up, and each time they were good opportunities."

Now, after two hurricanes and the ongoing expansion, Bedell says it is hard to remember when he last had a typical day. But his usual routine is to arrive at work at 6:30 a.m. Mornings are filled with meetings, including daily sessions to monitor the refinery's operations and less frequent sessions that focus on specific projects and budgets.

About twice a week, he schedules lunches with groups of 15 to 20 employees to better know the plant's workers and get their views. And then there are his weekly walks – strolls around the refinery to "get a much better feel of what is going on."

On one recent walk, he discovered the plant had an unwanted visitor. "One of the guys saw me walking and asked if I wanted a ride, and then he asked me if I was out looking for the

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alligator. Until then, I did not know we were trying to catch a seven-foot alligator in a ditch up on the north forty."

On a good day, Bedell leaves his office at 4:30 p.m., which allows him just enough time to beat the 5:00 p.m. quitting time at the construction site and the resulting traffic jam. But other days, he will have evening meetings with local and state community organizations that keep him working late. Once home, he has a recently acquired Blackberry to keep in touch with the refinery and admits he is fighting not to become a "Crackberry addict."

"I resisted getting one of those for the longest time. I finally got one this year and said I would not become one of those addicts," he says. "But I do find myself looking at it during television commercials."

Bedell agrees that Garyville seems like the right place to be. He is happy to be living in the Gulf Coast region, although he does not find enough time to go fishing or sit outside with his wife and enjoy a glass of wine in the evening. But there is satisfaction in having started his career at Garyville and now being on hand 30 years later to preside over the refinery's expansion.

"I've known some of the people here from when we were young and played basketball and bowled together back in the '70s," he says. "I have a great job, and we are doing something that has never been done in our company – to the extent that this is the largest project we have ever had. And you figure it's been 30 years since anyone built a refinery and we are doing it."

"So after 30 years I am back, and we are doing it bigger than we have ever done it."

About Richard Bedell

Born: 1954 in Greenwich, Connecticut

College: 1977, Lehigh University, Bachelor of Science in Chemical Engineering; 1984, University of Houston, Master of Science, Petroleum Engineering

Position: Manager, Louisiana Refining Division, Marathon Petroleum Company LLC

Career: 1979-1980 Refinery Engineer, Garyville, Louisiana; 1980-1982 Crude Oil Trader, Houston, Texas; 1982-1987 Operations Supervisor, Texas City, Texas; 1988 Products Manager, Garyville, Louisiana; 1988-1990 Operations Manager, Detroit, Michigan; 1990-1994 Operations Manager, Garyville, Louisiana; 1994-1995 Technical Services Manager, Garyville, Louisiana; 1995-2000 Refinery Manager, Texas City, Texas; 2001 Refinery Manager, Robinson, Illinois; 2001-2008 Refinery Manager Garyville, Louisiana

Pastimes: Fishing and golf

On his job: "This is a fantastic time to be working at the Garyville refinery. This major expansion is a project of historic size for Marathon, and I have the privilege of working in the middle of it all. Requiring an unprecedented level of coordination, organization and teamwork, it has been a once in a lifetime opportunity."

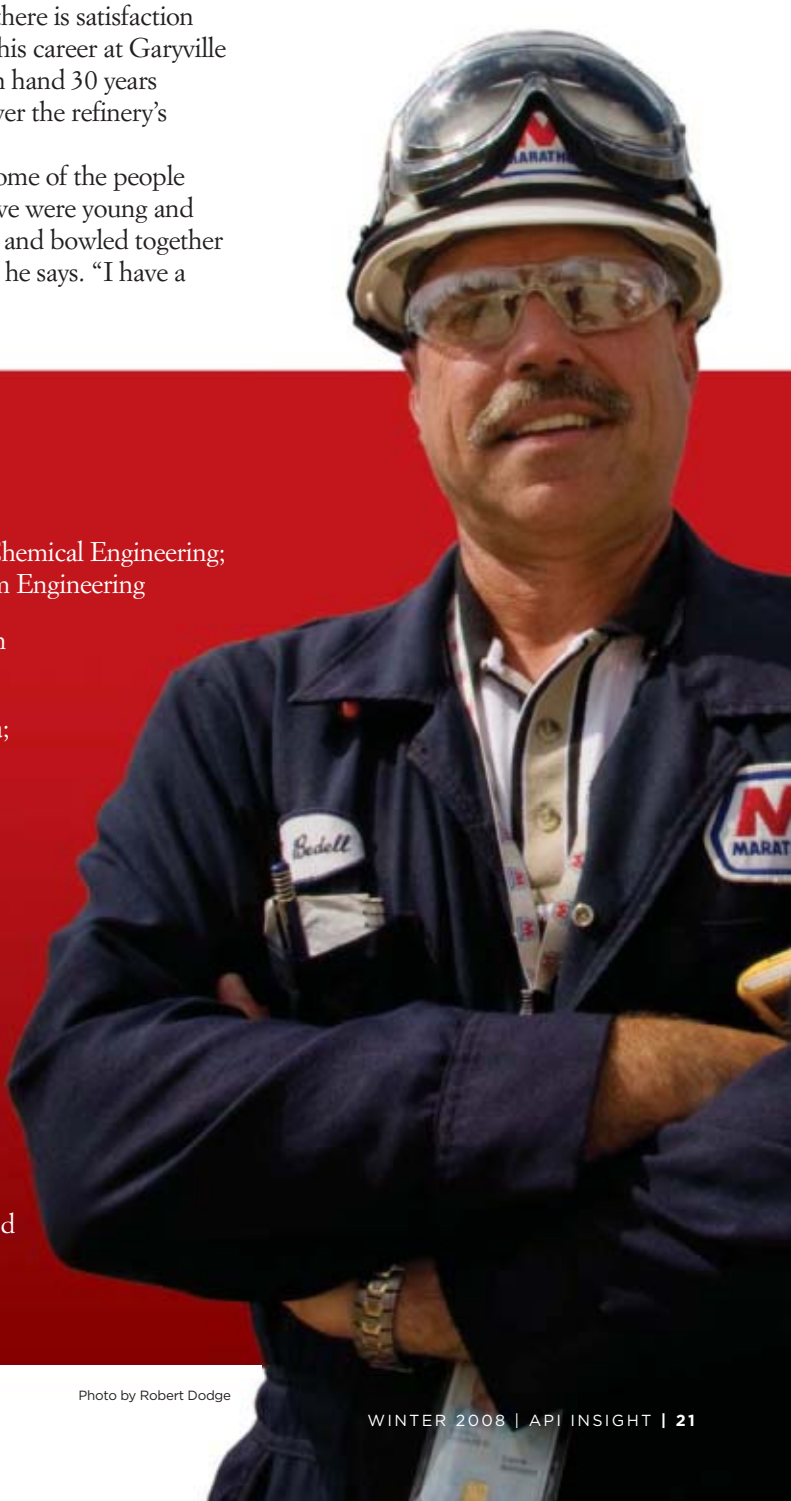

Photo by Robert Dodge

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KEY ENERGY SERVICES' TECHNOLOGIES CAN EXTEND A FIELD'S PRODUCTIVE LIFE

Whether or not commodity prices are at record high levels, operators are always sensitive to not only the price of oil but the cost of the various well services necessary to extend a field's life.

Bumping up against the above scenario is the so-called knowledge leak, the challenge of experienced oil industry employees retiring faster than new employees can be hired and trained. This scenario is affecting all sizes of oil and natural gas companies as well as service companies. As a result, they must compensate with new and innovative technologies and solutions that reduce manpower requirements and to deploy industry best practices using fewer and less-experienced but well trained personnel.

Key Energy Services, the world's largest rig-based well services provider, continually and successfully strives to better serve its customers' well servicing needs by providing the services that extend the life and value of existing assets and reducing the frequency of wellsite interventions. The company's ongoing commitment to its customers is demonstrated by its development of an expanded suite of comprehensive services that integrate the newest technologies with the highest safety and training standards.

Key's management understands that its customers ultimately determine its success, regardless of market conditions. As a result, the company evolves from the top down to better serve its customers' needs. Recently the company has undergone a re-organization initiative to ensure that it has the most qualified people in every position, from the Chief Executive to its field personnel. The result is that the people making decisions within Key, as well as those carrying out those decisions, have the knowledge and skills to perform at optimum levels. This, in turn, results in a higher level of customer service.

During this reorganization phase, Key Energy Services created several marketplaces for which its business development leaders are charged with identifying ways to enhance the company's contributions to its customers' projects. The company's operations, technical and sales teams work together, examining project plans and fiscal opportunities to eliminate unnecessary steps, trim field work teams where possible and increase efficiency while reducing customer costs.

A GROWING AND EVOLVING COMPANY

Growing both organically and through a series of strategic acquisitions, the company provides workover services, electric wireline, pressure pumping, fishing and rental services, fluid logistics services and drilling from 150 locations in the United States, Mexico and Argentina. Additionally, Key offers services in Canada and Russia through its part ownership in well-established service companies in those countries.

Key Energy Services grew out of The Yankee Companies, a holding company with interests in environmental services, energy and banking. In 1988, The Yankee Companies' board decided to re-focus the company's strategic plan and concentrate on the energy services business, divesting its non-operating companies as a result. The corporation was rebuilt with its West Texas well servicing division, Yale E. Key, as the foundation for the future.

During the next several years, an aggressive acquisition program led to the creation of Key Energy Services Inc. The company's strategy was to consolidate the fragmented well services business by building a strong company with critical mass and financial stability. While difficult due to the hundreds of small regional companies at that time, in less than 10 years Key grew and evolved from a company with less than 50 working rigs to the world's largest rig-based well services company. Rounding out the plan to become a total service provider was the acquisition of Q Services in 2002, which gave the company a pressure pumping division and strengthened its position in the fishing and rental services market.

Key's growth didn't stop there, however. In 2007 the company acquired Moncla Companies, which operated a fleet of 59 well servicing and workover rigs, including a fleet of inland water workover barges as well as other well servicing equipment. The acquisition allowed the company to expand its broad array of services to the offshore market.

Key also acquired Advanced Measurements Inc. (AMI), which develops technology for oilfield service equipment instrumentation. AMI assisted with the development of the proprietary KeyView® system.

Other 2007 acquisitions included Kings Oil Tools, a California-based company

Key has deployed coiled tubing units like this one in nearly every active U.S. shale play, including the Barnett, Marcellus, Bakken and Haynesville shales.

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This top drive is symbolic of renewed horizontal drilling and re-entry efforts by Key Energy Services to help customers reach untapped pockets of oil and gas.

that owned 46 well service rigs and related support equipment. In 2008, the company acquired a second California-based well service company, Western Drilling, with 22 rigs including several used for horizontal drilling. These acquisitions made Key the largest well services provider in the state with over 160 working rigs.

Another important acquisition was Hydra-Walk Inc, which provides pipe handling solutions. Key also purchased a 50% stake in Geostream, a Russian company that provides drilling and workover services as well as subsurface modeling and engineering.

Key Energy Services expects to continue its growth via additional acquisitions in the U.S. as well as selectively expanding its product line to better serve its customers. Internationally, the company continually seeks new opportunities and new markets to introduce its services.

KEY'S COMMITMENT TO SERVICE

Key Energy Services' business lines provide the industry with a comprehensive suite of products and services designed to serve all facets of oilfield operations. The wide range of products and services offered to the industry means added convenience for Key's customers by reducing the need for third party vendors. Customers can depend on Key as their single source for planned activities as well as emergencies at the wellsite.

In addition to workovers and general well servicing, the company's business lines include electric wireline for reservoir mapping, cased-hole logging, perforation and mechanical wireline. The company significantly expanded this business during 2007 and 2008. Key had been a regional player in the Appalachian Basin for many years. In 2006, the company introduced its wireline services to its Texas-based operations. Key began 2007 with four new wireline units and quickly expanded to 16 units by the end of that year. Another dozen units are expected to be in service by the end of 2008.

Key also provides pressure pumping services, including acidizing, cementing, coiled tubing operations and fracturing. The Patriot is a 1,000 HP, 100 barrel per minute (bpm) blending unit that is fully computerized for proppant control, chemical add control and dry add auger control. It features 24,000 lbs/min proppant delivery. The Super Patriot is a 1,600 HP dual blender, one of the world's largest hydraulic horsepower blenders. It is capable of blending rates up to 200 bpm and sand delivery up to 24,000 lbs/min.

Key's fluid management division serves its customers with more than 150 locations and strategically located dispatch centers. Key's fleet of vehicles can extract fluids from pits, tanks and other storage facilities; transport brine and other drilling fluids to and from well locations; transport produced salt water to disposal wells; and haul equipment to and from the wellsite. The company has one of the industry's largest fleets of frac tanks for storing fluids. Key also owns and leases permitted disposal wells for the disposal of salt water and incidental non-hazardous oil and gas wastes. Each well is strategically located in relation to Key's customers' producing wells.

Key Fishing and Rental Services operates more than 20 fishing locations, including two, 24-hour service locations and four regional sales offices, manned by fishing and rental service supervisors with extensive experience in downhole problems. The company's rental tool inventory includes tubulars, handling tools, pressure control equipment and a fleet of power swivels. Services include workstring rentals, fishing, premium tubing, foam air units, cutting and washover services, whipstocks and casing exits, jars, handling tools, pressure control equipment and thru tubing services.

The company also provides specialty well services including horizontal drilling onshore and marine barge rigs for workover services. Key operates the largest fleet of workover barge rigs in the Gulf Coast region with seven units, including two posted barges capable of working in up to 18 ft of water.

