Week of Nov 17, 2008/US$10.00

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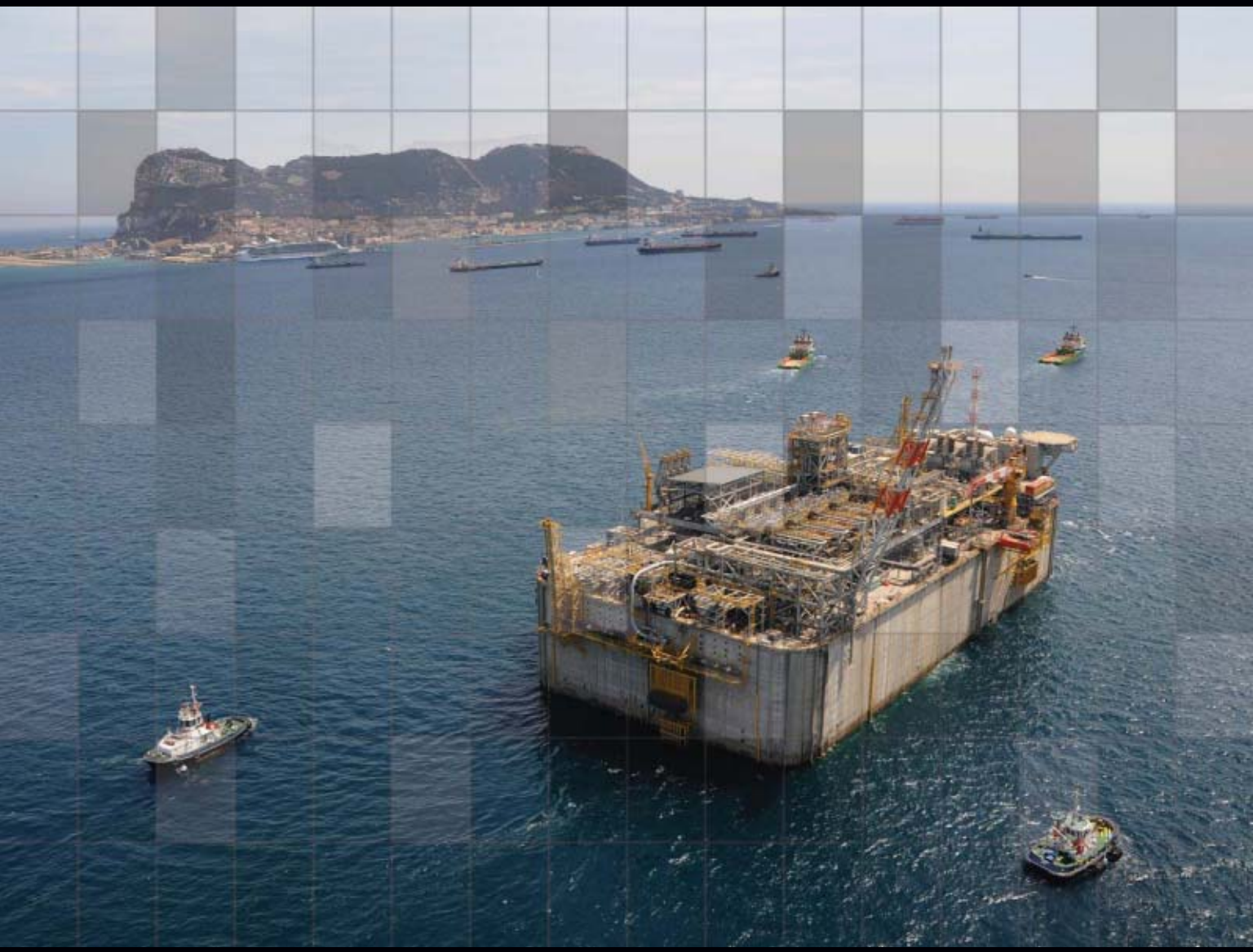

Worldwide Construction Update

OIL&GAS JOURNAL®

Nov. 17, 2008
Volume 106.43

WORLDWIDE CONSTRUCTION UPDATE

REGULAR FEATURES

COVER

The Adriatic LNG terminal left its construction site in Algeciras, Spain, on Aug. 30, for the 1,700-mile trip to its final destination, where it arrived Sept. 15. The terminal has been positioned at about 10 miles offshore Porto Levante, Italy, in the Adriatic Sea, in 95 ft of water and will be connected via pipeline to Italy's natural gas grid. It is designed to store and regasify LNG to deliver 775 MMcfd of clean-burning natural gas when it reaches full operational capacity in 2009. It will receive gas produced from Qatar's North field, which has resources of more than 900 tcf of gas, making it the largest nonassociated gas field in the world. The terminal is owned by ExxonMobil Italiana Gas, Edison, and Qatar Petroleum wholly owned subsidiary Qatar Terminal Ltd. Details of other projects are in Oil & Gas Journal's Worldwide Construction Update starting on p. 24 and in the survey tables at www.ogjonline.com. Photo from ExxonMobil.

General Interest

Exploration & Development

Drilling & Production

Processing

Transportation

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Nov. 17, 2008

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General Interest — Quick Takes

Europe seeks alternatives to Russian energy supplies

The European Union should improve access to gas from the Caspian region, coordinate supply problems among member states, and keep a closer watch on oil stocks, according to a report by the European Commission.

"A southern gas corridor must be developed for the supply of gas from Caspian and Middle Eastern sources—this is identified as one of the EU's highest energy security priorities," said a draft of the EU's Second Strategic Energy Review.

The 27-member bloc is seeking to reduce its reliance on Russian gas after pricing disputes between Russia and transit states disrupted supplies in recent years and Russia's invasion of Georgia in August increased tensions.

Russia already supplies 42% of the EU's gas, and Moscow—seeking to increase its sway over the EU—is competing hard to buy up volumes in North Africa and Central Asia.

European Energy Commissioner Andris Piebalgs last week visited Turkey and Azerbaijan, seeking to smooth the way for supplies of Caspian and Central Asian gas to reach Europe directly instead of passing through Russia (OGJ Online, Nov. 10, 2008).

The EC will seek firm gas supply commitments from Azerbaijan and Turkmenistan, and will look at creating a consortium for buying Caspian gas, said the review, which will be published Nov. 13.

Although the EU has a variety of gas suppliers, including Russia, Norway, Algeria, and other countries, some individual member states are particularly dependent on a single supplier, such as the Baltic countries' dependence on Russia.

"Strategies to share and spread risk and to make the best use of the combined weight of the EU in world affairs can be more effective than dispersed national actions," the draft report said.

In the commission's view, EU nations also could improve the security of their supplies by strengthening infrastructure.

"Connecting the remaining isolated energy markets in Europe is a priority," the report said, adding that the commission would develop plans next year for linking the Baltic countries' energy infrastructure with the rest of the bloc.

The commission also plans to draft an action plan for LNG infrastructure, study the possibility of an offshore wind park in the North Sea, and look into methods for improving links between Europe and countries along the southern Mediterranean shore.

The EC draft report also recommended that both strategic and commercial oil stocks be better managed.

Nigeria to streamline energy ministry

Nigerian President Umaru Yar'Adua is replacing his gas and power ministers in a cabinet reshuffle that builds on other restructuring within the country's petroleum sector.

Emmanuel Olatunde Odusina, Nigeria's Minister of State for Energy (Gas) has been ousted as has Alhaja Fatima Ibrahim, Minister of State for Energy (Power).

The Ministry of Petroleum Resources was split earlier this year into power, gas, and petroleum, with separate ministers heading each strand. At the same time it was renamed the Energy Ministry.

However, Yar'Adua has again consolidated the three divisions to streamline them under the name of the Ministry of Petroleum Resources, and he will appoint one minister to head it. He is compiling a list of ministerial nominees to send to the Senate in the coming days.

Other reforms include the creation of a new, separate ministry for the Niger Delta to coordinate a response to the crises in that area, where militants continue to attack oil company pipelines and installations.

Bakassi kidnappers release oil service vessel crew

Kidnappers on Nov. 11 released the 10 crew members of the oil service vessel Bourbon Sagitta, who were abducted Oct. 31 off the Bakassi peninsula between Nigeria and Cameroon (OGJ Online, Nov. 3, 2008). The French Foreign Ministry, which made the announcement, described their release as a "100% Cameroon operation." It said there was no violence involved and no ransom paid.

The politically motivated kidnapping was carried out by a Bakassi group called the Niger Delta Defense and Security Council, which disputed an International Court ruling handing over the Bakassi peninsula to Nigeria.

The crew included six Frenchmen, one Franco-Senegalese, a Tunisian, and two Cameroonians. All were said to be in good health, and they are expected to return home to their respective countries by Nov. 12.

The vessel belonged to Bourbon Offshore Surf, which expressed gratitude to the Cameroon authorities, the French Foreign Ministry, and others who contributed to the crew's release.

French president Nicolas Sarkozy said Cameroon President Paul Biya was instrumental in freeing the hostages, and Foreign Minister Bernard Kouchner credited the Nigerian authorities, with whom contact had been maintained throughout. ✦

Exploration & Development — Quick Takes

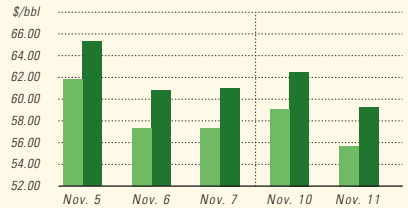
StatoilHydro, Chesapeake join in E&P pact

StatoilHydro has ventured into unconventional gas opportunities and gas shale development under an agreement signed with Chesapeake Energy Corp., the largest US natural gas producer.

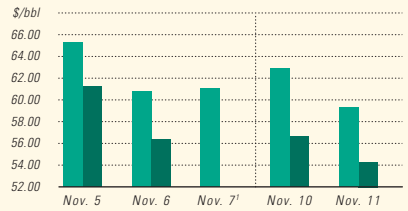
The companies have committed to jointly look for gas in China, Romania, and Ukraine, said Statoil Executive Vice-Pres. Peter Mell-

Industry Scoreboard

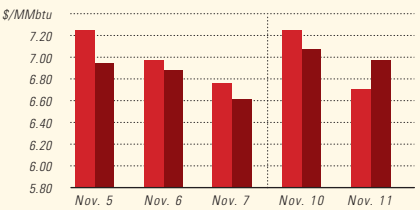
IPE BRENT / NYMEX LIGHT SWEET CRUDE



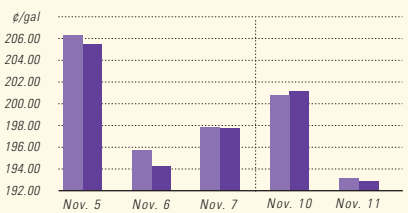
WTI CUSHING / BRENT SPOT



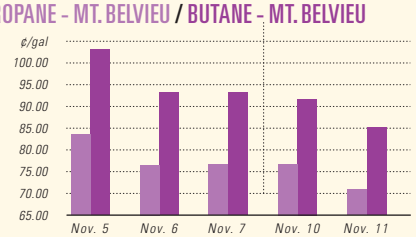
NYMEX NATURAL GAS / SPOT GAS - HENRY HUB



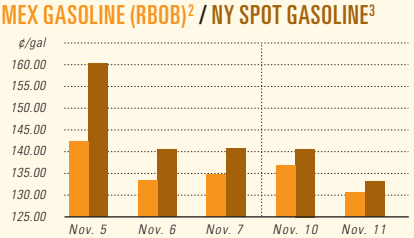
IPE GAS OIL / NYMEX HEATING OIL



PROPANE - MT. BELVIEU / BUTANE - MT. BELVIEU



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



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

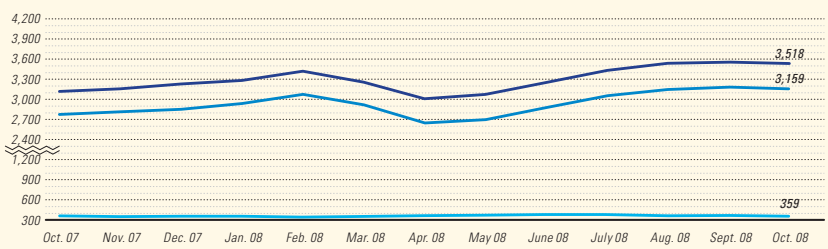
US INDUSTRY SCOREBOARD — 11/17

Latest week 10/31	4 wk. average	4 wk. avg. year ago[1]	Change, %	YTD average[1]	YTD avg. year ago[1]	Change, %
Demand, 1,000 b/d						
Motor gasoline	9,028	9,236	–2.3	9,012	9,295	–3.0
Distillate	4,012	4,213	–4.8	3,951	4,208	–6.1
Jet fuel	1,377	1,637	–15.9	1,539	1,627	–5.4
Residual	437	626	–30.2	595	725	–17.9
Other products	4,243	4,764	–10.9	4,638	4,811	–3.6
TOTAL DEMAND	19,097	20,476	–6.7	19,536	20,691	–5.6
Supply, 1,000 b/d						
Crude production	4,663	5,043	–7.5	4,948	5,070	–2.4
NGL production[2]	2,313	2,449	–5.6	2,258	2,382	–5.2
Crude imports	10,218	9,733	5.0	9,797	10,048	–2.5
Product imports	3,277	3,196	2.5	3,170	3,504	–9.5
Other supply[3]	1,321	1,094	20.7	1,369	1,038	31.9
TOTAL SUPPLY	21,792	21,515	1.3	21,542	22,042	–2.3
Refining, 1,000 b/d						
Crude runs to stills	14,659	15,431	–5.0	14,659	15,152	–3.3
Input to crude stills	14,901	15,242	–2.2	14,901	15,434	–3.5
% utilization	84.9	87.4	—	84.9	88.5	—

Latest week 10/31	Latest week	Previous week[1]	Change	Same week year ago[1]	Change	Change, %
Stocks, 1,000 bbl						
Crude oil	311,927	311,873	54	311,862	65	0.0
Motor gasoline	196,113	194,990	1,123	194,313	1,800	0.9
Distillate	127,835	126,629	1,206	135,377	–7,542	–5.6
Jet fuel-kerosine	36,652	35,991	661	41,505	–4,853	–11.7
Residual	38,842	38,622	220	38,471	371	1.0
Stock cover (days)[4]			Change, %		Change, %	
Crude	21.5	21.7	–0.9	20.8	3.4	
Motor gasoline	21.7	21.8	–0.5	20.8	4.3	
Distillate	31.9	31.8	0.3	32.2	–0.9	
Propane	50.7	58.1	–12.7	51.2	–1.0	
Futures prices[5] **11/7**			Change		Change	%
Light sweet crude ($/bbl)	64.31	65.44	–1.13	93.57	–29.26	–31.3
Natural gas, $/MMbtu	7.01	6.40	0.61	8.14	–1.13	–13.9

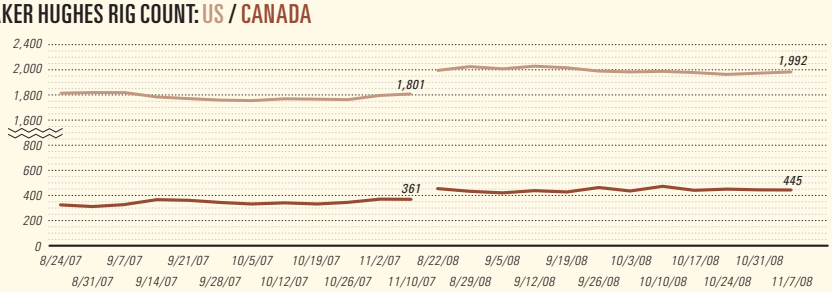
[1]Based on revised figures. [2]Includes adjustments for fuel ethanol and motor gasoline blending components. [3]Includes other hydrocarbons and alcohol, refinery processing gain, and unaccounted for crude oil. [4]Stocks divided by average daily product supplied for the prior 4 weeks. [5]Weekly average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

bye in a conference call with analysts and investors.

StatoilHydro has agreed to spend $3.38 billion for a 32.5% in Chesapeake's gas assets in the Marcellus shale region in Pennsylvania, West Virginia, and New York. StatoilHydro said $1.25 billion would be paid in cash, and the outstanding $2.125 billion would constitute a 75% carry on drilling and completion of wells during 2009-12.

"In order to earn this carry, Chesapeake is required to maintain a significant level of drilling activity," the Stavanger-based major added.

The acreage covers 7,300 sq km and will add future recoverable equity resources of 2.5-3 billion boe. StatoilHydro's equity production from the Marcellus shale gas play is expected to increase to a minimum 50,000 boe/d in 2012 and at least 200,000 boe/d after 2020, with net positive cash flow from 2013. Chesapeake plans to build upon its leases in the Marcellus shale play with StatoilHydro having a right to a 32.5% interest in them.

