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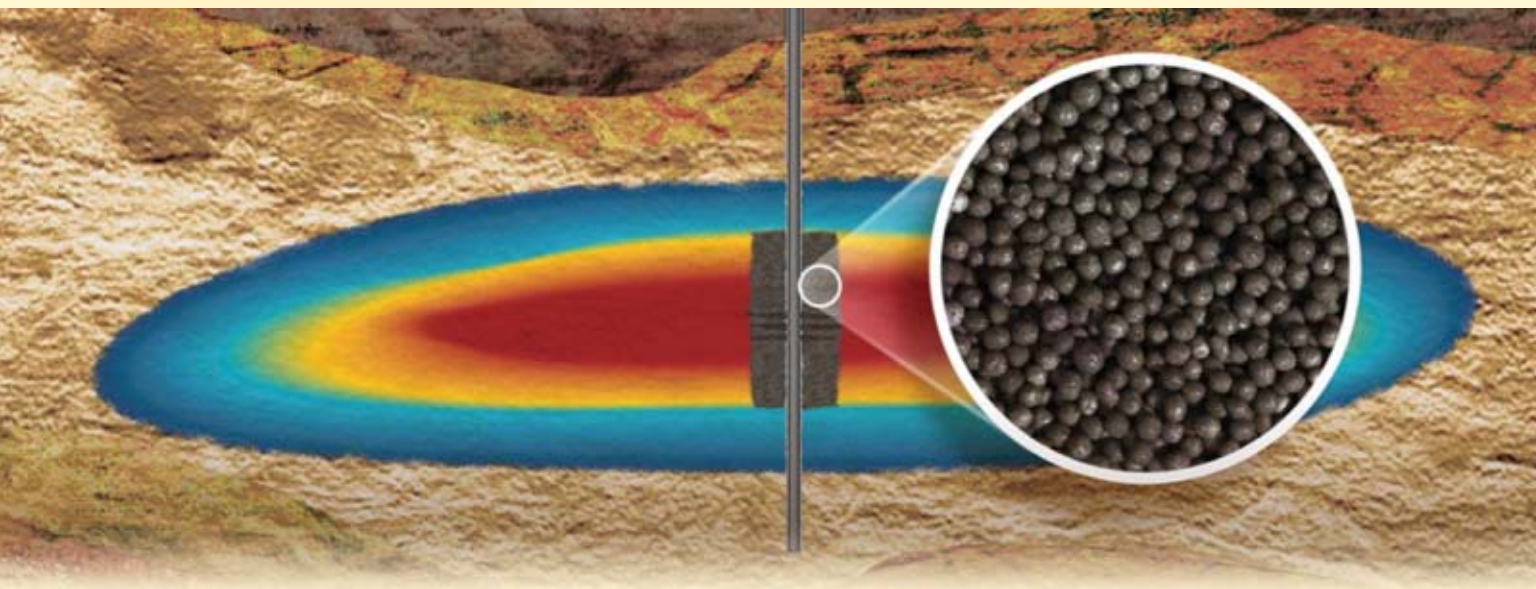
Completion Methods

EPRINC: Cap and trade will hurt and help oil industry
Abu Dhabi's Shah field sour gas-condensate project on track
US refinery investments align with oil sands supplies to 2015
Control of black powder requires multiple approaches

OIL&GAS JOURNAL®

Aug. 18, 2008
Volume 106.31

COMPLETION METHODS



REGULAR FEATURES

COVER

Completing a well involves setting casing, finishing the reservoir section, installing downhole "jewelry," and installing the wellhead. This week's special report, Completion Methods, begins on p. 48 with an article about Shell's optimized well completions in Pinedale gas field, western Wyoming. The cover photo by Nina M. Rach shows wellheads on Shell's Mesa 29B pad at Pinedale. Straddle packers offer a way to isolate production or injection zones above or below the packers. The second article in the special, beginning on p. 54, provides two examples of North Sea completions and one off Brazil to illustrate the use of straddle packers. Above, the header shows resin-coated proppant, perforations, and stylized fracture zone (image from Hexion).

General Interest

Exploration & Development

Drilling & Production

Processing

Transportation

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Aug. 18, 2008

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General Interest — Quick Takes

Chavez further expands PDVSA's role in economy

Venezuelan President Hugo Chavez, as part of a wider set of reforms for his country, has decreed changes to the statutes of state-owned Petroleos de Venezuela SA (PDVSA).

According to a copy of the Official Gazette, Chavez has given PDVSA the responsibility of "participating in ventures intended for the sustained, organic, and integral development of the country, including agricultural [and] industrial activities."

The changes, which purportedly aim at integrating the oil and gas industry more closely with other sectors of the national economy, also free members of the PDVSA board to actively participate in political activities—subject to Chavez's approval.

The new decree is in line with similar efforts by Chavez last year to expand the role of the state oil company. At the time, PDVSA created a series of units that included a construction company and an agricultural business unit, among others.

The decree is part of 26 new laws approved by Chavez on July 31, when the 18-month decree powers bestowed on him by Congress were set to expire. The powers enabled Chavez to issue decrees without any input from the legislature.

Brazilian platform worker union cancels strike

The Sindipetro-NF union, which represents oil and gas platform workers in Brazil, has decided to cancel a strike against state-owned Petroleo Brasileiro SA (Petrobras) originally planned to begin on Aug. 5 (OGJ Online, Aug. 4, 2008).

Workers originally called for the strike in an effort to win payment from Petrobras for the time they spend traveling from their platforms. The workers, who work 14 days on platforms and then have 21 days off, wanted Petrobras to count the 15th day—spent in transit—as a working day.

The union agreed to call off its planned strike after Petrobras offered to count the 15th day as half-time and also make it retroactive to 2005.

A 5-day strike by the platform workers over the same demand caused Petrobras to lose some 63,000 b/d of production in the Campos basin in mid-July. It is the second time in a week that Petrobras has been able to avert potentially disruptive labor actions by its workers.

Earlier, the Federacion Unica de Petroleros called off its nationwide strike—planned for Aug. 5—after Petrobras agreed to meet the demands of the workers for increased profit-sharing. In an effort to avert the nationwide strike, Petrobras agreed to raise the amount of profit shared with workers to 15% from 13%. It also agreed to improve its distribution of profits, which for the most part were given largely to managers and high-level executives. ✦

Exploration & Development — Quick Takes

Petrobras finds oil with Iara well off Brazil

A consortium comprised of Brazil's state-owned Petroleo Brasileiro SA (Petrobras), BG Group, and Galp Energia has made an oil discovery on Block BM-S-11 in the presalt layers of the Santos basin off Brazil.

The 1-BRSA-618-RJS discovery well, informally know as Iara, was drilled 230 km off Rio de Janeiro in 2,230 m of water.

Petrobras said the discovery was proved by "a light oil sampling collected via a cable test carried out in reservoirs at a depth of 5,600 m." The well, which yielded oil of 30° gravity, is still being drilled in search of deeper prospects.

Petrobras, operator, holds a 65% stake in the consortium, while BG holds 25% and Galp 10%.

BG makes oil find in Norwegian North Sea

BG Norge AS has reported finding oil in exploration well 34/3-1 S in the Norwegian North Sea.

The Norwegian Petroleum Directorate (NPD) said the well was drilled on production license 373 S and reached a total vertical depth of 4,057 m below sea level. Oil was discovered in a Jurassic reservoir, and the well was completed in the Triassic.

The well is northeast of StatoilHydro's Snorre field. "A comprehensive data acquisition program has been carried out. The resource potential will now be evaluated with a sidetrack," the NPD added.

Dolphin AS's Bredford Dolphin semisubmersible rig drilled the well in water 410 m deep. Production license 373 S was awarded in the 2005 Awards in Predefined Areas licensing round.

The well will be permanently plugged and abandoned once the sidetrack is completed. The rig will then move to PL 338 and drill appraisal well 16/1-8 for Lundin Petroleum.

VNG gains acreage in Norway

Verbundnetz (VNG) Gas AG has agreed to buy shares of three production licenses off central Norway that are held and operated by Norway's DNO AS.

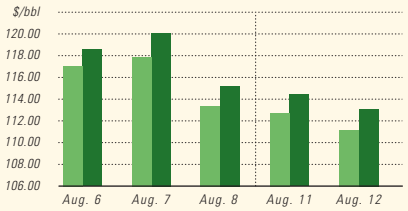
The deal requires Norwegian authority approval before it becomes effective starting from Jan. 1.

VNG Norge will acquire a 30% interest each in Fongen (PL 380) and Struten (PL 383). An exploration well is expected to be drilled on each license in 2009. VNG has agreed to carry 30% of DNO's drilling cost related to the two wells.

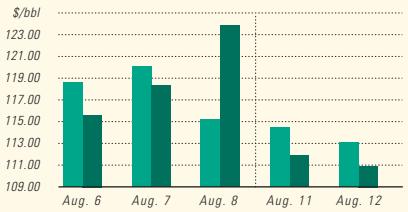
DNO also has sold a 20% interest in the Litjormen prospect (PL 447) to VNG, reducing its ownership from 50% to 30%. DNO

Industry Scoreboard

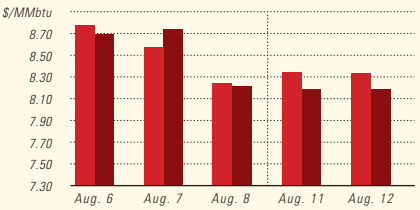
IPE BRENT / NYMEX LIGHT SWEET CRUDE



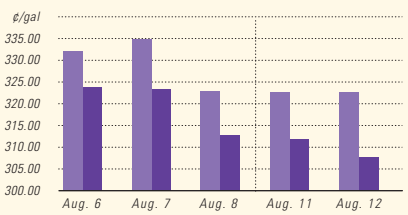
WTI CUSHING / BRENT SPOT



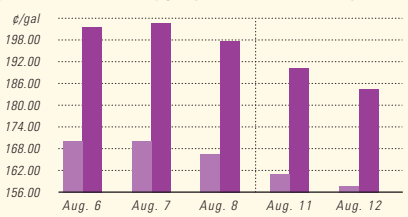
NYMEX NATURAL GAS / SPOT GAS - HENRY HUB



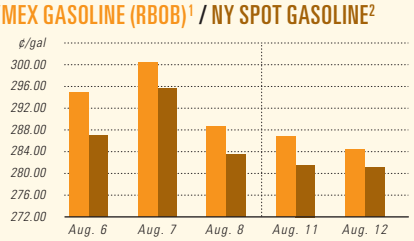
IPE GAS OIL / NYMEX HEATING OIL



PROPANE - MT. BELVIEU / BUTANE - MT. BELVIEU



NYMEX GASOLINE (RBOB)[1] / NY SPOT GASOLINE[2]



[1]Reformulated gasoline blendstock for oxygen blending.
[2]Non-oxygenated regular unleaded.

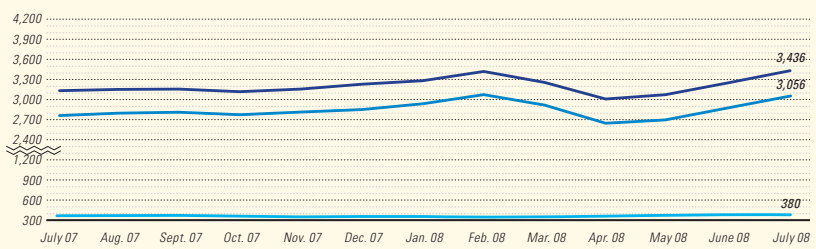
US INDUSTRY SCOREBOARD — 8/18

Latest week 8/1	4 wk. average	4 wk. avg. year ago[1]	Change, %	YTD average[1]	YTD avg. year ago[1]	Change, %
Demand, 1,000 b/d						
Motor gasoline	9,410	9,627	–2.3	9,115	9,267	–1.6
Distillate	4,139	3,998	3.5	4,132	4,223	–2.2
Jet fuel	1,548	1,667	–7.1	1,562	1,627	–4.0
Residual	608	659	–7.7	620	741	–16.3
Other products	4,425	4,717	–6.2	4,767	4,822	–1.1
TOTAL DEMAND	20,130	20,668	–2.6	19,962	20,712	–3.6
Supply, 1,000 b/d						
Crude production	5,159	5,096	1.2	5,131	5,123	0.2
NGL production[2]	2,247	2,491	–9.8	2,232	2,366	–5.7
Crude imports	10,199	9,911	2.9	9,844	10,017	–1.7
Product imports	3,148	3,785	–16.8	3,198	3,598	–11.1
Other supply[3]	1,405	1,070	31.3	1,413	1,062	33.1
TOTAL SUPPLY	22,158	22,353	–0.9	21,818	22,166	–1.6
Refining, 1,000 b/d						
Crude runs to stills	14,908	15,681	–4.9	14,908	15,163	–1.7
Input to crude stills	15,125	15,915	–5.0	15,125	15,449	–2.1
% utilization	86.3	91.2	—	86.3	88.5	—

Latest week 8/1	Latest week	Previous week[1]	Change	Same week year ago[1]	Change	Change, %
Stocks, 1,000 bbl						
Crude oil	296,863	295,249	1,614	340,395	–43,532	–12.8
Motor gasoline	209,216	213,560	–4,344	202,997	6,219	3.1
Distillate	133,346	130,505	2,841	127,516	5,830	4.6
Jet fuel–kerosine	41,429	41,745	–316	41,340	89	0.2
Residual	36,545	38,029	–1,484	38,607	–2,062	–5.3
Stock cover (days)[4]			Change, %		Change, %	
Crude	19.5	19.3	1.0	21.5	–9.3	
Motor gasoline	22.2	22.8	–2.6	21.0	5.7	
Distillate	32.2	31.3	2.9	31.2	3.2	
Propane	44.9	45.5	–1.3	48.1	–6.7	
Futures prices[5] **8/8**			Change		Change	%
Light sweet crude ($/bbl)	118.88	124.57	–5.69	76.77	42.11	54.9
Natural gas, $/MMbtu	8.61	9.23	–0.62	6.25	2.36	37.8

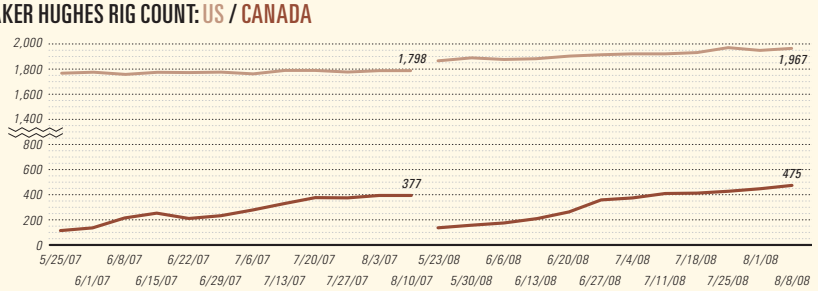
[1]Based on revised figures. [2]Includes adjustments for fuel ethanol and motor gasoline blending components. [3]Includes other hydrocarbons and alcohol, refinery processing gain, and unaccounted for crude oil. [4]Stocks divided by average daily product supplied for the prior 4 weeks. [5]Weekly average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

has acquired 3D seismic for PL 447, which was awarded in June 2007, but has not yet made any firm decisions about exploratory drilling.

Gas production begins at Tunisia's Chergui field

Petrofac Energy Developments began natural gas and condensate production Aug. 8 from Chergui field on Kerkennah Island in Tunisia. The $100 million development produced first commercial gas from two wells.

The central production facility can process 20 MMscfd of gas. Tunisian state gas and electricity company, Societe Tunisienne de L'Electricite et du Gaz (STEG) is buying the output, which is delivered via a 57 km pipeline to shore where it ties into STEG facilities at Ain Turkia near Sfax on its main pipeline to Tunis.

Production plateau rates of 20 MMscfd are expected for at least 4 years.

"Future potential gas development opportunities may extend the production plateau and the ultimate life of the field," said Petrofac. It operates the field and holds a 45% interest. Its development partner, Tunisian state oil company Entreprise Tunisienne D'Activities Petrolieres holds the remaining 55%. ✦

Drilling & Production — *Quick Takes*

ExxonMobil brings Kizomba C on production

ExxonMobil Corp. has begun oil production from Saxi and Batuque fields, which are part of the Kizomba C development project on Block 15 off Angola.

Production from the two fields, along with Mondo, which started production in January, is expected to reach 200,000 b/d later this year. Output from Block 15 will be 700,000 b/d when Saxi and Batuque fields reach peak production, ExxonMobil said.

Oil is produced via two floating production, storage, and offloading vessels and 36 subsea wells. It is the largest subsea development operated by ExxonMobil worldwide.

The twin Kizomba C FPSOs are the fourth and fifth production centers on Block 15, following Kizomba (2003), Kizomba A (2004), and Kizomba B (2005).

It is estimated that Kizomba C will produce 600 million bbl of oil over its lifespan.

StatoilHydro, a partner in the development, described Angola as a key building block for its international production growth. So far its nine producing fields contribute more than 200,000 b/d of equity production. It holds a 13.33% stake in Block 15.

Block 15 is operated by ExxonMobil, holding a 40% stake. Angola's state-owned Sonangol is concessionaire.

Turkey's Thrace basin gas to flow in 2009

A group led by Incremental Petroleum Ltd., Perth, plans to start gas production in mid-2009 from the Edirne license in the Thrace basin northwest of Istanbul.

Turkish authorities granted the group a wholesale license that allows gas sales to the national grid, and the group awarded contracts for the design and engineering of a gas processing plant and pipeline.

Uhde Shedden of Australia won the gas plant contract, and Boral of Turkey will design and route the pipeline. Uhde designed the plant for Zorlu, formerly Amity, field 70 km from Edirne.

The joint venture of Incremental, operator with 55% interest, Otto Energy Ltd., Perth, 35%, and Petrako Energy 10%, has made six new field gas discoveries on the license since 2004.

The joint venture will be Turkey's first to produce and sell onshore gas into the Botas gas distribution network. It will be able to sell gas anywhere in the country at the best price it can negotiate. The current Botas price is about $14.70/Mcf.

Incremental is also involved in an oil and gas exploration project on 30,000 acres in the Tuz Golu basin south of Ankara.

Jubilee field partners lease FPSO from MODEC

Tullow Ghana Ltd., operator of Jubilee oil field off Ghana, has signed a 7-year lease agreement in which Tokyo-based Mitsui Ocean Development & Engineering Co. Ltd. (MODEC) will provide and operate the floating production, storage, and offloading vessel for Jubilee field. The contract includes 13 1-year options, with the FPSO designed to remain in the field for as long as 20 years.

Jubilee, one of the largest oil fields discovered off West Africa in the past 10 years, is estimated with 90% probability to hold 170 million bbl of recoverable oil. However its suggested upside could be as much as 1.8 billion bbl of oil, Tullow reported following recent drillstem tests in two oil-bearing zones from the field's Mahogony-2 appraisal well (OGJ Online, July 16, 2008).

The tests indicate that a Jubilee production well should produce more than 20,000 b/d of 36-39° gravity oil, Tullow said. Initial field production is expected in 2010.

MODEC will install the FPSO in 1,100 m of water as part of the first phase of Jubilee's development plant. The FPSO will have the capacity to process more than 120,000 b/d of oil and to inject more than 230,000 b/d of water and 160 MMscfd of gas.

In addition to Tullow, Jubilee field partners include Kosmos Energy Ghana, Anadarko Petroleum Corp., EO Group, Sabre Oil & Gas, and Ghana National Petroleum Corp.

Northern Offshore to acquire Arctic semi rigs

Northern Offshore Ltd. has entered into agreements with affiliates of Transocean Inc. to acquire for $750 million the semisubmersible drilling rigs GSF Arctic II and GSF Arctic IV, currently operating in the UK North Sea under contract to Royal Dutch Shell PLC.

The transactions will complete Transocean's previously reported divestitures to the Office of Fair Trading in the UK related to Transocean's merger with GlobalSantaFe Corp. in November 2007. As part of the approval process, Northern Offshore will operate the rigs in the UK North Sea for at least 3 years from closing.

The rigs are both third-generation Friede & Goldman Enhanced Pacesetter design and can operate in water as deep as 1,200 ft for the GSF Arctic II and 1,500 ft for the GSF Arctic IV. Both rigs can drill to depths of 25,000 ft. The GSF Arctic II is contracted through

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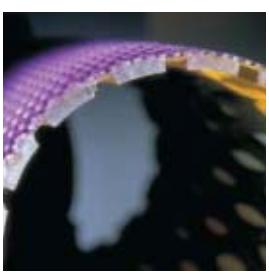

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late 2008 at rates exceeding $400,000/day. The GSF Arctic IV is contracted until September 2010.

The sale of the GSF Arctic IV is expected to close late in the third quarter and the GSF Arctic II in the fourth quarter following completion of its existing contract commitment.

Under the agreement, subsidiaries of Northern Offshore will own the rigs. Northern Offshore Ltd.'s current fleet consists of one floating production facility and five drilling units—a drillship, a semisubmersible, and three jack up rigs. ✦

Processing — *Quick Takes*

Placid Refining installs FCC reactor

Placid Refining Co. installed a 230-ton fluid catalytic cracking reactor at its Port Allen, La., refinery, marking a major milestone in the company's $300 million expansion.

Both project construction and turnaround maintenance are progressing on schedule, said refinery manager Joey Hagmann. "We anticipate restarting the improved refinery near the end of August," he said.

Workers oversee the day-long process of installing Placid Refining Co.'s new FCC reactor at its Port Allen, La., refinery. Photo from Placid.

Placid supplies 35-40% of the gasoline consumed in the Baton Rouge, La., area. When the full expansion is completed in 2010, the refinery's current production of about 1 million gpd of gasoline will increase to about 1.5 million gpd, and diesel production will increase to nearly 1 million gpd from about 750,000 gpd.

Valero breaks ground on Port Arthur expansion

Valero Energy Corp. broke ground Aug. 13 on a $2.4 billion expansion project at its 325,000-b/d refinery in Port Arthur, Tex.

The project, which includes the construction of a 50,000-b/d hydrocracker and 45,000-b/d coker, will increase the refinery's crude distillation capacity to 415,000 b/d.

"The Port Arthur expansion project emphasizes ultralow-sulfur diesel production, reflecting the significant projected growth in demand for diesel both in the US and around the world," said Bill Klesse, Valero chairman and chief executive officer, in a press release earlier this year.

The expansion is the company's largest-ever capital investment project. Valero expects the hydrocracker project to finish in fourth-quarter 2010 and the coker project to finish in second-quarter 2011.

Contracts have been awarded to Fluor Corp. for the hydrocracker project (OGJ Online, Aug. 7, 2008) and Technip for two processing units—a saturate gas recovery unit and an amine treating unit—and offsites work associated with the refinery expansion.

PCSP awards China chemical project

PetroChina Sichuan Petrochemical Co. Ltd. (PCSP) has selected the Unipol polypropylene (PP) process technology from Dow Technology Licensing for its new 450,000 tonnes/year PP facility at Chengdu, capital city of Southwest China's Sichuan province.

Aker Process BV, a wholly owned subsidiary of Aker Solutions ASA, Oslo, will carry out process design and technical advisory services.

When completed and on stream in 2010, the PCSP facility will be one of the largest single-train PP facilities in China, a part of PCSP's 800,000-tpy ethylene complex at Chengdu, the largest in Southwest China.

With this facility and others under construction at Fushun in Liaoning province and at QinZhou in GuangXi province, PCSP will have nearly 1 million tonnes of PP capacity available using the Unipol PP technology. Aker Solutions was awarded the contracts for basic engineering design and technical advisory services for each of the three plants.

The PCSP license agreement includes production capability for a broad range of PP resins, including homopolymers, random copolymers, and impact copolymers for various grades of plastics, Dow said.

When this plant and others currently in the execution stage enter service, Unipol PP technology will be used to produce nearly 11 million tpy of PP, which will represent more than 16% of total global capacity.

Valero lets $1.2 billion in expansion contracts

Valero Energy Corp. has awarded two contracts valued at a total $1.2 billion to Fluor Corp. for upgrades to its refineries at St. Charles, La., and Port Arthur, Tex.

Fluor will provide engineering, procurement, construction, and construction management services for Valero's unified hydrocracker expansion program. The installation of two hydrocracker units will enable the production of ultralow-sulfur diesel transportation fuels at the refineries.

Fluor will perform the expansion work from its Calgary, Houston, and New Delhi offices.

Flint Hills plans desulfurization unit

Flint Hills Resources LP, Wichita, Kan., plans to add a diesel desulfurization unit and a sulfur recovery unit to its 56-year-old West Plant, part of the company's 300,000 b/d Corpus Christi, Tex., refinery complex.

The sulfur recovery unit will enable the refinery to process additional feedstocks, including heavier and sour crudes, the company said.

Construction on the $250 million project likely will begin this

Is CP worthless?

What kind of question is this? Most in the pipeline industry agree that cathodic protection (CP) is the smart way to provide backup corrosion protection on underground pipelines.

But consider: If you use solid film backed corrosion coatings, you may be wasting money by adding CP to the pipeline.

There is a common sense reason for this statement. CP systems protect pipelines by delivering electrical current to the steel surface. Solid film back corrosion coatings have the property of *resistivity*, which means they *block* electrical current. This blocking effect is called *cathodic shielding.*

The phenomenon of *cathodic shielding,* or blocking of protective CP current, has been the subject of dozens of technical papers since the mid 1980's. You can review a cross section of these papers on Polyguard's website.You can also view a 10 minute explanation of the cathodic shielding process.

Worldwide, we estimate that over half of pipelines are being coated with solid film back coatings, such as shrink sleeves, tapes, and 2 or 3 layer systems. Most of these lines have CP systems. These are the operators who may be wasting their money on CP. Moreover, many install shielding coatings on girth welds, the most vulnerable area for corrosion.

Two corrosion coatings are proven to be non-shielding, and allow passage of protective CP currents. One of these coatings is FBE. The other is Polyguard RD-6.

NACE SP0169-2007 states: *"Materials … that create electrical shielding should not be used on the pipeline"* [1].

49 CFR §192.461 states: *"External protective coating …must …have properties compatible with any supplemental cathodic protection."* [2]

If you are concerned that your organization is behind this curve, we recommend:

1. **Visit polyguardproducts.com/failsafecoating.htm and review the large body of information about shielding problems.**

2. **Talk to operators who have used Polyguard's RD-6 system. *(There are many)* Ask them if they know of any serious corrosion or SCC ever found under RD-6. *(We don't, even after 19 years and thousands of installations).***

3. **Have someone in your organization attend the NACE course *"Coatings in Conjunction with Cathodic Protection"*.**

1. NACE SP0169-2007 *"Control of External Corrosion on Underground or Submergeed Metallic Piping Systems"*.
2. 49 CFR Ch.1 (§192.461 see also §195.559)

fall and is expected to take 18 months to complete, the company said.

Flint Hills's Corpus Christi complex is among the nation's lowest-emitting refineries. Latest data indicate air emissions of commonly regulated substances of 0.09 lb/bbl of oil refining capacity. The industry average is 0.19 lb/bbl of refining capacity.

The West Plant, which included a petrochemicals production operation, was purchased from Sun Oil Co. in 1981 and later combined with the adjacent Gulf States refinery, purchased a year later. In 1994, the $250 million midplant refining complex was completed with a capacity to process 150,000 b/d of crude oil. Kerr-McGee Corp.'s Southwestern Refinery on Nueces Bay Blvd. (now known as the East Plant) was acquired in 1995, and the complexes are operated as one refining and chemicals complex because of the addition of a state-of-the-art Central Control Center and pipelines connecting both facilities.

In 2001, the company began producing low-sulfur gasoline following a $32 million project. In 2002, the company spent an additional $145 million on projects that further increased the amounts of low-sulfur fuels produced and marketed.

Since 2002 Flint Hills has completed capital expansions and acquisitions worth more than $3 billion.

BP outlines cellulosic ethanol plans

BP PLC announced plans to invest $90 million in Verenium Corp. to accelerate the development and commercialization of cellulosic ethanol.

Verenium of Cambridge, Mass., will receive the investment from BP over the next 18 months for rights to current and future technology held within the partnership.

BP Biofuels North America said Verenium already has demonstrated an advanced technology for cellulosic ethanol production. Verenium recently opened a demonstration plant in Jennings, La.

BP and Verenium formed a special purpose entity (SPE) equally owned by the two. The SPE will serve as the licensing entity for cellulosic ethanol production.

Beyond the initial phase of this alliance, the companies expect to later form a joint venture. While the JV primarily will focus on US plants, the SPE technologies might be licensable to third-party commercial projects. ✦

Transportation — *Quick Takes*

FERC approves Midcontinent Express pipeline

Midcontinent Express Pipeline, a joint venture of Kinder Morgan Energy Partners LP and Energy Transfer Partners LP, received final US Federal Energy Regulatory Commission approval to construct its $1.27 billion Midcontinent Express gas pipeline (OGJ, Feb. 18, 2008, Newsletter).

The 506-mile interstate system will deliver as much as 1.5 bcfd of gas to customers in the southern and eastern US through 30-in., 36-in., and 42-in. gas transmission pipeline in Oklahoma, northeastern Texas, northern Louisiana, central Mississippi, and Alabama. The system also will include a 4.1-mile lateral in Louisiana and other related facilities, including 111,420 hp of compression at four new compressor stations and one booster station.

The pipeline is scheduled to be in service by early March 2009, the companies reported. FERC also approved a certificate authorizing Enogex Inc. to lease as much as 272,000 bcfd of capacity on its Oklahoma intrastate system to Midcontinent Express—a move that had been contested by several other companies but which FERC found not to be unduly discriminatory.

Mitsubishi drops California LNG plan, eyes Alaska

Mitsubishi Corp. subsidiary Sound Energy Solutions, faced with challenges in Southern California but eyeing new opportunities in Alaska, has abandoned plans to construct a regasification terminal at Long Beach, Calif.

The trading house, partnered by ConocoPhillips in the project, had planned to invest about ¥50 billion to build moorages for LNG carriers, regasification facilities, and storage tanks at the Port of Long Beach. But the project met with opposition from local residents fearful that the terminal could be a terrorist target or suffer an explosion. As a result of intense lobbying, the California state government decided to freeze approval screening for the terminal. Mitsubishi filed a lawsuit in response, but lost the case in April and chose not to appeal. It then decided to drop its plans after withdrawing its application with the federal government in early June.

In its filing with the US Federal Energy Regulatory Commission, Sound Energy Solutions said it was forced to withdraw its proposal after Long Beach harbor commissioners ended an environmental review on the project. Since then, Mitsubishi signed an agreement with the Alaska Gasline Port Authority (AGPA) to develop an LNG project in southern Alaska aimed at shipping Alaska North Slope gas to the Lower 48.

Under terms of the agreement announced June 20, Mitsubishi will work with the port authority in developing a spur pipeline to a gas liquefaction plant and export facility at Valdez, following the existing trans-Alaska oil pipeline from a point east of Fairbanks near Delta Junction (OGJ, Feb. 25, 2008, p. 32).

According to reports, Mitsubishi's interest lies in the liquefaction, transport, and marketing of LNG to Asia and possibly the US West Coast in conjunction with Sempra LNG, a subsidiary of Sempra Energy, San Diego.

In July, AGPA announced that Sempra LNG, which has regasification facilities just below the US-Mexico border, also had joined the Alaska project. AGPA noted in particular that Sempra LNG's Energia Costa Azul facility "is the only LNG receipt terminal on the West Coast of North America."

Bengal plans 55,000 b/d pipeline expansion

Bengal Pipeline Co. LLC, a joint venture of Shell Pipeline Co. LP and Colonial Pipeline, plans to add a pumping station near Garyville, La., to expand throughput capacity by 55,000 b/d of its products pipeline between Garyville and Baton Rouge, La.

The expanded portion is expected to be in service by early 2010, bringing Bengal's overall capacity to 305,000 b/d.

The Bengal pipeline system connects several refineries in southern Louisiana to the Plantation and Colonial pipeline systems. ✦

Calendar

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

OIL&GAS JOURNAL online

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

2008

AUGUST

ACS National Meeting & Exposition, Philadelphia, 1 (800) 227-5558, e-mail: natlmtgs@acs.org, website: www.acs.org. 17-21.

International Petroleum Petrochemical Natural Gas Technology Equipment Exhibition, Shanghai, +86 21 55611008, +86 21 65282319 (fax), website: postmaster@aiexpo.com.cn, website: www.sippe.org.cn. 20-22.

IADC/SPE Asia Pacific Drilling Technology Conference, Jakarta, (713) 292-1945, (713) 292-1946 (fax); e-mail: conferences@iadc.org, website: www.iadc.org. 25-28.

Deep Water India Summit, New Delhi, +31 (0)26 3653 444, +31 (0)26 3653 446 (fax), e-mail: workshops@energywise.nl, website: www.energywise.nl. 26-27.

Offshore Northern Seas Exhibition & Conference, Stavanger, +47 51 59 81 00, +47 51 55 10 15 (fax), e-mail: info@ons.no, website: www.ons.no. 26-29.