INNOVATIVE KEYVIEW RIG MONITORING AND CONTROL SYSTEM

Key Energy Services developed its KeyView® system, which is comprised of a network of monitors and controls integrated into its well servicing rigs. Safety incidents have been significantly reduced due to improved operational control. Job quality is improved as a result of operators' awareness of wellsite conditions. Overall well servicing efficiency is increased due to minimized downtime, lower periods of inactivity and longer intervals between interventions. The result is an improved bottom line for Key's customers.

KeyView monitors equipment, rig operations and rig activity and provides data in real-time. The data is transmitted from remote locations to Key's central database and is available via a secure website for viewing by Key personnel and the customer.

Nearly 250 rigs have been deployed with the KeyView system and more are being installed on new and existing rigs. KeyView rigs have experienced better safety, higher quality performance and better operating efficiency compared with rigs without KeyVew. For example, KeyView-enabled rigs have experienced up to 56% fewer safety incidents. They have improved job quality up to 63% and increased efficiency by reducing non-productive time by as much as 20%.

"AMI, which developed KeyView along with Key, is beginning field testing on

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KeyView is a patented satellite-enabled rig data capturing system proven to improve job safety, job quality and job efficiency.

the next KeyView generation," said Dick Alario, Chairman, President and CEO of Key Energy Services. "The next iteration will feature more data gathering capability and more controls."

The system utilizes sensors throughout the rig to monitor and control certain operating parameters. These include hookload, engine RPM, block position and velocity, hydraulic pressure and the presence of hydrogen sulfide (H_2S) gas. Data also is based on rig operator activities such as circulating, third party rig up/rig down, pulling out or running pipe into the hole and crew break.

In certain situations, conditions or activities may activate safety related interventions or alarms, enabling rig operators to respond quickly to such events. Additionally, the data is time stamped, allowing later data viewing for reporting, analysis and rig performance evaluation.

Safety is one of the most important features of the system with its crown out/floor out prevention. Combined with the high hookload limiter, the system will intervene within a fraction of a second after sensors detect the limits, preventing costly accidents and errors.

Higher quality performance is achieved by KeyView in several ways. The system's successful joint makeup feature avoids over torquing tubing or rod connections. Use of the hookload limiter avoids overpull on downhole equipment by monitoring gradual increases in pull until the equipment is freed.

In a Permian Basin well, a downhole tool string hung up while pulling out of the well. They operator had the KeyView system hookload limiter set at 10,000 lbs over the actual string weight. When the tool string hung up, the system disengaged the throttle in 1/50th of a second, preventing the tool string from parting and saving a $250,000 fishing job.

In another Permian Basin well, a Key Energy operator observed that progress was not being made on drilling out a cement plug. The work string was pulled and visual inspection revealed that the bit was missing a cone. Under similar circumstances, such failures might be considered the result of incorrect weight on bit during the drilling process. However, examination of the KeyView data during drilling confirmed that the correct weight on bit was used. The bit supplier verified the KeyView data and concluded that the failure was a bit problem rather than due to incorrect drilling processes. The bit supplier provided a replacement bit at no cost to the operating company.

In 2007, Key was awarded a contract from PEMEX for production enhancement services in Mexico utilizing the KeyView system. Key deployed three of its KeyView equipped rigs to Mexico and added the monitoring system to two PEMEX rigs. The result was almost immediate. Improved quality of work by enhancing safety and reducing the typical duration of PEMEX's well service jobs translated into more workovers per rig per year, longer well equipment life, more predictable scheduling, less downtime and more production days.

"We identified PEMEX's critical need, explained to them how Key could fix it and then proved ourselves," Mr. Alario said. "It is every company's dream to find a company like PEMEX, deploy your technology, people and resources and solve a problem."

PEMEX was so pleased with the results of the first contract that Key was awarded a second PEMEX contract in 2008. Key will initially provide four KeyView equipped well service rigs to PEMEX. Five KeyView systems were installed on PEMEX owned well service rigs. The contract gives the Mexican national oil company an option for additional rigs and KeyView systems in the future. It is estimated that Key will operate more than 20 rigs in Mexico by mid-2009.

"We are putting a well back on production for a fraction of the cost of drilling a new well," Mr. Alario said. "Depending upon the job's requirements, we are bringing the wells back on in as little as two days. Others may take a couple of weeks."

HYDRA-WALK AUTOMATED PIPE HANDLING SYSTEM

Key Energy Services acquired Hydra-Walk, Inc. in June 2008 and integrated the automated pipe handling system into its product line as an alternative to manual pipe handling. Hydra-Walk, based in Oklahoma, operates more than 80 patented pipe handling units in Oklahoma, Texas and Wyoming. Key intends to ramp up production and deployment of the pipe handling system to meet its customers' needs for such services. The Hydra-Walk system also can be combined with the KeyView monitoring and control system, moving the company further to its goal of becoming the safest and most efficient provider of rig-based well services.

"We wanted to move into the pipe handling business for several reasons, including better safety, faster operations and efficient handling of tubulars," Mr. Alario explained.

Hydra-Walk automates the pipe handling process by using a mechanical arm to lift pipe from the catwalk and transports them to the rig floor. Minimizing human interaction with the pipe increases safety for wellsite personnel and prevents damage to pipe. Jobs are completed more efficiently and cost effectively.

Enhanced job quality is achieved by automating the pipe handling process. This minimizes the human element that sometimes leads to improperly stacked

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pipe, which in turn can damage the pipe body, the collar of the threads. The system preserves the integrity of the pipe joints by virtually eliminating damage to pipe during their placement, adding longevity to the life of the pipe and reducing replacement costs.

Hydra-Walk is available in two different models to accommodate different floor heights. The standard model is capable of reaching rig floors up to 21 ft high. For jobs requiring maximum reach up to 28 ft, the Hydra-Walk System SS model is especially useful where equipment such as snubbing units are in use.

Hydra-Walk automates the pipe-handling process using a mechanical arm to lift pipe lengths from the catwalk and present them to the rig floor.

Among the safety features of the Hydra-Walk system is its design that allows control of the unit from the side or with a wired or wireless remote. This allows the operator to move and have a clear view of rig personnel and operations. Safety pins/laydown arms ensure a safe transition from pipe racks to the rack unit, preventing overshoot. The system provides an automated consistent function for decreased incidents and downtime.

The Hydra-Walk pipe handling system can pick up or lay down pipe up to 7 ⅝-in. OD and up to 47 ft in length. The system is capable of handling chrome, stainless steel and other premium pipe for expanded applications without the risk of damage when properly operated. The system's versatility means the unit can be installed on well service and drilling rigs.

Efficiency is increased by hydraulic adjusters that ensure a smooth transition of pipe from the pipe racks to the Hydra-Walk system. Portability and size allow for easy handling of the unit by forklift and positioning in small spaces or wellsites. Set up usually takes about 15 minutes.

KEY'S COMMITMENT TO SAFETY

Key's commitment to place the most capable employees in every position requires a selective recruitment process followed by rigorous training. Training and maintenance programs are aligned to ensure that crews and equipment meet the same superior standards, regardless of location. Properly trained crews implement the procedures and best practice that lead to customer satisfaction.

A Corporate Safety Council comprised of senior company management conducts in depth, bi-monthly safety reviews of a selected division's operations. The program has led to the sharing of best practices company wide, and has resulted in a safety record that is industry renown.

"The company's safety record had improved materially in 2004," Mr. Alario said. "We decided to enhance the programs being used to drive our performance higher.

"As a result," he continued, "we reduced the number of safety incidents by half from the 2004 level based upon the 200,000 man hour OSHA calculation that is standard for our industry."

A key component of the company's safety program is DuPont's acclaimed STOP™ process. Additionally, Key has developed practices in conjunction with Liberty Mutual Insurance's Managing Vital Performance® (MVP) process to identify tasks that have been high risk and then to develop task-specific observations to address the associated hazards. Combined with the STOP program, MVP provides a synergistic, behavior-based safety approach.

Key develops and delivers one of the most intensive training curricula in the well services industry. The program is a balanced blend of skills and safety courses taught in house by Key instructors in each of the company's regions.

"We conduct a lot of in house training and we also bring in external expertise as well," Mr. Alario said. "We use behavior-based safety training and we spend a lot of time with our managers in the field."

The classroom training is supplemented by on the job exercises during which students wear bright green hard hats to identify them as novices and to ensure that they are provided with all of the assistance they require.

Another of Key's training innovations is simulation exercises, and is best evidenced at facilities such as the Permian Basin Training School. Students learn to operate equipment on a fully-equipped and deployed service rig.

PERFORMANCE IS KEY

Key's performance is quantified by five established pillars: better people, better safety, better training, better equipment and better technology. The primary value propositions to its customers are to reduce the overall cost of wellsite interventions and extend the life and value of existing assets. Key's commitment to evolving oilfield operations for the benefit of its customers is demonstrated through the company's recent acquisitions and expanded services and technologies.

By establishing a new and heightened benchmark and level of accountability, Key's forward thinking has advanced customer service not only within its own organization but for the industry as a whole.

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Looking for a Few Good Men. And Women.

THE NEW WORKFORCE | By Martha Liebrum

VeteransToEnergy.org, API's new job search website, is dedicated to helping U.S. military veterans find careers in the oil and natural gas industry.

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Photo courtesy of U.S. Navy

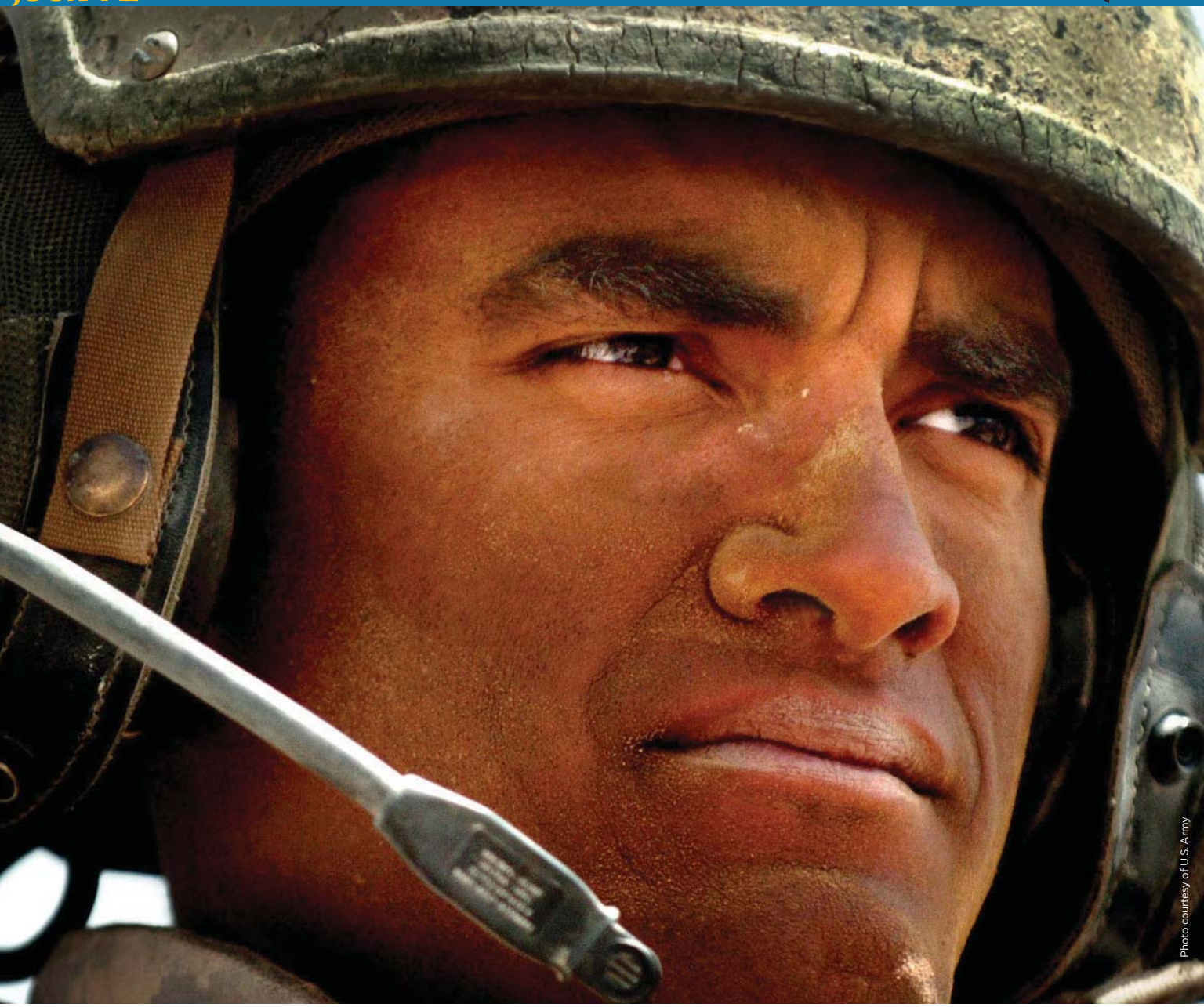

Photo courtesy of U.S. Army

From the battlefield to the oil field – it's not such a leap for returning veterans. The well-trained, adaptive individuals who have been serving the U.S. overseas are now being courted by the U.S. oil and gas industry.

A combination of a wave of retirees moving out of the oil companies, and the incoming wave of veterans made the decision to recruit them easy. United by the American Petroleum Institute's Workforce Task Force, member companies needing all levels of expertise are reaching out to veterans with a website, *www.veteranstoenergy.org,* and a massive organizational effort aimed at helping both sides of the equation.

The industry is being hit hard by the retirement of the 77-million baby boom generation, partly because many companies allow workers to retire as early as age 55. Indeed, the average age of the industry workforce is 54, and experts believe at least 50 percent of the current workforce will be retiring during the next five to 10 years.

