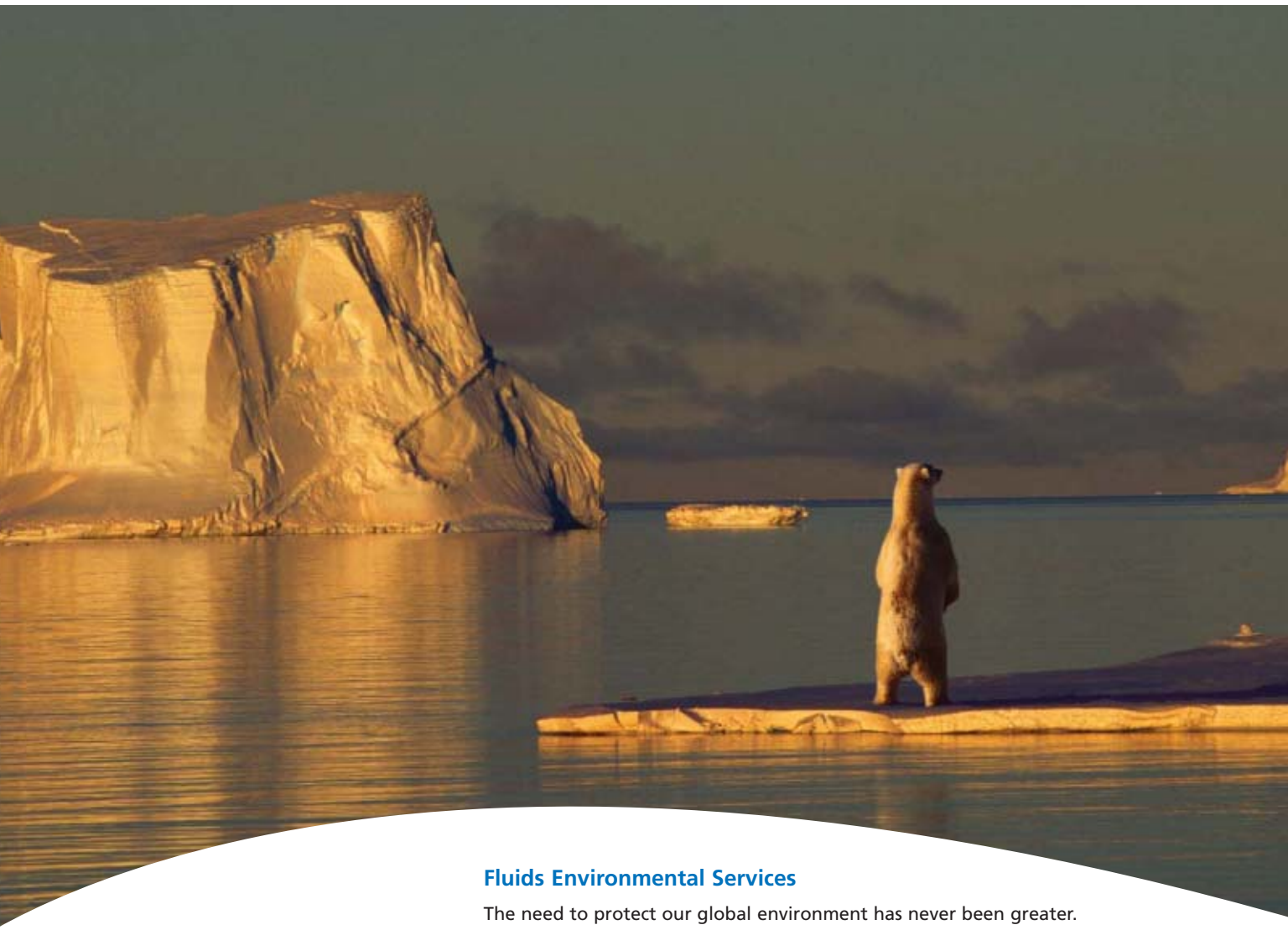
Environmental Worries?



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OIL&GAS JOURNAL®

Oct. 13, 2008
Volume 106.38

US Elections and Energy

Regular Features

Cover

US economic problems supplanted energy as the top issue in the 2008 political campaign's final month. Many Washington, DC-based oil and gas industry association executives, however, maintain that energy will be one of the biggest issues the next president and Congress confront in 2009, as discussed in the special report, US Elections and Energy, starting on p. 22. Association officials are encouraged that both major presidential nominees' energy positions have evolved, but they also see hard work ahead as Congress and the next president tackle taxes, regulatory reform, and global climate change against a backdrop of economic recession.

General Interest

Exploration & Development

Drilling & Production

Processing

Transportation

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Oct. 13, 2008

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General Interest — Quick Takes

Deutsche Bank updates oil, gas price forecasts

A research report released Oct. 3 by Deutsche Bank sees room for oil prices to continue to decline.

"We believe crude oil prices have further downside as the fallout of the financial crisis spreads into the real economy and ultimately global oil demand. Like gold, we also believe the oil price is trading rich relative to the US dollar, with the current euro/dollar rate suggesting an oil price nearer $80/bbl," the report says.

Over the last 2 years, 85% of the movement in the West Texas Intermediate oil price is explained by shifts in the value of the dollar, the report says.

Deutsche Bank recently reduced its fourth-quarter 2008 and first-quarter 2009 WTI price forecasts to $85/bbl. The price is forecast to average $90/bbl in second quarter 2009.

The report notes that some other analysts are looking for oil to move as low as $50/bbl, a price last seen in early 2007.

Analyst Adam Sieminski says that although $50/bbl oil is not out of the realm of 'reasonableness' in view of recent history, it seems unlikely in view of the consensus opinion that the Federal Reserve will cut interest rates when it meets later this month.

Meanwhile, natural gas is forecast to average $9/MMbtu in the final 2008 quarter and $8.50/MMbtu in first quarter 2009, rebounding to $9/MMbtu in the second quarter of next year.

Despite shut-in gas production in the Gulf of Mexico following Hurricane Ike, gas in underground storage continues to climb, and Deutsche Bank estimates gas is on track to reach 3,400 bcf by the start of winter.

"Since many meteorologists are forecasting a colder-than-normal start to the US winter, we continue to believe that US natural gas is trading cheap relative to oil," Sieminski says.

House Republicans ask DOI for next OCS steps

With the expiration of US Outer Continental Shelf and oil shale leasing moratoriums a day earlier, US House Republicans asked Interior Secretary Dirk A. Kempthorne on Oct. 2 to identify steps Congress should take to ensure potential resources in reopened areas are developed soon.

"We are concerned by media reports that radical anti-energy groups may, with the tacit support of the Democratic leadership, file a barrage of lawsuits to continue to deny the American people access to these vital sources of American-made energy," Minority Leader John H. Boehner (Ohio), Minority Whip Roy Blunt (Mo.) and seven more House Republicans said in a letter to Kempthorne.

"We are also concerned by speculation that federal red tape and bureaucratic hurdles exist that will prevent Americans from gaining quick access to these resources. Such delays would needlessly hinder the creation of tens of thousands of good American jobs and further slow our nation on its path to lower [gasoline] prices and energy independence," they continued. They asked Kempthorne to promptly identify such barriers and potential litigation as well as responsible actions which Congress might take to ensure that resources in the reopened areas "are fully and completely unlocked in the most expeditious manner possible."

California operator fined for Lands Act violation

The US Minerals Management Service fined a California offshore oil and gas operator $450,000 on Oct. 7 for violating the Outer Continental Shelf Lands Act following a multiyear investigation.

Pacific Operators Offshore LLC pleaded guilty and will also serve 5 years' probation for using a gas lift line in direct contradiction to an MMS order, the US Department of the Interior agency said.

MMS said it notified the Carpenteria, Calif.-based company, which operates two platforms off the state's coast, that the gas lift line was not fit for service in 2000 and that its continued use posed a significant workforce safety risk. MMS also said it notified POO that if it intended to use the gas lift line in the future, it would need to submit a repair plan for MMS's approval.

In 2002, according to MMS, its inspectors determined that POO was still using the gas lift line, and the agency referred the matter to the DOI Inspector General's office for criminal investigation. It added that the US Department of Justice also participated in the inquiry. ✦

Exploration & Development — Quick Takes

Rift flows gas at Puk Puk

London-based Rift Oil has flowed 29.2 MMcfd of gas during a test in its Puk Puk-1 wildcat on Papua New Guinea permit PPL235 in the country's Western Province.

The flow came from combined Toro Sandstone and Lower Hedinia pay intervals in the well. A separate flow from the Lower Hedinia measured 20.85 MMcfd.

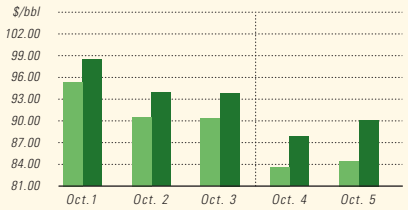
Rift now plans to isolate these two zones and test the Upper Hedinia zone in the structure. Once flow rates have stabilized, the company also plans to use its onsite separator equipment to measure the liquids content of the gas.

Rift is particularly pleased with the Lower Hedinia flow rate because it comes from thinner sands. The company adds that initial flow rates from the Toro are in line with expectations from this well-developed reservoir.

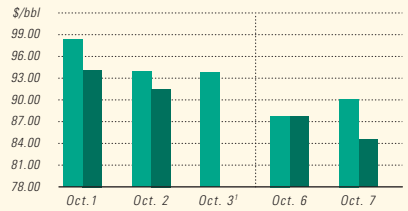
Testing at Puk Puk will be completed later this month. The com-

Industry Scoreboard

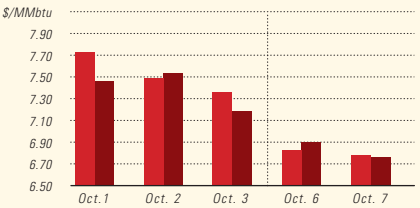
IPE BRENT / NYMEX LIGHT SWEET CRUDE



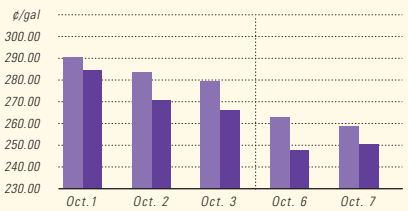
WTI CUSHING / BRENT SPOT



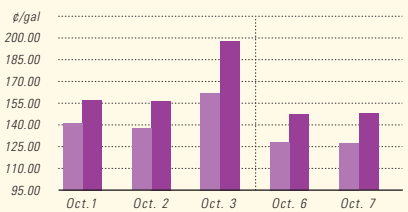
NYMEX NATURAL GAS / SPOT GAS - HENRY HUB



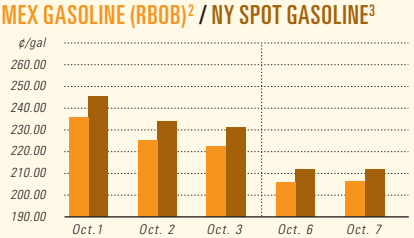
IPE GAS OIL / NYMEX HEATING OIL



PROPANE - MT. BELVIEU / BUTANE - MT. BELVIEU



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



[1]Not available
[2]Reformulated gasoline blendstock for oxygen blending.

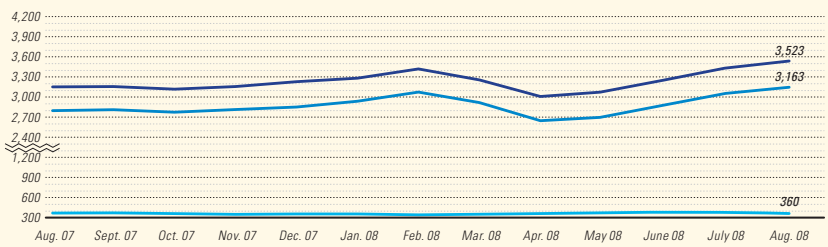
US INDUSTRY SCOREBOARD — 10/13

Latest week 9/26	4 wk. average	4 wk. avg. year ago[1]	Change, %	YTD average[1]	YTD avg. year ago[1]	Change, %
Demand, 1,000 b/d						
Motor gasoline	8,867	9,289	–4.5	9,092	9,302	–2.3
Distillate	3,811	4,160	–8.4	4,066	4,209	–3.4
Jet fuel	1,527	1,551	–1.5	1,555	1,627	–4.4
Residual	478	683	–30.0	608	737	–17.5
Other products	4,338	4,797	–9.6	4,717	4,818	–2.1
TOTAL DEMAND	19,021	20,480	–7.1	19,810	20,721	–4.4
Supply, 1,000 b/d						
Crude production	3,961	4,887	–18.9	5,002	5,076	–1.5
NGL production[2]	2,111	2,413	–12.5	2,247	2,374	–5.3
Crude imports	8,306	10,308	–19.4	9,706	10,079	–3.7
Product imports	3,177	3,337	–4.8	3,171	3,541	–10.4
Other supply[3]	1,108	873	26.9	1,370	1,035	32.4
TOTAL SUPPLY	18,663	21,818	–14.5	21,496	22,105	–2.8
Refining, 1,000 b/d						
Crude runs to stills	14,747	15,251	–3.3	14,747	15,169	–2.8
Input to crude stills	14,980	15,532	–3.6	14,980	15,456	–3.1
% utilization	85.4	89.0	—	85.4	88.6	—

Latest week 9/26	Latest week	Previous week[1]	Change	Same week year ago[1]	Change	Change, %
Stocks, 1,000 bbl						
Crude oil	290,186	291,706	-1,520	320,617	-30,431	-9.5
Motor gasoline	178,739	184,634	-5,895	191,366	-12,627	-6.6
Distillate	125,449	129,625	-4,176	137,060	-11,611	-8.5
Jet fuel-kerosine	37,087	39,084	-1,997	41,751	-4,664	-11.2
Residual	35,613	35,980	-367	37,960	-2,347	-6.2
Stock cover (days)[4]			Change, %		Change, %	
Crude	21.7	20.4	6.4	20.7	4.8	
Motor gasoline	19.8	20.1	-1.5	20.4	-2.9	
Distillate	32.0	32.1	-0.3	33.5	-4.5	
Propane	60.4	56.8	6.3	55.8	8.2	
Futures prices[5] **10/3**			Change		Change	%
Light sweet crude ($/bbl)	107.32	97.29	10.03	82.10	25.22	30.7
Natural gas, $/MMbtu	7.69	7.54	0.15	6.30	1.40	22.1

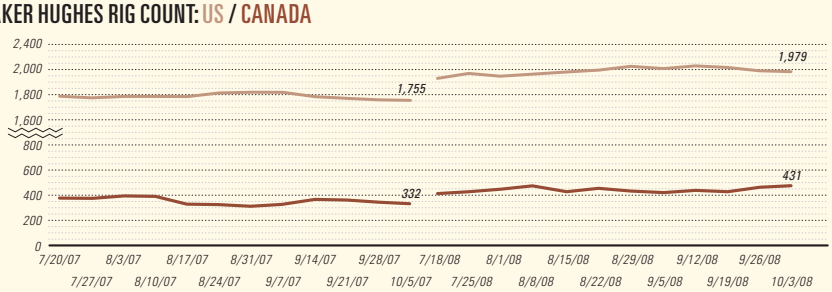
[1]Based on revised figures. [2]Includes adjustments for fuel ethanol and motor gasoline blending components. [3]Includes other hydrocarbons and alcohol, refinery processing gain, and unaccounted for crude oil. [4]Stocks divided by average daily product supplied for the prior 4 weeks. [5]Weekly average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

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



Note: Monthly average count

BAKER HUGHES RIG COUNT: US / CANADA



Note: End of week average count

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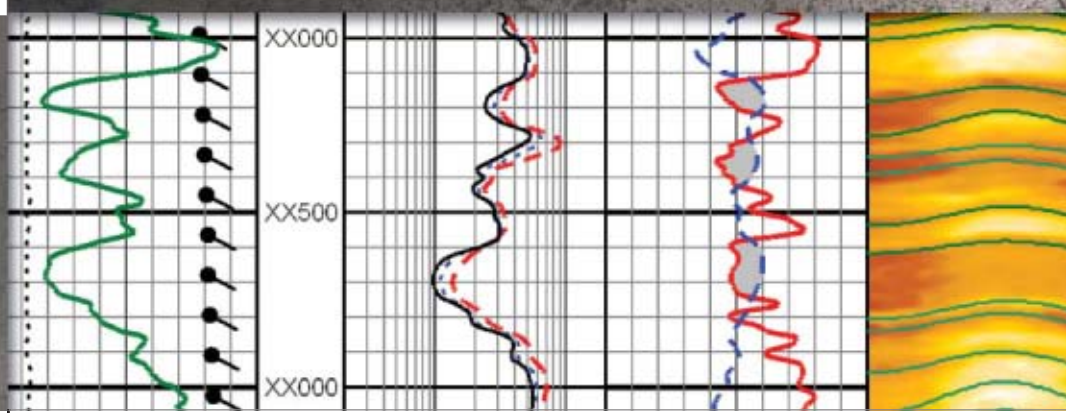

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pany is also running a 210 km 2D seismic program in the area.

A strong final result will enhance the company's plans for supplying gas to a floating LNG plant in the Gulf of Papua via an onshore-offshore pipeline from the discovery.

Flow rate high at Suez Gemsa area well

Vegas Oil & Gas SA, private Greek operator, reported a sustained flow rate of 3,388 b/d of 41° gravity oil and 4.25 MMcfd of gas from a well on the North West Gemsa concession in Egypt's Gulf of Suez basin.

It is suspending the Al Amir SE-1 sidetrack as a discovery and potential producer from the Kareem formation sandstones.

The concession covers more than 400 sq km about 300 km southeast of Cairo. The concession agreement includes the right of conversion to a production license of 20 years, plus extensions, in case of commercial discoveries.

RWE Dea discovers more oil in Sirte basin

Libya's state-owned National Oil Co. said RWE Dea has made its eighth oil discovery in the NC-193 concession area in the Sirte basin with exploration well G1-NC 193.

According to RWE, well G1-NC 193 encountered oil in the Upper Satal Formation at a depth of 4,631-61 ft. RWE said the wildcat tested 33.8° gravity oil at a net rate of 426 b/d through a 33/64-in. choke.

Last month, RWE Dea scored its sixth and seventh oil discoveries in the NC-193 concession.

The E1-NC193 well struck oil at a depth of 1,470 m, flowing 704 b/d during testing from the Dahra formation, while the F1-NC193 flowed 439 b/d from the Upper Dahra formation after hitting 1,346 m TD.

NOC has a 68% stake in the NC-193 concession project, while operator RWE holds the remaining 32%.

Chesapeake presses 3D seismic in Fort Worth

Chesapeake Energy Corp. has drilled 82 wells and has five rigs drilling for gas in the Barnett shale in Newark East field on its 18,000-acre lease on the Dallas-Fort Worth International Airport in the Fort Worth basin.

Sales are limited to 60 MMcfd of gas because the company has only a single pipeline outlet on the northeast side of the airport, but it is pursuing further connections on the south side, Larry Lunardi told OGJ's Unconventional Gas International Conference & Exhibition Oct. 1 in Fort Worth.

The company drilled the most recent well 7,000 ft vertically and a similar distance horizontally. Pipelines distribute frac water to drill pads around the airport.

It has converted four of the five rigs to electric power from diesel, and the five contribute less than one half of 1% of total airport emissions including aircraft.

Having completed its $4 million, five-stage 3D seismic survey of the entire airport property, the company plans to shoot 25-sq-mile and 10-sq-mile 3D surveys working only from city streets in west and northwest Fort Worth suburbs populated by 20,000 or more homeowners.

KazMunaiGas signs MOU for Caspian E&P

Kazakhstan's state-owned KazMunaiGas has signed a memorandum of understanding with ConocoPhillips and Mubadala Development Co. for joint exploration and production of the N Block in the Caspian Sea.

"The parties will now have until Dec. 31, 2008, to negotiate the definitive agreements for the assignment by KMG of a 49% interest in the subsoil use contract to be shared equally between ConocoPhillips and Mubadala," the Kazakh firm said, adding that, "KMG will remain the majority partner in the venture."

The N Block, also known as Nursultan, lies 30 km south-southwest off Aktau and covers some 8,100 sq km. According to KMG, the block "is considered highly prospective for both oil and gas." KMG had earlier estimated the block to hold about 637 million tonnes of oil equivalent.

The MOU was signed by KMG Chief Executive Kairgeldy Kabyldin, ConocoPhillips Chief Executive Jim Mulva, and Mubadala Chief Executive Khaldoon Khalifa Al Mubarak.

In January Kazakhstan's ministry of energy and mineral resources announced the signing of a profit-sharing agreement with KMG for N Block.

At the time, KMG Vice-Pres. Kezhebek Ibrashev said, "According to the government, at the stage of exploration and assessment KazMunaiGas will be operating this project independently."

Ibrashev said the company's minimum financial liabilities for the period of exploration were set at $40 million, and that the PSA specifies an allocation of funds for social-development projects, training of local specialists and monitoring and maintenance of the wells drilled earlier within the licensed area.

The N Block had been the target of attention of both Royal Dutch Shell PLC and ConocoPhillips before the Kazakh government granted exclusive exploration and production rights to KMG. ✦

Drilling & Production — *Quick Takes*

Dana, Crescent kick off Kurdish gas production

Dana Gas and equal partner Crescent Petroleum have started natural gas production in Iraq's northern Kurdistan region after commissioning stage one of a $650 million project.

The two companies said they have started production of 75 MMcfd of gas from Khor Mor field. Output is expected to gradually reach 300 MMcfd in first half 2009.

Gas produced will feed a electric power plant in Erbil province, while in a later stage the project would feed another power plant under construction in Suleimaniya province. The total power generation of the two plants would be 1,250 Mw.

Gas from Khor Mor field will be transported by a 180-km pipeline to feed the two plants.

In April 2007 the Kurdistan regional government awarded the two companies a service contract to develop, process, and transport gas from Khor Mor field on a fast-track basis and to appraise and develop the nearby Chemchamal gas field.

Khor Mor field has never been fully developed and has not op-

erated since 1991. The field has estimated gas reserves of 1.4 tcf. Chemchamal, which has never been appraised or developed, has estimated reserves of 2.2 tcf.

Crescent and Dana also are developing a 'Gas City' business park in the area, using gas as a feedstock for industries such as petrochemicals, steel, building materials, fertilizers, and manufacturing.

Kurdistan Gas City has a targeted initial basic infrastructure investment of $3 billion.

BLM approves Montana CBM projects in CX field

The US Bureau of Land Management's field office in Miles City, Mont., approved two coalbed methane projects proposed by Fidelity Exploration & Development Co. near Decker, Mont., on Oct. 1.

Work on 48 wells in the Tongue River-Deer Creek North and Decker Mine East projects will include drilling and infrastructure, the US Department of the Interior agency said. Project approvals include compliance measure to minimize environmental and land use impacts, it added.

Both projects will be within the existing CX field near Decker and will use roads, facilities, and water management infrastructure currently serving existing wells on state and private lands in the area, BLM said.

It said water produced with production of the gas from both projects will be put to beneficial use or discharged into the Tongue River in accordance with Fidelity's existing water discharge permits which it received from Montana's Department of Environmental Quality.

Angel gas field on stream off W. Australia

The North West Shelf gas project joint venture, operated by Woodside Energy Ltd., has brought the $1.6 billion (Aus.) Angel gas field development on stream off Western Australia. Angel has capacity to flow 800 MMcfd of gas along with as much as 50,000 b/d of condensate.

Angel lies 115 km off Western Australia inshore from North Rankin and Goodwyn fields. The three are the original North West Shelf fields Woodside-Burmah found in 1972.

The development comprises a new steel-leg platform in 80 m of water and associated infrastructure, which includes a 50-km undersea pipeline tied back to the existing North Rankin A platform—the original hub of the North West Shelf gas project. Gas from Angel is then sent via the main Rankin trunkline to the joint venture's LNG-domestic gas facility on the Burrup Peninsula near Karratha. Angel has been tapped by three subsea production wells. The gas will underpin supply to the five LNG trains now at the Burrup plant.

Demand rising for drilling services in Indonesia

Demand for drilling services in Indonesia is expected to jump by 20% in 2009 as domestic and international oil companies, eyeing government incentives and rising prices for crude, seek to increase their production.

Demand for drilling services has already increased during the past year due to rising oil prices, according to Bambang Purwohadi, chairman of the Indonesian Oil & Gas Drilling Contractors Association.

"Despite the [recent] decline in the oil prices, the prices are still higher on average than in previous years," Bambang told the Jakarta Post. "This will lure oil companies to increase their production, meaning more drilling projects will be available." Bambang said, "I think demand will increase by 20% next year," adding that plans by the government to tap marginal wells would contribute to this increase.

The energy and mineral resources ministry recently issued regulations allowing domestic oil and gas companies to exploit wells formerly managed by international oil companies.

Bambang said management of several marginal wells previously owned by state oil and gas company PT Pertamina had already been transferred to local firms. "About 12 drilling companies will begin work on this project immediately," he said. ✦

Processing — *Quick Takes*

Total's Provence refinery upgrades to begin

Total's 158,000 b/d Provence refinery at La Mede on the French Riviera will undergo a €100 million turnaround of its western installations scheduled to last 2 months starting Oct. 6.

The eastern units will continue to operate, ensuring delivery of products. A turnaround is slated every 5-6 years, but this one is unusually significant.

Total indicates that it is "a real challenge" for the refinery with 60 projects earmarked in order to improve the safety of installations, reduce their environmental footprint, and optimize production. The major projects to be carried out include:

- The catalytic cracker furnace will be replaced, at a cost of €12.8 million, in order to bolster the safety of the installation and the workers, reduce by 15% the plant's sulfur dioxide and carbon dioxide emissions, and improve the refinery's energy efficiency while increasing the processing capacity of the installation by some 50 tonnes/day.
- The Alkylation visbreaker modernization will cost €8.7 million. It will require 45 km of extra cabling to introduce 200 new instruments and replace some 30 security valves.
- A new flare stack tip costing €1.2 million will reduce both smoke and noise, achieving the modernization of both flares at the refinery within the last 4 years.

ExxonMobil expands capacity at Singapore plant

ExxonMobil Chemical has completed a 130,000 tonne/year (tpy) capacity expansion at its Exxsol hydrocarbon fluids plant in Jurong Island, Singapore, increasing capacity at the site to more than 500,000 tpy.

The capacity expansion will provide more of ExxonMobil Chemical's Exxsol series of differentiated fluids, and hydrocarbon fluids, including its proprietary Isopar and Solvesso.

Exxsol said the fluids are formulated to meet a diversity of customer needs "in applications such as drilling mud oil, metal working, polymer processing, industrial cleaning, adhesives, coatings, household products and mining."

The new capacity is designed to meet demand in Asia Pacific, which is growing at an estimated rate of 6% a year for differentiated hydrocarbon fluid products.

Increasing demand in Asia Pacific results from strong industrial growth accompanied by rising awareness of health, safety, and environmental issues and the future consolidation of different regulatory requirements under the Globally Harmonized System (GHS).

Last November, ExxonMobil Chemical Co. said it would build a second petrochemical complex on Jurong Island after completing a detailed study. The petrochemical project will include a 1 million tpy ethylene steam cracker, two 650,000 tpy polyethylene units, a 450,000 tpy polypropylene unit, a 300,000 tpy specialty elastomers unit, an aromatics extraction unit to produce 340,000 tpy of benzene, an oxo-alcohol expansion of 125,000 tpy, and a 220-Mw power cogeneration unit.

ExxonMobil awarded the design, engineering, procurement, and construction contract for the steam cracker recovery unit to the Shaw Group, while the contract for the steam cracker furnaces was awarded to Mitsui Engineering and Shipbuilding and Heurtey.

Mitsui Engineering and Shipbuilding has also been awarded contracts for the polypropylene and specialty elastomers units. The contract for the two polyethylene units was awarded to Mitsubishi Heavy Industries.

The chemical complex, scheduled to come on stream in early 2011, is expected to cost more than $4 billion. The complex—together with ExxonMobil's 605,000 b/d refinery—makes the company Singapore's single largest foreign manufacturing investor.

UOP advances crude upgrading technology

UOP LLC signed a technology cooperation agreement with Petrobras and Albemarle Corp. to demonstrate and further commercialize its catalytic crude upgrading (CCU) process technology.

The agreement calls for UOP to provide the technology, equipment, and system design, and Albemarle is providing the FCC catalyst for the process. Petrobras has run the process in a pilot plant, and will provide its knowledge and experience in FCC catalysts and heavy crude processing.

UOP developed the CCU process in 2005 as an option for upgrading heavy crudes and bitumen-derived crudes. The process reduces the crude's viscosity, which allows it to travel through pipelines without the use of diluents. ✦

Transportation — *Quick Takes*

Trinidad and Tobago vies to renegotiate contracts

Trinidad and Tobago has announced that it wants to renegotiate the contracts for Atlantic LNG Co.'s (ALNG) Trains 1, 2, and 3.

Patrick Manning, prime minister of the Caribbean twin-island nation, said his government is dissatisfied with the level of revenues collected from the gas producers that supply ALNG.

"It is clear that the circumstances have changed since the contracts for [ALNG's] Trains 1, 2, and 3 were negotiated and Trinidad and Tobago wants to get its fair share of the revenues," the prime minister said.

Manning will soon travel to Madrid, where he will meet with the Repsol-YPF SA Pres. Antonio Brusfau. He will then visit London to hold discussions with BP PLC's Chief Executive Officer Tony Haywood and BG Group Chief Executive Officer Frank Chapman.