Summer NAPE Expo, Houston, (817) 306-7171, (817) 847-7703 (fax), e-mail: info@napeexpo.com, website: www.napeonline.com. 27-28.

SEPTEMBER

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

OCTOBER

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

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

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

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

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

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

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

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

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

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

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

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

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

Calendar

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

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

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

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

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

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

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

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

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

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

NOVEMBER

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

DECEMBER

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

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

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

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

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

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

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

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

PIRA Understanding Global Oil Markets Conference, New York, (212) 686-6808, (212) 686-6628 (fax), e-mail: sales@pira.com, website: www.pira.com. 10-11.

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

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

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

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

2009

JANUARY

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

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

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

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

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

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

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

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

Calendar

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.

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

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

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

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

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

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

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

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

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

MARCH

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

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

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

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

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

Turkish International Oil & Gas Conference & Showcase (TUROGE), Ankara, +44 (0) 207 596 5233,

Calendar

+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.

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

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

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.

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.

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

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.

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.

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.

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

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.

✦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.

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.

✦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.

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, +61 7 3802 2208, e-mail: jhood@appea.com.au. website: www.appea2009.com.au. 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.

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

✦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.

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.

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

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

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

IADC World Drilling Conference & Exhibition, Dublin, (713) 292-1945, (713) 292-1946 (fax), e-mail: conferences@iadc.org, website: www.iadc.org. 17-18.

AAPL Annual Meeting, Clearwater Beach, Fla., (817) 847-7700, (817) 847-7704 (fax). e-mail: aapl@landman.org, website: www.landman.org. 17-20.

Journally Speaking

The 'Twilight Zone' challenge

Sam Fletcher
Senior Writer

A 1963 episode of the popular television series, "The Twilight Zone," told of a rich executive who, with no new business challenges to conquer, made a deal with the Devil to return as a young man to his childhood home in the late 19th Century and build his fortune again with the hindsight of modern knowledge.

He used the limited investment funds allowed him to buy land he knew would be a future oil field, then told the sellers how he outsmarted them. But they already knew about the oil; they also knew it couldn't be developed with the cable-tool technology of that day. Not to be thwarted, the executive approached a blacksmith with an idea for building a rotary bit. "Sure," said the blacksmith, "just show me the plans and specifications." Having always exploited other people's abilities, the executive couldn't produce tools of the future and returned to his own time as a poor man.

That episode came to mind recently when former Vice-President Al Gore challenged the US to produce all of its electricity "from renewable energy and truly clean carbon-free sources" in just 10 years. "Enough wind power blows through the Midwest corridor every day to meet 100% of US electricity demand," Gore said. "Enough solar energy falls on the surface of the earth every 40 min to meet 100% of the entire world's energy needs for a full year."

Great idea, Al. Now show us your plans and specifications.

Join, or step aside

It's not like hydrocarbon energy was just picked out of a pile of competitive resources to fuel the industrial age. Edwin Drake drilled the first oil well in 1859 when whales were hunted almost to extinction for their oil. At that same time, scientists and mechanics developed a method to refine crude into petroleum products including kerosine, which burned cleaner and brighter than whale oil.

In 1861, America erupted into civil war, fueling demand for heavy machinery that required more durable lubricants than the animal fat and vegetable oil previously used. When the combustion engine came later, there was nothing else readily available in such a convenient form that provided so much power so cheaply as oil. Still, that never stopped people—or even oil companies—from exploring alternatives.

The oil industry has long advocated sustainable energy programs that would tap into all available resources. And the industry's technology and knowledge have reduced the carbon intensity of fuels. Oilmen have no problem with development of new energy sources. But it does bother them when Gore said, "Those who, for whatever reason, refuse to do their part must either be persuaded to join the effort or asked to step aside."

For whatever reason. Sounds like a man who won't tolerate any questions about the feasibility of his proposal.

Ocean power

Oceans cover 70% of our planet and generate tremendous energy as hurricanes frequently prove. The first patent for a wave machine to tap that power was filed in the 18th Century. Hundreds more followed, including a project in the 1970s that used an oscillating water column to power warning whistles and navigation lights on a buoy. Although the maximum efficiency was only 60%, more than a thousand of those buoys were deployed.

Since the 1980s, ambitious projects have developed to generate electrical power from waves, tides, and estuarial flows in the US, Canada, Australia, and Europe. The world's first commercial wave farm is in Portugal. And in December 2007, Pacific Gas & Electric Co. said it would build the first commercial wave-power plant off northern California, consisting of 8 buoys, 2½ miles offshore, that generate electricity as they rise and fall with the waves. The plant is slated to begin operations in 2012, generating a maximum 2 Mw to power 1,500 homes.

Yet more than 200 years of efforts have not solved all problems of tapping that "free" energy source. Analysts at Pritchard Capital Partners LLC, New Orleans, recently reported, "A Canadian energy company says it has no plans to try floating a second experimental buoy to test the potential for generating energy from ocean waves off the Oregon coast. Finavera Renewables installed a $2 million test buoy off the coast at Newport only to have the 35-ton contraption malfunction, leak, and sink." Meanwhile, analysts said, waning interest in wave energy development has reduced the number of permit applications for such projects. ✦

Editorial

A sound energy policy

What's this?

US fuel prices are plummeting while members of Congress—aside from Republicans staying behind to speak on energy in an empty House chamber—are away on vacation.

How can this be? Haven't lawmakers spent months telling voters that they know the way to relief, that they in fact wield the power to lower gasoline prices?

Of course they have. They're politicians. It's an election year. And their declarations of influence over prices have been wrong, thoroughly and dangerously wrong.

The market sets gasoline prices. Pretensions to the contrary lead to mistaken policies, which always hurt consumers.

The energy problem in the US is not that the government hasn't acted on energy. It's that the government has acted too much in ways that limit supply. And the problem is not, as some observers keep asserting, that the US has no energy policy. It has a very discernible energy policy.

The US policy

The US energy policy as it relates to oil and gas is to hoard crude in strategic storage, limit domestic production with land-use policy, stimulate with tax policies and mandates the manufacture and use of uncompetitive fuels, err on the side of high fuel cost in environmental regulation, and treat oil companies like criminal enterprises when fuel prices rise. This is, in fact, a comprehensive energy policy. It's a poor one—but comprehensive, nonetheless.

Energy policy is poor because much of it was fashioned during a price-induced political uproar. Hysteria seldom produces constructive policy in any area, least of all energy. Yet energy receives scant attention when oil prices are low. So 10 years ago, when the initiative might have eased the price pain of 2008, Congress didn't expand federal oil and gas leasing. Because oil prices were low, public concern about future energy and the compulsion to act were negligible.

When the market cycled away from a long period of surplus earlier this decade, of course, popular attention to energy returned with a vengeance—literally—in response to the inevitable price increases. Along with subsidies for uneconomic energy have come calls for special taxation of oil companies, criminalization of "price gouging" during supply emergencies, and restrictions on energy trading. These moves would hurt oil consumers by constricting supply and bridling the market. They're the type of mistake consumers should expect when politicians feel urgent pressure to act—to do something, anything—on energy.

Policy in this area doesn't have to be a spiral of expensive mistakes. A sound energy policy is not beyond hope. And the characteristics of such a policy do not lie beyond the limits of popular comprehension. They are, in fact, quite simple.

A sound energy policy relies to the maximum possible extent on the market. It eschews fuel selection by the government. It helps emergent energy forms by preparing them to compete—with research assistance, for example, and loan guarantees—not by forcing them into the market with mandates and subsidies, which can only hurt them in the long run.

Because of its reliance on the market, a sound energy policy imposes and rigorously enforces antitrust and trading regulations.

A sound energy policy acknowledges the need to expand supply from all energy sources that make commercial sense and doesn't orient itself to the inevitably corrupt promotion of some sources at the expense of others.

A sound energy policy works to reconcile the imperatives of energy supply and environmental protection.

Domestic supply

And a sound energy policy favors domestic supply over foreign supply as long as domestic supply can compete. It does so less out of fear of foreign supply, which the US will continue to need, than from practical recognition of the manifold economic benefits of domestic production.

Obviously, implementation of sound energy policy would require the reconsideration of recent moves away from the market-based approach that serves consumer and national interests best over time. The current plunge in oil prices is discrediting many of the assertions underlying those mistakes. Maybe it will enable politicians to calm down and begin giving energy the rational treatment it needs. ✦

EPRINC: Cap and trade will hurt and help oil industry

Sam Fletcher
Senior Writer

A carbon cap and trade system and other initiatives to curb greenhouse gas (GHG) emissions will hurt the petroleum industry overall but also will create opportunities for some oil companies to cash in, said officials at Energy Policy Research Foundation Inc. (EPRINC), Washington, DC.

Political momentum is building in the US for legislative and regulatory action to constrain greenhouse gas (GHG) emissions.

"Some actions, such as the mandating of large quantities of ethanol, may have other purposes, but their policy rationale in part is to control GHGs. Others, such as cap and trade, are directly aimed at curbing these gases," EPRINC reported.

The report acknowledged, "Climate scientists have generally concluded that the Earth has been warming and that anthropomorphic activities, mainly the combustion of fossil fuels, have contributed to this warming. Though there remains considerable uncertainty regarding the magnitude of the anthropomorphic effect and only limited understanding of natural climate variation, model projections indicate that if current trends continue, there are significant chances that the Earth will experience a warming climate with adverse consequences such as increased numbers of severe weather events, rising sea levels, drought, and the spread of tropical diseases."

According to those scientists, annual emissions rose to 28 billion tonnes from 18 billion tonnes in 1980-2005 (Fig. 1). "Since carbon dioxide emissions represent better than three quarters of worldwide GHG emissions, the trend in GHG emissions is roughly similar to that for CO_2," EPRINC said. "The absolute level of GHGs increased steadily in most years between 1990 and 2000 but has increased only slightly since." During 1990-2006, US GHGs increased by 15% (Fig. 2).

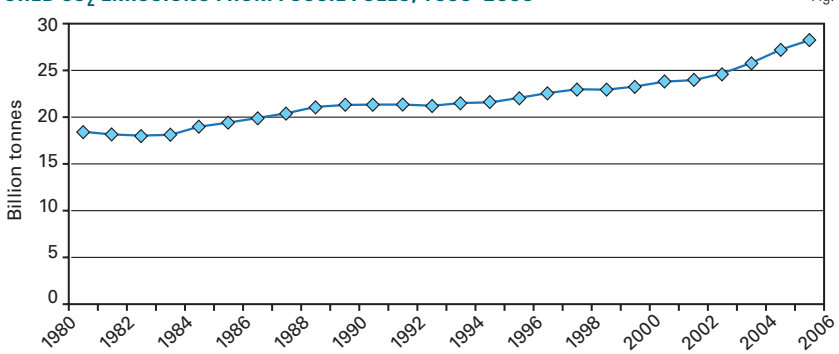
"In the US, petroleum use generates the most CO_2, coal the next most, and natural gas the least," EPRINC reported. CO_2 emissions from all three sources have trended upwards in the US since 1990. Yet despite that trend, the report said, "The GHG intensity of US gross domestic product has steadily dropped since 1990 and is now more than 27% below what it was in 1990." During 2002-06, US GHG intensity dropped almost 10 percentage points of the 18 percentage points that President George W. Bush set as the national objective through 2012.

The report argues that the US record on curbing GHGs "has been as good or better" than that of most other developed countries. But concern among policy makers has grown with successive reports by the Intergovernmental Panel on Climate Change emphasizing potential dangers of climate change. "While questions about the science of climate change are not fully settled, there is growing sentiment both at the national and state levels that strong, binding measures are necessary to curb increases in US GHGs and then to reduce them," EPRINC said.

As a result, legislators are pushing to reduce GHG through new laws and regulations at the state and federal levels. "It appears increasingly likely that some will be promulgated or enacted into law. Prominent among these is 'cap and trade,' in which the nation's GHG emissions would be capped, allowances to emit these gases given out or sold by the government, and parties receiving them allowed to transfer them in orga-

WORLD CO_2 EMISSIONS FROM FOSSIL FUELS, 1980-2005

Fig. 1



Source: Energy Policy Research Foundation Inc.

nized markets. A bill containing such a cap and trade system passed the Senate Environment and Public Works Committee in December 2007, and a close substitute was deliberated on the floor," the report said.

Recent legislation mandating substantial increases in the use of ethanol and other biofuels was justified in part because it would reduce GHG. "The same legislation mandates increased Corporate Average Fuel Economy (CAFE) standards, again in part to reduce GHGs. In addition, the state of California has mandated a Low Carbon Fuel Standard to reduce carbon emissions in that state, and a similar provision is contained in the Senate's recently debated cap and trade bill," the report stated.

GHG emission targets under cap and trade proposals likely will change the US energy makeup. If the targets in S.2191 are to be met, then GHGs per capita in the US would have to drop 30% by 2020 and 50% by 2030.

"Barring near term viability of large scale carbon dioxide sequestration, this implies a sharp drop in the use of fossil fuels, to be replaced by nuclear power, renewable energy sources, or energy efficiency measures," said EPRINC in the report. "Further, the gap between how much fossil energy would have been consumed and what actually could be consumed would steadily grow. For example, if emissions from these fuels otherwise would have risen by 1%/year, a reduction of 10% from 2008 levels by 2020 would imply a reduction of almost 23% from what otherwise would have occurred."

How it works

Under a cap and trade system, annual US GHG emissions would be capped at some chosen quantity, with emission rights (or allowances) given or auctioned to prospective emitters, expressed in terms of tonnes of carbon dioxide emissions.

"A single allowance might provide its owner the right to emit 1 tonne of carbon. An emitter would be required to submit an allowance to the government for each tonne of carbon emitted. Each year would have its own set of rights, distributed in accordance with the overall national target for that period, and emitters would be responsible for turning in allowances equal to the amount of carbon they emitted," EPRINC explained.

Emission rights would be transferable, so that those needing less than the amount they hold could sell them to others who needed more. The value of these emission rights would be determined by the amount of national constraint on carbon and demand for the rights, which in turn would be determined by the demand for goods and services resulting in GHG emissions.

"The general idea is to distribute emission rights to producers, processors, or importers of fossil fuels and let them raise prices to their customers to cover the costs of these rights. Thus end users would pay more for energy but would not be required [to acquire] emission rights. Because coal is most carbon intensive, its price would rise relative to oil and gas, while the price of oil would be up relative to clean burning natural gas," said EPRINC.

A cap and trade system might include the "safety valve" of a government guarantee to sell additional emission rights if the price exceeds a prespecified ceiling in a given year. But environmentalists oppose that, EPRINC said. The system also might feature a floor price for allowances to encourage investors to invest heavily in energy efficiency technologies.

"Other possibilities include allowing holders of emission rights to bank part of a given year's rights for future use," EPRINC said. "They also might borrow against future emission rights, to be paid back with interest by turning in more emission rights per unit of carbon emitted than the amount borrowed."

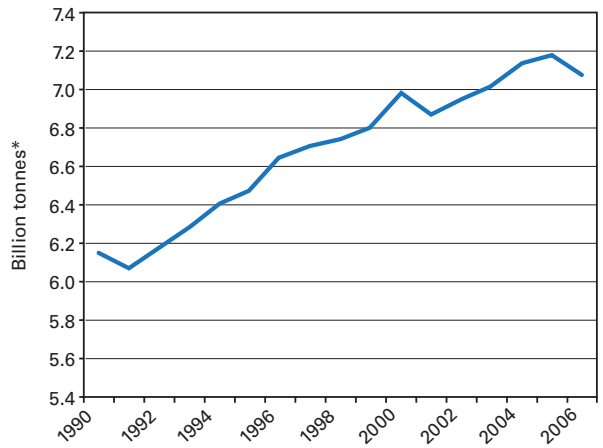
Various proposals would reduce US GHGs at different rates, but the general idea is to establish an initial target near present levels to be reduced over time. As initially proposed, S.2191 would distribute 5.2 billion allowances in 2012 to covered facilities (comprising about 80% of all emissions) and then reduce that amount by 96 million tonnes annually during 2012-50. That would result in a 70% reduction in US GHGs from 2005 levels. However, some proponents have called for greater cuts of as much as 85%.

An international system

A US cap and trade system would be part of an international emission rights trading system. Under the Kyoto protocol, offsets can be obtained through joint implementation projects among developed countries and via the Clean Development Mechanism in developing countries. Many cap and trade proposals would enable emitters to secure offsets from domestic agricultural sources. Yet to be determined is whether US parties

US CO_2 EMISSIONS

Fig. 2



*Estimated.
Source: Energy Policy Research Foundation Inc.

could trade within the European Trading System (ETS).

"Many environmentalists advocate auctioning emissions rights, while many in business want free allowances to compensate for rising energy costs. Most federal proposals would compromise with a low initial number of auctioned allowances that would rise over time," said EPRINC. As introduced, S.2191 would have auctioned 22% of the allowances initially, increasing to 100% in 2036.

Because allowance trading likely will be international, the price of allowances in the US will differ little from that in Europe and elsewhere. According to the report, "A preliminary assessment of S.2191 suggests that price would be no more than $20/tonne of CO_2 in 2015, or about 20¢/gal of petroleum product. However, the present price per ton in the ETS is about $40/tonne, and Charles River Associates projects that under S.2191 the price of allowances would be closer to $35-60/tonne, or 35-60¢/gal. Both assessments see the price of allowances rising with time."

Since the system fixes the quantity of allowable fossil energy supplies in any given year while demand remains uncertain, prices are likely to be volatile. In years when demand is great and permits are few, prices could spike; in years when demand is weak and permits are plentiful, prices would fall.

"With upwards of $100 billion in allowance value at stake each year, a variety of interests can be expected to compete, expending resources in the process. In the aggregate, such competition may lead to hundreds of millions if not billions of dollars in expenditures, none of it enhancing the wealth of the country," EPRINC said.

Continued immigration and a relatively high birthrate are expected to increase US population to 336 million in 2020 and 364 million by 2030 from 300 million at present. Under S.2191, current per capita emissions of 19 tonnes of carbon equivalent would be reduced by 30% in 2020 and by 50% in 2030.

"Possibly offsets, large scale carbon sequestration, and alternative forms of energy will be sufficiently inexpensive that per capita energy consumption could be sustained. But more likely, fairly dramatic changes in lifestyle would be necessary to achieve the targets," EPRINC said.

Meanwhile, the recent spike in petroleum product prices is already constraining carbon emissions as the public reduces fuel use. A $1/gal increase in the price of gasoline is roughly equivalent to a $100 increase in the cost per tonne of emitting CO_2. "The price of jet fuel has risen by a similar amount, and the price of diesel by even more," said EPRINC. The report calculates that price increases over the past year will reduce petroleum demand by 3% within a year and 20% over the long run. "Though rising population and per capita income will offset these reductions, price effects taken alone will reduce long-run CO_2 emissions from the consumption of petroleum products by about a fifth or by roughly 500 million tonnes/year," the report concluded.

Adverse effects

Sellers of carbon-based fuels can expect demand to fall off as consumers conserve on petroleum use and as substitute products enter the market. "These effects will come on top of those from recent increases in petroleum prices, which already are motivating conservation and the development of substitutes," EPRINC reported. The initial price increase has been estimated at 20-60¢/gal, but with fewer allowances each year relative to fossil fuel demand, the price increase is likely to become larger.

If the 5.2 billion initial allowances under bill S.2191 sold for $40 each, they would yield more than $200 billion in 2012. "Though the number of allowances would decrease over time, the per-allowance price likely would rise as they became scarcer so that this initial total might well substantially understate future annual amounts," said EPRINC.

Refiners would pay more for the energy used to process crude, and transport costs would increase to refiners, pipeline companies, jobbers, and distributors of heating oil and LPG.

"The cost of processing chemical feedstocks into finished product would increase as would the cost of power, particularly in areas where coal is a major feedstock for generation," the report said.

Energy companies likely would not be able to pass through all of the increase, particularly if competing with foreign firms not subject to GHG controls. Refineries operating in Asian countries that have not agreed to constrain GHGs would gain competitive advantage from a US cap and trade program.

"[Asian] refineries that have not agreed to constrain GHGs would gain competitive advantage from a US cap and trade program."

In addition, a cap and trade system probably would trigger energy price volatility, adversely affecting demand and hindering investment. "At minimum, even if the economy transitions smoothly to less carbon intensive forms of energy, a cap and trade program will impose a 'tax' on energy consumers that may well exceed $100 billion/year. If S.2191 is an indication, none of the monies raised by a cap and trade system would be returned directly to taxpayers and little if any to consumers. A 'tax' of that magnitude starting in 2012 and likely rising after that could have considerable adverse effect on aggregate economic activity and hence on energy demand."

Though the ultimate structure of a cap and trade system is yet to be determined, petroleum companies may be required to secure allowances not only

for the carbon that they themselves emit but also for that emitted when their products are combusted. Since transport constitutes about 28% of all US GHG, this means petroleum firms would be required to submit about that percentage of the annual allowances issued.

Many cap and trade proposals would allocate only a fraction of allowances to private sector firms, with the fraction diminishing with time. Thus, it is unlikely that petroleum firms would be freely allocated as many allowances as the emissions they would be held responsible for. Indeed, in some cases such as the Regional Greenhouse Gas Initiative in which a number of northeastern states are participating, 100% of allowances will be allocated through auction, EPRINC reported.

"...fairly dramatic changes in lifestyle would [likely] be necessary to achieve the targets."

Under cap and trade, petroleum firms will have to monitor the emissions for which they are responsible as well as their numbers of allowances to be sure they comply with the law. Assuming that banking and borrowing are a part of a cap and trade program, strategic management of the use of allowances over time would be important. This would require auditing emissions of each firm as well as managing its allowance accounts. Because the price of allowances may be volatile, firms might want to hedge via forward purchases or other contractual mechanisms. "In short, management of allowances is likely to be a major activity at larger petroleum firms, said EPRINC. The government would be responsible for the distribution of emission rights and would have to police emissions, allowances, and offsets.

The economic impact depends on how tightly the system constrains fossil fuel use relative to demand and how rapidly inexpensive sources of energy and of energy efficiency enter the market. In 2012, the first year of the program, GHG emissions from fossil fuels would have to be reduced 14% relative to baseline, with reductions escalating rapidly after that.

Opportunities

"Under cap and trade, allowances to emit carbon have value and hence are a potential source of wealth to the private sector," said EPRINC. "There are several means whereby petroleum firms may be able to take advantage of opportunities to acquire a portion of this wealth. The most obvious is by securing free rights to allowances. Virtually all of the Congressional proposals freely allocate substantial proportions of the annual allowances to the private sector, though usually these proportions diminish over time as more of the allowances are auctioned."

Petroleum firms will be forced to compete with other industries for free allowances. However, EPRINC said, "One criterion for awarding them likely will be historical emissions, and petroleum firms can qualify for allowances via this route." The report said, "If a firm can both obtain free allowances and fully pass through its increased costs of energy, it can obtain a 'windfall.' More likely, it will not fully pass through all of its cost increase, and the free allowances are a form of compensation."

Another method would be to create offsets at less cost than the price of allowances in the US market. "For example, a petroleum firm might sponsor the planting of trees under the Joint Development Mechanism in a developing country and receive sufficient credits to more than cover the costs," said EPRINC. "Under several of the Congressional proposals, opportunities to obtain such net savings also might be possible working with US agricultural interests."

A third possibility would be to obtain allowances in one year and sell them for a higher price in another. "Organized allowance markets already exist in the US and elsewhere, and with cap and trade these markets would greatly expand. Many firms probably would mainly use such markets to hedge against future allowance price changes, but if allowances rose in price over time, it would be possible to generate offsets in one year, sell them at a later time, and profit thereby," EPRINC advised. "More generally, adroit management of allowances and of participation in allowance markets may provide a means for petroleum firms to profit. Given the numbers of allowances that some of the firms likely would have to deal with on an annual basis, investment in allowance market expertise may well prove worthwhile."

It said, "One almost certain result of constrained carbon emissions will be to change the relative prices of fuels, with higher carbon content fuels becoming relatively more costly to produce and sell, and lower carbon fuels less so. Under these changed conditions, petroleum firms likely will experience greater relative demand for lower carbon fuels, especially natural gas in the power sector and possibly also in the industrial sector. Sales of LPG too may be relatively encouraged."

If a portion of carbon allowances are auctioned, it will generate substantial revenues for the federal government. "Proposals to date have earmarked these funds for utilities, states, alternative energy R&D and deployment, and other climate-related purposes," EPRINC reported. "Petroleum firms engaged in alternative fuel markets may receive benefits from some of the spending in the form of technology development and larger and more rapidly expanding sales opportunities."

Carbon tax

In addition to cap and trade, two other policies have been proposed: command and control; and taxation. A carbon tax would be "a socially superior alternative" to cap and trade for constraining GHG. "However, its relative impact on petroleum firms is mixed. If proceeds from a carbon tax were

used to reduce other taxes, particularly corporate income taxes, petroleum firms would share in the benefit," said EPRINC.

No free allowances would be available under a tax approach. "Thus, a tax would avoid many of the problems of cap and trade, but it would negate opportunities to profit from such a system as well," EPRINC said.

If some of the government's proceeds from sale of allowances were used to subsidize alternative transportation fuels, it might have further adverse effects on petroleum markets. However, some energy companies could benefit from government spending of tax revenues on development of alternative energy sources.

Economists generally support a carbon tax as the best means to deal with CO_2 emissions since it would be less costly to administer and would lead to less volatile energy prices. Revenues from such a tax could be redistributed to taxpayers via reductions in social security or income taxes. Such refashioning of the tax system would yield net gains to the economy, they claim.

If proceeds from a carbon tax were used to reduce other taxes, particularly corporate income taxes, petroleum firms would share in the benefit. Economists at the American Enterprise Institute estimated a tax of $10/tonne of CO_2 would provide enough revenue to reduce the corporate income tax rate by 20% or income taxes by 6-7%. According to its analysis, such a tax also would reduce US GHG by 7.5%, EPRINC said.

"In addition, a carbon tax would avoid many of the administrative and monitoring issues imposed by cap and trade, and might be easier for firms to adjust to."

The report said, "A carbon tax also has the advantage of making clear to the public what is being done. Cap and trade as presently formulated in Senate or House legislation gets at carbon reduction through what is essentially a very large tax and spending initiative but is not easily understood as such. The public is 'taxed' through the higher prices it would pay for fossil energy, with the revenues distributed to states, agricultural interests, private firms, and others via access to free allowances, or if raised through allowance auction then spent on a variety of climate-related programs. None of the leading legislative initiatives would recycle allowance-related monies back to the public in the form of reduced taxes."

"Economists [say] a carbon tax...would be less costly to administer and would lead to less volatile energy prices."

Nevertheless, most members of Congress are leaning toward cap and trade, which has broad support within the environmental community and some within the business community.

Energy efficiency

Command and control also will be part of the mix. "For example, the Senate and House enacted legislation in December 2007 (the Energy Independence and Security Act or EISA) that mandates an increase in CAFE to 35 mpg by 2020. The Department of Transportation, which is charged with implementing the law, recently proposed standards for passenger autos and light trucks under which their combined average fuel economy would reach 31.6 mpg by 2015. One major reason for imposing this constraint is to reduce emissions of CO_2 from motor vehicles," EPRINC reported.

"EISA also mandates vast increases in the use of ethanol, justified in part by projected reductions in GHGs. California has sought to impose a CO_2 standard on vehicles sold in that state, but EPA recently turned down its request for an exception to do so, and the matter is currently in the courts.

"California also plans to impose a Low Carbon Fuel Standard, which would compel sellers of motor fuels in that state to steadily decrease the life-cycle carbon content of the fuels they sell. A form of such a fuel standard also was included in a recent climate change bill passed by the Senate Environment and Public Works Committee.

"Many in Congress would impose a nationwide Renewable Fuel Standard on suppliers of electricity, but such an initiative recently was filibustered in Senate consideration of EISA and excluded from the final legislation. Some states have adopted such standards, however.

"Finally, Congress has mandated home appliance energy efficiency standards and building standards, largely to reduce GHG emissions," EPRINC said. ✦

BP faces aftermath of Caucasus region conflict

Eric Watkins
Senior Correspondent

BP PLC is dealing with the aftermath of the conflict in the Caucasus region after the Russian government sent troops and bombarded locations in Georgia on Aug. 8.

The Russian incursion came after Georgia earlier launched a major military offensive to retake the breakaway province of South Ossetia, threatening to ignite a broader conflict.

Hundreds of civilians were reported dead, while witnesses said the South Ossetian capital of Tskhinvali was devastated. It has been described as the worst outbreak of hostilities since the province won defacto independence in a war against Georgia that ended in 1992.

For BP, the sudden conflict im-

mediately threatened its efforts to use alternate routes and modes of transport to move crude oil from the region in the wake of the earlier shutdown of the 850,000-b/d Baku-Tbilisi-Ceyhan (BTC) oil pipeline. The BTC line has been out of action following a recent explosion and fire that occurred in the line's Turkish sector. In a statement dated Aug. 6 and posted on its web site, the People's Defense Force (the armed branch of the Kurdistan Workers' Party) said it had blown up the BTC line (OGJ Online, Aug. 7, 2008).

On Aug. 9, the Georgian government said, "Russia air forces attacked the BTC pipeline and Baku-Tbilisi-Erzirum pipeline lying parallel to it—the two main energy projects of the country." The government report claimed that "28 out of 30 bombs exploded, with some of them in the direct proximity to the pipeline, just 5 m away."

Russian officials, who denied the reports, said they had no intention of targeting the pipelines but held open the possibility of accidents interfering with the lines' operations.

BP's pipelines in the Caucasus

Baku-Tbilisi-Ceyhan (BTC) pipeline

The 1,768-km BTC pipeline began operating in June 2006. It extends 443 km through Azerbaijan, 249 km through Georgia, and 1,076 km through Turkey to the Ceyhan marine terminal. Built at a cost of $4 billion, the BTC pipeline is the first direct transportation link between the Caspian and the Mediterranean seas. At full capacity, it can deliver 1 million b/d of oil.

South Caucasus gas pipeline (SCP)

The 692-km South Caucasus Pipeline (SCP) started delivering natural gas from Shah Deniz field in the Caspian Sea to Azerbaijan and Georgia from December 2006, and in Turkey from July 2007, representing an important new source of gas supply for the region.

Western Route Export Pipeline (WREP)

The 830-km Western Route Export Pipeline (WREP), also known as the Baku-Supsa pipeline, transports oil from the Chirag field in the Caspian Sea, via the Sangachal terminal in Azerbaijan, to the Supsa terminal in western Georgia. WREP, which became fully operational in 1999, can transport as much as 155,000 b/d of oil.

WATCHING THE WORLD

Eric Watkins, Senior Correspondent

Putin bullies BP, Georgia

If anyone ever had any doubts about Russian intentions regarding the Caucasus as an energy bridge for the West, those doubts should have been laid to rest by now.

Before we start in on the violence that racked Georgia, though, it might do well to consider a sidebar that took place in Moscow.

On Aug. 13, Robert Dudley, chief executive officer of UK-Russian oil company TNK-BP Ltd., was summoned to appear to appear before Russian prosecutors for alleged violations of labor laws by his company.

Russia's Federal Labor and Employment Service had asked a court to look into a number of violations relating to labor protection and the use of a foreign work force at TNK-BP.

TNK-BP under investigation

Last month, the service conducted an investigation and found that TNK-BP "had not complied with the recommendations." That prompted the service to ask a court to look into the case.

BP has been embroiled in a bitter dispute with its 50-50 Russian partner in TNK-BP, a consortium of Russian industrialists known as AAR, who have been demanding Dudley's resignation amid speculation that BP could be forced to give up its 50% stake.

Is there any connection between that little bit of bullying in Moscow and the onslaught that took place in Georgia last week?

It would not have been lost on Russia's chief bully, Vladimir Putin, that BP decided to shut down its three pipelines in the Caucasus. In fact, as more than one observer has noted, that shutdown was one of the aims of Russia's cross-border incursion into Georgia.

A variety of targets

BP, of course, is hardly the sole target of Putin's grand strategy. In that regard, he has a number of plumper targets in mind: Azerbaijan, Kazakhstan, and Turkmenistan, just to name a few.

These countries are the potentially great producers of oil and natural gas that Western governments are counting on. Indeed, hopes have long been high that these countries will be ready, willing and able to provide the West with reliable supplies of oil and gas, bypassing Russia in the process.

BP, while hardly a government entity, has played a major role in the development and implementation of that strategy—a matter that has hardly gone unnoticed in Moscow.

The techniques Putin used to bring Georgia to heel have the same thuggish quality as the techniques he has used to silence domestic opposition and to expropriate the energy assets of OAO Yukos, Royal Dutch Shell PLC, and now, BP.

It's all of a piece: Putin knows that oil and gas fuel the West's political and economic preeminence as well as Russia's resurgence as a military and economic power. By holding oil and gas hostage, Putin can weaken his enemies while strengthening himself.