During the last big oil boom, companies scooped up as many employees as they could, says Jim Raney, a member of the task force. When they ran out of recently graduated engineers, they hired the professors away from a number of engineering schools. Schools can't turn out enough such graduates to satisfy the need.

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"As a member of the military you are taught that you are military 24 hours a day, seven days a week first, and everything else is second. You come in with a good attitude. You can be put out on a rig because you're used to being out in the field and you have the right frame of reference."

This will be the third major hiring program developed with API, according to Denise McCourt, API industry relations director. Already in place are a Monster.com effort to attract university students and the Rockies Energy Workforce Collaborative, a regional group designed to promote job opportunities in the industry.

It was the Rockies program that McCourt says first noted veterans as excellent prospects. "They were willing to relocate, were used to working outdoors under difficult conditions and understood the discipline required to work in the industry."

And there they were, coming back from Iraq and Afghanistan: Engineers, file clerks, squad leaders, back from the war and looking at their options. Jim Raney understood that. A West Point graduate and now retired colonel, Raney had just signed on at Anadarko when he was deployed to Afghanistan in 2001.

Raney is the Technology Manager at Anadarko and was recruited to help work on the hiring program with his friend Brian Roberts, a senior staffer in Anadarko's Human Resources program, who was charged with developing a plan to recruit vets.

Raney graduated from West Point in 1975, did six years of active duty and then was in the reserve until 2001. During that time he worked for Mobil and moved on to Anadarko. He retired as a colonel in 2005.

Raney says beyond helping veterans make the connection, he is prepared to help translate the skills the veterans have into oil and gas language.

Not such a big job for a guy whose previous military service included keeping Osama bin Laden's hands off the supplies of aid sent into Afghanistan in Operation Enduring Freedom.

Raney recalls how it was when overseas duty time was ending. "I am a returning vet myself," he notes. "But I wasn't too worried [about coming back to work]; the oil business was doing well. I didn't have the same problem as some. Some working guys had no prospects, or didn't know if their company would keep their job open and what position they'd go back to."

"There was a lot of anxiety among them and they'd just done a lot of good!"

Another West Point graduate, Manny Gonzalez, is currently in charge of Chevron's Los Alamos Alliance, which takes new technologies developed for the military and seeks to find uses for advanced energy solutions.

The idea of recruiting men and women who are leaving the military is a natural, Gonzalez says. "It's simple. As a member of the military you are taught that you are military 24 hours a day, seven days a week first, and everything else is second. You come in with a good attitude and you can be put out on a rig and you are used to being out in the field, you have the right frame of reference. And, by the time you have left the military, you might have a wife and family and you're probably pretty stable."

Roberts jokes, "Anyone who can lead a platoon, can lead a crew into work."

In truth, he says, returning veterans have been schooled in what's necessary; they can be expected to be "well-trained and well-disciplined," he adds. "And they bring the diversity of background and thought we increasingly want to work with."

Veterans look good to oil, McCourt says, for many reasons, not the least of which is "they are used to working in the elements. Used to taking orders, and that's important because safety is so important. We see returning veterans as a tremendous talent pool."

The website has an arms-wide-open appeal. An introduction says:

America's oil and natural gas industry is experiencing a shortage of people in three areas: exploration and production, refining, and service and supply. Operators are searching for drilling engineers, facilities operators, and welders to work on the 500,000 producing wells and 4,000 oil and natural gas »

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platforms operating in U.S. waters. America's 144 refineries need electricians, mechanics, and instrumentation professionals. Drilling contractors, which supply both the drilling rigs and the crews that search for oil and natural gas both onshore and offshore, need roustabouts, derrick hands, and equipment operators.

The website is meant to be a comprehensive guide to all the work available in the industry, for a "seamless transition" for the returning veteran.

Raney's experience with Mobil after the Vietnam war informs his planning for retraining veterans: After the war was over, they hired about 60 degreed engineers out of the military. They were a pay grade lower than petroleum engineers, but after five years the veterans were retroactively raised after a relook, he said.

So veterans may have all sorts of skill sets but need some intervention to make clear what their service amounts to, Raney says. "They need a chance at the interview," and "really need to understand what skills sets they have attained and give them credit for the attributes. Most project managers don't need to have oil field experience, they need leadership experience, and many of our veterans possess those skills."

McCourt says the site is meant to "emphasize that even though they may look for jobs and say I'm not trained for that, their experiences and skills can be translated for a broad spectrum of opportunity.

All these people are familiar with the roller coaster business that oil and gas can be, but Gonzalez is convinced the demand will keep the personnel needs high.

And he urges veterans to think outside the box when they read job requirements. "If you are trained in basic engineering, you can do anything. You can switch to petroleum engineer. I myself am a mechanical engineer." He adds regular workers who are not college grads should also look at the jobs in terms of responsibilities they've had.

Brian Roberts explains the other appeal of hiring veterans: "You know, with previous wars, like Vietnam, soldiers came home and often didn't have much to come home to in terms of employment. And here we have the opportunity to do something good."

Photo courtesy of U.S. Air Force

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FEDERAL REPORT | By Jim Ford

TRANSITION OF POWER

The oil and natural gas industry faces challenges as energy issues remain top items on the nation's policy agenda.

Imagine it is January 20, 2009. President Barack Obama and Vice President Joe Biden take the oath of office, standing on the West Front of the Capitol, accompanied by a glowing Senate Majority Leader and House Speaker.

The Senate is firmly in the hands of the Democrats, who may now have enough votes to cobble together a 60-vote majority with moderate Republicans. Ditto for the House, which has seen the Democratic majority substantially increase.

From day one of the new administration and Congress, the oil and natural gas industry is expected to face a host of challenges. Anyone who has followed the legislative policy battles since the hurricanes of 2005 is familiar with the issues: Proposals to increase taxes, impose marketplace restrictions, and legislate onerous greenhouse gas and other environmental restrictions designed to diminish the use of oil, natural gas and refined products, as well as access to explore and develop on federal lands, including the Outer Continental Shelf.

President-elect Obama's election victory has put him in a position of real power at a time when Democrats will take control of Congress and the White House for the first time since 1995.

Obama comes to the job with a mandate for change, and energy policies are among the top items he plans to address early in his presidency. He is expected to have strong support from House and Senate Democrats, who feel his coattails gave them their enlarged majorities.

Congress used this year's election-year session to signal its intentions by proposing a variety of energy measures. Before lawmakers left to campaign, they approved, and President Bush signed, a 10-year, $8.8 billion tax increase on the oil and natural gas industry that was tucked inside the $700 billion emergency bailout to rescue troubled banks.

The tax increase came in a bundle of extensions of popular tax breaks like credits for alternative energy and research and development. What the industry lost was a future increase in the rate of a general manufacturers' deduction and more favorable treatment of foreign income. In addition the legislation increased the oil spill fund tax that refiners pay from five cents per barrel of oil to nine cents in 2017.

Looking ahead to next year, Obama and Democratic leaders on Capitol Hill are expected to:

- Push for higher taxes on the industry to provide tax breaks for individuals and to promote renewable energy. Obama supports a windfall profits tax on the industry, as do any number of senators and House members. But tax hikes could be delayed if policymakers become concerned that new taxes would worsen an already weak economy.
- Decide if they want to re-impose the ban on drilling on the Outer Continental Shelf. Lawmakers decided against extending the moratoria when they approved a temporary spending bill before Congress adjourned in October.
- Resume efforts to draft mandatory greenhouse gas emissions limits. Legislation is expected that would cap emissions at a certain level and then allow the purchase and trading of emissions allowances by affected facilities, including a host of oil and natural gas industry operations. Obama will come to office having campaigned in favor of very restrictive "cap and trade" legislation. But economic conditions could force lawmakers to hold off or take a slower approach on any greenhouse legislation.

The industry will be arguing that a windfall profits tax and other tax increases will harm energy security and the economy by removing capital that otherwise could be used to expand domestic oil and natural gas production.

API, its member companies and other allies will be working vigorously throughout 2009 to find opportunities to advance the industry's issues agenda. There will be an equal effort to defeat initiatives that could undermine the nation's energy security and make less energy available to American consumers and businesses.

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STATE OUTLOOK | By Juan R. Palomo

BEYOND THE BELTWAY

For decades most energy-related legislative activity took place in Washington. Today, we're seeing more and more energy legislation originating outside the nation's capital.

State legislatures in a number of states are expected to consider legislation in the following areas next year:

Taxes

All but one state, Vermont, are required to adopt a balanced budget. With the economy suffering, tax revenues are expected to be down because most states rely on property taxes for income. So many states will have to come up with revenue to pay for all their proposed spending and some may look to oil companies for that revenue.

Climate Change

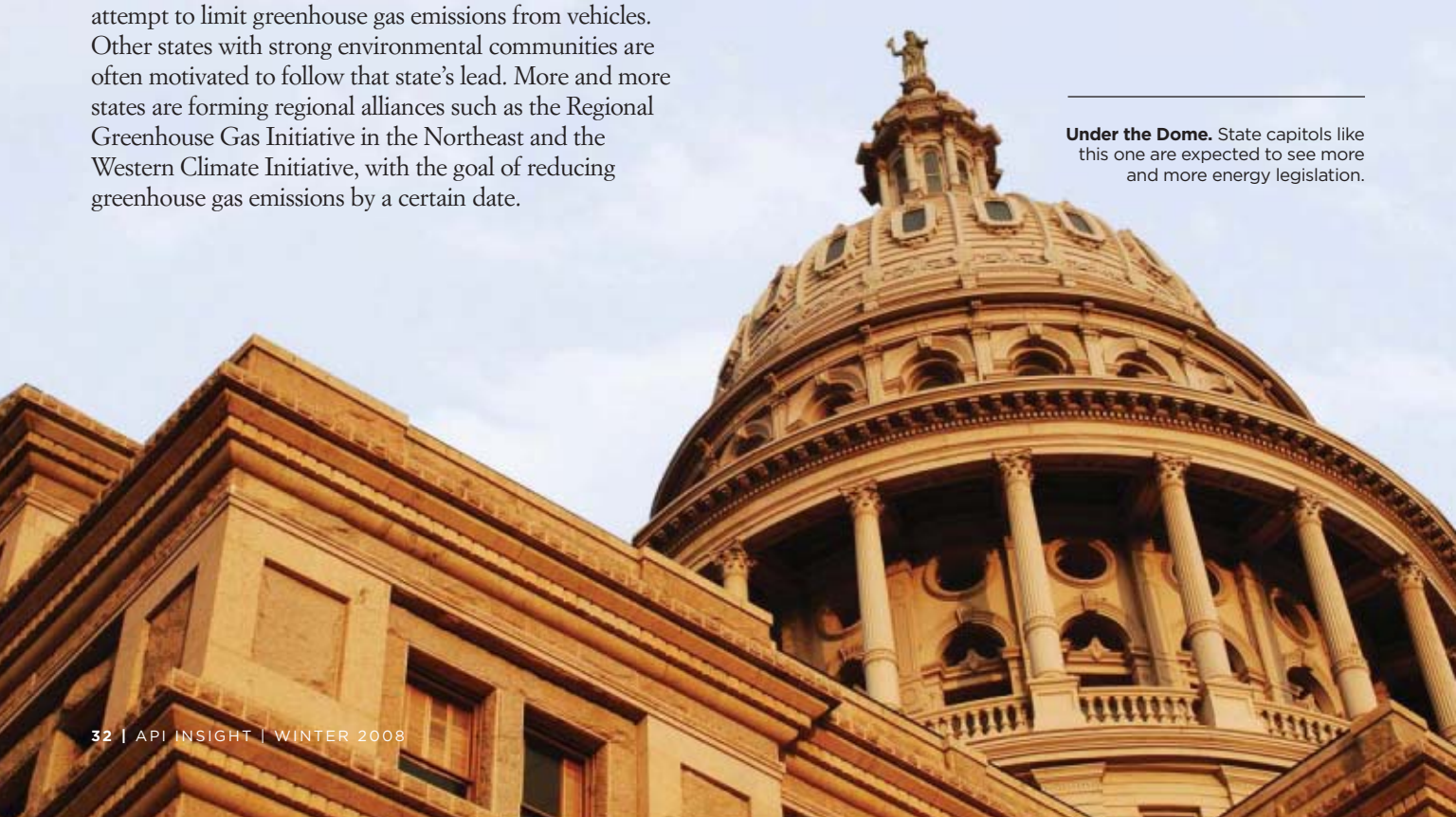
Many environmental activists are becoming increasingly disenchanted with the inability of Congress to address global climate issues. They are turning to the states instead. In many cases, it is California that is taking the lead, as it did when it adopted its low-carbon fuel standards and its attempt to limit greenhouse gas emissions from vehicles. Other states with strong environmental communities are often motivated to follow that state's lead. More and more states are forming regional alliances such as the Regional Greenhouse Gas Initiative in the Northeast and the Western Climate Initiative, with the goal of reducing greenhouse gas emissions by a certain date.

Fuels

A number of states are expected to be pressured by jobbers – wholesalers who buy gasoline for resale to retailers – who want the states to force refiners to sell them both gasoline that has been blended with additives (to meet clean-air requirements) and unblended gasoline, which they can blend with the additives themselves.

Retail Marketing

In some states, dealer organizations are pressing for legislation that would grant dealers the right of first refusal when companies sell their stations in the state. Companies are opposed to this legislation because it restricts their ability to sell multiple stations to a single buyer.



Under the Dome. State capitols like this one are expected to see more and more energy legislation.

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OFFSHORE OPERATORS CHOOSING CIR CABLE OVER METAL-CLAD VARIETY

As drilling and production technology evolves, the oil and gas industry demands innovative, next-generation cable products that provide reliable performance, greater worker safety, and lower cost installation.