Manning will be accompanied by the Minister of Energy and Energy Industries Sen. Conrad Enill and other senior technocrats in the twin-island nation's energy industry.

ALNG purchases gas from suppliers and sells freight on board to customers from its Point Fortin port in respect of Trains 1, 2, and 3. But in Train 4, ALNG operates as a processor of gas.

Inpex to construct LNG terminal off Indonesia

Inpex Corp., bowing to pressure from the Indonesian government and seeking to start deliveries of LNG to Japan as soon as possible, will likely construct an offshore export terminal at a cost of more than ¥1 trillion. Inpex Pres. Naoki Kuroda said the Japanese firm will make a final decision in 2-3 months, and is likely to sign an agreement with Indonesia by yearend.

Inpex had two options for the terminal: to build on solid ground in Australia and transport gas from Indonesia through pipelines, or to build an offshore terminal inside Indonesian territorial waters.

Gas for the terminal would come from the Masela block, currently under development in the Timor Sea, where Kuroda owns a 100% stake. The Masela block lies 400 km from Darwin in northern Australia.

Indonesian officials, who made construction of the offshore terminal a condition for Inpex's Masela block project, said development could begin as early as November, assuming that a final agreement was reached (OGJ Online, Sept. 4, 2008).

In July Inpex confirmed sufficient gas reserves to start 4.5 million tonnes/year of LNG production in the Masela block in 2016, following its completion of a four-well appraisal program.

In August Inpex said it had decided to build an LNG regasification terminal in northwestern Japan to meet robust growth in LNG demand, with operations to begin there in 2014.

The new Japanese receiving terminal is expected to be able to handle around 500,000 to 1 million tonnes of LNG imports in its first year of operation, and in excess of that afterwards, according to Hisatake Matsuno, a director at Inpex.

Matsuno also said the terminal would receive LNG supplies from Inpex's own projects in Indonesia and Australia, where, with partner Total SA, will build a facility to produce more than 8 million tonnes/year of LNG starting in 2014 in Darwin.

Desirous of starting LNG production as soon as possible to meet the needs of the planned developments, Kuroda said that Inpex will build the offshore terminal in Indonesia. Kuroda nonetheless said that growing LNG demand and high LNG prices would make the project worthwhile, offsetting its estimated cost of ¥1 trillion.

He said construction will be financed by bank loans and Inpex's own cash reserves, and that Inpex also will consider selling part of its stake in the Timor Sea gas field to foreign energy companies.

The new terminal, which would secure up to 7% of Japan's annual LNG imports, will provide some 4.5 million million tonnes/year of LNG by 2015—all of it bound for Japan. ✦

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]

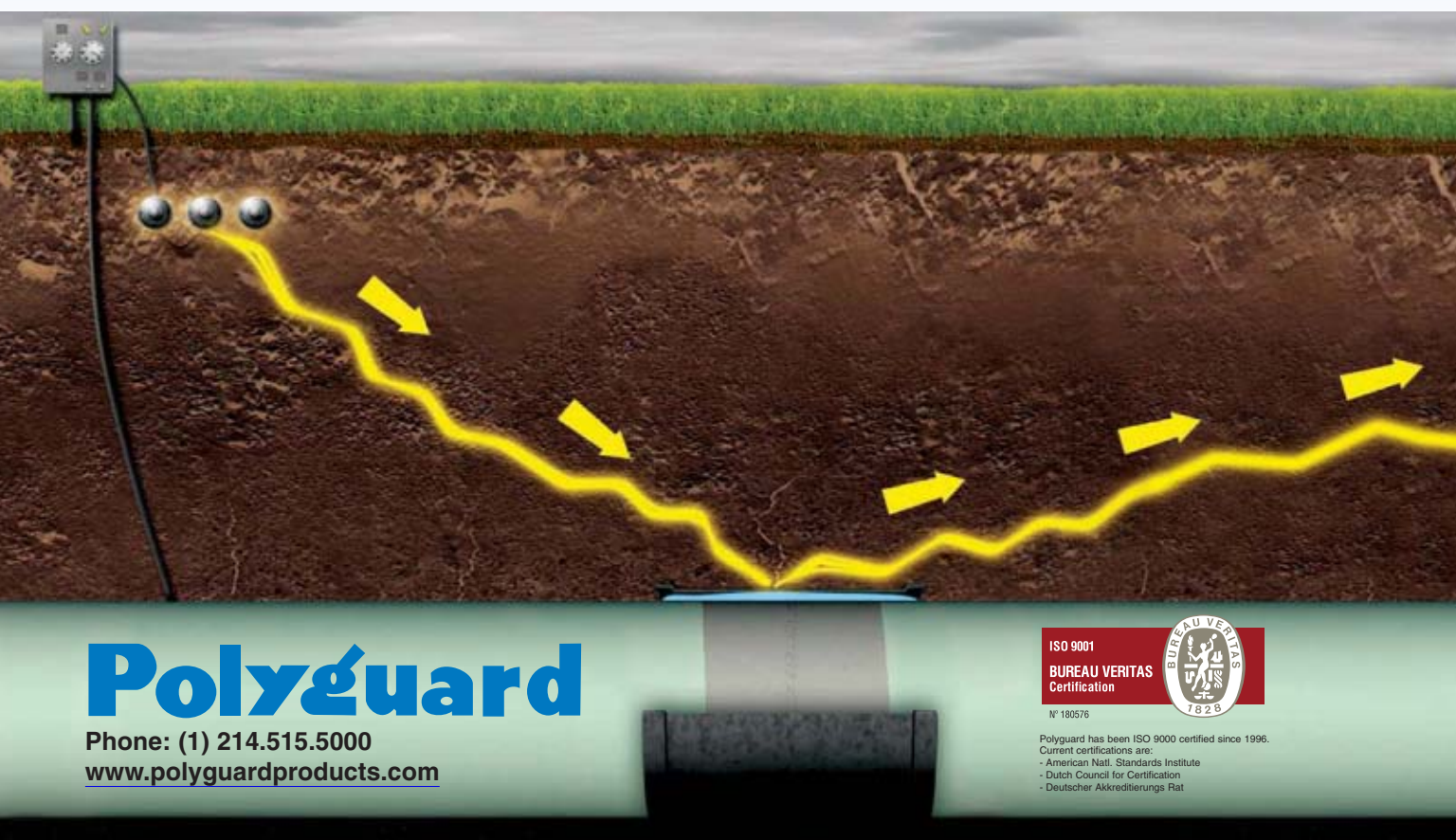
If you are concerned that your organization is behind this curve, we recommend:

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)



Polyguard

Phone: (1) 214.515.5000
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Polyguard has been ISO 9000 certified since 1996.
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- Dutch Council for Certification
- Deutscher Akkreditierungs Rat

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.

OCTOBER

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Gas to Liquids Conference, London, +44 (0) 20 7827 6000, +44 (0) 20 7827 6001 (fax), website: www.smi-online.co.uk/08gtl44.asp. 28-29.

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

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

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

Offshore Middle East Conference, Doha., (918) 831-9160, (918) 831-9161 (fax), e-mail: registration@pennwell.com, website: http://ome08.events.pennnet.com/fl/index.cfm. 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

Sulphur International Conference and Exhibition, Rome, +44 20 7903 2410, +44 20 7903 2432 (fax), e-mail: conferences@crugroup.com, website: www.sulphurconference.crugroup.com. 2-5.

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.

Purvin & Gertz Latin American LPG Seminar, Rio de Janeiro, (713) 331-4000, (832) 209-4451 (fax), e-mail: ts@prvingertz.com, website: www.purvingertz.com. 3-6.

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

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

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

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

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

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

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

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

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

Financial Modelling in the Oil and Gas Industry Conference, London, +44 (0) 20 7827 6000, +44 (0) 20 7827 6001 (fax), website: www.smi-online.co.uk/oilgasmodelling38.asp. 12-13.

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.

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 Asia/Pacific 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,

Calendar

+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.

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

2009

JANUARY

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

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

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

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

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

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

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

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

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

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

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

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

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

FEBRUARY

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

MARCH

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

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

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

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

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

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

ARTC Annual Meeting, Kuala Lumpur, +44 1737 365100, +44 1737 365101 (fax), e-mail: events@gtforum.com, website: www.gtforum.com. 10-12.

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

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

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

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

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

SPE/IADC Drilling Conference & Exhibition, Amsterdam, (972) 952-9393, (972) 952-9435 (fax), e-mail:

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spedal@spe.org, website: www.spe.org. 17-19.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

APRIL

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

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

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.

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

Pipeline Technology Tradeshow, Hannover, +49 511 89 31240, +49 511 89 32626 (fax), website: www.hannovermesse.de. 20-24.

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.

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

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

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

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

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

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

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

MAY

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

JUNE

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

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

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

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Journally Speaking

Cleanup fund gets attention

Paula Dittrick
Senior Staff Writer

Environmental cleanup funds rarely generate much attention. But the Oil Field Cleanup Fund (OFCU), under authority of the Texas Railroad Commission, (RRC) has been the subject of debate for more than a year.

The debate centers around a drilling permit backlog that has developed as RRC is falling behind in processing permit applications. High oil prices encourage more drilling activity, which means more permit applications.

Consequently, oil companies face delays in drilling, which is why the Texas Independent Producers & Royalty Owners Association (TIPRO) became involved.

RRC members voted unanimously on Sept. 23 to authorize the use of as much as $750,000 from the OFCU as emergency funding to hire contract help and pay overtime for RRC employees to reduce the backlog in permit processing.

Normally, OFCU is used for plugging abandoned wells and remediating contaminated drilling sites. As permit applications have gone up so has revenue from permitting fees.

TIPRO supports the interim transfer pending the September 2009 implementation of a new state budget. The RRC plans to ask the 2009 Legislature for OFCU reimbursement from the state's general revenue.

OFCU revenue climbs

The fund's revenue is forecast to reach $33 million this year, RRC said. Currently, state law dedicates this money to the OFCU for well-plugging expenses, but that could change.

"Since the fund has been highly successful in its mission—reducing the number of unplugged abandoned wells from over 20,000 to under 8,000 today—now is a good time to review the statutory limits on RRC funding streams," TIPRO said.

TIPRO, the RRC, and the State Issues Committee have examined multiple proposals.

RRC staff salaries have not kept pace with other state agencies such as the General Land Office and the Public Utility Commission. The difference in the same job category can be as high as $9,000/year in an employee's salary, TIPRO said.

Separately, Midland oilman Clayton Williams asked RRC to approve money to hire more people. "You have less people and more work to do," Williams said. RRC has 706 fulltime employees today compared with 851 fulltime employees in 1999.

In 2007, the legislature approved $2 million from the OFCU to pay for RRC staff raises. TIPRO said the state can keep transferring revenue from the fund every biennium when the RRC workload changes or the state could make a one-time revenue shift from the fund to general revenue.

Drilling permits soaring

RRC officials expect to issue 29,000 permits this year compared with nearly 20,000 issued last year. The record was 47,940 permits issued in 1981, RRC statistics show.

As of Sept. 29, the agency took an average of 40 business days to process a standard drilling permit compared with 14-21 business days to process a standard permit in 2007.

Processing time also has increased for an expedited permit. TIPRO said expedited permits can take 2-3 weeks now instead of 2-3 days.

The RRC has used money from industry fees and fines for the OFCU since 1984. During 1984-91, RRC plugged 4,078 wells. During 1992-2003, RRC plugged 16,941 wells.

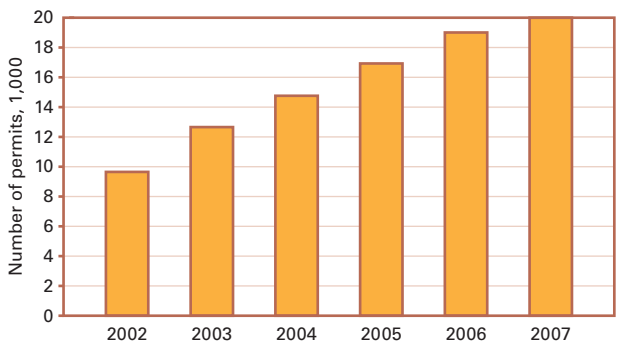
Normally, operators voluntarily plug their wells. The cleanup fund is used for wells left behind by irresponsible producers.

"Times are good in the industry," TIPRO said. "The OFCU is flush with money paid by producers, and the number of abandoned wells has dropped dramatically." But legislators, RRC, and others are mindful of possible future oil price busts.

"One factor that has changed since the fund's creation was the implementation of universal bonding and financial assurance in 2001," TIPRO said. "This mechanism helped provide a financial backstop for wells that may be covered by the fund."

Meanwhile, permit fees go into the OFCU so it makes sense that OFCU funding is applied to accelerate the permitting process. ✦

TEXAS DRILLING PERMITS ISSUED



Source: Texas Railroad Commission statistics

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Editorial

An unprecedented rebuke

While addressing mortgage debt deemed "toxic" in a desperate effort to rescue the US economy, Congress somehow saw fit to raise toxicity of the political climate for oil and natural gas. The message is chilling: A government willing to launch lifeboats for American business has only torpedoes for the industry that meets 65% of American energy needs. It's chilling but not, after 2 years of mindless demagoguery on energy, surprising.

After terrorizing equity markets by rejecting on Sept. 29 the $700 billion rescue that Treasury Sec. Henry Paulson proposed for a financial industry suffering from sclerosis, Congress resorted to the political graft with which it has earned itself a place in history for depth of public disapproval. It fattened up the bail-out package, basically the public purchase of housing loans no one else will buy, with giveaways that would look expensive if not hitched to an already mind-numbing federal commitment. When the economic going gets tough, Congress piles on pork. The House passed the historic package on Oct. 1, the Senate on Oct. 3, when President Bush signed it into law.

Vote-buying goodies

One of the vote-buying goodies was an energy bill that got nowhere when introduced last spring. The Energy Improvement and Extension Act of 2008, now enshrined as Division B of the Emergency Economic Stabilization Act, extends and expands tax credits and other subsidies for energy forms preferred by Congress but not markets, such as wind, geothermal, solar, marine renewables, and, of course, biofuels. There's even a "transportation fringe benefit" for bicycle commuters.

With oil and gas, the measure isn't so generous. In fact, it's altogether peevish. It singles out the oil and gas industry for tax increases from which other industries are spared. That this can occur in a bill designed to rescue the American economy is appalling.

The tax hikes aren't unintended by-products of clumsy wording or organizational complexity. They're unmistakably deliberate.

One of them denies access to a scheduled tax benefit by companies that produce, refine, process, transport, or distribute crude oil, natural gas, or oil products. The American Jobs Creation Act of 2004 introduced the manufacturer's tax deduction to help American companies compete internationally after exporters lost a tax break challenged successfully by the European Union. The deduction rate began at 3% of net income in 2005, grew to 6% in 2007, and is scheduled to reach 9% in 2010. For oil and gas companies, the rate now stays at 6%.

Use by oil and gas companies of the manufacturer's deduction has been subject to crass misrepresentation. Lawmakers have been disparaging "$18 billion in tax breaks for the oil industry," all but $4 billion of which is the 10-year value to oil and gas companies of the manufacturer's deduction, which is anything but a break for one industry. Now it's a benefit worth less to oil and gas companies than to the US companies with which they compete for capital.

Beyond that, the new law reduces the amount of foreign taxes that oil and gas companies can deduct in calculations of US income tax and probably will expose production earnings in some places to double taxation. It also raises the Oil Spill Liability Trust Fund tax from 5¢/bbl to 8¢/bbl through 2016 and 9¢/bbl in the expiration year of 2017.

Hostility

The combined bite of these tax hikes won't be great—perhaps $8-9 billion over 10 years in an industry in which the largest 27 companies paid $90 billion in income tax alone in 2006. It's still money that can't be invested in new production, refining capacity, or other essential elements of future oil and gas supply. Any suggestion that forgone domestic supply contributes to economic health is preposterous.

Worse than the dollar amount is the industry-specific hostility that undergirds the tax hikes. A capricious change in the terms of oil and gas investment is bad enough for a country whose huge energy needs are impossible to satisfy with politically pampered alternatives. But punishing oil and gas in an otherwise palliative law is an unprecedented rebuke. ✦

Energy to be main focus for incoming president, Congress

Nick Snow
Washington Editor

US economic problems dominated the 2008 presidential campaign as the two major nominees prepared to meet in their second debate last week. But energy still was a major issue.

"Our economy is still hurting. Working families are worried about the price of groceries, the price of [gasoline], keeping their jobs and paying their mortgage. Further action is needed. We need to restore confidence in our economy and in our government," Sen. John S. McCain (R-Ariz.) said at an Oct. 6 rally in Albuquerque.

Sen. Barack H. Obama (D-Ill.) said on Oct. 3 at a similar event in Abington, Pa., "This financial crisis is a direct result of the greed and irresponsibility that has dominated Washington and Wall Street for years." His proposed responses included investing $15 billion annually in wind, solar and other energy sources to generate 5 million new jobs and reduce US dependence on foreign oil.

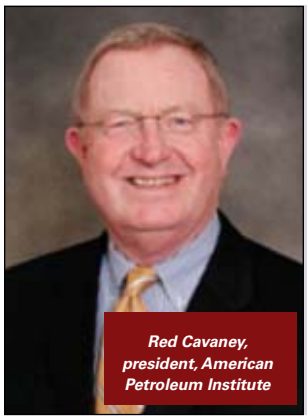
US presidential campaigns react quickly as issues change. When 2008 began, many political pundits believed the wars in Iraq and Afghanistan would be dominant. Then crude oil and gasoline prices soared, and voters complained to members of the 110th Congress. By late summer, as Democrats and Republicans held their national conventions, federal lawmakers in both parties were talking about increasing access to domestic oil and gas supplies as well as developing alternatives. Then the financial crisis hit.

This year's election issues were changing quickly from mid-September to early October as OGJ interviewed Washington-based oil and gas industry association executives for this article. Yet they agree that energy would be one of the foremost, if not the biggest, question confronting the new president and Congress in 2009. Changing public attitudes toward leasing more of the US Outer Continental Shelf was the primary reason, they said.

Public education

"This was a case where sufficient public education made a difference. Before Republicans picked up on it, we were hearing it in spades from polling and focus groups," said American Petroleum Institute Pres. Red Cavaney. The debate changed as more federal lawmakers recognized that most US voters wanted to see more access to domestic oil and gas resources and leasing bans were allowed to expire, he continued. "But we've heard from a number of people on Capitol Hill that moratoriums will be brought back after Mar. 6. It would take overt action, either by Congress or the new president, to make them dead," he said.

The industry's next OCS challenge will be to convince federal lawmakers that increased access to offshore resources should be genuine and not



Red Cavaney, president, American Petroleum Institute

"As they say in sports, and it can be transferred to politics, it's all about momentum. The oil and gas industry will end the year in a better position than where it began."

cosmetic, Cavaney said. For starters, the most easily recoverable crude is within 50 miles of the coast, which the House's bill would have placed off-limits. Coastal states not only deserve a share of the revenues but also could use offshore energy production as a way to attract new industry. "It will be necessary for lawmakers to grasp that pushing production deeper will require rigs that are produced overseas instead of domestically," API's president said.

"On the access side, certainly offshore, that genie won't get put back into the bottle. There's a broader concern not only with gasoline prices, but also national security and reliance on unstable foreign sources," observed Daniel T. Naatz, vice-president, federal resources and political affairs, at Independent Petroleum Association of America. Producers become frustrated when some members of Congress talk about increasing access, then act to restrict it, he said.

"There have been positive developments. Lawmakers and the public recognize we need more energy, and it makes no sense to close areas off. It's going to take time to move on to the next step, but we're ready to work on it with the next Congress and administration," added IPAA Pres. Barry Russell.

Tom Fry, president of the National Ocean Industries Association, said that a former member of Congress had suggested that the Sept. 16 US House vote on opening more of the OCS to oil and gas leasing would have been inconceivable 2 years earlier. The bill wasn't what leasing proponents wanted, but at least the issue was being discussed, the NOIA official said.

Officials responded

"I'd always thought it would take a crisis to bring energy issues to the forefront. The problem was no one knew what the crisis would be. Prices drove the issue this time. People called their elected officials and said, 'Do something about this.' There were enough calls that the officials responded," Fry said.

Officials at the Interstate Natural Gas Association of America found it ironic that US House Speaker Nancy Pelosi (D-Calif.) and other congressional leaders embraced gas as an intermediate step to petroleum alternatives after crude oil and gasoline prices climbed. "The challenge is to translate this into a resource base and infrastructure to deliver these supplies. It's incumbent on us to convince Congress that gas is not produced and delivered magically," INGAA Pres. Donald F. Santa said.

Daniel T. Naatz, vice-president, federal resources and political affairs, Independent Petroleum Association of America

"On the access side, certainly offshore, that genie won't get put back into the bottle. There's a broader concern not only with gasoline prices, but also national security and reliance on unstable foreign sources."

"I think there's a perception among some members of Congress that we don't need to do anything about gas, and that it will always be there," added Martin E. Edwards, INGAA vice-president, legislative affairs. He said that the compromise proposed by a group of US senators this summer did little initially except increase taxes, and even appeared to close more areas than it opened. Legislation developed by a bipartisan House working group, which eventually grew to more than 170 cosponsors, was a little better, he indicated.

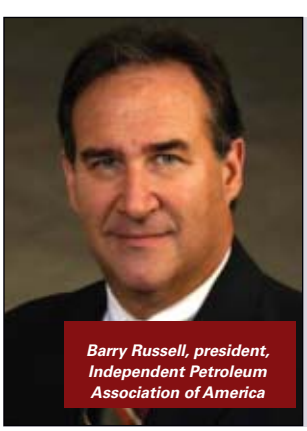
Congress and the next president also can expect to be confronted with energy infrastructure questions, according to Santa. Gas could provide an example for other sources, he said. "Approaches that are attractive in the abstract could raise problems in the concrete. The question could become whether we have the political will to site the necessary infrastructure, whether transmission lines from wind turbines or oil pipelines from new supplies. If we don't, we could be left with less-than-optimal solutions," he said.

"How can we translate our aspirations into reality? Given today's political environment, would the United States have been able to build a nationwide railroad network in the 19th century or to begin the interstate highway system in the 1950s?" Santa said.

Tax concerns

Industry association executives also expressed concern that Congress and the new administration would increase oil and gas taxes to relieve pressure on other businesses. That essentially happened when Congress passed a revised economic rescue package that US President George W. Bush signed on Oct. 3. Its additions included a 1-year extension of renewable and alternative energy tax credits partially funded by a frozen industrial credit for oil and gas businesses and revisions in foreign tax allowances.

"We saw the disastrous consequences of a windfall profits tax in the 1980s



Barry Russell, president, Independent Petroleum Association of America

"Lawmakers and the public recognize we need more energy, and it makes no sense to close areas off. It's going to take time to move on to the next step, but we're ready to work on it with the next Congress and administration."

Tom Fry, president, National Ocean Industries Association

"I think both campaigns realize the importance of energy. It's something they'll have to address. But there will be other issues, and it won't be apparent how they'll be approached until the new president is sworn in."

when capital came off the table and moved overseas. Both presidential nominees want to make major tax reforms. Obama has supported bringing back a windfall profits tax. McCain hasn't, but would like to do a major tax overhaul," said Lee O. Fuller, IPAA vice-president, government relations.

Congress also remains ready to consider cap-and-trade proposals, he continued. "It could be approached more cautiously. A lot of voices from the global climate debate's economic side weren't engaged last time. The ultimate reduction target could be scaled back to 60% from 80%, and the pace could be slower so the general economy isn't disrupted as badly," he said. Back-door regulation through the Endangered Species Act and National Environmental Protection Act also is possible, he said.

All this will put more pressure on gas, Fuller said. "This past year, US production increased 9%, largely from onshore shale formations and the Gulf of Mexico. Now, we're seeing orchestrated efforts to characterize hydraulic fracturing as a threat to New York City's drinking water. In its 150 years, fracing has one of the best environmental records. But it could become more political in areas which do not have oil and gas production experience," he explained. The US will need to be careful, if it opens more of the OCS for leasing, to not create litigation routes parallel to onshore public acreage, he added.

"Getting all the requisite permits from all the federal and state entities can consumer time and be cumbersome," said Fry, who was a former director of both the US Minerals Management Service and Bureau of Land Management before joining NOIA. Lead agencies normally move more quickly, but many are short-handed and underfunded, he said.

Other changes

Fuller said the retirements of US Sen. Pete V. Domenici (R-NM), Rep. John E. Peterson (R-Pa.), and other federal lawmakers with extensive oil and gas experience also will have an impact on a Congress that already has developed energy bills through the majority leadership instead of committees. One of the few panels that produced a major energy bill this year, the House Natural Resources Committee, came out with the so-called "Use it or lose it" bill a year after it tried to place constraints on oil and gas development, the IPAA official said.

Several association executives apparently expect Democrats to increase their majorities in both the House and Senate. But they also noted that bipartisan energy initiatives materialized in both congressional bodies this summer. "The problem with the bill developed by what initially was a US Senate "Gang of 10" that eventually became a Gang of 20 was that it contained a little bit of everything and not enough of anything," said Cavaney. He was more impressed with what Peterson and Rep. Neil Abercrombie (D-Ha.) accomplished with their House bipartisan energy working group.

Bigger Democratic majorities wouldn't necessarily make onerous oil and gas legislation inevitable in a new Congress because new members conceivably could include more moderates, the two INGAA officials suggested. "They'll need to deal more with supplies along with greenhouse gas issues," said Santa.

"I think solutions will need to be more bipartisan, with both parties supporting a package. John McCain has a history of reaching across the aisle on controversial issues. Barrack Obama's approach is almost a more Socratic method that's intellectually focused. He could be better at the long-term response than the short-term steps," said Edwards.

Donald F. Santa, president, Interstate Natural Gas Association of America

"Given today's political environment, would the US have been able to build a nationwide railroad network in the 19th century or to begin the interstate highway system in the 1950s?"

Positions evolve

Both considered it significant that each major presidential nominee's energy positions have changed since they began seeking the office. "Even Obama's position with respect to OCS access has evolved from a few months ago, when he seemed to think it was not important, to where he believes it needs to be part of a comprehensive plan," Santa said.

"It's almost unreasonable to criticize a candidate for changing his position on such an important issue. You can argue that this is what rational people do as they learn more," Edwards added.

Cavaney agreed. "From our industry's perspective, if you look at the big patterns, both candidates are in a different place on oil and gas than when their candidacies began. That speaks well for them. They listen to their advisors and to voters. As they say in sports, and it can be transferred to politics, it's all about momentum. Oil and gas will end the year in a better position than where it began," he said.

"I think both campaigns realize the importance of energy. It's something they'll have to address. But there will be other issues, and it won't be apparent how they'll be approached until the new president is sworn in," said Fry.

"Energy will be only one of about a half dozen monumental issues, includ-

ing health care, the economy, and the wars in Iraq and Afghanistan, that the new president will have to face. If he can have some successes early on, he will climb to the top tier alongside Franklin Delano Roosevelt and Ronald Reagan as someone who accomplished a great deal against tremendous odds," Cavaney maintained. ✦

POINT OF VIEW

More money for technology needed for the oil industry

Eric Watkins
Oil Diplomacy Editor

Innovative entrepreneur Gennady "Gene" Moshkovich has established several companies that cater to various aspects of the oil industry, especially desulfurization: He currently is CEO of DS2Tech Inc., president of Moschanco Investment Group 2000, and managing director of 21st Century Technologies LLC.

"Moschanco Investment Group 2000 is an investment firm that focuses on developing energy infrastructure projects in Russia," said Moshkovich. "The company is also involved in facilitating US investment and technology transfer to the Russian energy industry in Western Siberia, where 70% of Russia's oil production is located."

Moshkovich, who holds advanced degrees in industrial economics and systems engineering, founded Moschanco Investment Group 2000 in 1993. It became a major developer of energy infrastructure projects in Khanty Mansisk—an autonomous region of Russia in Western Siberia.

Also in 1993, Moschanco Investment Group 2000, in a joint venture with Saratovneftgas, created a new oil firm called Technoforce. "Technoforce was a joint stock oil company in Russia that focused on exploration and production," Moshkovich says. "Technoforce successfully developed and deployed Ren-Oil technologies for secondary oil recovery before being sold to TNK-BP-Sidanko in 1997."

Moschanco Investment Group 2000 retains the rights to Ren-Oil technology and to Enviroagent for oil extraction from tar sands and other media, according to Moshkovich.

Meanwhile, as those firms developed, Moshkovich was moving ahead with other ventures, founding 21st Century Technologies LLC in 1998. Initially, the company had the exclusive distributorship for DS2Tech Inc., a firm founded by William Wissman, Floyd England, and Jacques Jeanblau that specialized in desulfurization. In just 7 years, though, 21st Century Technologies acquired DS2Tech Inc. and now offers desulfurization units that can be installed at refineries and terminals as well as along petroleum product pipelines.

More growth eyed

At the moment, Moshkovich is looking for even more growth, and he is clear about the challenges he faces. "The top operational challenge for my company is to scale up to be a truly global enterprise," he says, adding, "This is not easy."

Why so? "There are so many things that one has to know, ranging from the cultural realities of where you are operating to the details of the law—especially tax and labor," he says. "You quickly become aware that if you do not pay close attention to small details, they can develop into very big and serious issues that could make it difficult to continue to operate in certain countries."