When Russian bombs hit Georgia and a Muscovite court took up charges against BP last week, the unpleasant implications for the rest of us were all too evident. ✦

BAKU-TBILISI-CEYHAN OIL PIPELINE

"The Russian Defense Ministry has no plans to bomb the pipeline in Georgia," said deputy chief of Russian armed forces general staff Anatoli Nogovitsin at an Aug. 11 press conference. However, he voiced "deep concern" over the possibility of "ecological catastrophe."

BP has consistently said the firm had no knowledge of any bombings on or near its pipelines. But BP reportedly confirmed knowledge of the incident reported by the Georgian energy ministry, while repeating that the pipeline is not damaged.

Hostilities in Georgia have now largely shut down an oil and gas route, initially designed to bypass Russia, estimated to carry as much as 1.6 million boe/d. In early August, exports of Azeri, Kazakh, and Turkmen oil and products from and through Azerbaijan stood at around 1.3 million b/d before falling to 350,000 b/d during the week ended Aug. 8.

Uncertain future

Additional transportation routes were affected by the conflict. On Aug. 13, BP declared a force majeure on liftings of oil from the 150,000-b/d Western Route Export Pipeline (WREP), while supplies of natural gas through the South Caucasus Pipeline (SCP) can continue to flow into Turkey for about another week.

BP closed the WREP and SCP systems on Aug. 12 after Georgian officials issued reports of Russian air attacks on or near the lines. On its web site, the Georgian energy ministry said that WREP "was repeatedly bombed by Russian military forces (near the capital Tblisi)." It said, "This time rocket bombs have been used."

Closure of the three pipelines—the main showcase of BP activity in the Caucasus—underlines the uncertain future faced by the company in the region as well as by the region itself as an alternative energy corridor to the routes dominated by Russia.

Robert Johnston, director of energy and natural resources at consultancy Eurasia Group, said during an Aug. 11 conference call that the Russia-Georgia conflict will help Russia maintain "a stranglehold" on Central Asian exports of oil and gas.

"Georgia's reputation as a safe alternate route for pipelines bringing oil and gas from (Central Asia) into the Mediterranean has been compromised," he said. "If you take the Georgian option off the table...it plays into Russian hands because most of the other viable options go through Russian territory."

That point was partially confirmed as BP, faced with the shutdown of its three main lines across Georgia, had to turn to alternative routes.

While one route consists of rail transport across Georgia to the port of Batumi, the other remaining route for BP's Azerbaijan crude goes from Azerbaijan via Chechnya to the Russian Black Sea port of Novorossiisk.

The need to utilize the Russian route represents a reversal of policy—if not an outright failure of that policy—particularly for countries such as Azerbaijan and Kazakhstan long concerned about using or routing pipelines through Russia which gives Moscow control over their oil and gas flows.

According to analyst Global Insight, events of the past week will undoubtedly prompt Azerbaijan and Kazakhstan "to consider diversifying their supply routes more significantly, as it has highlighted the risks both countries face in transporting their oil to international markets."

Meanwhile, BP said it could take a week to judge how long the BTC line will remain closed after the recent explosion and fire. It said that Turkish pipeline operator Botas has started assessing the damage, with a view to assessing its cause. ✦

EPA denies Texas RFS mandate waiver request

The US Environmental Protection Agency has denied a request submitted by Texas Gov. Rick Perry for a 50% waiver from the federal renewable fuel standard (RFS) mandate for corn-based ethanol.

The RFS, part of the Energy Independence and Security Act of 2007, requires increased national production of renewable biofuels to 36 billion gal/year by 2022 from 9 billion gal/year in 2008.

Perry blamed increased demand for ethanol for contributing to escalating corn prices, which he said contributes to higher food prices and also higher

costs for livestock feed (OGJ Online, July 22, 2008).

EPA said it recognized that high commodity prices have economic impacts but that an extensive analysis found no compelling evidence that the RFS mandate is causing severe economic harm during the time period specified by Texas.

Current law authorizes EPA to waive the national RFS if the agency determines that the mandated biofuel volumes would cause "severe harm" to the economy or the environment.

"After reviewing the facts, it was clear this request did not meet the criteria in the law," EPA Administrator Stephen L. Johnson said during a conference call with reporters from Washington, DC, on Aug. 7.

EPA conducted detailed analysis, consulted closely with the Departments of Energy and Agriculture, and considered more than 15,000 public comments. This was the first RFS-related waiver request. ✦

More House Democrats introduce compromise legislation

Nick Snow
Washington Editor

Six more US House Democrats introduced their own bill Aug. 1 to open more of the Outer Continental Shelf to oil and gas leasing and repeal a moratorium on oil shale lease regulation preparation while accelerating alternative energy research and development.

"Rather than waste more time pointing fingers, I believe we have to pull all the levers available to us, starting with producing as much oil and natural gas as possible in this country," said the bill's sponsor Rep. Jim Matheson (Utah) Aug. 6. Reps. Jason Altmire (Pa.), Joe Donnelly (Ind.), Mike Doyle (Pa.), Charlie Melancon (La.), and John S. Tanner (Tenn.) are cosponsors.

HR 6817, the Fulfilling US Energy Leadership (FUEL) Act, followed HR 6709, which has 49 Democratic and Republican sponsors, to the floor on Aug. 1, but it resembled the bipartisan proposal advanced by the US Senate's so-called "Gang of 10" the same day (OGJ, Aug. 11, 2008, p. 24).

HR 6817 would establish a fund to accelerate research and development of next-generation alternative and energy-efficiency technologies with as much as $40 billion financed from OCS revenues.

The US Energy secretary would be authorized to invest the money in plug-in electric vehicles, smart grid technology, wind and solar energy, industrial and vehicle energy efficiency, and other projects.

It also would provide the US Commodities Futures Trading Commission more authority to regulate energy commodity trading and increase its full-time workforce by 100 employees. It would extend renewable energy R&D tax credits and provide $1.5 billion for carbon capture and sequestration projects. And it would direct the Energy secretary to study the impact of more nuclear power on energy costs and establish an interagency working group to identify incentives.

"Although there is no one solution to this crisis and no one political party or politician to blame, many of us feel that drilling for oil and natural gas has to be part of the comprehensive solution," Tanner said on Aug. 6. "In the FUEL Act, we propose lifting the ban on domestic drilling while also investing in the development of alternative forms of energy. Both of these steps will help loosen our dependence on foreign oil," he said. ✦

US court overturns FERC OK of Cove Point LNG expansion

Nick Snow
Washington Editor

A federal district court on July 18 overturned the Federal Energy Regulatory Commission's approval of a proposed expansion of Dominion Resources' Cove Point LNG installation on the Chesapeake Bay in Cove Point, Md., just south of Baltimore.

The US District Court of Appeals for the District of Columbia granted Washington Gas Light Co.'s petition for review despite finding that "substantial evidence supports FERC's conclusion that any threat of increased leakage is due to defects in WGL's system."

The court overturned the approval because it did not accept FERC's conclusion that the local distribution company, which serves Northern Virginia and Suburban Maryland as well as Washington, DC, can address safety concerns before the project's scheduled November in-service date. The commission did not support the conclusion with sufficient evidence, the court said.

WGL said in its petition that the project, which would significantly increase Cove Point's LNG output, would introduce more LNG into the utility's system. It said that for 2 years after it began receiving a limited amount of unblended LNG from Cove Point at WGL's facilities in Prince George's County, Md., leaks at the facilities increased 16-fold.

WGL also submitted a report to FERC finding the LNG's low-hydrocarbon

content caused seals inside its pipe couplings to leak, the decision said. FERC concluded that the leaks occurred because WGL applied hot tar when it installed the pipes decades before.

"We do not dispute that WGL operated its system for decades after applying the hot tar and only experienced high leak rates after it began receiving LNG in PG County. But at the same time, the PG County facilities received LNG for months without experiencing significant leakage, and only suffered those leaks when the weather became cold," the decision said.

WGL said the coupling conditions that exist in PG County also exist in the other 86% of its system and that it would be a decade or longer to install replacements. While reinjecting heavy hydrocarbons into the LNG could stop some leaks, the efficacy of such measures was uncertain, it added.

Dominion Cove Point LNG LP's Cove Point LNG installation. Photo from Dominion.

FERC's finding that WGL had time to correct any remaining problems was not sufficient because it was based only on repairs in PG County and did not consider how the utility might repair the rest of the system once the expansion begins operations in a few more months, the court said.

Dominion is proceeding with the Cove Point expansion, a spokesman said on July 21. "In key respects, the court affirmed FERC's ruling and agreed with its decision, including finding that the leaks were results of defects in WGL's system, and Dominion should not have to pay repairs. We're confident that the expansion is safe and in the public interest. We also expect that FERC will act expeditiously so that the Cove Point expansion will proceed on schedule," he told OGJ. ✦

Colorado cleared for Anvil Points leasing revenue

Nick Snow
Washington Editor

The US Energy and Interior secretaries jointly notified Congress on Aug. 8 that the way has been cleared for Colorado to begin receiving leasing revenue from Naval Oil Shale Reserves No. 1 and 2 on the Roan Plateau.

Funds have been obligated, and the US Bureau of Land Management has let a contract for the Anvil Points cleanup project in western Colorado, said Energy Secretary Samuel W. Bodman and Interior Secretary Dirk A. Kempthorne. The money comes from a fund established to provide financial resources for cleaning up spent shale at the former oil shale research area.

"Our notification certifies that we have met the legal requirements for allowing Colorado to begin receiving its share of current and future oil and natural gas revenue from a major section of the Roan Plateau," Kempthorne said. "Currently, about $2.7 million is generated each month from leases in this area and the state will now receive 49% of these payments as well as its 49% share of all future bonus bids, rents, and royalties on oil and gas leases in the area."

Colorado Gov. Bill Ritter, while responding that he was pleased the cleanup is moving forward, said other key steps should be taken before further leasing and development occurs on the plateau.

"We remain disappointed that the federal government seems intent on shortchanging Colorado by rejecting our proposal for phased leasing," Ritter said. "This certification fails to direct any extra money from the Anvil Points cleanup fund back to Colorado. The state stands to lose up to $50 million if legislation is not passed to direct Colorado's fair share of lease revenues that have already accumulated back to the state instead of reverting back to the federal treasury," he said.

Upcoming lease sale

Reaction from the state's congressional delegation was mixed. US Sen. Wayne Allard (R-Colo.) said the certification was significant because Colorado will finally get its share of revenue from the Anvil Points federal oil and gas leases. The timing was particularly important because of the BLM's scheduled Aug. 14 Roan Plateau lease sale, which could generate as much as $1 billion in bonus bids, he indicated.

"The national energy debate will undoubtedly continue, but I have spent years working with the Department of the Interior to cross this threshold and ensure that Colorado gets our share. The $400-500 million from these royalties over the next 20 years could fund many important needs for Western Slope communities and our state," said Allard, who proposed directing leasing royalties to local communities in 2007 and who is retiring at the end of this year.

"The best that can be said about today's announcement is that the Bush administration has finally officially

recognized that there is no need to continue short-changing Colorado by keeping all the royalties from the existing leases in the Roan Plateau area," observed US Rep. Mark Udall (D-Colo.), who is running for Allard's Senate seat. "But they are doing nothing to refund the state's share of the money already collected, let alone listen to Gov. Ritter or the Colorado communities that want them to change their plans for leasing all the rest of the Roan at one time."

By law, all revenue from oil and gas activity in this area of the Roan Plateau has been diverted to the Anvil Points Fund, according to BLM, which let the cleanup contract. It said anticipated costs include $15.4 million for environmental remediation, $39.4 million to reimburse DOE for past activities at the site, including installation of wells and related infrastructure, and about $10 million for environmental monitoring and compliance activities.

Management of the area was transferred from DOE to DOI in 1997 under the Transfer Act, which also established the fund as a special US Treasury account, the DOI agency said. It said that Colorado's Health and Environment Department concurred in the design and location of a proposed repository for the spent shale.

Ritter said the state's Natural Resources Department has submitted a protest to BLM over the federal agency's plan to lease the entire top of the plateau on Aug. 14. "The Roan Plateau is vital to our citizens as an energy resource, an economic resource, a recreational resource, and as an environmental resource. We must get this right," the governor maintained. ✦

WATCHING GOVERNMENT

Nick Snow, Washington Editor

Keeping marginal wells producing

Nearly lost in the energy issue shuffle as Congress took its August recess was a bill its sponsors say could slow the domestic oil and gas production decline.

US Sen. James M. Inhofe (R-Okla.) and Rep. Dan Boren (D-Okla.) each introduced the Marginal Well Production Preservation and Enhancement Act on their respective sides of the Capitol on July 31. The bill aims to streamline and clarify regulations, prolong economic feasibility and enhance production volumes from US marginal or stripper wells, its sponsors said.

Individually, these wells recover less than 10 b/d of oil or 75 Mcfd of gas, according to the National Stripper Well Association. But there are 400,000 of them in 36 states, producing almost 20% of the nation's oil and gas, the Tulsa group said.

Inhofe noted that a producing well provides state and federal taxes, pays royalties to land and mineral owners, "and keeps jobs and dollars on American soil and in American pockets. A plugged well provides none of this."

Smaller independents

"The producers who operate marginal wells are small independents that assist local and state economies. This bill ensures that the nation's policies recognize the economic importance and energy contribution of marginal well production," Boren said.

The bill would increase the percentage depletion allowance for marginal wells from 15% to the historical rate of 27.5%, exclusive of daily production levels. This provision would not be available for major oil companies, the sponsors noted.

Another provision, which majors could not use, would permanently eliminate the net income limitation on percentage depletion. Congress temporarily suspended that on a recurring basis beginning in 1998 after recognizing that it discourages investing to maintain marginal wells. The current suspension expired in 2007.

Other provisions

Inhofe and Boren noted that their bill clarifies a Clean Air Act provision that keeps the US Environmental Protection Agency from aggregating emissions from exploration and production equipment, pipeline compressors, and pump stations under the law's hazardous air pollutants section. It also would make clear congressional intent to not aggregate emissions from small engines and other E&P-related equipment.

The two lawmakers said the bill also would amend the federal Water Pollution Control Act by defining produced water tanks as water treatment facilities in a manner similar to other industries. In addition, it would provide regulatory relief to small facilities with less than 50,000 gal of oil storage capacity and no single tank of more than 21,000 gal capacity.

Associations and state agencies applauded the bill. "It will allow operators to offset the rising cost of operations while making it possible to reinvest in new development of domestic oil and gas," said James M. Revard, executive director of Oklahoma's Commission on Marginally Producing Oil and Gas Wells. ✦

Bush, GOP congressmen call for OCS moratorium vote

Nick Snow
Washington Editor

US President George W. Bush urged the Democratic congressional majority on Aug. 12 to schedule a vote on opening more of the Outer Continental Shelf to oil and gas leasing when federal lawmakers return from their August recess.

"Members have now had an opportunity to hear from their constituents, and if they listen carefully I think they'll hear what I heard today: A lot of Americans from all walks of life wonder why we can't come together and get legislation necessary to end the ban on offshore drilling," Bush said following a White House meeting with the Coalition for Affordable American Energy (CFAAE).

He said he was joining US House Republicans in urging House Speaker Nancy Pelosi (D-Calif.) to schedule an OCS vote as soon as possible. "The way ahead is this: The moratorium on offshore drilling is included in the provisions of the [US Department of the Interior] appropriations bill. When Congress returns, they should immediately bring this bill to the House floor and schedule an up or down vote on whether to lift the moratorium on offshore drilling," he said.

Bush said the bill should not include any provisions inserted expressly to defeat it. "The Democratic leadership should bring up a clean bill, give the members a chance to vote up or down...and not insert any legislative poison pills. Our goal should be to enact a law that reflects the will of the overwhelming majority of Americans who want to open up oil resources on the Outer Continental Shelf," he said.

Other steps

Congress also should authorize leasing on the Arctic National Wildlife Refuge's coastal plain, development of federal oil shale leasing regulations and incentives to expand US refining capacity as part of a comprehensive energy strategy that includes conservation, alternatives and renewables, the president said. "But a part of solving the dilemma that hard-working Americans face...the high price of gasoline...[is more] exploration here in America. And we can do it in a way that protects the environment," he said.

Bush's remarks followed a meeting with the CFAAE, which a group of business organizations formed in mid-July to press Congress and the administration to produce more US energy in an environmentally sensitive manner.

"There is no way to separate the issue of energy from the issue of economy. These issues are absolutely linked together, so if we're going to talk about a strong economy long-term, then we need to get a fix on reliable energy supplies," said Don Sterhan, chief executive of the Mountain Plains Equity Group, an affordable housing developer in Billings, Mont., and chairman of the US Chamber of Commerce's Environment and Energy Committee.

Dyke Messinger, president of Power Curbers Inc., a 55-year-old family-owned manufacturing business in Salisbury, NC, and a member of the National Association of Manufacturers' board of directors, said manufacturers feel higher energy costs more than other US business sectors because they are least able to pass them on to customers. "While manufacturers can raise productivity and manage costs for the inputs that go into products, they cannot address structural costs, of which energy is the biggest, without strong leadership from elected officials," he said.

"One of the things that came out in this discussion was there's a lot of folks in our country who understand we could be doing something about the high price of gasoline, and we're not. Obviously, we need to be wise about conservation, but we've got to be wise about increasing the supply of oil here in America. If you're concerned about the price of gasoline, one way to affect that...is to increase oil supplies," Bush said following the meeting. ✦

EIA: near-term forecast sees better supply-demand balance

Nick Snow
Washington Editor

Underlying world oil market fundamentals point to a better supply-demand balance with lower prices in the near term, the US Energy Information Administration said in its latest short-term energy outlook.

But EIA also reduced its 2008 outlook for supply growth outside the Organization of Petroleum Exporting Countries and warned that "any weakness in oil prices could be minimal and short-lived" if demand grows more than expected or supplies are interrupted.

EIA said a combination of slower US and global demand growth, increased OPEC production capacity beginning in the third quarter and continuing through 2009, and higher supplies outside OPEC "raises the prospect for a drop in demand for OPEC crude oil and an increase in surplus capacity."

EIA added, however, that the US Department of Energy's forecasting and analysis revised its second-half 2008 non-OPEC supply growth outlook to an additional 510,000 b/d. This

revision was due to project delays in Asia, lower-than-expected production growth in former Soviet Union republics, lower growth in Canada caused by an upward revision of 2007 data, and reduced production in Azerbaijan with closure of the Baku-Tiblisi-Ceyhan pipeline.

EIA anticipated that the 850,000 b/d of non-OPEC supply growth that it forecast for 2009 would be led by Brazil, the US, and Azerbaijan, but added, "Given recent history, possible additional delays in key projects as well as accelerating production declines in some older fields cannot be ruled out."

OPEC production outlook

Downward price pressure also could be limited by supply risks in Iraq, Nigeria, and Iran and from hurricanes, and by OPEC possibly deciding to limit production and keep inventories tight, EIA said. Initially, however, it said that it expected OPEC production to rise by 600,000 b/d during the third quarter to 32.9 million b/d, assuming that Saudi Arabia maintains its July production level of 9.7 million b/d through the quarter. It forecast that OPEC's total production could drop to about 32.4 million b/d during the fourth quarter and 31.6 million b/d in 2009.

It also said that lower crude production, combined with planned increases in OPEC's total liquids production capacity, suggests that the cartel's surplus crude production capacity could grow from its current 1.2 million b/d level to about 3.6 million b/d by yearend 2009. "Although an increase in the supply cushion could ease upward price pressure, it does not appear large enough to trigger a sharp price decline. Moreover, possible delays in adding supply capacity, proactive OPEC decisions to cut output or expectations that supply growth in the post-2009 period will have a difficult time keeping pace with demand, could minimize and shorten any market weakness," EIA said.

Domestically, it projected that total US petroleum and other liquids consumption will shrink by nearly 500,000 b/d in 2008 based on prospects for a weak economy and continuing high crude oil and product prices extending into 2009. Preliminary data show that year-to-year demand declines narrowed to just over 400,000 b/d during June and July from almost 900,000 b/d during 2008's first 5 months, it added. EIA said that it expects year-to-year demand declines during 2009 to be even less, about 120,000 b/d below the 2008 average.

It said it expects West Texas Intermediate crude prices, which averaged $72/bbl in 2007, to average $119/bbl in 2008 and $124/bbl in 2009. Retail regular gasoline prices, which averaged $2.81/gal nationwide in 2007, are expected to average $3.65/gal this year and $3.82/gal in 2009. "Gasoline prices are expected to continue falling slowly, average just less than $3.80/gal over the next few months. This forecast reflects continuing weak gasoline margins because of the decline in gasoline consumption and growth in ethanol supply," EIA said. ✦

FTC moves closer to addressing oil market manipulation

Nick Snow
Washington Editor

The US Federal Trade Commission moved a step closer to addressing petroleum market manipulation on Aug. 13 as it sought public comments for a proposed rule. The notice of proposed rulemaking (NOPR) will assist the commission in determining whether and how it should develop a final rule, which it hopes to accomplish before yearend, FTC said.

The commission said it is exercising authority it received under Section 811 of the Energy Independence and Security Act of 2007 (EISA 2007) and began the process with an advanced NOPR on May 1.

The proposed rule focuses on fraudulent or deceptive conduct that threatens the integrity of wholesale oil markets. FTC said, consistent with Section 811's language, it has modeled its proposed rule on US Securities and Exchange Commission Rule 10b-5, which that federal agency promulgated under its own long-standing market manipulation authority.

FTC said the proposed rule would make it illegal for anyone, directly or indirectly, in connection with the purchase or sale of oil or oil products at the wholesale level to use or employ any scheme with fraudulent intent; to make any untrue statement or omit to state a material fact concerning a misleading activity; and to engage in act, practice, or course of business that would operate as a fraud or deceit.

"Thus, fraudulent or deceptive acts, including false reporting to private reporting services or misleading announcements by refineries, pipelines, or investment banks, may be covered by the proposed rule," FTC said. "Similarly, trading practices in physical or futures markets may also be covered. By focusing the proposed rule on fraudulent and deceptive conduct, the commission seeks to avoid discouraging procompetitive or otherwise desirable market behavior that benefits consumers."

It said the proposed rule would not impose affirmative duties or obligations or record-keeping requirements. EISA 2007 subjects anyone violating a FTC rule promulgated under Section 811 to civil penalties of as much as $1 million per violation per day, in addition to any relief available to the commission under the FTC Act, it said.

Comments on the NOPR will be accepted through Sept. 18. ✦

Abu Dhabi's Shah field sour gas-condensate project on track

ConocoPhillips and Abu Dhabi National Oil Co. signed an interim agreement to develop the Shah sour gas-condensate field onshore in southern Abu Dhabi.

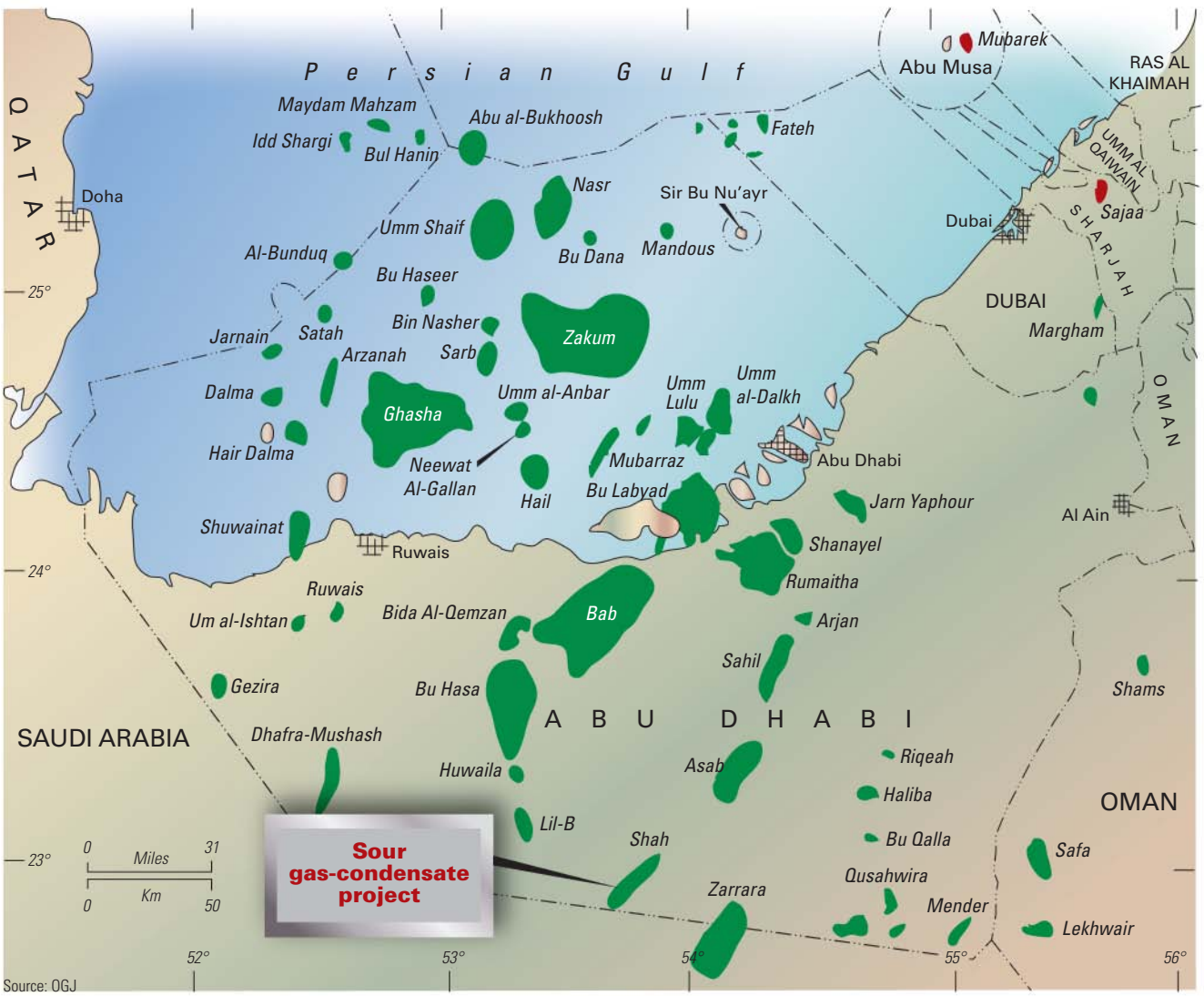
The project, valued at more than $10 billion, involves producing sour gas-condensate, stripping the liquids and sulfur for pipeline shipment to the Persian Gulf, and reinjecting the gas for pressure maintenance.

Final agreements are to be completed by yearend. The interim agreement provides for the two companies to share the cost of front-end engineering and design and project mobilization for development.

Shah field, near the border with Saudi Arabia 180 km southwest of Abu Dhabi city, was discovered in 1966 with original reserves of 500-600 million bbl of 30° gravity oil in Cretaceous carbonates at 8,000 ft. The gas-condensate is in the deeper Jurassic Arab formation.

ConocoPhillips said the project will involve construction of a 1 bcfd gas processing plant at the field, new natural gas and liquid pipelines, and sulfur exporting facilities in Abu Dhabi's

ABU DHABI FIELDS AND DISCOVERIES



Source: OGJ

Ruwais industrial zone. One pipeline will transport elemental sulfur in hot water to Ruwais.

Project interests are ADNOC 60% and ConocoPhillips 40%.

OGJ estimated Abu Dhabi's proved gas reserves at 198.5 tcf (OGJ, Dec. 24, 2007, p. 24). ✦

Menzel Ledjmet East output goal is mid-2011

The target for first hydrocarbons production from the $1.3 billion Menzel Ledjmet East (MLE) development in eastern Algeria's Berkine basin is the second quarter of 2011, said First Calgary Petroleums Ltd., Calgary.

The plan entails combined production of the MLE and Central Area Field Complex (CAFC) producing areas, with MLE to be developed first.

The company plans to relinquish the ZER area about 20 km northwest of the nearest producing well in the CAFC area after having determined it would not be economic to develop.

A gas plant and gathering system with capacities of up to 300 MMcfd and 40 million b/d are to be designed.

The company, which in July received four engineering, procurement, and construction bids for the project, placed orders for $141 million in line pipe. Three pipelines are to transport gas, condensate, and LPG to the national grid 140 km west of Block 405b, and a crude oil pipeline will tie into an existing pipeline in the basin.

One rig is drilling delineation wells in the MLE area. The first section of a housing base for 185 joint venture staff at Hassi Messaoud is to be available for occupancy by December 2008.

Sonatrach is under contract to market gas from the fields, and discussions are under way for it to market the liquids. ✦

Equitable reports progress with Berea gas play

Equitable Resources Inc., Pittsburgh, said it has had encouraging results from early drilling for gas in Lower Mississippian Berea sandstone mostly in Kentucky and plans to have spud 25-30 Berea wells in 2008.

The company has drilled eight Berea wells this year, five of which are on line. The two most recent wells drilled have been flowing less than one month but are expected to average first-month rates of 1.5 MMcfd. Completed well cost is $1.4 million/well.

Equitable hasn't booked any Berea reserves and remains uncertain about vertical and lateral drainage areas, but based on the results of previous drilling believes as many as 3,800 more locations could exist on its acreage where no previous Berea drilling has taken place.

The company has begun planning to add midstream facilities to support the Berea development.

Equitable also plans to drill 11 horizontal wells this year into other nonshale formations of Mississippian age, five in the Weir and three each in the Ravencliff and Big Lime. ✦

Low-quality pay could hike Pinedale reserves

The placing on production of low-quality pay zones at giant Pinedale gas-condensate field in northwest Wyoming could increase the original gas in place estimate, said Ultra Petroleum Corp., Houston. "The significance of continually evaluating the low-quality pay is to provide necessary data to increase the OOIP estimate of Pinedale field and over time, increase Ultra Petroleum's natural gas reserves and production," the company said Aug. 5.

The company has completed 45 wells in low-quality pay with 178 frac stages, or about four fracs per well across about 450 ft of completed Cretaceous Lance/Mesaverde section for just the cost of perforating and the added frac stages.

"The results indicate that the low-quality pay is from uncontacted sand lenses near the wellbore that are beyond the detection range of logging tools," the company said.

Ultra, with plans to have drilled 155 operated wells in Pinedale in 2008, is to have drilled 38 delineation wells this year compared with 13 in 2007. Reserves attributed to all delineation wells drilled so far averaged 120% of predrill reserve estimates.

Ultra drilled and cased 74 wells in the 6 months ended June 30, compared with 87 in all of 2007. Spud to TD averaged 22 days in the most recent quarter, down from 35 days in all of 2007, reducing well costs in spite of large steel price increases.

Further efficiency is expected from a Bureau of Land Management final supplemental environmental impact statement record of decision to be issued shortly that is to allow year-round drilling and completion in concentrated development areas.

Along with a large increase in the number of wells drilled, the full-year access is expected to enable operators to optimize development and limit environmental degradation (OGJ, June 16, 2008, p. 19). ✦

Cuba

Sherritt International Corp., Toronto, its Cuban oil production steady, has finalized the production-sharing contract for a carbon dioxide enhanced oil recovery pilot in Varadero field east of Havana.

After completion of the $15 million pilot, Sherritt will decide whether to

proceed to a commercial scale project. Varadero produces 8-10° gravity oil from 6,000 ft.

Meanwhile, Sherritt signed a production sharing contract on Block 8 in south-central Cuba. The company's gross working interest oil production in Cuba averaged 33,813 b/d in the quarter ended June 30, compared with 30,899 b/d in the 2007 second quarter.

Indonesia

Continental Energy Corp., Dallas, plans to buy a 30% working interest in the 565,500-acre Tungkal production-sharing contract in Central Sumatra, Indonesia, for $27.32 million, subject to approvals.

Operator Pearl Energy Ltd. of Abu Dhabi with 70% interest produces 1,000 b/d from Mengoepeh field. It is to drill 16 development wells on a southern extension of the field starting in late 2008 with a goal of hiking output to 4,500 b/d.

Two prospects will most likely be drilled after the 16 wells, and 3D seismic is available over the field, Continental said. The company said it is negotiating for another property in Indonesia.

Namibia

The Sintezneftegaz-operated Kunene-1 wildcat on Block 1711 in the Namibe basin off northwestern Namibia is to be tested for gas but probably will not be a commercial producer, said partner EnerGulf Resources Inc., Houston.

EnerGulf elected not to participate in gas tests of the well, the first in the basin south of Angola. The company may elect to pay double its share of testing costs to reinstate its participation in case of a commercial discovery.

The government relieved the participants from performing all other minimum work obligations including drilling a second well because Kunene-1 went below the originally planned 4,400 m Albian-Aptian level to 5,050 m to the synrift Barremian stage.

EnerGulf let a contract to Petrophysical Solutions Inc., Houston, to provide expert gas electric log analysis and rock and fluid interpretation for the well and exploration guidance for Block 1711 and its Lotshi Block in Congo (former Zaire).