"The agreement we have entered into with Chesapeake provides us with a solid position in an attractive long-term resource base at competitive terms," said Helge Lund, president and chief executive officer of StatoilHydro. "This is a significant step in strengthening our US gas position, building on our existing capacity rights for the Cove Point LNG terminal, our gas trading and marketing organization, and the gas producing assets in the US Gulf of Mexico."

The development program could support the drilling of 13,500-17,000 horizontal wells over the next 20 years, using up to 50 drilling rigs. The expected cost is estimated at $3.5 million/well, with an ultimate recovery of 560,000 boe/well.

The transaction is expected to close by yearend.

This announcement follows other recent deals that Chesapeake has struck with Plains Exploration & Production Co. and BP America to raise funds and develop its natural-gas holdings: Plains bought a 20% working interest in its assets in the Haynesville shale in north Louisiana and East Texas for $3.3 billion, and BP America acquired a 25% stake in its assets in the Fayetteville shale for $1.9 billion.

Ithaca Energy to develop Jacky field

Ithaca Energy (UK) Ltd. expects to produce 7,500 b/d of oil from one well on Jacky field in the UK North Sea under its development plan, which the UK government has just approved.

The field, which is expected to come on stream in early 2009, will require a small wellhead platform and downhole pumping to assist the production well. The platform will be installed when the weather has improved. Pipelines are scheduled to be laid in December.

The company will work with partner North Sea Energy (UK) Ltd. on Jacky, which holds 5.2 million bbl of proved and probable reserves, some 10 km northeast of Beatrice field in the Inner Moray Firth area of the UK continental shelf.

Oil from Jacky will be processed at the company's nearby Beatrice oil facilities and exported via the Beatrice pipeline to the Nigg oil terminal, which Ithaca also leases, for storage and offloading to tankers.

"Ithaca intends to invest in enhancing production from Beatrice, and as part of this, the pipeline from Jacky to Beatrice will also be used to restore production from the Beatrice Bravo facility, which was shut in last year by Talisman," the company said.

Lawrie Payne, Ithaca chief executive, said Jacky would provide large cash flow and would help develop the Beatrice area and other projects.

Ithaca holds a 90% share in Jacky, and North Sea Energy (UK) 10%.

Circle Oil tests Ouled N'Zala gas well in Morocco

Circle Oil PLC has tested 3.32 MMscfd of natural gas from an exploration well on the Ouled N'Zala permit in Morocco.

Exploration well ONZ6, which is the first successful well for the company in the country, struck gas in the Upper Ouled formation. It will now undergo an extended production test.

Circle Oil is evaluating the results to determine the size of the resource, including carrying out an extended well test. It has not completed a full assessment of the reserves.

"The field test results are in line with our expectations for this area," said Circle Oil Chief Executive David Hough. "We look forward to the results of the next well, which will be the first in the Sebou permit where Circle holds a 75% interest."

Circle Oil will now drill on the Sebou permit, which is the second of the six-well drilling program.

The Ouled N'Zala permit lies northeast of Rabat in the Rharb basin in Morocco. The Rharb basin is a foredeep basin in the external zone of the Rif folded belt.

Circle Oil can convert the concession agreement to a production license of 30 years, plus extensions, if it has commercial discoveries.

Norway offers 79 blocks in latest licensing round

Norway, in its 20th licensing round, has invited operators to bid for 79 blocks or parts of blocks on the Norwegian continental shelf.

Operators can apply for 51 blocks in the Norwegian Sea and 28 blocks in the Barents Sea. In this—one of the country's largest licensing rounds ever—Norway hopes that companies will make new discoveries and enhance production, particularly in the Barents Sea where successful wells may open new exploration areas.

"However, this [development] must be balanced against environmental and fishery interests," said Terje Riis-Johansen, Minister of Petroleum and Energy.

Several blocks are in the deep waters of the Voring basin, which is a relatively underexplored area of the Norwegian Shelf.

Interest has been strong from small and medium sized oil companies as they seek to build their asset bases.

The deadline for operators to submit bids is Nov. 7. Winners will be announced next spring. ✦

Drilling & Production — *Quick Takes*

Vaalco restarts production off Gabon

Vaalco Energy Inc., Houston, has successfully upgraded its floating production, storage, and offloading vessel off Gabon and restored production from its oil fields sooner than expected.

The vessel, the Petroleo Nautipa FPSO, which gathers oil from Etame and Avouma/Tchibala fields, was operating at full produc-

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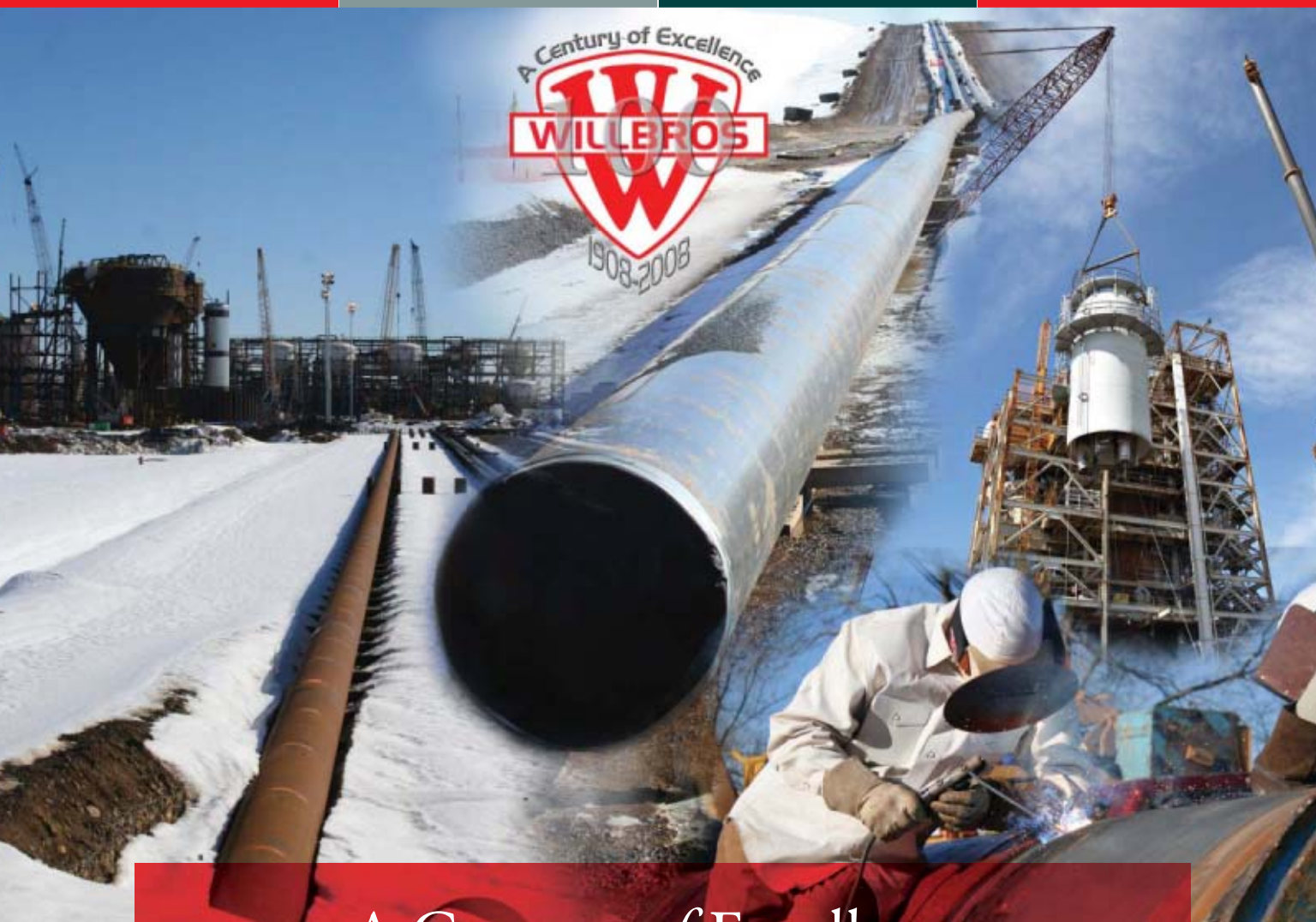

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tion within 3½ days, instead of the 5-7 days schedule originally quoted. It has a 1.1 million bbl of oil storage capacity and recent debottlenecking increased its processing capacity to 25,000 b/d.

The company installed an expanded flare system and increased the water processing capacity at the FPSO to accommodate production from its planned development well in Ebouri.

This area has the potential to produce 5,000 b/d of oil and its development well is expected to come onstream in January 2009. Vaalco plans to drill on Ebouri in mid-November using the Adriatic 6 jack up drilling rig. Once this starts production, Vaalco's total production will reach 25,000 b/d.

Last January, Avouma started production from two wells, which currently deliver 10,000 b/d.

On the Etame block off Gabon, Vaalco will drill three exploration wells back to back using the Pride Cabinda jack up drilling rig, Pride Cabinda. This area already produces 12,000 b/d.

Italian Castello gas field development approved

Italy has granted Sydney-headquartered producer Po Valley Energy Ltd. a 20-year production concession for Castello gas field near Milan.

It is the first concession grant in the Po Valley region since the country's gas sector was deregulated in 1998.

Po Valley Energy has completed construction of a surface plant for Castello, and connection of the pipeline to the Italian national gas grid 500 m away will begin in December to be completed early in 2009. Gas production is scheduled to begin in second-quarter 2009.

The field will be produced from a single well at an initial production rate of about 2.7 MMcfd of gas. The field's remaining proved gas reserves are put at 4.6 bcf of gas.

Some 12 bcf of gas was first produced from Castello field by Italian state company Eni over a period of 8 years during the 1980s.

ConocoPhillips lets contract for Greater Ekofisk

ConocoPhillips has awarded the front-end engineering and design for its Greater Ekofisk area development's 2/4 Z wellhead platform in the Norwegian North Sea to two John Wood Group PLC companies, Mustang Engineering and JP Kenny.

Mustang will design the 7,400-tonne jacket and topsides for the 40-slot wellhead platform, which will be installed in 70-75 m of water.

JP Kenny will provide design services for subsea flow lines and pipelines across the Greater Ekofisk area, "building upon a prior contract to provide services associated with the subsea water injection," John Wood Group reported.

The FEED project is expected to be complete by yearend 2009.

Pemex can 'triple' drilling program says official

Petroleos Mexicanos could triple the amount of its exploratory drilling to an average of 1,800 wells/year from the current 600 as the result of new contracting arrangements approved under reform legislation, according to a senior company official.

Pemex Exploration & Production (PEP) director Carlos Morales Gil told Mexico's El Financero newspaper that the new contracts provided for in the Pemex law—Regulating Article 27 of the Constitution—and to its amendments "are going to allow us to quicken the pace and build a stronger Pemex."

In this regard, Morales told the paper that, with the substantial improvement in Pemex's ability to execute projects on land and offshore, the state-owned firm will be able to replenish 100% of its reserves by 2012 and begin developing deepwater deposits in 2014-15.

The boost in exploration capacity will increase output in the medium term, so that it is back to more than 3 million b/d, the level of Pemex production until 2007.

"We're going to be able to generate more value and more oil revenue," Gil said, explaining that the new legislation will enable Pemex to offer incentives that will improve services from contractors.

In particular, Morales said the new contracting arrangements would provide an additional incentive for companies to work hard, improve, and be more efficient, creating more value for the Mexican people.

Morales said the new legislation empowers PEP to award contracts directly under certain conditions, as when safety and protection of the environment are involved or in the case of risk or emergency.

All other contracts will be awarded under the traditional arrangement of competitive bidding, he said.

Morales emphasized that Pemex will be able to reach its targets of higher production and reserves because it also will have greater flexibility and capacity to manage its budget more independently.

He added, however, that greater accountability and transparency would also be required of it.

He said the country would likely not have to import crude oil to meet its needs.

"We don't see the possibility of Mexico becoming an importer. Pemex is producing 2.8 million b/d, which is far more than we consume—1.3 million b/d on average."

Morales' views largely echoed those of Energy Secretary Georgina Kessel Martinez, who told delegates at a conference: "As a result of the reform that has been approved, the country would reverse the decline in crude oil production that we have seen in recent years."

Kessel said that, due to the new legislation, Pemex "will be able to develop highly complex deposits, such as Chicontepec and the deep waters in the Gulf of Mexico, in an effort to boost output, the rate of reserve replenishment, and the rate of recovery at our deposits." ✦

Processing — *Quick Takes*

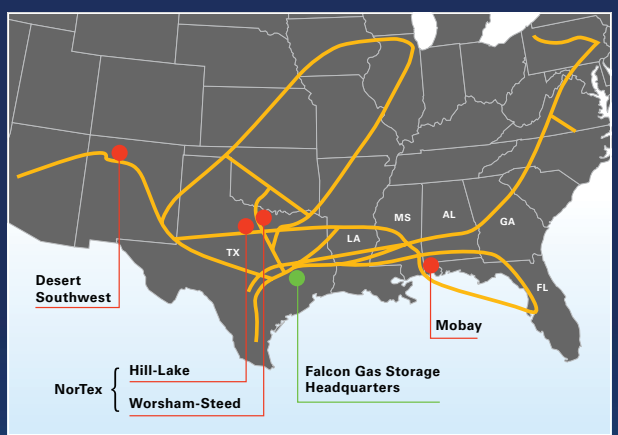
Dow, Sabic start up 'world's largest' PP train

Dow Technology Licensing and Saudi European Petrochemical Co. (Ibn Zahr)—a Saudi Basic Industries Corp. (Sabic) joint venture—have started up what they say is the world's largest single polypropylene (PP) train at Al Jubail industrial city on the Persian Gulf coast. Nameplate capacity is 500,000 tonnes/year of PP resins, the companies say.

To manufacture homopolymers and random copolymers, the

EXPANDING HORIZONS

Falcon Gas Storage Company



Falcon Gas Storage is meeting the growing need for natural gas "on demand," providing storage, processing and transportation for operators from Texas across the southeast U.S.

We're already known as the largest operator of high-deliverability, multi-cycle natural gas storage in North Texas. Our Hill-Lake and Worsham-Steed storage facilities provide more than 35 Bcf of capacity and nearly 1 Bcfd of injection and withdrawal capability.

Now our NorTex Gas Storage subsidiary has become a major mid-stream service provider in the Barnett Shale, with two cryogenic gas processing plants providing 120,000 Mcfd of capacity and a 60-mile, high-pressure pipeline that can transport more than 450,000 Mcfd of Barnett Shale gas.

And our new MoBay Storage Hub in south Alabama, at the nexus of the southeast natural gas pipeline system, interconnects to five major pipeline systems with an additional three interconnects planned, creating access to over 6 Bcfd of pipeline capacity.

It all adds up to a new vista of supply options for the natural gas market.

FALCON GAS STORAGE

5847 San Felipe, Suite 3050
Houston, Texas 77057
713.961.3204
www.falcongasstorage.com

NorTex MoBAY STORAGE HUB

facility uses the Unipol PP process technology, a gas-phase process that requires no equipment for handling, separating, or recycling solvents in producing the PP resins.

"When this plant and others currently in the execution stage enter service, Unipol PP process technology will be used to produce nearly 11 million tonnes/year of [PP], which will represent more than 16% of total global capacity," the companies reported.

PetroSA's $11 billion Coega refinery moves ahead

South Africa's Department of Minerals and Energy in early October granted a manufacturing license to PetroSA for its Project Mthombo—an $11 billion, 400,000 b/d refinery to be built in the Coega industrial development zone outside Port Elizabeth.

KBR has completed a prefeasibility study for the project, and PetroSA has received about 30 bids for the feasibility and the front-end engineering and design phases. These are expected to be awarded shortly, according to PetroSA Chief Executive Sipho Mkhize.

PetroSA said that a strong focus will be given to "maximum black economic-empowerment participation," and emphasized that "proven experience in projects of the planned refinery's size and nature" was a primary consideration.

PetroSA more recently named UK-based KBC Process Technology Ltd. as technical and commercial services advisor for the development.

HSBC, London, is project financial adviser for the refinery. HSBC will provide fiscal guidance and manage project investment funding and structuring arrangements for PetroSA.

A final decision on constructing the project will be made, possibly in 2010, after the feasibility and FEED studies are completed. The refinery is expected to be operational in 2014. ✦

Transportation — *Quick Takes*

Vopak pursues new Turkish storage terminal

Royal Vopak plans to construct an oil products storage terminal on the coast of the Sea of Marmara in the vicinity of Yalova, Turkey.