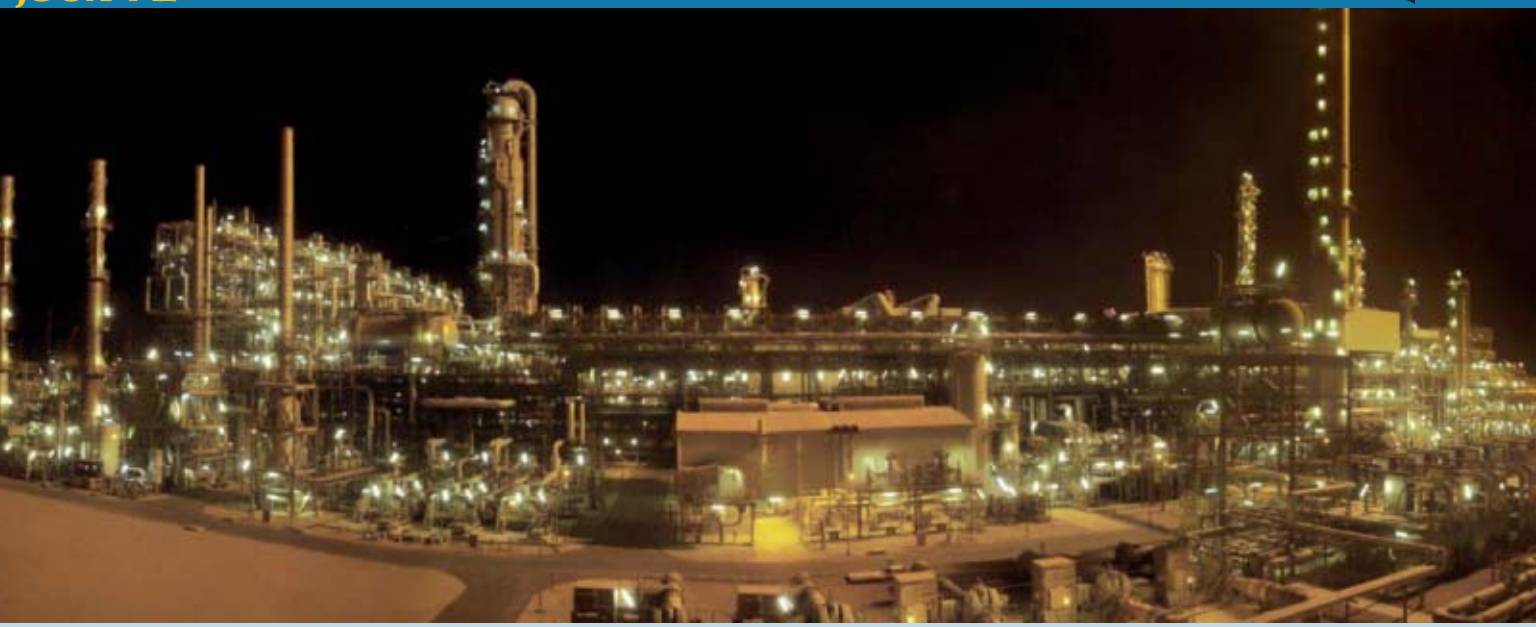
There's little doubt that Moshkovich has gained insights into the challenges of working overseas. In fact, from 1996-99, he was employed as senior advisor to the head of the United Nations Development Program (UNDP). In that capacity his direct responsibilities were to evaluate and commercialize new technologies for deployment in the Confederation of Independent States (CIS).

From 1993-97, Moshkovich served in Saratov, Russia, as president of Technoforce.

Moshkovich said he has fond memories of those days, not the least of which is the satisfaction of seeing the incredibly rapid rise of Sartovneftgas.

"In 1994," he says, "I went to see Alex Putilov, who was head of Rosneft at the time. I said 'Why not buy the

"Just as we sponsor cancer research, we should be sponsoring R&D in alternative technologies."
—Gene Moshkovich



Career highlights

Gennady "Gene" Moshkovich, Beverly Hills, Calif., (Gennadymoshkovich@sbcglobal.net) has been president of Moschanko Investment Group 2000 Inc. since 1993, president of 21st Century Technologies LLC since 1999, and chief executive officer of DS2Tech Inc. since 2006.

Employment

Moshkovich served as senior advisor to the head of the United Nations Development Program (UNDP) during 1996-99 and was president of Technoforce in Saratov, Russia in 1993-97.

He was president of Kompat in Moscow during 1998-2002, president of the Federation of Research Chemical Engineers, Ventura, Calif., in 1989-92, and an independent developer in Los Angeles and Torino, Italy, during 1982-89.

Earlier in his career, Moshkovich was a senior industrial engineer at the automation aluminum plant of Martin Marietta Aerospace in Torrance, Calif., during 1980-82, and he worked for Thomas Electronics Inc. as product manager at the cathode ray tube division in Wayne, NJ, for the US Department of Defense. Prior to that he was department head for the automation glass industry at the Institute R&D of Automation & New Technologies (VIASM) in Kiev, USSR.

Education

Moshkovich was awarded a masters degree in industrial economics at the University of Industrial Economics, Saratov Russia in 1969. He later earned a PhD in system engineering in 1975 at the Kiev Institute of Construction Technology, Moscow Institute of Glass and Building Materials. In 1981 he was certified as a manufacturing engineer in robotics at the Robotics Institute of Detroit.

controlling interest of Sartovneftgas?' [Putilov] asked his experts, and a few days later they told him the position was not worth more than $10 million, so Putilov passed on the deal. In 2006 this same position in Sartovneftgas was sold for $577 million."

Experience abroad has given Moshkovich remarkable insights into aspects of the global oil and gas industry—especially the refining industry in Russia.

"The problem of quality refineries is not...limited to one geographical area, it is a problem everywhere in the world," says Moshkovich. "For example, in Russia, all refineries are owned by the oil companies. And since environmental standards in Russia are not tough enough, even if they are moving to the right direction, the oil companies focus on just selling oil," he says.

"Though there are a few large refineries going through upgrades, the process is very slow," Moshkovich says. "The government is trying to make environmental regulations stronger. It recently proclaimed that it was going to sponsor the construction of a dozen independent refineries. They will not enjoy the windfall profits of the vertical oil companies, and they will have to be very efficient to be in business there."

In his view, "This is a very smart move by the Russian government to put competition in the refinery business in Russia. This will be the best instrument to insure that refineries will compete for the better and most cost-effective production," he said.

Upbeat view

Moshkovich has an upbeat view of the oil and gas industry, especially looking to the future.

"This time is a good opportunity for oil companies to diversify," he says. "They could look for new fields—they now have plenty of money—[and] upgrade refineries with new technologies, particularly the refineries that are owned by the oil companies," he says.

"This is also a good time for the oil companies to invest in alternative energy technology," he added. He said the need for hydrocarbon products will remain very high, "and I think for the next 10-20 years the world will not be able to replace hydrocarbon fuel, particularly for the next 10 years," he says.

"Even during the next 20 years, the world—especially the more developed countries— can replace 50-60% of hydrocarbon fuels with alternative technology," he says, adding, "That would be a goal for the industrialized countries."

While some observers take a pessimistic view of the future, especially when it comes to cooperation among nations in the search for oil and gas, Moshkovich is much more optimistic.

"Oil fields that in the past would have been impossible to develop, like [those in] the Arctic Sea, are now able to be explored," he says.

While conceding that the US will develop a "very smart and aggressive" policy to obtain concessions in different parts of the world, Moshkovich still believes "there could be a joint effort [among] Russia, United States, Canada, Norway, England, and perhaps China to work in the Arctic Sea." In fact, he says if such cooperative efforts were made today, "within 10 years we will know exactly what is there."

Meanwhile, he says, there is room for improvement in other areas of the industry—in particular, research and development of new technologies.

"We need more money for technologies from the industry. Just as we sponsor cancer research, we should be sponsoring research and development in alternative technologies, we have to have more grants and funding for R&D development." For example, he said, the lone technology that today is "the technology of choice for desulfurization—because there is no choice—is hydrodesulfurization. And with all the upgrades of this technology, it is still one of the most energy-consuming and inefficient technologies.... And there are many such technologies—new technologies—that have been developed but could not find a place under the roof." ✦

Russians: 'Kazakhs want to use ESPO pipeline'

Eric Watkins
Oil Diplomacy Editor

Russian Energy Minister Sergei Shmatko said Kazakhstan's state-owned oil pipeline operator KazTransOil is interested in transporting Kazakh oil through Russia's East Siberia-Pacific Ocean pipeline.

"Our Kazakh partners are looking at the project with great interest and enthusiasm. We are happy about that," Shmatko said at the launch of a section of the pipeline between Talakan and Taishet.

"Their participation in the launching of the pipeline from Talakan to Taishet indicates that they are exploring the possibility of using Russia's new transportation capabilities for the transfer of Kazakh oil," Shmatko said.

The new section was launched at Oil Booster Station No. 10 to which a 10-km supply line has been built from the field, according to OAO Transneft subsidiary Vostoknefteprovod.

Transneft Chief Executive Nikolai Tokarev said the 1,100-km pipeline will transport as much as 4,000 tonnes/day of crude, in reverse mode.

The pipeline will supply about 220,000 tonnes of oil to the Angarsk petrochemical company by yearend, Tokarev said, including 180,000 tonnes from Talakan and 40,000 tonnes from Verkhnechonskoye field.

TNK-BP volumes

Meanwhile, TNK-BP plans to begin supplying oil to the ESPO line later this month from its Verkhnechonskoye field in the Irkutsk region, said Viktor Vekselberg, chairman of Renova Group, the co-owner of TNK-BP.

"We will complete the first stage of East Siberia's Verkhenchonsk project in October and connect it to the first leg of the ESPO pipeline, which has been commissioned. We will supply oil to it jointly with our partners," Vekselberg said at a meeting with Russian President Dmitry Medvedev.

In September, the Russian energy ministry said Russia will market oil exported through the pipeline as a new blend of crude, possibly of higher quality than the country's main Urals export blend.

"We will establish a separate blend of crude for the deliveries via the East Siberia-Pacific Ocean pipeline," a spokesman with Russia's energy ministry said, citing Deputy Energy Minister Stanislav Svetlitsky.

"The decision has been taken; the details have been worked out," Svetlitsky said, according to the spokesman. He added that the new blend has not yet been named.

The Taishet-Talakan section of the ESPO line was completed at the end of September, while the remaining stretch to Skovorodino, near the border with China, is scheduled for completion by yearend 2009. Although present at the launch of the section, Kazakh officials were not quoted as expressing interest in using the line. ✦

Political uncertainty reduces Indonesian production

Eric Watkins
Oil Diplomacy Editor

Indonesia's declining oil production, as well as its recent departure from the Organization of Petroleum Exporting Countries, is the result of political uncertainty in the country, according to a media report.

The collapse of the Suharto government in 1998 resulted in management confusion at state-run oil company Pertamina, which deterred its Western oil-firm partners from making new investments in Indonesia, according to a report in the Nikkei Business Daily.

The consequent delay in developing new oil fields caused the eventual drop in crude oil production, the newspaper said. As a result, Indonesia quit OPEC, deciding that further membership was meaningless, as its crude oil output has declined so much that it is now a net oil importer.

Indonesia's withdrawal was accepted at an OPEC meeting in Vienna in September, after which Purnomo Yusgiantoro, Indonesia's minister of energy and mineral resources, issued a statement outlining the country's intention to raise production and rejoin OPEC within a few years.

Indonesia produced more than 1.5 million b/d of crude oil in the mid-1990s, and has been Japan's largest oil supplier outside of the Middle East.

Political instability

However, the political and economic instability following the 1998 fall of the Suharto regime had an adverse impact on oil field development, leading crude oil production to decline rapidly.

By 2004, the country had become a net oil importer, with an output that fell below 1 million b/d last year.

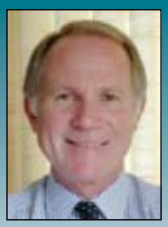
In late May, the government of President Susilo Bambang Yudhoyono announced it would pull out of OPEC. However the withdrawal was also aimed at obtaining public understanding for a sharp price increase for petroleum products that it carried out concurrently with the announcement.

Yudhoyono himself was reportedly reluctant to quit OPEC, but pressure to

WATCHING THE WORLD

Eric Watkins, Oil Diplomacy Editor

Blog at www.ogjonline.com



Electrifying news for Bodman & Co.

US Energy Sec. Samuel Bodman seems a little behind the times when it comes to alternative fuels and the interests of carmakers.

Last week, Bodman released a study by the Department of Energy showing that cars can run on gasoline with a much higher ethanol component than the 10% blend now being sold at pumps across the US.

Bodman said that 13 different "late-model" cars were tested using gasoline that was 15% and 20% ethanol, and the results were "very encouraging."

The US corn lobby was pleased to hear the results. Tom Buis, president of the National Farmers Union, called the DOE study results "good news." He's also on record as saying, "America's farmers are ready, willing, and able to play a vital role in reducing our dependence on foreign oil."

Courting farmers

After all, ethanol is made in the US from corn, and ethanol demand is assuming a growing importance in the farming industry. A higher ethanol blend in gasoline would mean stronger demand for the corn-based fuel by gasoline producers. It would also reduce demand for "foreign" oil.

To his credit, Bodman cautioned that more research on a wider variety of vehicles is necessary to determine whether the results of the study could be sustained more broadly.

With due respect to Bodman, Buis, and other people locked into the current US presidential campaign—and desirous of capturing the farmers' votes in November—one wonders whether they might also look at expanding the kinds of fuel to be studied. After all, cars do not run on ethanol alone.

In fact, some automakers now believe that cars of the future will be driven by electricity. Consider the statement by Volkswagen AG Chief Executive Martin Winterkorn: "The future belongs to the electric car—with power from the socket."

The future is electric

The biggest European car maker by sales is testing the Golf TwinDrive, in which an electric powertrain supports a diesel motor. The company also wants to introduce a purely electric model of its "Up!" small car.

Daimler AG's Mercedes-Benz cars unit plans to build an electric version of its Smart car from the end of 2009, while Mitsubishi Motors Corp. plans to launch a mass-produced electric vehicle next year in Japan.

Would these developments en mass affect the oil and gas industry? Well, yes. Gasoline demand could decrease dramatically. And an all-electric car has no gearbox, valves, clutch, muffler, or exhaust and requires no spark plugs, no filters, and—no oil.

Developments of this sort really should be occupying the minds of oil and gas industry thinkers. What is the likelihood of their coming to fruition and how, in detail, will they affect the industry?

In an election year, though, it seems that about all the US energy secretary can think of are the number of votes the corn lobby can muster up. ✦

withdraw had been mounting in parliament. Opponents argued that a net oil importer would not gain anything from membership, which was costing €2 million/year in membership fees.

The government had formulated a plan in 2007 to develop a number of new oil fields to take crude oil output back up to 1.3 million b/d by 2009.

Cepu development delays

Reaching that target is becoming unlikely, however, particularly because of delays in developing the Cepu Block holding the country's largest untapped oil field, which could yield 180,000 b/d.

Besides Cepu in central Java, Indonesia has many promising untapped oil fields, including Jeruk field offshore, with 50,000 b/d potential in East Java Province, and other offshore oil fields within the country's territorial waters.

And in West Papua Province, Korea National Oil Corp. discovered one of the largest oil fields in Indonesia in 2007. It has estimated reserves of 671 million bbl and could yield 150,000-200,000 b/d.

Another government plan is to boost crude oil output to 1.2 million b/d from 950,000 b/d by 2012 in cooperation with such overseas firms as Brazil's state-owned Petroleo Brasileiro SA. However it is uncertain whether such partnerships will be created.

Nevertheless, South Korean, Russian, and Chinese oil companies, including China National Offshore Oil Corp., as well as Western oil majors such as ExxonMobil Corp. and Chevron Corp. are showing a positive stance toward developing crude oil and natural gas fields in Indonesia.

Lack of leadership

According to the Nikkei report, however, crude oil development has been impeded by the Yudhoyono government's lack of leadership and rising nationalism surrounding the country's natural resources.

Yudhoyono, a former military commander who also served as minister

of energy and mineral resources, like Suharto regards oil and gas as Indonesia's main means of gaining foreign currency.

Yet he is unable to control internal strife directed at interests in the government and Pertamina, or at growing resource-related nationalism among parliamentarians.

Although it runs the country, Yudhoyono's Democratic Party is a minority party accounting for only 10% of parliamentary seats.

Opposition parties such as the Islamic party argue that oil and natural gas should be supplied preferentially to domestic users at prices lower than international levels. Overseas oil companies oppose such a stance.

An executive at a Western oil company said that although Indonesia has abundant oil and gas resources, there are few negotiations on development projects. The reason, he believes, is the absence of a strong chief executive officer like Suharto. ✦

Egypt struggles to meet demand growth for natural gas

Eric Watkins
Oil Diplomacy Editor

Egypt has awarded a drilling contract to the recently formed Egyptian Offshore Drilling Co. (EODC), a joint venture of Toyota Tsusho 50%, Egyptian Natural Gas Holding Co. 35%, and Ganoub El-Wadi Petroleum Holding Co. 15%.

The award comes as Egypt is stepping up efforts to increase its output of natural gas to meet growing domestic demand, as well as hoped-for exports to neighboring Arab countries and the European Union.

EODC will place a $400 million order for drilling rigs with a Singaporean heavy-machinery maker, yet to be named, and drilling is slated to begin as early as 2011.

Trading firm Toyota Tsusho, a subsidiary of Toyota Motor Co., will manage the entire project and procure the rigs, while Egyptian Natural Gas will operate them and carry out test drilling.

The JV has signed a $500 million loan agreement with a bank syndicate consisting of Japanese and Egyptian banks.

JBIC to back JV

In late September, Japan Bank of International Cooperation (JBIC) said it agreed to participate in the syndicated $500 million loan to the Japanese-Egyptian offshore drilling joint venture.

JBIC said the credit will finance the construction and operation of two offshore drilling rigs by EODC.

Also in late September, Egypt offered seven offshore exploration permits in Mediterranean areas potentially rich in natural gas, and companies have until Feb. 9, 2009, to submit bids.

Egypt's reserves of natural gas now stand at 76 tcf, according to Egyptian Minister of Petroleum Sameh Fahmi at a meeting of the Egyptian Holding Co. for Natural Gas on Sept. 22.

But there is growing competition for the supplies, especially in Egypt.

Demand on the rise

According to analyst BMI, Egypt's domestic natural gas demand has grown rapidly as thermal power plants, which account for about 65% of Egypt's total gas consumption, have switched from oil to gas.

BMI forecasts suggest that gas supply could reach 88 billion cu m in 2012 which, with demand of an estimated 40 billion cu m, provides export potential of 48 billion cu m.

In July, Fahmi and Syrian Petroleum and Mineral Wealth Minister Sufiyan al-Aw discussed the possibility of linking the Arab Gas Pipeline to the European gas network to deliver natural gas to Europe via Turkey.

"The fact that the Arab region has big gas reserves highlights the importance of the Arab Gas Pipeline as one of the most important projects linking main gas production centers with consumer centers," Aw said.

Egypt began exporting gas to Syria in July, and according to reports is expected to export some 900 million cu m of gas in the first year of operations, rising to 2.2 billion cu m/year over the next 9 years.

Syria gets gas, Lebanon doesn't

The start of Egyptian supplies is considered a useful boost to Syria which is struggling to stem the decline in production of its own hydrocarbons.

With an eye to eventual sales of gas beyond the Arab world, the AGP is being extended to Homs and Kilis on the Turkish border, widening the link to send the gas on to Turkey and, eventually, Europe.

Europe, meanwhile, is eyeing Egyptian supplies as well. In May, EU energy commissioner Andris Piebalgs said he expects to see the EU importing about 2 billion cu m/year of pipeline gas from Egypt in early 2010 through the AGP.

Still, there could be problems ahead as indicated in September when Egypt announced a delay in gas exports to Lebanon through the AGP until at least January 2009, after initially scheduling them to come on-stream in July or August.

Lebanon's Minister of Energy and Water Alan Tabourian confirmed the lack of current Egyptian supply capacity on his return from a visit to Egypt, adding that it appeared Egypt would only be able to supply half of the agreed volumes—60 MMcfd—when supplies are launched.

"The Lebanese team that traveled to Egypt was surprised to find out that the natural gas shipment has been delayed

to January 2009 instead of this month," Tabourian said.

According to one analyst, Lebanon came into the picture "a little too late"—after the Egyptian government had been forced by popular protests to put a moratorium on future gas export contracts and renegotiate gas prices upwards with its buyers. ✦

US independents report cuts to drilling budgets

Sam Fletcher
Senior Writer

Chesapeake Energy Corp., Oklahoma City, along with Petrohawk Energy Corp. and ATP Oil & Gas Corp., both of Houston, are cutting their drilling budgets and focusing on their best prospects due to the deteriorating economy and declining demand.

Chesapeake, the second-largest independent and third-largest overall gas producer in the US, is slashing its drilling capital expenditure budget by $3.2 billion, or 17%, for the second half of 2008 through 2010. Company officials blamed a 50% drop in natural gas prices since June and a possible gas surplus.

Petrohawk said it will cut its 2009 capital budget by a third and focus on those projects "with the highest internal rates of return and highest potential for reserve growth, namely, development in the Haynesville and Fayetteville shales."

ATP Oil & Gas plans to cut more than $200 million from its capital expenditure budget for the rest of 2008 and 2009.

Analysts in the Houston office of Raymond James & Associates Inc. expect other firms to lay down rigs as well. "We continue to see reduced drilling activity (lower rig count) as necessary to balance the natural gas market. Still, this may lead to the decline in activity about a quarter earlier than we anticipated," they said.

Chesapeake's plan

Chesapeake's budget cut includes $800 million attributable to the drilling capex carry in the firm's recently formed Fayetteville shale joint venture with BP America Inc. Chesapeake closed that 25% joint venture with BP PLC on Sept. 19 for $1.1 billion cash plus $800 million funding by BP of Chesapeake's 75% share of drilling and completion expenses in that program through 2009.

The budget reduction also includes $500 million for the anticipated drilling capex carry in a Marcellus shale 25% JV that the company expects to complete by the end of this year. However, the bulk of the cut, $1.9 billion, represents a rollback in drilling activity, reducing its current count of 157 operated rigs to 140 rigs by yearend. Chesapeake then expects to keep its rig count relatively flat in 2009-10.

"This should not be considered good news for domestic land drillers given that Chesapeake does not typically lay down its own rigs," Raymond James analysts warned. Nomac Drilling Corp. in Oklahoma City belongs to Chesapeake.

Moreover, Raymond James noted, "This does not seem to be a fundamental savior for gas prices since Chesapeake still plans to increase its production by 16% year-over-year despite 11% less rigs."

Chesapeake lowered its production growth forecasts to 16%/year for 2009-10 from 19% previously. The company said its production growth will remain near the top of its large-cap peer group because of continued strong drilling results from its shale plays. In September, Chesapeake completed three horizontal Haynesville shale wells with average initial production exceeding 10 MMcfd of gas equivalent per well, bringing its total horizontal Haynesville shale wells on production to 14.

Analysts said, "Companies tied to the production enhancement side of the business may be a bit better off due to the service intensive nature of the new shale plays, but with numerous wells expected to be shut in and capacity coming online, 2009 is shaping up to be an ugly year in North America."

Chesapeake temporarily is curtailing part of its unhedged natural gas production in the Midcontinent region due to "unusually weak wellhead prices substantially below industry breakeven costs." It has shut in 100 MMcfd of net gas production (125-150 MMcfd gross), representing 4% of its current net production of 2.3 bcfd of gas equivalent (92% gas). Officials said they will restore this production when the market recovers from recently depressed wellhead price levels of $3-5/Mcf.

The company reduced its 2008 production growth estimate to 18% from 21% to account for production curtailment, sale of 45 MMcfd of gas equivalent production associated with its joint venture with BP, the anticipated sale of 60 MMcfd of gas equivalent in the fourth quarter associated with Chesapeake's fourth volumetric production payment, and shut-ins of onshore production due to gas processing plant limitations resulting from Hurricane Ike.

Chesapeake recently resumed plans to sell a minority interest in its midstream natural gas business to institutional investors, with the projected $1 billion proceeds to fund a portion of the costs associated with building the midstream infrastructure in various shale plays, primarily in the Haynesville shale. As part of that move, Chesapeake is transferring all of its midstream natural gas assets outside of Appalachia, primarily of gas gathering systems and processing facilities, into new partnership entities managed by Chesapeake Midstream Partners LP.

Through asset sales and budget

reductions, Chesapeake expects to generate $2 billion excess cash in 2009-10 that will be directed primarily to debt reduction.

Chesapeake has focused on exploratory and developmental drilling and corporate and property acquisitions in the Midcontinent, Fort Worth Barnett shale, Fayetteville shale, Haynesville shale, Permian basin, Delaware basin, South Texas, the Texas Gulf Coast, the Ark-La-Tex region, and the Appalachian basin.

Petrohawk's actions

Petrohawk sliced its budget to $1 billion for drilling, completions, seismic exploration, and facilities, down from $1.5 billion previously. Officials said the change affirms the company's strong capitalization. The firm has "no current plans or need to access the equity capital markets," they said. Petrohawk's undrawn credit facility was increased to $1.1 billion from $800 million Sept. 10.

In addition, the company is looking to divest some conventional assets in the Permian basin next year. These properties include interests in Waddell Ranch, Sawyer, Jalmat, and TXL fields of West Texas and southeastern New Mexico. The Permian basin properties currently produce 35 MMcfd of gas equivalent.

Even with the budget reduction, Petrohawk expects a production growth of 25-35% in 2009. It reaffirmed a third quarter guidance of 310-320 MMcfed.

Petrohawk will emphasize development of nonproved locations in its successful Haynesville and Fayetteville shale projects and expects higher overall reserve growth potential. It projects that its production will grow 25-35% through the drill-bit in 2009 from estimated 2008 production of 305 MMcfd. The Haynesville shale sits 11,000 ft underground in East Texas and northwestern Louisiana. The Fayetteville shale play is east of Little Rock, Ark.

Petrohawk Energy is engaged in the acquisition, production, exploration, and development of natural gas and oil

WATCHING GOVERNMENT

Nick Snow, Washington Editor

Blog at www.ogjonline.com

Peterson's energy legacy

US Rep. John E. Peterson (R-Pa.) could take pride in watching Outer Continental Shelf oil and gas leasing moratoriums expire Sept. 30. He also is realistic enough to know that more work must be done, even though he is leaving Congress at yearend.

"Seven years ago, when I began the fight to open up our vast offshore energy reserves, I could count on one hand the number of supporters," he said Sept. 24 after the House approved a continuing resolution to keep the federal government running through Mar. 6, 2009, and abolished more than 20 years of federal OCS leasing bans.

"As the days and years passed, the American people began to understand this issue and realized the United States Congress was the number one obstacle impeding the expansion of domestic energy production. Today, their voices were heard," Peterson said.

Allowing the bans to expire should only be the beginning, he continued. "Congress needs to create an environment where scientists and entrepreneurs can work together and create next-generation energy sources like coal-to-liquids, coal-to-gas, and the reprocessing of nuclear waste so we can end our dependence on imported oil and transition to a clean energy future," he said.

Work across the aisle

Federal lawmakers also must find ways to increase domestic refining capacity, reform litigation, and streamline regulatory permitting processes, Peterson said. "In the coming years, it is of the utmost importance that members of Congress continue to work across the aisle and find reasonable and effective solutions to the energy crisis," he said.

This member of Congress practiced what he preached. Peterson and Rep. Neil Abercrombie (D-Ha.) cosponsored bills for several years to lift the OCS leasing moratoriums. They went farther in 2008 and established a bipartisan energy working group. Its proposed legislation would have funded alternative and renewable energy research and development with part of the revenues from new OCS leasing.

Their bill attracted more than 170 cosponsors by mid-September, including key members of committees that would have had jurisdiction over it. It was ignored by both parties' House leaders.

Locked-in positions

"They were locked in political positions and didn't think they could move. The people in our group came in with more-flexible approaches because they wanted to come up with a solution," a staff member for one of the cosponsors told me.

In remarks on the House floor Sept. 24, Peterson urged House members not to follow the last three US presidents or the past 14 Congresses who did not make energy a major priority.

"This is more of a crisis than many people believe. The future availability of energy will determine whether our people can stay in their homes, can feed their families, can travel to work, and whether companies can afford to stay in this country," he said. ✦

primarily in north Louisiana, Arkansas, East Texas, Oklahoma, and the Permian basin.

ATP's outlook

Chairman and Chief Executive T. Paul Bulmahn, said ATP's budget reduction is "prudent" due to the current economic and financial climate. Because ATP operates 100% of its current developments it can accelerate or defer projects in accordance with market conditions.

"We completed our most recent financing in June,...which provided us the strength and flexibility to withstand these volatile markets," said Bulmahn. ATP completed its development plans at High Island A-589 and South Marsh Island 190 and expects both projects to be in production this quarter. Its development plans for Morgus and Mirage in the Gulf of Mexico and Wenlock in the North Sea are progressing on schedule and should add new production in 2009.

"We expect to grow production and cash flow in 2009. The reduction to our capital expenditure budgets will impact production in the latter part of 2010 and beyond. Additional information about our revised developments will be provided as the details of our reduced capital program are finalized and implemented," Bulmahn said.

ATP Oil & Gas is an international offshore oil and gas development and production company with operations in the Gulf of Mexico and the North Sea. ✦

NGSA: No change in wholesale price pressure this winter

Nick Snow
Washington Editor

Pressure on domestic wholesale natural gas prices this winter heating season will mirror last year's because producers have drilled more wells, and technology has helped them improve recovery rates, the Natural Gas Supply Association said in its annual forecast on Oct. 2.