Pakistan

Mari Gas Co. Ltd. drillstem tested gas at an unstimulated rate of 8.61 MMcfd from the Sui Main limestone at the Koonj-1A well on the Sukkur exploration block in Pakistan, said partner International Sovereign Energy Corp., Toronto.

Another test will take place following acid stimulation.

The joint venture of Mari Gas 50%, Petroleum Exploration Ltd. 35%, and International Sovereign 15% is exploring two other prospects on the block. The 4.1 sq km Structure B is to be drilled next.

New Brunswick

A gas flow at the rate of 1.058 MMcfd is reported from Mississippian Hiram Brook sandstone at the E-08 (Feenan-2) well in eastern New Brunswick.

PetroWorth Resources Inc., Calgary, said the flow is commingled from four zones on a 120-hr test at 155 psi flowing tubing pressure and 347 psi casing pressure.

Feenan-4 reached TD at 1,340 m, and preliminary log interpretation indicates it encountered an extremely hard metamorphosed Hiram Brook section. The Feenan wells are off the west edge of Stoney Creek oil and gas field. Rather than continue to the Mississippian Frederick Brook shale at this location, the company plans to move elsewhere on the 40,846-acre Rosevale license for what should be a less costly attempt.

Quebec

Petrolia, Rimouski, Que., farmed out to an undisclosed oil company its Bourque exploration property 50 km northwest of Gaspe, Que.

The first phase of work includes a 60 sq km 3D seismic survey and drilling a well to 3,000 m. Older seismic indicates the possible development of reef complexes under the property along a 20-mile trend.

The farmee is to spend $20 million in 5 years, including $2.5 million in the first 18 months and $8 million in the first 3 years, without financial participation from Petrolia, to secure its right to participate in the agreement and eventually earn a 70% interest. Petrolia will exercise operational control through an executive committee.

Colorado

Pioneer Natural Resources Co., Dallas, has confirmed that a second and third zones in Cretaceous Pierre shale are contributing to gas production in the Raton basin in southeast Colorado.

The company hasn't yet tested the also-prospective, shallower fourth and fifth members of the shale.

Coalbed methane production from the overlying Raton coals was 24% higher in this year's first half than the same period of 2007, and 10-15% year-on-year increases are expected through 2011 as the shale's share rises.

The company is to ramp up drilling in 2009 from the 160 CBM wells and 15 shale wells planned in 2008. The shale play has evolved in the past 2 years (OGJ, Apr. 14, 2008, Newsletter).

North Dakota

Marathon Oil Corp. plans to drill 65 company-operated wells in the Williston basin Bakken shale oil play in 2008.

The company has seven rigs working and expects to have 100 wells in the play by yearend.

The company's net Bakken oil and gas production in the quarter ended June 30 was 5,070 boe/d, up 130% from the end of 2007, and was 6,200 boe/d at the end of July.

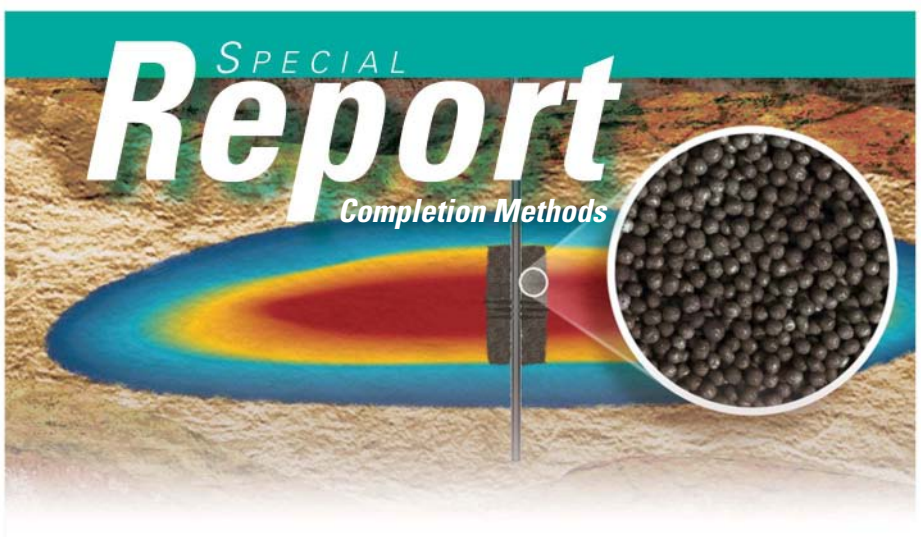
Shell optimizes new Pinedale completions

Nina M. Rach
Drilling Editor

Shell Rocky Mountain Production LLC is optimizing drilling, well design, and completions in the Pinedale field in western Wyoming's Green River basin to increase production and reduce surface disturbance. The company is drilling more than 90 wells in the 150-sq-mile area this year.

The Pinedale anticline is 35 miles long, 6 miles wide, and produces from upper Cretaceous fluvial shales, siltstones, and sandstones. The California Co. drilled the first well in 1939, but the low permeabilities of the rock and distance to the nearest pipelines precluded production.

Introducing hydraulic fracturing in the 1990s and using multistage fracs have allowed operators to develop Pinedale into the second-largest natural gas field in the US (OGJ, June 25, 2007, p. 39), based on Shell's estimated recoverable reserves of 25 tcf.



Shell entered the field in 2001 and is the third-largest leaseholder, after Ultra Petroleum Corp. and Questar Corp. Since 2002, Shell has drilled more than 280 wells, performed more than 2,800 frac jobs, and invested more than $1.5 billion at Pinedale.

The company formed its tight gas task force, with an initial focus on Pinedale, to "find, develop, and implement technologies that would assist in unlocking natural gas resources from ultra tight reservoirs (>0.01 md) in North America."[1]

Shell discovered that there is no single "silver R&D bullet" that addresses the technical challenges. Producing gas from low and ultralow permeability reservoirs requires an integrated approach that incorporates optimized drilling, completions, and reservoir performance modeling, according to Shell.

Well design

The design of Shell's Pinedale wells has evolved. The company is drilling directional wells with slimmer profiles (9⅝-in. surface casing, 7-in. intermediate casing, 4½-in. production casing), using underbalanced drilling techniques, PDC bits, and oil-based mud, according to Operations Manager Geoff Sell. Wells in the field were originally designed with large casing profiles (13⅜-in. surface, 9⅝-in. intermediate, 7-in. liner, 4½-in. production), conventional (overbalanced) well control, rock bits, and water-based mud.

The company is also drilling with casing and skidding rigs on drill pads, as part of the effort to reduce the number of surface pads in the field (OGJ, June 16. 2008, p. 19). Most of the anticline is on 10-acre well spacing but may be reduced in future (Fig. 1), says Shell.

Twenty-eight rigs were drilling on the Pinedale anticline in June 2008, including Unit Drilling's Rig 108, shown here (photo by Nina M. Rach; Fig. 1).

Drilling

Drilling Superintendent Tony Harris told OGJ that Shell is using tricone bits, primarily from Hughes Christenson, to drill the 12¼-in. upper section to about 2,500 ft with clear gypsum water. Shell uses PDC bits to drill the remaining hole and usually get about 80 hr/bit. Drillers switch to oil-based mud to handle swelling shales; they see a clear gamma ray marker at about 7,500 ft, he said.

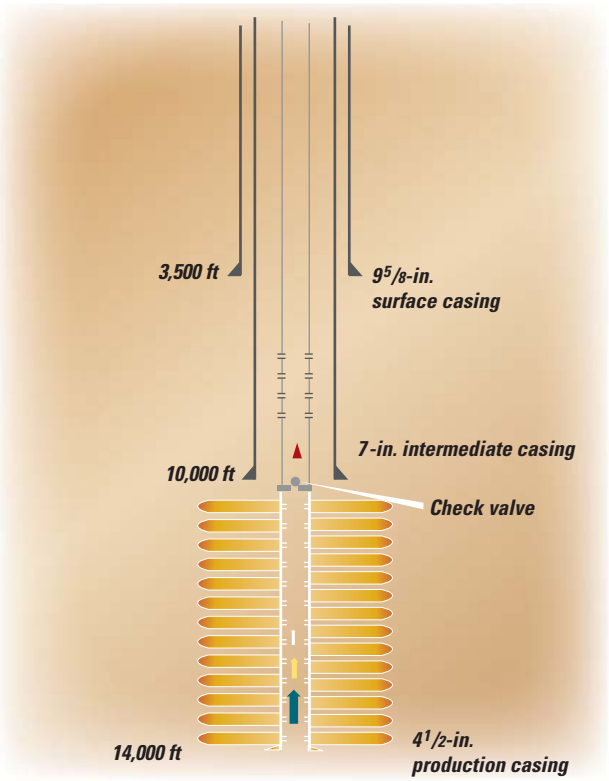
A typical well is drilled directionally, in an 'S' shape, to 13,500-14,000 ft MD, using a mud motor with a 1.5° bent sub. The drillers set intermediate casing above the pay, then drill about 5,000 ft vertically (Fig. 2).

Harris said the pressure at the bottom of the productive interval is usually 15-16 lb and Shell drills at 13.5-14 lb for more efficient drilling and ROP.

Sell said Shell typically drills four to six wells and completes multiple wells simultaneously in groups of two to four, alternating perforating and fracturing operations. The company uses Schlumberger and Halliburton coiled-tubing equipment to drill the plugs.

TYPICAL PINEDALE COMPLETION

Fig. 2



Completion design

Shell uses a commercially available completion modeling software package. Some of the company's design issues include:

- Subsurface complexity (discontinuous, thin sands).
- Zonal isolation.
- Perforation selection.
- Proppant selection and volume.
- Flow-back time, cleanup.
- Isolation technique, staging, connectivity.
- Cross-sections, production logging tools (run on every well, sometimes multiple PLTs/well).

Mike DeWitt, Shell's completion superintendent, told OGJ that Shell has run a number of technology trials at Pinedale, including fracing

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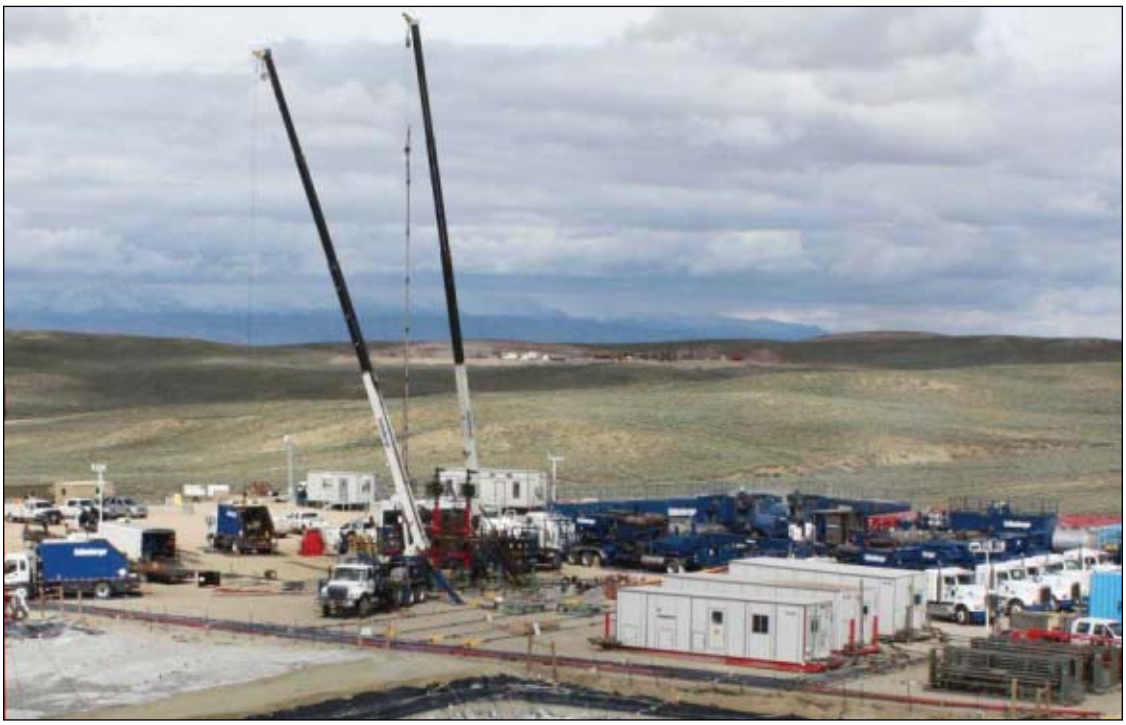

Shell runs 24-hr completion operations at Pinedale. The photo shows three wells being completed simultaneously, with two wireline perforating units at lower left. The crane on the right hoists a lubricator and a select fire perforating and plug setting assembly; the assembly is used to set a composite plug to isolate the previous frac stage and then perforate the next frac stage in a single run in the well (photo by Robin Naughton-Rumbo, Shell E&P Co.; Fig. 3).

with coiled tubing and different isolation systems, such as the Excape system from BJ Services Co. and Marathon Oil Co.[2] "Subsurface complexity has made it very difficult to determine if the technology trials produced measurable improvements in performance," he said.

Completions

Shell focuses on pay zones from 14,000 ft to 7,000 ft MD, consisting of as many as 50 different sands. Pressures range 11,000-3,800 psi, and permeabilities average 0.005 md.

Each frac interval is 100-400 ft and includes two to four individual sands. The crew pumps slick water and cross-linked gel fluid at an average 35 bbl/min but can range 25-45 bbl/min.

In general, each well will has 15-22 individual frac stages, using an average 105,000 lb of proppant/stage. Shell's completion superintendent Mike DeWitt told OGJ that about 65-70% of the proppant is 20/40 Ottowa sand, and 30-35% is a mix of intermediate-strength ceramic and economy ceramic. Sell said Shell pumps a "river frac" in the top 3,000-4,000 ft of the reservoir—20/40 sand with slick water. It uses a cross-linked polymer gel for lower intervals.

A few years ago, Shell experimented with trailing-in resin-coated sand but did not see a noticeable benefit, said Sell. Shell trucks all proppants north from Rock Springs, the closest railhead.

Shell filters produced water and reuses it for hydraulic fracturing. The company plans to increase the amount of water available for reuse.

Shell typically fracture stimulates wells about 2 weeks after getting the drilling rig off location (Fig. 3). Preparing the location includes checking the plugback TD, cement bond log, and spotting water tanks. The completion follows a set process:

1. Perforate stage 1.
2. Mobilize hydraulic fracturing crew.
3. Frac stage 1 with no flow-back.

Pinedale reservoir characteristics

Maastrichtian-age Lance formation
5,500-ft interval of stacked, fluvial clastics between 7,500-14,000 ft TD

Porosity	8%
Permeability	1-10 md
Pressure gradient	0.5-85 psi

4. Plug; perforate stage 2.
5. Frac stage 2 with no flow-back.
6. Plug; perf; frac; repeat up to 22 stages.
7. Flow back upper zones until coiled tubing is rigged up.
8. Drill out composite plugs with CT. All gas to sales; minimal flaring.
9. Flow well 6-8 days to clean up.
10. Hand off well to production.

Wells typically flow for 6 months to 18-24 months before liquid loading begins to require tubing installation. Shell generally installs 2⅜-in.-diameter jointed tubing in the initial workovers. Only a handful of wells have plunger lift systems. Sell told OGJ that Shell will try running 1¼-in. diameter CT strings inside 2⅜-in. tubing.

Operations

A typical Pinedale well completed in the Upper Cretaceous MesaVerde and Lance sands has 16-18 frac stages in 8-9 days. Sell told OGJ the company sees about 20%/year inflationary cost increases but is "leveraging our size to reduce costs."

In 2007, Shell ran 8 rigs, drilled 80 wells, completed 75 wells, and performed 1,409 frac jobs. US onshore asset manager David Todd said that rig crews were consistently delivering "sub-30-day wells" in 2007 and that the best performance in 2008 was a well completed in 18.2 days. Todd said that sub-20-day wells were consistently possible.

This year, the company is drilling more than 90 production wells using 8 Nabors rigs. There are about 20 other rigs working in the field this year; Questar operates 11-12 and plans only 26 production wells for the year (OGJ, Mar. 3, 2008, p. 37).

After 6 years of operations at Pinedale, Shell sees significant improvement in total completion cost, cycle time, and individual frac stage cost.

Shell considers itself "the low-cost driller" at Pinedale. Todd said the company will be successful through its application of technology, economies of scale, and integration of drilling, completion, and reservoir modelling. Margins are tight, and "the low-cost emphasis is always going to be part of the formula for success here." ✦

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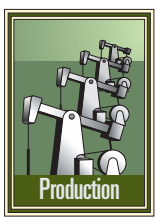
Straddle packer assemblies allow selective completions, stimulations

Gordon Mackenzie
Garry Garfield
Baker Hughes Inc.
Houston



In well completions, straddle packers offer a way to shut off zones from producing or injection intervals above or below the packers. In this article, two examples from completions in the North Sea and one off Brazil illustrate the use of straddle packers.

In its simplest form in an oil field application, a straddle assembly will have two packers connected to each other in a manner that isolates the section between these two packers from the zones above and below the assembly.

Packers differ from bridge plugs in that packers have an unrestricted ID that allows for fluid flow from top to bottom or vice versa. Bridge plugs, on the other hand, are tools that, when set in a well, have no through-bore communication and prevent fluid flow in either direction.

This article discusses two main types of straddle packer operations. In the first, a straddle assembly is in either a temporary or permanent application whereby the straddle shuts off the area between the two packers from either production flow or surface injection and subsequently allows for continued production from or injection into zones both above and below the set packers.

The second operation consists of temporary retrievable service-type straddle assemblies placed in position and left in communication with a service string such as threaded or coiled tubing (Fig. 1). These assemblies provide a means to perform pumped remedial operations such as zonal stimulation.

One primary requisite of a straddle packer is a minimal OD to ID ratio. A larger straddle packer ID provides less resistance to flow, creating less of a downhole choke. Also, a larger ID facilitates running well servicing tools below the packers for such operations as perforating, logging, or plugging back.

Nonservice straddles

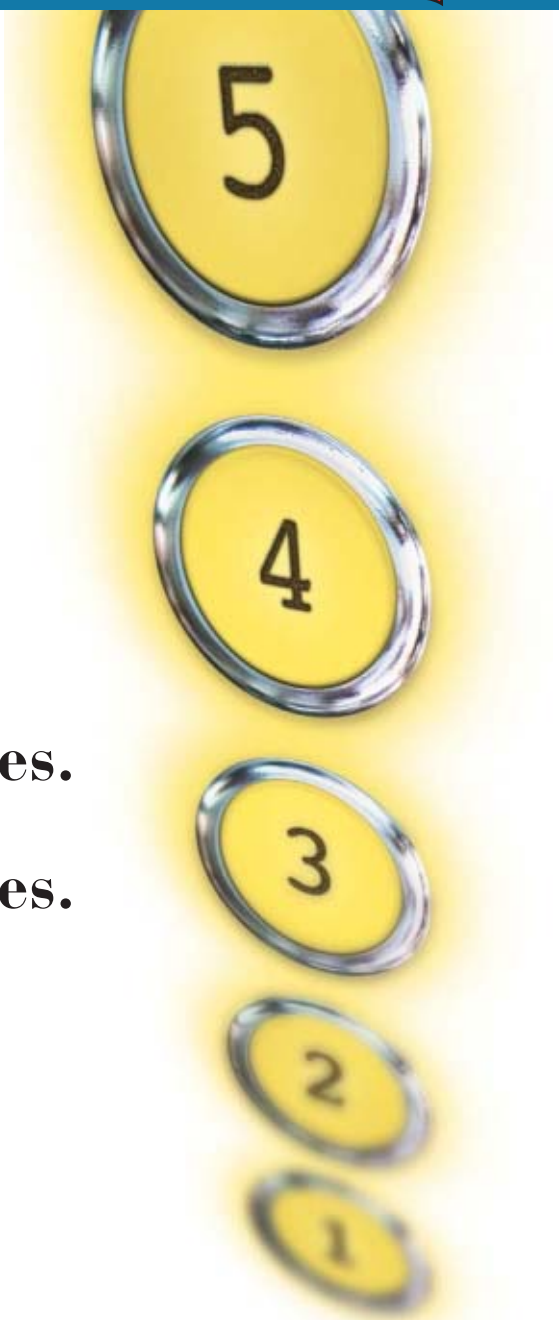
The nonservice-type straddle assemblies are deployed in either through-tubing or in the full bore. Common applications for these straddles include:

- Isolate intermediate zones.
- Isolate upper zones.
- Insert sand-control screens.
- Insert flow-control equipment.
- Install velocity strings.

Through-tubing straddle assemblies on coiled tubing have the advantage of allowing deployment of downhole equipment in a live well. This reduces health, safety, and environmental requirements, allows for faster trip times, reduces operational footprint, eliminates kill weight fluids, keeps wells on production during intervention, and eliminates the need to remove completion equipment.

Baker Oil Tools inflatable straddle systems have a small run-in OD to facilitate running through the completion string and creating a seal in the larger casing ID below.

A variety of designs and sizes of through-tubing, inflatable straddle assemblies is available for both permanent and retrievable options. The assemblies can be as simple as two standard inflatable packers and interval spacing to as complex as running fit-for-purpose, exotic material devices more than 1,500 ft in length.



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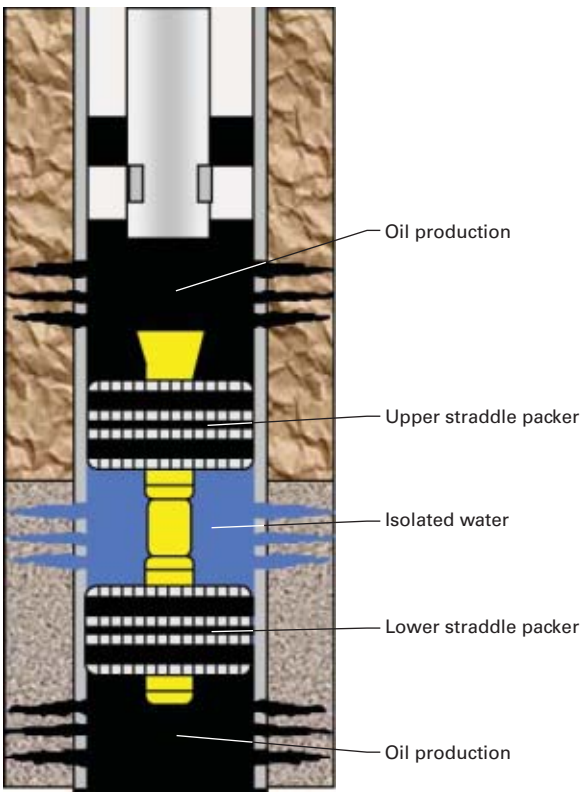
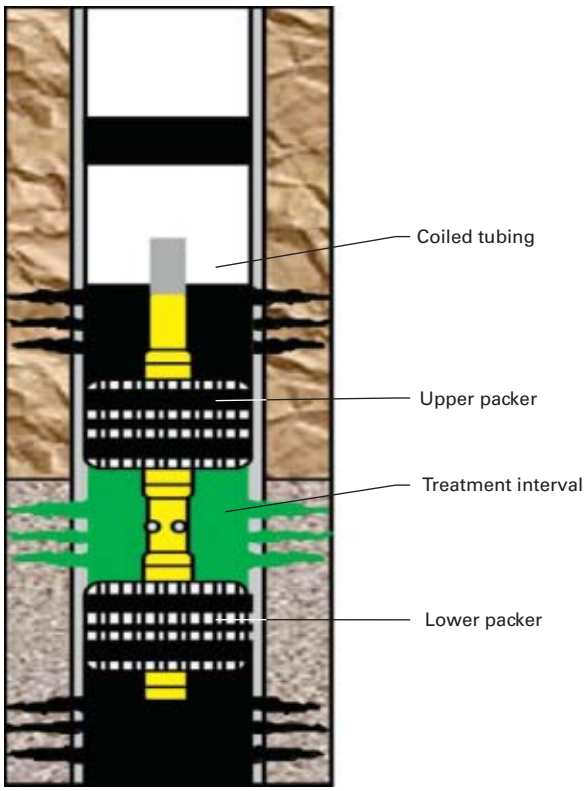
PERMANENT STRADDLE PACKERS

Fig. 1



COILED TUBING RUN STRADDLE PACKERS

Fig. 2



A through-tubing permanent straddle packer assembly includes inflatable packers designed to isolate permanently a wellbore section. The packers are set one at a time or both in the same trip. These assemblies are run on threaded tubing, coiled tubing, or electric wireline.

In-hole latching mechanisms allow the straddle assembly to be run in sections, thereby facilitating longer straddles in cases where a complete assembly length does not fit in the surface riser or lubricator.

The production or injection areas within the wellbore are not the only areas that may require straddle isolation for remediation. If the upper production tubulars develop holes or leaks, straddle assemblies can isolate areas, thereby eliminating well workovers that require pulling out downhole tubulars.

Service straddles

Service-type straddle assemblies also are deployed either through tubing or in the full bore. In treatment operations, these assemblies with inflatable packers on coiled tubing have the same advantages as previously listed for nonservice assemblies.

An inflatable straddle acidizing packer (ISAP) allows precise injection of acid or other chemical treatments into short, select wellbore sections. This feature replaces other less effective methods used previously for selectively placing treating fluids, such as bull-heading, ball sealers, or chemical diverters. The inflatable straddle assembly primarily is run on coiled-tubing workstrings; thus the tool operates within the safe tension, set down, and pressure limits of the coiled tubing.

Straddle assemblies that require only a slight tension and no set down weight for operation are ideal for applications in horizontal or highly deviated wellbores. The inflatable straddle assembly has a resettable design, thus a single trip in the well can treat multiple intervals.

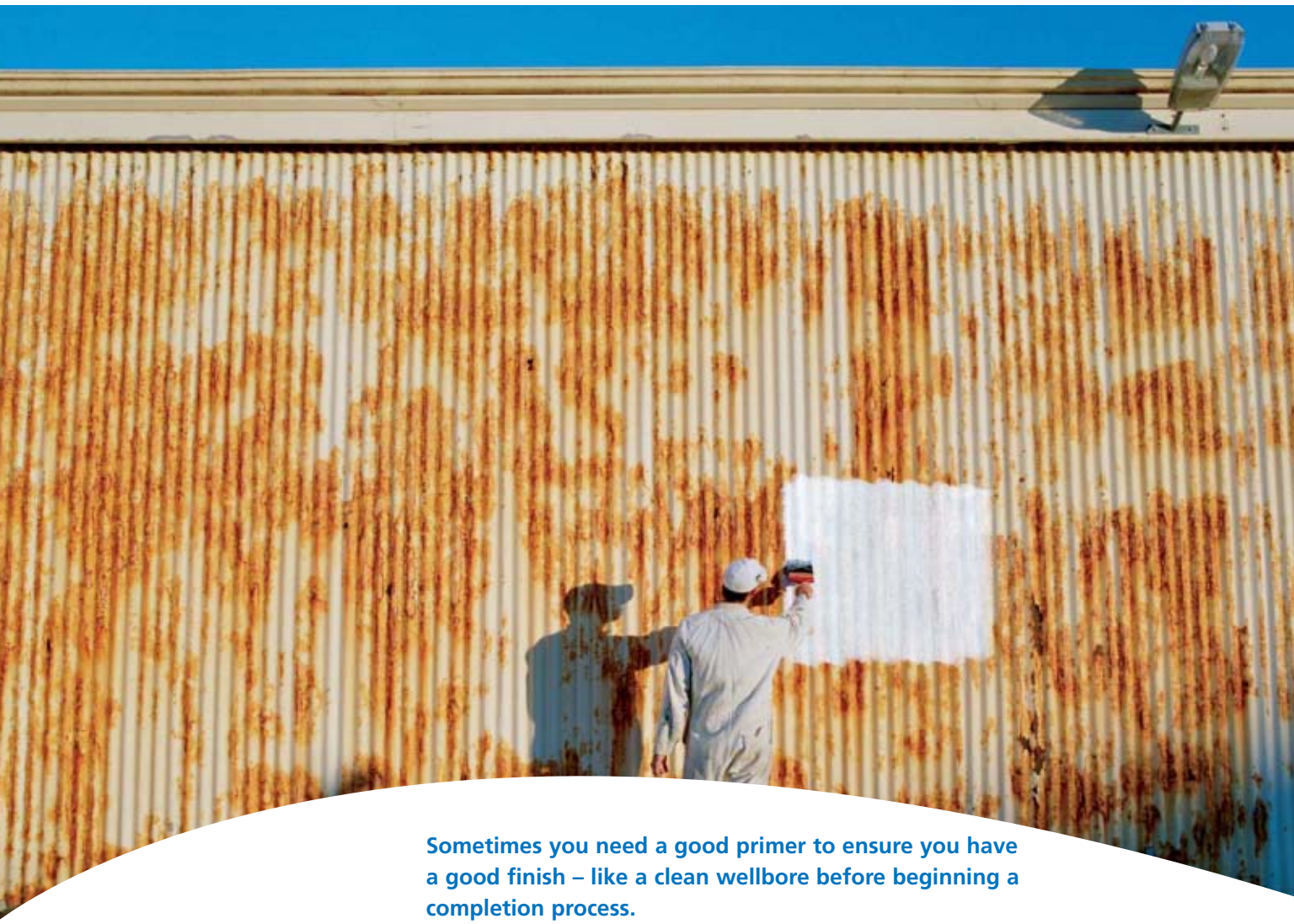
The design of the inflatable elements also allows the packers to be set in perforations, screens, or open holes. This facilitates treatment of long, continuous intervals without the need for a blank casing packer seat in which to set the elements. Installation of threaded spacers can adjust the spacing between the top and bottom packer sections (Fig. 2).

Another service straddle assembly is an inflatable, multiset, straddle packer for zonal isolation service work in cased and openholes. The inflatable test and treat system (ITTS) can treat or test flow from selective intervals.

The ITTS design allows it to be run on threaded pipe, in vertical, deviated, and horizontal wellbores, so that short sections of the formation can be chemically treated precisely or flow tested. This straddle is a modular assembly that can be made up as it is being run in the hole.

The straddle assembly has a two-position operation: pick up for setting, and set down for injection and testing. The ITTS design allows for treatment

Does Your Wellbore Need a Primer?



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and testing multiple zones in a single trip, saving the operator rig time during intervention operations.

Full-bore straddles

In a monobore (nonrestricted), the full-bore straddle assembly has the advantages of a more robust design, higher pressure capability, and pinpoint placement accuracy of treatment fluids.

One main technology development in recent years is a full-bore straddle tool with no packer cups for pressure isolation and large treatment ports for maximum injection rates. An assembly without cup-type packing elements has instead hydraulic-set packing elements rather than the more traditional compression set elements for zone isolation.

The hydraulic-set packing elements will have a longer life in the well, so that more zones can be treated in a single run. The elements also allow faster running and pulling times due to their having greater annular clearance.

The assemblies have full-opening stimulation ports between the packing elements to support large fluid volumes. These large-bore straddle assemblies are seeing increased use in large-volume acid and proppant fracs for restimulating production intervals.

These assemblies allow the operator precisely to place and inject fracturing and other stimulation into a desired formation length. Generally, full-bore service straddle assemblies are run primarily on threaded pipe; some assemblies can be run on a coiled-tubing workstring, however.

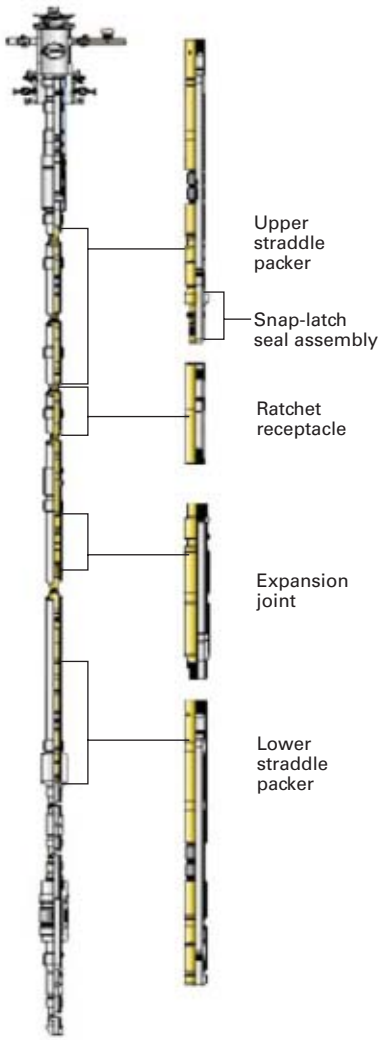
One common straddle tool design currently in use is based on the application of compression set service packers and uses the concept of running two packers and spacer pipe to form a straddle assembly. As simple as it sounds, this type of fullbore straddle assembly is effective and efficient at placing large fluid treatments across a single zone or multiple sets of perforations.