The company has bought GY Elyaf ve Iplik Sanayi Ticaret Anonim Sirketi from Global Yatırım Holding AS, the Turkish public natural gas and power generation company, for an undisclosed sum. It will submit applications to secure necessary permits and prepare marketing, technical, and economic plans. "Thereafter a final investment decision to construct the terminal can be taken," Vopak said.

The 26-ha industrial plot of land will serve the greater Istanbul area and store liquid bulk chemical, oil, and vegetable oil products.

Vopak said its customers were interested in using independent storage facilities around the Sea of Marmara because of its major development.

Oman sells its 7% stake in CPC to Russia

Oman has sold Russia its stake in the Chevron Corp.-led Caspian Pipeline Consortium (CPC), which owns and operates the 1,580-km Tengiz-Novorossiisk oil pipeline.

"Rosimushchestvo (Russia's federal property agency) has finalized the deal to buy Oman's 7% stake in CPC," confirmed Igor Dyomin, a spokesman for Russia's state pipeline monopoly OAO Transneft.

In early October, an Omani official said the Arab country would consider selling its stake, but that no firm offer had been made.

"If the offer is right, then why not? We have had a few interested parties but nobody put in a firm proposal," said an Omani finance ministry official.

The Omani government gave no reason for selling its stake, but industry sources said Muscat had grown frustrated over protracted disagreements among the consortium members about funding expansion of the pipeline.

Russia had long opposed the plan to double the capacity, saying the pipeline yielded low returns and that its expansion would add pressure to the already congested Turkish Straits shipping route.

But Russian objections ended when most of the partners agreed to raise the shipping tariff to $38/tonne from last year's $30.24/tonne and when investors agreed to reduce interest rates by 50% on a $5 billion loan to CPC.

BP PLC, however, still opposes the expansion plan and said it might also sell its 6.6% stake—held through Lukarco and Kazakhstan Pipeline Ventures—if the CPC partners do not reach a compromise.

Russia owns a 31% stake in CPC through Russian crude pipeline monopoly OAO Transneft, while the Kazakh government has a stake of 19%.

Other CPC shareholders are Chevron 15%, Lukarco 12.5%, a Rosneft-Shell joint venture 7.5%, ExxonMobil 7.5%, Eni 2%, BG 2%, Kazakhstan Pipeline Ventures 1.75%, and Oryx Caspian Pipeline 1.75%.

Enbridge announces open season on Midla pipeline

Enbridge Energy Partners LP announced a nonbinding open season for additional firm capacity on its Enbridge Pipelines (Midla) LLC subsidiary's interstate natural gas pipeline system. Enbridge said the proposed expansion will allow Midla shippers improved access from the Perryville hub to the ANR Pipeline in Franklin Parish, La., the Transco Pipeline in West Feliciana Parish, and industrial facilities in the Baton Rouge area.

Each of the connections will receive an additional 25 MMcfd on the system by virtue of new compression. Enbridge anticipates project completion in third-quarter 2009.

The open season will begin Dec. 1 and end Feb. 28, 2009.

Imports from Northeast Texas into the Southeast US-Gulf Coast region via Carthage-to-Perryville shipment were up an average of 1.8 bcfd as of July compared with the same period in 2007, including a 1 bcfd gain on CenterPoint's CP Line and a 700 MMcfd increase on Gulf South's East Texas-to-Mississippi expansion (OGJ, July 7, 2008, p. 74).

The Midla pipeline consists of 170 miles of 22-in. OD low-pressure pipeline running across Louisiana and Mississippi from Perryville to Baton Rouge. ✦

Letters

Tons of confusion

I read your article "Musings on 'M,'" and I agree wholeheartedly about the confusing nature of certain abbreviations in our industry (OGJ, Oct. 27, 2008, p. 18). 'M' in particular never gave me much trouble, but there are a few that do.

I am from Houston, and my oil and gas experience is grounded in American abbreviations such as "MCF/d," "bbl/day," and, in particular, the larger numbers associated with those. Any decent industry publication has articles about Gulf of Mexico projects that will produce 250,000 bbl/day or transportation projects that will move 1.2 bcf/day (or 850 MMCF/day), and we all completely understand the approximate scope of the project. However, I have seen countless examples of projects that talk about gas in terms of "bcm" and oil in "million tons."

While I know the approximate value of bcm and tons in relation to mcf and bbl, the math is complex for a casual reader, and it is no fun to actually try to make a conversion to get an idea of the scope of the project. I think the European measurements are fine, but can someone please make it a convention to at least put the English equivalent in parentheses for us non-human-calculator types?

Colin R. Eddington
Houston

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.

NOVEMBER

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: vanes

sahurrell@dmgworldmedia.com, website: www.theeagc.com. 25-26.

Offshore Energy, Den Helder, +31(0)10 4360112, e-mail: jl@navingo.com, website: www.offshore-energy2008.nl. 27.

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, +44 1206 545190 (fax), e-mail: events@seatrade-global.com, website: www.seatrade-middleeast.com. 14-16.

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.oilandgas-maintenance.com. 19-21.

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

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

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

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

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

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

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

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

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

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

FEBRUARY

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

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

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

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

Russia Offshore Annual Meeting, Moscow, +44 (0) 1242 529 090, +44 (0) 1242 529 060 (fax), e-mail:

Calendar

wra@theenergyexchange.co.uk, website: www.theenergyexchange.co.uk. 4-6.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

APRIL

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

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

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

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

Rocky Mountain Unconventional Resources Conference & Exhibition, Denver,

(918) 831-9160, (918) 831-9161 (fax), e-mail: registration@pennwell.com, website: www.RMURconference.com. 14-16.

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

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

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

✦Hannover Messe Pipeline Technology Conference, 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.

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

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

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

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

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

Calendar

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

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

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

MAY

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

JUNE

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

PIRA Understanding Global Oil Markets Seminar, London, 44 1493 751 316, e-mail: miles@pira.com, website: www.pira.com. 17-18.

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

IAEE International Conference, San Francisco, (216) 464-2785, (216) 464-2768 (fax), website: www.usaee.org. 21-24.

Society of Professional Well Log Analysts Annual Symposium (SPWLA), The Woodlands, Tex., (713) 947-8727, (713) 947-7181 (fax), website: www.spwla.org. 21-24.

SPWLA Annual Symposium, The Woodlands, Tex., (713) 947-8727, (713) 947-7181 (fax), e-mail: webmaster@spwla.org, website: www.spwla.org. 21-24.

International Offshore and Polar Engineering Conference (ISOPE), Osaka, (650) 254-1871, (650) 254-2038 (fax), e-mail: meetings@isope.org, website: www.isope.org. 21-26.

Asia LPG Seminar, Singapore, (713) 331-4000. (713) 236-8490 (fax), website: www.purvingertz.com. 22-25.

API Exploration & Production Standards Oilfield Equipment and Materials Conference, Westminister, Colo., (202) 682-8000, (202) 682-8222 (fax), website: www.api.org. 22-26.

Moscow International Oil & Gas Exhibition (MIOGE) & Russian Petroleum & Gas Congress, Moscow, +44 (0) 207 596 5233, +44 (0) 207 596 5106 (fax), e-mail: oilgas@ite-exhibitions.com, website: www.oilgas-events.com. 23-26.

JULY

Rocky Mountain Energy Epicenter Conference, Denver, (303) 228-8000, e-mail: conference@epicenter2008.org, website: www.denverconvention.com. 7-9.

API Offshore Crane Operations and Safety Conference, Houston, (202) 682-8000, (202) 682-8222 (fax), website: www.api.org. 14-15.

Oil Sands and Heavy Oil Technologies Conference & Exhibition, Calgary, Alta., (918) 831-9160, (918) 831-9161 (fax), e-mail: registration@pennwell.com, website: http://oshot09.events.pennnet.com/fl/index.cfm. 14-16.

AUGUST

SPE Asia Pacific Health, Safety, Security and Environment Conference and Exhibition, Jakarta, (972) 952-9393, (972) 952-9435 (fax), e-mail: spedal@spe.org, website: www.spe.org. 4-6.

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Journally Speaking

Political fracturing

Bob Tippee
Editor

Oil and gas producers in the US can profit by brushing up on the regulatory background of hydraulic fracturing. So can consumers of natural gas. So, for that matter, can anyone eager to lower emissions of carbon dioxide in response to climate change.

Producers may think regulatory questions ceased when the Energy Policy Act of 2005 became law. The comprehensive energy bill contains an exemption for hydraulic fracturing from federal regulation under the Safe Drinking Water Act.

But the exemption may be in jeopardy. It has received persistent scorn from Rep. Henry Waxman (D-Calif.), who launched a portentous leadership challenge the day after this month's general election.

Challenging Dingell

Waxman wants to replace John Dingell (D-Mich.) as chairman of the House Energy and Commerce Committee. So far, his move against the most senior member of Congress has been analyzed mostly in the context of climate change policy (see story, back page).

Dingell and Rick Boucher (D-Va.) last month finished climate change legislation on which they have worked for months and which environmental groups dislike because of accommodations to industries important to the lawmakers—autos and coal. In fact, the environmental group Greenpeace has formally complained to House Speaker Nancy Pelosi of California about the lawmakers' approach to the issue.

A Waxman takeover of the energy committee can be counted on to harden climate change legislation in the House. But the indefatigable Waxman wouldn't stop there.

As chairman of the House Committee on Oversight and Government Reform, he has made clear his dislike of the energy bill's exemption for hydraulic fracturing.

"I and other members opposed this special interest giveaway," he said while opening an October 2007 hearing entitled "Oil and Gas Exemptions in Federal Environmental Protections." Waxman used the hearing to bore into officials from the Department of the Interior, complaining that the agency ignored a requirement in the 2005 energy law for a study of coalbed methane and the effects of hydraulic fracturing.

"The theory seems to be that the less we know about the dangerous practice of hydraulic fracturing, the better," he said.

Wrong. Operators have used hydraulic fracing safely for nearly 60 years. By 2002, when the Interstate Oil & Gas Compact Commission completed a survey of the subject, nearly 1 million wells had been hydraulically fraced.

US producers now apply the technique to about 35,000 wells/year, regulated by states. There is no record of consequent harm to groundwater.

But facts seldom stop environmental witch-hunts.

In 1994 an environmental group called the Legal Environmental Assistance Foundation (LEAF) petitioned the Environmental Protection Agency to regulate hydraulic fracing of coalbed methane wells in Alabama.

EPA declined. In 1997 LEAF won a court ruling that hydraulic fracing represents underground injection and therefore falls subject to EPA regulation. The court didn't address environmental damage—or the absence of it. Its ruling had to do strictly with legal definitions.

So Alabama adapted its underground injection control program to federal requirements and court directives.

The results, testified Deputy Director of the State of Alabama Oil and Gas Board David E. Bolin at the October 2007 hearing: "Substantially increased administrative and production costs with no public health or environmental benefit."

In 2004, EPA completed a study that concluded "that the injection of hydraulic fracturing fluids into coalbed methane wells poses minimal threat to underground sources of drinking water."

Facts thus demolish Waxman's "the-less-we-know" innuendo. Yet he still raises undue alarm at every opportunity over an altogether benign and well-regulated production technique.

He'll stay on this crusade if he displaces Dingell. And if he succeeds in raising the costs of producing natural gas he'll contravene his own agenda for climate change.

Cause vs. outcomes

Any effort to limit emissions of carbon dioxide has to emphasize gas. Almost half of US gas production now comes from unconventional reservoirs—coalbeds, tight sands, and shales—and the share is rising. Most such reservoirs require hydraulic fracing, raising the costs and regulatory burden of which would constrict gas supply and lift prices. That's no way to lower carbon dioxide emissions or help energy consumers.

Liberal fire-breathers like Waxman, of course, never heed self-contradictions like these. To them, the presumptive righteousness of cause trumps practical worry over outcomes.

Waxman's lightning assault on the energy committee bespeaks a legislature in political turmoil. For a new president, the obvious void in perspective represents an immediate test. ✦

Editorial

Obama's energy program

Because political promises exist to be broken, no one would feel morally usurped if President-Elect Barack Obama ignored the energy program on which he and his running mate campaigned. According to early reports, however, energy will receive high priority when Obama and his vice-president, Sen. Joe Biden of Delaware, take office in January. The prospect is troubling.

The Obama-Biden energy platform calls for heavy spending by government on uneconomic forms of energy in pursuit of three overall goals: energy independence, a "solution" to climate change, and the creation of 5 million "green" jobs associated with governmentally sponsored energy. These goals are, at best, dubious.

Energy independence is unachievable. Under any set of regulatory and economic circumstances, the US will continue to need more energy than it can produce. To think otherwise is delusional. Policy predicated on energy independence is doomed to wasteful failure. Similarly, climate change is not something to be solved; it is natural. Even if human activity influences climate change—a proposition that is by no means certain—the effect can't be great. People might change their activity profoundly and expensively without affecting climate change much, if at all. And jobs "created" by government energy programs inevitably come at the expense of jobs destroyed by the forced substitution of costly for cheaper energy.

In pursuit of these popular but misguided goals, the Obama-Biden energy program would, among other things:

- Divert profits from oil companies to rebates for energy consumers.
- Close regulatory "loopholes" that encourage "excessive energy speculation."
- Draw light crude from the Strategic Petroleum Reserve to be replaced later with heavy oil.
- "Tackle climate change" with an aggressive cap-and-trade system for managing carbon emissions, and use proceeds from the auction of emission credits to fund "the next generation of biofuels and clean energy vehicles."
- Create those "green jobs" with a variety of programs funded by $150 billion in federal spending over 10 years.
- Tighten vehicle fuel-efficiency standards.
- Set mandates for sales of electric and flexible-fuel vehicles.
- Raise the mandate for fuel ethanol to 60 billion gal/year by 2030.
- Set a "national low-carbon fuel standard" that would require fuel suppliers to cut the carbon content of fuel by 5% within 5 years and by 10% within 10 years.
- Require oil and gas companies to drill on or lose federal leases.
- Promote specific oil and gas activity, such as production from unconventional resources in areas already producing, construction of an Alaskan gas pipeline, and enhanced oil recovery by carbon-dioxide injection and sequestration.
- "Diversify" energy sources with a renewable fuel standard for electricity and incentives for clean coal technology and nuclear energy.
- Use regulations to cut energy consumption.

This approach, heavy with regulation, has been tried before and only wasted public money. Over-regulation creates little more than the chance for energy opportunists to enrich themselves at the expense of consumers and taxpayers. It inevitably gives way to market forces that the government can neither anticipate nor supplant.

The impending regulatory assault on energy would occur not only in service to illusory goals but also in an economic context much different from that in which it first appeared. Obama outlined his energy agenda while oil, gas, and other energy prices were extraordinarily high and while the economy seemed reasonably healthy. Those conditions have changed. As usual, market responses have relieved consumers of the pain of high energy prices before the government could act. And the economy has taken a frightening downturn that should make the government loath to undertake any expenditure that doesn't promise certain benefits.

The context changes give Obama an escape route. He should take it. The US can't afford more energy mistakes. The country has steered itself onto a fanciful energy course by choosing to indulge mindless outrage over high gasoline prices rather than give careful thought to why prices got so high. On energy, America needs to grow up. If Obama is serious about change, there's a place to start. ✦

Rise seen in petrochemical, refining construction

Leena Koottungal
Survey Editor/News Writer

Oil & Gas Journal's semiannual Worldwide Construction Update shows a slight increase in refining and petrochemical construction activity compared with the previous edition of the update (OGJ, Apr. 7, 2008, p. 24).

Following are project details from the survey available online (see box).

OGJ subscribers can download free of charge the 2008 Worldwide Construction Update tables at www.ogjonline.com: Click on OGJ Subscriber Surveys, then Worldwide Construction. This link also includes previous editions of the update. To purchase spreadsheets of the survey data, please go to www.ogj.com/resourcecenter/orc_survey.cfm or email orcinfo@pennwell.com.

Refining

Mariisky NPZ Ltd. awarded a contract to Foster Wheeler Italiana SPA, Milan, for the expansion of the Mari-El refinery's capacity to 90,000 b/sd from 27,000 b/sd. Foster Wheeler will define the design basis, undertake the basic design package for nonlicensed process units, utilities and offsites, and front-end engineering design for the project. Mariisky plans to install a train, which will include crude and vacuum distillation units, hydrocracking, hydrodesulfurization, amine and sulfur recovery units, a solvent deasphalting unit, a hydrogen production unit, and sour water stripping facilities, according to Foster Wheeler. The project is scheduled for start-up in 2012.

On Aug. 13, Valero Energy Corp. broke ground on a $2.4 billion expansion project at its 325,000-b/d refinery in Port Arthur, Tex. The project, which includes the construction of a 50,000-b/d hydrocracker and 45,000-b/d coker, will increase the refinery's crude distillation capacity to 415,000 b/d. The expansion is the company's largest-ever capital

investment project. Valero expects the hydrocracker project to be completed in fourth-quarter 2010 and the coker project to finish in second-quarter 2011. Contracts were awarded to Fluor Corp. for the hydrocracker project (OGJ Online, Aug. 7, 2008) and Technip for two processing units—a saturate gas recovery unit and an amine treating unit—and offsites work associated with the refinery expansion.