"This winter season, we believe that all the combined market forces (slightly warmer than normal weather, stagnant economic growth, moderate growth in overall demand, near-record storage levels and a healthy supply) will cause flat price pressure on the gas market compared to last winter," said NGSA Chairman Patrick J. Kuntz, who also is vice-president of gas and oil sales at Marathon Oil Co.

He said US gas production is expected to be nearly 8% higher this winter than a year earlier, based on an independent analysis by ICF International of Fairfax, Va., which NGSA commissioned. "Explorers and developers responded to the market signals, and companies are producing more domestic gas. Current production rates are at their highest level since the early to mid-1970s," Kuntz told reporters at a briefing.

Technology also is playing a significant role, he continued. "Much of our increase in domestic gas production is coming from unconventional plays where technological advances have unlocked the resource. Horizontal drilling is another big advance that allows more gas to be produced from a single well," he said.

NGSA forecasts that 31,530 wells will be completed during the 2008-09 heating season, 753 or 2.4% more than the 30,777 completions during the same period a year earlier. Average production is expected to climb 7.9% year-to-year to 57.5 bcfd from 53.3 bcfd, while the annual average rig count is expected to rise 4.4% to 1,535 from 1,470.

Less gas from Canada

The forecast also projects a 6.25% decline in US imports of Canadian gas to an average 7.5 bcfd from 8 bcfd during the 2007-08 winter heating season. "While we are expecting to import less, supplies from Canada continue to play an important role in supply during the winter heating season," Kuntz said.

The combination of increased domestic gas production and higher global market prices for LNG suggests that the US could lose LNG volumes to countries willing to pay more this winter, he indicated. US LNG imports normally average 1-1.8 bcfd each winter, Kuntz said. NGSA's forecast calls for a 25% year-to-year increase to 1 bcfd from 800 MMcfd.

"But the important takeaway is that rising US gas production and domestic supply is a direct and positive response to market signals, enabled by the advances in technology. This resulted in downward pressure on the gas market for the winter season," Kuntz said.

He also warned that higher domestic onshore production, while encouraging, also involves unconventional gas. "It's in its infancy. I don't think it's going to solve our problems. We're going to have to rely on a variety of sources," he said.

More gas from domestic offshore deposits will be needed because onshore unconventional supplies will be costly, Kuntz continued. "It could be a bigger part of the solution than we realize, but we shouldn't foreclose other opportunities," he said.

Different challenges

With much of this new onshore production occurring in regions with little previous experience, state government regulators and producers may encounter unexpected problems, Kuntz said. "I don't think there's nearly the gas gathering, treating, and other infrastructure that many people imagine. Disparate ownership and right-of-way questions also may make it difficult to get permits. There probably will be a different, but equal, set of challenges on

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the state level," he said.

Climate and geography also may pose unexpected problems, Kuntz added. "There are more creeks that will need to be crossed. Many of those bridges have been in place for 70 years. A 2-ton rig may not always make it across," he said.

NGSA expects gas storage going into the heating season to be 3,450 bcf, 98% of the 5-year average but 95 bcf or 2.7% lower than the record 3,545 bcf of storage entering the 2007-08 winter heating period. "This year, we understand that another 100 bcf of storage capacity is being built," Kuntz said.

The forecast also calls for a 2.4% year-to-year increase in overall US winter heating season gas demand to an average 78.5 bcfd from 76.7 bcfd a year earlier. Kuntz said that Energy Ventures Analysis Inc. of Arlington, Va., predicts in its demand outlook prepared for NGSA that the most growth will occur in power generation, where it expects gas-fired generating capacity to grow 33% year-to-year to 6.9 Gw.

"If it weren't for the slowing economy and evidence of commercial and residential conservation, our projections for overall demand could likely be higher. But as it stands, the 2.4% increase in demand doesn't meet our threshold, and therefore our expectation is that pressure on prices will be flat," he said. ✦

Africa, EU develop energy cooperation actions

Doris Leblond
OGJ Correspondent

Last month the African Union Commission and the European Commission jointly established an Africa-European Union energy partnership that could attract more than €1 billion in EU funds for concrete energy investments in Africa.

At a high-level meeting in Addis Ababa, Ethiopia, African Commissioner for Infrastructure and Energy Elham Mahmoud Ahmed Ibrahim, EC Commissioner for Development and Humanitarian Aid Louis Michel, and EC Energy Commissioner Andris Piebalgs signed a joint statement on the Africa-EU partnership. It represented the first concrete application approved by the eight strategic partnerships in the EU-Africa joint strategy and the first 2008-10 action plan adopted at the partnership's December 2007 Lisbon summit.

At the Addis Ababa meeting, the AUC and EC defined a strategy to address key challenges covering energy security, access to renewable energy sources, and climate change issues.

They also underlined the need for a roadmap to implement energy priorities, among which is the need to bolster African institutions and establish the legal, fiscal, and regulatory environments best able to promote private investments in energy and establish national transparency plans and guidelines for energy companies. Also strengthened will be cooperation in improving energy efficiency, launching a renewables energy program, and promoting regional electricity market integration in Africa.

Trans-Saharan gasline

Developing energy interconnections between Africa and Europe, including identifying energy projects of common regional interest, was a high priority. This included revival of the Trans-Saharan gas pipeline project, which could become a key strategic structure and attract investments from EU companies. Piebalgs followed up with a visit to Nigeria Sept. 9 to discuss it further.

The proposed 4,300 km gas line, to cost more than €7 billion, would link Nigeria to Algeria. Its planned 20 billion cu m/year capacity, carrying Nigerian gas to the EU in 2015 via either Spain or Italy, could increase to 30 billion cu m/year in 2030. In time it could remedy the EU gas shortfall and simultaneously supply gas to north-central Nigeria, southern Algeria, and the Sahel countries of Niger, Burkina Faso, and Mali.

And because Nigeria currently flares the world's largest volumes of gas, the Trans-Saharan gasline would enable it to cease flaring and transport part of its gas, another AUC-EC priority. The AUC and EC will participate in the "Global gas flaring-reduction partnership" of oil and gas-producing countries and seek ways to implement small-scale associated gas utilization projects.

The two senior ministers with whom Pieblags met—failing a meeting with Nigeria President Yar'Adua, who was ill—were committed to the project. The ministers also discussed the unrest in the Niger Delta, and the commissioner offered the EU's help in developing the Delta region to reduce turmoil in that area.

To "make swift progress in implementing the AOC-EC partnership," a number of arrangements will be put into place. These include a high-level Africa-EU "Energy Dialogue" meeting every 2 years, the first of which is scheduled for second-half 2009; an Africa-EU energy partnership forum involving civil society, research institutes, and private companies on both continents, also to be held every 2 years; and an informal joint experts group on energy to meet at least once/year to coordinate the various activities. ✦

Reliance, Niko start production at MA oil field off eastern India

Reliance Industries Ltd., Mumbai, and Niko Resources Ltd., Calgary, began a new chapter in India's hydrocarbon production with the startup of MA oil field in the Krishna-Godavari basin in the Bay of Bengal.

Crude oil output began on Sept. 17, 2008, at the early rate of about 5,000 b/d of 42° gravity crude. The field, in 8,000 ft of water on the KG-D6 block 50 km off Kakinada, is expected to reach target peak production of 40,000 b/d of oil in a few months.

Exploration on the 7,645 sq km D6 block is far from complete, however, and further exploratory drilling is planned in Niko Resources' 2009 fiscal year that began Apr. 1, 2008.

Development of giant Dhirubhai 1 and 3 gas fields on the same block is substantially complete, and gas production is to start in the third calendar quarter of 2008.

Phase 1 development cost is estimated at $5.2 billion.

Conceptual studies are under way for the development of eight other gas discoveries on the D6 block adjacent to and to be tied back to Dhirubhai 1 and 3 gas fields.

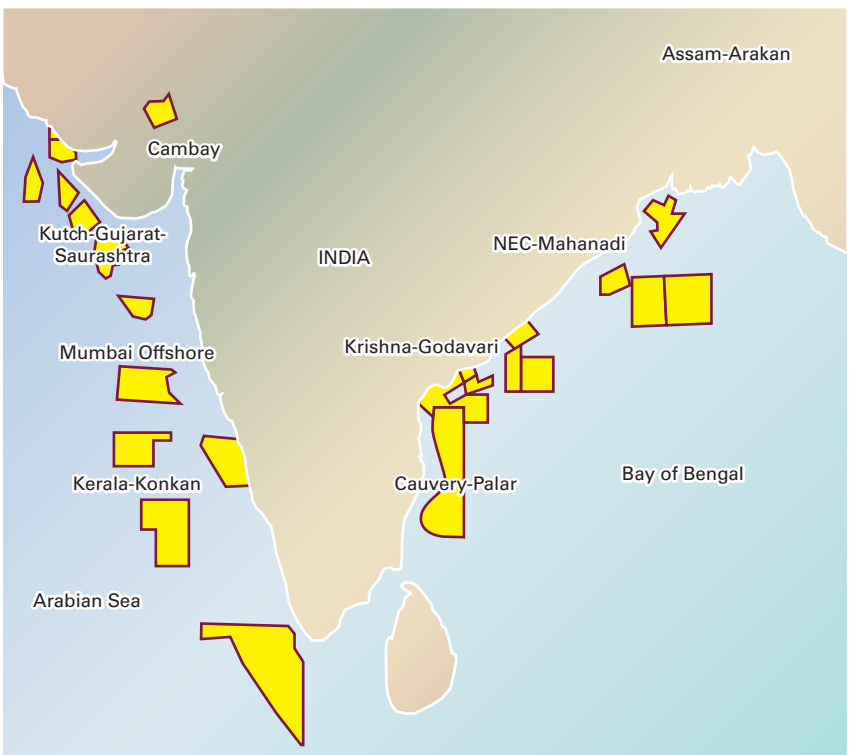
Dhirubhai 1 and 3 gas fields are expected to reach combined production of 2.8 bcfd of gas in the first year. The facilities are designed with capacity to increase output to 4.2 bcfd. The government established a pricing formula that will result in a sales price of about $4.20/MMbtu.

MA oil field

Niko Resources pointed out that MA oil field:

- Is India's first deepwater hydrocarbon producing area.
- Produces a grade of oil that can be processed at any refinery in India.
- Has been placed on production in the 30th month after its discovery, making it one of the world's fastest greenfield deepwater developments.

RELIANCE INDUSTRIES BLOCKS IN INDIA'S BASINS Fig. 1



Source: Reliance Industries Ltd.

Initial field development cost is estimated at $1.5 billion.

Niko Resources also noted that production was "achieved against challenges like difficult ocean conditions, lack of adequate subsea data, low seabed temperature of 5° C., severe supply chain constraints, and shortage of technical manpower."

Serving MA field is the Dhirubhai-1 FPSO, the first vessel of its kind in Indian waters. The vessel, converted and delivered by Aker Floating Production, can operate in more than 1,200 m of water and can withstand harsh environment and sea conditions off Andhra Pradesh. It has a disconnectable turret mooring system, insulated manifold, and short, flexible flow lines.

Aker Solutions ASA manufactured and delivered the field's subsea production system and managed the subsea equipment installation (OGJ Online, Sept. 23, 2008). Both the subsea system and FPSO were delivered less than 16 months after the award of the contracts.

The KG-D6 block in Krishna Godavari basin was awarded to Reliance Industries and Niko Resources under NELP-I. Block interests are Reliance Industries 90% and Niko Resources 10%. ✦

Papua New Guinea gas-condensate find tested

Rift Oil PLC reported a flow of 29.2 MMcfd of gas during a test in its Puk Puk-1 wildcat on Papua New Guinea permit PPL 235 in the country's Western Province.

The flow came from combined Cretaceous Toro sandstone and Jurassic Lower Hedinia pay intervals in the well.

A separate flow from the Lower Hedinia measured 20.85 MMcfd.

Rift now plans to isolate these two zones and test the Upper Hedinia zone in the structure. Once flow rates have stabilized, the company plans to measure the liquids content of the gas.

Rift is particularly pleased with the Lower Hedinia flow rate because it comes from thinner sands. The company adds that initial flow rates from the Toro are in line with expectations from this well-developed reservoir.

Testing at Puk Puk (the term is Pidgin English for crocodile) was to be completed later in October. The company is also running a 210 line-km 2D seismic program in the area.

A strong final result will enhance the company's plans for supplying gas to a floating LNG plant in the Gulf of Papua via an onshore-offshore pipeline from the discovery.

Rift recently signed a heads of agreement with Norwegian company Flex LNG to jointly develop Rift's onshore gas reserves in PNG via the floating facility.

Rift also has a nonbinding memorandum of understanding with aluminium company Alco to supply about 40 bcf/year of gas to Alcan's alumina plant at Gove in Australia's Northern Territory for 20 years. ✦

Eni tests gas from Argo-2 well off Sicily

Eni SPA plans to develop on a fast-track basis its offshore discoveries in the Sicilian Strait following test results of 170,000 cu m/day of natural gas from the Argo 2 well. The well is 20 km off Agrigento in 500 m of water.

The results confirm the adjacent Argo 1 gas discovery well drilled in 2006.

Eni also found gas in deeper water in Argo 2. Panda and Cassiopeia fields are also nearby, and Eni plans to link them under its development plan.

In August Eni tested 190,000 cu m/day of gas from the Cassiopeia 1 well in 560 m of water 22 km off Agrigento. Cassiopeia's reserves are estimated at 16 billion cu m.

Eni said the Sicilian Strait area potential is an estimated 18 billion cu m recoverable.

Eni is operator of Argo 2 with a 60% share, and its partner Edison SPA holds the remaining 40%.

Eni said the Argo 2 discovery will increase its 200,000 boe/d equity production in Italy. ✦

Nido Petroleum finds oil off Philippines

Nido Petroleum Ltd., Perth, said its Yakal-1 wildcat in SC54 of the Northwest Palawan basin off the Philippines has encountered a 66-m gross oil column.

No definitive oil-water contact has been determined.

Nido will evaluate the find with a logging suite and fluid sampling to clarify the extent of the column below 1,839 m.

The jack up rig WilBoss drilled Yakal-1 to 1,975 m TD. Yakal-1 is the first exploration well drilled in the area in the past decade. The drill site is in the northeastern part of SC54 south of the producing Malampaya gas and oil field.

Nido holds a 60% interest, and joint venture partner Kairiki Energy has the remaining 40%. ✦

Brunei

Field work has begun in support of a 350 sq km 3D seismic survey in eastern onshore Brunei, said Loon Energy Inc., Calgary.

The survey is to be finished by the end of 2008 on 550,000-acre Block L. It covers most of eastern Brunei and involves some offshore shooting.

Nations Petroleum SE Asia Ltd. is conducting the survey as part of its commitment to fund the first $20.5

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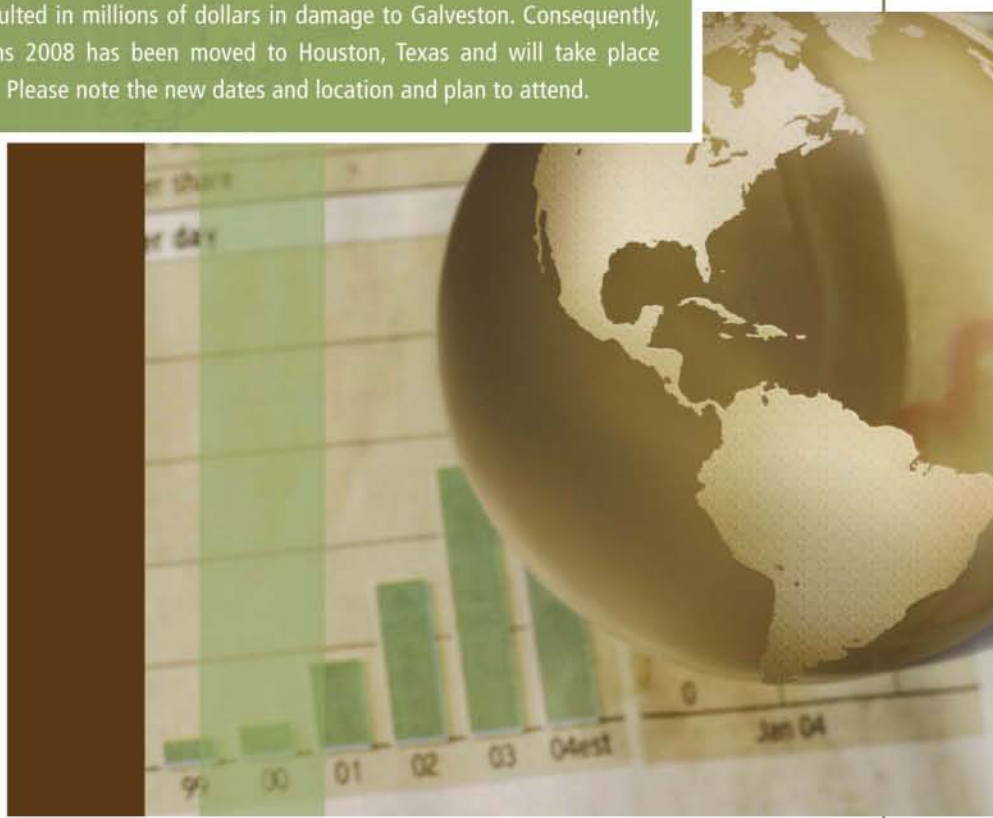

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million in exploration on the block to earn a 50% working interest.

Giant Champion and Seria oil fields lie within 25 km of the block, which has had some historic production but no exploration and development for 20 years. Other interests are Loon 40% and QAF Brunei Sdn. Bhd. 10%.

Kazakhstan

Kazakhstan's Central Committee for Development approved plans by Arawak Energy Ltd., St. Helier, Jersey, UK, to develop Akzhar and Besbolek oil fields in the Precaspian basin.

The first Besbolek well is to spud within days, and four rigs are to be drilling by mid-October. Previously shut-in wells are being returned to production.

The fields had NI 51-101 proved and probable reserves of 23.4 million and 7.9 million bbl of oil, respectively, as of Dec. 31, 2007.

Pakistan

Jura Energy Corp., Calgary, and Petroleum Exploration (Pvt.) Ltd. of Pakistan each plan to assign a 12.5% interest in six Pakistan concessions to Gulf Petroleum Exploration International Ltd. of Kuwait.

The concessions are Badin IV North, Badin IV South, Kandra, Salam, Mirpur Mathelo, and Karsal. The Kandra assignment excludes the Sui Main limestone development.

GPX will pay 66.67% of the first $6 million in expenditures to drill the first four exploration wells of the work program in the blocks, 58.33% of the first $6 million to drill the next five exploration wells, and 50% of the first $6 million to drill two more wells as long as the first nine wells result in at least four commercial discoveries. Jura Energy will receive $4.25 million toward historical costs from GPX.

Block operator PEL let a long-term contract to Weatherford Drilling International for a new rig that is drilling the Kandra 4D well, the first of the nine committed exploration wells. Next the rig will move to the Badin IV North block.

British Columbia

Operators hope to start production in late 2008 from a coalbed methane project in Northeast British Columbia.

Canada Energy Partners Inc., Vancouver, BC, with 50% interest, and the undisclosed partner as operator have drilled and run fracs on five wells and connected them and three previously shut-in wells to the Spectra Energy pipeline that crosses the lease near Hudson's Hope northwest of Dawson Creek, BC.

The 50,188-acre Peace River project property has room for 315 wells on 160-acre spacing.

Capital spending exceeds $36 million (Canadian) since 2001, on four core holes, four water disposal wells, and nine production-tested wells. Consulting engineers estimate a discovered resource of more than 2.3 tcf of gas excluding carbon dioxide.

Quebec

Petrolia, Rimouski, Que., completed large-scale surface geochemical and geomicrobial surveys on Anticosti Island in the Gulf of St. Lawrence off Quebec.

The aim of the surveys is to detect potential light hydrocarbon microseepage in order to prioritize a number of structures already identified on seismic surveys. Petrolia collected 1,700 samples at a cost of about $500,000.

Petrolia holds interests in more than 6,000 sq km on Anticosti and is operator of 68% of the acreage.

Maryland

Garrett and Allegany counties in westernmost Maryland have become areas of interest in the Appalachian basin Devonian Marcellus gas shale play since 2006, said the Maryland Geological Survey, Baltimore.

Lodge Energy LP, a private Fort Worth company, has leased 36,000 acres in western Maryland for $1,150/acre and 16% royalty, said a report by analysts Jefferies & Co.

The report did not identify the location of the acreage.

Western Maryland has produced modest volumes of gas in the past from other formations.

Pennsylvania

The Lower Delaware River Wild and Scenic Management Committee plans to sample waterways around the Delaware River in advance of drilling in Bucks County, eastern Pa.

The committee will use a $25,000 National Park Service grant to obtain baseline data before Arbor Resources LLC of Michigan drills in the far north Philadelphia suburb, press reports said.

Arbor Resources has state permits to drill two exploratory wells in Nockamixon Township in the Newark basin (see map, OGJ, Feb. 2, 2007, p. 36).

Washington

Delta Petroleum Corp., Denver, signed land deals increasing its land position and spreading its risk in the Columbia River basin in Washington and Oregon, where the company and its undisclosed partner plan to drill at least three exploratory wells, including the Gray 31-23.

Delta acquired all of EnCana Corp.'s leasehold position and interest in wells in the basin in Washington, bringing Delta's leasehold to 844,000 acres.

Delta also formed a joint venture with a major Canadian energy company to sell a 50% working interest participation in its leasehold and wells in the basin. That agreement, when closed, will reduce Delta's position to 422,000 net acres.

DRILLING MARKET FOCUS

Australian operators drill for gas to feed LNG trains

Nina M. Rach
Drilling Editor

Natural gas is driving drilling in Australia, while oil production continues to decline.

LNG trains have opened the market for Australia's abundant natural gas. Operators are drilling for associated gas as well as coal seam gas (CSG).

In early September, energy economics group EnergyQuest said that Australian CSG production rose to 132.9 petajoules (22.8 mboe) for the year ending June 2008, up 38.9% from the previous year. Domestic gas production increased 2.3%, even though conventional production was down 2.1%, compensated by growth in Queensland CSG.

Well activity

Table 1 provides quarterly counts of wells being drilled on and offshore Australia 2000-07, breaking out wildcat, appraisal, development, and coal seam methane (CSM) wells. The counts are based on quarterly drilling statistics published by the Australian Petroleum Production & Exploration Association Ltd.[1]

The number of active land wells ranges from a low of 26 in first-quarter 2000 to a high of 103 in fourth-quarter 2006. The number of land wells rises from first to fourth-quarter about half the time.

There is no discernible trend for offshore wells. Offshore drilling activity was about 25% higher in 2003-04 and also jumped about 50% from 2006 to 2007.

Offshore framework

As of July 1, 2008, the Offshore Petroleum Act 2006 (OPA) became effective, replacing the Petroleum (Submerged Lands) Act of 1967. PSLA was rewritten to simplify, after years of amendments.

When he announced that the Governor-General proclaimed OPA and related Acts to come into effect, the Minister for Resources, Energy, and Tourism, the Hon. Martin Ferguson said this will make the offshore petroleum legislation easier to understand and reduce compliance and administrative costs to both industry and governments.[2]

In September, 17 mobile offshore drilling units were working off Australia for 9 different operators. These units included 1 drillship, 10 semisubmersibles, 4 jack ups, and 2 platform rigs. Two additional platform rigs were ready-stacked.

Woodside Petroleum was the most active operator, with four semisubs under contract. Apache Corp. had two semisubs and two jack ups working (Fig. 1); Santos had two semisubs; ExxonMobil through its subsidiary, Esso

The Stena Clyde semisubmersible has been drilling for Apache Corp. in deep water off Australia (Fig. 1).

AUSTRALIAN DRILLING ACTIVITY, 2000-07

Table 1

	Active onshore wells					Active offshore wells			
	Wildcat	Appraisal	Development	Coal seam methane	Total, onshore	Wildcat	Appraisal	Development	Total, offshore
2000-Q1	5	1	18	2	**26**	16	1	5	**22**
2000-Q2	9	3	20	7	**39**	17	3	9	**29**
2000-Q3	7	5	28	5	**45**	19	3	3	**25**
2000-Q4	10	7	24	9	**50**	14	1	4	**19**
2001-Q1	14	4	26	15	**59**	14	6	6	**26**
2001-Q2	14	4	19	25	**62**	12	1	8	**21**
2001-Q3	15	5	17	31	**68**	11	2	9	**22**
2001-Q4	13	13	9	23	**58**	16	2	5	**23**
2002-Q1	7	7	22	7	**43**	14	3	8	**25**
2002-Q2	2	7	22	23	**54**	7	3	17	**27**
2002-Q3	7	7	10	39	**63**	5	4	15	**24**
2002-Q4	8	9	12	25	**54**	8	7	12	**27**
2003-Q1	8	3	13	9	**33**	19	2	14	**35**
2003-Q2	5	1	16	14	**36**	12	4	7	**23**
2003-Q3	8	3	25	23	**59**	15	4	15	**34**
2003-Q4	22	7	12	32	**73**	9	1	21	**31**
2004-Q1	17	9	7	27	**60**	5	2	16	**23**
2004-Q2	20	7	11	29	**67**	10	11	21	**42**
2004-Q3	19	7	14	28	**68**	7	2	17	**26**
2004-Q4	18	9	12	15	**54**	13	3	13	**29**
2005-Q1	8	5	25	11	**49**	17	3	8	**28**
2005-Q2	11	13	21	10	**55**	11	5	5	**21**
2005-Q3	23	12	14	9	**58**	11	7	2	**20**
2005-Q4	26	10	17	15	**68**	15	5	2	**22**
2006-Q1	14	6	25	14	**59**	12	1	3	**16**
2006-Q2	29	10	31	21	**91**	10	3	3	**16**
2006-Q3	30	22	9	19	**80**	12	2	10	**24**
2006-Q4	36	31	22	14	**103**	16	6	20	**42**
2007-Q1	19	20	21	0	**60**	4	4	9	**17**
2007-Q2	25	23	10	0	**58**	24	13	14	**51**
2007-Q3	27	28	19	0	**74**	13	13	21	**47**
2007-Q4	18	18	21	0	**57**	12	11	20	**43**

Source: Data summarized from Quarterly Drilling Statistics issued by the Australian Petroleum Production & Exploration Association Ltd.

Australia Pty. Ltd., had two platform rigs; and several operators were each running a single rig: Coogee Resources Ltd., Eni SPA, Hess Corp., Peak Well Management, and Shell. Operators have wells planned in the Gippsland, Carnarvon, Bass, Otway, and Browse basins (Table 2).

Esso Australia also operates Australia's largest privately owned helicopter fleet to service Bass Strait operations.

State agencies

The South Australia government will spend an additional $11 million (Aus.) over the next 4 years to strengthen its Primary Industries and Resources SA regulatory agency, so that E&P applications can be processed more efficiently.[3] Operators apply to the Minerals and Energy Resources Division of PIRSA.

The Queensland government allocated $550,000 in its 2008-09 state budget for Queensland's Petroleum and Gas Inspectorate. It is adding four staff to boost monitoring, inspections, and audits, because the state has more than 3,400 CSG locations.[3]

Queensland's Minister for Mines and Energy, Geoff Wilson, said the Surat basin has abundant gas and is "set to rival the Bowen basin in central Queensland as the state's economic powerhouse."[3]

Consolidations

The industry is consolidating, evinced by a series of mergers of small Australian companies with coalbed methane (CBM) gas reserves that can be used for liquefied natural gas export projects.

Roc Oil Co. Ltd. recently won a 53.1% controlling share of Anzon Australia, a subsidiary of London-based Anzon Energy. Anzon has a 40% stake in Basker-Manta-Gummy oilfield (BMG) off Victoria.

Britain's BG Group PLC attempted to take control of Perth-based Origin Energy Ltd. and its coal fields for $11 billion but was thwarted in early September. Origin initiated a CBM joint venture with ConocoPhillips, for which it received $8 billion. Conoco said it would book reserves of about 100 mboe from the JV in 2008.

South Perth-based Cooper Energy Ltd. bought 4.99% of Incremental Petroleum on the open market, then initiated an $86.4 million hostile takeover bid in September.

In April 2008, Beach Petroleum Ltd. sold a 10% interest in Basker-Manta-Gummy oil and gas fields to Sojitz Energy Australia Pty Ltd. for $123 million (Aus.). This reduced Beach's equity in the field to 30%. Three wells in the field produce to the Crystal Ocean FPSO. A fourth well, the Basker-6, will be put online in September-October 2008. This well was drilled, sidetracked, cased, and completed as a three-zone tandem with smart completion technology to enable remote switching of production zones.[4]

Drilling consortia

Australian Drilling Associates (ADA) manages multioperator drilling consor-

WELLS PLANNED OFF AUSTRALIA, 2008

Table 2

Operator	Total number	Basin	Lease: well names	Rig
Apache Corp.	4 wildcats	Gippsland	VICP 59: Hermit; Elver; Dory/ Nemo; Oyster	Diamond's Ocean Epoch semisub
	47 total: 23 exploration 24 development	Carnarvon	WA-155-P: Van Gogh Drill Center A WA-334-P: Dibbler-1	Stena clyde semisub; ENSCO 106 and West Triton jack ups
Beach Petroleum Ltd.		Bass	T/39P: PeeJay-1 T/38P: Spikey Beach-1	West Triton
		Otway	VIC/P46: Fermat-1	
		Gippsland	BMG area wells	Songa Venus semisub
BHP Billiton Petroleum	1 well	Gippsland		
	6 wells	NW Shelf		
Coogee Resources Ltd.	9 wells	Bonaparte	Montara	West Atlas jack up
Esso Australia Pty. Ltd.		Bass Strait		Nabors platform rigs: ISDL 173, Pool 453
Hess Corp.	4 wells	NW Shelf	WA-390P: Glencoe-1, Briseis-1, Nimblefoot-1, Glencoe-1	Jack Bates semisub
MEO Australia Ltd	1 well	NW Shelf	WA-361P: Zeus-1	Songa Venus
Mosaic Oil NL	12 wells	Surat-Bowen		
Nexus Energy Ltd.	1 development	Gippsland	Longtom-4	West Triton
OMV	1 appraisal well	Browse	AC/RLG: Audacious-5	Songa Venus
Peak Well Management				Wilcraft jack up
Santos Ltd.	7 exploratory wells; many development wells and injectors, wildcats	Barrow, Houtman, Sorell, Otway, Bonaparte, Browse	Frigate Deep-1	Ocean Patriot, Songa Mercur, Songa Venus semisubs
Shell Development Australia Ltd.		Browse	AC/P41: Libra	Frontier Discoverer drillship; Ocean Epoch semisub
Stuart Petroleum Ltd.	1 exploration	Gippsland	VIC/P53; Bazzard 1	West Triton
Victoria Petroleum NL	3 wells	Surat		
Woodside Energy Ltd.	2 exploration + 8 in 2009	Browse	Pluto	4 semisubs; 2 platform rigs

Source: Operator reports

tia in Australia and New Zealand, coordinating jack ups and semisubmersibles. The company offers well engineering and drilling project management (www.australiandrilling.com.au).