AmerCable's CIR® (Crush & Impact Resistant) cable is a revolutionary cable technology that delivers added safety, productivity and lower total installed costs, while offering a true alternative to old fashioned MC (metal clad) cables. AmerCable's CIR cable is crush and impact resistant without external armoring, yet passes the same stringent crush and impact testing required by UL 2225 for Type MCHL.

CIR power, control and instrumentation cables are flame retardant (IEEE 1202) and impervious to water, air, gas and vapors while having a 40% smaller bend radius and up to 35% less tray fill than type MC cable. AmerCable's exclusive Gexol® insulating compound provides superior flexibility, dielectric properties and field-proven performance in the most unforgiving operating environments.

Additionally, CIR cable is ergonomically superior to MC cable and much safer to handle. The smooth, flexible CIR jacket eliminates the sharp edges encountered by personnel during type MC cable installation, glanding and termination, as well as during splicing. These qualities also help reduce the potential for sustaining repetitive strain injuries to cable handlers, which are costly and result in lower worker productivity. Such injuries include lower back strains and sprains, *lateral epicondylitis* (tennis elbow), and carpal tunnel syndrome, among others.

COST SAVINGS ABOUND

According to Rudy Bright, technical director for AmerCable's Oil and Gas Unit, customers benefit from a lower installed cost by specifying CIR over type MC cable. In a recently conducted cost comparison test using 100 ft of each of five different cable assemblies, each with two glands, the installation and labor costs using CIR were reduced by as much as 36% from those of similar MC cable assemblies.

"It takes only one tool – a knife – to prepare CIR cable for installation," said Bright. "And in addition to its superior flexibility, CIR glands cost up to 50% less than metal clad glands, and take up to 30% less time to install."

What's more, he noted, referring to resistance to outside contaminants and wear, CIR's jacket cannot be damaged even by routine sand-blasting, a common practice in cleaning and preparing metal surfaces for re-coating or painting.

"Try that with meal-clad cable runs and see what happens," he said.

Crush and impact resistant CIR cable's smooth jacket, superior flexibility and lower overall installation costs make it the new favorite for oil and gas companies looking for innovative cable solutions.

FAST, PROMPT DELIVERY

AmerCable works in partnership with customers to develop cost effective cable solutions. As the cable industry leader in shortest lead times and best on-time delivery – AmerCable adds value through reliable, innovative cable products and predictable delivery for new build or renovation projects across the globe.

AmerCable Systems, the company's engineered assembly unit, designs and turn-keys cable assembly solutions for hazardous oil and gas environments. With the overall shortage of qualified electricians, assemblies are an effective way to lower overall connectivity costs.

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ONE ON ONE | With Robert Bryce | By Martha Liebrum

DANGEROUS DELUSIONS

Author Robert Bryce takes a sledgehammer to the idea of America's energy independence. He thinks it's impossible.

You heard it before and during the election season. Now you're hearing it again: The U.S. needs to achieve "energy independence." Every politician says so. And the public, recognizing that oil reserves often are in unstable political hot spots, thinks it is a good idea to be less reliant on overseas sources. But energy writer Robert Bryce says that's an impossible, even dumb, idea. He documents why in his book *Gusher of Lies, The Dangerous Delusions of "Energy Independence."* Bryce doesn't take a gentle approach to this concept of eventual independence. In fact, he bashes it with a sledgehammer, in a surprisingly interesting fact-filled 300 pages. Most people, he notes, would be amazed at how many very essential items, besides oil, the U.S. imports from all over the world. There's arsenic (for pesticides) from China and Mexico, mica (for paint and cement) from India and Germany and uranium (nuclear reactors) from Australia, Canada, Russia and Kazakhstan, among others.

His point: This is an international economy and the U.S. is thoroughly enmeshed in the world market for the current source of energy, oil and gas. And it's not possible in the next few decades to reach "independence," even if we want to – and Bryce doesn't. He is a believer in most alternative fuel efforts (he has solar panels on his Austin, Texas, house). But it does not supply his home at all times with all the energy he needs, nor will it in the foreseeable future, he says. Bryce, who was a featured speaker at the API annual meeting in October, expanded on his book for *Insight:*

When the presidential campaign was waging full tilt, every candidate called for "energy independence." Is it rhetoric or do you think the politicians really believe it's possible.

Rhetoric? Of course it is. Anyone who has even the vaguest understanding of the size and scope of the global energy market knows that energy independence is not doable. Look at the world's most energy-rich countries: Saudi Arabia, Iran, Russia – none of them are energy independent. And yet, Obama, McCain, Pelosi, Clinton – and even Paris Hilton – are saying we should be energy independent. It's just dumb. The idea that the U.S., the world's single-biggest energy consumer, could be independent of the world's single-biggest business, the $6 trillion per year energy business, is ludicrous on its face.

This political season spawned some of the silliest political posturing that I have ever seen. Few people – very few – understand the energy business or energy in general, so politicians are free to demagogue on the subject without fear of contradiction. As the Cato Institute's Jerry Taylor and Peter Van Doren wrote in May 2007, "Once the topic of conversation turns to oil, the human brain spontaneously short-circuits, nodal synapses fire randomly, and I.Q. points bleed out of the cranium and all over the kitchen floor." They were absolutely right.

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You favor increased U.S. domestic production. How can that best be accomplished?

The answer here is obvious: Increase offshore exploration and production. The claims by the Democrats and the Green/Left that there's not very much oil offshore are just plain dumb. The biggest discoveries of the past few years have been offshore, look at the Jack discovery in the Gulf of Mexico in 2006 or the Tupi discovery offshore Brazil last year. There is a lot – a whole lot – of oil and gas in U.S. waters. We just need to let private industry start looking for it. It will take a while, probably a decade or more to develop those resources, so we need to get busy.

When the government restricts access for exploration, it's most often because of environmental concerns. What do you see as a logical way to balance access for oil or gas exploration and preservation of natural resources?

When it comes to offshore drilling, I think the oil and gas industry has a pretty good environmental record, particularly over the last few years. Thus, I think most offshore areas under federal control should be opened up to leasing. Sure there will be environmental risks that come with that exploration and production. But when it comes to energy, there's no such thing as a free lunch.

In your chapter on possible solutions, you give first place to getting government out of the energy business. How do you see that happening?

Alas, I don't see it happening. For the last few decades, Congress has been trying to pick winners in the energy field and it continues to fail miserably at that.

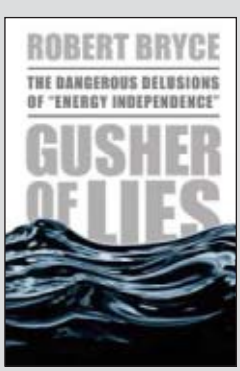
You say people should be motivated to restrict their driving, but you live in Texas, where spaces are vast and mass transit isn't a serious alternative. What's the solution?

I think you misapprehend my position. I have written many times that the only thing that will make Americans drive less is higher fuel prices. And that's what we are seeing today. As for the solution, it's obvious: Higher fuel prices mean that drivers are going to have to drive less, opt for more efficient vehicles, and seek other alternatives, if they have them. I'm not suggesting that any of that will be easy or cheap. It's going to be hard and expensive and in the coming years, as oil becomes more expensive – and I think that in about a decade, it surely will – the transition to other fuels, whether it is electricity or natural gas or something else, is going to be protracted and painful.

"Anyone who has even the vaguest understanding of the size and scope of the global energy market knows that energy independence is not doable."

Americans were running out of whales for oil to light our homes when someone found oil underground. Do you foresee a time when someone will discover something now unknown that will make oil, gas, coal, wind turbines, solar panels and thermal-heated driveways an antique concept?

Perhaps. But I am convinced that no matter how much money is thrown into the alternative energy sector, the world is going to continue using fossil fuels for a long time to come. As Vaclav Smil, a distinguished professor of geography at the University of Manitoba and a real savvy voice on energy issues has said, energy transitions are "deliberate, protracted affairs." That's absolutely true. We are going to be using coal, natural gas, and oil for decades to come. That said, I am hopeful – and history is showing – that we will continue moving toward fuels that use less carbon. I'm very bullish on nuclear and natural gas in particular. Solar and wind will continue to be players, but unless or until we can come up with viable systems that can store lots of electricity, I think they will be niche players. Beyond that, who knows? The energy business is ruthlessly policed by the immutable laws of thermodynamics. And those laws have snuffed out many promising ideas.



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HOT
OFF THE PRESSES

Since 1924, API has been a cornerstone in establishing and maintaining standards for the worldwide oil and natural gas industry. Here are just a few of the newly published standards available.

For a complete list of publications that will be updated or completed in the coming months,visit **www.api.org/publications.**

COMMITTEE ON PETROLEUM MEASUREMENT

Ch. 17.12
Procedure for Bulk Liquid Chemical Cargo Inspection by Cargo Inspectors, 1st Edition, September 2008

Ch. 19.1A-A1
Addendum 1 to Evaporative Loss from Fixed Roof Tanks, 1st Edition, August 2008

TR 2569
Evaporative Loss from Closed-vent Internal Floating-roof Storage Tanks, 1st Edition, August 2008

REFINING

RP 554-Part 2
Process Control Systems-Process Control System Design, 1st Edition, October 2008

RP 554-Part 3
Process Control Systems-Project Execution and Process Control System Ownership, 1st Edition, October 2008

RP 581
Risk-Based Inspection Technology, 2nd Edition, September 2008

RP 941
Steels for Hydrogen Service at Elevated Temperatures and Pressures in Petroleum Refineries and Petrochemical Plants, 7th Edition, August 2008

Spec 936
Refractory Installation Quality Control Specification – Inspection and Testing Monolithic Refractory Linings and Materials, 3rd Edition, November 2008

Std 530
Calculation of Heater-tube Thickness in Petroleum Refineries, 6th Edition, September 2008

Std 546
Brushless Synchronous Machines 500 kVA and Larger, 3rd Edition, September 2008

Std 650-A1
Addendum 1 to Welded Tanks for Oil Storage, 11th Edition, November 2008

TR 941
The Technical Basis Document for API RP 941, 1st Edition, September 2008

EXPLORATION AND PRODUCTION

RP 11BR
Recommended Practice for the Care and Handling of Sucker Rods, 9th Edition, August 2008

Spec 12B
Specification for Bolted Tanks for Storage of Production Liquids, 15th Edition, October 2008

Spec 12D
Specification for Field Welded Tanks for Storage of Production Liquids, 11th Edition, October 2008

Spec 12F
Specification for Shop Welded Tanks for Storage of Production Liquids, 12th Edition, October 2008

Spec 12J
Specification for Oil and Gas Separators, 8th Edition, October 2008

Spec 12K
Specification for Indirect Type Oilfield Heaters, 8th Edition, October 2008

Spec 12L
Specification for Vertical and Horizontal Emulsion Treaters, 5th Edition, October 2008

Spec 12P
Specification for Fiberglass Reinforced Plastic Tanks, 3rd Edition, October 2008

TR 10TR1
Cement Sheath Evaluation, 2nd Edition, September 2008

TR 6AF
Technical Report on Capabilities of API Flanges Under Combinations of Load, 3rd Edition, September 2008

TR 6AF2
Technical Report on Capabilities of API Integral Flanges Under Combination of Loading - Phase II, 3rd Edition, September 2008

PIPELINE

RP 1168
Pipeline Control Room Management, 1st Edition, September 2008

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KEEP UP

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Each year, API offers meetings, conferences and workshops designed to keep you informed of current topics, technologies and trends in the oil and natural gas industry.

To find a trusted source for your training needs, look no further than API University. API University is dedicated to providing excellence in oil and natural gas industry training. That's why we offer a wide variety of courses throughout the year designed to provide flexible training opportunities, developed and taught by the most knowledgeable industry experts.

Below is a selection of meetings, conferences, workshops and API University courses. For additional information, please visit *www.api.org/meetings* or *www.api-u.org*.

2009 CALENDAR OF MEETINGS AND EVENTS

JANUARY 19-23	Exploration and Production Winter Standards Meeting	San Antonio, Texas
JANUARY 21-23	API/AGA Joint Committee on Oil and Gas Pipeline Welding Practices	San Antonio, Texas
JANUARY 27-30	API Inspector Summit	Galveston, Texas
FEBRUARY 8-10	State and Local Income and Franchise Taxation Forum	Austin, Texas
FEBRUARY 16-19	API RP 579 Fitness-for-Service Course	Madrid, Spain
MARCH 3-5	API RP 571 Damage Mechanisms Course	Houston, Texas
MARCH 9-11	API 580/581 Risk Based Inspection Course	Houston, Texas
MARCH 11-12	Overview of API Spec 6A, 19th Edition	Houston, Texas
MARCH 15-17	International Trade and Customs Conference	San Antonio, Texas
MARCH 17-20	API RP 579 Fitness-for-Service Course	Shaker Heights, Ohio
MARCH 23-26	Spring Committee on Petroleum Measurement Standards Meeting	Dallas, Texas
MARCH 24-26	API 520/521 Pressure Relieving Systems Course	Houston, Texas
APRIL 15-17	API 520/521 Pressure Relieving Systems Course	Bergen, Norway
APRIL 20-21	API Federal Tax Forum	Houston, Texas
APRIL 20-23	API RP 579 Fitness-for-Service Course	Bergen, Norway
APRIL 21-22	Pipeline Conference	Fort Worth, Texas
APRIL 27-29	Spring Refining and Equipment Standards Meeting	Denver, Colorado
APRIL 28	API/NPRA Spring Operating Practices Advisory Committee	Denver, Colorado
MAY 4-5	Excise Tax Forum	Houston, Texas
MAY 4-7	API RP 579 Fitness-for-Service Course	Edmonton, Alberta, Canada
MAY 7-8	API Course on Pipeline Valves (API 6D and 6DSS)	TBD
MAY 19-21	API 520/521 Pressure Relieving Systems Course	Shaker Heights, Ohio
JUNE 3-4	Overview of API Spec 6A, 19th Edition	Houston, Texas
JUNE 5	Designing Bolted Flanges to API and ASME Requirements	Houston, Texas
JUNE 22-26	Exploration and Production Standards Conference on Oilfield Equipment and Materials	Westminister, Colorado
JUNE 23-25	API 580/581 Risk Based Inspection Course	Shaker Heights, Ohio

Many of our meetings and conferences offer excellent sponsorship and exhibit opportunities. Laura Barcaskey of Durable Mecco said of one API conference: "It was a well spent three-days to get better acquainted with the key industry leaders of your industry, and to learn more about the application of our products in the oil industry. As with most industries today, markings for traceability is a key topic, and technology is allowing data to be captured in new ways in heavy applications such as down-hole drilling and those subject to harsh environments/processes. We, at Durable Mecco, look forward to strengthening our relationship with API to handle their diverse markeing and identification needs."