A coker and refinery expansion project at the Wood River, Ill., refinery, a 50-50 joint venture of EnCana Corp. and ConocoPhillips, began in September, says EnCana. The $3.6 billion project includes a 65,000-b/d coker to enable the refinery to process heavier crudes, increase total crude distillation capacity by 50,000 b/d to 356,000 b/d, more than double heavy crude refining capacity to 240,000 b/d, increase clean-product yield to 330,000 b/d from 250,000 b/d, and eliminate 40,000 b/d of low-value asphalt production. The project will be operational in 2011.

In October, Petroleos de Venezuela SA (PDVSA) began construction of the 100,000-b/d Santa Ines refinery, in Barinas state (OGJ Online, Oct. 13, 2008). The $1.2 billion complex is being developed in two phases: the first is scheduled for completion in 2011 with an initial capacity of 30,000 b/d, while the second will be reached in 2014, bringing the plant to full capacity. The facility will refine oil from Barinas and Apure states, as well as oil from the Orinoco heavy crude belt. It will produce regular and high-octane gasoline, LPG, diesel, kerosine, fuel oil, and asphalt. Santa Ines is one of four domestic refineries either under way or planned. The others include the 50,000-b/d Caripito refinery, a 200,000-b/d refinery in the state of Zulia, and a 400,000-b/d refinery at Cabruta.

Meanwhile, Petrovietnam awarded Foster Wheeler a contract to design the 200,000-b/d Nghi Son refinery and petrochemical project (OGJ Online, July 22, 2008). The refinery is expected to meet 60% of Vietnam's domestic demand for gasoline and other products. The Nghi Son project will import oil from Kuwait to produce high-quality products and is scheduled for completion in 2013.

ConocoPhillips is constructing a 20,000-b/d hydrocracker at its Rodeo, Calif., refinery. Photo from Bigge Crane & Rigging Co.

Petrochemical

S-Oil Corp. selected Axens' ParamaX Technology Suite for the No. 2 Aromatics complex at the Onsan refinery in South Korea. The 1.18 million tonne/year (tpy) plant will add capacities of 900,000 tpy paraxylene and 280,000 tpy benzene. Plant start-up is planned for first-half 2011.

PetroChina Sichuan Petrochemical

Work continues on Navajo Refining Co.'s 15,000-b/d mild hydrocracker project in Artesia, NM. Completion is scheduled for December. KP Engineering is providing engineering, procurement, and construction services for the project. Photo from KP Engineering.

Co. Ltd. selected UOP LLC to supply technology, basic engineering services, and equipment for an integrated refining and petrochemicals complex to be installed at its facility near Chengdu, in Sichuan Province (OGJ Online, July 16, 2008).

The plant is a grassroots installation that will produce both fuels and petrochemicals, including 600,000 tpy of paraxylene using the UOP Parex process.

The plant also will produce more than 350,000 tpy of benzene. Feedstock to the aromatics complex will in part be provided by a UOP Unicracking process unit that will process 2.2 million tpy of heavy gas oil from oil and convert it to more usable products such as diesel, kerosine, and naphtha. This will be the fifth aromatics complex UOP has designed for PetroChina and the sixth Unicracking unit.

PetroChina Sichuan also selected the Unipol polypropylene process technology from Dow Technology Licensing for its 450,000-tpy polypropylene facility at Chengdu. Aker Process BV will carry out process design and technical advisory services. The facility will be one of the largest single-train polypropylene facilities in China, a part of PetroChina Sichuan's 800,000-tpy ethylene complex at Chengdu, the largest in Southwest China. It will be completed and on stream in 2010.

In September, Essar Gujarat Petrochemicals Ltd. awarded contracts to CB&I-Lummus Technology with a total value of $45 million for technology licenses and basic engineering related to a major grassroots petrochemicals complex in Vadinar, Gujarat, India. The cornerstone of the petrochemical complex will be a 1.3 million-tpy mixed-feed ethylene unit that will utilize Lummus' latest generation SRT VI cracking furnaces and recovery technology.

Workers install one of the two 1,375-ton reactors for the world-scale ethylene oxide/monoethylene glycol plant at the Shell Eastern Petrochemicals Complex in Singapore. Foster Wheeler is involved in the engineering, procurement, and construction of the project. Photo from Foster Wheeler/Shell.

ONGC Mangalore & Petrochemicals Ltd. let a contract to UOP to supply technology, basic engineering services, and equipment for an aromatics complex to be built in Mangalore, India. The petrochemical complex is expected to produce 900,000 tpy of paraxylene and 275,000 tpy of benzene to support growing demand for these petrochemicals in Asia.

The aromatics complex will be integrated with an existing Mangalore Refinery & Petrochemical Ltd. refinery complex in the Mangalore Special Economic Zone and will use the naphtha and aromatic-rich stream from the refinery as feedstock to produce aromatics. It is scheduled to be completed in 2010 and will be the largest petrochemicals plant in southern India.

LNG

The North West Shelf gas project's fifth LNG train at the Woodside Petroleum Ltd.-operated facilities on the Burrup Peninsula near Karratha in Western Australia was brought on stream in September (OGJ Online, Sept. 2, 2008). The Train 5 project, built at a cost of $2.6 billion (Aus.), includes the fifth train, a jetty extension, and a second LNG loadout berth. The train has increased the gas project's capacity by 4.4 million tpy to a total output of 16.3 million tpy.

Sonatrach awarded Saipem/Snamprogetti, in joint venture with Chiyoda, a €2.8 billion lump sum, turnkey contract for an LNG train. The contract encompasses engineering, procurement, and construction of a single 4.7-mil-

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Anadarko Petroleum Corp. is expanding its Chapita gas processing plant to 500 MMcfd from 250 MMcfd with a planned start-up for first-quarter 2009. Upon completion, the plant could be further expanded to 750 MMcfd. Photo from Anadarko.

lion tpy train to be built near Arzew, Algeria, about 400 km west of Algiers. Work is to be completed by yearend 2012.

Gas processing

ExxonMobil Corp. unit Mobil Producing Nigeria commenced operations of its $1.3 billion East Area Natural Gas Liquids II project on Bonny Island, about 17 miles off Nigeria. The project will produce at its peak about 50,000 b/d of natural gas liquids. It is designed to ultimately recover 275 million bbl of NGLs and utilize 950 MMscfd of gas.

"The East Area NGL II project was completed ahead of schedule with outstanding safety performance and demonstrates ExxonMobil's ongoing commitment to helping meet the world's growing need for energy," said Mark Albers, ExxonMobil senior vice-president. "In addition, this project represents the first time a major oil and gas joint venture in Nigeria has completed a financing package exclusively through Nigerian financial institutions," he said.

Major components of the project include an offshore NGL extraction complex, more than 125 miles of natural gas and NGL pipelines, and expansion of the existing onshore Bonny River fractionation terminal, says the company.

Crosstex Energy announced plans to construct an $80 million natural gas processing facility called Bear Creek in the Barnett shale region of North Texas. The plant, which is expected to become operational in third-quarter 2009, will have a gas processing capacity of 200 MMcfd, increasing the company's total processing capacity in the Barnett shale to 485 MMcfd. The plant will be strategically located near Crosstex's midstream assets in Hood County.

GTL, other gas

Construction on World GTL Trinidad Ltd.'s, gas-to-liquids plant in Pointe-a-Pierre will be completed by the end of the year with production starting in first-quarter 2009.

It will be the first commercial GTL facility in the Americas and will produce 2,250 b/d of GTL.

Sulfur

Petroleo Brasileiro SA (Petrobras) awarded a $125 million contract to Skanska AB to build a sulfur recovery unit and a tail gas treatment unit (TGTU) at its 47,000 b/d Capuava refinery in Sao Paulo, Brazil (OGJ Online, Sept. 30, 2008). The project is part of a nationwide environmental program to reduce sulfur contaminants in petroleum byproducts. The SRU facility will have a capacity to recover 20 tonnes/day of sulfur, and the TGTU will clean 40 tonnes/day of tail gas.

The scope of the contract includes detailed engineering, purchasing, construction, electromechanical installations, and assistance with commissioning and start-up of the plant. The total contract value is $125 million, with Skanska's share 40% or $50 million. Skanska's partner in the consortium is Brazilian engineering firm Promon. The project is scheduled for completion in 2010.

Pipeline

Midcontinent Express Pipeline, a joint venture of Kinder Morgan Energy Partners LP and Energy Transfer Partners LP, is currently constructing the Midcontinent Express gas pipeline. The 506-mile interstate system will deliver as much as 1.5 bcfd of gas to customers in the southern and eastern US through 30-in., 36-in., and 42-in. gas transmission pipeline in Oklahoma, northeastern Texas, northern Louisiana, central Mississippi, and Alabama. The system also will include a 4.1-mile lateral in Louisiana and other related facilities, including 111,420 hp of compression at four compressor stations and one booster station. The pipeline is scheduled to be in service by early March 2009, the companies reported. Project cost is $1.27 billion.

After earlier delays, Bolivia's state-owned Yacimientos Petroliferos Fiscales Bolivianos and recently nationalized gas transporter Transredes began construction of the 130-MMcfd Gasoducto Carrasco-Cochabamba natural gas pipeline in July (OGJ Online, July 31, 2008). The $170 million GCC line will consist of 250 km of 16-in. pipe extending from the gas-producing region of Carrasco to the city of Cochabamba.

Pembina Pipeline Corp. completed its $400 million Horizon pipeline, which will provide 250,000 b/d of dedicated transportation capacity to Canadian Natural Resources Ltd.'s Horizon oil sands project. Work began in November 2006. Construction involved laying 73 km of pipeline following twinning in 2004 of the original Alberta Oilsands pipeline (now called the Syncrude pipeline) which the company acquired in late 2001.

The UAE's Dolphin Energy awarded a $418 million contract to Russia's Stroytransgaz for the construction of the Taweelah-Fujairah natural gas pipeline. The 48-in., 240-km line will be completed in 2010. The line will link Dolphin's receiving facilities at Taweelah in Abu Dhabi with Fujairah on the UAE's eastern coast. ✦

Aramco, ConocoPhillips delay Yanbu refinery construction

Eric Watkins
Oil Diplomacy Editor

Saudi Arabia's Saudi Aramco and ConocoPhillips, citing uncertainties in financial and contracting markets, have agreed to halt the bidding process for construction of their planned 400,000 b/d export refinery at Yanbu.

"Although the original schedule for the Yanbu export refinery project will change, [Aramco] remains strongly committed to completing this important project with ConocoPhillips," said Pres. and Chief Executive Officer Abdallah S. Jum'ah.

"We believe that a delay at this time will allow both the

Corrib controversy

How long have we been talking about Royal Dutch Shell PLC's Corrib natural gas field development off the northwest coast of Ireland? Too long, but it looks like we'll be talking about it even more in the future.

"It will be at least 2 years, even if we started building now without any difficulties," said Irish Energy Minister Eamon Ryan. "It is a very difficult project," he said, adding, "We are talking years rather than months."

Corrib field, estimated to contain 1 tcf of gas and due to come on stream in 2009, has been beset by protests and delays ever since its discovery in 1996.

Local people want Shell to process the gas at a shallow-water platform as they fear that onshore processing at Bellanaboy would bring a pipeline too close to their homes.

Painful process

"The Corrib gas project has been a protracted and sometimes painful process for many of the people involved," said Ryan, who announced the establishment of a new forum aimed at bringing together the contending parties.

"This forum will be the first time all of the parties sit down together," said Ryan, who wants to unite local opinion about the project, which he hopes will reduce Ireland's dependence on imported gas and boost state coffers.

The minister ruled out, however, any renegotiation of the original deal on the gas license or the relocation of the gas terminal, although his own Green Party passed a motion in June stating that relocation of the Bellanaboy facility was the "only way" to resolve the issue.

"That cannot be on the agenda," said Ryan.

"There is a legal process that has been gone through. There has been a planning process and we cannot supplant and replace An Bord Pleanala," said Ryan, referring to the country's national planning board.

"What we can change is the dynamic that has happened in the absence of government involvement," said Ryan, adding, "We are now putting government center stage."

Opposition persists

Ryan rejected criticism that the forum was a case of too little, too late.

"It is never too late in terms of dialogue and common engagement," he said. "It's better to do this than not to do it. Things could have taken a very different course if there had been engagement at the outset."

Ryan certainly got a positive response from Shell, which naturally wants to advance the Corrib development as quickly as possible.

"As developers of the most significant infrastructural project ever undertaken in the region, we look forward to participating wholeheartedly in the forum's work," said a Shell spokesman.

But opponents do not agree.

Pobaill Chill Chomain, a community group opposed to the citing of the Bellanaboy refinery, insisted no subject must be off limits. "The Bellanaboy location is the fundamental problem and has to be up for discussion," a spokesman said.

Stay tuned. ✦

contracting and financial markets to better accommodate the project and will prove to be advantageous for the project company," Jum'ah said.

The companies had requested bids to be submitted during December but expect that the project will be rebid in second-quarter 2009. Meanwhile, to ensure project continuity, the firms will maintain joint engineering, start-up planning, and other preparatory activities.

The Yanbu refinery, which had a price tag of $6 billion when it was announced in 2006, was one of four plants Aramco planned to increase its refining capacity. But equipment and labor shortages have pushed costs up globally in the energy sector, casting doubt on whether the projects would go through as planned.

Uncertainty in Aramco

The decision regarding Yanbu follows earlier reports suggesting uncertainty in the Saudi national oil company regarding the effect that the current global financial crisis would have on its projects.

Earlier this week, an Aramco executive director said the firm is reviewing some of its long-term projects following the sharp decline in oil prices and a dramatic slowdown in demand growth for crude.

"We are going back to our partners and discussing with them the new economic circumstances," said Khaled al-Buraik, an executive director at Aramco. "We are not talking about delays, we are talking about reviewing."

Al-Buraik said a decision on the projects would be made based on the re-evaluation process, and that Saudi Arabia and other countries would be conducting their own reviews in the wake of changing dynamics.

"People would like to go and re-evaluate, and maybe some projects were evaluated at $80 or $100/bbl—now we are talking about $65/bbl," he said.

Al-Buraik said he thinks the whole oil industry will re-evaluate new expansions: "It will be reassessed based on the current

economic circumstances," he said.

Al-Buraik's view diverges sharply with remarks made last week by Khalid G. Al-Buainain, Aramco's senior vice-president of refining, marketing, and international activities.

Crisis' minimal impact

"When it comes to our new crude-oil increments and gas expansion projects, the impact of the present economic turmoil will be minimal," Al-Buainain said at a meeting of the Society of Petroleum Engineers.

"By and large, our upstream projects are self-financing, or 'corporate financed,' meaning that we are not reliant on the banks or credit institutions to finance our expansion programs," Al-Buainain said.

Softening demand means an extra cushion for project timetables and more flexibility in production, he added.

The company also is involved in several joint ventures with international partners, from export refineries to petrochemical projects, and Al-Buainain expressed optimism that they will be unaffected by the current global economic situation.

"I can tell you that our partners are still highly committed and anxious to see these projects move forward. I think it is realistic to say that financing these megaprojects through borrowing in a tight credit market will be a challenge," he said.

"However, because of the uncertain nature of the global financial crisis, it is really too early to tell what sort of fallout there will be for the funding of these projects." He added that the economic viability of the projects is not in question.

Advantageous position

The construction boom in the Middle East might cool off because of the slowdown in credit, putting Aramco in a more advantageous position.

"Declining commodity prices that are a byproduct of the global economic slowdown will help to reduce the estimated price tags of these projects, as the cost of materials like steel and copper falls sharply," he said.

Equipment and qualified personnel are also likely to be easier to obtain as other projects in the region are canceled or delayed, both in the industry and in the construction and infrastructure sectors.

"As a result, short-term project economics may actually benefit from the current financial turmoil, and companies with a lot of cash will come ahead," said Al-Buainain.

"The day-to-day noise generated by the markets doesn't matter very much when it comes to [Aramco's] project portfolio," Al-Bunainain said. ✦

Saudi production dominance to continue, analyst says

Eric Watkins
Oil Diplomacy Editor

Saudi Arabia will account for 20.93% of Middle Eastern regional oil demand by 2012 while providing a dominant 40.71% of supply, according to a recent analyst report.

BMI's Saudi Arabia Oil & Gas Report also said that regional oil use, which stood at 8.24 million b/d in 2001 and rose to 10.61 million b/d in 2007, should average 10.86 million b/d in 2008 and rise to some 11.81 million b/d by 2012.