Kan Tan IV semisub began a contract in mid-2007 for four operators and expanded to 12 wells over 540 days, in Bass Strait and New Zealand. The rig is owned by Sinopec, managed by Maersk Contractors (www.maersk-drilling.com), and will mobilize from the Caribbean during first-quarter 2009.

ADA provides project management for the wells and will coordinate and manage drilling operations once the rig leaves the Caribbean. The drilling program will serve: Origin Energy (four wells); Anzon Energy (three wells in Gippsland basin); Tap Oil (two exploration wells in Bass basin); Nexus (one of two wells in Gippsland).

Songa Offshore ASA's Songa Venus semisub begins work October 2008 for an initial term of 376 days; potential second term of 376 days. The contract value for the primary term is about $150 million; the secondary term is a "mutually agreed market rate" (www.songaoffshore.no).

The consortium includes five operators scheduled to drill 10 wells in the North West Shelf area, Bass Strait, Timor Sea, and Browse basin. ADA provides well engineering and project management to each operator and will coordinate and manage all day-to-day operations once the rig is handed over from its current contract in Australia.

First well will be for MEO Australia Ltd. (one well, North West shelf); followed by CNOOC Ltd. (three wells in Timor Sea); Anzon Energy (three wells in Gippsland); Hawkestone Oil (two wells in Browse basin, 2009). The rig is also drilling for Albers Group.

Songa Venus has been drilling off Australia for ENI Australia and Inpex Browse (neither is part of the consortium).

West Triton (newbuild) jack up will work for ADA in a consortium arranged in 2007. The rig arrived in the Bass Strait off Victoria in February 2008 for a 324-day initial term. It's a new rig for Norwegian contractor Seadrill and spud its first well, Wasabi-1, on Feb. 14 for Apache Energy.

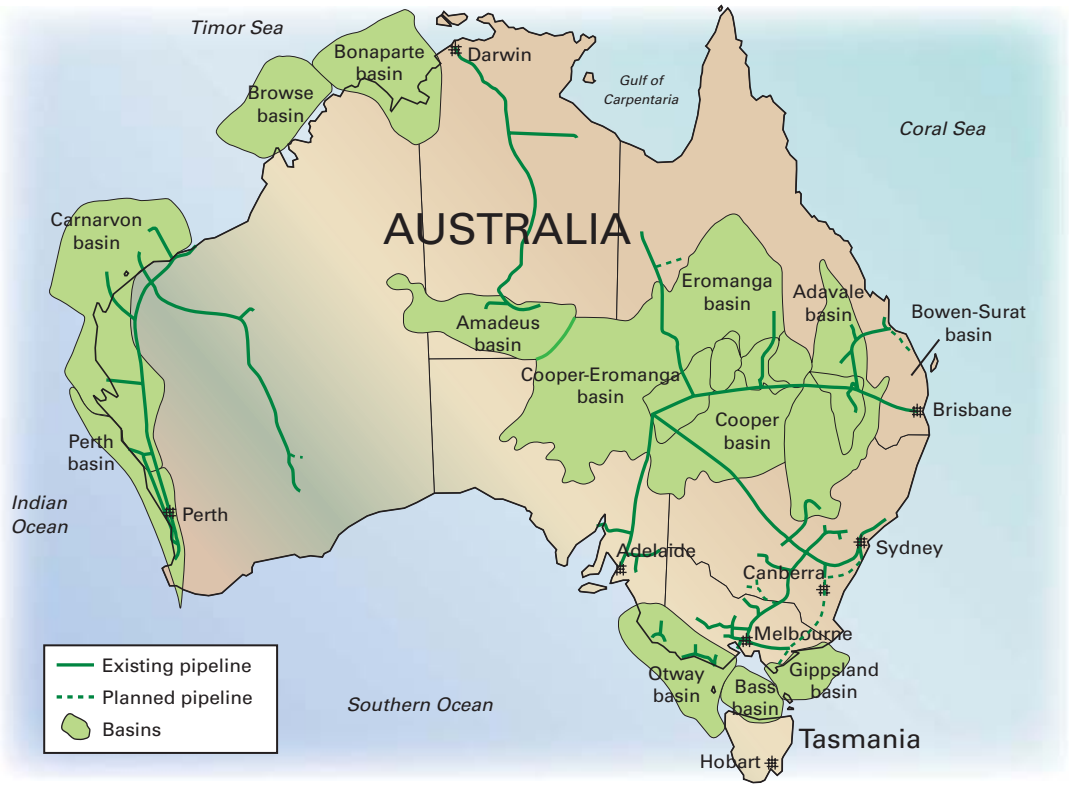
This consortium consists of five operators who have a total of 11 wells scheduled in both the Gippsland and Otway basins: 3D Oil (2 wells drilled in Gippsland basin); Apache Energy (3 wells drilled in Gippsland, early 2008); Stuart Petroleum (1 well Gippsland basin); Beach Petroleum (3 wells in Otway and Bass basins); and Nexus (1 of 2 wells in Gippsland).

Contractors

Land drilling services in Australia are provided by a variety of small drilling contractors. The Australian Drilling Industry Association (ADIA) serves the oil and gas, water well, and geotechni-

AUSTRALIAN BASINS

Fig. 2



cal drilling industries and publishes a journal, Australasian Drilling.

Century Drilling Ltd., a division of Downer EDI Ltd., has a fleet of 13 rigs, working in Australia (4), Indonesia (4), New Zealand (2), India (2), and Oman (1). The Australia-based rigs are light-duty, 750-800 hp.

Oman-based MB Petroleum bought a 51% controlling stake in Century Drilling for $45 million in early September; the company will be renamed MB Century Drilling.

AED Oil

Australian Energy Developments Oil Ltd. and joint-venture partner East Puffin Pty. Ltd. plan to drill two wells in Puffin field. East Puffin spud the Puffin-11 exploration well in the southwest part of the field in water 86.6 m deep in the Timor Sea off Australia (Fig. 2) with Premium Drilling's Wilcraft jack up rig. The company drilled a 17½-in. hole to 975 m and set 13⅜-in. casing with a shoe at 970.5 m. Drilling proceeded with 12¼-in. hole and reached 1,001 m by Sept. 11.

The second well, Puffin-12, will be drilled in the northeast area of the field.[5]

Apache

Apache Corp. has four wildcats planned for the Gippsland basin, using Diamond Offshore Drilling Inc.'s Ocean Epoch semisub (Table 2). The company also plans to drill 47 wells (23 exploration, 24 development) in the Carnarvon basin with the Stena Clyde semisub (Fig. 1), in permit WA-155-P.

The Apache-led Harriet joint venture is preparing to bring two wells on at the company's producing Simpson oil field off Western Australia.

In early September, Apache spud the Dibbler-1 exploration well on permit WA-334-P in the Carnarvon basin off Western Australia, targeting gas in the Dupuy formation. The planned TD is 3,595 m and the well is only 215 m from the John Brookes gas pipelines belonging to the Harriet JV. Apache holds an 80% stake and partner Tap Oil has 20% in the permit.

Beach Petroleum Ltd.

During fiscal year 2008, Beach Petroleum participated in 108 wells in the Cooper Eromanga region, spanning exploration, appraisal, and development. Of the 108, 66 wells operated by Santos targeted oil, and 28 were exploration wells with a 32% success rate, resulting in the discovery of nine new oil fields.

Beach became involved in the Santos activities after acquiring Delhi Petroleum and its Cooper basin JV assets in late 2006.[4]

In the Gippsland basin, Beach and its JV partners have two semisubmersibles scheduled to drill three wells in the Bass and Otway basins (Table 2). This includes the PeeJay-1 well in tenement T/39P and the Spikey Beach-1 in tenement T/38P, both in the Bass basin. Beach said these two wells will test oil at the top of the Eastern View coal measures. The third well will be the Fermat-1 in VIC/P46 in the Otway basin.

The Songa Venus will begin a 120-150 day drilling program in December 2008. The Kan Tan IV will begin a 135-day program in May 2009.

BHP Billiton

BHP Billiton Petroleum is Australia's largest oil and gas producer. The company increased its exploration spending in fiscal year 2008 to about $700 million from $395 million in previous year. Spending in fiscal year 2009 will

be equal to or exceed current spending. Worldwide, the company will drill 24 exploration and appraisal wells in short-term; 7 of these in Australia.[6]

Bass Strait is one of the company's four "base producing areas" worldwide. After nearly 40 years, BHP Billiton "achieved record winter gas sales." BHP has 32.5% of Kipper project, 80 MMcfd natural gas and 10,000 bo/d condensate development (gross). The company has executed subsea contracts and anticipates startup in 2011. On July 25, BHP sanctioned Turrum gas field development in the Bass strait; BHP has 50% and will spend $625 million.[6]

In Western Australia, BHP has 41 permits, with working interests from 8.3-100% on 9.2 million acres (gross), in water depths 170-2,500 m. Recently BHP had two major discoveries in the Exmouth area: Thebe and Scarborough.

Stybarrow FPSO and subsea well project in 2,707 ft water depth began production in November 2007. BHP operates Stybarrow (50% working interest). The project has record-setting single well flow rates of 32,000 bo/d and sustained gross production of 80,000 bo/d.

Also in WA, BHP has 71.43% of the Pyrenees project in water 820 ft deep. The company expects 96,000 bo/d and 60 MMcfd gas. With the FPSO conversion underway, startup should be first-half 2010.

In the future in Western Australia, the Macedon project in Exmouth area will require subsea wells and a gas plant. BHP has 71.43%. There are also three LNG projects planned: Thebe, Scarborough, and Browse.

In the North West Shelf JV, the fifth LNG train (T5) is due by late 2008 and BHP has 16.67%.

Angel is a 800 MMcfd and 50,000 bo/d condensate development. Topsides are installed; expect start-up by yearend 2008 (BHP, 16.67%).

North Rankin B project is a 2.5-bcfd gas facility, sanctioned in March 2008. BHP has 16.67% and start-up is expected in 2012.

Central Petroleum

South Perth-based onshore explorer Central Petroleum Ltd. has a seven-well 2008 drilling program. The company is analyzing results of its first well in the frontier Pedirka basin of Central Australia, contiguous with the Cooper basin.

Log results suggest that the Blamore-1 hit a Permian coal sequence that was four times thicker than expected.

The Permian sequence of coals seen at Blamore-1 will be further tested in CBM well 93001, the next well to be drilled.

Chevron

Chevron Australia Pty. Ltd. has been in Australia for more than 50 years. The company operates Gorgon and Wheatstone projects, Barrow Island and Thevenard oil fields, and is a founding partner of the North West Shelf Venture.

The company is now offering engineering contracts for the Barrow Island and Thevenard Island projects.

In early September, Chevron announced a $400 million commitment to an exploration program off Western Australia aimed at finding more natural gas for its planned LNG plants.

ConocoPhillips

Several companies are pursuing new gas developments in the Timor Sea to feed into Darwin LNG. The Timor-Bonaparte basin drilling programs include:

- ConocoPhillips's Barossa and Caldita fields in Timor basin.
- Caldita field, 265 km northwest of Darwin is being appraised. The Caldita-2 well was drilled to 3,973 m in 2007; there are new 3D seismic surveys over Caldita and Barossa structures.

The Bayu-Undan field was discovered 1995, 500 km northwest of Darwin, in Timor Sea. It has expected reserves of 3.4 tcf gas and 400 million bbl of condensate and LPG.

The development will require a wellhead platform, a central production and processing complex, an FSO, and a 500-km pipeline to ConocoPhillips's Darwin LNG plant at Wickham Point in Darwin Harbor. The project life is 25 years and will require 22 wells; 12 are already drilled.

Coogee Resources

West Perth-based Coogee Resources Ltd. has assets in the Timor Sea and Bonaparte basin. It began a 4-year, 11-well drilling program in late 2007.

The company has postponed drilling its exploratory Wisteria well off northwest Australia until next year. It needed the West Atlas jack up for installation work at its Montara project, which includes Montara, Skua, and Swift-Swallow oil fields. The development plan for Montara includes nine wells, six already drilled in Phase 1, and three in Phase 2, to be completed in third-quarter 2009.[7]

Cooper Energy

On Sept. 10, Cooper announced that it would recommence its drilling program in the Cooper basin in early December, after securing the Ensign No. 30 rig. The company will drill two low-risk exploration wells in PEL92, targeting the Gunyah and Perlubie prospects. These are slightly south of the Parsons-2 well in recently discovered Parsons oil field.

TD for the Gunyah-1 is 2,050 m and the well will cost $1.8 million (Aus.). TD for the Perlubie-1 is 1,796 m and it will cost $1.6 million (Aus.).

Empire Oil & Gas

Perth-based Empire Oil & Gas NL shifted the drilling site for the long-delayed Lake MacLeod-1 well in the onshore Carnarvon basin, Western Australia. The well, in the Gascoyne subbasin, was about to spud in mid-September. DCA Rig 7 was rigging up Sept. 16. The well targets the Lake MacLeod anticlinal structure on the EP 439 and EP 461 permits and will be drilled to 1,000 m.[8]

Partners include Rough Range Oil Pty. Ltd. (operator, 30.35%); Jurassica Oil & Gas (35%); Longreach Oil (9.352%); Indigo Oil (4.676%); Falcore (2.596%); and Vigilant Oil (0.52%). Black Fire Energy and DVM International earned stakes of 7.5%

and 10% under farm-in deals.

Empire reported that the Western Australian Dept. of Industry and Resources approved the plan for the Bee-eater-1 well on Aug. 15. That well will be drilled on EP 359 in the Exmouth subbasin of the Canning basin, immediately following the MacLeod-1 well.

Rough Range operates the Bee-eater-1 well (33.36%) on behalf of Victoria Petroleum (31.65%), Pace Petroleum (1.67%); and farm-in partners (33.32%).

Magellan Petroleum Corp.

Magellan has three core areas in Australia:[9]

- Amadeus basin, central Australia.
- Cooper-Eromanga basins, central Australia.
- Coal seam gas in Maryborough basin, eastern Australia.

The Amadeus basin includes three fields. Magellan operates Palm Valley field (52%; Santos 48%). Santos operates Mereenie field, 62 wells drilled (65%, Magellan 35%); and Dingo field (65.7%; Magellan 34.3%)

The Cooper-Eromanga basins are Australia's most prolific onshore hydrocarbon province. Magellan has interests in seven production leases and six exploration licenses. But production is operated by Santos and Beach Petroleum.

In CSG, Magellan has interests in 3 permits, ATP-613P, ATPA-674P, and ATPA-733P. There have been five wells drilled in the Cretaceous Burrum coal measures, which are younger than the Permian coals in the Bowen basin and the Jurassic coals in the Surat basin.[9]

Mosaic Oil

Mosaic Oil NL has increased its 2008 drilling program to 12 wells, up from 10, all in the Surat-Bowen basin.

The company has several drill sites in Queensland. It spud the Freneau-1 exploration well on the ATP 709P permit with the Century 7 rig in early September and said it would take about 16 days to drill to the potential gas and condensate reservoir at 2,400 m.[10]

New Standard Energy

West Perth-based New Standard Energy Ltd., formerly Hawk Resources Ltd., has large land holdings in the south Canning basin. It spud its Lanagan-1 well on the EP 417 permit in the Canning basin in Western Australia in August, with ADS Rig 6.

According to a company drilling report, the well reached 1,490 m on Sept. 17 with no show of hydrocarbons in the Laurel sandstone.

The well would be drilled to 1,530 TD, logged, and probably plugged and abandoned.

New Standard said it plans to drill a second well on EP 417 by the end of the year.[11]

Nexus Energy Ltd.

Nexus Energy will spend $1 billion in exploration over next 3 years to find enough gas for an LNG project. The company plans to focus on offshore Crux field, in exploration permit AC/P23, Browse basin.

Nexus Energy recently drilled the Longtom-4 development well on permit VIC/L29 in the Gippsland basin off southeast Australia with the West Triton jack up. Nexus announced that it intersected 100 m of gas sands and would run a production test in mid-September.[12]

Santos

Santos Ltd. has drilled a lot of development and injection wells and coreholes this year and also planned a seven-well exploration drilling program off Australia. The exploration program includes two wells in the Otway basin and a single well in the Barrow, Houtman, Sorell, Bonaparte, and Browse basins.[13]

The company has two semisubmersibles under contract—Ocean Patriot and Songa Mercur.

In late August, Santos announced that it hit gas in its Frigate Deep-1 wildcat well near the company's Petrel-Tern fields in the Bonaparte basin off northern Australia.[13]

Stuart Petroleum

In late August, Adelaide-based Stuart Petroleum Ltd. announced that it bought a 50% operating stake in Oliver oilfield in the Timor Sea off northwest Australia.

In September, the company began drilling the Bazzard 1 exploration well in permit VIC P53 in the Gippsland basin. Stuart is a member of the Bass Strait drilling consortium enabling it to secure a slot on the West Triton jack up drilling rig

Stuart estimated the drilling costs at $20 million (Aus.). Stuart is assuming the total cost to earn a 50% equity share and operatorship in the permit, along with partners Cue Petroleum Pty Ltd. (25%), Exoil Ltd. (16.667%), and Moby Oil & Gas Ltd. (8.333%).[14]

Victoria Petroleum

Perth-based Victoria Petroleum NL planned to drill 20 wells in June-December 2008.[15]

This includes 3 wells on two permits in the Surat basin, 17 wells in the Cooper basin on three permits, and single wells in the Perth and Carnarvon basins.

In August, Victoria Petroleum NL spud the Growler-4 appraisal well on the PRL 15 permit in South Australia's Cooper basin. The new well is being drilled to 1,800 m TD to test the extent of oil pay found in the Jurassic Birkhead formation in the Growler-1 well and test secondary targets in the Namur and Hutton sandstones.

Victoria said the well was 400 m north of Growler-1 and would test the crest of the structure. The company spud a second appraisal well, Growler-3, immediately afterward, in late August.

Both wells showed positive oil; Growler-3 flowed 1,673 bo/d according to company reports in September, and was completed as a production well. The rig moved to spud the Warhawk-1 well in mid-September.

Woodside

In September, Woodside Energy Ltd.

said it would drill as many as eight exploration wells off Western Australia next year. The company is seeking additional natural gas for a proposed expansion of its 90%-owned Pluto LNG project. JV partners Tokyo Gas and Kansai Electric each have 5%.

Plans for a second train at Pluto are in danger after Woodside's Bellatrix-1 well came up dry. It was the third dry hole in the Pluto exploration area, following the Ixion-1, drilled earlier this year, and Belicoso-1, drilled late last year.

Woodside has two more exploration well to drill in the greater Pluto area before the end of 2008. ✦

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New software moves distributed-temperature sensing data

Ron Cramer
Shell Global Solutions
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Martijn Hooimeijer
Andre Franzen
Shell Global Solutions
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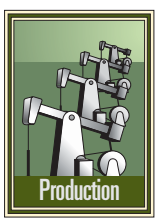


Shell has developed open standards software to fill the gap of moving distributed-temperature sensing (DTS) data from the wellsite to the engineer's office desktop. The software, known as the DTS database, translates DTS data simply and effectively into a database of temperature vs. depth.

Many different industries have used distributed temperature sensing (DTS) for years. The technology uses a fiber optic cable installed along or around the object observed. In production operations, the fiber is installed along a wellbore within a control line clamped to the tubing. A light box installed at the beginning of the fiber contains a laser that sends light pulses into the fiber. The light box then records the light as it bounces back from the fiber.

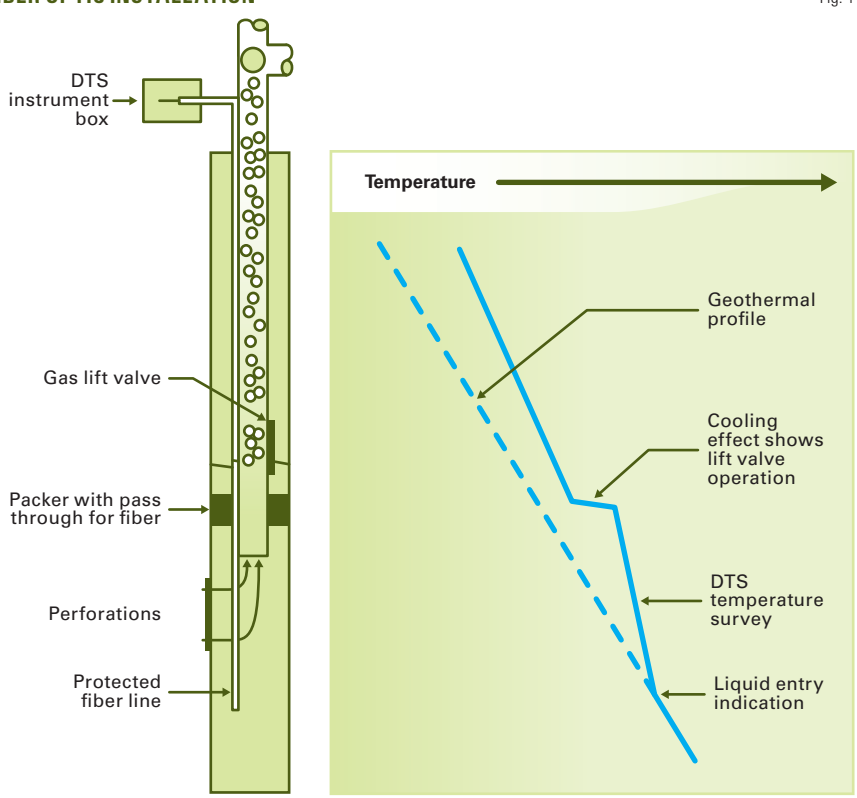
A part of the back-scattered light is temperature dependent and determining the average spectrum at different depths provides a means for obtaining the temperature along the object.

The fiber provides temperature readings at about 1-m intervals with a wide range of sample frequencies ranging from 30 sec to many hours. The number of light pulses used in calculating the spectrum dictates the accuracy of the temperature measured.

Fig. 1 illustrates a typical fiber cable installation and resulting temperature profile for a gas lifted well.

The DTS voluminous real-time data stream, transferred electronically to the engineer's desktop, provides timely well status.

FIBER OPTIC INSTALLATION Fig. 1



Data transfer limitations

Prior to Shell's rollout of the DTS database architecture, existing data handling systems had limitations. The systems gathered wellsite data in a proprietary file format and periodically transferred it to a remote, foreign server.

A proprietary process digested and manually interpreted the data, while a foreign database stored the data. To access the data, engineers logged into a website that displayed graphically the processed and partially interpreted data.

Engineers lacked confidence in data quality because of:

- Inability to precheck the raw DTS data.
- Uncertainty whether the service provider validated the raw data.

• Uncertainty about which data the service provider processed.

Additional concerns included:

• *Data security.* To access data, third parties needed to penetrate firewalls into the potentially vulnerable process-control domain.

• *Data ownership.* Data stored on foreign databases and computers were out of company control and potentially noncompliant with related company standards

• *Data formats.* Dependence on proprietary data formats limited the possibility of prechecking data.

• *Data analysis.* Lack of appropriate visualization tools limited data analysis.

Consequently, the operators were motivated to develop internal data acquisition, processing, visualization, and storage systems.

DTS data-handling changes

Shell defined a DTS data-handling architecture to overcome the previously mentioned problems (Fig. 2). It resolved security issues by having the software comply fully with associated Shell data security. The new architecture and security standards led to supplier independent data transfer and storage. This decoupled the DTS hardware from data handling, visualization, and interpretation.

The net effect enables selection of "fit for purpose" elements from different suppliers without changing the associated data-handling systems. It also allows for clearly defined and managed data ownership. With this architecture, engineers have access to raw data and can develop interpretation skills to translate the data into valuable assessments.

This architecture thus incorporated two key elements:

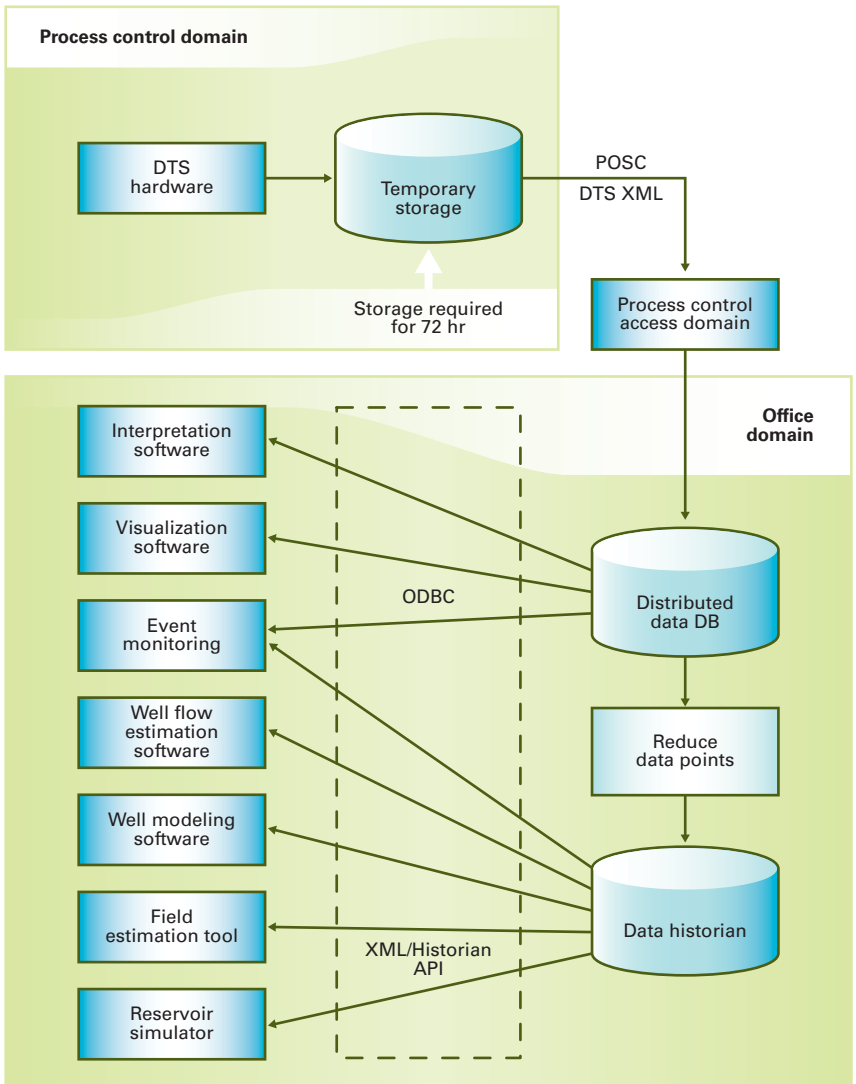
1. An industry-wide standard for DTS data exchange.
2. A database for storing DTS data.