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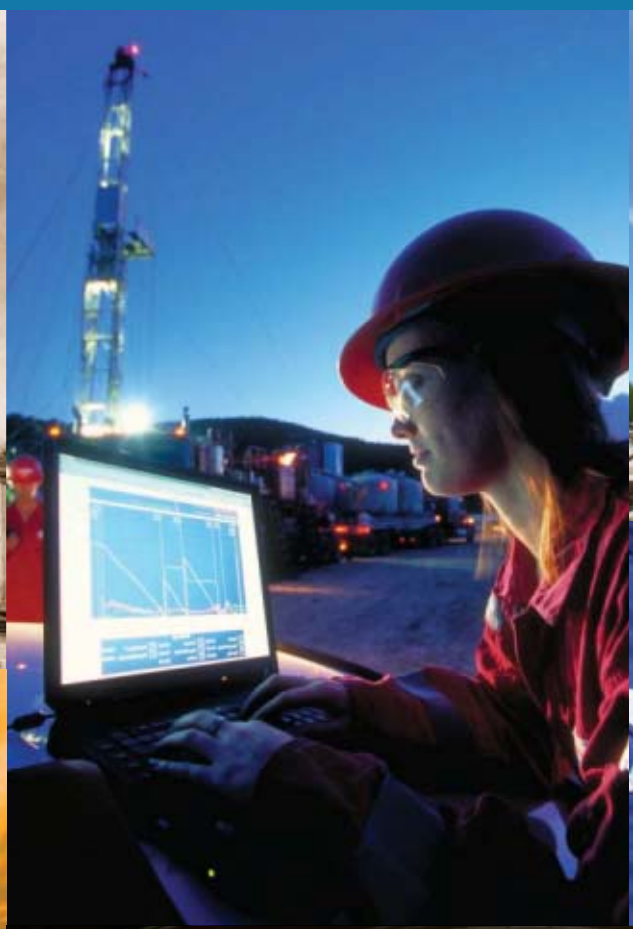

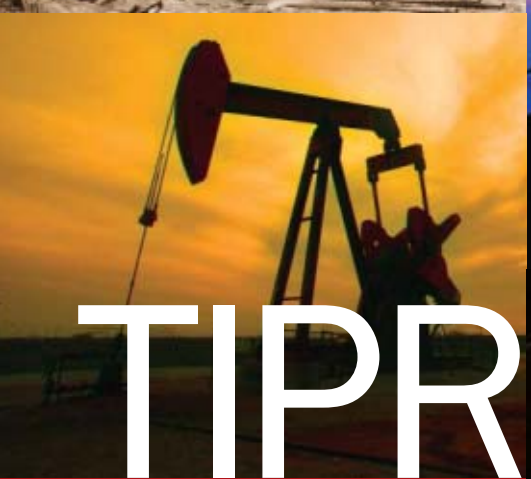

TIPRO: Exploring Our Past, Producing Our Future

supplement to:

OIL&GAS JOURNAL

TIPRO

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Texas Independent Producers and Royalty Owners Association

Apache rig in Limestone County, TX
Photo courtesy of Apache Corporation

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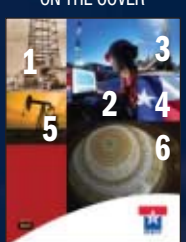

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TIPRO history:

The stories of the independent producers and royalty owners

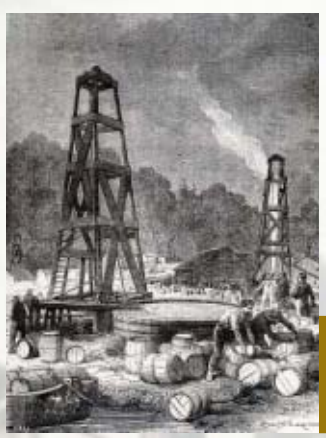
Humble Beginnings

While the legal beginning of TIPRO starts in 1946, its philosophical origins predate that event. To understand the dynamic of the premier association for independents, one has to understand how oil came to be king in Texas.

One by one the great oil fields of Texas were discovered: Spindletop in Beaumont in 1901; Burkburnett in North Texas in 1915; Luling in Central Texas in 1924; Santa Rita – the strike that funded the Texas university systems for a century - in the West Texas Permian Basin in 1923; Amarillo in the Panhandle in 1926, and more.

Circumstances in each field raised specific conflicts between independents and the majors. Often, the issues involved the majors' reluctance to invest in the risky and expensive exploration phase but then swoop in after a discovery and use various methods to corner the field's supply and distribution. These behaviors contributed to the 1880's anti-trust legislation against Standard Oil and the formal break-up of the trust into the Seven Sisters in 1911. These companies, however, often continued such business practices.

The most dramatic and significant example of this was the world-famous East Texas Field. Discovered during the Great Depression, hundreds of farmers, share croppers and all manner of workers toiled for little or no pay in exchange for royalties if anything materialized. Many majors thought it was a fool's errand.



Early wildcatters had to endure the most tumultuous working conditions

Then the Daisy Bradford hit in 1930. Overnight hundreds of regular citizens became royalty owners. In no other place in the world were so many regular citizens such large, private owners of a precious national resource. The largest reserve discovery in the world at that time, the 600 derricks in Kilgore in 1935 alone signaled the presence of almost as many wells as the town had people in 1930! (Lawrence Goodwyn *Texas Oil, American Dreams*[1], p.53.) This discovery also made the Texas Railroad Commission the most influential governing body for global oil prices.

But such a significant supply also had a quick and devastating impact on global oil prices, sending them plummeting due to overproduction and theft and raising the ire of the majors. They lobbied hard at both state and federal levels for proration limits and other measures to reduce the flood of supply. Seeing this massive threat to their livelihoods in what had become a very personal business, many independents resisted such measures, especially those dictated by the Railroad Commissioners in Austin. In 1931, martial law was actually declared in East Texas with National Guard troops sent out by Governor Ross S. Sterling to enforce the limits.

Against this backdrop, independent producers began organizing. Regional groups formed in each significant field in Texas. The East Texas field gave rise to the Independent Petroleum Association of Texas in 1933, the group that would later reconstitute itself as TIPRO in 1946. (Goodwyn, p.51.)

The War Years: Oil

In his book *Texas Oil, American Dreams*, which places the founding of TIPRO into the political context, Goodwyn states, "The event that caused Texas oilmen to take notice was the public surfacing in 1943-44 of the Anglo-American Petroleum Agreement.(Goodwyn, p 58)

"One of the key conclusions of the agreement was that 'American security required restraint on the use of

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domestic reserves and larger drafts on foreign oil supplies,'" he wrote. (Goodwyn, p 59)

Houston oilman Glenn McCarthy brought a group of independent producers together to assure the U.S. government understood the agreement's implications to the American oil and gas industry. The independent oilmen became an important force in sidelining the treaty.

These operators learned that there was no one clear voice representing independents. Consequently, the Texas Independent Producers and Royalty Owners Association (TIPRO) was established in 1946 by a group of 39 Texas wildcatters led by McCarthy and Jack Porter, who was the organization's first president.

The War Years: Natural Gas

Just as the outcomes of WWII began disputes for independents over oil that was supposed to last a generation, it also sparked new battle lines with majors over natural gas.

Natural gas was largely considered a by-product to be flared off during the early days of the oil industry. That changed as its value was realized and technology provided more efficient means of transportation, storage and distribution. But, as with everything in this industry, they were all extremely expensive, long-term, large-scale and risky endeavors. Enter Uncle Sam.

During the war, getting essential supplies like oil to the industrial north was becoming disrupted and risky due to the increases in German U-boat patrols near the U.S. The government, corporations and others realized massive investment in pipeline infrastructure was needed in conjunction with a huge investment for the Houston Ship Channel itself. This was essential to America's war effort.

After the war, this lasting infrastructure created a new market for natural gas. Though it would take the next half century for natural gas to mature into its own, the early seeds of conflict were sewn in the late 1940s.

For years, small independents signed long-term natural gas contracts for pennies as an oil by-product. Once the demand and corresponding value increased, they were anxious to revisit such contracts. The majors and their pipeline subsidiaries were less than anxious, however. Because the distribution systems in many areas amounted to monopolies, and monopolies using taxpayer-funded infrastructure, no less, the dispute over regulation had begun.

1946 Coline Well Courtesy of Halliburton

With some significant milestones, natural gas regulation was largely secondary to the numerous oil issues until the 1990s. However, it would jump to the forefront early in the 21st century as Enron became the new equivalent of the previous century's Standard Oil, and the world's appetite for cleaner burning fuel seemed insatiable.

Since its humble beginnings, TIPRO has grown into the largest statewide association of its kind in the nation. It has led efforts for fairness and representation for independent producers and royalty owners for more than 60 years. TIPRO's focus has primarily concentrated in Texas, but the association also works at the federal level. The organization provides representation in the legislative process when bills that impact the industry are debated in the legislature.

TIPRO continues to work for its membership that has grown to include not only independent producers and royalty owners, but many other industry related-companies with a common interest. Many of TIPRO's members bring their own history to the group. Many of the association's recent presidents also have parents that were active in the organization and previously served as president of the Association.

Two generations of TIPRO presidents

TIPRO's immediate past president, Scott L. Anderson, who held the position from July 2006 until July 2008, is the son of past TIPRO president, Bruce Anderson, who served from 1983-1985. Bruce Anderson was active in TIPRO since the 1960s. He founded Anderson Oil in 1949 in Casper, Wyoming, moving to Denver eight years later.

"With incredible foresight, in 1965 he felt he needed to move the company to Houston because he thought Houston was going to become the energy capital," Anderson said.

Bruce joined TIPRO a short time after the company moved to Houston. By this time, the privately-owned company had production in several states. Today, the company produces in 14 states.

Scott Anderson began working at the family business when he was in the sixth grade, working during the summer digging ditches, and working with gaugers and pumpers on workover rigs and perforating trucks. He worked with Amoco on summer jobs while attending college and was prepared to work for Amoco after college.

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"My father had some health problems," Scott explained, "So I went to work for Anderson Oil in January 1981." Bruce passed away in 2001.

Scott became more involved with TIPRO, joining several committees and eventually being elected president. "This industry has been very good to our family," Scott said, "but things don't happen by themselves. There has to be people who take proactive stances on issues and make sure that this continues to be a good business.

"We are very fortunate to live in Texas, where a lot of regulators and legislators know the importance of the energy industry," he continued, "but so many times people pass regulations and laws that can hamper the industry."

"That's why you need to have an active lobbying arm to promote the industry," Anderson continued, "and make sure people are aware of the consequences of legislation and regulations."

TIPRO members traveled to Washington, D.C. twice during Scott's presidency to visit the Texas Congressional delegation.

"We provide a good source of information for them to be able to support the positions we need them to take," Scott said.

In Texas, TIPRO has been active during the urbanization of E&P activity, notably in the Barnett Shale play around Fort Worth. "TIPRO and its members have been present and participated and supported the companies at meetings in those areas, such as at water district meetings," Scott explained.

A quarter century as TIPRO Treasurer

Bennie Downing, a CPA in Austin, is TIPRO's immediate past treasurer, a position he held for more than a quarter century, ending on June 30, 2008. He's been a TIRPO member since 1977, shortly after he became a royalty owner. "The first meeting I attended was in the Gondolier Hotel in Austin, and Texas Governor Dolph Briscoe came into the meeting," Downing said. "It was a small meeting, maybe 30 or 40 people but it was impressive when you have the governor come in and carry the day for you."

"In the mid-1970s the Federal government implemented the windfall profits tax as a result of high oil prices and resulting high oil company profits. That became a tremendous opportunity for royalty owners to become involved and we eventually received a tax credit," Downing said.

"TIPRO had a major role in obtaining that credit for the royalty owners. That is one of the benefits of becoming a TIPRO member.

"Frank Pitts (later to become TIPRO's president from 1980-81) was a great speaker and traveled around the state talking about the tax," Downing continued. "We also went to Washington, D. C. in 1977 to talk with and lobby our Senators and Representatives. It was a challenging time for the oil and natural gas industry during the Carter Administration, Downing said. "History was made when President Carter froze natural gas prices, and then de-regulation of natural gas from wells below 15,000 ft."

As a result of numerous classifications of natural gas, all with different prices, TIPRO implemented special programs for royalty owners from how to prepare leases, accounting procedures, setting up accounting books, and other related topics.

"It was a great program, and very well attended," Downing recalled.