Regional oil production, which stood at 22.87 million b/d in 2001 and averaged 25.24 million b/d in 2007, is set to rise to 28.94 million b/d by 2012.

In terms of natural gas, the region in 2007 consumed 370 billion cu m, with demand of 541 billion cu m targeted for 2012, representing 46% growth.

Production of 363 billion cu m in 2007 should rise some 58% across the region and reach 575 billion cu m in 2012, which implies net exports rising to 34 billion cu m by the end of the period.

BMI said Saudi Arabia in 2007 consumed 20.50% of the region' gas, with its market share forecast at 17.78% by 2012. It contributed 20.91% to 2007 regional gas production and, by 2012, will account for 16.73% of supply.

Prices forecast

In second-quarter of this year, BMI estimates that the OPEC basket price averaged just under $115/bbl—up about 24% from the first quarter level. The OPEC basket price had exceeded $127 on May 22, slipping back towards $121/bbl later in the month.

In June, BMI assumed an average of around $120, to deliver its quarterly estimate of $114.98/bbl. The estimated second quarter average prices for the main marker blends are now $118.63 for Brent, $119.61 for West Texas Intermediate, and $115.89/bbl for Russian Urals (Mediterranean delivery).

"Our projections for 2008 as a whole have been revised upwards from the last quarterly report," the analyst said. "We are now assuming an OPEC basket price average of $106/bbl for 2008, compared with the $81 estimate provided by our last quarterly report."

Based on recent price differentials, this implies Brent at $109.71, WTI averaging $110.64/bbl, and Urals at $106.88/bbl.

Saudi GDP growth

Saudi real GDP growth is now forecast by BMI at 4.0% for 2008, following 3.4% in 2007. The analyst is assuming 4.3% growth in 2009, 3.6% in 2010-11, followed by 3.9% in 2012.

"We expect [Saudi] oil demand to rise from 2.15 million b/d in 2007 to 2.47 million b/d in 2012, represent-

ing 3% annual growth that lags our underlying economic assumptions," BMI said.

State-owned Saudi Aramco, wholly responsible for oil and liquids production, is forecast to increase output to 11.78 million b/d by 2012 from 10.41 million b/d in 2007.

There is no foreign involvement in the upstream oil segment, although international oil companies could have a role in future gas field development and are major players in refining and petrochemicals.

Saudi gas production should reach 96.2 billion cu m by 2012, up from 75.9 billion cu m in 2007.

Consumption will match the trend, leaving Saudi Arabia with no import requirement or export potential during the period.

In 2007-18, BMI is forecasting an increase in Saudi oil production of 29.7%, with volumes rising steadily to 13.5 million b/d by the end of the 10-year forecast period.

Oil consumption during 2007-18 is set to increase by 37.1%, with growth slowing to an assumed 3%/year towards the end of the period and the country using 2.95 million b/d by 2018.

Gas production is expected to rise to 117 billion cu m by the end of the period from 76 billion cu m.

"With 2007-18 demand growth of 54.5%, this provides a balanced market throughout the period," BMI said. ✦

IPAA: Unconventional gas changing US supply picture

Paula Dittrick
Senior Staff Writer

Shale gas plays helped US natural gas production increase within the last year, while US oil production continues to decline, said speakers at the Independent Petroleum Association of America's annual meeting Nov. 11.

"This is the era of shale gas plays in North America," said Jeff Wojahn, president of EnCana Oil & Gas (USA) Inc.

Wojahn spoke during a chief executive roundtable at the IPAA meeting in Houston along with Mark Papa, chairman and chief executive officer of EOG Resources, and Porter Bennett, president and chief executive officer of Bentek Energy LLC.

Papa said, "It will be interesting to see how many additional resource plays will be found and how they will develop.... Technology that started in the Barnett shale [of North Texas] is now migrating to Canada and to the rest of the world."

The US Geological Survey classifies the Barnett as an unconventional gas play. Barnett shale wells are known for long-lasting production and a high drilling success rate. Two other shale plays, Haynesville in Louisiana and Texas, and Marcellus in the US Northeast, also are expected to boost US production.

"Geologic risk is now very low," Papa said, and it's not as difficult to find significant quantities of gas as it was 10-15 years ago. He expects more plays to be found and that large independents will be the primary developers of regional unconventional plays.

Wojahn said horizontal drilling and advances in hydraulic fracturing technology has enabled oil executives to devote more time to cost management and efficient operations than to finding the gas in the first place.

Papa said horizontal drilling has been "the biggest game changer" that he has seen in his 40-year career in oil and gas.

"There always will be a place for conventional oil and gas," Papa said. "But if you stay away from horizontal drilling, as an independent you are dealing with a smaller portion of the pie."

Barnett shale

The Barnett shale has been the single biggest driver in US gas production growth, Papa said. Barnett shale production is about 4.4 bcfd today compared with 1 bcfd in production 4 years ago, he said.

EOG estimates Barnett shale production will peak next year at 4.8 bcfd and then hold at a plateau for 2-3 years before gradually winding down. Papa notes that estimates vary and that some within industry expect the Barnett to peak at 6 bcfd.

Johnson County, Tex., "will be drilled up like a pin cushion" by yearend 2009, he said. Wojahn said EnCana is staying out of the Barnett shale peaking discussion. But he noted that emerging technology typically finds a way to sustain production for long periods.

"The Barnett shale may not be that big driver of growth as it has been, but it will remain a source of supply," said Wojahn.

Porter said the US now has abundant, predictable gas supplies but that lawmakers who are keen on promoting alternative energy probably do not understand the availability and the economics of natural gas.

Wojahn said, "I think all of us collectively as natural gas independents have to step up to the plate and start educating the government." ✦

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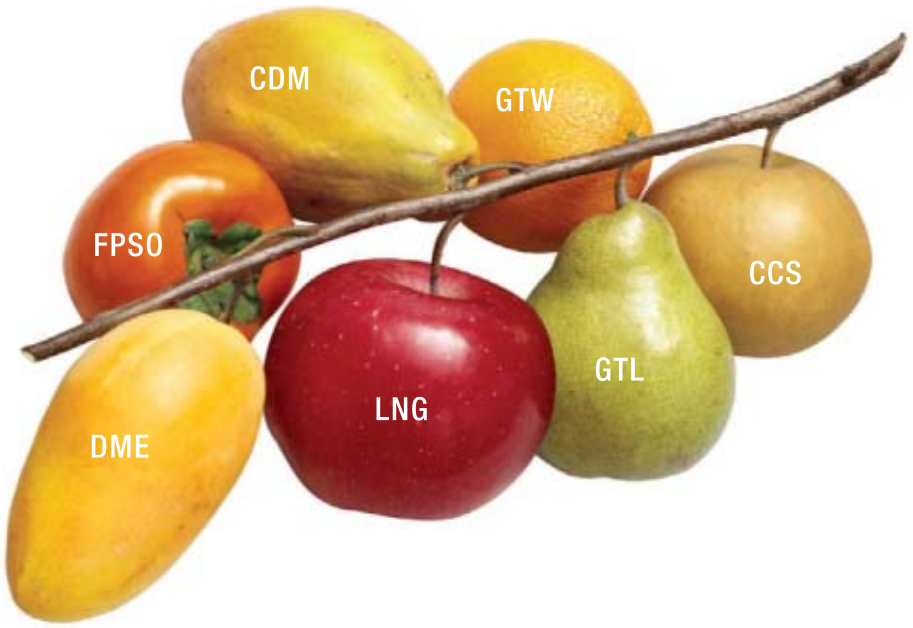

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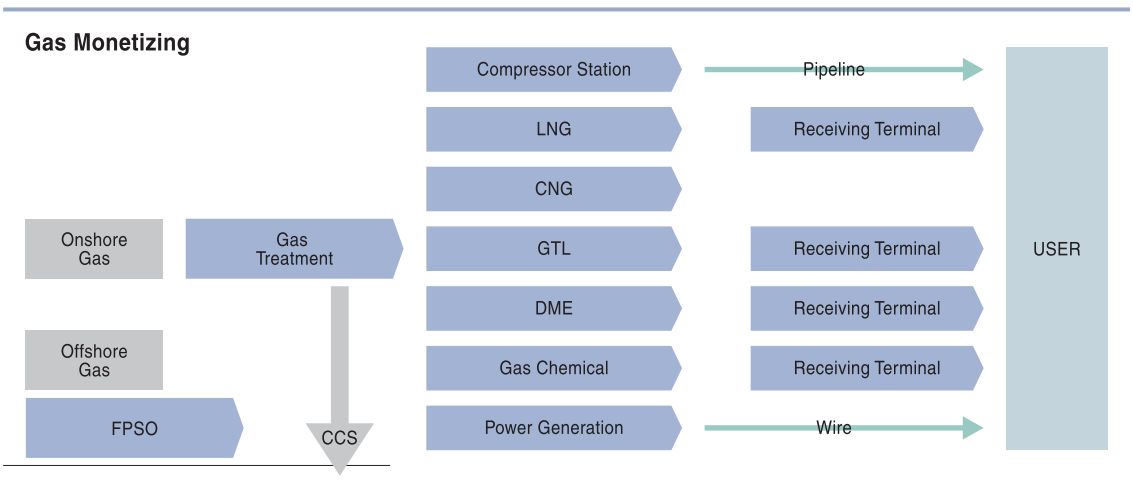

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Analysts assess possible Obama administration actions

Sam Fletcher
Senior Writer

Voting machines had barely cooled down earlier this week before energy analysts began to evaluate the apparent election victory of Ill. Sen. Barack Obama.

In the Houston office of Raymond James & Associates Inc. (RJA), analysts reported Nov. 6: "One overarching point is that history would suggest that energy prices often move higher under Democratic administrations due to supply-constraining policies. All in all, we do not see the Democrats' victory as a game-changing event for either conventional or alternative energy."

After announcing transition team members and appointing Rep. Rahm Emanuel (D-Ill.) as his White House Chief of Staff, President-elect Obama is to consider a proposal by the Washington-based Center for American Progress (CAP) for creation of a National Energy Council within the White House. Transition team co-chair John Podesta is serving as CAP president.

Analysts at Friedman, Billings, Ramsey & Co. Inc. in Arlington, Va., reported that Obama's goal is to have a coordinating council to make sure federal agencies are working together for a clean energy economy. Currently, energy policy decisions are scattered through a half-dozen federal agencies and coordinated through three: the Council on Environmental Quality, the National Economic Council, and the National Security Council.

RJA analysts said, "Our fundamentally bullish long-term thesis on the energy complex is based on the long-term structural imbalance between ever-increasing energy demand and constrained energy supply. This imbalance is not something that governments can eliminate," adding, "Even the centerpiece of Obama's energy platform—binding carbon emissions caps—is not something that will likely impact the fundamentals of the oil and gas industry, or the coal industry, anytime soon."

Despite "macroeconomic developments" over the past 3 months that have reduced assessments of global oil demand growth for 2009, RJA analysts said, "We have a negative stance on natural gas given the prospect of a meaningful US gas oversupply in 2009—[T]he fundamentals for conventional energy are not unique to the US, and in the grand scheme of things, it does not matter very much who is in the Oval Office or on Capitol Hill. For alternative energy, stronger leadership from Washington that Obama has pledged would certainly facilitate greater domestic growth in renewables, adding to the policies that are increasingly visible at the state level."

Other propositions

But expensive alternative fuel programs may be hard to enact during troubled financial times. Clean Energy Fuels Corp., leading provider of natural gas (CNG and LNG) for transportation in North America, noted that California voters on Nov. 4 rejected Proposition 10, the California Renewable Energy and Clean Alternative Fuels Initiative. That was a $5 billion, first-in-the-nation public investment to provide funds for a wide variety of clean energy projects across the state, including consumer incentives for clean alternative vehicle fuels and construction of renewable energy generation facilities, such as solar and wind power plants.

"Passage of Prop 10 would have provided an important funding mechanism to rapidly turn these goals into a reality throughout the state," said Andrew J. Littlefair, Clean Energy Fuels president and chief executive officer.

US-Europe relations

One of the earliest and most comprehensive analyses of the election came from Chatham House, home of the Royal Institute of International Affairs, a leading institute for debate and analysis of international issues. According to director Robin Niblett, Obama's first job "will be to keep Americans safe and not to please the international gallery," adding, "This does not mean that Europeans should resign themselves to be disappointed. To start with, the Obama campaign has pulled together a talented and deep bench on foreign policy. They are ready to act and, with a strong Democratic majority in the Senate, can expect to be confirmed into their posts quickly."

But as an Obama administration juggles its complex domestic and international agenda, Niblett said, "[It] should expect its European allies to step forward with their own suggestions of how to implement realistic transatlantic policies towards each of our common challenges. The success of Obama's foreign policy initiatives in his first term will depend significantly on what European capitals can deliver and not just on his administration's own creativity."

Further, the deepening economic crisis of recent months "will make it even harder for Obama to focus on new US international initiatives, never mind changing US policies on Afghanistan, Iran, the Middle East peace process, climate change mitigation, and the rest of the wish-list that many in Europe are hoping for," Niblett said.

US-Africa relations

Alex Vines, research director and head of the group's African program, said, "Reining in stratospherically high expectations both from within Africa and from within his own administration will be a principal preoccupation for the first years of Obama's Africa policy." He said, "The large number of Obama's campaign advisors with Africa expertise under the Clinton Administration such as Susan Rice and Witney Schneidman, are impatient to make their mark. The danger is that, as with the first British Labor administration

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of 1997, impatience and overconfidence both underestimates the political complexities of African states, and chafes with socially conservative African leaders, leading to misunderstandings, blunders, and set-backs."

Vines said, "There are many good policy proposals, including a secretary of state for overseas development assistance to rationalize America's generous but ponderous aid programs. However, public relations is key, and as China and other emerging powers gain greater influence across the continent, Obama's Africa team will have to take ever more care that good intentions are not blunted by poor diplomacy."

US-Asia relations

Meanwhile, Gareth Price, head of the group's Asia program, warned: "While the fresh start is widely welcomed in the region, [Obama's] protectionist impulses have caused concern, notably in India where his talk of ending tax breaks for US companies that move jobs offshore has gone down badly. However, "most assume" that, when in office, Obama's hands will be tied and that his rhetoric will not become practice, Price said.

"A likely shift away from a security-dominated agenda formulated in response to the threat of radical Islam is to be welcomed," Price said, "but in Afghanistan and Pakistan, enabling that shift, in a worsening security climate, will be challenging. There seems little likelihood that he will call a halt to air strikes within Pakistani territory, continuing to alienate Pakistanis." He added, "His threat to tie military aid to performance in the fight against the Taliban and Al-Qaeda could cause rifts between the US and Pakistani military, but his shift towards economic development assistance may help shore up the weak democratic government in Pakistan."

Price foresees little change in US relations with China. "The aims will remain the same: to identify common interests and work together; to acknowledge dependency, especially in the economic sphere; and to manage areas of clear conflict," he said, adding, "Obama should be able to take advantage of rapidly improving relations between Taiwan and China to soften the relationship, but concerns over trade, will remain a threat."

In the past Obama has voted against increasing the number of work visas offered in Asia, but lately he has suggested increasing the number of professional migrants. "The fact that this is a key issue, despite the economic difficulties the US faces, demonstrates the continued attractiveness of the US," said Price. Because he spent his formative years in Indonesia, Obama brings greater cultural awareness of the diverse region than any previous president.

Economic recovery

"The downward lurch of the US economy during the final month of the campaign undoubtedly helped [Obama] win the election. Can he now return the favor by arresting the economic decline?" asked DeAnne Julius, Chatham House chairman.

"The fundamentals are against him," Julius said. "A strong contractionary spiral has taken hold as households curtail spending and banks curtail lending, while house prices continue to drop, and unemployment mounts. A US recession is 'baked in the cake' regardless of the stimulus package the new Congress decides to enact."

Nevertheless, said Julius, "Psychology will be as important as policy in sparking the eventual recovery. The pre-election vacuum of leadership clearly contributed to the dire state of consumer confidence and the precipitous drop in the stock market during October. This [Obama] has a good chance of fixing—starting even before the inauguration. The sight of a young, new president articulately engaging with other world leaders next week in Washington could be the spark that rekindles the optimism for which Americans are widely known and admired."

US-Middle East relations

Claire Spencer, head of the Chatham House Middle East program, said: "Expectations for a change in US direction towards the Middle East are high, especially amongst the Arab populations of the region. The recent US attack within Syria is seen as a last ditch attempt by the Bush presidency to pressure the Syrians into controlling their border with Iraq and curbing their alliances with both Iran and Hezbollah. However, this is seen to be going against a wider trend, supported in Europe and Israel, to engage with Syria through negotiations and diplomatic enticements. It is anticipated that the new US presidency will fall into line with this."