Industry-wide format

In 2004-05, several members of the petrotechnical open standards consortium (POSC) formed a work

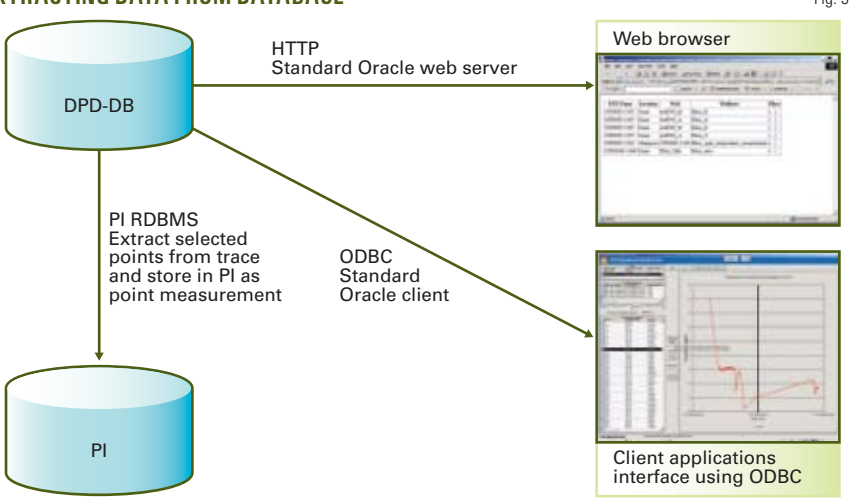
DTS ARCHITECTURE

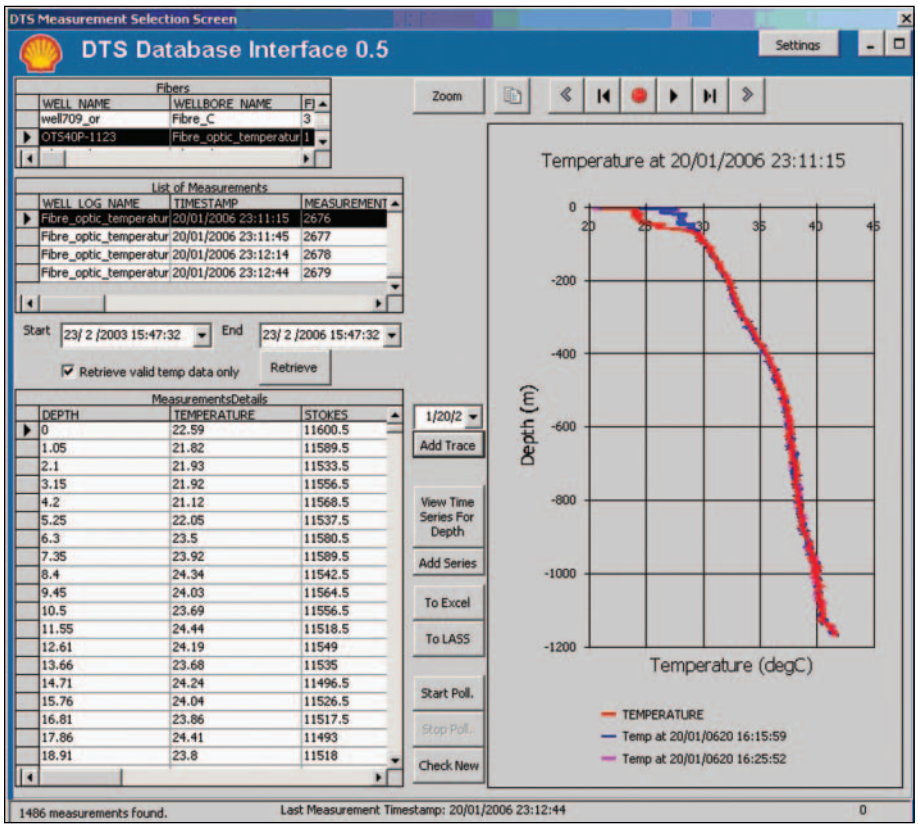
Fig. 2



EXTRACTING DATA FROM DATABASE

Fig. 3





This screen is the most common way for viewing DTS data. It shows the temperature at different time steps for a shut-in well (Fig. 4).

group to define a standard for DTS data exchange. POSC was an industry-wide organization that defined oil and gas industry data and data exchange standards. Prominent standard examples are the wellsite information transfer standard markup language (WITSML) used in drilling and the production markup language (PRODML) currently under development.

POSC has reorganized under the name Energistics (www.energistics.org).

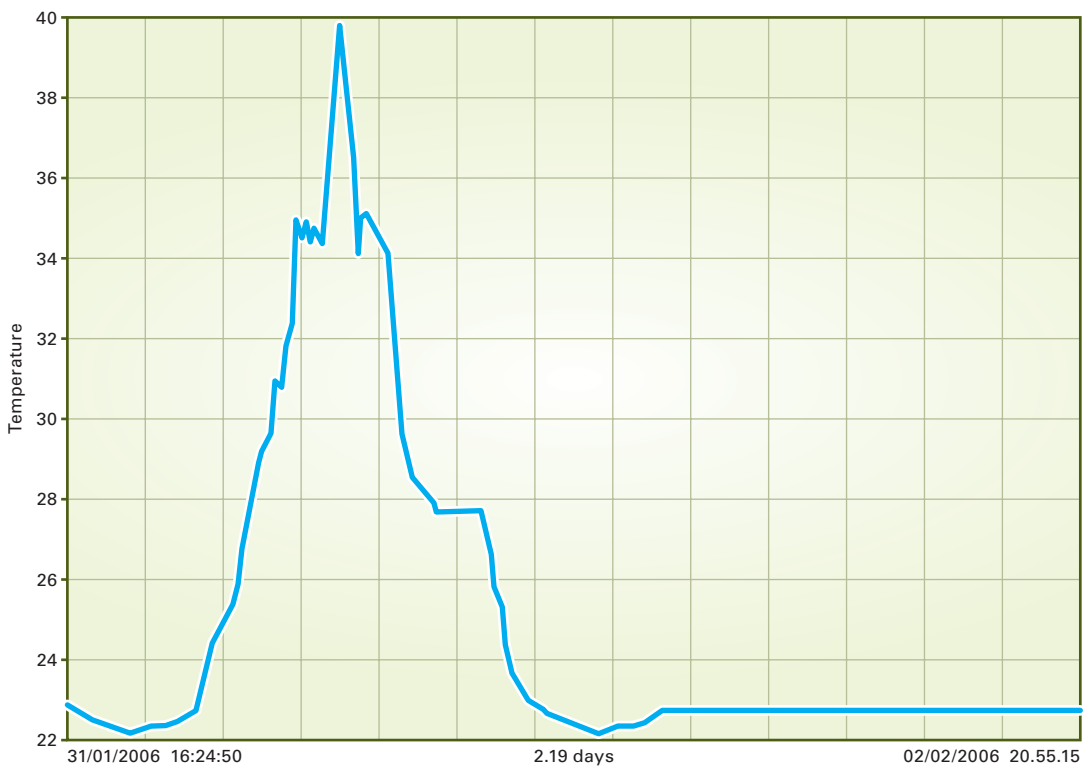
In third-quarter 2005, POSC integrated the final version of the DTS exchange standard with the latest WITSML version. Shell supports compliance with this standard for all DTS systems. At the time of this article, multiple vendors comply with this new DTS data-exchange standard.

An industry common interest group called subsea fiber optic monitoring group (SEAFOM), established in 2006, promotes the growth of fiber optics for subsea applications (www.seafom.com). SEAFOM also supports DTS data handling standard approach based on POSC and WITSML.

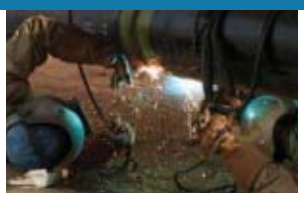
The DTS data-handling approach

DTS DATA DISPLAY

Fig. 5



Note: Fiber 6 depth 31 m.

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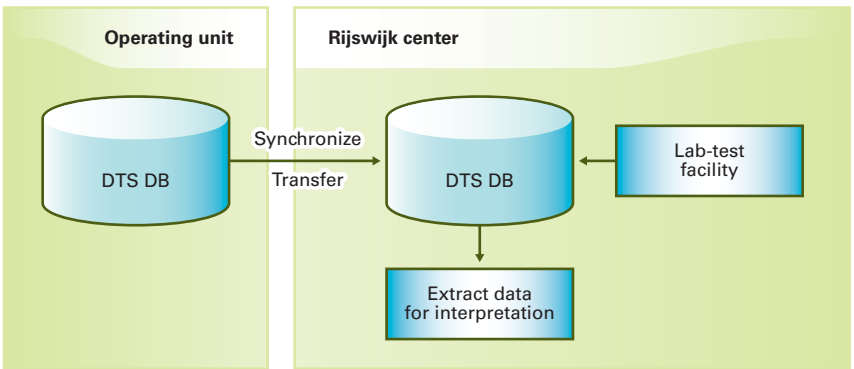
DTS INTERPRETATION FRAMEWORK

Fig. 6



described in this article fully complies with POSC-WITSML standards.

Data storage

Before Shell designed its new DTS database, a market survey showed that no existing generic database could be found to satisfactorily handle and store DTS data.

The primary reason for this is that DTS systems generate data vectors (temperature vs. depth vs. time) incompatible with standard industry control and data-acquisition systems that are designed for processing only individual, time series point measurements. Hence, Shell decided to develop a dedicated database for storage of distributed production data in-house.

The DTS database is relational and includes leveraging techniques such as processing extensible markup language (XML) files "on the fly" that use a standard hypertext transfer protocol (HTTP). It also has built-in data database security features, such as cyclic redundancy checking.

Large data volumes

DTS measurements provide voluminous data. The database, therefore, required a compression algorithm that ensures that the database only stores the latest trace if there are substantial changes from the previous acquisition.

An important part of this compression algorithm is the ability to specify zones of interest. The database only stores measurements with substantial changes in these zones, while ignoring changes outside these zones.

For example, temperature variations near the wellhead due to surface temperature could cause enough temperature change to trigger storage of traces. Additionally, one can configure the algorithm such that it stores data in a minimum interval, separate and distinct from temperature change.

Extracting data

The database provides several ways for extracting data (Fig. 3). One way to extract data to a spreadsheet uses open database connectivity (ODBC), with features such as:

- Plotting temperature vs. fiber length.
- Playing temperature development in time as in a movie.
- Plotting multiple traces in one graph.
- Showing temperature development in time at a selected depth.
- Zooming capabilities in fiber length and temperature.

Fig. 4 shows the most common means for viewing DTS data. It illustrates the temperature at different time steps for a shut-in well.

One can also view DTS data in the database with an internet browser using standard relational database web server features. This allows administrators and support staff to check on the status and data that are in the database without needing to install a viewer on the end user's personal computer. Also viewers are becoming available commercially.

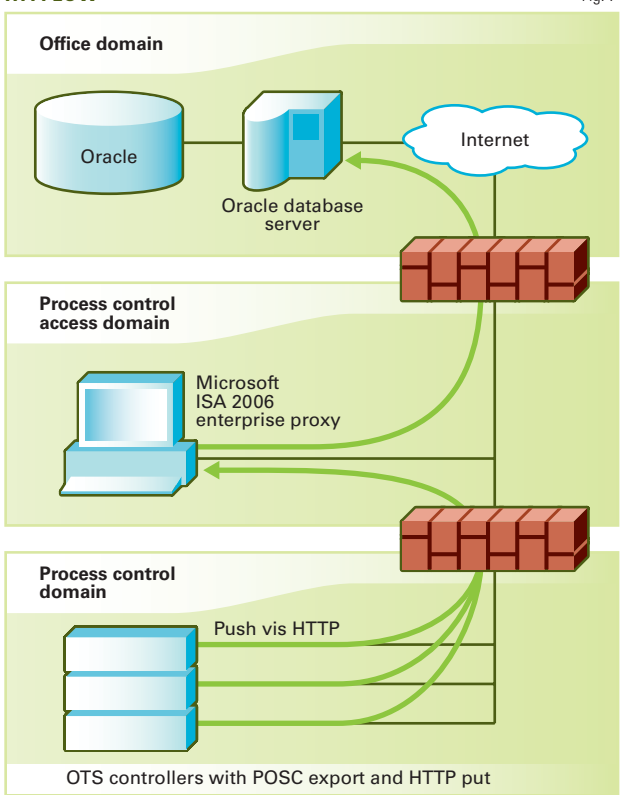
Another useful data-viewing possibility is a system for selecting data at a certain depth and storing this as a point measurement in the plant historian.

Shell has implemented this link with a standard historian to a relational database interface.

Fig. 5 is an example of a DTS data displayed in the historian. The plot shows DTS

DATA FLOW

Fig. 7



data exported to the historian at a depth of 31.85 m.

Remote expert center

A remote expert center for interpretation of DTS data required access to good quality data from numerous wells in various operating companies. Factors taken into account were:

- Operators may have legal requirements to control access to their data and may restrict access to selected individuals.
- Extraction of large data volumes could affect performance, especially if databases are around the globe with bandwidth limitations.

The DTS database has an inbuilt functionality for transferring data between different databases, inclusive of flags for controlling the sharing of data, thus preventing the sharing of restricted data. This allows operating companies to control shared data.

The DTS interpretation framework provides this functionality (Fig. 6).

Data security standards

The DTS database complies with Shell data security standards. Fig. 7 shows the path for the data transfer to the database.

The system has an HTTP post service installed between the process control domain and office domain and uses an HTTP post service for receiving XML files and transferring the data into the database.

DTS database status

Six Shell worldwide locations currently use the DTS database, including an expert center implementation for central support and remote "expert" data analysis.

The DTS database systems have operated for more than 2 years, confirming sustainable operations. Shell expects the installed base to grow with several more installations already on the drawing board.

Shell is gathering large volumes of DTS data for engineers and their skills are progressing in interpreting the data. As the understanding in interpreting DTS data increases, Shell has under development automatic monitoring and fingerprinting/pattern recognition so that engineers receive automatic notification of events occurring in wells.

These processes add value by supporting production optimization and surveillance such that engineers can spot potential well problems earlier, leading to improved production efficiency. ✦

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A recent study found that the more accurate methods for analyzing hydrogen consumption are the feed-total liquid product (TLP) H-content analysis and chemical analysis methods. These comparable methods were more accurate than using gas analyses alone.

Study compares methods that measure hydrogen use in diesel hydrotreaters

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Due to variability in the various methods used to determine chemical hydrogen consumption in pilot-plant testing, however, all three methods discussed in this article should be used.

The chemical analysis method can provide some insight into where and how much H_2 is consumed in the various reaction classes and the effects of processing conditions such as pressure, temperature, and space velocity. A properly designed and executed pilot-plant testing program can determine hydrogen consumption within ±2 normal cu m/cu m (±12 scf/bbl).

Obtaining an accurate estimate of the hydrogen requirement for the design of a grassroots or revamped diesel hydrodesulfurization (HDS) unit is important given the current global refining environment. There have been substantial increases in the capacity and operating severity of diesel HDS units worldwide in recent years.

In response to tightening of sulfur and other specifications of diesel fuels, many refiners have built or plan to build grassroots diesel HDS units and almost all refiners have revamped or plan to revamp existing units (OGJ, Oct. 23, 2006, p. 28). Consequently, the consumption of hydrogen has increased substantially.

With today's natural gas prices, hydrogen consumption can account for more than 80% of the variable operating costs of a diesel HDS unit. It is therefore important to obtain an accurate estimate of the hydrogen requirement when designing a grassroots or revamped diesel HDS unit.

And because the hydrogen requirement is strongly dependent on the feedstock and design conditions, conducting pilot-plant tests using the design feedstock is important.

Several different methods can determine the chemical hydrogen consumption in pilot-plant testing. This article compares chemical H_2 consumption calculated by various methods and discusses advantages and shortcomings of each and their applicability to commercial diesel HDS and other hydroprocessing units.

Measuring H_2 consumption

In a pilot-scale diesel HDS test unit, as in a commercial HDS unit, Equation 1 (see attached Equation box) can represent the hydrogen balance. Two commonly used methods for determining chemical hydrogen consumption, in mass per unit time, are represented in Equations 2 and 3, which derive from Equation 1.

The first method (Equation 2) requires measuring flow rates and hydrogen content in the feed and TLP as well as flow rates and compositions, such as light hydrocarbons, H_2S, H_2O, and NH_3, in all offgas streams. The second method (Equation 3) requires only the flow rates and H_2 analyses of the makeup gas and all offgas streams.

Because hydrogen consumption is commonly expressed as N cu m/cu m (normal cu m of hydrogen/cu m of oil, at 0° C. and 1 atm) or scf/bbl, Equations 2 and 3 can be rearranged to calculate the volumetric H_2 consumption per unit volume of oil feed.

For example, Equations 4 and 5 can determine hydrogen consumption in N cu m/cu m.

In addition to these two methods, one can determine total chemical hydrogen consumption by calculating the sum of the stoichiometric hydrogen consumption for each class of

Equations

$$M_f * H_f + M_{mg} * H2_{mg} = M_p * H_p + M_{og} * H_{og} + M_{og} * H2_{og} \quad (1)$$

$$CH2 = (M_p * H_p) + (M_{og} * H_{og}) - (M_f * H_f) \quad (2)$$

$$CH2 = (M_{mg} * H2_{mg}) - (M_{og} * H2_{og}) \quad (3)$$

$$CH2\ (N\ cu\ m/cu\ m) = [(Y_p * H_p) + (Y_{og} * H_{og}) - H_f] * (SG_f / SG_{H2}) \quad (4)$$

$$CH2\ (N\ cu\ m/cu\ m) = [(Y_{mg} * H2_{mg}) - (Y_{og} * H2_{og})] * (SG_f / SG_{H2}) \quad (5)$$

$$CH2\ (N\ cu\ m/cu\ m) = CH2_{HDS} + CH2_{HDN} + CH2_{HDO} + CH2_{OLF} + CH2_{ARO} \quad (6)$$

$$CH2_{HDS} = 0.0252 * SG_f * [S_f - (S_p * SG_p / SG_f * Y_p)] \quad (7)$$

$$CH2_{HDN} = 0.08 * SG_f * [N_f - (N_p * SG_p / SG_f * Y_p)] \quad (8)$$

$$CH2_{HDO} = 0.05 * SG_f * [(O_f) - (O_p * SG_p / SG_f * Y_p)] \quad (9)$$

$$CH2_{OLE} = 1.4 * SG_f * [(BR_f) - (BR_p * SG_p / SG_f * Y_p)] \quad (10)$$

$$CH2_{ARO} = 3.3 * SG_f * [(PA_f) - (PA_p * SG_p / SG_f * Y_p)] + 3 * SG_f * [(MA_f) - (MA_p * SG_p / SG_f * Y_p)] \quad (11)$$

$$C_mH_nS + X_{HDS}\ H_2 \rightarrow C_mH_{n+2*(X-1)} + H_2S \quad (12)$$

$$C_mH_nN + X_{HDN}\ H_2 \rightarrow C_mH_{n+(2*X-3)} + NH_3 \quad (13)$$

$$CH2_{HDS} = 0.0252 * SG_f * [(S_f) - (S_p)] \quad (14)$$

$$CH2_{HDN} = 0.08 * SG_f * [(N_f) - (N_p)] \quad (15)$$

$$CH2_{HDO} = 0.05 * SG_f * [(O_f) - (O_p)] \quad (16)$$

$$CH2_{OLE} = 1.4 * SG_f * [(BR_f) - (BR_p)] \quad (17)$$

$$CH2_{ARO} = 3.3 * SG_f * [(PA_f) - (PA_p)] + 3 * SG_f * [(MA_f) - (MA_p)] \quad (18)$$

Nomenclature

BR_f	=	Bromine number in feed
BR_p	=	Bromine number in total liquid product
$CH2$	=	Chemical hydrogen consumption, kg/hr or lb/hr
$CH2$	=	H_2 consumption by aromatics saturation, N cu m/cu m
$CH2_{HDN}$	=	H_2 consumption by HDN, N cu m/cu m
$CH2_{HDO}$	=	H_2 consumption by HDO, N cu m/cu m
$CH2_{HDS}$	=	H_2 consumption by HDS, N cu m/cu m
$CH2_{OLE}$	=	H_2 consumed by olefins saturation, N cu m/cu m
H_f	=	Hydrogen content in feed, fraction
H_{og}	=	Hydrogen content in offgas (except free H_2), fraction
H_p	=	Hydrogen content in total liquid product, fraction
$H2_{mg}$	=	Free hydrogen in makeup gas, fraction
$H2_{og}$	=	Free hydrogen in offgas, fraction
M_f	=	Mass flow of feed, kg/hr or lb/hr
M_{mg}	=	Mass flow of makeup gas, kg/hr or lb/hr
M_{og}	=	Mass flow of offgas, kg/hr or lb/hr
M_p	=	Mass flow of total liquid product, kg/hr or lb/hr
MA_f	=	Monoaromatics (including conversion from polyaromatics) in feed, wt %
MA_p	=	Monoaromatics (including conversion from polyaromatics) in total liquid product, wt %
N_f	=	Nitrogen in feed, ppm (wt)
N_p	=	Nitrogen in total liquid product, ppm (wt)
O_f	=	Oxygen in feed, ppm (wt)
O_p	=	Oxygen in total liquid product, ppm (wt)
PA_f	=	Polyaromatics in feed, wt %
PA_p	=	Polyaromatics in total liquid product, wt %
S_f	=	Sulfur in feed, ppm (wt)
S_p	=	Sulfur in total liquid product, ppm (wt)
SG_f (Eqs. 4 and 5)	=	Specific gravity of feed at 0° C.
SG_f (Eqs. 6-11)	=	Specific gravity of feed at 60° F.
SG_{H2}	=	Specific gravity of hydrogen at 0° C. At 1 atm = $0.9*10^{-5}$
SG_p	=	Specific gravity of total liquid product at 60° F.
Y_{mg}	=	Mass flow ratio of makeup gas to feed = M_{mg}/M_f
Y_{og}	=	Offgas yield in fraction = M_{og}/M_f
Y_p	=	Total liquid product yield in fraction = M_p/M_f

hydrogen-consuming chemical reactions, such as HDS (for sulfur conversion), hydrodenitrogenation (HDN), hydrodeoxygenation (HDO), olefins saturation, and aromatics saturation (Equation 6).

Experimental program

Petrobras plans to install a grassroots diesel HDS unit to produce ultralow-sulfur diesel (ULSD) in its Alberto Pasqualini Refinery, Canoas, RS, Brazil (REFAP SA).

REFAP solicited and received design proposals from several process licensors. To assist in evaluating the various process design proposals, REFAP contracted PetroTech Consultants LLC to plan and execute a catalyst testing program to compare the catalyst systems proposed by the various vendors and licensors.

The pilot plant and lab facility of Intertek-PARC Technical Services, Pittsburgh, were used to carry out the testing program.

Table 1 shows the feed properties. The design feed for the new diesel HDS unit consists of 62 vol % straight-run heavy gas oil, 10 vol % coker light gas oil, and 28 vol % FCC light cycle oil.

The test program encompassed running multiple reactors, each loaded with a different catalyst system proposed by one of the vendors and licensors, for a range of processing conditions for treating the design feed. Test results include yields and product qualities (sulfur, cetane, aromatics, etc.) as well as hydrogen consumption at the various processing conditions for each of the catalyst systems.

This article discusses only the results for hydrogen consumption.

Typical feed properties

Table 1

Gravity, °API	21.0
Specific gravity	0.9279
Total sulfur, ppm (wt)	6,400
Total nitrogen, ppm (wt)	2,200
Aromatics by SFC, wt %	
Monoaromatics	32.0
Polyaromatics	28.8
Total aromatics	60.8
Bromine number	12.5
Hydrogen, wt %	11.5
Cetane index, ASTM D-4737	33.2

Results comparison

In pilot-plant testing, the most common method used to determine chemical H_2 consumption is Equation 4, which requires measuring H_2 in the feed and TLP. This method is accurate, for any single data point, to about ±10 N cu m/cu m or 60 scf/bbl, due to analytical test accuracy of measuring hydrogen in the feed or TLP of ±0.1 wt %. Variability in mass flow measurement

H_2 CONSUMPTION VARIABILITY

Fig. 1

Fig. 1a

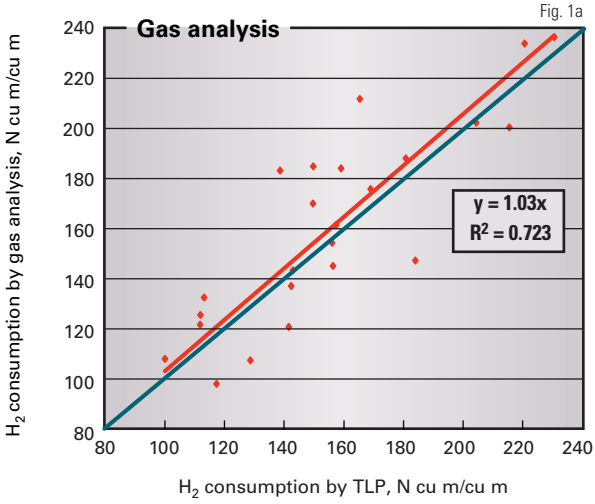
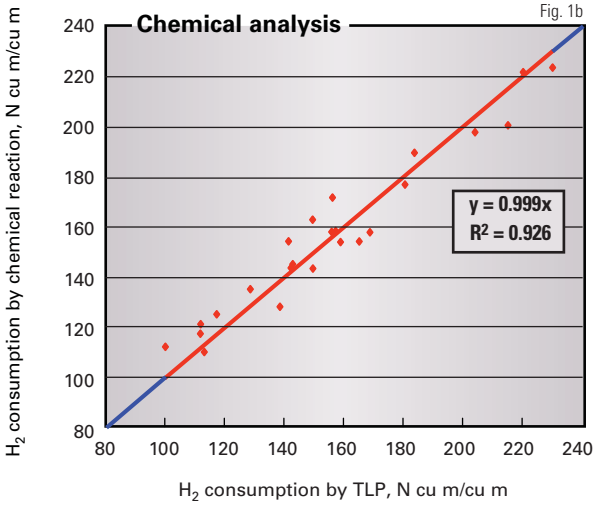


Fig. 1b



H_2 CONSUMPTION

Fig. 2

Fig. 2a

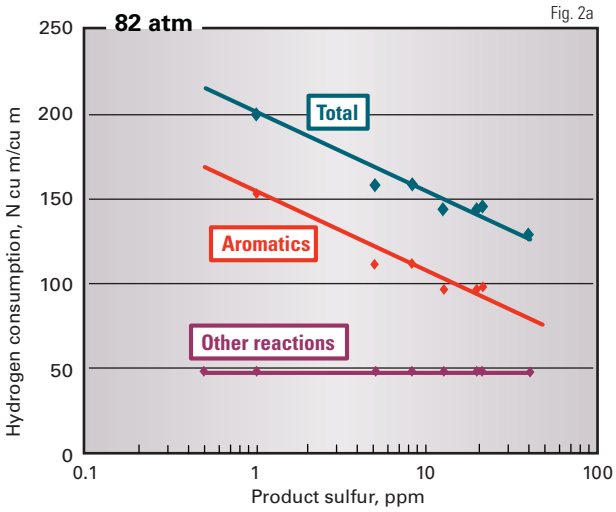
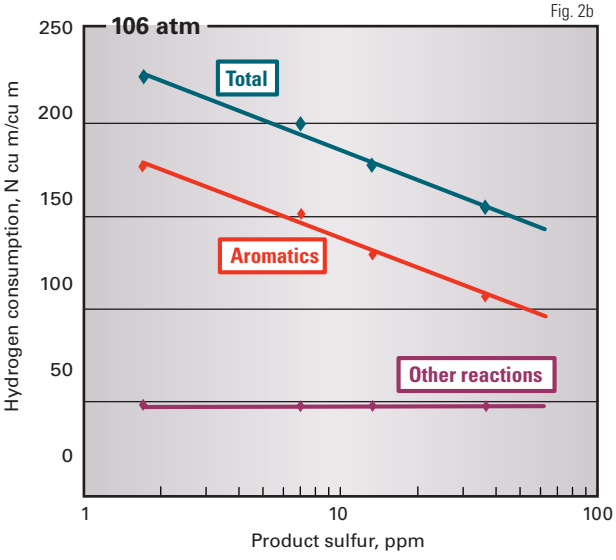


Fig. 2b



of feed and liquid and gas products, however, can add to variability in the H_2 consumption determination.

To assess the variability of hydrogen consumption results calculated by other methods, we compared results of Method 2 (Equation 5) and Method 3 (Equations 6-11) against those from Method 1 (Figs. 1a and 1b).

Fig. 1a compares H_2 consumption by gas analysis (Equation 5) with that of feed-TLP-H-content method (Equation 4). Although the bias (represented by the slope of the curve of 1.03 vs. the parity line) is good, H_2 consumption from gas analysis varies significantly vs. that of the feed-TLP-H-content method.

The variance, represented by an R^2 of 0.723, is poor and the standard deviation of 20.7 N cu m/cu m (123 scf/bbl) means that the gas analysis method is unacceptable as a replacement for the feed-TLP-H-content method.

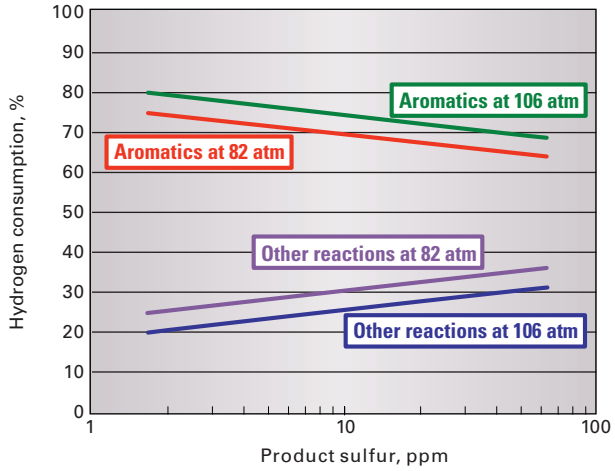
This is understandable because H_2 consumption calculated from Equation 5 is based on the small difference between mass flow rates in the makeup gas and offgas streams. Accuracy of the mass flow measurement of the offgas stream is usually poorer relative to flow measurements of feed or makeup gas.

This problem is exacerbated due to the varying composition of the offgas streams, which may contain various amounts of light hydrocarbons (C_1-C_5) as well as H_2S, NH_3, and N_2 obtained at different treating severities. Calibrating the feed hydrogen and offgas meters at the beginning of the run eliminates any bias.

Fig. 1b compares H_2 consumption by chemical analysis method, Equations 6-11, with that of the feed-TLP method. Agreement between the two methods, represented by a curve slope of 0.999, is excellent and the variance (R^2= 0.926 with a standard deviation of 8.7 N cu m/cu m or 52 scf/bbl) is reasonable. The H_2 consumption by the chemical analysis method is therefore an acceptable alternative to the feed-TLP method.