40 years separate father and son TIPRO presidents

Joe Abel, president of M.D. Abel Company, was president of TIPRO from 2002-2004. His father, M. D. Abel, who founded the company in 1961, was TIPRO's president from 1964-66. Joe began working for his father in 1976, with the company's primary focus in south Texas and non-operated interests in west Texas, plus mineral interests in more than 50 Texas counties.

"TIPRO works for me by working with the state legislature and representing us in the regulatory process," Abel said. "It's like a voice in the wilderness bringing some reasoning to the public about the oil and gas industry."

M. D. Abel testified on natural gas pricing for two weeks in the mid-1960s in front of the Federal Power Commission (FPC), predecessor of the Department of Energy (DOE). "TIPRO was trying to raise the price of natural gas from a nickel to 12 cents," Abel explained. "They were trying to increase the market potential for natural gas and needed a better price in order to put in the infrastructure to transport the gas to market."

When Joe Abel became involved with TIPRO in 1996, the Texas Railroad Commission (RRC) and the public were concerned with orphaned and unplugged wells. "The Oilfield Cleanup Fund had been in place for more than 10 years but the industry was being accused of not devoting enough money to the effort and plugging enough wells," Abel said.

Joe Abel, Rusty Howell with Howell Oil & Gas, Doug Robinson with Henry Petroleum and Obie O'Brien, then a lobbyist for Apache, represented TIPRO in a joint effort with Texas Oil & Gas Association to increase funding of the Oilfield Cleanup Fund. "We spent a lot of hours and several years to the funding effort," Abel said.

"We also established the Oilfield Cleanup Advisory Committee," Abel explained. Increasing oil industry funding for the Oilfield Cleanup

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Fund wasn't easy. Controlled by the RRC, which is responsible for assuring that wells are plugged, the fund is supported by the industry from fees and taxes on natural gas and oil sold.

The major oil and gas companies wanted the entire increased funding to come from fees. Smaller companies believed the only equitable way to come up with increased funding was from sales.

"TIPRO worked with other associations, developed a compromise and then worked through the legislative process to attain a process that has worked very well," Abel said.

Another recent issue with which TIPRO worked for independent oilmen is storm water runoff. Site preparations at oil and gas properties are not covered by permitting requirements for storm water runoff. First, the Environmental Protection Agency attempted to regulate these sites without a change in the law from Congress. TIPRO initiated a lawsuit to continue the correct interpretation of the law.

"Without the exemption, industry would need a permit before the operator could receive a drilling permit anywhere in the U.S," commented Abel.

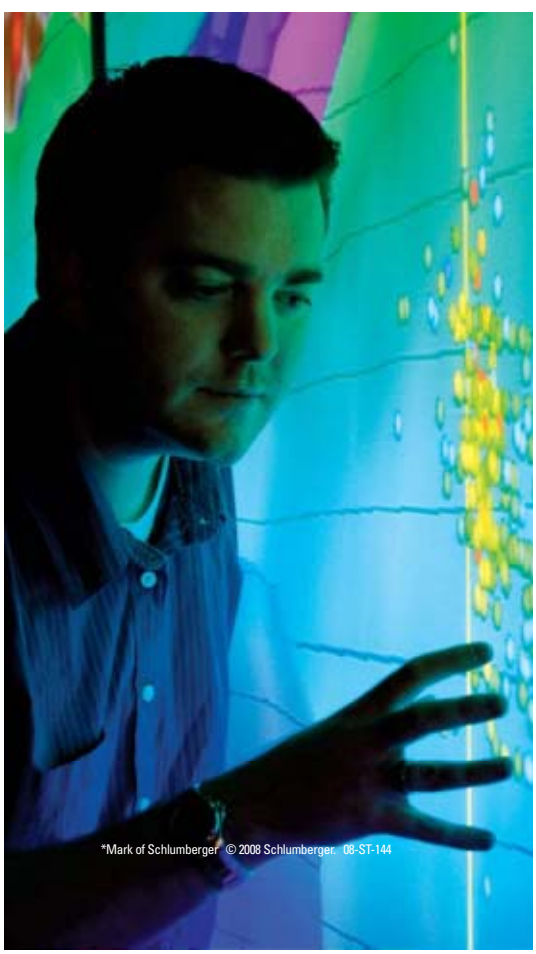
"TIPRO envisioned a 1-2 year Federal permitting process," Abel continued, "and we could lose our oil and gas lease while waiting on the Federal government to approve our storm water runoff plans.

"Our current President, Tad Mayfield, took up the initiative on that issue," stated Abel. "After that was settled and we agreed on EPA's new rules, an environmental group sued EPA over them." TIPRO has continued to be involved in the case now defending the revised rules.

Abel remains very active in TIPRO. "With TIPRO, you build relationships with different individuals that you meet," Abel said. "We are all facing the same kind of problems and we address them.

"I still get called from time to time to testify at legislative committees, depending upon what kind of expertise TIPRO requires."

1. *Texas Oil, American Dreams* Goodwyn, Lawrence, Texas State Historical Association, 1996, Pages 58-63



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TIPRO proactively represents the industry's interests

TIPRO's full-time professional staff actively lobbies at the state and federal levels, providing Texas independent producers and royalty owners representation in the legislative and regulatory process when bills and rules that impact the industry are being debated. The organization has two registered lobbyists on staff. The organization's State Issues Committee and Federal Issues Committee follow all relevant bills and rules through the legislative process, from drafting to voting, should the proposed legislation reach that stage.

While TIPRO is primarily involved with Texas state issues, it sometimes is engaged in Federal regulatory and legislative issues. "Our main focus is at the state level," said Donna Warndof, TIPRO's Director of Public Affairs and one of the association's registered lobbyists. "When there are federal issues where we feel we can make a difference, we become engaged in that process.

"Examples of federal regulations where we became involved have included stormwater rules and certain pipeline regulations," Warndof added.

TIPRO sometimes works with city councils and other local government agencies, and that is something that may increase in the future as the industry in Texas becomes more urbanized. What TIPRO typically does rather than send an association staff member to a local water district board meeting in Tarrant County, for example, is to contact a TIPRO member who lives in that district to attend the meeting.

"We can bring our expertise to the table," Warndof said, "but nothing is more helpful than policy makers hearing from someone that lives and votes where the issues are."

TIPRO also calls on the expertise of its members when working with the state legislature. For example, if an owner of a company in Corpus Christi has an interest in a bill that affects his company, TIPRO staff may ask him to meet with area legislators to help explain how a particular bill affects his company. The same process is used for whatever part of the state is affected by a particular bill or amendment to a bill, whether it is west Texas, east Texas, south Texas, etc.

"If a Senator from west Texas is promoting a bill, then we might request that a TIPRO member or even a State Issues Committee member who is from west Texas go to the Senator as one of his constituents and discuss the bill. Whether we like it or we oppose it, having a local connection puts a face on the issue for the Senator," said Lindsey Dingmore, Manager of Government and Regulatory Affairs for XTO and TIPRO's State Issues Committee Chairman.

In another example, TIPRO's State Issue Committee will look at a bill in the legislature and note that it is an issue primarily affecting east Texas. In that instance, the committee will examine TIPRO's membership and determine that there is a producer in Tyler, for example, who probably is the best person to address the issues with a particular legislator.

In this case, a TIPRO staff member will contact the producer, explain the issues and TIPRO's concerns and determine if the producer has the same concerns. "Nine times out of ten the member thanks TIPRO for flagging the issue for him and asks what he can do to help TIPRO," Dingmore said.

"Sometimes we ask the producer to testify on a piece of legislation," Dingmore explained. "Other times it's knocking on a legislator's door and asking if he can speak with him about the legislation.

"If TIPRO supports the bill, we can offer the legislator any assistance he may want us to help pass the bill," Dingmore said. "If we oppose the bill or a section of the bill, we can say, 'We see what you are trying to accomplish but here are our concerns.'"

Member-driven legislative agenda

The legislative lobbying efforts and agenda that TIPRO pursues is member-driven. In addition to the organization's professional staff that follows a bill's progress, TIPRO constantly receives input from its general

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membership regarding pending legislation that affects them. For example, a member might contact TIPRO about a bill he hears about and wants to make sure that TIPRO is aware of it, or he wants to know what TIPRO is doing regarding the potential legislation.

"That's one method to assure that we are pursuing the message for TIPRO members," Dingmore said.

Additionally, the committee depends on TIPRO staff to cull through the bills and flag potential concerns. Usually the professional staff knows there are concerns with a particular bill but other times they may want to talk with members about how a bill might affect them or the industry. The staff then reports to the committee, which reports to the association's Board of Directors. Additionally, TIPRO reports on the committee's actions in the Target, the twice-monthly member newsletter.

TIPRO works for its members

The Texas legislature is in session only 140 days every other year but TIPRO's professional staff, like Texas legislators, don't vacation during the interim. "The legislature's committees meet regularly during the interim," Dingmore said. "They have charges given to them by the Speaker of the House and the Lt. Governor and they study a number of issues during that process.

"TIPRO staff attends those committee hearings and we are anticipating legislation," Dingmore said.

As a bill moves through the legislative process, TIPRO will be very much engaged in a discussion to amend it should it be detrimental to the industry. "That is very much a part of the legislative process, and TIPRO's registered lobbyists become very engaged in that process," Dingmore explained.

During the interim between sessions, the committee meets on an as-needed basis that could include meetings in Austin or via conference calls. During legislative sessions, members of the State Issues Committee typically meet weekly in conference calls or in face-to-face meetings, discussing the legislative action during the week and receiving input from committee members. Committee members represent many of the disciplines necessary to understand potential legislation and its impact to the independent oil and gas operators and royalty owners. For example, one committee member is a tax expert and can advise the committee if a tax issue

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arises. Other committee members offer additional expertise.

It is a misnomer that lobbying is always an adversarial process. While it can be, that is not usually the case. There are legislators that understand the exploration and production business very well and realize that TIPRO wants to be engaged in the legislative process. On the other hand, there also are legislators who may not understand the industry as well but who want TIPRO's input when they sponsor legislation. Most often, legislators want to address a particular issue in the best practical way and not to be detrimental to the production of oil and natural gas in the State of Texas.

"We have those discussions with legislators all the time," Dingmore explained. "That is the real value of an association like TIPRO, both to its members and to the legislature, to be that voice that can credibly come to the table and suggest workable ways to pass bills."

In addition to legislators seeking advice from TIPRO, the association regularly seeks out legislative committee members and committee chairmen to provide them regular briefings on the state of the oil and gas industry or on a particular issue.

Thousands of pieces of legislation to vet

There can easily be up to 5,000 pieces of legislation offered during a legislative session. As a result, the State Issues Committee depends upon TIPRO staff to read through the bills and to flag those that could contain potential concerns to TIPRO members and the industry. Each of the bills contains a subject line so in many cases it's just a matter of reviewing the subject to learn if it affects the exploration and production sector.

"If the subject line refers to the board of cosmetology, it's obviously not going to be a bill with which we will be concerned," Dingmore said. "But there could be a bill that deals with road infrastructure and deep in that bill could be a section that levies an additional tax or fee on oil and gas-related vehicles on state roads.

"In that case, we will examine the bill and learn what the legislator is proposing," Dingmore added.

Photo by Norma J. Cornejo

As a result, the actual number of bills that TIPRO staff and lobbyists work with each session could be several hundred, sometimes as many as 1,000 or more. TIPRO maintains a tracking list that follows each bill through every step of the legislative process. The reason is that a bill that is read as it was introduced, and deemed good for the oil and gas industry, can be amended by another legislator and reverse the impact for TIPRO members

"We follow the bills through the committee process, including having a TIPRO staff member at the committee hearings, to assure that an amendment detrimental to the industry isn't attached," Dingmore explained.

As the bills progress, TIPRO staff discusses the bill or amendments with the sponsors. This includes the bills the organization supports as well as opposes. TIPRO staff typically sends a message to the sponsors of the bills it supports, outlining the reasons for its support. This also is a method of registering the association's support for the bill.

"Many of the sponsors will know that TIPRO has an interest in their bill because it deals with the oil and gas industry," Dingmore noted, "but some legislators may not know about our interest. Being an effective voice for the industry means clearly telling our story, even if we disagree with the sponsor.

"Also, if there is an amendment to the bill that we might oppose, it is important to quickly visit with the bill's sponsor and discuss that amendment."

It can be a complex process and could seem overwhelming to the legislative outsider. That's where TIPRO's professional staff and registered lobbyists come in. It's a grueling process for the staff 140 days every other year. The truth is, it would be a difficult task to accomplish what they do 12 months of the year, every year, but that, in effect, is what the organization's professional staff does. After all, as noted earlier, the legislative process doesn't shut down for 18 months between sessions.

TIPRO develops legislation

While TIPRO's professional staff and lobbyist track bills and engage their sponsors in support or opposition. TIPRO also develops legislative proposals. Only members of the House of Representatives and Senate can actually introduce legislation. If the association has identified a problem that it thinks needs to be addresses, TIPRO staff will visit with a member of the legislature or interested stakeholders to develop proposals.

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Dingmore explains, "We will lay out our issue to them, identify the problem and say, 'Here is why we think there is a problem and here is our recommended solution.'

"We may ask them to introduce a bill or add an amendment to remedy the situation. Or we may work with task forces and study groups to make recommendations."

At times TIPRO may write model drafts of legislation and ask a legislator to sponsor the proposal with TIPRO's support throughout the legislative process. Sometimes, the legislator will ask TIPRO to talk with other committee members to make certain they understand the issue as well as it was explained to the sponsoring legislator. When that occurs, TIPRO's professional staff and certain members with interests in the issue will visit with committee members to support the legislator's effort.

On the other side, a legislator who is sponsoring a bill might approach TIPRO noting that there may be a problem with another legislator who opposes the bill. TIPRO will visit with the opposing legislator to explain the association's and the industry's support of the bill.