Spencer said: "The main headaches for the US administration will remain the three 'I's': Iran, Iraq, and the lingering Israel-Palestine conflict. In none of these areas will the new presidency have much room for maneuver over the first few months. Withdrawal of US forces from Iraq will depend on the shape that the still unresolved 'State of Forces Agreement' takes. There is no guarantee that the outgoing Bush administration will agree to terms with the Iraqi government in time for the projected Dec. 31 deadline, when the [United Nations] mandate for the US presence in Iraq runs out. This could prompt a crisis of legitimacy in January 2009, yet in managing this, the new administration will be guided more by 'facts on the ground' than precipitate timetables for withdrawal."

Iran's presidential elections in midsummer 2009 will not see a change in official positions over the nuclear issue, "even if President Mahmoud Ahmadinejad fails to secure a second term," Spencer said, adding, "The dilemma then to be faced is how US officials might engage with Iran in ways that don't concede too much ground from the now weakened UN Security Council sanctions regime."

Although it may pain Obama's supporters to hear, the state-run Iranian newspaper claimed Obama is no better than Bush. Although prospects for an armed US-Iran conflict "will be close to zero" under Obama's administration, Iranian officials expect him to engage a "more circuitous route but his aim is

the same as his predecessor…[Obama] considers talks not as a means to a solution but as a means to exert more pressure…[with] a stronger position to negotiate with Russia, China, and Europe to impose tighter sanctions," Spencer said.

In the Middle East, Spencer said: "The greatest expectation is that the new US presidency will change its tone—away from the language of the 'global war on terror' to a more detailed understanding of the local and regional dimensions of change since 2003. Already, Washington, DC, is buzzing with new 'strategic plans' to combat terrorism and engage anew with the Islamic world. Whether US policy will reflect the wider reality that other actors are now taking the lead remains to be seen. The [Persian] Gulf states, China, India, Russia, and Turkey (inter alia) have moved the balance in the financial, diplomatic, and energy sectors away from the central role once played by the US as the region's main security guarantor. Where this affords local actors and states such as Iran more leeway to resist US pressure, local hopes placed in a 'post-Bush' era for the Middle East may well be disappointed."

US House, Senate

The Democrats' advantage in the US Senate rose to 57-40 on Nov. 6 after Sen. Gordon Smith (R-Ore.) conceded to Democrat Jeff Merkley. On Nov. 7, three Senate races remain "too close to call" (Alaska, Georgia, and Minnesota), where Republican incumbents would lose their seats to Democratic newcomers; upsets in all three states would give Democrats a 60-vote filibuster-proof majority.

Meanwhile, FBR analysts reported that House Oversight and Government Reform Committee Chairman Henry Waxman (D-Calif.) announced he will challenge John Dingell (D-Mich.), for chairmanship of the House Energy and Commerce Committee (ECC). Dingell is the longest-serving member and de facto Dean of the House (see p. 20).

According to CongressDaily, "Success for Waxman will likely depend on support from the large California delegation and liberals who feel Dingell's support of the automobile industry and concern about automobile emissions limits would prevent strong environmental legislation." FBR analysts said Environment and Energy News quoted an unnamed "refining industry lobbyist" as saying, "Given the scope of jurisdiction of the [ECC], all hell will break loose legislatively if Waxman [becomes chairman]."

Waxman reportedly favors letting the Environmental Protection Agency deal with climate change legislation while Dingell would prefer for Congress to retain that responsibility. ✦

Woodford shale play forms up in Oklahoma Anadarko basin

A play for gas-condensate and oil in the fractured Upper Devonian Woodford shale formation is emerging on the Oklahoma side of the Anadarko basin.

The Woodford shale, thought of until relatively recently as a source rock, has developed into a considerable gas producing formation in the Arkoma basin on the opposite side of the Nemaha ridge, and production is also emerging in the Ardmore basin.

Cimarex Energy Co., Denver, began assembling acreage about 18 months ago to drill the Woodford as a primary objective in the Anadarko. Cimarex said the play holds potentially 1.5 to 2 tcf recoverable to the company. Several other operators are believed to be pursuing or evaluating positions as well.

Cimarex amassed 50,000 acres in Woodford-prospective areas of central-western Oklahoma and in late October completed the acquisition of a further 38,000 net acres from Chesapeake Energy Corp. for $180 million. The acreage is in Blaine and Canadian counties.

Only $5 million of that transaction went for reserves, Cimarex revealed. It was the last large block to be acquired in its core area in the Woodford play, the company said.

Linn Energy LLC, Houston, announced the sale of its deep rights including the Woodford shale interval in certain central Oklahoma acreage to an undisclosed buyer on Oct. 10 for $229 million, subject to closing adjustments. That sale included no producing assets, and Linn Energy retained the shallow rights.

Continental Resources Inc., Enid, said it held 111,000 net acres in early November 2008 in the Anadarko Woodford shale.

Drilling progress

Cimarex, still leasing in the play, had participated in 28 wells by late October, of which 16 are completed and 12 were still drilling or being completed.

Drilling totals 31 wells by all operators, Cimarex said, and the other three wells were still being drilled in late October.

Continental Resources said it was drilling two operated wells in the play as of Nov. 6. The company holds a mix of acreage, some of which is held by production from other formations.

Other companies in the emerging play include Devon Energy Corp. and Western Oil & Gas Development Corp., both of Oklahoma City. Other companies appear to have HBP acreage and may be evaluating their positions.

Cimarex looks for the average well to recover nearly 5 bcf on 160-acre spacing with a 4,000-ft lateral. Wells with that lateral length have averaged initial production rates of 5 MMcfd.

Cimarex defines the Anadarko Woodford as occurring at 11,000-16,000 ft, where it is 120-280 ft thick, has 3-9% total organic carbon, good porosity and permeability, and gas in place of 145-195 bcf/sq mile. The Woodford represents "a big, multiyear drilling program in a play we like," said F.H. Merelli, chairman, chief executive officer, and president of Cimarex. The company is already studying the desirability of downspacing to 80 acres.

Half of Cimarex's 88,000 net acres is held by production from other formations, so the company is in control of development timing rather than being governed by lease expiration deadlines.

Well cost could moderate slightly from the current $8.5 million to $9 million, Cimarex said.

The company said it was dropping five rigs in the Texas Panhandle, but it expects to be running 9-11 rigs in the spring of 2009, up from five operated rigs in late October 2008.

While climbing learning curves on drilling and completion techniques in the Anadarko Woodford shale, operators will be deciding how far west they will be able to pursue the play given the economics. The formation plunges well below 15,000 ft as it trends westward toward the deep Anadarko basin trough. ✦

Atlas to pursue New Albany shale in Indiana

Atlas Energy Resources LLC, Pittsburgh, plans to drill more than 100 horizontal wells to Devonian New Albany shale in southwestern Indiana by the end of 2009.

The company has acquired 114,000 net acres and has taken a farmout on 78,000 net acres from Aurora Oil & Gas Corp., Traverse City, Mich. The combined transactions give Atlas rights to 284,000 largely contiguous gross acres in the Illinois basin, mainly in Sullivan, Knox, Greene, Owen, Clay, and Lawrence counties, Indiana.

Drilling is to start in 2008, with Atlas Energy using capital from its syndicated oil and gas investment programs. The total acreage contains about 800 horizontal drilling locations.

The farmout requires that Atlas Energy drill at least 20 wells/year and grants Aurora a right to participate for 25%. Aurora will receive a well site fee for and overriding royalty interest in each well.

The acreage is in the northern "biogenic" part of the New Albany shale play, where several operators have drilled more than 40 successful horizontal wells, said Atlas Energy.

"We have been studying the New Albany shale for over 2 years and believe the predictable and statistical nature of its development is a perfect fit for our investment programs," said Atlas Energy president and chief operating officer Richard D. Weber.

Overseeing Atlas Energy's New Albany shale development will be the company's Antrim Shale operating team, led by Dick Redmond, president of Atlas Energy Michigan LLC. The New Albany shale has many similarities to Michigan's biogenic Antrim shale, in which Atlas Energy is the largest and one of the lowest cost operators.

Atlas Energy noted that New Albany is a blanket formation 100-200 ft thick and 500-3,000 ft deep. Natural fracture patterns are low-angle in the Antrim shale and vertical in the New Albany.

Atlas Energy reviewed more than 30 successful horizontal completions in and near its acreage and observed an average estimated ultimate recovery of 1.3 bcf/well. Horizontal New Albany wells with 4,000-5,000-ft laterals can be drilled and completed for $1.3 million.

Aurora Oil & Gas, through predecessors, has been working in the New Albany play since 1994. Operator and majority owner until now of its 121,702-gross-acre Wabash project in Clay, Greene, Owen, and Sullivan counties, it has drilled 13 wells. All may be considered productive, but all are shut-in awaiting connection to pipeline and processing facilities. ✦

Encore making run at Tuscaloosa marine shale

Encore Acquisition Co., Fort Worth, is exploring for oil in the highly overpressured Cretaceous Tuscaloosa marine shale and has accumulated 210,000 net acres along the Louisiana-Mississippi line east of the Mississippi River.

The company mapped a silt in the shale that is of sufficient integrity to drill a horizontal wellbore. It has drilled and cased to just beyond 17,000 ft measured depth the Weyerhaeuser-1H, in irregular section 60-1s-4e, in the northwestern corner of St. Helena Parish, La.

Encore Acquisition plans to attempt completion in the well's 4,100-ft lateral, but the attempt has been delayed 5 weeks due to the short supply of high-strength proppant.

The company, which has drilled four horizontal wells in the play in 2008, took a $26.3 million impairment charge on the first two, Richland Plantation-A1 in East Feliciana Parish and Joe Jackson 4-13H in Amite County, Miss.

"These appraisal wells, while experiencing some mechanical problems, demonstrated the ability to drill a horizontal lateral in a stable shale and establish sustained oil production from the TMS," Encore Acquisition said. The company hasn't booked any proved reserves in the shale.

Louisiana State University's Basin Research Institute estimated that the shale could hold 7 billion bbl of recoverable oil in a large area extending entirely across south Louisiana and southern Mississippi (see map, OGJ, Dec. 29, 1997, p. 91). ✦

USGS: 2.4 tcf of gas beneath eastern Oregon, Washington

An estimated 2.4 tcf of natural gas and 9.8 million bbl of natural gas liquids lie beneath eastern Oregon and Washington, the US Geological Survey reported.

The figures are mean estimates of undiscovered gas resources beneath 60,000 sq miles of the two Pacific Northwest states. A USGS team conducted a geology-based assessment using the total petroleum system approach, the US Department of the Interior agency said. The work was done in 2006, but specific figures were not released until recently, a spokeswoman said.

The report said the Columbia River Basalt Group, 4,000-18,000 ft in thickness, overlies the Cretaceous Tertiary total petroleum system in the area east of the Cascade Mountains. Volcanic rock units from the Miocene epoch through the Quaternary period overlying the province's most southern part had previously limited knowledge of that area's stratigraphy and structural geology, USGS said.

In the hypothetical Columbia basin assessment unit (AU), which covers more than 4 million acres, the assessment team estimated that 2.1 tcf of

gas and 9.2 million bbl of NGL are in Tertiary rocks beneath the Columbia River basalt, according to the report. The largest undiscovered gas field in the AU holds a mean estimate of 362.9 bcf, it added.

In a second area, the hypothetical Eastern Oregon and Washington conventional gas AU covering more than 22.2 million acres, the report listed a mean estimate of 300 bcf of conventional gas and 610,000 bbl of NGL. It said the estimated mean size of the AU's largest undiscovered gas field is 78.3 bcf (OGJ, Jan. 14, 2008, p. 35).

The report said that the assessment team identified a third area, the Republican Graben Gas AU, but did not quantitatively assess it.

Known to be present beneath the basalt of north-central Oregon and central Washington are some 5,000-10,000 ft of arkosic sandstone, mudstone, lacustrine shale, and coal, which include potential source and reservoir rocks. The province's only discovered commercial gas accumulation is the abandoned Rattlesnake Hills field, in Benton County, Wash., which produced about 1.3 bcf of gas.

Numerous other gas shows are known in the province, but as of 2006 no new commercial accumulations have been found, the report said. ✦

Israel

Zion Oil & Gas Inc., Dallas, plans to spud the Ma'anit-Rehoboth-2 well in Israel in early 2009.

Aladdin Middle East Ltd. has refurbished a 2,000-hp rig to directionally drill the well deeper than 18,000 ft. Pending the receipt of permits from Israel, the rig is to be shipped from Turkey in January 2009.

Zion's overall work plan, depending on funds raised, is to drill a second well on the Joseph license to the Triassic at 15,400 ft and-or Permian at 18,040 ft, drill a well on the Asher-Menashe license to the Triassic and, if appropriate, the Permian, and prepare to drill a further well on either license (see map, OGJ, July 5, 2004, p. 42).

Kazakhstan

Tethys Petroleum Ltd., Toronto, gauged gas at the rate of more than 10.2 MMcfd at the AKK-16 well in Kazakhstan's North Ustyurt basin and named the discovery Southeast Akkulka.

The discovery well is northwest of the Aral Sea and 22.5 miles southeast of Kyzyloi gas field. The gas flow came from a 26-ft sand on a 1.4-in. choke with 183.5 psig flowing tubinghead pressure. The company said 73-mm tubing appears to have restricted the flow rate.

Seismic and geological analysis indicates that the Paleogene basin in which these sands were deposited deepens to the south and east and the reservoir in the AKK-6 well, which initial data indicate to have high porosity and permeability, may represent a more distal equivalent of the Paleogene sand sequence productive in Kyzyloi field, the company said.

Gulf of Mexico

A group led by Noble Energy Inc., Houston, plans to start gas production by the end of 2008 from the deepwater Raton discovery in Mississippi Canyon Block 248 in the Gulf of Mexico, said 33% interest owner Energy Partners Ltd., New Orleans.

Noble Energy has 68% working interest in Raton and the nearby Redrock discovery in Mississippi Canyon Block 204. The finds are in 3,300-3,400 ft of water.

Alaska

GeoPetro Resources Co., San Francisco, plans to spud an exploratory well in Alaska's Cook Inlet basin in May 2009.

The planned 8,000-ft Frontier Spirit-1 well is to evaluate a 100% owned, 11,500-acre prospect identified on 50 miles of reprocessed 2D seismic acquired from Amoco Production Co. Primary objective is conventional gas in Middle and Lower Tyonek. Secondary target is the Hemlock formation. All are of Tertiary age.

The prospect is 6 miles north of Anchorage and less than 2 miles from the Enstar 20-in. gas pipeline.

Montana

Continental Resources Inc., Enid, Okla., and several other companies have formed the Montana Bakken EOR Consortium to conduct a carbon dioxide pilot project in Richland County, Mont.

The other parties in the consortium asked that their names not be revealed as yet, Continental Resources said.

The group plans to begin gas injection by the end of 2008, inject for one month, and then shut in the well for one month. They will then produce the well and analyze data to determine EOR potential.

Pennsylvania

Atlas Energy Resources LLC, Pittsburgh, said it has 90 wells, some of which have been on line for 2 years, producing a combined 25 MMcfd of gas into a pipeline from Devonian Marcellus shale in Pennsylvania.

Cumulative production exceeds 4 bcf, making Atlas Energy the largest Marcellus producer (OGJ Online, Oct. 8, 2008).

The last 13 vertical Marcellus completions have averaged an initial 1.3 MMcfd, and one vertical well in Fayette County came on at 3.6 MMcfd and has produced 132 MMcf in 60 days.

The company plans to drill 32 vertical wells between next week and Mar. 31, 2009, and 75 more vertical wells the rest of 2009. It is also drilling 12 horizontal wells by next Mar. 31 as operator with 50% working interest and 12 more horizontals with 100% by the end of 2009.

UFRJ, Petrobras study strength behavior of expandable tubulars

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Researchers at COPPE/Federal University of Rio de Janeiro and Petrobras present a method for determining the necessary diameter-to-thickness ratio of tubulars corresponding to required minimum collapse pressures. The article describes the theoretical and experimental studies used to evaluate the behavior of solid expandable tubes.

Solid expandable tube technology has many advantages when compared to conventional technology for wells. The expansion of tubes in situ allows development of reserves in many different scenarios found in the oil industry; the technology is compatible with directional and horizontal wells, and facilitates side-track operations.

Although the expansion of tubes is attractive, a better understanding of its influence on the tube mechanical strength is necessary. This article explains the methodology of experimental tests and numerical analyses used to determine the effect of parameters such as diameter-to-thickness ratio and expansion rate on the collapse resistance of expandable tubes. We developed nonlinear numerical models using finite-element analysis and, after calibration, used them to analyze further the mechanical behavior of solid expandable tubes and the influence of expansion on tube resistance to collapse.