Conveyed on threaded pipe, a set-down straddle tool can effectively isolate perforations for washing or acidizing. After individual treatment of perforations, one can then move the straddle tool up hole to treat the entire set of perforations.

The straddle assembly has many features of standard service packers including button-type hold down pistons to maintain pack-off during high-pressure operations from below and a built-in unloader.

SNAP-LATCH SEAL ASSEMBLY

Fig. 3



UK North Sea

One example of a straddle packer application is from the offshore Foinaven oil field, west of the Shetland Islands. The field produces through subsea wells that are connected to a floating production, storage, and offloading vessel (FPSO).

Unlike most available straddle assemblies, the packer seals on the straddle assembly installed in a water-injection well in the field have metal-to-metal seals rather than traditional elastomeric seals. The design concept for the seals relies on the controlled application of load to expand the seal and create a fully formed pressure barrier. The compliant metal of the seal forms this pressure barrier with the inner diameter of the tubular wall into which the tool is set.

Although still relatively new, these metal-to-metal seals are being employed primarily on well service tools such as permanent and temporary wellbore plugging devices and straddle assemblies. Metal-to-metal seals have the advantage of mitigating or eliminating commonplace failure modes such as gasification, explosive decompression, temperature degradation, chemical attack, reliance on elastomer memory for retrieval, and extrusion gap shearing. Also for straddle applications, the relatively small seal cross-sectional area as opposed to an elastomeric seal offers a greater potential for increased straddle packer ID.

This water-injection well in the field required isolation of an upper zone to allow the continued injection in lower zones. The mixed 5½-in. OD, 17 lb/ft, and 20 lb/ft tubing string had a minimum 3.650-in. ID restriction because of a partially closed fluid control valve. The straddle assembly run required the top pack-off to set in the 17 lb/ft tubing and the lower pack-off to set in the 20 lb/ft tubing.

The operator's objectives were first to mill out the partially closed fluid-control valve with coiled tubing-deployed mills and motors to a 3.91-in. ID. Also, the job required the straddle assembly to allow injection of up to 20,000 b/d, be compatible with either slickline or coiled-tubing conveyance methods, and be retrievable.

The assembly developed, tested, and installed had a 3.85-in. OD and a 1.81-in. ID and could be expanded

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while a 5,000-psi pressure differential was being maintained.

The installation procedure involved running the lower straddle packer on coiled tubing and setting it in the 5½-in. OD, 17 lb/ft pipe. This was followed by running in a single run the upper packer on coiled tubing and setting it in 5½-in. OD, 20 lb/ft tubing with the spacer tubing and centralized latch stinger in place.

The straddle assembly was about 875 ft long, thought to be the longest known straddle deployed from a semisubmersible.

Dutch North Sea

This next example is from the Ameland field, in the Dutch sector of the North Sea. Platform-completed wells produce the field, the third largest gas field in the Netherlands.

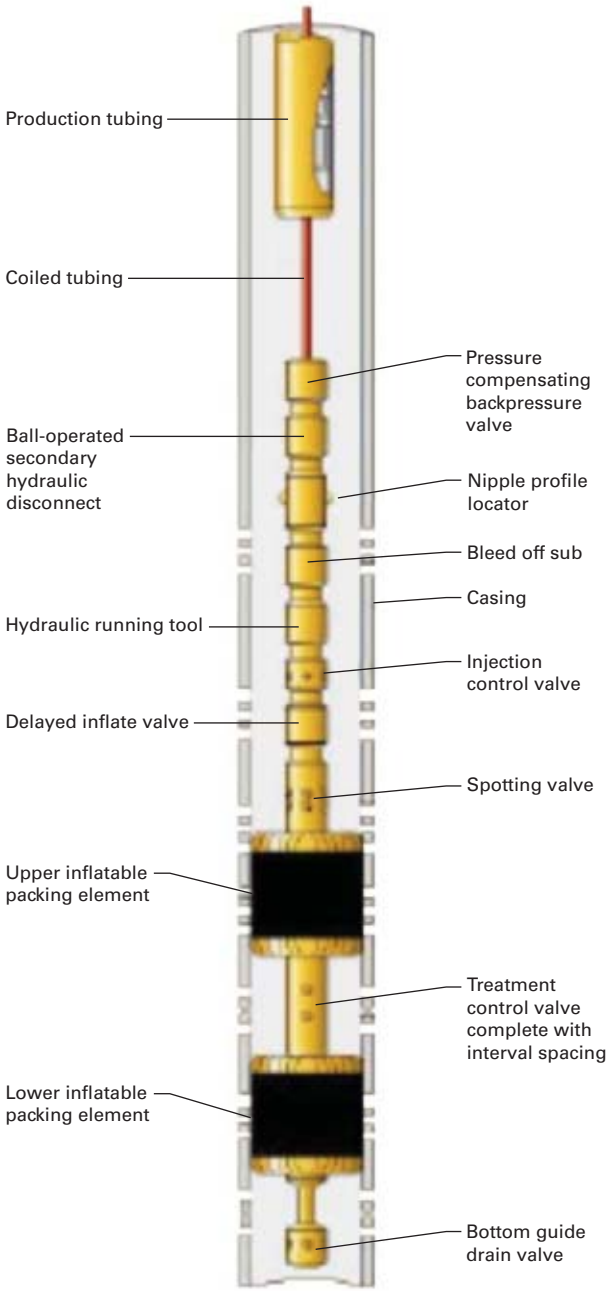
The operator required the straddle assembly to repair production tubing damage sustained during a previous acid job. The 5-in. 15 lb/ft, 13% chrome L-80 tubing string had substantial holes and cracks over a 1,640-ft interval, as determined in a downhole video survey.

The operator decided to repair the tubing with an inflatable packer straddle assembly because of a 3.81-in. ID restriction in the completion string. The 3.625-in. permanent straddle assembly requires a minimum 2.25-in ID (Fig. 3).

The job called for setting the lower packer at 13,327 ft MD and the upper straddle packer at 11,522 ft MD. The wellbore's maximum deviation was 47.5°.

Setting the straddle assembly, conveyed on coiled tubing, required three separate trips. The first trip set the lower packer at 13,327 ft. The second run conveyed 1,871 ft of 2.875-in., 6.4 lb/ft interval spacing tubing incorporating a snap-latch sealing assembly to connect to the previously positioned lower straddle packer and an expansion joint.

SELECTIVE ACIDIZING STRADDLE Fig. 4



The last trip involved running the upper straddle packer and latching it into the interval pipe receptacle before setting the packer.

All components of this inflatable straddle packer assembly were of 13% chrome. This was the first known run of an inflatable straddle assembly with chrome materials.

Brazil

The third example is from a water-injection well in the Marlim field off Brazil. Subesa completed wells in about 3,400 ft of water produce this Campos basin field.

One water-injection well in the field had a 2,200-ft horizontal section with 4.50-in. 12.6 lb/ft screens. The minimum completion restriction was 3.50-in. Because of skin damage and screen plugging the water injection rates had peaked at only 4,100 b/d compared with the predicted 18,800 b/d. To increase the injectivity index and reduce the skin damage, the operator decided to treat the well selectively with acid.

To allow for this selectivity, the job included a 2.50-in. OD inflatable acidizing straddle packer (ISAP) system run on 1.75-in. OD coiled tubing (Fig. 4). The spacer length between the two packers was 65 ft.

The job involved pumping a combination of treatment fluids including ammonium chloride brine, butyl glycol acetate, 10% hydrochloric acid, 9:1 mud acid, and 4% xylene. The pump maintained a flow regime of about 43-50 gpm through the straddle system with a surface pressure of up to 4,600 psi.

In total, the selective straddle system

was run four times, combining a total of 33 sets and more than 250,000 gal of fluid pumped.

The results of this straddle positioned stimulation were better than expected.

Injection rates increased to more than 26,000 b/d. The injectivity index improved by more than 500% and skin damage decreased to 1.08 from 4.6 ✦

The authors

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Garry Garfield is business development manager for thru-tubing intervention for Baker Oil Tools, Houston. He has worked for Baker Oil Tools for more than 12 year in various operations and marketing positions, including product line strategist, region engineer, and applications engineer. Garfield has a BS in petroleum engineering from Montana Tech.

US refinery investments align with oil sands supplies to 2015

Lindsay Sword
Wood Mackenzie
Edinburg

Supply of Canadian oil sands products will increase by 2 million b/d between 2007 and 2015; half of this growth will be in Canadian heavy crude blends. A recent study shows that the export pipeline infrastructure and US refinery capacity will be able to handle forecast additional supplies of Canadian crude during 2007-15. Planned export pipeline infrastructure should keep pace with forecast additional supply of oil sands products to 2015; export pipeline capacity will increase by 2.1 million b/d. Current capacity tightness should be resolved once expected new pipelines start up in 2008 and 2009. By the end of 2015, spare capacity will reduce, suggesting the need for additional export capacity shortly after 2015.

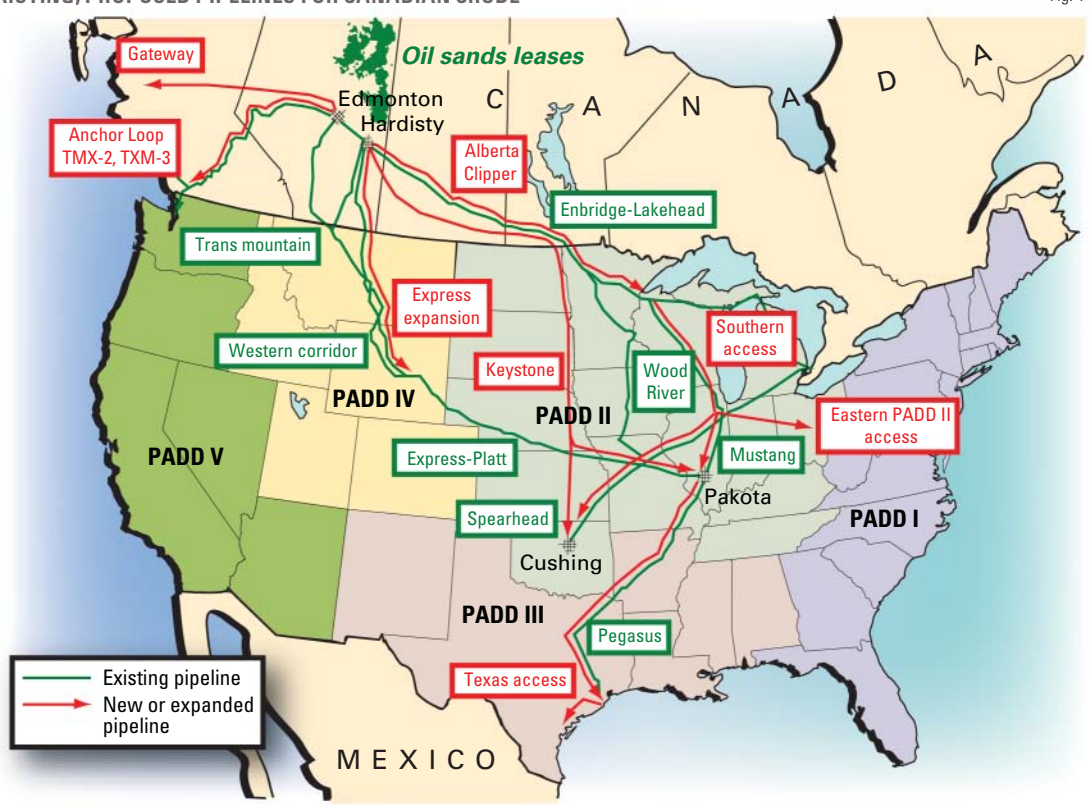
Refinery projects targeting Canadian heavy blends that we expect to proceed are aligned with our forecast of additional supply: Canadian heavy blends supply will increase by 1 million b/d by 2015, and projects that are planning on processing heavy blends will increase by 1.1 million b/d.

Flexibility in Canadian heavy blends supply vs. refinery capacity will be available only after commissioning of the proposed Texas Access pipeline to the US Gulf Coast (post 2012). At that point, heavy-oil capacity in the region could be used to process Western Canadian blends if projects do not progress as planned in US Petroleum Administration for Defense District (PADD) 2.

Currently disclosed project costs reveal that pipeline companies and US refiners plan to invest more than $31 billion by 2015 to export and distribute oil sands products as well as process them in the US refining system. This figure excludes any investments in in-

EXISTING, PROPOSED PIPELINES FOR CANADIAN CRUDE

Fig. 1



ternal pipelines in Alberta, the Canadian refining and upgrading system, and undisclosed refining investments.

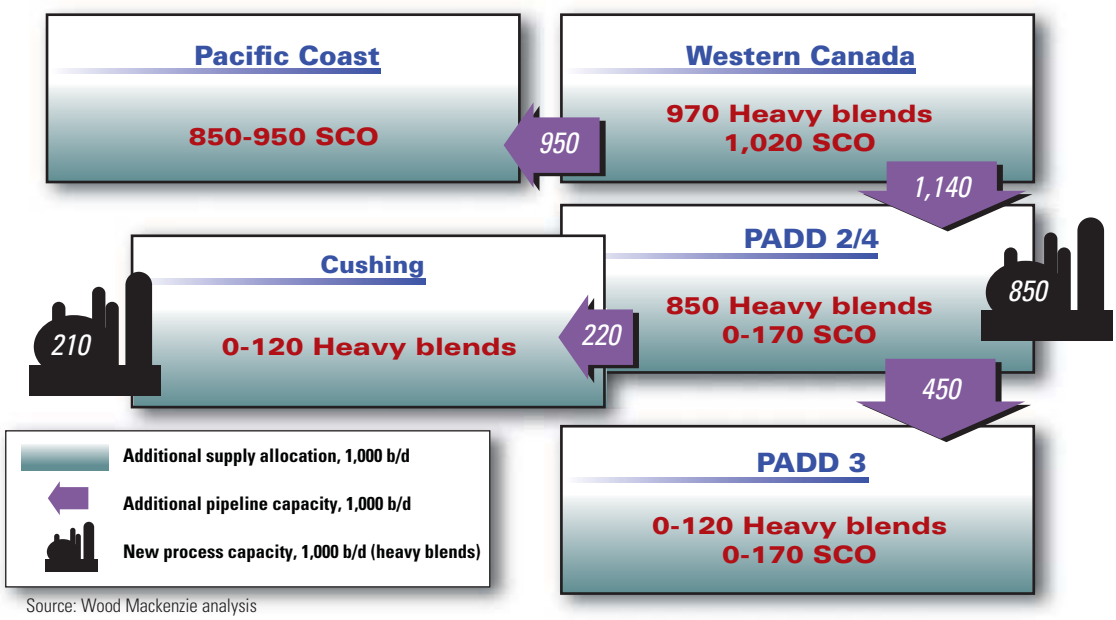
Our study shows that pipeline availability will largely determine the actual allocation of crude supplies by 2015:

- *Canadian heavy blends.* Most additional Canadian heavy blends will be refined in PADD 2 by 2015, with remaining supplies processed in new markets of the US Gulf Coast or supplied from Cushing, Okla.
- *Synthetic crude oil.* Most additional SCO will be shipped to the US Pacific Coast by 2015; pipeline constraints will limit transfers to PADDs 2 and 3. SCO that will make its way to the Midcontinent will be run in PADD 2 and US Gulf Coast refineries.

This study uses Wood Mackenzie's refinery evaluation model, which provides independent appraisal of global refinery competitive position.

ALLOCATION OF ADDITIONAL PRODUCTS, 2015

Fig. 2



Source: Wood Mackenzie analysis

Canadian crude

Canada ranks as having one of the world's largest oil reserves, after only Saudi Arabia and potentially Venezuela. The Albertan oils sands deposit has in-place resources of about 1.75 trillion bbl, of which about 10% are recoverable with current technologies.

Projected growth of Alberta's oil sands output is triggering investments in US midstream and downstream sectors in anticipation of the new production. In Canada, oil producers have announced production projects as well as upgraders that will supply growing volumes of bitumen and SCO.

This has encouraged Canadian and US pipeline companies to propose new midstream infrastructure to deliver the production to market. US refiners have announced projects in preparation for the incoming flows from Western Canada.

This article analyzes the effect of pipeline and refinery investments during 2008-15, focusing on:

- Who is expected to invest and where?
- How will the projects fit together?
- How will the medium term look?

Upstream outlook

Strong growth in oil sands production during the past few years has been an important contributor to global supply and provided the US with the prospect of a secure source of supply from Canada. Bitumen production from Alberta's oil sands during 2007-15 will increase to 3.1 million b/d from 1.2 million b/d.

This outlook is based on an assessment of individual projects that are currently in production or likely to come on stream. It also anticipates delays to projected start-up dates and less than full utilization rates due to anticipated technical problems.

A significant portion of bitumen production will be upgraded to SCO. Currently there are four upgraders in Alberta and Saskatchewan, operated by Suncor, Syncrude, Husky Energy, and the Athabasca Oil Sand Project. Canadian Natural Resources Ltd. and OPTI-Nexen have invested in new upgraders, scheduled for start-up in 2008. In addition, another 11 upgraders and one refinery conversion have been announced, projected to begin operating before 2015.

In reality, several of these projects including proposed expansions of existing upgraders are likely to be delayed, rescaled, or canceled due to increased cost, complexity of regulatory requirements, engineering and construction material shortages, as well as revisions to forecasts for bitumen output.

Nonupgraded bitumen is blended with diluents, synthetic oils, and conventional crude to reduce its viscosity before being pumped to the refineries. Resulting Canadian heavy blends and SCO supply will grow to 3.7 million b/d by 2015 from 1.7 million b/d in 2007.

PLANNED REFINERY INVESTMENTS

Company	Refinery location	Project	Additional heavy blends, 1,000 b/d	Investment, $ billion	Start-up
Flint Hills Resources	Rosemount, Minn.	Expansion 2007 (oil pipeline 2008)	50	0.2	2007
Sinclair Oil	Sinclair, Wyo.	Upgrade	35	N/A	2008
Holly	Woods Cross, Utah	Capacity expansion, upgrade	10	0.1	2008
Frontier Oil	El Dorado, Kan.	Capacity expansion, upgrade	10	0.4	2009
Sinclair Oil	Tulsa, Okla.	Capacity expansion, upgrade	60	1.0	2010
Marathon Petroleum	Detroit, Ill.	Capacity expansion, upgrade	80	1.9	2010
WRB Refining	Wood River, Ill.	Capacity expansion, upgrade	130	1.9	2010
BP	Whiting, Ind.	Upgrade	260	3.8	2011
Holly	Artesia, NM	Capacity expansion, upgrade	40	N/A	2011
WRB Refining	Borger, Tex.	Debottleneck	40	0.3	>2012
WRB Refining	Wood River, Ill.	Capacity expansion, upgrade	210	2.0	2014
BP/Husky Energy	Toledo, Ohio	Capacity expansion, upgrade	60	2.5	2015
WRB Refining	Borger, Tex.	Capacity expansion, upgrade	70	0.6	2015
Total			**1,055**	**14.7+**	

Source: Wood Mackenzie refinery evaluation model

Existing pipelines

The existing pipeline infrastructure to deliver oil sands crude to foreign markets consists of export pipelines and the internal distribution network in the US (Fig. 1). Most of the Canadian crude is exported to US markets through four major trunk-line systems:

- Enbridge-Lakehead system is the main route for Western Canadian crude exports to the US. It links Alberta with PADD 2 and also with Ontario. This system connects to downstream pipelines in Illinois, which extend to Cushing and the US Gulf Coast.
- Express-Platte system links Alberta with PADD 4 and, in a limited way, to PADD 2.
- Western Corridor connects the Rangeland and Cenex pipelines in Western Canada with PADD 4.
- Trans Mountain pipeline is the only system that links Alberta with the Pacific Coast (Vancouver in Canada and Anacortes in the US).

These trunk lines transported about 1.7 million b/d of Canadian crude, including both conventional crude and oil-sands products, to the US in 2007. They are unable, however, to accommodate the projected increase in heavy oil supply from Western Canada.

New pipeline investments

There are many proposals to expand and extend the pipeline infrastructure to meet growing supplies from Western Canada in the short and medium term. In many cases, the decision to invest will be subject to support from pipeline users and regulatory approval, leaving considerable potentials for delay.

Fig. 1 shows the existing and proposed pipelines to export and distribute Canadian crude.

Enbridge is investing the most in pipeline infrastructure. Its projects with disclosed cost information total more than $8.5 billion. Other companies including Kinder Morgan and ConocoPhillips-TransCanada have announced investments totaling more than $7.3 billion, and there are three substantial projects proposed for after 2010 with undisclosed costs.

New and incremental export pipeline projects will provide an additional 2.1 million b/d of capacity between 2008 and 2015. The downstream distribution pipelines most likely to proceed will add 250,000 b/d of additional capacity to Eastern PADD 2, 65,000 b/d to Cushing, Okla., and 450,000 b/d to the US Gulf Coast during 2008-15.

Expansion of the pipeline infrastructure will focus on PADD 2 in the short term. Expansions will not allow significant oil sands products to reach the US Gulf and Pacific Coasts until after 2012.

Downstream

Fig. 2 shows an indicative allocation of additional oil sands products by 2015.

It also shows that, assuming Canadian heavy blends' intake into PADD 2 reach maximum capacity by 2015, only small volumes of oil sands products would reach the US Gulf Coast (PADD 3) by yearend 2015.

This raises a question regarding the future supply of additional heavy crude in PADD 3, given the significant number of projects that are planning to upgrade heavy oils in this region, and may lead to some strong price competition for Canadian heavy blends that could affect the various flows in Fig. 2.

Canadian heavy blends

The growth of heavy oil sands production and the attractive price differential vs. conventional light crudes has encouraged proposed refinery investments in the US targeted at processing heavy blends.

Refiners that lead the investment in refinery expansions and upgrading to run Canadian heavy blends are BP PLC (including its partnership with Husky Energy), ConocoPhillips (by means of its WRB Refining joint venture with EnCana), and Marathon Petroleum Corp. These three companies and their partners currently plan to invest $13 billion to add about 850,000 b/d of heavy blends processing capacity by 2015.

Other refiners have announced refinery projects that will require investments exceeding $1.7 billion to process an additional 205,000 b/d of oil sands blends by 2015.

The investment climate is changing quickly; increasing project costs, availability of raw materials and labor, as well as reductions in refinery margins are delaying and could lead to cancellation of several proposed projects.

Most of the announced capacity will be built in PADD 2 areas already supplied by Western Canadian crude and only 250,000 b/d in southern markets.

In addition to the investments listed in the accompanying table, there are several expansion and upgrading projects that will increase heavy oil processing, most of them on the US Gulf Coast but not necessarily planned exclusively for Canadian heavy blends feedstocks.

Synthetic crude oil

There have been no announcements of new capacity in the US specifically for processing SCO. SCO can replace light sweet conventional crude in most refineries. The sensitivity of each refinery to the weak point of SCO—poor quality of the distillates—determines how much each refinery can process. In most cases, dilution in the crude slate is sufficient to overcome this.

Wood Mackenzie assumes that SCO will compete with both domestic and foreign light crude oil in the US. Canadian SCO penetration will redistribute domestic light crude flows within the US. This will likely result in less domestic crude from the US Gulf Coast and Texas transferring to PADD 2. PADD 3 refineries will instead process this crude.

The net effect of increased SCO intake by US refineries will be the replacement of foreign crude in the US market. ✦

The author

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BLACK POWDER—Conclusion

Management requires multiple approaches

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Effective control of black powder usually requires a combination of several management methods varied for each specific case. Several removal and prevention methods can help gas pipeline operators mitigate and manage black powder's effects.

Black powder occurs globally. It is regenerative, forming inside natural gas pipelines as their internal walls corrode, and spurred by the reaction of iron (Fe) in ferrous pipeline steel with condensed moisture containing oxygen (O_2), hydrogen sulfide (H_2S), and carbon dioxide (CO_2). These chemicals are benign in dry sales gas but can become corrosive when dissolved in water.

In sales-gas transmission pipelines exposed to oxygen contamination, black powder consists primarily of iron hydroxides, iron oxides, and small amounts of iron carbonates. Contaminants such as sand, dirt, hydrocarbons, elemental sulfur, and metal debris typically make up 20 wt % of black powder. Black powder's jagged shape and high hardness erode pipeline control valves. In pipelines transporting untreated sour natural gas, black powder consists primarily of iron sulfides.

The first part of these two articles (OGJ, Aug. 11, 2008, p. 54) reviewed recent laboratory and field work conducted at Saudi Research and Development Center to determine the composition, sources, and formation mechanisms of black powder in gas transmission systems. Microhardness, nano-indentation, x-ray diffraction (XRD), x-ray fluorescence (XRF), and scanning electron microscopy (SEM) techniques, as well as several bacterial analysis methods analyzed black powder samples collected from the field.

This concluding article describes black powder's physical and mechanical properties and presents a summary and brief discussion of various black-powder management methods.

Properties

The accompanying photograph shows scanning electron microscopy (SEM) images of dry and wet black powder. Both black powder samples consist of fine, jagged particles. X-ray diffraction (XRD) analysis further confirmed the average particle size of black powder as less than 100 nanometers.

Microhardness measurements conducted on both pipeline steel and black powder revealed average Vickers hardness values of 179±10 VHN (87±2 R_b) and 498±62 VHN (49±4 R_c), respectively. Hardness measurements conducted on black powder particles with the nano-indentation technique revealed an average hardness value of 475±162 VHN (47±10 R_c).

These results show both hardness measurement techniques provide comparable hardness values for black powder, and black powder is harder than carbon steel (the hardness of black powder is in the Rockwell C range, while pipeline steel has hardness in the Rockwell B range). The large standard deviation in hardness measurements with the nano-indentation technique stems from the differing composition of the particles (iron oxides or iron carbonates), known to have different hardness values.

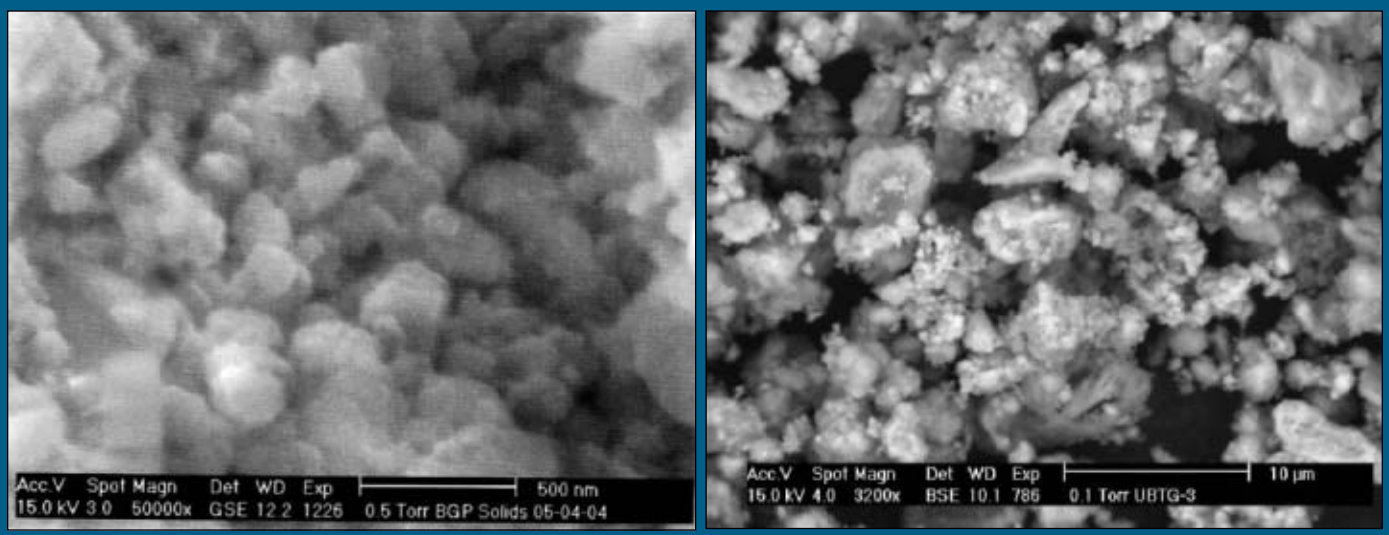
Management methods

Gas pipeline companies practice various methods to manage and control black powder in their systems. These methods reside in two categories: removal methods and prevention methods.

Removal

Pipeline companies have observed the presence of black powder and its effects for years but have viewed it primarily as a nuisance and therefore done little to understand and prevent it. This has led most management efforts to focus on removal of black powder rather than prevention. Removal methods include:

• ***Mechanical cleaning.*** Mechanical pigs scrape debris from the pipeline wall



Both dry (left) and wet (right) black powder consist of jagged particles harder than carbon steel and averaging less than 100 nanometers across.

and remove black powder. This method may keep the pipeline fairly clean when black powder has not been a major problem. This method, however, cannot address large quantities of black powder.

• ***Chemical cleaning.*** Several chemical cleaning agents can remove black powder from gas pipelines. Gel and surfactant cleaners are used most frequently. Gel can carry large amounts of solids, but dealing with large gel batches becomes difficult when cleaning has to be done online. Removal of gel residues from the pipeline also requires extra attention.

With a proven record in removing black powder, surfactants can dissolve in diesel or organic solvents. Dissolution in water should be avoided to prevent exposing the pipeline to water. Surfactants can penetrate contaminants, lowering the surface tension properties of pipelines and removing large amounts of black powder.

• ***Separators.*** Separators and cyclones use centrifugal force. Black powder-laden gas passes through them and the particles are physically knocked out of the gas stream to the walls of the separator where they collect in a hub at the bottom. This method only works if the concentration of solid particles is relatively high and particle size is relatively large (>8-10 µm).

• ***Filters.*** These usually consist of cartridges placed downstream of the gas pipeline to protect control valves and customers. The design and size of these filters depends on the amount of black powder, its particle size, and hardness.

• ***Cyclo-Filters.*** These combine the best features of cyclones and filters in a two-stage removal process. The cyclone knocks out black powder particles larger than 8-10 µm in the first stage. The second stage consists of cartridge filters that remove finer particles.

Each of these methods can work separately or in combination. For example, mechanical cleaning by instrument scraping can combine with installation of filters downstream. This combination ensures the scraped black powder gets filtered out from the gas supply before reaching customers.

Although removal approaches protect downstream operations and customers from black powder's effects, they have several common drawbacks:

• They are after-the-fact treatments and do not address the root cause of black powder.

• They require subsequent handling and disposal procedures and processes.

• They require frequent applications.

• They often require multiple units, as in the case of filters and cyclones.

• They add to the ongoing operational costs of gas transport systems.

Prevention methods

Prevention methods start with the premise that internal corrosion of gas pipelines causes black powder and then seek to prevent the corrosion. These methods include:

• ***Moisture control.*** Eliminating water condensation in the pipeline is critical in preventing black powder formation. Improving efficiency of the gas dehydration process ensures dry gas in the pipeline.

Appropriately sized triethylene glycol (TEG) dehydration units coupled with installation of appropriately sized refrigeration and knockout drums upstream and downstream of these units, respectively, will ensure drier gas entering the gas lines. Controlling and minimizing process upsets such as water and TEG carryovers also play an important role in limiting pipeline moisture. Appropriately sized, designed, and maintained molecular sieves and chillers might be expensive, but they ensure drier gas.

Strict adherence to sales gas standards would ensure elimination of condensed water in internally bare

pipelines and in turn prevent black powder formation. Process upsets, however, would still allow excess moisture into the delivery network, leading potentially to condensation and internal corrosion. Networks with multiple gas treatment plants feeding into them are particularly vulnerable due to the potential cumulative effects of process upsets. A gas network connected to seven plants, for example, each of which suffered one 3-day outage/year would be exposed to a potential of 21 days of moisture condensation.

- *Internal coatings.* Organic coatings, such as high-solids solvent based epoxy polyamine films, reduce drag but have the added benefit of preventing black powder. Typical application measures 2-3 mil (50-80 μm) thick to cover pipe roughness (Ry5 = 30 μm). Used globally for 55 years in more than 300,000 km of pipelines, they have good ageing properties, showing no degradation after 30 years exposure to dry.

International Standards (API 5 L 2 and ISO 15741) cover specifications of internal coating for gas pipelines. Internal coatings are a cost-effective means of preventing black powder in new pipelines. They are, however, very difficult to apply and not cost effective in existing pipelines, particularly buried pipelines.

- *Commissioning practices.* Improving dewatering and drying procedures during hydrotesting by flash drying with methanol or nitrogen instead of air drying can help prevent black powder formation.

The use of sweet water with biocides and corrosion inhibitors will prevent corrosion during hydrotest shut-in periods. If sweet water is not readily available in the field, as is the case in many Middle Eastern regions, fresh water slugs run between pigs will wash the line and remove salt water. Chemical cleaning should follow hydrotesting in sales-gas transmission pipelines to ensure the pipeline is free of loose debris and mill scale before operations start. ✦

New load cell signal conditioner

The OM-19 load cell signal conditioner enables a weighing system to be controlled by a computer or programmable logic controller, eliminating the use of a digital display.