"There is some degree of this taking place in every legislative session," Dingmore said.

Federal Issues

"The Federal Issues Committee works in much the same way," explains Warndof. "The federal legislative process usually includes fewer numbers of bills but they are broader in scope and often change faster in the legislative process. In contrast, federal agency rulemaking is often slower than at the state level but is also more complex.

The Federal Issues Committee functions about the same as the State Issues Committee," she continues. "We as staff monitor and flag issues and raise them with the Committee members. Any member may also bring an issue for consideration. Then positions and actions are discussed that can result in anything from calls and letters of support or opposition, to formal written comments or testimony."

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Technology
is key to optimally producing reserves

The entire idea behind evolving technology in the oil and gas industry is to maximize an operator's return on his investment, which, of course is his reservoir. The key is understanding what is occurring subsurface by learning the reservoir's characteristics via seismic and offset wells, and then understanding what the operator needs to successfully apply technology to optimally access the reserves. Knowing the reservoir's geology and the formation's attributes is only the beginning. Working with various service companies, the operator applies the technologies that, based upon reservoir characterization, result in the highest percentage of reserve depletion.

In many instances today, the industry has moved from drilling "simple" vertical wells to the more complex horizontal wells necessary to bring value to the reservoir. "The reason to utilize horizontal well technology is to achieve the best production rate possible," said Jeff Gorski, Vice President, Sales & Marketing for Schlumberger Oilfield Services, Dallas/Fort Worth and the company's representative at TIPRO. Over the past few years, he has been involved with numerous presentations to TIPRO membership about the industry's innovative technologies.

Technology for drilling horizontal wells

The number of horizontal wells drilled in Texas and in the United States is increasing, according to Gorski, primarily in fields produced from tight gas sands and shale gas plays. This includes plays such as the Barnett Shale around Fort Worth, the Fayetteville shale in Arkansas and numerous tight gas sands plays in the Rocky Mountains.

"Horizontal drilling appears to be the technique of choice in terms of bringing the ultimate value to these reservoirs," Gorski said.

To illustrate the growth of horizontal wells, about 45 rigs operate in the Fayetteville shale, with approximately 80% drilling horizontal wells. As of September 2008, operators in the Barnett Shale play were further developing horizontal techniques: operators are utilizing about 190 rigs with more than 170 drilling horizontal wells. Horizontal well success factors begin with a cohesive work flow. This includes researching and understanding the formation's geology, geophysics, petrophysics and geomechanics in order to optimally place and maintain the drillbit's orientation through the formation. Understanding reservoir characterization is important when utilizing horizontal well technology such as rotary steerable systems, logging while drilling (LWD) and measurement while drilling (MWD) to steer the drillbit to the geologic objective.

"It is important when drilling horizontal wells to stay within the reservoir and assuring that we have the lateral extent," Gorski explained, "so the ultimate production matches the well's design."

One of the enabling technologies brought to market is Schlumberger's PeriScope bed boundary mapper service. PeriScope enhances well placement by providing the ability to "see" the reservoir and map the reservoirs' boundaries as the wells are being explored. The technology eliminates the potential necessity of drilling expensive and time-consuming sidetrack wells and enhances production. The service is the industry's first deep and directional electromagnetic LWD measurement, allowing the producer to continuously monitor the position of the formation and fluid boundaries up to 21 ft away. It is unique it its ability to map bed boundaries, enabling the drilling team to explore these horizontal wells and remain in the formation's sweet spot.

The deep measurement range provides early warning when steering adjustments are necessary to avoid water or exploration hazards or to avoid exiting the reservoir target, an important feature when drilling thin or dipping formations.

Remotely monitoring wells

Additional technology used to optimize exploration and completions is remote operations centers, where the collaborative drilling team of the operator and service company can monitor the exploration and logging of wells in real time. Schlumberger has numerous remote Opera-

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tions Support Centers (OSC) around the world that monitor, on a 24/7 basis, various parameters of a well in progress. More and better quality downhole data is being transmitted in real time. Decisions based on that data could be made at the well site but in many cases immediate access to experienced and expert drilling engineers is imperative to the success of the well.

The company's OSCs incorporate advanced processes, leading exploration technology and proven drilling software for data optimization and analysis as well as communications software for directional drilling, MWD and LWD operations. Monitoring the same processes to optimize exploration also enhances safety and reduces risk.

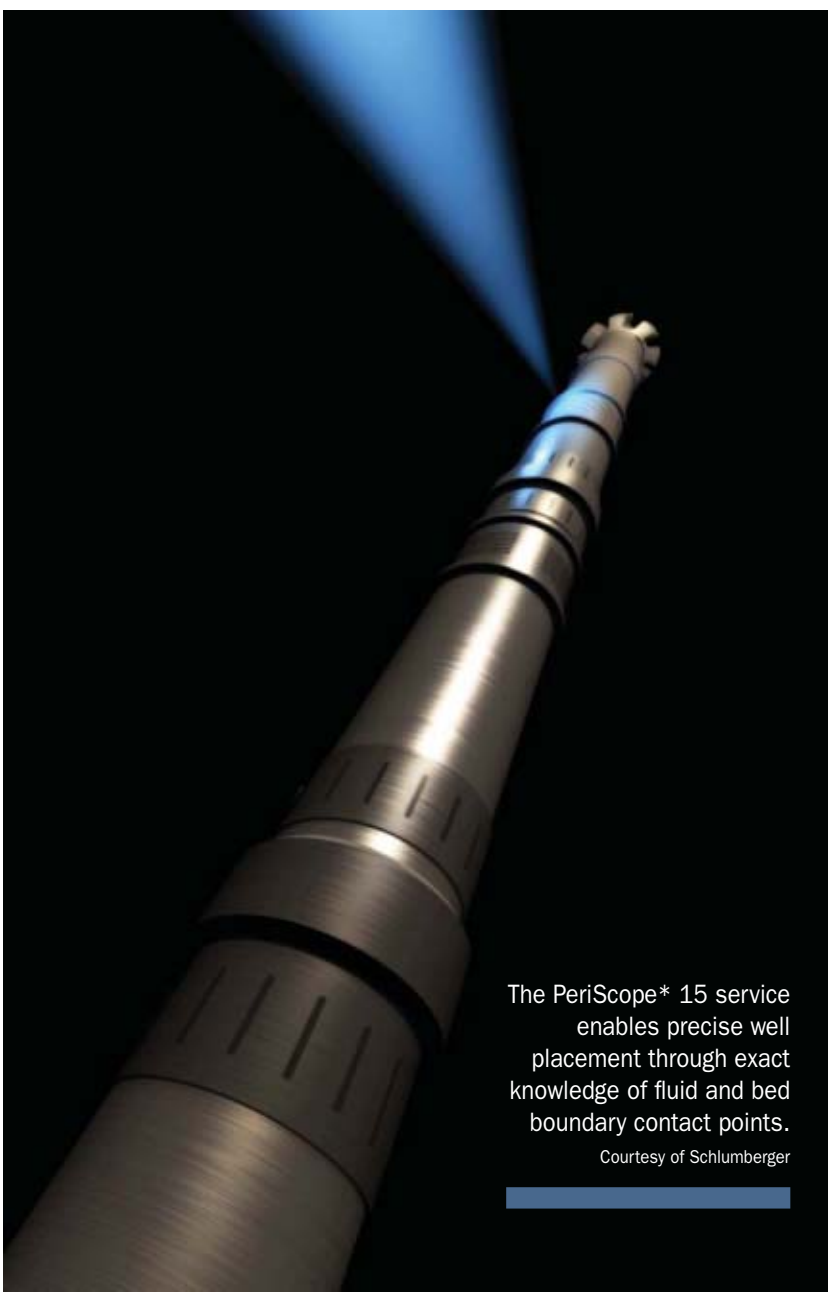
"The bulk of the OSCs are focused on the drilling operations," Gorski said, "but many of the OSCs provide monitoring of various other disciplines such as wireline and fracing operations, for example. We have a center in Oklahoma that monitors the performance of wells with electrical submersible pumps."

OSCs can be configured to meet specific operator objectives. These options include Schlumberger's in-house OSCs for short-term projects, or dedicated full-support centers built in the operator's offices for larger, longer-term projects. The levels of service provided by the company's OSCs also are tailored to meet the customer's requirements. Some operators and projects might require more service offerings than others. Schlumberger meets its customers' needs by offering three levels of service, each providing a higher level of solutions.

Remote monitoring locations are established worldwide, with differing functions. For example, the company' OSCs that monitor LWD and MWD operations are located in Youngsville, LA; Aberdeen; Calgary; Ciudad del Carmen, Mexico; and Port Gentile, Gabon. Experienced LWD and directional drilling engineers provide operational support for LWD and MWD field crews as well as monitoring operations for trends in pore pressure and real-time tool performance, downhole shocks and other exploration mechanics data.

Stimulating and completing horizontal wells

The next stage after landing and understanding the horizontal well is executing and optimizing the completion. In many instances, tight gas sands and gas shale plays require not only an optimal completion system but successful fracturing and stimulation of the formation.



The PeriScope* 15 service enables precise well placement through exact knowledge of fluid and bed boundary contact points.

Courtesy of Schlumberger

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"The hydraulic fracture mapping becomes very important from the standpoint of assuring that the fracture stays in the formation," Gorski explained, "and that you are opening the reservoir itself rather than running into dangers of fracturing a nearby water sand, for example."

The company's StimMAP LIVE diagnostic service optimizes the fracture treatment by mapping the fractures while they are being created. This is accomplished by analyzing micoseismic events created during the fracturing process and automatically locating them in 3D space. The heart of the service is a processing platform that automatically detects and locates microseismic events. It then incorporates the processing tool into hydraulic fracturing operations to ensure identification and location of microseismic events orders of magnitude faster than hand picking, enabling operators and technicians to make better onsite decisions.

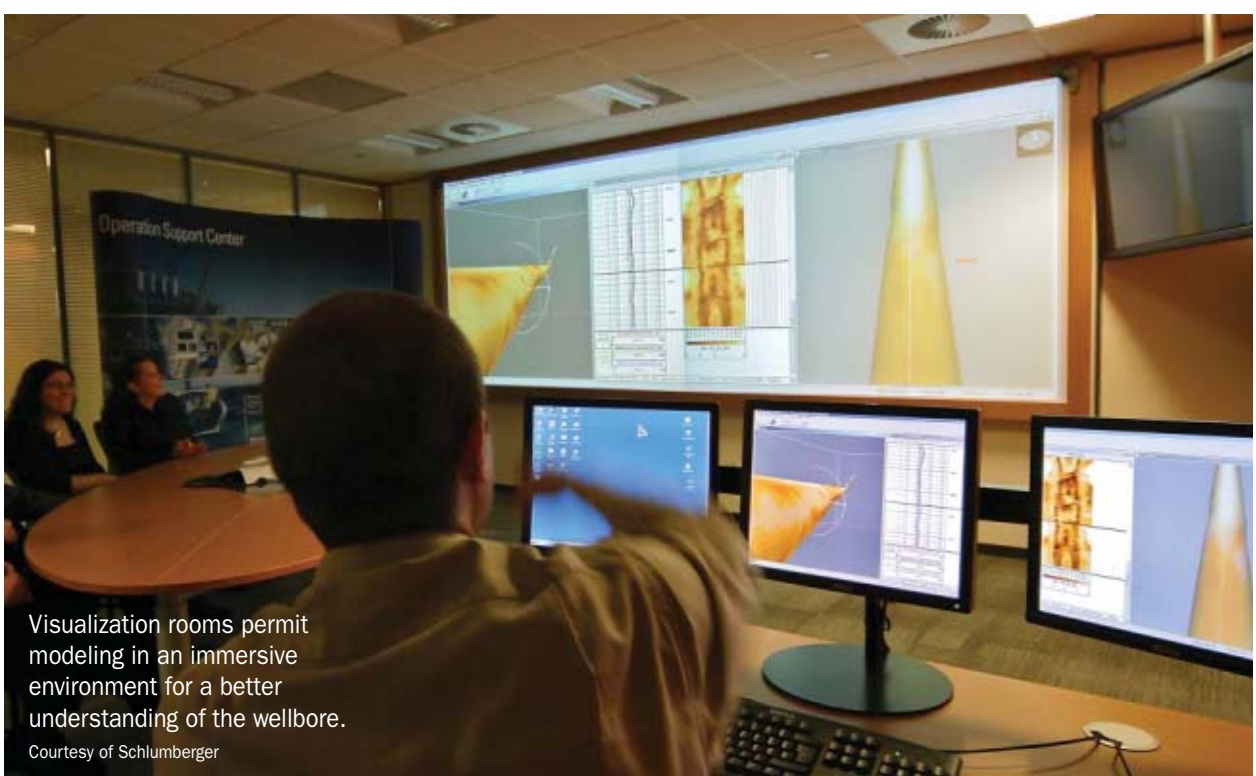
The company recently introduced its StimMORE fluid diversion service for diverting fracture treatments along a wellbore in cemented or openhole completions for shale fracturing applications. Used in combination with StimMAP LIVE, StimMORE allows real-time optimization of the fracture treatments. The service can be used in most well geometries and is ideally suited to cased and openhole horizontal wellbores up to a maximum of 250°F. The service also is especially well-suited for use in shale formations.

The diversion slurries can be pumped on the fly as part of the main treating fluid, diverting the fracture as needed based on the real-time integration of microseismic data. The slurries are based on standard fracturing fluids and proppants, with the addition of a proprietary mix of materials that enable fracture diversion. The technologies allow the operator to create complex drainage patterns within the reservoir, enabling access to reserves that may otherwise have been left in place.