Based on a presentation to the Rio Oil & Gas Conference, Sept. 15-18, 2008.

Background

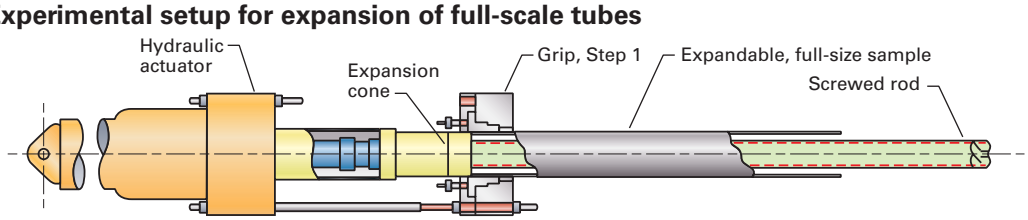
A 2-3%/year increase in the already high demand for energy, oil in particular, is expected for the next few decades (Energy Information Administration, 2006). As a result, oil companies are intensifying efforts to meet global demand. These efforts must be made in E&P, especially towards the discovery and development of new reservoirs, by improving the performance, developing feasible new technologies, and reducing costs. Once drilling and completion represent a major percentage of the field development cost, companies will concentrate their efforts on those segments.

Some of the current challenges in drilling and completion segments are: high-pressure/high-temperature drilling; drilling through salt layers; deep wells; ultradeepwater horizon; extended-reach wells; complicated trajectory wells; and rig availability.

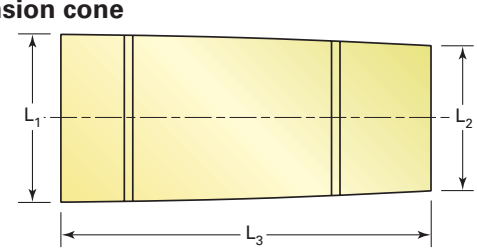
APPARATUS, CONE DETAILS

Fig. 1

Experimental setup for expansion of full-scale tubes

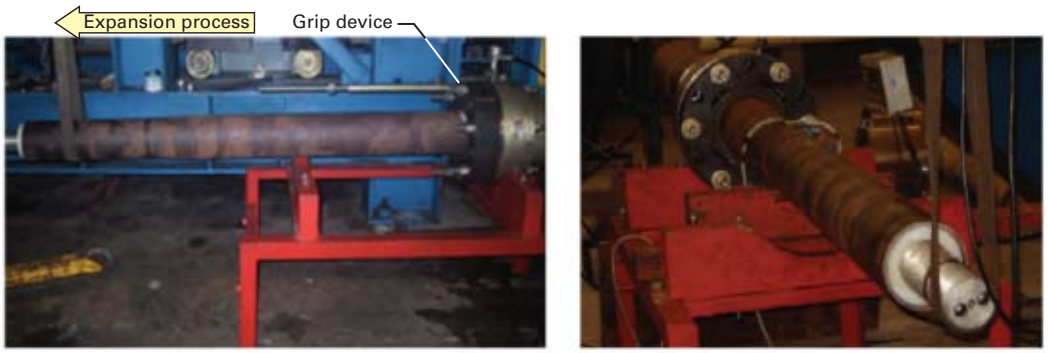


Expansion cone



EXPANSION PROCESS OF SOLID STEEL TUBE*

Fig. 2



*These photos illustrate the expansion process of a solid steel tube, showing the gripping device in the second and third-stage positions.

With more than 1,000 installations in place, solid expandable tubular has proven to be an economically and viable alternative to conventional drilling technology. Originally developed to extend well depth while maintaining larger borehole diameter (monodiameter or slim well system), expandable tubes can also be used as a contingency drilling liner in any well. Drilling liners are used to maintain hole size when a geographical anomaly or problem is encountered.

Another application is the openhole cladding system. It consists of an expandable string with elastomers that is run and expanded against the formation to isolate specified areas. The cladding differs from the liner system because it is not tied back to the base casing.

Expandable tubular technology can be used in cased holes as well. The expandable cased hole liner system enables operators to repair existing damage or worn casing in deep drilling or other contingencies.

Expansion process

The expansion of solid tubes is a cold work process inside the well that expands the diameter of a liner by passing a mandrel through it. Expansion may result in a decreased thickness and a variation in length of the expanded body. It also results in stress-induced material anisotropy.

For a downhole expansion process, the capabilities required include:

- Expand the tubular to the desired diameter without fracturing, bursting, or damaging the tubular
- Maintain structural strength of the expanded tubular to provide sufficient resistance to burst and collapse loads in service
- Achieve a constant diameter and wall thickness of the expanded tubular over the whole length of the expanded section
- Maintain integrity of expanded tubular connections
- Expand long sections at high rates.

The expansion can be performed both in open and cased holes. In open holes, the tube is expanded against the formation. In cased holes, the tube is expanded against casing previously installed in the well. Different service companies use different expansion methods.

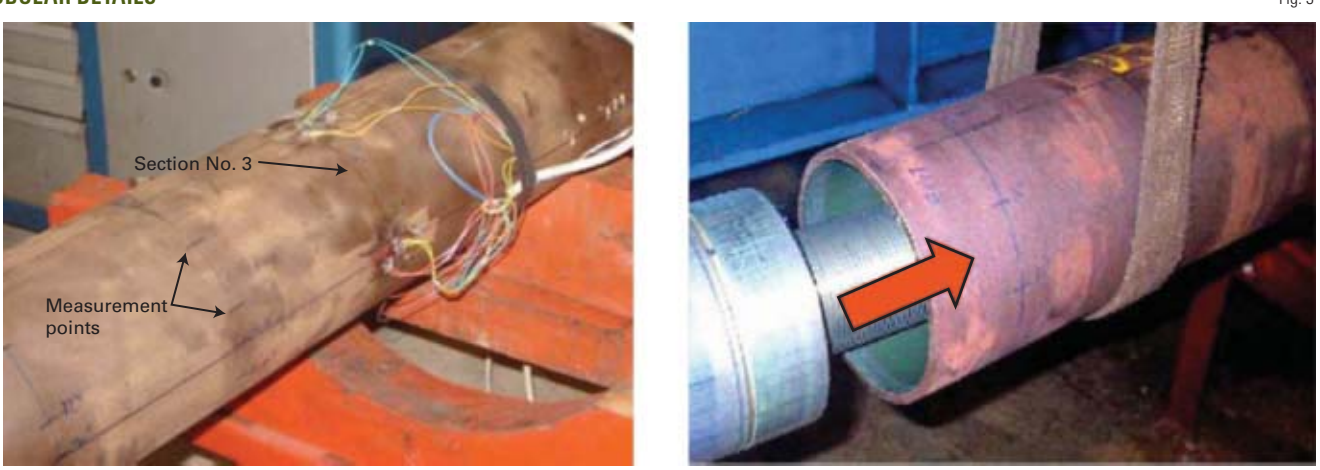
Experimental tests

We performed experimental tests on specimens taken from expandable tubes dedicated to oil well applications, provided to the lab by Petroleo Brasileiro SA (Petrobras).

To have good representation of the studied phenomenon (radial expansion

TUBULAR DETAILS*

Fig. 3



*Tubular specimens, instrumentation, and measurement points along the circumference.

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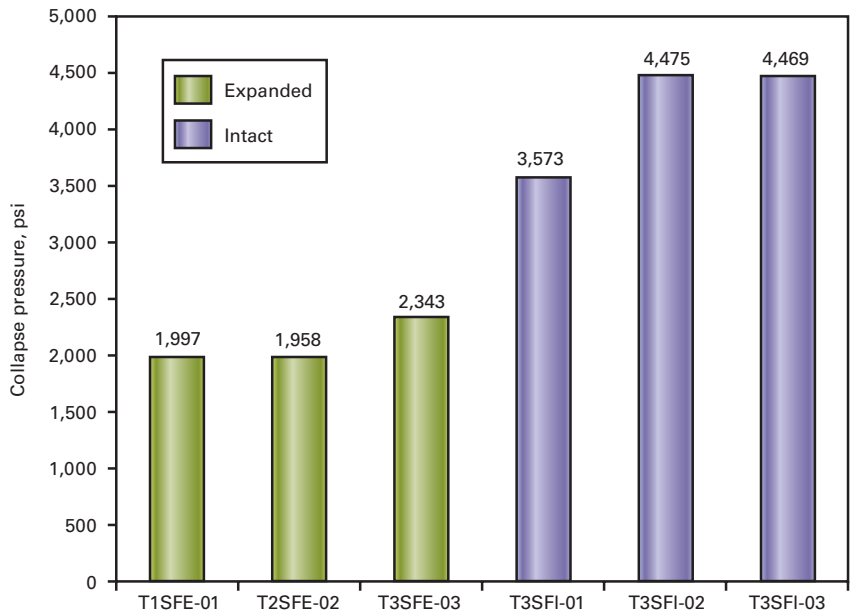
Specimen T2SFE-02 collapsed after exposure to external pressure applied inside a hyperbaric chamber (Fig. 4).

RESULTS OF THE COLLAPSE TESTS FOR SOLID TUBES

Fig. 5



of pipes), we developed an expansion apparatus in the Subsea Technology Laboratory (LTS) of the Federal University of Rio de Janeiro to carry out the experimental tests.

Material properties

Because the material parameters of the tubular samples were not provided by the manufacturer, we determined them from uniaxial tension tests, based on nine specimens removed from the tubes in the longitudinal direction (three samples per tube).

We determined the elastic characteristics of the material (yield strength and Young's modulus) and obtained a stress-strain curve in the elastic-plastic regime.

ELASTIC MATERIAL PROPERTIES

Table 1

Sample	E, MPa	v	σy, MPa
T1	207,255.6	0.264	410
T2	207,408.9	0.273	408
T3	205,180.2	0.286	347

One of the three specimens of each tube was instrumented with two uniaxial strain gages, applied in the longitudinal direction, a uniaxial strain gauge in the transversal direction and a clip gauge. The other two specimens received only the clip gauge.

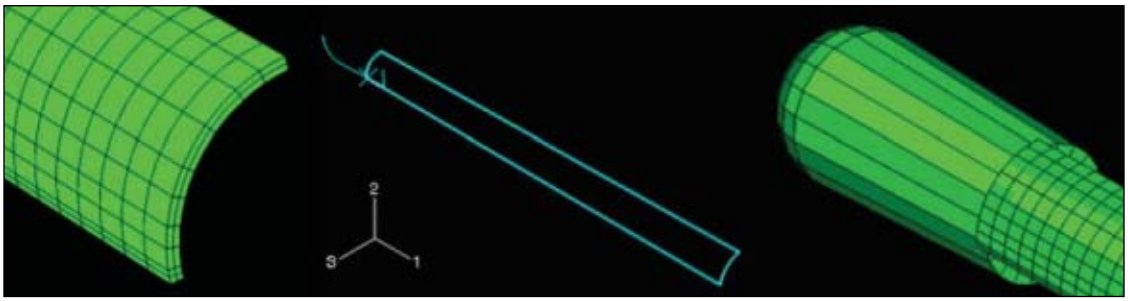
We conducted the tests according to ASTM's E8M standard. Table 1 shows the material elastic properties.

Expansion apparatus

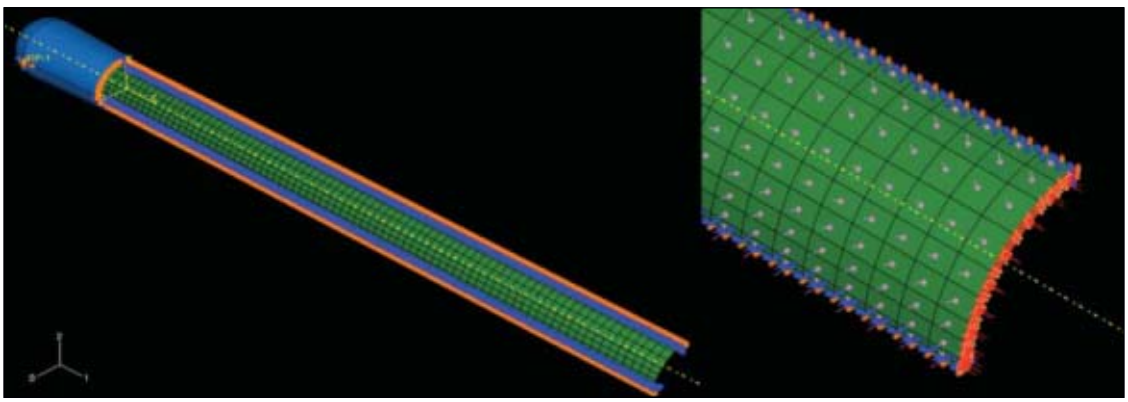
As previously mentioned, an experimental setup was designed and built at the Subsea Technology Laboratory to reproduce the expansion of full-scale tubulars with diameters up to 152.4 mm. Its function is expanding the tube under tension. The main parts are hydraulic actuator, grips, and screw-driven expander cone.

The cylinder imposes displacement to the expander cone through a long screw. The cone, in turn, expands the tube in the radial direction. One edge of the tube (where the expansion process begins) is fixed by grips, while the other end remains free.

The expansion is carried out in three steps. Initially, the cone is forced inside the tube between one edge and the first-stage grip with the hydraulic cylinder. Then we remove the first-stage grip and force the cone further along the length of the tube until the maxi-



This 3D finite-element model shows the details of a solid tube and a conical mandrel (Fig. 6).



These finite-element graphics show loads and boundary conditions for Step 1 (A) in the image on the left and Step 2 (B) used for modeling the effect of hydrostatic load that occurs inside the hyperbaric vessel (Fig. 7).

mum displacement of the cylinder rod is achieved (second stage). Because the maximum extension of the cylinder rod is insufficient to perform the whole expansion, another expansion stage is necessary.

Then we retract the rod and move the screw through the cone to follow the rod tip. Finally, we actuate the hydraulic cylinder again against the screw to finish the expansion process (third stage).

Fig. 1 outlines the apparatus and details of the expander cone. The cone has a cylindrical hole along its entire length with screw profile. The dimensions of the cone, L1, L2, and L3, are respectively 154, 133, and 309 mm.

Solid tube expansion

We expanded three solid expandable specimens, each 2 m long, to 1.10 times their original diameter, and used strain gauges to calculate hoop and axial strains. Using the apparatus presented previously allowed us to evaluate the deformation behavior during the expansion and to calibrate the numerical model. Fig. 2 shows the expansion process of a solid tube with the grip in the second and third stages.

The outer diameters and the thickness of each specimen were determined before and after the expansion on 10 different sections. We measured each section using 10 equidistant points (36° between each point) and recorded a total of 10 thickness dimensions and 5 diameters. Fig. 3 shows details of the measurement points.

Table 2 contains geometric data, collected before and after the expansion, of the three expanded specimens of solid tubes (T1SFE-01, T2SFE-02, T3SFE-03) and of the three nonexpanded tubes used in this work. It also contains the average ovalization for each tube calculated with the following equation, where Δ_o = ovalization, and D_{max} and D_{min} represent the maximum and minimum diameter in a given section:

$$\Delta_o = (D_{max} - D_{min})/(D_{max} + D_{min})$$

Table 2 shows an ovalization increase when a decrease was expected. This may be explained by the gap between the outer cone surface and the inner solid tube surface during expansion. Thus, the cone does not exactly imprint its circular geometry onto the tube. The tube, in turn, maintains its ovalized section, which in some cases is aggravated with the expansion. The eventual existence of this gap is mentioned by Pervez et al. (2007). The tube eccentricity is another factor that may increase the ovalization.