Mainly used for strain gauge sensors such as load cells, torque, or pressure sensors, the OM-19 provides a voltage output of ±10 v DC or 0-10 v DC and current output of 4-20 mA, while supplying the needed excitation voltage to power up to four (350 ohm, 4 or 6 wire) strain gauge load cells (350 ohm).

Available in board only, DIN rail, or industrial enclosure versions, it can be used in a range of applications and environments. All three versions are equipped with a shunt calibration feature. A solid-state relay output option with two set points (OM-19-2S) is also available.

Source: **RDR Technology Inc., Load Cell Central Div.,** Box 91, Monroeton, PA 18832.

New ultrasonic flowmeter

The new Innova-Sonic in-line ultrasonic flowmeter is an alternative choice for typical liquid mag-meter applications.

It offers ±0.5% of reading accuracy and has the ability to measure down to zero flow and virtually any clean liquid regardless of conductivity.

The firm's PicoFly technology allows ultrasonic transit time-of-flight to be measured in picoseconds (one trillionth of a second) rather than nanoseconds (one billionth of a second). The result is excellent resolution that enables extreme low flow detection, the company notes.

The unit features high precision, high reliability, high capability, low power consumption, digital signal processing with advanced noise filtering capability, and good applicability. Repeatability is ±0.07% of reading, operating temperature range is –40° F. to +176° F., and bidirectional flow range is 0-23 fps (0-7 mps) liquids.

Source: **Sierra Instruments Inc.,** 5 Harris Court, Bldg. L, Monterey, CA 93940.

Enventure Global Technology LLC,

Houston, has appointed Greg Bailey vice-president of engineering and technology. He is responsible for leading and managing the advancements of Enventure's solid expandable technology (SET) and service lines. With more than 20 years of engineering experience, Bailey will lead Enventure's engineering and research and development divisions in producing solutions-based technology. Prior to joining Enventure, he worked for Grant Prideco, where he served as the company's vice-president of engineering in the tubular technical division. Bailey has also served in various management capacities with Hydril and FMC and was president and owner of a technical services business for several years. He has a degree in mechanical engineering from the University of Alabama and is a licensed professional mechanical engineer in Texas. He is a licensed professional engineer certified by the Texas Board of Professional Engineers and an active member of the American Society of Mechanical Engineers and the Society of Petroleum Engineers (SPE). Bailey holds several patents and has published technical papers at the Offshore Technical Conference and with SPE and the International Association of Drilling Contractors.


Bailey

Enventure is the world's leading provider of SET solutions for the energy industry. The company has a global presence with operations in North America, the Middle East, Asia Pacific, South America, Europe, and the Far East.

Stallion Oilfield Services Ltd.,

Houston, has closed on two acquisitions—Mile High Oilfield Services Inc. on June 30 and J-M Oil Co. Inc. on July 31. Mile High is located in Vernal, Utah, and expands the company's workforce accommodations business currently servicing the Piceance, Uinta, and Paradox basins of Utah and Colorado. David Morton, former owner of Mile High, will remain with Stallion. J-M, based in Paris, Ohio, gives Stallion entry into the expanding Marcellus shale play. Key J-M executive Mark Wimsatt will remain with the company as well. Stallion also announced the opening of a sales office in Pittsburgh, Pa.

Stallion provides wellsite support services and production and logistics services to the oil industry, including onshore and offshore workforce accommodations and remote camp complexes, surface rental equipment, solids control, communication services, wellsite construction, rig relocation, heavy equipment hauling, fluids handling, and logistics.

The company serves the South Texas, Gulf Coast, Ark-La-Tex, Fort Worth basin, Permian basin, Midcontinent, Prudhoe Bay (Alaska), and Rocky Mountain regions, as well as the global offshore industry.

Iridium Satellite LLC,

Bethesda, Md., has selected Lockheed Martin and Thales Alenia Space to participate in the final phase of its procurement process for the company's next-generation satellite constellation, Iridium NEXT. The final phase will last about 9 months and is expected to result in the award of a full-scale development agreement for Iridium NEXT with one prime contractor by the middle of 2009. Through Iridium NEXT, the company plans to offer a flexible array of new services in addition to continuing what it offers today. Iridium NEXT will maintain the company's unique and advanced cross-linked satellite architecture. It will feature an IP-based architecture, leveraging broad-based technology enhancements from the industry. In addition, Iridium NEXT has the potential to host multiple secondary payloads, which will broaden the scope of the network's capabilities while providing an additional platform for applications such as sensing, earth observation, and command and control.

Iridium, with more than 285,000 subscribers, is the fastest-growing mobile satellite services provider to the oil and gas, utilities, maritime, aerospace, mining, and other industries.

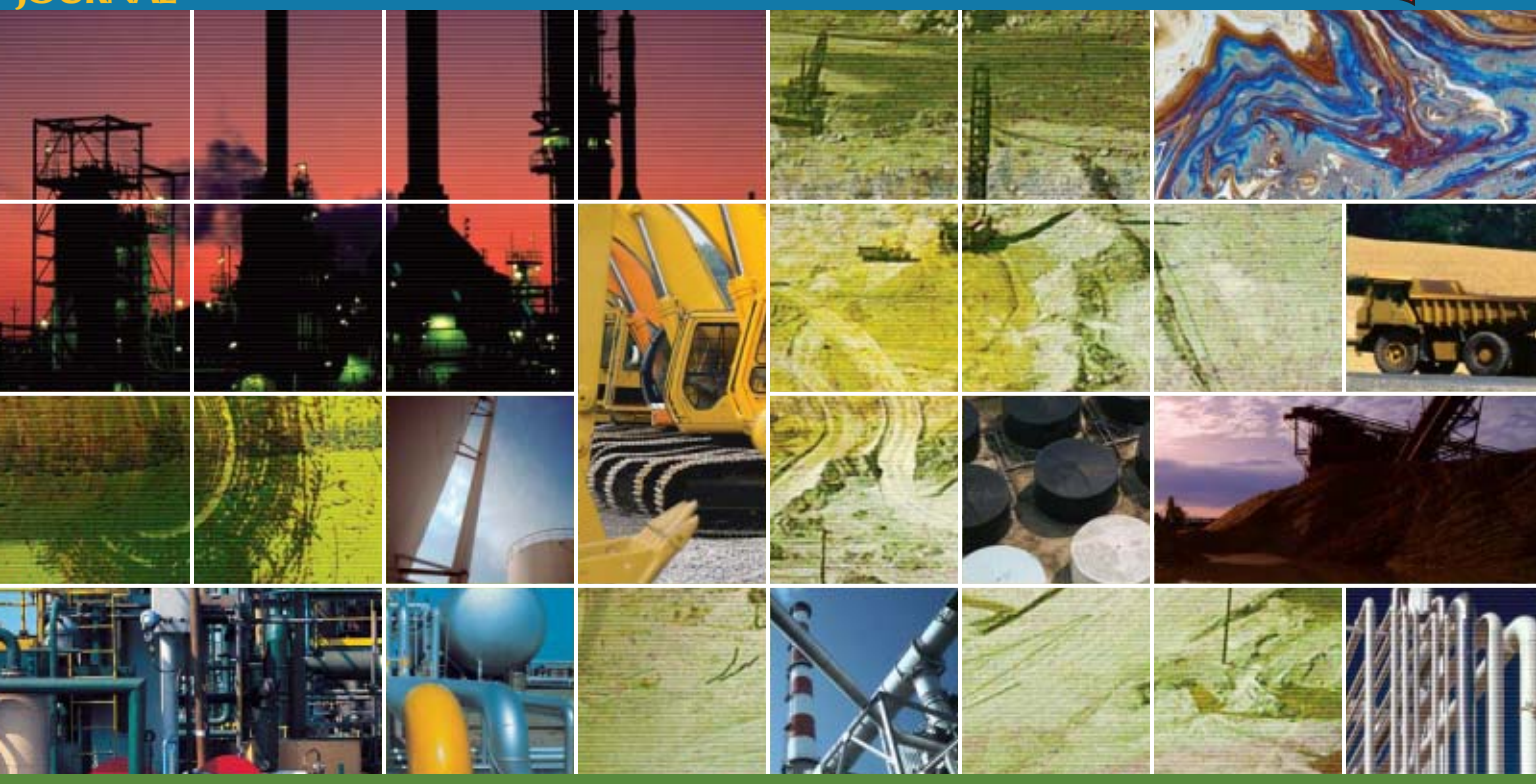
Industrial Scientific Corp.,

Pittsburgh, Pa., has named Dr. Eva Yi Chen president of Industrial Scientific Asia-Pacific. She assumes her new duties following the retirement of Dr. Annie Wang. Chen will be based at the company's Asia-Pacific headquarters in Shanghai. She most recently served as director of Alcatel-Lucent Ventures in Murray Hill, NJ. Prior to that, she was president of Guoxin Lucent Inc. (a joint venture), general manager of Lucent Technologies Optical Networks, and chief representative of Lucent Technologies, all in Shanghai. Chen has a BS in physics from Peking University and MS and PhD degrees from the University of Michigan in electrical engineering/applied physics. In 2005, she was the recipient of the Magnolia Award, given by the Shanghai government to multinational executives for their contributions to the economic development of Shanghai.

In addition, Werner Tilling has been appointed Industrial Scientific's country manager for Germany. In this position, he will have managing director responsibilities at Industrial Scientific's German subsidiary. Tilling comes to Industrial Scientific from Dresser Europe GmbH, where he held positions of export manager, sales and marketing director, and CEO. Prior to Dresser, he worked for many years with Siemens Nixdorf in Germany, Singapore, and Australia in various roles relating to their ERP sales and project activities. Tilling has a degree in economics, politics, and German from the University of Göttingen.

Also, Industrial Scientific has promoted Kavita Iyengar to the position of director of quality and reliability. She will have responsibility for leading the implementation and execution of global systems, processes, and tools that ensure the highest quality and reliability of Industrial Scientific products and services throughout their entire lifecycle. Iyengar has been with Industrial Scientific for 4 years and has held the positions of SQA engineer, software QA team lead, and, most recently, software engineering manager. Previously, she held various software engineering positions with Merrill Lynch and One World. Iyengar has a bachelor of engineering degree in electronics and telecommunications from PSG College of Technology in India.

Industrial Scientific is a global leader in gas detection equipment, software, and services to protect human life in the most demanding work environments. The company has manufacturing operations



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in Pittsburgh; Shanghai; Arras, France; and Dortmund, Germany, with additional offices in Australia, Brazil, Canada, Czech Republic, Dubai, Mexico, the Netherlands, Qatar, Singapore, Switzerland, and the UK.

Jergens Inc.,

Cleveland, has appointed Eric Van Steenlandt director of sales and marketing. In his new capacity, he will be responsible for all of Jergens's sales and marketing activities in North America. His staff includes 18 direct sales and manufacturers' representatives, as well as product managers and support personnel. He will also interface with the company's more than 200 distributors throughout the US and Canada. Van Steenlandt has previously served as a corporate national sales manager and as a systems design and development engineer. He brings to Jergens a combination of strategic skills and experience in sales, engineering, and management. Van Steenlandt has a BS in mechanical engineering from the University of Michigan.

Steenlandt

Jergens is a privately held manufacturing company made up of separate divisions that include a tooling components manufacturer of workholding products for the production environment, an industrial supply distributor, a master distributor of precision torque screwdrivers and assembly products, and a manufacturer of drill bushing and thread inserts.

The International Association of Drilling Contractors (IADC),

Houston, has elected Joseph Eustace chairman of the IADC Well Servicing Committee. Eustace is executive vice-president and president of Pioneer Drilling Co.'s production services division. The Well Servicing Committee was developed to advance the interests of IADC's well-servicing members in health, safety, and environment; well control; training; regulation and legislation; and other areas where IADC's expertise proves critical to the drilling industry. The committee's charter is to establish processes and programs that work independently and in collaboration with other key industry organizations. Eustace was appointed to his present position at Pioneer on Mar. 1. Previously, he served as President of WEDGE Oil & Gas Services since 2004. Prior to that, he served as group vice-president for Key Energy Services from 1998 to 2004 and as vice-president of operations for Dawson Production Services from 1982 until Key Energy Services acquired Dawson Production Services in 1998. Eustace holds a degree in agribusiness from Texas Tech University.

IADC represents the worldwide oil and gas drilling industry, promoting commitment to safety, preservation of the environment, and advances in drilling technology. Members include E&P companies, well servicing contractors, and other oil field service and supply companies.

Key Energy Services Inc.,

Houston, has promoted Kimberly R. Frye to senior vice-president and general counsel. She joined the company in October 2002 and has served as its associate general counsel. Frye helped lead Key's efforts to deal with issues it faced in 2004-2007 that culminated in the relisting of its common stock on the New York Stock Exchange, following the company's becoming current with its financial reporting. Frye has a BS from the University of Alabama and a JD from the University of Houston.

Frye

Key is the world's largest rig-based well service company. It provides well servicing, pressure pumping, fishing and rental tools, electric wireline, and other oil field services in all major onshore oil and gas producing regions of the continental US as well as in Argentina and Mexico.

AGM Inc.,

Austin, has signed a corporate enterprise agreement with BP PLC for its Recon high-end 3-D geological interpretation and visualization technology and related services. The agreement provides for deployment of Recon, its flagship product, throughout BP worldwide. The multiyear contract also provides customized, enhanced training, delivered by AGM, to ensure the successful uptake and full utilization of the technology. Training will be conducted at AGM's facilities in Houston and London.

In addition, AGM is opening a new training facility and adding staff at Chertsey, Surrey, UK, in September.

AGM specializes in state-of-the-art 3-D interpretation and visualization solutions for geoscientists that enable them to analyze well and seismic data in real time.

Linklaters LLP,

London, is relocating its energy and infrastructure partner, Richard Ginks, to the company's Singapore office, effective Sept.1, from London. He joined Linklaters as a trainee solicitor in London in 1996 and was elected a partner in 2007. Ginks will bring to the firm's leading banking and projects group in Asia extensive experience in energy and infrastructure projects spanning oil and gas, power, transport, telecommunications, and water in the UK, Europe, Africa, and South America. He has advised government agencies, bidders, sponsors and lead arrangers, including most of Linklaters' key clients with operations in Asia, on a number of complex financings. The firm's Asian group recently closed Phase 2 financing of the $20 billion Sakhalin 2 LNG project—the world's largest limited recourse oil and gas financing to date.

Linklaters is a law firm that specializes in advising the world's leading companies, financial institutions, and governments on their most important and challenging transactions and assignments.

Transocean Inc.,

Houston, has agreed to sell its GSF Arctic II and GSF Arctic IV semisubmersible rigs to Northern Offshore Ltd., Houston, for about $750 million. The divestitures

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Transocean Inc.'s GSF Arctic II (left) and GSF Arctic IV semisubmersible drilling rigs.

will complete Transocean's previously announced undertakings to the Office of Fair Trading in the UK related to the merger with GlobalSantaFe Corp. The sale of the GSF Arctic IV is expected to close late in third quarter 2008, and the sale of the GSF Arctic II is expected to close in fourth quarter 2008, following completion of existing contract commitments. Under the purchase and sale agreements, the Transocean subsidiaries will provide seller financing for $745 million of the purchase price until December 31, 2010, at an annual interest rate of 10%. The financing will be secured by the GSF Arctic II and GSF Arctic IV. Upon closing the GSF Arctic IV sale, Transocean will bareboat charter the unit back from the buyer at a rate of $180,000/day for the duration of the rig's contract with Royal Dutch Shell PLC, which is expected to end in fourth quarter 2010. During the bareboat charter term, Transocean will receive the contracted day rate from the customer but will also be responsible for the rig's normal operating expenses. A payment from the buyer of $180,000/day will be made and applied to the interest and principal of the seller financing. Commencing 1 month after closing of the GSF Arctic II sale, Transocean will receive principal and interest payments of $200,000/day for the rig from Northern Offshore. The GSF Arctic II and GSF Arctic IV are third-generation Friede & Goldman Enhanced Pacesetter design semisubmersible rigs, capable of operating in up to 1,200 ft of water and 1,500 ft of water, respectively.

Transocean is the world's largest offshore drilling contractor and the leading provider of drilling management services worldwide, with a fleet of 137 mobile offshore drilling units, plus 10 announced ultradeepwater newbuild units.

CIT Group Inc.,

New York City, has co-arranged a $190 million senior secured credit facility to affiliates of Vision Logistics Holding Corp., a portfolio company of Welsh, Carson, Anderson & Stowe. The financing was provided to effect the acquisition of the four operating businesses of Vision Logistics and combine them to create a leading provider of transportation and logistics management solutions for oil and gas exploration and production activities in the Gulf of Mexico. The combination creates the largest oil field-focused logistics business in the US. CIT served as co-lead arranger on Welsh Carson's initial platform acquisition of a Vision subsidiary

Vision Logistics is the leading provider of transportation services to the US oil and natural gas industry and one of North America's largest "asset light" logistics providers. Vision primarily provides expedited ground transportation services for time-sensitive and mission-critical components and supplies used in the exploration and production of oil and gas, throughout the Gulf Coast and other energy producing regions of the US.

Welsh Carson is one of the largest and most successful private equity investment firms in the US focused exclusively on investments in business, information, and healthcare services. Since its founding in 1979, Welsh Carson has organized 14 limited partnerships with total capital of over $16.0 billion.

CIT is a global commercial finance company that provides financial products and advisory services to more than 1 million customers in over 50 countries across 30 industries. A leader in middle market financing, CIT has more than $70 billion in managed assets and provides financial solutions for more than half of the Fortune 1000.

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Imports of crude and products

	Districts 1-4 8/1 2008	Districts 1-4 7/25 2008	District 5 8/1 2008	District 5 7/25 2008	Total US 8/1 2008	Total US 7/25 2008	Total US *8/3 2007
	1,000 b/d						
Total motor gasoline	858	870	6	95	864	965	1,397
Mo. gas. blending comp.	743	739	6	91	749	830	1,005
Distillate	292	121	0	0	292	121	303
Residual	341	261	0	125	341	386	402
Jet fuel-kerosine	54	71	5	48	59	119	247
Propane-propylene	190	76	7	7	197	83	82
Other	559	744	79	(38)	638	706	209
Total products	**3,037**	**2,882**	**103**	**328**	**3,140**	**3,210**	**3,645**
Total crude	**8,918**	**8,757**	**1,275**	**1,248**	**10,193**	**10,005**	**9,998**
Total imports	**11,955**	**11,639**	**1,378**	**1,576**	**13,333**	**13,215**	**13,643**

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

Purvin & Gertz LNG netbacks—August 8, 2008

Receiving terminal	Liquefaction plant: Algeria	Malaysia	Nigeria	Austr. NW Shelf	Qatar	Trinidad
	$/MMbtu					
Barcelona	9.33	7.16	8.69	7.03	7.92	8.59
Everett	7.70	5.10	7.23	5.14	5.83	8.07
Isle of Grain	9.28	6.84	8.46	6.81	7.36	8.49
Lake Charles	5.73	3.43	5.44	3.63	3.97	6.51
Sodegaura	8.54	10.40	8.79	10.89	10.05	7.61
Zeebrugge	10.63	8.11	9.91	7.96	8.77	9.92

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: Total	Motor gasoline: Blending comp.[1]	Jet fuel, kerosine	Fuel oils: Distillate	Fuel oils: Residual	Propane-propylene
	1,000 bbl						
PADD 1	13,835	58,833	34,602	10,941	46,538	13,514	3,540
PADD 2	63,824	50,812	18,163	7,124	30,706	1,396	20,027
PADD 3	151,584	65,904	31,160	13,626	39,422	16,471	21,304
PADD 4	14,087	6,094	1,770	502	3,247	285	[1]1,929
PADD 5	53,533	27,573	20,921	9,236	13,433	4,879	—
Aug. 1, 2008	**296,863**	**209,216**	**106,616**	**41,429**	**133,346**	**36,545**	**46,800**
July 25, 2008	**295,249**	**213,560**	**108,044**	**41,745**	**130,505**	**38,029**	**45,769**
Aug. 3, 2007[2]	**340,395**	**202,997**	**92,604**	**41,340**	**127,516**	**38,607**	**50,354**

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

Refinery report—Aug. 1, 2008

District	Refinery operations: Gross inputs	Refinery operations: Crude oil inputs	Refinery output: Total motor gasoline	Refinery output: Jet fuel, kerosine	Refinery output: Fuel oils: Distillate	Refinery output: Fuel oils: Residual	Refinery output: Propane-propylene
	1,000 b/d						
PADD 1	1,424	1,411	2,058	101	516	121	58
PADD 2	3,121	3,129	2,341	199	1,020	48	205
PADD 3	7,435	7,258	3,034	734	2,300	234	685
PADD 4	521	519	277	24	171	13	[1]104
PADD 5	2,810	2,722	1,351	501	623	120	—
Aug. 1, 2008	**15,311**	**15,039**	**9,061**	**1,559**	**4,630**	**536**	**1,052**
July 25, 2008	**15,336**	**15,162**	**9,045**	**1,592**	**4,724**	**567**	**1,145**
Aug. 3, 2007[2]	**15,920**	**15,791**	**9,151**	**1,408**	**4,098**	**737**	**1,135**
	17,606 Operable capacity		**87.0% 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

	*8-8-08	*8-10-07	Change $/bbl	Change, %
SPOT PRICES				
Product value	127.74	81.31	46.43	57.1
Brent crude	119.64	70.72	48.92	69.2
Crack spread	8.10	10.59	–2.49	–23.5
FUTURES MARKET PRICES				
One month				
Product value	129.11	81.90	47.21	57.6
Light sweet crude	118.88	71.94	46.94	65.2
Crack spread	10.23	9.96	0.27	2.7
Six month				
Product value	131.00	82.32	48.68	59.1
Light sweet crude	119.59	70.87	48.72	68.7
Crack spread	11.41	11.45	–0.04	–0.3

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

OGJ GASOLINE PRICES

	Price ex tax 8-6-08	Pump price* 8-6-08	Pump price 8-8-07
	¢/gal		
(Approx. prices for self-service unleaded gasoline)			
Atlanta	344.0	388.4	282.6
Baltimore	342.1	384.0	274.5
Boston	344.5	386.4	272.0
Buffalo	326.6	386.2	288.5
Miami	334.9	386.5	292.1
Newark	342.8	375.7	267.5
New York	324.3	383.9	288.1
Norfolk	339.4	377.4	266.1
Philadelphia	333.8	384.5	285.8
Pittsburgh	331.7	382.4	280.6
Wash., DC	347.5	385.9	285.3
PAD I avg	337.4	383.8	280.3
Chicago	349.4	407.3	293.8
Cleveland	326.6	373.0	258.3
Des Moines	327.2	367.3	282.3
Detroit	328.5	382.9	286.1
Indianapolis	322.8	372.9	284.0
Kansas City	330.0	366.0	271.7
Louisville	340.0	376.9	290.9
Memphis	325.9	365.7	284.3
Milwaukee	330.9	382.2	287.3
Minn.-St. Paul	333.5	373.9	272.3
Oklahoma City	325.3	360.7	264.8
Omaha	332.6	374.9	274.5
St. Louis	331.8	367.8	289.9
Tulsa	323.4	358.8	264.8
Wichita	318.5	361.9	283.3
PAD II avg	329.8	372.8	279.2
Albuquerque	330.9	367.3	278.7
Birmingham	335.2	373.8	270.2
Dallas-Fort Worth	335.1	373.5	268.7
Houston	332.8	371.2	272.6
Little Rock	333.5	373.7	269.6
New Orleans	335.3	373.7	272.8
San Antonio	333.6	372.0	268.0
PAD III avg	333.8	372.2	271.5
Cheyenne	342.8	375.2	280.3
Denver	361.6	402.0	293.2
Salt Lake City	357.5	400.4	293.6
PAD IV avg	354.0	392.5	289.0
Los Angeles	353.8	417.7	290.6
Phoenix	347.3	384.7	288.6
Portland	349.3	392.7	289.9
San Diego	351.9	415.8	302.9
San Francisco	362.4	426.3	299.9
Seattle	347.3	401.7	284.2
PAD V avg	352.0	406.5	292.7
Week's avg.	**337.3**	**381.8**	**280.8**
July avg.	**361.3**	**405.7**	**295.2**
June avg.	**360.2**	**404.2**	**309.4**
2008 to date	**307.2**	**351.0**	—
2007 to date	**228.2**	**271.8**	—

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

REFINED PRODUCT PRICES

	8-1-08 ¢/gal		8-1-08 ¢/gal
Spot market product prices			
Motor gasoline (Conventional-regular)		Heating oil No. 2	
New York Harbor	301.06	New York Harbor	340.88
Gulf Coast	304.43	Gulf Coast	338.75
Los Angeles	305.93	Gas oil	
Amsterdam-Rotterdam-Antwerp (ARA)	302.97	ARA	358.02
Singapore	287.48	Singapore	346.90
Motor gasoline (Reformulated-regular)		Residual fuel oil	
New York Harbor	299.55	New York Harbor	249.71
Gulf Coast	308.43	Gulf Coast	258.64
Los Angeles	312.93	Los Angeles	301.53
		ARA	269.03
		Singapore	263.19

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

BAKER HUGHES RIG COUNT

	8-8-08	8-10-07
Alabama	5	4
Alaska	5	6
Arkansas	56	49
California	45	36
Land	45	35
Offshore	0	1
Colorado	112	109
Florida	2	1
Illinois	1	0
Indiana	2	4
Kansas	12	15
Kentucky	12	9
Louisiana	187	178
N. Land	75	62
S. Inland waters	29	28
S. Land	27	28
Offshore	56	60
Maryland	0	1
Michigan	2	3
Mississippi	11	14
Montana	11	18
Nebraska	0	0
New Mexico	88	87
New York	7	6
North Dakota	73	41
Ohio	12	13
Oklahoma	208	190
Pennsylvania	25	17
South Dakota	2	4
Texas	932	844
Offshore	7	9
Inland waters	2	1
Dist. 1	21	25
Dist. 2	39	33
Dist. 3	62	64
Dist. 4	94	83
Dist. 5	181	180
Dist. 6	121	124
Dist. 7B	29	38
Dist. 7C	70	58
Dist. 8	138	108
Dist. 8A	30	20
Dist. 9	42	37
Dist. 10	96	64
Utah	46	37
West Virginia	26	32
Wyoming	73	70
Others—OR-1; TN-2; VA-8; WA-1	12	10
Total US	**1,967**	**1,798**
Total Canada	**475**	**377**
Grand total	**2,442**	**2,175**
Oil rigs	387	305
Gas rigs	1,571	1,487
Total offshore	66	72
Total cum. avg. YTD	**1,840**	**1,752**

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

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

SMITH RIG COUNT

Proposed depth, ft	Rig count	8-8-08 Percent footage*	Rig count	8-10-07 Percent footage*
0-2,500	87	3.4	59	8.4
2,501-5,000	132	46.9	108	53.7
5,001-7,500	255	15.2	219	25.1
7,501-10,000	470	3.4	441	4.5
10,001-12,500	483	2.2	439	1.3
12,501-15,000	341	—	294	—
15,001-17,500	145	—	112	—
17,501-20,000	93	—	66	—
20,001-over	33	—	36	—
Total	**2,039**	**6.4**	**1,774**	**8.1**
INLAND	33		45	
LAND	1,953		1,658	
OFFSHORE	53		71	

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

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

OGJ PRODUCTION REPORT

	[1]8-8-08	[2]8-10-07
	1,000 b/d	
(Crude oil and lease condensate)		
Alabama	17	20
Alaska	720	674
California	657	662
Colorado	56	48
Florida	5	5
Illinois	28	27
Kansas	97	104
Louisiana	1,337	1,259
Michigan	16	16
Mississippi	55	56
Montana	95	94
New Mexico	163	160
North Dakota	121	124
Oklahoma	172	171
Texas	1,350	1,335
Utah	47	53
Wyoming	149	149
All others	63	85
Total	**5,148**	**5,042**

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

US CRUDE PRICES

	8-8-08 $/bbl*
Alaska-North Slope 27°	127.45
South Louisiana Sweet	123.00
California-Kern River 13°	101.60
Lost Hills 30°	109.75
Wyoming Sweet	110.02
East Texas Sweet	111.25
West Texas Sour 34°	104.25
West Texas Intermediate	111.75
Oklahoma Sweet	111.75
Texas Upper Gulf Coast	108.25
Michigan Sour	104.75
Kansas Common	110.50
North Dakota Sweet	103.00

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

WORLD CRUDE PRICES

$/bbl[1]	8-1-08
United Kingdom-Brent 38°	125.29
Russia-Urals 32°	120.41
Saudi Light 34°	118.99
Dubai Fateh 32°	121.80
Algeria Saharan 44°	124.53
Nigeria-Bonny Light 37°	126.85
Indonesia-Minas 34°	129.99
Venezuela-Tia Juana Light 31°	121.36
Mexico-Isthmus 33°	121.25
OPEC basket	123.54
Total OPEC[2]	120.70
Total non-OPEC[2]	122.03
Total world[2]	121.29
US imports[3]	119.05

[1]Estimated contract prices. [2]Average price (FOB) weighted by estimated export volume. [3]Average price (FOB) weighted by estimated import volume.

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

US NATURAL GAS STORAGE[1]

	8-1-08	7-25-08	8-1-07	Change, %
	bcf			
Producing region	745	752	931	–20.0
Consuming region east	1,418	1,363	1,535	–7.6
Consuming region west	354	346	405	–12.6
Total US	**2,517**	**2,461**	**2,871**	**–12.3**
	May 08	**May 07**	**Change, %**	
Total US[2]	**1,836**	**2,179**	**-15.7**	

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

International rig count

Region	July 2008 Land	July 2008 Off.	July 2008 Total	July 07 Total
WESTERN HEMISPHERE				
Argentina	74	—	74	73
Bolivia	3	—	3	3
Brazil	24	29	53	37
Canada	411	1	412	349
Chile	2	—	2	2
Colombia	41	—	41	41
Ecuador	10	—	10	12
Mexico	71	31	102	97
Peru	5	2	7	8
Trinidad	1	2	3	5
United States	1866	67	1932	1777
Venezuela	67	16	83	81
Other	1	—	1	1
Subtotal	**2,575**	**148**	**2,723**	**2,486**
ASIA-PACIFIC				
Australia	14	13	27	24
Brunei	—	2	2	4
China-offshore	—	22	22	18
India	51	28	79	82
Indonesia	46	25	71	59
Japan	4	—	4	2
Malaysia	—	15	15	19
Myanmar	3	—	3	8
New Zealand	6	1	7	5
Papua New Guinea	3	—	3	3
Philippines	3	1	4	—
Taiwan	—	—	—	—
Thailand	2	11	13	10
Vietnam	—	9	9	7
Other	—	4	4	3
Subtotal	**132**	**131**	**263**	**244**
AFRICA				
Algeria	23	—	23	24
Angola	1	4	5	3
Congo	1	0	1	2
Gabon	1	1	2	3
Kenya	—	—	—	—
Libya	15	—	15	14
Nigeria	3	5	8	5
South Africa	—	1	1	1
Tunisia	4	1	5	3
Other	2	1	3	5
Subtotal	**50**	**13**	**63**	**60**
MIDDLE EAST				
Abu Dhabi	8	3	11	14
Dubai	1	—	1	1
Egypt	43	10	53	46
Iran	—	—	—	—
Iraq	—	—	—	—
Jordan	2	—	2	1
Kuwait	11	—	11	14
Oman	53	1	54	49
Pakistan	23	—	23	19
Qatar	3	9	12	14
Saudi Arabia	67	9	76	78
Sudan	—	—	—	—
Syria	21	—	21	21
Yemen	15	—	15	17
Other	1	—	1	1
Subtotal	**248**	**32**	**280**	**275**
EUROPE				
Croatia	—	—	—	—
Denmark	—	3	3	5
France	1	—	1	1
Germany	8	—	8	4
Hungary	5	—	5	2
Italy	4	1	5	5
Netherlands	—	2	2	4
Norway	—	25	25	18
Poland	1	—	1	2
Romania	15	3	18	2
Turkey	6	0	6	5
UK	4	22	26	27
Other	7	—	7	4
Subtotal	**51**	**56**	**107**	**79**
Total	**3,056**	**380**	**3,436**	**3,144**

Definitions, see OGJ Sept. 18, 2006, p. 42.
Source: Baker Hughes Inc.
Data available in OGJ Online Research Center.

Oil import freight costs*

Source	Discharge	Cargo	Cargo size, 1,000 bbl	Freight (Spot rate) worldscale	$/bbl
Caribbean	New York	Dist.	200	374	3.17
Caribbean	Houston	Resid.	380	257	2.44
Caribbean	Houston	Resid.	500	217	2.07
N. Europe	New York	Dist.	200	349	4.77
N. Europe	Houston	Crude	400	287	5.80
W. Africa	Houston	Crude	910	251	5.56
Persian Gulf	Houston	Crude	1,900	155	6.36
W. Africa	N. Europe	Crude	910	262	4.30
Persian Gulf	N. Europe	Crude	1,900	152	4.55
Persian Gulf	Japan	Crude	1,750	260	6.30

*July 2008 average.
Source: Drewry Shipping Consultants Ltd. Data available in OGJ Online Research Center.