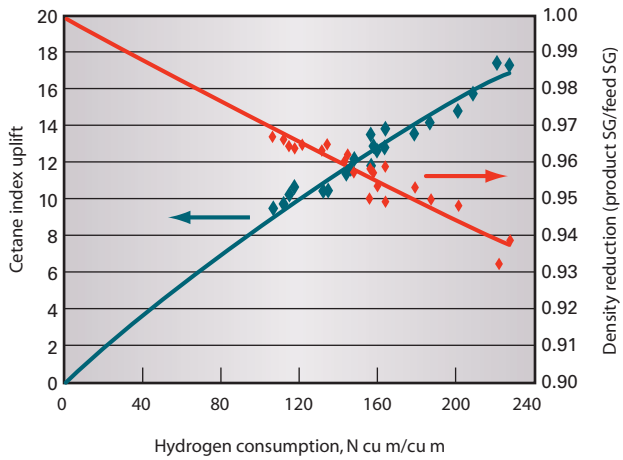
AROMATICS VS. OTHER REACTIONS

Fig. 3



DIESEL EFFECT

Fig. 4



One major benefit of the chemical analysis method is that it allows an estimate of where the H_2 is consumed amongst the various reaction classes.

Hydrogen consumption

Equations 7-11 estimate the amount of H_2 consumed in the various reaction classes. For example, Table 2 shows hydrogen consumption via the various reaction classes to produce ULSD from the feedstock in Table 1 at 82 atm.

Table 2 shows that only 30% of all hydrogen consumption is due to all nonaromatics, which are consumed roughly in equal amounts by HDS, HDN, and olefin saturation (for the feed in Table 1). For comparison, monoaromatics consume almost 30% and polyaromatics consume about 40% of the total chemical hydrogen.

The amount of H_2 consumption by nonaromatics stays relatively constant at various product sulfur levels, while H_2 consumption by aromatics continues to increase significantly with decreasing product sulfur level resulting from increasing hydrotreating severity.

Figs. 2a and 2b show this trend. Fig. 3 shows that the percent of H_2 consumption by aromatics increases with decreasing product sulfur and increasing hydrogen partial pressure.

H_2 CONSUMPTION

Table 2

	Feed	Product	— H_2 consumption — cu m/cu m	% of total
Total sulfur, ppm (wt)	6,400	8.3	15.0	9.4
Total nitrogen, ppm (wt)	2,200	8.0	16.3	10.3
Olefins bromine number	12.5	—	16.3	10.3
Total nonaromatics			47.6	30.0
Monoaromatics, wt %	32.0	*38.7	45.7	28.8
Polyaromatics, wt %	22.8	7.7	65.2	41.2
Total aromatics, wt %	60.8	45.5	110.9	70.0
Total			**158.5**	**100.0**

*Monoaromatics in product includes conversion from polyaromatics.

Accuracy of hydrogen analyses

The accuracy of any single hydrogen analysis is about ±10 N cu m/cu m, or 60 scf/bbl given normal laboratory conditions. This accuracy can improve, however, if one averages multiple analyses.

A typical pilot study will often include many different catalysts and operating conditions giving 20 or more determinations of hydrogen consumption. If the errors in hydrogen consumption determination are random (unbiased), which they usually are, then value-averaging reduces the error in determining hydrogen consumption by a factor of $1/N^{1/2}$ where N is the number of hydrogen consumption determinations.

Twenty experiments would improve the accuracy to ±2 N cu m/cu m or 12 scf/bbl.

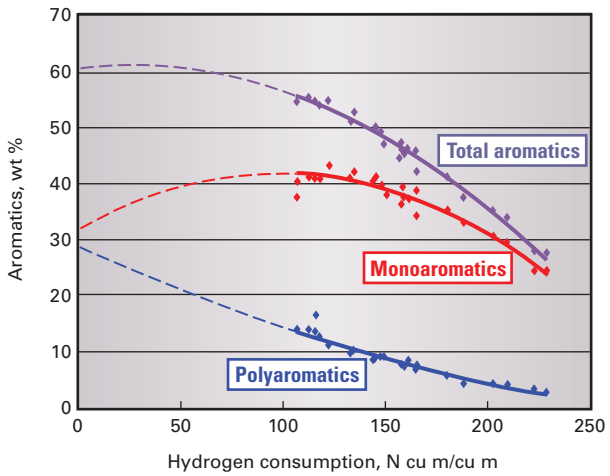
Product quality improvement

Although the increase in hydrogen consumption does not seem to dramatically reduce the product sulfur level to less than 100 ppm (wt) (Figs. 2a, 2b, and 3), it does significantly improve other diesel product qualities, such as increased cetane index and reduced density (Fig. 4). This improvement in diesel quality primarily results from increasing conversion of polyaromatics and monoaromatics (Fig. 5).

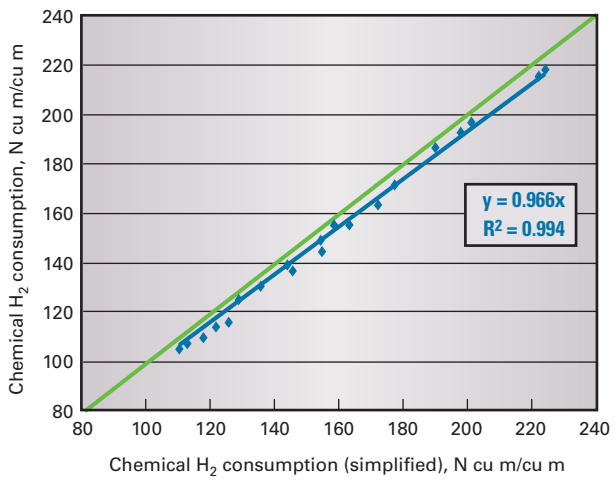
Hydrogen consumption is a strong function of feed quality and operating pressure (OGJ, May 15, 2006, p. 48). The extent of aromatic saturation is much greater at a higher pressure and lower space velocity of ULSD units designed for aromatic feeds.

The combination of more-severe conditions and higher feed aromatic content gives much higher hydrogen consumption. Depending on the relative values of hydrogen and diesel, the volume swell that results from polynuclear aromatic and aromatic saturation during the production of ULSD might not fully offset the cost of hydrogen that is required for aromatic saturation.

AROMATICS SATURATION Fig. 5



SIMPLIFIED EQUATIONS Fig. 6



Cetane additives can improve the cetane of ULSD products that meet all specifications except cetane number. Cetane increases of 5-10 numbers are possible at treatment costs of about 0.1 ¢/gal-cetane number.

Actual cetane uplift and treatment costs depend on the composition and base cetane of the diesel fuel; therefore, actual costs are site-specific. Its effectiveness decreases and cost increases as dosage level is increased. The use of a cetane improver additive is often a more cost-effective way of increasing diesel cetane than aromatic saturation.

Commercial unit

In addition to chemical H_2 consumption, some H_2 will be lost due to solution losses, purge losses, and mechanical losses in a commercial ULSD unit as in any other hydrotreating unit. Sufficient fresh hydrogen must be supplied to the ULSD unit to meet product-quality specifications and achieve the catalyst cycle length target.

Solution loss is H_2 that leaves the reactor circuit dissolved in liquid hydrocarbon leaving the high-pressure separators. Increased H_2 partial pressure at the product separator will increase solution losses. Typical ULSD solution losses are 2-10 N cu m/cu m or 12-60 scf/bbl.

Purge loss is H_2 that leaves the reactor circuit in a recycle gas purge to improve recycle gas purity. Mechanical loss is H_2 that is lost through mechanical leakage from the makeup and recycle gas compressors, i.e., packing vents and seals.

Depending on the unit's design, solution and mechanical losses may be 10-20% of the total H_2 consumption; purge losses are under operator control. Purging minimizes the buildup of light hydrocarbon gases as well as H_2S for units without an amine absorber. Typical losses for purging range from 3% to 20%, depending on makeup gas H_2 purity, H_2 consumption, and H_2S levels in the recycle gas, with higher purge losses for units without an amine absorber.

Derivation of Equations 7-11

For sulfur-removal reactions, Equation 12 shows the generic HDS reaction. X_{HDS} is the stoichiometric H_2 consumption (molar ratio of H_2 to hydrocarbon) of the generic HDS reaction.

For example, X_{HDS} = 1 for mercaptans, 2 for sulfides, 3 for disulfides, 3 for benzothiophenes (or 6 if the adjacent benzo-ring is saturated), 4 for thiophenes, and 2 for di-benzothiophenes (or 5 if one of the adjacent dibenzo rings is saturated). For a typical diesel feedstock, an average molar ratio of 3.6 is assumed.

To calculate H_2 consumption for all HDS reactions, these assumptions apply:

- Basis: 1 cu m of feed: $(1{,}000 * SG_f)$ = kilograms of feed.
- Total sulfur in feed, kg = $1{,}000 * (S_f * 10^{-6}) * SG_f$.
- Total sulfur in total liquid product, kg = $1{,}000 * (S_p * 10^{-6}) * SG_p$ * TLP yield.
- Total sulfur removed by all HDS reactions, kg-mole = $1{,}000 * 10^{-6} * SG_f * [(S_f) - (S_p * SG_p / SG_f * \text{TLP Yield})] / 32$.
- Total H_2 consumed, kg-mole = X_{HDS} * total S removed, kg-mole.
- Total H_2 consumed, N cu m = 3.6 * 22.41 cu m/kg-mole * total H_2 consumed, kg-mole.

The total H_2 consumed by HDS in N cu m of H_2/cu m of feed is calculated from Equation 7:

$$CH2_{HDS} = 0.0252 * SG_f * [(S_f) - (S_p * SG_p / SG_f * Y_p)]$$

Similarly, for nitrogen-removal reactions, Equation 13 shows the generic HDN reaction. X_{HDN} is the stoichiometric hydrogen consumption (molar ratio of H_2 to hydrocarbon) of the generic HDN reaction.

For example, X_{HDN} = 1 for primary amines, 2 for secondary amines, 3 for tertiary amines, 1 for anilines, 4 for pyroles, 6 for indoles, and 7 for quinolines or carbazoles. For a typical diesel feedstock, an average molar ratio of 5.0 is assumed.

Given a basis of 1 cu m of feed: $1,000 * SG_f$ = kilograms of feed.

- Total nitrogen in feed, kg = $1,000 * (N_f * 10^{-6}) * SG_f$.
- Total nitrogen in TLP, kg = $1,000 * (N_p * 10^{-6}) * SG_p$ * TLP yield.
- Total nitrogen removed via all HDN reactions, kg-mole = $1,000 * 10^{-6} * SG_f * [(SG_f * N_f) - (N_p * SG_p / SG_f * \text{TLP yield})] / 14$.
- Total H_2 consumed, kg-mole = X_{HDN} * total nitrogen removed, kg-mole.
- Total H_2 consumed, N cu m = 5.0 * 22.41 cu m/kg-mole * total H_2 consumed, kg-mole.

Equation 8 shows the total H_2 consumed by HDN in N cu m of H_2/cu m of feed.

A similar approach can estimate the H_2 consumption by oxygen-removal reactions (Equation 9 and assuming a stoichiometric hydrogen molar ratio $X_{HDO} = 5$). The organic oxygen content, however, in most diesel feeds is negligible; therefore the amount of H_2 consumed by HDO reactions is negligible.

Olefins saturation

Bromine number is usually used to measure olefin content. Bromine will react with the amount of carbon double-bonds in the oil. This method is used to calculate H_2 consumption, given a basis of 1 cu m of feed:

- Feed $(1,000 * SG_f)$ = kg of feed.
- Total double bonds in feed, kg = $1,000 * (BR_f / 100) * SG_f$.
- Total double bonds in TLP, kg = $1,000 * (BR_p / 100) * SG_p$ * TLP yield.
- Total double bonds removed, kg-mole = $1,000 / 100 * SG_f * [(BR_f) - (BR_p * SG_p / SG_f * \text{TLP yield})] / 159.8$.
- Total H_2 consumed, N cu m = 22.41 (cu m/kg-mole) * total H_2 consumed, kg-mole.

Equation 10 is then used to calculate total H_2 consumed by olefins in N cu m of H_2/cu m of feed.

Aromatics saturation

Under typical hydrotreating conditions, polyaromatics will undergo a multi-step hydrogenation to monoaromatics, which are further hydrogenated to cyclic saturates: 4-ring aromatic + (1-2) H_2 → 3-ring aromatic + (1-2) H_2 → 2-ring aromatic + (1-2) H_2 → 1-ring aromatic + 3 H_2 → cyclic saturates.

The extent of the conversion from polyaromatics to monoaromatics depends strongly on the reactor's operating pressure and catalyst type. The single-ring aromatics are much more difficult to hydrogenate to cyclic saturates. All of the reaction steps are reversible.

For typical diesel feeds, multiring aromatics may contain up to 4-ring aromatics, depending on the cut point. To estimate H_2 consumption for all polyaromatics to monoaromatics, we assumed a stoichiometric H_2 consumption (molar ratio of H_2 to hydrocarbon) of 3.3. For monoaromatics to cyclic saturates, we used a stoichiometric H_2 consumption of 3.0.

Equation 11 calculates the total H_2 consumption by aromatics saturation.

In pilot plant or commercial units in which the specific gravity and yield of the TLP are not unavailable, Equations 7-11 can be further simplified to Equations 14-18 by assuming the term $(SG_p / SG_f * \text{TLP yield}) = 1$.

The H_2 consumption results obtained from the simplified Equations 14-18 differ from the results from original Equations 7-11 by only 3.34% (Fig. 6). ✦

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DEFECT ASSESSMENT—Conclusion

Modified Ln-Secant equation improves failure prediction

John F. Kiefner
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Limitations in the original Ln-Sec equation prompted development of a modified equation better suited thru the original equation for remaining life assessments. The modified Ln-Sec equation described in this concluding article slightly improves the failure stress prediction capability of the original. Even when including two poorly-fitting points, the modified Ln-Sec equation shows better correlation with the database of 35 full-scale experiments than the original Ln-Sec equation.

Excluding the X100 experiments yields an average ratio of actual failure stress to predicted failure stress of 1.10, with a standard deviation of 0.13. This ratio would likely exceed 0.84 in 97.5% of cases and the two poorly fitting points should be discounted.

Similar experiments appear to fit the modified model. Because it eliminates the shallow-flaw limitations of the original equation, the modified Ln-Sec equation can perform remaining life assessments for materials with sub-optimal toughness and establish flaw size following a hydrostatic pressure test in any line pipe material in common usage.

Modified equation

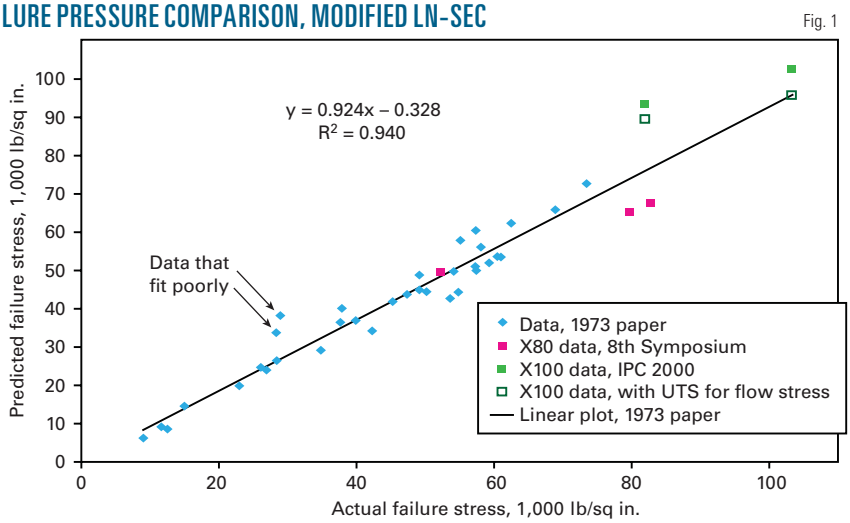
The usefulness of a closed-form solution for predicting defect failure pressures in pipes makes it worth having a modified Ln-Sec equation which avoids the deficiency described in Part 1 of this article. Developing an improved Ln-Sec equation would seem to entail altering the original equation so the ln-sec correction becomes defect-depth dependent. When the depth of the defect is zero, the correction should converge to a value of $\pi/2$.

Equation 1 is the original Lu-Sec equation. If corrected properly for a defect of zero depth, Equation 1 would default to Equation 2, and the predicted failure pressure for any length of zero-depth defect would be the burst pressure of the pipe. For depth-to-thickness ratios greater than zero, the inverse Ln-Sec correction should decrease from a value of $\pi/2$ at depth-WT = 0, causing only small corrections to defects with depth-WT ratios greater than 0.4.

Equation 3 would seem to do this, yielding the predicted hoop stress at failure.

Comparing the modified Ln-Sec equation to the set of full-scale experi-

FAILURE PRESSURE COMPARISON, MODIFIED LN-SEC Fig. 1



ments used to validate the original model demonstrates its validity.

Fig. 1 shows this comparison, presenting the data reanalyzed with the modified Ln-Sec equation. Its plot has a higher R2 ratio than the plot based on the original Ln-Sec equation (0.94 vs. 0.92) and the point corresponding to the test with a notch depth-WT of 0.25 has moved much closer to the trend line (OGJ, Oct. 6, 2008, p. 78).

Points for two of the reanalyzed tests, however, moved away from the trend line on the nonconservative side. They had the lowest Charpy energies in the entire data set (about 15 ft-lb full-size-equivalent). But this may not explain their poor fit. A number of other points representing low-Charpy-energy materials fit well.

The ratios of actual-to-predicted failure stress for the two poorly fitting points measure 0.75 and 0.84. The ratios of actual-to-predicted failure stress for the other tests range from 0.88 to 1.44. Without the two poorly fitting points and the one X100 experiment, the minimum measures 0.94. These two poorly fitting points should not invalidate the modified Ln-Sec equation given that the rest of the data except for the X100 material show good correlation between predicted and actual failure stresses.

Remaining-life assessments

The modified Ln-Sec equation can calculate remaining life for longitudinally oriented defects. The method applies to corrosion, stress corrosion cracking, or any defect-growth mechanism for which growth can reasonably be assumed to be linear with time and can be estimated with reasonable certainty.

The method also can apply to growth by pressure-cycle-induced fatigue. This growth, however, is nonlinear with time and requires continuing reassessment of failure stresses as cycles accumulate. A discussion of the evaluation of pressure-cycle-fatigue-crack growth lies beyond the scope of this article.

Fig. 2 shows relationships generated for 12.75-in. OD, 0.25-in WT, X52 material, assuming the material has a 15 ft-lb upper shelf Charpy energy (full-size equivalent).

The remaining defect life equals the time it takes for a defect barely surviving integrity assessment to grow to a size causing the pipe to fail at operating pressure. Representing a defect barely surviving integrity assessment as having a failure pressure of 100% SMYS is reasonable. Any larger defects would have failed in a hydrostatic test to that level or been repaired if detected by in-line inspection. If operating pressure corresponds to 72% SMYS, then the remaining life of the defect corresponds to the time it takes for a 28% reduction in failure pressure.

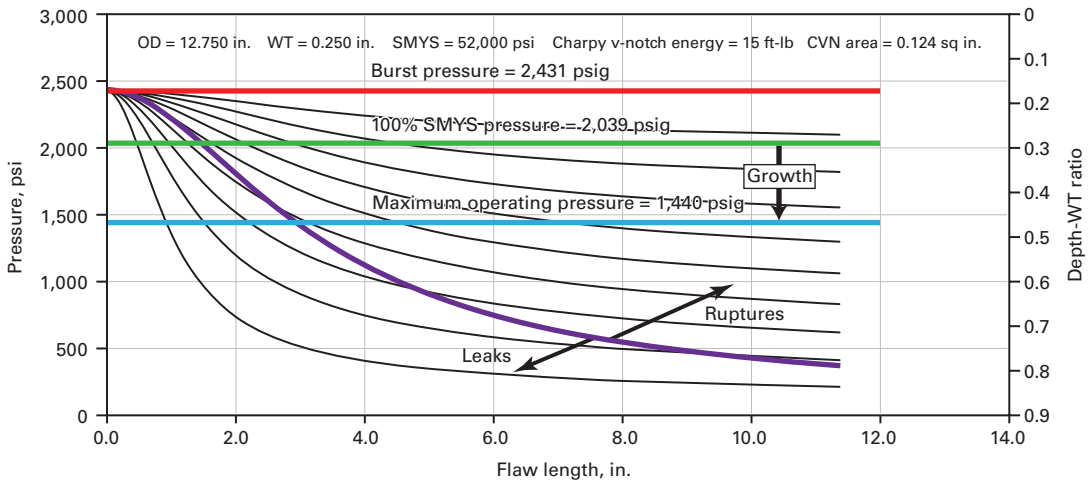
Fig. 2 shows the 100% SMYS pressure level as a horizontal line at 2,039 psig and the operating pressure as a horizontal line at 1,440 psig. If one assumes a given defect will grow only in depth, not length, then the vertical distance between these two horizontal lines represents the amount of growth in depth corresponding to the remaining life of the defect.

A 10-in. long defect intersects the horizontal line representing the test pressure of 2,039 psig at a depth-WT of 0.12. The horizontal line representing an operating pressure of 1,440 psig intersects a vertical line drawn at 10 in. on the length axis at a depth-WT ration of 0.36.

An arrow on Fig. 2 shows this growth. The growth of this defect equals 24% of the 0.25-in. wall thick-

REMAINING LIFE CALCULATIONS, MODIFIED LN-SEC

Fig. 2



TIME TO FAILURE, MODIFIED LN-SEC EQUATION

Defect length, in.	WT, in.	Depth-WT ratio Initial	Depth-WT ratio Final	Depth-WT ratio Change	Growth, in.	Years-to-failure, 6 mil/year
10	0.25	0.12	0.36	0.24	0.06	10
8	0.25	0.14	0.38	0.24	0.06	10
6	0.25	0.16	0.42	0.26	0.065	11
4	0.25	0.22	0.53	0.31	0.0775	13
2	0.25	0.42	0.73	0.31	0.0775	13

Equations

$$\sigma_{fs} = \left(\frac{\bar{\sigma}}{M_P}\right)\left(\frac{2}{\pi}\right)\cos^{-1}(e^{-x}) \quad (1)$$

Where:

$$x = \left(\frac{12\frac{CVN}{A_c}E\pi}{8c\bar{\sigma}^2}\right)$$

$$\frac{\sigma_{fs}}{\bar{\sigma}} = \frac{A_0 - A}{A_0 - A\left(\frac{1}{M_T}\right)} \quad (2)$$

$$\sigma_{fs} = \left(\frac{\bar{\sigma}}{M_P}\right)\cos^{-1}(e^{-x})/(\cos^{-1}(e^{-y})) \quad (3)$$

Where:

$$x = \left(\frac{12\frac{CVN}{A_c}E\pi}{8c\bar{\sigma}^2}\right)$$

$$y = \left(\frac{12\frac{CVN}{A_c}E\pi}{8c\bar{\sigma}^2}\right)\left(1 - \left(\frac{d}{t}\right)^{0.8}\right)^{-1}$$

ness, or 0.06 in. If the defect grows at a rate of 6 mils/year (0.006 in./year), 60 mils of growth would take 10 years, the remaining life of the defect.

Repeating this process for defects of other lengths (2 in., 4 in., 6 in., etc.) yields the times to failure shown in the accompanying table. Remaining life stands as practically independent of defect length for defects longer than $\sqrt{Dt}$ and integrity assessment to 100% SMYS guarantees about 10 years. A prudent operator will, of course, prevent the remaining life from running out, instead scheduling remediation. A widely accepted practice suggests remediation when half the remaining life has expired, assuring a safety factor on remaining life of 2. ✦

Equipment / Software / Literature

New software suite aids sesimic computing efficiency

Newly released CUDA 2.0, the latest version of C language programming environment for graphics processing units, enables software developers to tap into the massively parallel architecture of the GPU for the acceleration of complex computational problems.

This latest production release of the CUDA software suite includes support for 32 and 64-bit Windows Vista and Mac OS X as well as 3D textures and hardware interpolation to increase the efficiency of seismic computing.

Also included in CUDA 2.0 is an Adobe Photoshop plug-in example for PC and Mac versions of the software. The example allows developers to design plug-ins that move the most compute-intensive functions of Adobe Photoshop to the GPU, such as filtering and image manipulation. The plug-in is available as source code so developers can easily develop advanced filters and imaging techniques that are available directly within Adobe Photoshop.

CUDA 2.0 also features additional source code examples and new compiler optimizations.

Source: **Nvidia Corp.,** 2701 San Tomas Expressway, Santa Clara, CA 95050.

New flow computer, transmitter for gas operations

Two new products are designed for the transmission and production of natural gas—the AutoPILOT PRO (see photo) flow computer and the AutoMITTER PRO smart multivariable transmitter for gas measurement. The AutoPILOT PRO offers a combination of flexibility, durability, and measurement accuracy, while the AutoMITTER PRO easily integrates with the entire line of this firm's gas flow computers.

AutoPILOT PRO gas flow computer is scalable from a single run measurement application to multiple runs with full station control, enabling a single platform to be utilized and expanded as needed. Once configured, the AutoPILOT PRO automatically performs tasks that typically need to be programmed, including flow calculations, alarms, and I/O sampling. Engineered to use minimal power, the new flow computer's design also requires less monitoring and maintenance. Its advanced plunger lift algorithms have proven to increase production, the firm says.

The new AutoMITTER PRO integrates with the AutoPILOT PRO. Its new three-in-one design measures differential pressure, static pressure, and temperature, eliminating the need for separate transducers.

The AutoMITTER PRO seamlessly integrates into the AutoPILOT PRO motherboard, eliminating the need for an external card. High-accuracy measurement is suited for applications that are more sensitive to varying temperatures, such as ultrasonic measurement.

Source: **Thermo Fisher Scientific Inc.,** 81 Wyman St., Waltham, MA 02454.

MOGAS Industries Inc.,

Houston, has appointed two new key executives. Ton Korporaal is the company's new refining and hydrocarbons industry specialist for Western Europe. Korporaal brings almost 20 years of experience in valve sales throughout the Netherlands.

Korporaal

Delp

Rob Delp has joined MOGAS Industries as territory manger for the Eastern US. Delp has been involved in sales for more than 7 years, with the last 3 having been in the valve and flow instrument business.

MOGAS is a leading supplier of severe-service ball valves, selling primarily to power, mining, process, and specialty application industries.

Stallion Oilfield Services Ltd.,

Houston, and UK-based Stirling Group have announced that they will not proceed with current plans for Stallion to purchase Stirling's international risk management and loss prevention business. The two companies cited current market conditions and stressed that they will continue to explore ways to work together and co-market their services in international markets, including a possible strategic alliance.

Stallion provides wellsite support services and production and logistics services to oil and gas fields, 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.

Stirling is a provider of risk and facilities management solutions to the hydrocarbon industry in Europe, Africa, and the Middle East.

Pace Global Energy Services LLC,

Fairfax, Va., has assigned Executive Vice-Pres. Jim Diemer to its Houston operating base. As corporate officer responsible for the Houston office, he also maintains his current role focusing on the development and execution of business strategies for major energy companies, as well as development support and financing of energy infrastructure projects and procurement practices for large energy consumers, such as independent power plants and industrial power houses. With over 10 years at Pace, Diemer has contributed to Pace's expanding platform in the Houston market for the past 5 years.

Diemer

Pace provides expertise and represented clients in all segments of the energy value chain from exploration, production, and generation through transportation and distribution down to end use consumption.

TransTex Gas Services LP,

Houston, has acquired Time Technical Services LLC, Three Rivers, Tex. Terms aren't disclosed. The acquisition expands the size range of TransTex's equipment offerings.

TransTex provides natural gas treating and processing equipment on a lease basis to midstream and upstream customers in the US. The company also provides contract treating services.

Time is a provider of natural gas treating equipment along with related maintenance services operating principally in South and East Texas.

Cathedral Energy Services Income Trust,

Calgary, has appointed John Ruzicki executive vice-president. Ruzicki has over 21 years of experience in the oil and gas industry, most recently as vice-president, sales and marketing for Peak Energy Services Trust and Polar Completions (a division of Precision Drilling Trust). He is a Certified Engineering Technologist through the Association of Science and Engineering Technology Professionals and holds an engineering technology diploma from Southern Alberta Institute. Ruzicki has extensive experience in completions and drilling in Canadian, US, and other markets since 1987.

In addition, Cathedral has appointed David DeFreitas vice-president, completion services, US, relocating from Calgary to Denver. He will oversee the trust's US wireline and production testing operations, including their future expansion. Previously, DeFreitas was general manager of the trust's Canadian production testing operations.

Cathedral is a leading provider of selected oil field services, including horizontal, directional, and underbalanced drilling and related equipment rentals, production testing, and completion services, as well a full complement of cased-hole wireline services.

GE Oil & Gas's PII Pipeline Solutions division,

Houston, has signed a pipeline integrity services distributor agreement with Tecnicontrol SA, in Colombia, as part of GE's strategy to strengthen its pipeline integrity services in South America. Tecnicontrol will act as distributor for PII services in the Andean region by providing local inspection tools and crews, project management, and logistics. PII will continue to support Tecnicontrol by supplying its state-of-the art inspection technology, data analysis, and pipeline integrity management expertise.

GE's PII Pipeline Solutions provides pipeline inspection technology and integrity management services for the oil and gas industry. Tecnicontrol provides integral solutions to the industry ranging from engineering, procurement, supervision, QA/QC, and project management to asset integrity management, including inspection, maintenance, and repairs.