The StimMORE re-fracturing treatment was applied to a major operator's horizontal well in the Barnett Shale. The well's initial gas production of 2,200 Mcf/d declined to less than 500 Mcf/d over a four-year period. The StimMORE service coupled with the StimMAP Live real-time fracture monitoring service enabled sufficient and cost-effective coverage of previously unstimulated well sections, resulting in a net increase in estimated ultimate recovery of 0.7 billion cubic feet.

Better seismic imaging and interpretation

Of course, before drilling and ultimately completing a well, attaining seismic to help characterize the reservoir and formation is paramount. Seismic surveys and interpretation



Visualization rooms permit modeling in an immersive environment for a better understanding of the wellbore.
Courtesy of Schlumberger

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Typical multiple fractures enabled by StimMORE* service in the Barnett Shale. Courtesy of Schlumberger

technology is significantly ahead of where the industry was only a few years ago. In one example, an operator in the Rocky Mountains conducted 2D seismic surveys and interpretations but then came back and surveyed the area with 3D seismic, greatly enhancing his ability to characterize the reservoir before drilling his first well.

"Seismic is the exploration tool of choice. The recent technology advances in acquisition and processing allows for improved reservoir characterization, that is before you begin turning to the right," Gorski said.

Better reservoir characterization through better seismic, coupled with new technologies and applications in imaging and algorithms to interpret the data, results in better information before spudding the well. In some cases, operators don't have to take the time and expense of exploring a pilot hole first to make certain they are in the correct well section and then kick off toward the target formation.

With PeriScope, and other technologies that enable real-time monitoring, there are many regions today that don't require the expense of drilling a pilot hole. This allows the exploration of multiple wells from a single well pad. For example, in the Piceance Basin in the Colorado Rockies, one operator is drilling as many as 22 wells from a single pad, all of them directional. This process not only allows the operator to bring his production on line quicker from the first 4-6 wells but to continue exploring the remaining wells while sending the natural gas to the sales line. In effect, the gas sales from the first 4-6 wells pay for the entire 22-well pad drilling program.

This procedure also saves the operator time and money by not having to move the rig from one location to another. Additionally, the exploration and fracturing process is environmentally friendly since the drill site is significantly smaller than a typical onshore drilling location. Another environmental positive that also results in lower overall cost is water conservation. Water that is used for the drilling fluid, after it is cleaned, also can be used for well stimulation and fracturing processes, and then reused again for drilling fluids.

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TIPRO looks ahead,

plans for future in changing industry and political landscape

In 2008, 62 years after its founding in 1946, TIPRO began an ambitious and visionary strategic planning exercise to guide it through the next decades as a result of extraordinary changes in the industry and the political landscape that took place during the past couple of years. This tremendous undertaking involves the entire TIPRO membership. We hired a prominent industry planning and development consultant, who brought extensive oil and gas industry experience with several major operators as well as IT experience.

The first phase of the strategic planning effort included initial planning meetings attended by about 20 TIPRO members, including former presidents, board members, committee chairs and founding members.

The attendees also reviewed TIPRO's original objectives contained in the organization's 1946 charter, and then participated in several exercises aimed at drafting a new mission statement, a list of core values and a vision statement for the Association.

"In reviewing the original charter documentation, it was interesting to see how relevant the issues still are" said Donna Warndof, TIPRO's Director of Public Affairs. "We also were able to bring new issues to light."

The next phase of the planning involved the entire TIPRO membership, who was asked to provide their input. We sent a draft version of the vision statement to the entire membership with a survey form to be submitted for feedback. A revised vision statement will be based upon membership feedback.

"This vision document will help the Association create multi-year plans to enhance our current efforts, increase member participation and adapt our communications to better represent the exploration and production sector," explained TIPRO Executive Vice President Adam Haynes.

"We are actively seeking and soliciting new members," Haynes continued. "As new companies are formed or new ventures occur, we are in communication with those entities, making sure they know that TIPRO is here for them.

"Our members are very smart and they understand the benefits of joining together to help ensure laws and regulations for our industry continue to be favorable. Our members support TIPRO's work so they can have a voice in government," Haynes continued.

American oil and gas demographics is changing

Change is affecting the oil and gas exploration sector. Two of the industry's challenges are the age of its participants and the "urbanization" of the industry. The average age of the industry's professionals is in the 50s. For the past couple of years, the industry has been trying to attract new engineers, geologists, geophysicists, geoscientists and other engineers in their 20s that are just out of college. The industry has had some success of this recently, but even with more money, better incentives, sign-on bonuses, full-ride scholarships, and specialized community college program development, the supply of professional or even skilled workers is not keeping up.

The American oil and gas industry sometimes encounters a shortage of students with technical degrees who are born in the U.S. As a result, some companies are looking internationally for qualified personnel to work in U.S. companies, resulting in a more diverse workplace. However, this sometimes creates issues that need to be overcome. For example, foreign students may run into language or culture barriers. Fortunately, independent producers are adept at meeting changing circumstances and adjust well to the new operating norms.

Additionally, trying to hire a foreign worker can sometimes be difficult due to U.S. immigration laws. Major oil and gas companies have been hiring foreign workers for decades but for independents, and particularly

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smaller companies, it can be difficult to negotiate the complex set of laws and bureaucracies.

"It's a definite demographic challenge for the industry, especially when our preference has always been to hire Americans first," Warndof said.

As far as the urbanization of the industry is concerned, Warndof said, "the low hanging fruit in terms of finding and producing oil and gas has been picked. Now we are moving into the more difficult areas, untraditional formations in new places, and that includes urban areas."

"The pace and scale of worldwide urbanization is new in history. The latest demographics point out that this decade will see 50% of the world's population is living in what is defined as an urban area," Warndof noted.

"We know that is the future," she said, "and we are going to have to find ways to meet it."

The challenges of urban exploration and production include focusing on technologies such as water recycling or making drilling rigs quieter and less intrusive. "There is a lot of pride in the fact that we are developing these technologies and best practices under U.S. laws," Warndof said. "We are on the cutting edge of best practices and it is going to spread worldwide."

New programs, initiatives for the future

TIPRO is in a transition phase for the entire organization, and that includes educational programs, seminars and publications. The association produces a twice-monthly newsletter for its membership, but it also has begun growing different types of publications. For example, more white papers on different issues are being prepared for legislators as well as the public and TIPRO membership.

Along the lines of more effective communication is a revamping of the Association's website. The website was redesigned to be more user-friendly and will be used to better educate the public about the state's independent operators. People seeking information about TIPRO or the independent operators, whether it is a policy maker, elected official, a citizen or one of the association's members, will be able to find it on the new website. It is a great tool for TIPRO members.

"For a policy maker or elected official who reads hardcopy paper reports, storage will no longer be an issue because TIPRO's white papers will be available online," Warndof said. "If you are a citizen looking for a particular article, you won't have to write or email us to send it because it will be online and searchable."

Other publications are aimed at smaller companies that don't have departments devoted to work with new regulations. For example, check lists have been produced by TIPRO to help small companies meet legal requirements when new regulations are implemented that affect them. "We have provided summaries to our members in the past but we are seeing that they need to be more specific," Warndof explained.

The association has conducted workshops as well when new regulations are implemented, such as workshops to better understand and meet legal filing requirements for new tax regimes. While the workshops are not usually conducted on a regular schedule due to the nature of the timing of new regulations (the Texas legislature meets for 140 days every other year), the association has conducted workshops more frequently during 2008.

At the beginning of 2008, for example, new franchise tax laws went into affect. TIPRO conducted several

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workshops in different parts of the state explaining what E&P companies needed to know about the new tax law. "They were well attended and we received good feedback," Warndof said, "so we likely will conduct more in the future."

These particular workshops were more interactive than previous events. Several different people spoke to the groups during the one-day workshop, and attendees were able to bring their forms and questions and receive answers. The workshops were tailored specifically to the E&P industry, and that will be the template for future similar endeavors.

For example, as the Clean Air Act requirements change for Texas, workshops that typically would be available from organizations other than TIPRO might focus on refineries. That is not where TIPRO's membership would learn what they need to know. As a result, the association's workshops will be geared for the independent operators discussing the regulations that apply to compressors and timelines for when they need to be changed, for example.

Issues in the 2009 Texas legislative session

The Texas legislature meets for 140 days every other year. As a result, the legislature typically focuses on issues to take the state through the following 24 months. Topics generally include the state budget, transportation, education and health and human services issues. Some of those are recurring issues and likely will be the major topics in 2009 as well.

"For our industry, as legislators are spending time on these big ticket items, our job is to focus on our issues," said Lindsey Dingmore, Manager of Government and Regulatory Affairs for XTO and TIPRO's State Issues Committee Chairman. "In the grand scheme, they might be considered by some to be small issues, but they are our important issues, and we will constantly push them to the front whether we support or oppose an issue."

Dingmore believes the important oil and gas issue for the 2009 legislative session will be tax issues. "There are going to be some key tax issues on what is called the Texas margin tax, which is a relatively new tax for our members," he said.

This tax formerly was called the franchise tax, however, it is not exactly the same tax since the legislature has broadened it. "Now more TIPRO members pay that tax, so some potential changes to the margin tax will be important to our members," Dingmore explained.

Property tax also will be a large issue, one of a number of issues related to the valuation of minerals and personal property in the oil and gas sector.

The margin tax applies to taxation of a business's gross receipts. The property tax applies to properties that companies own as well as minerals, which are assessed a valuation as a person's home would be assessed a valuation. School taxes, county taxes, road taxes, etc. are paid based upon the mineral valuations.

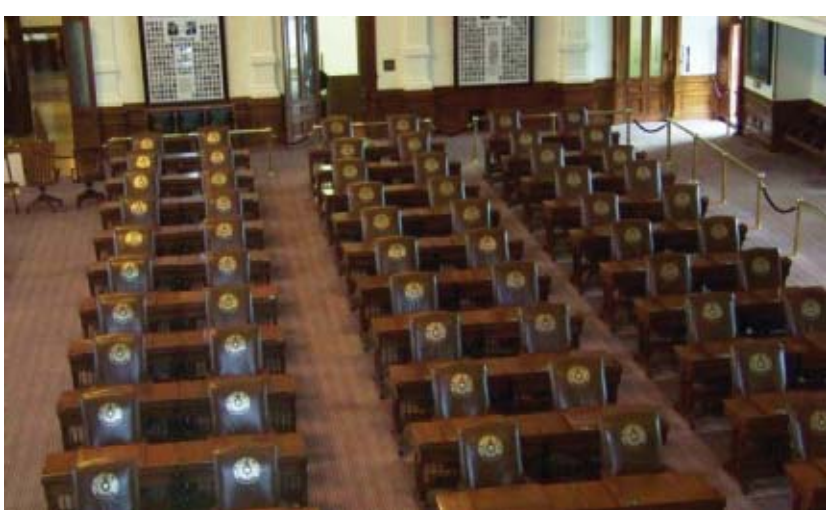
"Eminent domain also will be a large issue for our membership," Dingmore said, "especially those members that are producing in areas where new infrastructure needs to be installed, such as the Barnett Shale."

There are new wells in the Barnett Shale and along with that comes the necessity to lay new pipelines. Some of TIPRO's members own either separate entities that lay pipe or they lay pipe as a producer, Dingmore noted. "Sometimes they have to use the power of eminent domain to cross property with the pipelines, and those issues will be discussed in the next legislative session."

Water will be another issue discussed in the 2009 legislative session. Texas is growing rapidly and there continues to be a strain on our surface and ground water resources. Water is a major component of the oil and gas production process so TIPRO will monitor those discussions closely.

"Without water our exploration process comes to a halt pretty quickly," Dingmore emphasized. "If there is going to be restrictions, fees or permitting processes to access water, we want to be a part of that debate."

Adequate funding of the Texas Railroad Commission (RRC) is something



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Courtesy of Cristina Cornejo

that TIPRO always watches closely during the legislative session. "Is the agency getting the funding they need for personnel and other things," Dingmore asked, "and is it going to be able to fulfill its function?"

For example, "if there are bad actors in our industry, we want the laws enforced for those who consider ourselves good actors," Dingmore explained.

The Texas exploration and production industry also wants to assure that the permitting function of the RRC is well funded because the industry needs permits approved within a reasonable time frame. Additionally, TIPRO is interested in assuring that the Oilfield Cleanup Fund, which is entirely funded through fees paid by the industry, is sound and used to clean the environment. As such, producers want to ensure the rules governing the Fund are adequately implemented and administered by the RRC. TIPRO was a strong supporter of increasing the fund to assure that orphaned wells were properly plugged.

"We have a great interest in seeing that the Oilfield Cleanup Fund continues as we originally designed it," Dingmore said. TIPRO has also participated in an industry study group on the relationship of inactive wells to the Cleanup Fund. Warndof, who chairs the group, comments, "This group will make recommendations for a menu of steps that will help keep inactive wells from increasing liability to the OFCU and also from provoking disputes with surface owners. We are proud to take another proactive step in stewardship."

TIPRO also becomes involved when the RRC goes through the sunset review process with the legislature. During the sunset review process, each state agency is examined with greater scrutiny than during the normal legislature. Agencies that do not meet certain criteria may not be allowed to continue to exist.

"A sunset review is a funding as well as a programming scrutiny opportunity," Dingmore explained. "We are very involved in that process because the legislature wants to find out if an agency is doing the things it should be doing and if it is doing them efficiently.

"Among other things, the legislature debates whether an agency should have broader or more restricted authority to implement its functions," Dingmore concluded.

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1 Emission reductions vary by type of vehicle and type of pollutant. 2 U.S. Dept. of Energy, EIA: "Natural Gas Issues and Trends." 3 Navigant Consulting, Inc., July 4, 2008.
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