Waterborne Energy Inc. US LNG imports

Country	Aug. 2008	July 2008	Aug. 2007	Change from a year ago, %
	MMcf			
Algeria	—	—	2,810	—
Egypt	3,000	6,280	11,570	–74.1
Equatorial Guinea	—	—	5,880	—
Nigeria	—	—	14,970	—
Norway	—	—	—	—
Qatar	—	—	6,270	—
Trinidad and Tobago	30,800	24,630	45,750	–32.7
Total	**33,800**	**30,910**	**87,250**	**–61.3**

Source: Waterborne Energy Inc.
Data available in OGJ Online Research Center.

Propane prices

	June 2008	July 2008	June 2007	July 2007
	¢/gal			
Mont Belvieu	181.29	186.15	113.90	119.00
Conway	174.59	176.36	113.34	118.18
Northwest Europe	178.32	186.84	112.44	117.28

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

Muse, Stancil & Co. refining margins

	US Gulf Coast	US East Coast	US Mid-west	US West Coast	North-west Europe	South-east Asia
	$/bbl					
July 2008						
Product revenues	154.30	141.23	146.79	144.53	148.48	145.50
Feedstock costs	–144.85	–138.66	–134.47	–129.13	–135.76	–138.09
Gross margin	9.45	2.57	12.32	15.40	12.72	7.41
Fixed costs	–2.10	–2.42	–2.36	–2.75	–2.36	–1.83
Variable costs	–2.87	–1.86	–2.53	-4.78	–5.12	–1.38
Cash operating margin	**4.48**	**–1.71**	**7.43**	**7.87**	**5.24**	**4.20**
June 2008	8.52	2.96	9.42	18.79	7.16	3.96
YTD avg.	8.80	2.03	9.67	14.51	6.25	3.57
2007 avg.	12.53	6.65	18.67	20.89	5.75	2.26
2006 avg.	12.54	6.38	14.97	23.69	5.88	1.06
2005 avg.	12.53	6.98	12.31	20.55	5.51	1.52

Source: Muse, Stancil & Co. See OGJ, Jan. 15, 2001, p. 46
Data available in OGJ Online Research Center.

Muse, Stancil & Co. gasoline marketing margins

June 2008	Chicago*	Houston	Los Angeles	New York
	¢/gal			
Retail price	420.37	393.32	449.69	421.05
Taxes	65.02	38.40	70.48	56.75
Wholesale price	344.69	339.89	380.84	353.71
Spot price	323.91	332.05	362.11	334.93
Retail margin	10.75	15.03	-1.63	10.59
Wholesale margin	20.78	7.84	18.73	18.78
Gross marketing margin	**31.53**	**22.87**	**17.10**	**29.37**
May 2008	11.77	15.96	0.90	22.43
YTD avg.	22.35	19.24	11.84	27.98
2007 avg.	26.96	23.12	19.05	31.10
2006 avg.	19.74	20.34	18.03	27.90
2005 avg.	19.77	16.26	20.39	27.13

*The wholesale price shown for Chicago is the RFG price utilized for the wholesale margin. The Chicago retail margin includes a weighted average of RFG and conventional wholesale purchases.
Source: Muse, Stancil & Co. See OGJ, Oct. 15, 2001, p. 46.
Data available in OGJ Online Research Center.
Note: Margins include ethanol blending in all markets.

Muse, Stancil & Co. ethylene margins

	Ethane	Propane	Naphtha
	¢/lb ethylene		
July 2008			
Product revenues	79.07	145.98	178.96
Feedstock costs	–56.32	–105.95	–171.40
Gross margin	22.75	40.03	7.56
Fixed costs	–5.38	–6.36	–7.19
Variable costs	–9.08	–10.84	-14.83
Cash operating margin	**8.29**	**22.83**	**–14.46**
June 2008	13.86	17.73	–28.34
YTD avg.	16.63	18.55	–16.56
2007 avg.	14.41	14.14	–7.42
2006 avg.	19.53	22.44	1.34
2005 avg.	14.43	20.68	1.28

Source: Muse, Stancil & Co. See OGJ, Sept. 16, 2002, p. 46.
Data available in OGJ Online Research Center.

Muse, Stancil & Co. US gas processing margins

July 2008	Gulf Coast	Mid-continent
	$/Mcf	
Gross revenue		
Gas	10.98	8.65
Liquids	2.07	5.35
Gas purchase cost	12.22	11.61
Operating costs	0.07	0.15
Cash operating margin	**0.76**	**2.24**
June 2008	0.55	1.84
YTD avg.	0.57	1.84
2007 avg.	0.44	1.47
2006 avg.	0.26	0.97
2005 avg.	-0.06	0.25
Breakeven producer payment % of liquids	62%	57%

Source: Muse, Stancil & Co. See OGJ, May 21, 2001, p. 54.
Data available in OGJ Online Research Center.

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LEGAL TENDER

EXPRESSIONS OF INTEREST

USE BITUMEN ROYALTY-IN-KIND

GOVERNMENT OF ALBERTA, CANADA

The Government of Alberta Request for Expressions of Interest to USE BITUMEN ROYALTY-IN-KIND

As the resource owner, the Government of Alberta, Canada is entitled to take its royalty share of bitumen production in-kind in lieu of cash, as it does currently for conventional oil production. This amount of royalty share could be a significant and growing source of reliable hydrocarbon feedstock for the future. The government intends to have a portion of its royalty share of bitumen in-kind commercially upgraded to higher value products in the province.

The Alberta government hereby invites interested parties to make a submission detailing their interest, and explaining how they would participate in using the government's bitumen royalty-in-kind (BRIK) volumes.

Submissions should reflect the Province's objective of maximizing return from its royalty share of bitumen, and may contemplate: upgrading, refining, producing petrochemicals, managing commercial processes, marketing higher value products, facilitating access to new markets, providing infrastructure, providing ancillary services, or any other related activity.

Proposals will be received up until 4:30 PM (MST) Friday, October 17, 2008.

For detailed information on this REOI process and how to submit your proposal please visit:
www.energy.alberta.ca/BRIK-REOI.asp

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JOINT VENTURE BID PROPOSAL

Joint Venture «Asia Trans Gas» Limited Liability Company calls for Tender on the SCADA & TELECOMMUNICATION Systems for Uzbekistan – China Gas Pipeline Project:

The Uzbekistan-China Gas Pipeline Project (UCGP), which is a part of the Central Asia Gas Pipeline project, begins from the border of Uzbekistan and Turkmenistan, and terminates at the border of Uzbekistan and Kazakhstan. The total length of the trunk line is 490km. The pipeline has double line which is laid in parallel, with diameter of 1067mm (X70) and pressure of 9.81MPa. There are 33 valve chambers and 3 compression stations and 2 metering stations.

For realization of the project Joint Venture «Asia Trans Gas» LLC requires company which will render the SCADA & TELECOMMUNICATION Systems for the entire UCGP Project as described below.

The Contractor shall be assigned the single-point responsibility for the design, functionality and integration of all the SCADA & TELECOMMUNICATION Systems for the entire UCGP Project, including FOC(Fiber optic cable), voice exchanges, VSAT system, Video conference system, CCTV- and Intrusion Detection System, LAN Networks, Radio telecommunication equipments, Satellite phone devices, Satellite TV system etc., as well as for the integration of the Station Control Systems into the SCADA.

The detailed scope of work, specification and terms of rendering of services are specified in bid documentation.

Eligibility requirements for organization interested in obtaining of tender documentation:

- Experience and capability must be sufficient in order that the objectives of the contract are achieved.
- BIDDER has been the Prime Contractor or significant JV Partner or Subcontractor in an EPC Contract for at least three combined SCADA Systems and Telecommunication Systems projects within the past five years.
- The key parameters of such projects are defined as: Contract value not less than US$ 20 million. A length in a remote location of at least 300km Involvement of high-speed Communication (Gigabit Ethernet: SDH) via FOC and satellite backup communication. Providing local and remote operation of no less than five stations.
- Traceable experience in the realization of both Conventional SCADA and Distributed Control Systems (DCS).
- Traceable experience in long distance FOC laying in remote locations.
- Submission ISO 9001, ISO 14001 and OHSAS 18001 (or National equivalent) Certificates to demonstrate that management Quality, Environmental and Safety are compliant with international standards..

Closing Date for bid proposals submission: before 10 AM Tashkent time September 30, 2008.

We welcome organizations which are wishing to participate in our tender competition. Interested organizations should submit written application and bank receipt confirming the payment of USD 2 000.00 and receive all package of tender documentation.

Our bank details:
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New York Times writer yields to glacier seduction

A celebrated New York Times columnist has observed glaciers melting in Greenland and issued this judgment on proposals for expanded oil and gas leasing of the Outer Continental Shelf: "Madness. Sheer madness."

Oil and gas professionals should heed what Thomas L. Friedman's non sequitur says about the OCS debate.

Much opposition to OCS leasing relates less to concern about effects on marine environments than to a desire to foreclose consumption of oil and gas.

This agenda probably repels most Americans, who like their energy to be cheap. But it attaches itself to more-widespread fear of global warming and becomes explicit in the prominent words of a columnist who has earned fame for his writing about the Middle East.

Friedman dislikes Middle Eastern oil and has made clear in earlier columns his preference for governmental interventions aimed at cutting US imports. At one level, Friedman's positions contradict each other. The writer wants to lower imports because he assumes foreign oil bankrolls US enemies. Yet he resists an activity that might cut US oil imports—OCS leasing—because combustion of any consequent hydrocarbons might aggravate warming.

The positions are in fact compatible from the broader perspective of antipetroleum radicalism. But a three-time Pulitzer Prize winner and best-selling book author might be able to afford life without oil. Most people cannot.

So another bright person has yielded to the glacier seduction, concluding from the sight of melting ice that the planet is warming—which of course it is or at least has been until recently—and that people must act sacrificially to stop it.

The glacier seduction blinds its victims to suggestions that observed warming has causes other than human activity and that human responses therefore might have little effect beyond state-sanctioned deprivation. But Greenland is, according to Friedman's vivid reporting, an enchanting place, dripping with change, so apparently everyone should ignore questions about the wisdom of costly reaction.

A millennium ago, however, Greenland was warm enough to support agriculture in areas later engulfed by glacial ice.

This indication of warming caused by something besides oil-fired prosperity doesn't appear in Friedman's analysis.

(Online Aug. 8, 2008; author's e-mail: bobt@ogjonline.com)

The Editor's Perspective

by Bob Tippee, Editor

Market Journal

by Sam Fletcher, Senior Writer

Another oil price spike predicted

Unless demand for oil collapses within 5-10 years, the world will experience a serious "supply crunch" with prices shooting above $200/bbl for crude, according to an Aug. 8 report by Chatham House, home of the Royal Institute of International Affairs, a leading institute for debate and analysis of international issues.

That's because investment in exploration and development of new crude supplies "has been and will be inadequate," said the report, The Coming Oil Supply Crunch, authored by Paul Stevens, senior research fellow for energy at Chatham House in London and emeritus professor at Dundee University.

"Even allowing for some increase in capacity over the next few years, a supply crunch appears likely around 2013," he said. To ward off a potential crisis, the report recommends helping producing countries manage the "resource curse" of slower economic growth despite ample natural resources; welcoming investments from sovereign wealth funds; and bringing the Organization of Petroleum Exporting Countries into the International Energy Agency's emergency sharing mechanism.

The pending crunch "is partly due to incentives for international oil companies to return dividends to shareholders rather than reinvest them. It is also a result of a resurgence in 'resource nationalism' and some governments starving their national oil companies of investment funds," the report said.

Rising domestic consumption is eating into the exports of many producer countries while resource nationalism excludes international oil companies (IOC) from helping develop more capacity, Stevens said. Meanwhile, IOC investments are constrained by lack of access to low-cost reserves, manpower shortages, and shortages in the service industries. A crunch could result from excess crude production capacity falling to low levels followed by a supply disruption, leading to a price spike with "long-lasting effects on the global energy picture," Stevens said. To avoid a crunch, government energy policies need to reduce the growing demand for liquid fuels, increase the supply of conventional liquid fuels, or increase the supply of unconventional liquid fuels, said Stevens.

However, the report concludes: "Only extreme policy measures could achieve a speedy response—and these are usually politically unpopular." It argues that an oil price spike "might break down opposition to a much greater interventionist approach by governments in their energy sectors." Stevens said, "An intelligent and informed debate is needed about which energy policy interventions are desirable and which are not, and on what basis such judgments should be made." Price escalations have continued "partly because the Organization for Economic Cooperation and Development governments are reluctant to intervene in energy markets. The market alone cannot necessarily provide sufficient incentives for conservation, fuel-switching, or bringing more energy on stream, so this laissez-faire attitude has failed to either constrain demand or increase supply," he said.

Similarities and differences

Escalation of oil prices to record highs in July resembles in some ways the 1970s oil boom. Both periods were characterized by high crude oil prices and a widespread view that the prices would go ever higher, said Stevens. Each time, price increases were triggered "by similar causes, with supply and demand playing a role," he said. "Following the oil shocks of the 1970s, the vast majority of what were then classed as developing countries did not pass on the higher international price of crude to their consumers, preferring instead to subsidize product prices."

Today several countries, including the major oil exporters and India and China, are again subsidizing low fuel prices locally, stimulating much of the demand growth over the last 2 years. In both periods, security of supply was a major issue, and there was strong growth of "resource nationalism." Stevens notes important differences, however. "In the 1970s, the world experienced deep economic recessions.

"Today there has been no recession," he said. "Today oil is much less important in the macroeconomy than in the 1970s." Although it may not seem so to current consumers, the speed of the price change was much greater and the increase was proportionately larger in the 1970s. Stevens reported, "The nature of supply and demand is different in the two periods. Today, environmental concerns are a key driver of energy policy; this was not the case in the 1970s." He said, "There have been major changes in ideology affecting government policy. In particular, unlike in the 1970s, the 'Washington Consensus' discouraged government intervention. Industry investment has also been increasingly influenced by new ideas of 'value-based management' for the [IOCs] and 'principal-agent' analysis for the national oil companies."

(Online Aug. 11, 2008; author's e-mail: samf@ogjonline.com)

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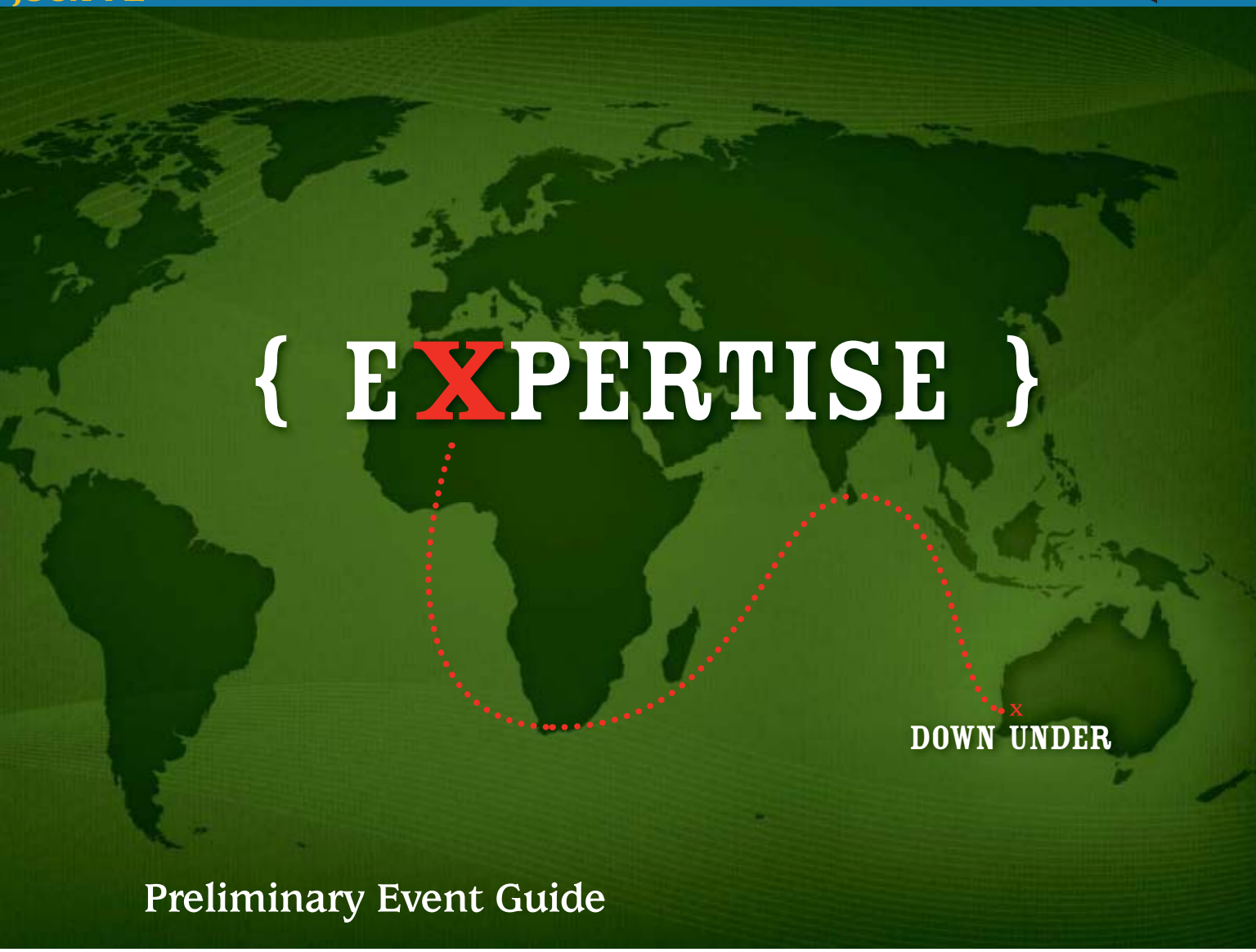

Preliminary Event Guide

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Welcome to the 21st Deep Offshore Technology International Conference & Exhibition

Woodside Energy is proud to host the *21st Deep Offshore Technology International Conference & Exhibition* in Perth, Australia, the inaugural event in the Asia Pacific region.

The mission of the Deep Offshore Technology International Asia / Pacific conference is to provide a forum dedicated to the advancement of the industry that addresses the technical challenges to safely and cost-effectively develop resources from deepwater and ultra-deepwater basins around the world. This event provides a unique networking opportunity for attendees to discuss issues with professionals in their respective fields of expertise and to gain an understanding of the changes that are taking place within those technologies.

Woodside is supporting this event because the offshore industry in Australia finds itself at a pivotal point in its history. Market forces are creating revolutionary change, causing a boom period of unprecedented growth and expansion. This occurs at a time where the industry is facing increasing scrutiny by governments and communities on our environmental and social performance. Demographics of the industry, combined with the remoteness of the region, mean that effective design, build and installation strategies are critical to success.

The fruits of this boom are there for all players to benefit from. History teaches us that the ultimate winners will be those that execute projects effectively by being responsive and adaptable to changes in their surroundings. This adaptability includes the appetite to be creative, deploy new technology and to enable new, fresh ideas. I am energised to be a part of this environment and hope that we as an industry through events such as DOT, can encourage the brightest and the best of the industry to be part of it.

The conference theme for DOT International Asia / Pacific 2008, *The Next Generation of Deepwater Challenges*, recognises the imperative to address some of the many deepwater technology issues faced by Operators in developing the world-class hydrocarbon fields and prospects located offshore Australasia.

Woodside is particularly well placed to contribute via our experiences, and in learning from contributors to this conference. Not only is Woodside Australia's leading independent oil and gas company and a major supplier of energy to the Australian and international markets, we also have a portfolio of operating projects, development opportunities and exploration prospects in deepwater and ultra-deepwater environments.

Woodside already operates Australia's two largest hydrocarbon resource projects; the North West Shelf Venture in Western Australia and the adjacent Pluto liquefied natural gas (LNG) project which is currently under construction. We also operate two other LNG developments off Australia's north coast; Sunrise in the Timor Sea and the Browse Development to the west. We aim to begin construction of both developments within the next few years.

While our focus is on LNG, we also have a large portfolio of other operated oil and gas projects predominantly offshore Australia and also in the Gulf of Mexico. With most of our greenfield projects located in deepwater, we have an enduring interest and involvement, in deep offshore technology.

On behalf of the Advisory Board, I welcome you to DOT International Asia / Pacific 2008. I believe you will find this year's program stimulating, engaging and beneficial. I look forward to seeing you during the conference and on the show floor.

Roy Thompson
Woodside Energy Ltd
Chairman of the 2008 DOT International Asia / Pacific Advisory Board

DOT Mission Statement

DOT is recognized as the leading forum addressing technical issues related to exploration, development, and production of oil and gas in deep and ultra-deepwater basins around the world. As our industry confronts new challenges, the sharing of deepwater experiences will play a critical role in improving the quality, safety, and economics of future endeavors.

The mission of DOT is to provide an annual forum dedicated to the advancement of the deepwater exploration and production. The conference addresses the technical challenges to safely and cost-effectively develop deepwater reserves, and encourages the development of young professionals.

DOT Charter

The intent of the Deep Offshore Technology International Conference and Exhibition is to provide an international conference to discuss the challenges and issues facing future field development in the deep and ultra-deepwater oceans of the world. More specifically, the intention is to provide a conference where:

Knowledge is Shared – Information and knowledge is brought out into public domain and shared with the industry.

Knowledge is Captured – Information is captured electronically and distributed to a wider audience.

Understanding is Increased – A better understanding of the challenges and the importance of solutions are provided.

Industry Trends are Identified – Current and future trends are identified and shared.

Relevant to the Offshore Industry's Needs – The theme and sessions topics are in alignment with industry needs.

Emerging Solutions are Presented – New technical and commercial solutions are identified and shared.

DOT Planning Process and Structure is Improved – Improvements, which will help us to achieve the objectives, as outlined below.

Our objectives are:

Needs are Expressed – To provide a forum where Operators and Contractors can clearly express their needs from their own perspective.

Increase Awareness – Raise the Oil & Gas Industry's awareness of the challenges and issues.

Learn from Others – To provide a forum where we can learn from other experiences by encouraging candid discussion in a supportive environment.

Unknowns Identified – It is not what we know, but what we don't know.

DOT 2008 Advisory Board

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Roy Thompson — WOODSIDE

DOT 2008 Co-Chairman:
Eddie Stuart — WOODSIDE

DOT 2008 Advisory Board

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Event Overview:

The Deep Offshore Technology International Conference is the most significant deepwater technology event in the world. This event offers:

- A unique convocation of the world's leading executives, managers, and engineers from major and independent E&P companies.
- Visionary reports on the current and future state of technology in this frontier environment delivered by the key personnel involved in groundbreaking projects.
- A renewed focus on the ultra-deepwater spectrum between 1,500 and 3,000 meters, viewed at the strategic level with case studies and reports on first-application technologies.
- An overview of the geopolitical and economic influences shaping the future of deepwater theaters around the globe with input from major, independent, and state-owned operators and producers.

Who Attends DOT:

DOT is vital to industry leaders who seek information and emerging technology with which to plan future deepwater operations. DOT has a multi-national audience that provides a professional setting for making contacts and other business arrangements. DOT exhibitors have consistently recognized this conference as having the highest caliber of professionals in attendance. Exhibitors are exposed to technical specialists, key department managers, operating vice presidents, and leaders who influence purchasing decisions and bid lists.

Premium Value:

Why Exhibit

As a company interested in the latest complexities of the offshore market you cannot afford to miss this event. Exhibiting at this forum will provide opportunities to make instrumental connections that hold the key to successfully enter this revitalized market.

Exhibit at consecutive DOT conferences and receive a 10% discount in exhibit space costs - no matter the booth space size!

Exhibitors at DOT benefit from a select audience and multiple opportunities to:

- Increase brand awareness thus building brand value
- Meet strategic decision-makers in person
- Build and maintain meaningful business relationships
- Source new suppliers

Space cost at the DOT Asia/Pacific show is US$ 640.00 per square meter of space (minimum 9 square meters).

Shell Scheme is available for US$ 790.00 per square meter (minimum 9 square meters).

In addition to the exhibit space above, a compulsory enhanced listing on the DOT International Asia / Pacific interactive on line community will be charged at a flat rate of US$ 275. This listing includes descriptions and photos of up to five products, a 35-word company description and full contact details. This full searchable community will give your buyers access to your information and provide an opportunity for you to communicate with potential customers before the event.

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- Session Tracks

(and many more including customized sponsorships)

For more detailed information concerning sponsorships, visit us on line at www.deepoffshoretechnology.com or contact:

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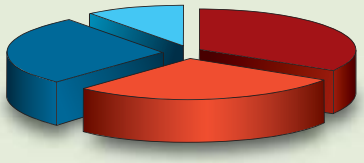
Deep Offshore Technology International 2007 Attendee Profile (Stavanger, Norway)



By Purchasing Responsibility:

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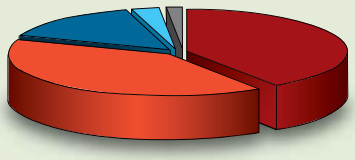
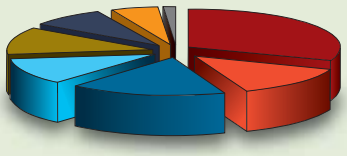
- 28% Other
- 10% Specify



By Job Function:

- 40% Management (CEO, Pres, VP, Partner, Director, etc.)
- 40% Engineering/Technical/Geoscience
- 15% Other
- 3% Purchasing/Consulting
- 2% Superintendent/Field Professional/Foreman



By Company Type:

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- 12% Other
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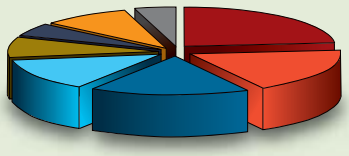
- 12% Consulting
- 11% Contractor
- 8% Service/Supply
- 5% Oil/Gas (Independent)
- 2% Government/Education/Financial



By Area of Interest:

- 25% Production
- 19% Pipeline/Transportation
- 17% Exploration
- 13% Drilling
- 8% Gas Processing
- 5% Other
- 9% Petrochemical/Refining
- 4% Financial

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DOT 2008 George Murray Award Recipients:

Best Presentation

Presenter: Roy Shilling *Company:* BP USA
Presentation: Developments in Riser Technology for the Next Generation Ultra-Deep HPHT Wells

Best Technical Innovation Award

Presenter: Mauro Costa de Oliveira *Company:* Petrobras
Presentation: Offshore Platforms Sizing Optimization Through Genetic Algorithms

George Murray Memorial Young Engineer Award

Presenter: Nathan Ames *Company:* EWI
Presentation: Embedded Sensor for Offshore Component Life Extension

Don Voelte

Managing Director & Chief Executive Officer

Woodside Petroleum Ltd

Don Voelte has 30 years of experience in the global oil and gas industry, and has been Managing Director and Chief Executive Officer of Woodside since joining the company in 2004.

Born in Omaha, Nebraska, Don graduated with a degree in Civil Engineering from the University of Nebraska in 1975.

Don began his career at Mobil Corporation in the same year, staying with the company for 22 years. During his time with Mobil he held a variety of executive positions, including Vice President and General Manager of US marketing.

His final role with Mobil was as President, New Exploration and Producing Ventures, with responsibility for world-wide exploration and building and implementing Mobil's corporate upstream global growth strategy. He reported to the Chairman and Chief Executive Officer.

Don left Mobil in 1997 to join Atlantic Richfield Company (ARCO) as Executive Vice President, responsible for exploration and production international operations, redeveloping global growth and risk management strategy. Don also had responsibility for global crude and product trading activities and worldwide pipeline operations. He remained with ARCO until the company's acquisition by BP in 2000.

Immediately prior to joining Woodside, Don was Director, President and Chief Executive Officer of Chroma Energy Inc. based in Houston.

Don is a member of the Society of Petroleum Engineers, the American Society of Civil Engineers and the Chi Epsilon Honor Society. He is a trustee of the University of Nebraska Foundation and was awarded the University of Nebraska Engineering Alumni of Year in 2002.

Roy Thompson

Senior Vice President Oil & Gas Projects

Woodside Petroleum Ltd

Roy Thompson has over 30 years experience in the global oil and gas industry and has been employed by Woodside since 1987.

Throughout his career Roy has worked at several locations, starting initially in the UK sector of the North Sea and progressing through the Middle East, the Gulf of Mexico and Scandinavia.

Roy began his career with Santa Fe International in 1975, gaining experience in fabrication and installation of offshore facilities and the development, construction and commissioning of the first reelship "Apache".

Roy left Santa Fe in 1981 to join Maersk Oil and Gas in Copenhagen, Denmark where he was involved in the design, fabrication and installation of subsea facilities and pipelines for numerous developments in the Danish sector of the North Sea.

Since joining Woodside, Roy has held project management positions for the development of the Goodwyn, Wanaea/Cossack, Laminaria/Corallina, Echo Yodel and Trunkline System Expansion projects.

Roy has been Woodside's Senior Vice President managing its portfolio of Oil & Gas Projects for the past 5 years.

Roy holds a Higher National Diploma in Mechanical Engineering.

Deep Offshore Technology International 2008 Conference Program Detail

Wednesday 3 December 2008

9:00 – 10:30....OPENING PLENARY SESSION

Welcome & Introduction; Eldon Ball – *Conference Director, Pennwell Corporation*
Chairman's Remarks; Roy Thompson – *Senior VP Oil & Gas Projects, Woodside Petroleum*
Keynote Address; Don Voelte – *CEO & Managing Director, Woodside Petroleum*
Industry Perspective; *TBD*

10:30 – 11:30 .... COFFEE BREAK

***11:30 – 13:00*....SESSION 1**

TRACK 1 Floating Production Systems • Construction & Installation • Flowlines & Pipelines • Mooring & Station-Keeping

FLOATING PRODUCTION SYSTEMS 1 – Chair: John Murray – *FloaTEC, LLC* / Co-chair: Claude Berbigier – *GEP*

11:30 – 12:00.....New Semi-submersible Design for Ultra-Deepwater Dry Tree Applications; Dr. Alaa Mansour – *WorleyParsons Sea*
This paper introduces a new conceptual semisubmersible design that provides heave motion similar to a spar. Two new features provide significant improvement to the platform heave and rotational responses.

12:00 – 12:30..... Ultra-Deepwater TLP Vibration Absorbers; Dr. Michael Spillane – *SBM Atlantia*
This paper examines a system of vibration absorbers using water columns and air springs to suppress resonant TLP motions, which has been extensively investigated theoretically and tested in a model-wave basin for a wide range of wave conditions.

12:30 – 13:00..... SAIPEM Novel Hybrid Riser Concept – RSC; Floriano Casola – *SAIPEM*
This paper discusses an intergrated approach to riser technology and the description of novel hybrid riser systems to address the limitations of SCR.

Alternate..... Conclusive Evidence for Round Floater Design to Eliminate Vacating Offshore Location during Severe Storms and Hurricanes; Per Josefsson – *OPE Inc.*
This paper will verify the safe station-keeping of a round-shaped floater in hurricane or typhoon conditions and confirm that, subject to riser selections, the potential overall shut-in time can be reduced.

TRACK 2 Subsea Technology • Subsea Boosting & Processing • Risers & Riser Technology • Flow Assurance Sponsored by: Chevron

RISERS & RISER TECHNOLOGY 1 – Chair: Arnt Olufsen – *StatoilHydro* / Co-chair: Ian Frazer – *Acergy*

11:30 – 12:00 ..... Model Test of Grouped SLOR Deep Water Riser System; Dr. Daniel Karunakaran – *Subsea 7*
The growing trend of deep and ultra-deepwater developments necessitates the use of risers that will give good stress response and fatigue performance, and be able to optimize field architecture. This paper discusses a grouped riser solution.

12:00 – 12:30..... Rosa BHOR–Analysis Challenges and Solutions in Riser Tower Design; Frank Grealish – *MCS*
This paper discusses the new advanced tools and analysis methodologies that were developed for the detailed analysis of the BHOR.

12:30 – 13:00..... SAIPEM Framework for Future Deep and Ultra-Deepwater Hybrid Riser Technology;
Garry Mahoney – *SAIPEM SA, Saibos Division*
This paper overviews the SAIPEM group framework and vision for the next generation of EPCI deep/ultra-deepwater riser technology.

ALTERNATE..... Installation Challenges for Deepwater Risers in Remote Locations; David Thomas – *2H Offshore Inc*
This paper considers the installation challenges that exist for deepwater, fatigue-critical riser systems and looks at methods to overcome the difficulties presented by the limited construction infrastructure in these areas.