Knight Fishing Services,

Lafayette, La., has named Bill Keenan vice-president, Gulf Coast. He was previously a division manager for a rental and fishing services company and a contract fishing tool supervisor and an area manager for the Texas Gulf Coast for an oil field service company. He also was a member of the safety leadership team for a major operator. Keenan, to be based in Corpus Christi, Tex., has an associate's degree in business and industry from Texarkana Junior College.

Keenan

Knight Fishing is a division of Knight Oil Tools, the largest privately held rental and fishing tools business in the oil and gas industry.

Imports of crude and products

	Districts 1-4		District 5		Total US		
	9-26 2008	9-19 2008	9-26 2008	9-19 2008	9-26 2008	9-19 2008	*9-28 2007
	1,000 b/d						
Total motor gasoline	1,222	1,211	39	0	1,261	1,211	1,154
Mo. gas. blending comp.	927	766	39	0	966	766	636
Distillate	195	199	0	0	195	199	192
Residual	206	352	169	88	375	440	335
Jet fuel-kerosine	122	59	23	9	145	68	112
Propane-propylene	243	241	9	17	252	258	159
Other	397	293	86	129	483	422	677
Total products	**3,312**	**3,121**	**365**	**243**	**3,677**	**3,364**	**3,265**
Total crude	**8,020**	**5,956**	**969**	**1,187**	**8,989**	**7,143**	**10,253**
Total imports	**11,332**	**9,077**	**1,334**	**1,430**	**12,666**	**10,507**	**13,518**

*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.

OIL&GAS JOURNAL online research center

OGJ crack spread

	*10-3-08	*10-5-07	Change	Change, %
	$/bbl			
SPOT PRICES				
Product value	108.03	88.69	19.34	21.8
Brent crude	94.63	77.74	16.89	21.7
Crack spread	13.40	10.95	2.45	22.4
FUTURES MARKET PRICES				
One month				
Product value	105.60	87.59	18.01	20.6
Light sweet crude	96.68	80.58	16.10	20.0
Crack spread	8.93	7.01	1.91	27.3
Six month				
Product value	110.18	91.81	18.36	20.0
Light sweet crude	96.92	77.23	19.69	25.5
Crack spread	13.26	14.59	–1.33	–9.1

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

Purvin & Gertz LNG netbacks—Oct. 3, 2008

Receiving terminal	Liquefaction plant					
	Algeria	Malaysia	Nigeria	Austr. NW Shelf	Qatar	Trinidad
	$/MMbtu					
Barcelona	10.13	8.50	9.19	8.37	9.19	9.10
Everett	6.55	4.25	6.15	4.32	4.89	6.87
Isle of Grain	11.51	8.98	10.74	8.85	9.68	10.77
Lake Charles	4.78	2.69	4.53	2.86	3.17	5.46
Sodegaura	9.83	12.15	10.08	11.79	11.24	8.99
Zeebrugge	11.44	8.99	10.74	8.86	9.69	10.74

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

Crude and product stocks

District	Crude oil	Motor gasoline		Jet fuel, kerosine	Fuel oils		Propane-propylene
		Total	Blending comp.[1]		Distillate	Residual	
	1,000 bbl						
PADD 1	12,460	43,919	25,617	7,817	47,514	13,370	4,590
PADD 2	58,863	47,457	18,487	7,069	27,818	1,299	24,227
PADD 3	158,542	55,739	26,087	10,770	32,504	16,689	26,941
PADD 4	14,189	6,333	2,233	485	2,914	358	[1]2,573
PADD 5	50,410	26,192	20,428	9,909	12,340	4,512	—
Sept. 26, 2008	**294,464**	**179,640**	**92,852**	**36,050**	**123,090**	**36,228**	**58,331**
Sept. 19, 2008	**290,186**	**178,739**	**92,799**	**37,087**	**125,449**	**35,613**	**55,636**
Sept. 28, 2007[2]	**321,755**	**191,325**	**87,516**	**40,846**	**135,887**	**37,408**	**59,105**

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

Refinery report—Sept. 26, 2008

District	REFINERY OPERATIONS		REFINERY OUTPUT				
	Gross inputs	Crude oil inputs	Total motor gasoline	Jet fuel, kerosine	Fuel oils		Propane-propylene
					Distillate	Residual	
	1,000 b/d						
PADD 1	1,481	1,475	2,247	86	471	95	55
PADD 2	3,195	3,167	2,382	211	938	52	226
PADD 3	4,683	4,520	2,330	459	1,460	146	392
PADD 4	554	551	252	24	181	12	[1]119
PADD 5	2,813	2,739	1,479	494	628	96	—
Sept. 26, 2008	**12,726**	**12,452**	**8,690**	**1,274**	**3,678**	**401**	**792**
Sept. 19, 2008	**11,747**	**11,504**	**7,954**	**1,152**	**3,258**	**392**	**585**
Sept. 28, 2007[2]	**15,268**	**15,154**	**8,698**	**1,341**	**4,074**	**698**	**1,035**
	17,610 Operable capacity		**72.3 utilization rate**				

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

OGJ GASOLINE PRICES

	Price ex tax 10-1-08	Pump price* 10-1-08	Pump price 10-3-07
	¢/gal		
(Approx. prices for self-service unleaded gasoline)			
Atlanta	320.8	367.3	280.1
Baltimore	329.4	371.3	267.0
Boston	325.5	367.4	264.0
Buffalo	301.4	362.3	280.0
Miami	312.7	364.3	299.7
Newark	324.7	357.3	261.0
New York	306.4	367.3	279.0
Norfolk	323.0	361.4	261.9
Philadelphia	318.7	369.4	276.0
Pittsburgh	315.6	366.3	276.0
Wash., DC	326.0	364.4	279.0
PAD I avg	318.6	365.3	274.9
Chicago	331.1	395.5	309.5
Cleveland	320.5	366.9	277.9
Des Moines	320.8	361.2	271.0
Detroit	307.9	367.3	302.6
Indianapolis	302.7	362.1	287.9
Kansas City	322.5	358.5	276.1
Louisville	332.2	373.1	288.3
Memphis	316.9	356.7	257.5
Milwaukee	315.9	367.2	296.7
Minn.-St. Paul	320.7	364.7	290.3
Oklahoma City	313.4	348.8	269.2
Omaha	297.0	342.3	272.0
St. Louis	319.4	355.4	261.9
Tulsa	314.6	350.0	265.8
Wichita	308.9	352.3	266.9
PAD II avg	316.3	361.5	279.6
Albuquerque	321.6	358.0	273.8
Birmingham	316.8	356.1	263.2
Dallas-Fort Worth	305.7	344.1	262.2
Houston	326.3	364.7	267.5
Little Rock	314.4	354.6	263.5
New Orleans	326.1	364.5	269.2
San Antonio	318.8	357.2	264.6
PAD III avg	318.5	357.0	266.3
Cheyenne	312.0	344.4	278.9
Denver	337.0	377.4	286.0
Salt Lake City	313.5	356.4	281.3
PAD IV avg	320.9	359.4	282.1
Los Angeles	299.9	367.0	284.9
Phoenix	315.5	352.9	294.8
Portland	314.5	357.9	293.8
San Diego	307.6	374.7	296.8
San Francisco	313.9	381.0	292.8
Seattle	307.1	363.0	289.8
PAD V avg	309.8	366.1	292.1
Week's avg.	**316.7**	**362.3**	**278.1**
Sept. avg.	**322.7**	**367.2**	**280.4**
Aug. avg.	**330.8**	**375.3**	**280.8**
2008 to date	**310.6**	**354.6**	—
2007 to date	**229.6**	**273.2**	—

*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

	9-26-08 ¢/gal		9-26-08 ¢/gal
Spot market product prices			
Motor gasoline (Conventional-regular)		Heating oil No. 2	
New York Harbor	265.75	New York Harbor	299.60
Gulf Coast	283.75	Gulf Coast	296.97
Los Angeles	286.25	Gas oil	
Amsterdam-Rotterdam-Antwerp (ARA)	253.53	ARA	310.34
Singapore	258.90	Singapore	288.45
Motor gasoline (Reformulated-regular)		Residual fuel oil	
New York Harbor	262.63	New York Harbor	206.02
Gulf Coast	264.75	Gulf Coast	210.79
Los Angeles	292.25	Los Angeles	246.88
		ARA	209.41
		Singapore	216.89

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

BAKER HUGHES RIG COUNT

	10-3-08	10-5-07
Alabama	4	5
Alaska	9	4
Arkansas	56	48
California	45	38
Land	45	37
Offshore	0	1
Colorado	106	109
Florida	3	0
Illinois	1	0
Indiana	2	2
Kansas	12	13
Kentucky	12	11
Louisiana	188	154
N. Land	85	58
S. Inland waters	20	28
S. Land	26	27
Offshore	57	41
Maryland	0	1
Michigan	2	1
Mississippi	15	13
Montana	9	12
Nebraska	0	1
New Mexico	94	66
New York	8	6
North Dakota	75	43
Ohio	10	13
Oklahoma	199	198
Pennsylvania	27	17
South Dakota	2	1
Texas	932	843
Offshore	9	5
Inland waters	0	1
Dist. 1	26	25
Dist. 2	32	32
Dist. 3	65	58
Dist. 4	88	89
Dist. 5	185	174
Dist. 6	135	123
Dist. 7B	29	40
Dist. 7C	62	59
Dist. 8	129	121
Dist. 8A	29	19
Dist. 9	41	38
Dist. 10	102	59
Utah	46	44
West Virginia	30	33
Wyoming	78	68
Others—NV-4; OR-1; TN-2; VA-6; WA-1	14	11
Total US	**1,979**	**1,755**
Total Canada	**431**	**332**
Grand total	**2,410**	**2,087**
Oil rigs	422	318
Gas rigs	1,544	1,431
Total offshore	72	48
Total cum. avg. YTD	**1,874**	**1,760**

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	10-3-08 Percent footage*	Rig count	10-5-07 Percent footage*
0-2,500	89	5.6	59	5.0
2,501-5,000	133	49.6	110	59.0
5,001-7,500	276	18.1	219	22.8
7,501-10,000	461	3.0	440	2.7
10,001-12,500	459	1.3	435	2.2
12,501-15,000	362	—	276	—
15,001-17,500	155	—	111	—
17,501-20,000	88	—	68	—
20,001-over	31	—	33	—
Total	**2,054**	**6.8**	**1,751**	**7.9**
INLAND	25		39	
LAND	1,977		1,661	
OFFSHORE	52		51	

*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]10-3-08	[2]10-5-07
	1,000 b/d	
(Crude oil and lease condensate)		
Alabama	20	21
Alaska	660	657
California	645	657
Colorado	59	66
Florida	6	6
Illinois	27	27
Kansas	100	104
Louisiana	770	1,164
Michigan	15	14
Mississippi	55	58
Montana	94	94
New Mexico	161	159
North Dakota	124	127
Oklahoma	169	171
Texas	1,205	1,324
Utah	50	54
Wyoming	148	149
All others	60	73
Total	**4,368**	**4,925**

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

US CRUDE PRICES

	10-3-08 $/bbl*
Alaska-North Slope 27°	110.67
South Louisiana Sweet	97.00
California-Kern River 13°	80.95
Lost Hills 30°	89.55
Wyoming Sweet	79.88
East Texas Sweet	89.75
West Texas Sour 34°	82.75
West Texas Intermediate	90.25
Oklahoma Sweet	90.25
Texas Upper Gulf Coast	86.75
Michigan Sour	83.25
Kansas Common	89.50
North Dakota Sweet	80.00

*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]	9-26-08
United Kingdom-Brent 38°	101.41
Russia-Urals 32°	98.27
Saudi Light 34°	97.60
Dubai Fateh 32°	94.03
Algeria Saharan 44°	101.44
Nigeria-Bonny Light 37°	104.46
Indonesia-Minas 34°	101.00
Venezuela-Tia Juana Light 31°	105.35
Mexico-Isthmus 33°	105.24
OPEC basket	101.30
Total OPEC[2]	98.44
Total non-OPEC[2]	99.29
Total world[2]	98.82
US imports[3]	97.90

[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]

	9-26-08	9-19-08	9-26-07	Change, %
	bcf			
Producing region	832	808	961	–13.4
Consuming region east	1,855	1,804	1,855	0.0
Consuming region west	423	411	431	–1.9
Total US	**3,110**	**3,023**	**3,247**	**–4.2**
	July 08	**July 07**	**Change, %**	
Total US[2]	**2,516**	**2,894**	**–13.1**	

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

Statistics

WORLDWIDE CRUDE OIL AND GAS PRODUCTION

	July 2008	June 2008	7 month average production 2008	7 month average production 2007	Change vs. previous year Volume	Change vs. previous year %	July 2008	June 2008	Cum. 2008
	Crude, 1,000 b/d						Gas, bcf		
Argentina	650	630	623	629	–6	–0.9	150.0	149.0	909.18
Bolivia	40	40	40	45	–4	–9.8	43.0	41.5	293.60
Brazil	1,824	1,830	1,795	1,755	40	2.3	38.0	37.0	256.00
Canada	2,673	2,490	2,546	2,590	–43	–1.7	470.2	416.9	3,316.66
Colombia	580	580	569	521	48	9.2	24.0	23.0	157.00
Ecuador	500	500	500	501	–1	–0.3	1.0	1.0	7.00
Mexico	2,782	2,839	2,846	3,162	–317	–10.0	214.0	210.6	1,437.80
Peru	118	113	109	114	–5	–4.3	11.5	11.0	63.50
Trinidad	110	110	112	123	–11	–8.6	115.0	111.0	804.72
United States	5,140	5,109	5,132	5,123	9	0.2	1,862.0	1,788.0	12,524.00
Venezuela[1]	2,360	2,360	2,371	2,394	–23	–1.0	75.0	72.0	519.00
Other Latin America	81	81	80	80	1	0.8	5.5	5.3	38.08
Western Hemisphere	**16,857**	**16,682**	**16,724**	**17,037**	**–312**	**–1.8**	**3,009.2**	**2,866.3**	**20,326.53**
Austria	16	16	16	17	–1	–7.1	5.0	4.8	35.30
Denmark	288	294	291	312	–21	–6.9	26.5	27.1	201.83
France	20	20	20	19	1	4.8	2.9	2.8	20.84
Germany	65	60	62	69	–7	–10.2	42.3	40.0	321.21
Italy	84	95	101	108	–7	–6.9	20.0	23.0	171.00
Netherlands	30	20	35	41	–6	–15.5	140.0	140.0	1,750.00
Norway	2,302	2,023	2,178	2,305	–127	–5.5	266.7	247.6	2,073.05
Turkey	42	42	40	41	—	–1.1	0.0	0.0	0.00
United Kingdom	1,314	1,374	1,450	1,569	–119	–7.6	152.9	205.8	1,545.86
Other Western Europe	4	4	4	4	—	–5.2	0.7	0.3	13.40
Western Europe	**4,165**	**3,947**	**4,196**	**4,486**	**–290**	**–6.5**	**656.9**	**691.5**	**6,132.49**
Azerbaijan	1,000	1,000	956	846	111	13.1	33.0	32.0	221.00
Croatia	15	15	15	16	–1	–6.3	5.7	5.7	39.44
Hungary	15	15	15	16	–2	–10.0	7.7	6.9	50.40
Kazakhstan	1,300	1,400	1,377	1,071	306	28.5	45.0	50.0	408.00
Romania	90	95	94	99	–4	–4.5	18.0	17.0	123.00
Russia	9,740	9,720	9,736	9,874	–139	–1.4	1,700.0	1,800.0	13,600.00
Other FSU	400	400	400	443	–43	–9.7	400.0	400.0	3,290.00
Other Eastern Europe	43	50	49	47	2	4.3	15.0	14.5	116.79
Eastern Europe and FSU	**12,603**	**12,696**	**12,642**	**12,412**	**230**	**1.9**	**2,224.5**	**2,326.1**	**17,848.62**
Algeria[1]	1,380	1,380	1,384	1,344	40	3.0	280.0	270.0	1,925.00
Angola[1]	1,948	1,965	1,923	1,643	280	17.0	5.0	5.0	34.60
Cameroon	84	84	87	84	2	2.9	—	—	—
Congo (former Zaire)	20	20	20	20	—	—	—	—	—
Congo (Brazzaville)	240	240	240	240	—	—	—	—	—
Egypt	610	610	619	643	–24	–3.8	135.0	130.0	945.00
Equatorial Guinea	320	320	320	320	—	—	0.1	0.1	0.42
Gabon	240	240	231	230	1	0.6	0.3	0.3	2.14
Libya[1]	1,680	1,730	1,740	1,694	46	2.7	34.0	33.0	236.00
Nigeria[1]	1,970	1,830	1,939	2,159	–220	–10.2	85.0	80.0	548.00
Sudan	480	480	480	467	13	2.8	0.0	0.0	0.00
Tunisia	90	89	83	100	–17	–17.1	7.8	5.4	37.89
Other Africa	217	217	217	218	–1	–0.5	9.1	8.7	62.20
Africa	**9,279**	**9,205**	**9,283**	**9,163**	**120**	**1.3**	**556.3**	**532.5**	**3,791.25**
Bahrain	170	170	170	173	–4	–2.0	25.0	24.0	168.88
Iran[1]	3,970	3,950	3,951	3,914	37	0.9	290.0	280.0	2,050.00
Iraq[1]	2,405	2,510	2,420	1,986	434	21.9	20.0	20.0	135.20
Kuwait[1,2]	2,635	2,635	2,608	2,405	203	8.4	45.0	45.0	283.00
Oman	710	720	720	717	3	0.4	60.0	58.0	406.00
Qatar[1]	880	880	854	800	54	6.8	190.0	180.0	1,255.00
Saudi Arabia[1,2]	9,365	9,365	9,099	8,506	594	7.0	225.0	220.0	1,520.00
Syria	380	380	384	391	–7	–1.8	18.0	17.0	123.00
United Arab Emirates[1]	2,660	2,690	2,647	2,571	76	2.9	130.0	130.0	925.00
Yemen	310	300	311	346	–34	–9.9	—	—	—
Other Middle East	—	—	—	—	—	–22.8	11.1	9.8	73.16
Middle East	**23,485**	**23,600**	**23,165**	**21,810**	**1,356**	**6.2**	**1,014.1**	**983.8**	**6,939.24**
Australia	464	453	437	457	–20	–4.4	121.6	110.9	777.40
Brunei	148	144	161	180	–20	–10.9	32.9	27.0	232.48
China	3,818	3,895	3,801	3,758	43	1.2	218.4	276.9	1,690.20
India	672	635	674	683	–9	–1.4	86.0	81.8	595.08
Indonesia[1]	860	860	860	843	17	2.0	200.0	200.0	1,400.00
Japan	16	16	17	17	—	2.3	10.1	9.5	76.91
Malaysia	700	720	750	746	4	0.6	140.0	140.0	1,015.00
New Zealand	54	55	60	20	39	195.7	14.0	13.0	88.90
Pakistan	66	68	67	68	–1	–1.3	123.7	119.3	862.59
Papua New Guinea	40	40	42	49	–7	–14.7	1.0	0.9	6.70
Thailand	228	238	225	212	12	5.8	44.0	43.0	312.00
Vietnam	280	280	290	317	–27	–8.6	15.5	15.0	105.00
Other Asia–Pacific	35	40	38	35	3	7.6	96.5	93.3	673.27
Asia Pacific	**7,381**	**7,443**	**7,421**	**7,386**	**35**	**0.5**	**1,103.7**	**1,130.7**	**7,835.54**
TOTAL WORLD	**73,770**	**73,573**	**73,432**	**72,294**	**1,138**	**1.6**	**8,564.8**	**8,530.9**	**62,873.66**
OPEC	32,613	32,655	32,297	30,260	2,037	6.7	1,580.0	1,536.0	10,837.80
North Sea	3,923	3,709	3,936	4,204	–268	–6.4	487.7	522.3	4,343.31

[1]OPEC member. [2]Kuwait and Saudi Arabia production each include half of Neutral Zone. Totals may not add due to rounding.
Source: Oil & Gas Journal. Data available in OGJ Online Research Center.

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US can raise tax revenue by cutting corporate tax rate

Political discourse in the early 1980s treated "tax rates" and "tax revenue" as synonymous phrases. As they grapple with a new century's economic problems, policymakers must not repeat the mistake.

It was common in those years long gone to hear US lawmakers lament growth of the federal deficit and to proclaim the need to "raise revenue." By that they meant "raise tax rates," terminology much less likely

The Editor's Perspective

by Bob Tippee, Editor

to elicit political support and much more likely to provoke a fight with the Republican administration then newly in office.

Indeed, the administration of Ronald Reagan adhered to the insight, popularized by Arthur Laffer, that when tax rates are high, lowering them can increase government tax receipts.

Many politicians scoffed at the notion. Some still do.

A new report by Mehreen Younis, research assistant at the National Center for Policy Analysis, Dallas, argues that history supports Laffer's notion and calls for a cut in the corporate tax rate.

"Most countries have found that tax revenues rise following cuts in their corporate tax rates," Younis writes.

Citing Cato Institute data, the analyst reports that while the average corporate tax worldwide fell from 46% to 33% during 1982-99, income tax collections rose from 2.1% of aggregate national income to 2.4%.

Similarly, the average corporate tax rate in 19 member countries of the Organization for Economic Cooperation and Development fell from 45% in 1985 to 29% in 2005. In that period, corporate tax revenue rose from 2.6% of the group's gross domestic product to 3.7%.

Alex Brill and Kevin Hassett of the American Enterprise Institute have estimated that the revenue-maximizing corporate rate in developed countries was about 34% in the late 1980s but has declined to about 26%, according to Younis.

The US corporate tax rate is 35% at the federal level and 39.25% with the addition of average state levies. The latter rate is second among developed countries to Japan's 39.54%.

To stimulate its faltering economy and move back toward fiscal balance, the US should cut the corporate tax rate—quickly. Doing so is not the same as cutting revenue.

(Online Oct. 3, 2008; author's e-mail: bobt@ogjonline.com)

Market Journal

by Sam Fletcher, Senior Writer

September crude prices fall

Front-month crude plunged $10.52/bbl Sept. 29 as the House of Representatives rejected a $700 billion plan to resolve the most severe threat to the US economy since the Great Depression.

It was "a painful reminder that there is one thing more inept and selfish than a banker in New York: a politician in Washington, DC," said Olivier Jakob at Petromatrix, Zug, Switzerland.

Still, the surprise move accomplished one thing politicians had been promising to do all year—it brought down oil prices in the second-largest 1-day drop ever in the New York futures market, surpassed only by a $10.56/bbl loss in January 1991 during the early success of Desert Storm. But the equity market was hammered even harder, with the S&P 500 Index suffering its biggest drop since the 1987 stock market crash. The Dow Jones Industrial Average plummeted a record 777 points. Stock losses on the Dow Jones Wilshire 5000 Index totaled $1.2 trillion.

Crude rebounded above $100/bbl Sept. 30 as the US Senate revived and sweetened the rescue plan. "The dollar index was under an extreme rally, the rest of the commodity complex was under pressure, published demand data points were weaker than expected, but oil against all odds managed to make strong gains," Jakob noted.

September ended with crude prices down almost 13% for the month and 28.1% lower for the expiring third quarter, also the biggest decline in that category since January 1991. Even so, the average crude price was still up 5% for the year.

Crude prices dipped below $100/bbl Oct. 1 as the Energy Information Administration reported US crude inventories gained 4.3 million bbl to 294.5 million bbl in the week ended Sept. 26, surpassing the Wall Street consensus of a 2.4 million bbl build. Gasoline stocks increased by 900,000 bbl to 179.6 million bbl, below average for the time of year. Wall Street was anticipating a drop of 1.7 million bbl. Distillate fuel inventories fell 2.3 million bbl to 123.1 million bbl, surpassing an expected decline of 1.6 million bbl.

Below January prices

Energy prices continued to fall with the front-month crude contract tumbling lower than price levels at the start of the year and world demand at the lowest level in 5 years. The November contract of benchmark US light, sweet crudes dropped to $93.97/bbl Oct. 2 on the New York Mercantile Exchange vs. a closing price of $99.62/bbl for the front-month contract Jan. 2, the first day of regular trading for 2008. Another front-month contract hit an intraday low for the year of $90.51/bbl Sept. 16.

Jakob described the steep sell-off as "the case of the commodity house turning into a slaughter house." He said, "Commodities across the board were under severe pressure. A depressive recession is not the best climate for the commodity theme, but Sept. 30 was also the cut-off date for [yearend] redemptions for many hedge funds."

Energy prices continued to decline Oct. 3 for the third consecutive session of the New York market even as the US House of Representative passed the revised $700 billion economy rescue plan.

The Dow Jones Industrial Average climbed in early trading that day and was up more than 300 points as House members began to vote. But that gain was wiped out among rising fears that the rescue plan won't unfreeze credit markets. US stock indexes fell for a third consecutive day, with the Dow Jones Industrial Average down 7.4% for the week.

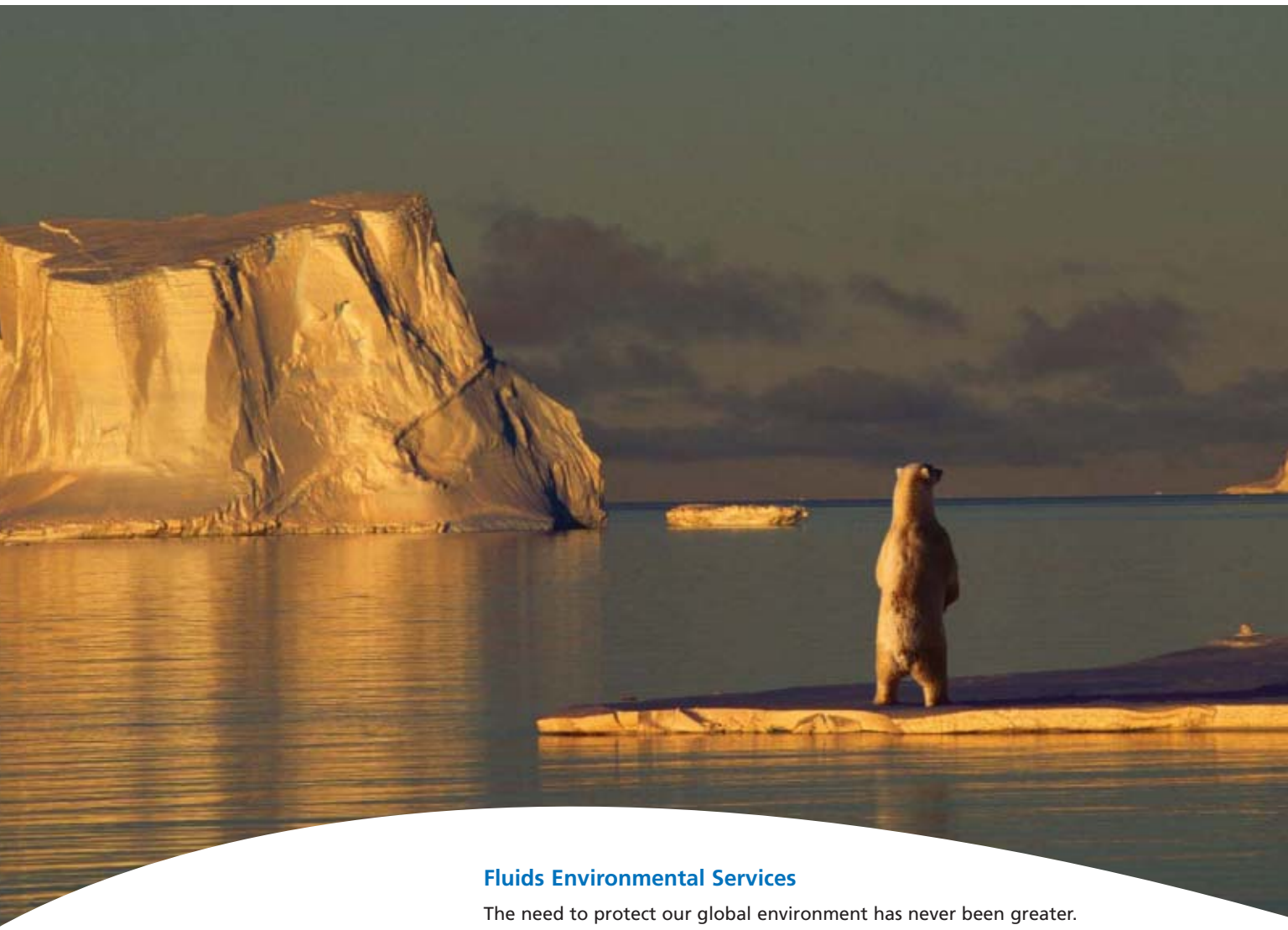
That same day Swiss bank UBS AG announced it is reorganizing its investment bank and closing most of its commodities business, with a loss of 2,000 jobs because of the financial crisis. The world's biggest wealth manager, UBS announced a small profit in the third quarter after a year of losses. Its US subprime mortgage exposure in the US earlier forced the firm to write down $42 billion.

The US economic rescue package "might provide some short covering," Jakob said. "But the gasoline crack trading below $1/bbl is an indicator of the poor state of the oil markets. US refining margins remain at risk, and this can only translate into lower crude oil demand and oil being pushed back to the producers. On a dollar adjusted basis, the price of crude oil is however probably not yet low enough for Saudi Arabia to panic."

Meanwhile, the US dollar hit a 13-month peak vs. the euro after the European central bank said it was willing to cut rates for the first time in 5 years.

(Online Oct. 6, 2008; author's e-mail: samf@ogjonline.com)

Environmental Worries?



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