TRACK 3 Lessons Learned – Deepwater • Field Architecture/Development Concepts • Well Construction • Regional Challenges

REGIONAL CHALLENGES 1 – Chair: Eddie Stuart – *Woodside Petroleum* / Co-chair: Hayden Marcollo – *AMOG Consulting*

11:30 – 12:00 ..... Stybarrow, Offshore Australia's Deepest Subsea Development; Robby O'Sullivan – *Technip Subsea 7 Asia Pacific*
This paper describes the installation engineering and operations associated with installing the infield flowline and umbilical (SURF) system, consisting of 50 km of flexible flowlines, risers, jumpers, static umbilicals, dynamic umbilicals and flying leads.

12:00 – 12:30..... FPSO Operational Experience Offshore NW Australia; Dr. Arun Duggal – *SOFEC, Inc.*
The focus of this paper is to describe the experience of the authors with several FPSO systems offshore NW Australia, with a focus on the technology and the associated operational aspects that should help in the evaluation of the future prospects.

12:30 – 13:00..... TOTAL Deepwater Development New Avenues: Challenges and Experiences; Eric Rambaldi – *TOTAL*
This paper will review field developments where deeper and smaller reservoirs, complex fluids and longer tie-backs have encouraged TOTAL to explore new technologies.

ALTERNATE..... Applying the Technology and Lessons Learned from Field Developments in West Africa and the North Sea to Offshore Australia; Harry Johnson – *Acergy*
The paper deals with the proposed architecture, fabrication methodology, and construction method based on a description of the actual recent experience in West Africa for a large deepwater development including the largest hybrid riser towers to-date.

13:00 – 14:30.....LUNCH Sponsored by: Department of Industry and Resources

14:30 – 16:30 ...SESSION 2

TRACK 1 Floating Production Systems • Construction & Installation • Flowlines & Pipelines • Mooring & Station-Keeping

CONSTRUCTION & INSTALLATION – Chair: Graham Sharland – *Subsea 7* / Co-chair: Erwin Lammertink – *Heerema Marine Contractors US Inc.*

14:30 – 15:00..... **Offshore Deck Mating on a Floating Substructure in an Exposed Environment;** Michel Seij – *Dockwise Shipping B.V.*
Due to the remoteness of Australasia from the traditional offshore production centers in the world, semisubmersible crane vessel availability is limited and at a high cost. This paper will present the use of offshore deck mating for integration of floating production facilities.

15:00 – 15:30..... **Design Considerations for the Modifications of the H-851 into a Float-over Vessel;**
Marc Rozeboom – *Heerema Marine Contractors Australia Pty Ltd*
The experiences on Malampaya and the East Area Gas float-overs were used to evaluate the feasibility of the H-851 as float-over barge for the North Rankin B topsides installation. This paper discusses the challenges and high demands.

15:30 – 16:00 **Installation of Deepwater Moorings;** Kingsley Wood – *Acergy*
This paper highlights the critical issues relating to the installation of mooring systems for deepwater FPSOs. The paper draws on the experiences from installation work on large FPSO projects in West Africa, such as Girassol, Bonga and Erha.

16:00 – 16:30 ..... **Installation of Subsea Structures in Deep and Ultra-Deepwater using Steel Wire Rope Deployment Systems;**
Olav Vennemann – *Acergy MS.Ltd.*
This paper addresses the challenges associated with operating steel wire rope deployment systems in very deep water.

ALTERNATE..... **Fibre Rope Deployment System and Rope Management Process;** Sverre Rye Torben – *ODIM Alitec*
The paper will give an update on the status of the development and use of the fibre rope deployment system with special focus on the rope management process.

TRACK 2 Subsea Technology • Subsea Boosting & Processing • Risers & Riser Technology • Flow Assurance Sponsored by: Chevron

SUBSEA TECHNOLOGY 1 – Chair: Jan T. Lisztwan – *Nexen Petroleum USA Inc.* / Co-chair: Brian Skeels – *FMC Technologies*

14:30 – 15:00..... **Solutions for Deepwater Positioning and Subsea 7's First Commercial Utilisation of the Nautronix NASnetTM System in 2007;** Martin Day – *Subsea7*
This paper discusses some of the major new technologies that have been developed.

15:00 – 15:30..... **Optimized Materials Selection for High Integrity Subsea Systems;** Dr. Eric Wright – *ExxonMobil Development*
This paper reviews industry lessons learned during the design, fabrication, installation, commissioning, and operation of optimized, high-integrity subsea systems.

15:30 – 16:00..... **Implementation of the Worlds First all Electric Subsea Production Control System;** Rory MacKenzie – *TOTAL E&P*
This paper will review the current status of the evaluation, discuss the learning points from project execution, installation, system start-up, and overview the operational performance through the early months of production of the K5F development in the Dutch sector of the North Sea.

16:00 – 16:30..... **Comparative Technical Specifications of Thermoplastic Hose and Steel Tubes Umbilicals;**
Michael Grimm – *JDR Cable Systems*
This paper examines the technical specifications of steel tubes and thermoplastic hoses, shows how umbilical designs have been used to solve similar technical requirements of projects in deepwater basins, and illustrates the wide scope of subsea umbilical design options.

ALTERNATE..... **Technical Challenges Confronting Deepwater Umbilical Systems for Subsea Pumping Applications;**
Carl Roemmele – *Oceaneering*
This paper addresses some of the challenges for umbilical systems designed to serve subsea pumps and explores the techniques used to overcome them.

TRACK 3 Lessons Learned – Deepwater • Field Architecture/Development Concepts • Well Construction • Regional Challenges

REGIONAL CHALLENGES 2 – Chair: Mal G. Ryan – *Chevron Australia Pty Ltd.* / Co-chair: Lee Gillette – *FMC Technologies*

14:30 – 15:00..... **Design of TLPs and Semi-submersible Platforms for Wet and Dry Tree Applications in Mild, Hurricane and Cyclonic Environments;** Andrew Kyriakides – *MODEC International*
This paper discusses the various parameters that control the design TLPs and semisubmersible platforms and outlines the differences and consequences in design methodology when designing the platforms for cyclones, hurricanes, or mild conditions.

15:00 – 15:30..... **Battered Column TLP & Semi-submersible Solutions for Deepwater Applications Offshore Australia;**
Dr. Neil Williams – *SBM Atlantia*
This paper discusses the hydrodynamic and structural aspects of the battered column hull concept and will present the results from a range of engineering studies, including the results of the model test programs. The relative merits of the TLP and semisubmersible solutions will be discussed.

15:30 – 16:00..... **The Development of Floating Control Facilities for Remote, Deepwater Fields;**
Peter Brownlie and Dr. Jinzhu Xia – *INTEC Engineering*
The paper provides an insight into the technology and the key commercial drivers for the selection of a control strategy. The historical development of control buoys is summarized and relevant technologies are described.

16:00 – 16:30..... **GAP™ Evolution Following Kikeh Project;** Lionel Fromage – *SBM Offshore*
This paper develops the technical lessons learned in the course of the Kikeh near-surface fluid transfer system and gives an overview of the interactions between the design drivers.

ALTERNATE..... **Riserless Light Well Intervention – Deepwater Challenges;** Pal Ligard – *FMC Technologies*
This presentation will describe the riserless light well intervention technology and operation and discuss the challenges to develop it to a safe and reliable deepwater service.

16:30 – 18:00.....OPENING NIGHT RECEPTION Sponsored by: WOODSIDE

Thursday 4 December 2008

09:00 – 10:30…SESSION 3

TRACK 1 Floating Production Systems • Construction & Installation • Flowlines & Pipelines • Mooring & Station-Keeping

FLOWLINES & PIPELINES 1 – Chair: Francesco Paone – *Mellitah Gas B.V* / Co-chair: Brian Skeels – *FMC Technologies*

09:00 – 09:30 ....Collapse and Stress Analysis of Concrete Coated Pipelines in Deepwater Conditions; Dr. Alexander Aynbinder – *WorleyParsons Sea*
This paper considers the beneficial effect of concrete coating on buckling, as the thickness of concrete is substantially bigger than wall thickness bare pipe and compressive strength of concrete is relatively high.

09:30 – 10:00.....Challenges and Solutions for Deepwater Pipeline Projects; Elizabeth Lakey – *JP Kenny*
The paper investigates the drivers for deepwater technology, identifies the consequential challenges and presents state of the art solutions being applied.

10:00 – 10:30.....Safer Bend Stiffener Connections for Flexible Risers and Umbilicals on Deepwater Platforms; Paul Hughes – *First Subsea Ltd*
This paper reports on research into safer and easier to install alternatives to bend stiffeners and connectors, focusing on engineering the connector for a diverless connection mechanism.

ALTERNATE .....A Methodology for Engineering Criticality Assessment (ECA) for Offshore Pipelines; Dr. Ben Lee – *JP Kenny*
This paper presents a methodology for an Engineering Criticality Assessment (ECA), and results from a study, for the flaws in the welded joints of gas export offshore pipelines.

TRACK 2 Subsea Technology • Subsea Boosting & Processing • Risers & Riser Technology • Flow Assurance Sponsored by: Chevron

RISERS & RISER TECHNOLOGY 2 – Chair: Bob Kipp – *WorleyParsons Sea* / Co-chair: Uri Nooteboom – *INTEC – WorleyParsons Group*

09:00 – 09:30 ....2nd Generation Drill Pipe Riser (DPR): A Step Change in Performance for Deepwater Intervention; William Gamisans – *VAM Drilling*
The paper presents a detailed review of the development of a 2nd generation Drill Pipe Riser (DPR), a few years after the successful deployment of the 1st generation DPR Intervention System for Brazil deepwater fields.

09:30 – 10:00.....Deepwater SCRs: Design Challenges and Solutions for Semi-submersibles; Conor Galvin – *MCS*
This paper addresses the key issues for steel catenary riser design for ultra-deepwater developments with semi-submersible hull facilities. The paper concludes on key technical issues for future ultra-deepwater semisubmersible developments.

10:00 – 10:30.....State of the Art Riser Solutions for Shallow and Ultra-Deepwater; Cobie Loper – *Wellstream International Ltd.*
This paper presents two modified vertical and catenary riser configurations, where distributed buoyancy are used to alleviate extreme top tension loads without significant increase to installation costs.

ALTERNATE .....Feasibility of SCRs in Shallow Water; Dr. Ivan Sladojevic – *DeepSea Engineering Australia*
This paper presents the results of case studies aimed at evaluating the feasibility of SCR in water depths ranging from 300 m to 1,000 m. An SCR ranging from 18-inch to 30-inch diameter and attached to a disconnectable turret is investigated.

TRACK 3 Lessons Learned – Deepwater • Field Architecture/Development Concepts • Well Construction • Regional Challenges

REGIONAL CHALLENGES 3 – Chair: Eldon Ball – *PennWell Corporation* / Co-chair: David Paganie – *PennWell Corporation*

09:00 – 09:30 ....Challenges of the Jansz Deepwater Tie-back; David Equid – *Gorgon Upstream*
This paper discusses the development of both the Gorgon and deepwater Jansz fields, off the northwest coast of Barrow Island, and the unique challenges of routing of the pipeline from Jansz in 1,350 m water depth.

09:30 – 10:00.....Paper Title TBD; Chris Mijnsen – *Shell*

10:00 – 10:30.....Deepwater Pipeline Design – Integration Challenges; Lanre Odina – *Xodus Group Pty Ltd.*
This paper considers the specific deepwater challenges facing pipeline design and how the inclusion of an integrated multi-disciplined team influences the design outcomes.

ALTERNATE .....Challenges Related to the Use of Large Diameter Flexible Pipes for Offshore Applications; Adriana Botto – *MCS*
This paper examines current industry design limits, evaluates new research and development areas focused on expanding the limits of flexible pipe applications, and describes new additions and amendments to the flexible pipe design codes and standards.

10:30 – 11:30 .....COFFEE BREAK

11:30 – 13:00…SESSION 4

TRACK 1 Floating Production Systems • Construction & Installation • Flowlines & Pipelines • Mooring & Station-Keeping

FLOATING PRODUCTION SYSTEMS 2 – Chair: Claude Berbigier – *GEP* / Co-chair: Alvaro Negrão – *Repsol YPF E&P*

11:30 – 12:00…..Spectral Fatigue of Offshore Floating Facilities; Cristian Bran – *Bureau Veritas*
This paper will present examples of full ship fatigue spectral analysis carried out in different environments such as North Sea and NW Australia and their comparison with traditional deterministic assessment.

12:00 – 12:30 ….Highlights of the 3rd Edition of API RP2T; Dr. Steve Leverette – *SBM Atlantia*
The American Petroleum Institute is issuing a new edition of the Recommended Practice for the Planning, Design, and Construction of Tension Leg Platforms, API RP2T. This paper will present highlights of the new RP2T and discuss implications for designers and owners of TLPs.

12:30 – 13:00 ….Going Deeper and Safer: Global Response of Ultra-Deepwater Floating Systems; Dr. Ming-Yao Lee – *Chevron*
This paper will use a real-life design case to demonstrate how analysis and model tests can fit into the overall design process, and provide a basis for the full-scale verification.

ALTERNATE …….Latest Evolution of Metocean Analysis Practices and their Applications for F(P)SO Designs;
Guillaume Gourdet – *Bureau Veritas*
The paper details the methodology for heading analysis, including the typical site data that are required, the typical results obtained for different locations such as North Sea, Atlantic coast of America and East Pacific area.

TRACK 2 Subsea Technology • Subsea Boosting & Processing • Risers & Riser Technology • Flow Assurance Sponsored by: Chevron

SUBSEA TECHNOLOGY 2 – Chair: David Morgan – *Cameron* / Co-chair: David Brookes – *BP*

11:30 – 12:00…..New Method for Sea Line Maintenance; Dr. Gholam Hossein Khalaf – *Fars Science and Technology Park*
This paper discusses a new method for sea line emergency repair with stud friction welding, which bypasses the clamping method.

12:00 – 12:30 ….Deepwater Subsea Tie-ins between Chevron Blind Faith and Williams Devils Tower Export Pipelines;
John Charalambides – *Oceaneering International, Inc.*
This presentation will focus on the design challenges, experience, and lessons learned from the SIT and offshore installation of two deepwater pipeline tie-ins using first-of-its-kind subsea technology and installation methodologies.

12:30 – 13:00 ….Deepwater Umbilical and Equipment Installation for the Independence Hub; Murray Dick – *Subsea 7*
This paper outlines practical issues that arose from the product load-out through to completion of acceptance testing of Independence Hub, details how they were dealt with and the experiences and key learning's developed from them.

ALTERNATE …….HIPPS Design Methodology; Kevin Mullen – *INTEC Engineering*
This paper brings a formalized approach to the design of a subsea High Integrity Pipeline Protection System (HIPPS) which allows for the down-rating of a subsea flowline below the wellhead shut-in pressure.

TRACK 3 Lessons Learned – Deepwater • Field Architecture/Development Concepts • Well Construction • Regional Challenges

WELL CONSTRUCTION TECHNOLOGY – Chair: Kurt Nielsen – *M-I SWACO* / Co-chair: Hayden Marcollo – *AMOG Consulting*

11:30 – 12:00…..New Method to Reduce the Cost of Well Construction Compared to Convention (Wells of the Future);
Russell Furner – *Caledus*
This paper describes the development, prototype testing, test well full system test, and field trials of an evolutionary well construction system.

12:00 – 12:30 ….Overcoming Deepwater Challenges in the Middle East and Asia using Advanced Cementing Technologies;
Salim Taoutaou – *Schlumberger*
This paper will describe the deepwater challenges and solutions in Asia (Pakistan, Indonesia, and Malaysia) and the solutions to achieve the zonal isolation in conductors and surface casings. The paper outlines several case histories for different clients, including Shell, Eni, Chevron, and Murphy Oil.

12:30 – 13:00 …..Choosing a High Strength Thin Wall all Steel Drill Pipe Solution for uERD Wells; Lance Spencer – *BP Exploration Alaska, Inc.*
This paper will discuss the primary selection drivers for the various hole sections as well as the new product performance characteristics that enabled the operator to select this all-steel alternative.

ALTERNATE …….Deepwater Safety System Challenges; Dr. David McCalvin – *Schlumberger Completions*
This paper discusses the key issues of design applicability, quality control, interfaces with production and well related products, operator training and safeguards, and applicable ISO and API industry regulations.

13:00 – 14:30…..LUNCH Sponsored by: Bennett & Associates

LUNCHEON PANEL DISCUSSION – Moderator – Eldon Ball – *PennWell Corporation*

14:00 - 14:30…..Dangers of the Deep;
Panelists: Thomas Sunde – *Sapura Acergy;* Bob Kipp – *WorleyParsons Sea;* Brian Skeels – *FMC Technologies;* Graham Sharland – *Subsea 7*
Panel members will discuss construction and installation lessons learned and best practices determined during execution of previous deepwater projects. Questions and comments from the audience will be encouraged.

14:30 – 16:30 ... SESSION 5

TRACK 1 Floating Production Systems • Construction & Installation • Flowlines & Pipelines • Mooring & Station-Keeping

MOORING & STATION KEEPING – Chair: Michael W. J. Wyllie – *SBM Offshore* / Co-chair: Uri Nooteboom – *INTEC ~ WorleyParsons Group*

14:30 – 15:00 .... **Full-Scale Validation Testing of In-Service Low Toughness Mooring Shackles;**
Dr. Fraser McMaster – *Chevron Energy Technology Company*
The focus of this paper is on presenting the results of the full-scale structural testing of the spare mooring shackles. Full experimental test results, with an overview comparison with previous finite element analysis and deterministic analysis, will be presented.

15:00 – 15:30 .... **A Disconnectable FPSO with SCR's;** Philippe Lavagna – *SBM Atlantia*
This paper gives an overview of the existing FPSO technologies for deep, hurricane-prone waters, highlighting the need for a new mooring system concept to enable the use of steel catenary risers.

15:30 – 16:00 .... **Monitoring of Drag Anchor Embedment Parameters;** Roderick Ruinen – *Vryhof Anchors B.V.*
This paper will discuss the technical challenges involved with the development of the monitoring system, results of actual anchor installations and the application of the technology in future drag embedment anchor installations.

16:00 – 16:30 .... **Genesis Spar Platform VIM Mitigation – Review of Mooring System Performance after Implementation of the Stepped Line Tensioning Plan;** Samrat Das – *Granherne, Inc.*
This paper examines the Genesis Spar vessel motions performance since the SLT plan was made operational. The focus of this work is on system behavior under extreme events like hurricanes Rita and Katrina and high loop/eddy current conditions.

ALTERNATE ..... **Fibre Rope Deepwater Moorings: Towards Complete and Consistent Design and Qualification Procedures;**
Franck Legerstee – *Bureau Veritas*
This paper illustrates how recent advances have been successfully implemented in software tools and corresponding classification guidelines for fiber rope deepwater moorings.

TRACK 2 Subsea Technology • Subsea Boosting & Processing • Risers & Riser Technology • Flow Assurance Sponsored by: Chevron

FLOW ASSURANCE – Chair: Eamonn J. McCabe – *Woodside Petroleum* / Co-chair: Drew Peoples – *Chevron Australia Pty Ltd.*

14:30 – 15:00 .... **Rapid Subcooling in Partially Insulated Deepwater Tiebacks;** Matthew Healey – *Multiphase Solutions Pty Ltd.*
This paper discusses how some configurations can lead to a complex interaction between insulated and uninsulated pipeline sections on shutdown, leading to temperatures well below the ambient seawater temperature and inside the hydrate/wax envelope.

15:00 – 15:30 .... **The Development of Holistic Corrosion Management Strategies through an Understanding of Corrosion Mechanisms, Detection Methods, and Prevention Technologies;** Robert Sisco – *Granherne Inc.*
This paper will provide a survey of corrosion mechanisms, commercially available detection and prevention technologies as well as a discussion of how the combination of these elements can be used to develop holistic corrosion prevention and control programs.

15:30 – 16:00 .... **How to Overcome Challenges when Incorporating Active Electrical Heating Systems for Deepwater Field Developments;** Loic Delebecque – *Saipem SA*
As Saipem is highly involved in the development of solutions for extended tie-backs, a specific active heating system adequate for pipe-in-pipe configuration and for J-Lay installation has been recently developed and will be presented in this paper.

16:00 – 16:30 .... **Thermodynamic Inhibitor Performance Extender that Effectively and Economically Prevents Hydrate Formation in Production Systems;** Stephan Allenson – *Nalco Co.*
This paper presents the development of a new additive that was developed to improve the effectiveness of the treatment two to four fold when added to the thermodynamic hydrate inhibitor (THI).

ALTERNATE ..... **A Novel Thermal Insulation System for Subsea use, Design, Qualification and Performance;**
Dr. Adam Jackson – *Bredero Shaw Norway*
Thermoplastic materials and thermal insulation systems have been developed where the inherent thermal conductivity of the solid matrices are sufficiently low as to render the systems interesting for direct application in deepwater. This paper will describe the systems.

TRACK 3 Lessons Learned – Deepwater • Field Architecture/Development Concepts • Well Construction • Regional Challenges

DEEPWATER DRILLING OPERATIONS – Chair: Kurt Nielsen – *M-I SWACO* / Co-chair: Lee Gillette – *FMC Technologies*

14:30 – 15:00 .... **NASNet®, Long Term Positioning Technology for Deepwater Drilling Applications;** John MacLeod – *Nautronix*
As the day rate costs of these vessels have increased and the return to a period of GPS instability is forecast, using acoustics as an input to a vessels DP system now assumes more importance. This paper will explore the technology used, project considerations, and the benefits gained.

15:00 – 15:30 .... **Development of a Submerged and Fully-Automated Seabed Drilling Rig;** Kenneth Mikalsen – *Seabed Rig AS*
This paper will discuss the design and operation of an innovative drilling rig to be located submerged at the seabed for cost-effective drilling in deep waters and arctic areas.

15:30 – 16:00 .... **The Importance of Advanced Dynamic Software Models in Deepwater Drilling;** Bjørn-Tore Anfinsen – *SPT Group*
The presentation will focus on areas where dynamic modeling is of particular importance to the successful outcome of the operation. This will be illustrated by several field cases.

16:00 – 16:30 .... **Extreme Deepwater Drilling Semisubmersible for Harsh Environments;** Nora Haug – *Aker Solutions*
This paper will focus on H-6e drilling semi-submersible and its capabilities to meet the challenges faced in exploration and development drilling in ultra-deepwater, harsh environment, ecologically sensitive, and remote areas.

ALTERNATE ..... **Drilling Safer and Faster with Improved Technologies for Challenging Drilling Applications;**
Anne Sévignon and William Gamisans – *VAM Drilling*
This paper describes the lessons learned during recent extended reach drilling operations with HP/HT downhole conditions and presents the key factors to be considered for appropriate drill string specification and field running in such cases.

Friday 5 December 2008

09:00 - 10:30 ... SESSION 6

TRACK 1 Floating Production Systems • Construction & Installation • Flowlines & Pipelines • Mooring & Station-Keeping

FLOWLINES & PIPELINES 2 – Chair: Uri Nooteboom – *INTEC – WorleyParsons Group* / Co-chair: Christian Geertsen – *ITP InTerPipe*

09:00 – 09:30 .... **Advances in Subsea and Deepwater Pipeline Pre-commissioning;** John Grover – *BJ Process & Pipeline Services*
This paper will review the challenges subsea and deepwater developments bring where there are no surface connections to the pipeline available for pipeline testing and pre-commissioning.

09:30 – 10:00..... **Detailed Design and Installation of an Elastomeric Component to Protect Pipelines from Dropped Object;** Guy Mencarelli – *Acergy*
This paper will discuss the engineering design and installation of an elastomeric component to protect pipelines on field Tombua Landana against the impact of dropped objects.

10:00 – 10:30..... **Design of High Temperature/High Pressure (HT/HP) Pipelines Against Lateral Buckling using Vertical Triggers;** Arash Nikkhaah – *SLT-International Sdn Bhd*
Design of HP/HT pipelines differ significantly from traditional methods in designing subsea pipelines. In this paper, lateral buckling of HP/HT pipelines will be discussed by presenting a real case study.

ALTERNATE ..... **Ultrasonic Phased Array Inspection of Offshore Pipelines;** Dr. Michael Moles – *Olympus NDT*
New technology, specifically ultrasonic phased arrays, offers advantages for weld inspection. This paper will describe the phased array system, with special applications for offshore pipeline construction.

TRACK 2 Subsea Technology • Subsea Boosting & Processing • Risers & Riser Technology • Flow Assurance Sponsored by: Chevron

RISERS & RISER TECHNOLOGY 3 – Chair: Ian Frazer – *Acergy* / Co-chair: Jan T. Lisztwan – *Nexen Petroleum USA Inc.*

09:00 – 09:30 .... **A System For Measuring Wellhead Bending Moments During Completion Operations;** Otávio de Brito Collaço Veras - *2H Offshore*
This paper describes a novel monitoring system to address the issue of measuring wellhead bending moments during completion operations, and a system is described for accurately measuring bending moments in the wellhead.

09:30 – 10:00..... **Fatigue Resistant Threaded and Coupled Connectors for Deepwater Riser Systems: Design and Performance Evaluation by Analysis and Full Scale Tests;** Dr. Celine Sches – *V&M Tubes*
This paper will demonstrate how the new design and performance evaluation methods were implemented into the standard development process of T&C connectors, with a focus on finite element analysis techniques.

10:00 – 10:30..... **Uncertainty Propagation in Clashing Analysis of Deepwater Flexible Risers;** Dr. Hari Kanegaonkar – *Aibel AS*
In this paper, the uncertainties in the static, dynamic and simplified VIV estimates are modeled as Type2 fuzzy variables and probabilistic-possibilistic-belief function theories are used to estimate the propagation of the uncertainties.

ALTERNATE ..... **Integrity Monitoring of Deepwater Risers;** Donald Thomson – *Schlumberger Subsea Surveillance*
Deepwater and harsh environments demands have stimulated the development of new approaches to riser integrity monitoring. This paper presents details of a number of applications, focusing on the design, manufacture and varying installation methods.

TRACK 3 Lessons Learned – Deepwater • Field Architecture/Development Concepts • Well Construction • Regional Challenges

FLOATING SYSTEMS TECHNOLOGY – Chair: Hayden Marcollo – *AMOG Consulting* / Co-chair: Eddie Stuart – *Woodside Petroleum*

09:00 – 09:30 .... **The Design of Disconnectable Riser Systems for use in Australia;** Enda O'Sullivan – *MCS*
This paper deals with key aspects of disconnectable riser system design, and gives insight on techniques for improvements for future disconnectable designs worldwide.

09:30 – 10:00..... **Development of Design Metocean Conditions for a Permanently Moored Vessel in Cyclone-Affected Area;** Dr. Yuriy Drobyshevski – *INTEC Engineering Pty Ltd*
This paper presents analyses for floating LNG and FSO vessels permanently moored at an Australian offshore location. The study quantifies that the highest return period sea state only need to be applied within a limited range of incident angles.

10:00 – 10:30..... **The Virtual Control Buoy;** Kevin Mullen – *INTEC Engineering*
This paper describes a future method of controlling remote wells, with the potential to be more robust and lower cost than control buoys, without the difficulties and risk associated with the installation and operation of long distance umbilical systems.

ALTERNATE ..... **Technical and Economic Feasibility of Mini-LNG and Micro-LNG Production Systems;** Wen Sin Chong – *Keppel Offshore & Marine Technology Centre*
This paper presents the results of a technical and economic feasibility study of much smaller LNG production systems suitable for associated gas and small deposits.

10:30 – 11:30 ..... COFFEE BREAK

11:30 – 13:00....SESSION 7

TRACK 1 Floating Production Systems • Construction & Installation • Flowlines & Pipelines • Mooring & Station-Keeping

FLOWLINES & PIPELINES 3 – Chair: David Paganie – *PennWell Corporation* / Co-chair: Bob Kipp – *WorleyParsons Sea*

11:30 – 12:00 ..... **Simulation of Seabed Pipeline-Soil Interaction using Geotechnical Centrifuge Modeling;** Prof. David White – *COFS, UWA*
This paper describes insights from physical modeling using the geotechnical centrifuge facility at UWA in Perth. Results from two series of tests are described, focusing on dynamic lay effects and the large-amplitude lateral sweeping.

12:00 – 12:30 .... **In-Line Inspection for Deepwater Offshore Pipeline;** Chris Yoxall – *Rosen, Australia*
This paper will discuss the challenges associated with intelligent pigging of deepwater offshore pipelines and some of the technical solutions that are required to overcome these challenges.

12:30 – 13:00 .... **Advanced Corrosion Technology and Management for Large Diameter Subsea Pipelines;** Faridah Che Ibrahim – *ExxonMobil Development Company*
This paper describes the application of enhanced flow modeling and corrosion testing to more accurately simulate the local top of the line environment for large diameter, sour wet gas lines and to define a comprehensive inhibitor qualification plan and corrosion management program.

ALTERNATE ..... **Leak Detection While Running Tool;** Waqas Munir – *Smith International*
This paper discusses the methods to detect leaks while running the tool inside the pipeline, as well as the importance of flow assurance and of leak detection while running the tool.

TRACK 2 Subsea Technology • Subsea Boosting & Processing • Risers & Riser Technology • Flow Assurance Sponsored by: Chevron

SUBSEA BOOSTING & PROCESSING – Chair: Drew Peoples – *Chevron Australia Pty Ltd* / Co-chair: David Morgan – *Cameron*

11:30 – 12:00..... **Deepwater Multiphase Boosting;** Dr. Gunder Homstvedt – *Aker Solutions*
The economic benefit of subsea multiphase boosting has been proven, lately in deepwater. This paper discusses the installation of the Aker Solutions MultiBooster in 1,700 m of water in the BP King Field in the Gulf of Mexico.

12:00 – 12:30 .... **Subsea Gas Compression;** Håkon Skofteland – *Aker Solutions*
This paper describes the subsea technology developed for the subsea compression system built as part of the Ormen Lange pilot project, including process, power distribution and control system.

12:30 – 13:00 .... **A World Technology First in Subsea Separation;** Pascal Girondon – *TOTAL E&P Angola*
After the successful Girassol, Dalia and Rosa developments, Pazflor represents a major new stage in the development of block 17 offshore Angola. This paper covers the challenges in developing four main fields with different oil and reservoir characteristics.

ALTERNATE: ..... **Direct Electric Flowline Heating – An Option that Should Not Be Ignored;** Richard Voight – *INTEC Engineering*
This paper discusses the basic design principles and state-of-the-art for the PIP-based direct electric heating system first developed by Shell and employed in the Gulf of Mexico.

TRACK 3 Lessons Learned – Deepwater • Field Architecture/Development Concepts • Well Construction • Regional Challenges

HPHT TECHNOLOGY – Chair: Lee Gillette – *FMC Technologies* / Co-chair : Mal G. Ryan – *Chevron Australia Pty Ltd.*

11:30 – 12:00..... **The Impact of HPHT on the Oil Industry;** Brian Skeels – *FMC Technologies*
This paper outlines suggested design guidelines and areas of basic research to establish near-term HPHT application engineering, and longer term research into extreme HPHT and ultra-HPHT environments.

12:00 – 12:30 .... **Developments in Riser Technology for the Next Generation Ultra-Deep HPHT Wells;** Jacky Massaglia – *V&M Tubes*
This paper will present information on next generation developments of ultra-deep HPHT wells and the salient studies that are ongoing regarding the design and qualification work on high strength steels, T&C riser connectors, and advanced fatigue rating methodologies.

12:30 – 13:00 .... **A Simplified Monte Carlo Simulation – Finite Element Reliability Analysis of Laterally Buckled Offshore PIP Flowlines under XHPHT Conditions;** Dr. Ayman Eltaher – *JP Kenny*
In this paper, a simplified Monte Carlo Simulation approach will be presented for a PIP flowline under XHPHT conditions. The presented technique allows for expanding the use of MCSim to the more complex physical phenomena with highly nonlinear LSF, using existing software.

ALTERNATE: ..... **Incorporation of Strengthening Effects of Cladding in Pipeline Analysis;** Arash Nikkihaah – *Slt-Engineering Sdn Bhd.*
This paper will discuss the advantage possible from the strengthening effect of pipeline clad material in performing lateral buckling analysis for a high-temperature and a high-pressure clad pipeline in South East Asia.

13:00 – 14:00 LUNCH / CLOSING PLENARY/AWARDS SESSION

Chairman's Closing Remarks; Roy Thompson – *Senior VP Oil & Gas Projects, Woodside Petroleum*

Industry Closing Presentation; John Westwood – *Chairman, Douglas-Westwood Ltd.*

Awards Ceremony and Closing Remarks; Eldon Ball – *Conference Director, PennWell Corporation*

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Thursday, 4 December ..... 10:00 – 18:00
Friday, 5 December ..... 10:00 – 14:30

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Tuesday, 2 December ..... 12:00 – 17:00
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Thursday, 4 December ..... 08:00 – 18:00
Friday, 5 December ..... 08:00 – 14:30

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DEEP OFFSHORE TECHNOLOGY INTERNATIONAL ASIA / PACIFIC

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3. Areas of Interest/Involvement:

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