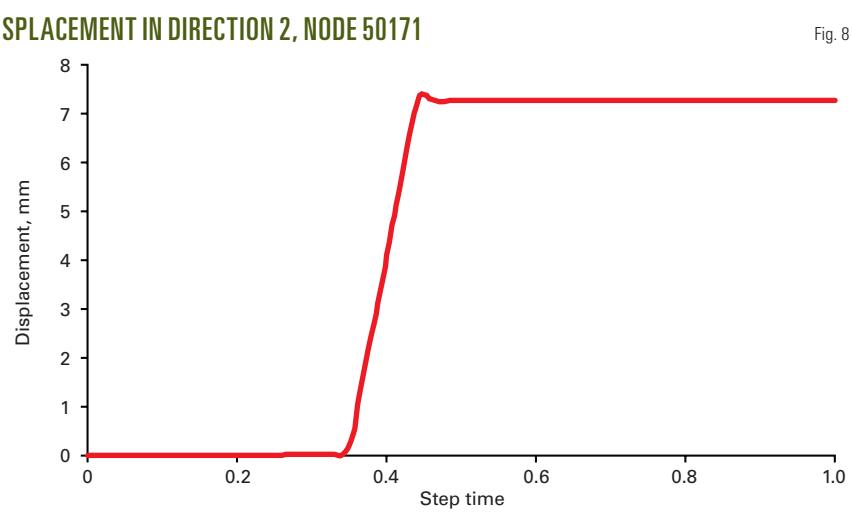
After the first expansion stage, we outfitted specimen T3SFE-03 with six electric strain gages. We placed the instrumentation in Section 3, 1,025 mm from the edge where expansion begins. We installed the strain gauges in

GEOMETRIC DATA, TUBING SPECIMENS*

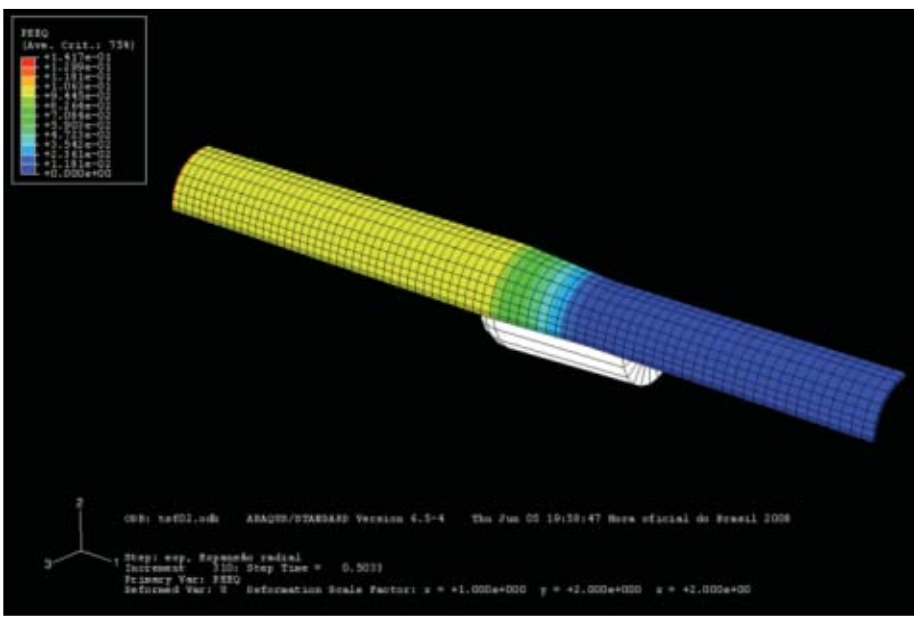
Table 2

Specimen	Avg. diameter, mm — Before	Avg. diameter, mm — After	Avg. thickness, mm — Before	Avg. thickness, mm — After	Maximum ovalization, % — Before	Maximum ovalization, % — After
T1SFE-01	151.69	166.47	6.492	6.434	0.100	0.168
T2SFE-02	151.53	166.40	6.439	6.439	0.100	0.098
T3SFE-03	151.37	166.30	6.425	5.974	0.070	0.111
T3SFI-01	151.11	—	6.427	—	0.200	—
T3SFI-02	151.71	—	6.489	—	0.082	—
T3SFI-03	151.63	—	6.428	—	0.083	—

*Before and after expansion.



Note: U:U2 at part instance TUBO node 50171.



Finite-element grid shows equivalent plastic strain along the tubular during Step 1 (Fig. 9).

pairs, in hoop and longitudinal directions, in three different points along the section chosen: 0°, 90°, and 180°. Fig. 3 shows this distribution. We outfitted the hydraulic cylinder with a pressure transducer.

The pressure applied to the cylinder, limited to 3,000 psi, controls the expansion test. Thus, the expansion rate was low, and the radial expansion followed a quasistatic process with a deformational gradient only in the region of pipe under expansion. As soon as the tube length shortens while the diameter is expanding, the transverse gauges mark an increase in strain, and the longitudinal ones show decreased strain. We observed limited elastic strain recovery.

Collapse tests

We performed the collapse tests in a pressure vessel at the Subsea Technology Laboratory, COPPE, the Alberto luis Coimbra Institute for graduate engineering project coordination, at the Federal University of Rio de Janeiro (UFRJ).

The vessel was filled with water until all the air was evacuated from its interior. The pressurization occurred at lower than 100 psi/min, with a flow-control valve. Other equipment included:

- Hyperbaric vessel with capacity of 7,500 psi.
- 30,000-psi hydraulic pneumatic drive pump (Haskel).
- 15,000-psi pressure transducer.
- Signal conditioner module SCXI-1001 (National Instruments AQD002M2).
- Microcomputer with A/D board for data acquisition.

The expanded tubes had their initial ends cut off to prevent undue influence of the boundary conditions in the expansion process on the collapse pressure. Thus, the specimens remained with a length of 1,500 mm instead of the original 2,000 mm.

Seeking the collapse pressure determination, we tested three expanded solid tubes in the pressure vessel. For purposes of comparison, we also exposed three nonexpanded solid tubes to external pressurization. The collapse occurred in the central portion of each solid tube specimen (Fig. 4).

Fig. 5 provides a representation of the results of the collapse tests performed on the six solid tubes. Among the expanded tubes, specimen T3SFE-03 showed the greatest resistance against collapse. However, the geometric properties of the tube (ovalization, OD, WT, D/t ratio) do not explain this behavior.

As expected, the nonexpanded solid tubes (specimens T3SFI-01, T3SFI-02, and T3SFI-03) exhibited collapse pressures significantly greater than those exhibited by the expanded tubes. On average, the collapse pressure of the expanded tubes was nearly 50% lower than the collapse pressure of nonexpanded tubes.

Finite-element modeling

We developed nonlinear numerical models using the finite-element method that employs Abaqus software (Version

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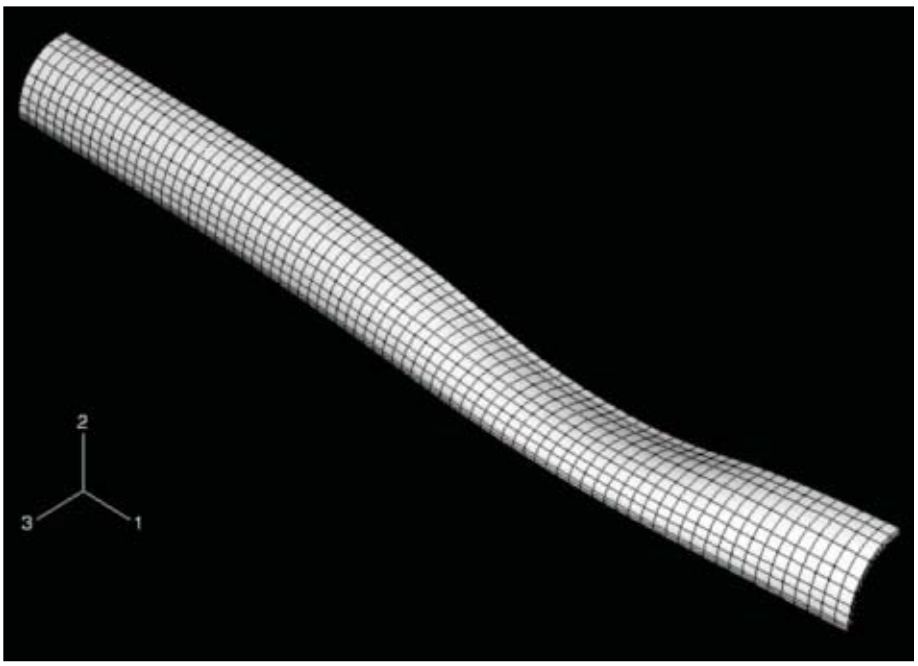


Finite-element grid shows deformed configuration of the tubular alter it collapses from external pressure (Fig. 10).

6.5-1), which can simulate the cold-expansion process and the behavior of solid tubes under external pressure. The modeling took into account material kinematic hardening, contact between tubulars and the conical expander, and geometrical nonlinearities.

We simulated the expansion process and the external pressure loading until collapse, using implicit integration of the equilibrium equations in two steps. The models were capable of successfully reproducing the physical experiments. After using experimental results to calibrate, we used the models to analyze further the mechanical behavior of solid expandable pipes and the influence of the expansion process in their structural strength against collapse.

Geometry

We developed 3D finite-element models of a solid tube and a conical mandrel using Abaqus (Fig. 6). Since there is no axial symmetry that allows reduction of the model, the tube geometry was build with the same length of the tube, after it had been prepared for collapse test (1,500 mm). The model had one angle symmetry in Direction 2 and one in Direction 3. Therefore, only one fourth of the tube was modeled, reducing the number of equations to be calculated and, consequently, the computational time.

We built the geometry of each tube as a deformed body, based on the actual geometric properties of each tube. The values used were the average diameter and thickness and the maximum ovalization found along the length of each specimen. We created the mesh in a Fortran routine to allow the model section to have an elliptical shape. It provides the desired ovalization, which has a maximum value in the middle of the tube and decreases toward each end.

We modeled the cone as an analytical rigid body, with a reference point (RP) to control its displacement and permit the expansion. Its corners, where contact may take place, were smoothed to avoid any possibility of inducing stress concentration.

Material properties

The finite-element model requires the material properties of the solid tube in order for us to study its structural response under expansion and external pressure.

Since the tubular undergoes large plastic deformation, we used an elastic-plastic material behavior. We followed a kinematic hardening plasticity model in addition to the isotropic model in order to simulate the Bauschinger effect (reduced yield stress under reverse loading after plastic deformation has occurred in the initial loading). The material properties input to the program depend on the tube being analyzed and are based on the properties determined from the uniaxial traction tests.

Mesh

We used 3D quadratic solid elements (C3D27) and carried out a refinement study to determine the ideal mesh. A typical mesh had 80 elements in axial direction, 2 elements in thickness, and 10 elements in the angular direction. The angular direction was divided in the following configuration, with one element in every section: 10°, 10°, 15°, 15°, 10°, 10°, 7.5°, 7.5°, 2.5°, and 2.5°. In this way, areas that are expected to suffer larger deformations and stress were more refined. Fig. 6 shows details of the mesh of the tube.

Interaction, load, boundary conditions

We modeled the contact between the mandrel and the internal surface of the tube in accordance with the Coulomb's friction law, but because the experiment was conducted with grease between the surfaces, we set the friction coefficient equal to zero. In future simulations, this parameter can be easily changed to add the friction effect.

During the first step, as in the expansion test, no load was applied. In the second step, to simulate the collapse test, we applied pressure on the external surface of the tube and an equivalent pressure, in axial direction, on the lateral area of the tube. The latter pressure was used to reproduce the effect of hydrostatic load that occurs inside the hyperbaric vessel (Fig. 7).

In order to reproduce the experimental tests, we used specific boundary conditions. During the first step, the edge of the tube where the expansion begins was constrained in direction one (axially), simulating the second and third-stage grip assembly. In addition, we applied an axial displacement to the cone reference point to move it forward while it was being constrained from rotating. For the collapse step, one end was constrained in all directions, while the other edge remained free in the axial direction. We varied the boundary conditions, in displacement and velocity. Fig. 7 contains loads and boundary conditions for both steps.

Numerical results

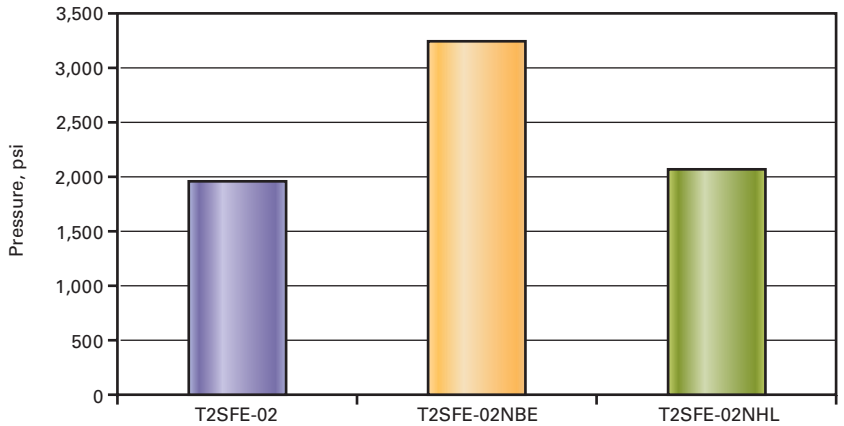
During the analysis of the expansion step, we monitored the strains of the tube and compared them to the results obtained during the experimental test. Fig. 8 refers to a node in the middle portion of the tube situated in coordinates (6.56250e + 002, 7.57703e + 001, 0.00000e + 000), belonging to numerical model T2SFE-02. Fig. 9 shows a plot of equivalent plastic strain at integration points along the tube.

The model reproduces only the quasistatic process of expansion (deformation occurs just in the region that is being expanded); it shows a small plastic strain recovery that was not read by the acquisition system used in the experiment but can be seen on the graph in Fig. 9. The final displacement in Direction 2 for Node 50171 was 7.27 mm, which results in a deformation of 10.08% (at this node). The average deformation on the experiment was 9.81%. We observed similar behavior for all models developed.

To determine the collapse pressure for the expanded tube, or the nonexpanded ones, we applied pressure on the external surface. We chose to use the Modified Rik's algorithm for load-deflection analysis because the load is proportional and the solution exhibits instability.

NUMERICAL ANALYSIS*

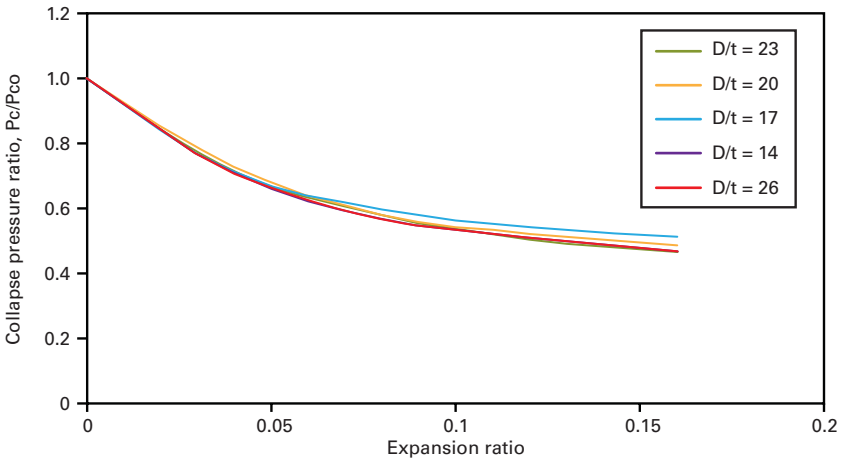
Fig. 11



*Comparison of collapse pressures for the original model (T2SFE-02), model without kinematic hardening (T2SFE-02NBE), and model without axial loading (T2SFE-02NHL)

EFFECT OF DIAMETER-TO-THICKNESS RATIO*

Fig. 12



*Collapse pressure ratio vs. expansion ratio for tubes with different diameter-to-thickness (D/t) ratios.

Fig. 10 presents the positive collapse configuration for numerical model T2SFE-02, the displacement in Directions 3 and 2 are plotted along the tube length. An elevation in Direction 3 is seen while a sink occurs in Direction 2. As observed on the experimental tests, the tube assumes an infinite symbol configuration.

Fig. 11 shows how the Bauschinger effect and the hydrostatic loading are important on the numerical analyses for determination of the collapse pressure sought in this work.

We developed two extra models for specimen T2SFE-02: one not taking in consideration the Bauschinger effect (T2SFE-02NBE) and the other disregarding the hydrostatic effect during the collapse test (T2SFE-02NHL). Although the difference

COLLAPSE PRESSURE OF SOLID TUBES, COMPARISON

Table 3

Sample	Experimental Pc, psi	Numerical Pc, psi	ΔPc, %
T1SF-01	1,997	2,045	2.4
T2SF-02	1,958	1,984	1.32
T3SF-03	2,343	1,810	–22.5
T3SFI-01	3,573	3,868	8.26
T3SFI-02	4,475	4,303	–3.84
T3SFI-03	4,469	4,235	–5.24

between the original model and the model without axial loading is small for this case, it does vary from model to model depending on the geometry and process being analyzed.

When the Baushinger effect is disregarded, the difference between the determined collapse pressures is much bigger. Model T2SFE-02NBE showed a collapse pressure 65% greater than the original one given by model T2SFE-02. Thus, the inclusion of both effects is essential for the model reliability.

Experimental-numerical correlation

Table 3 contains results from experimental tests and numerical analyses; it also shows the difference in percentage between both collapse pressures. To achieve this correlation, we adjusted the numerical model to reproduce the experiments.

We found good correlation between experimental tests and numerical analyses, proving the reliability of the numerical model. Once validated, the model can be used to analyze further the expanded tube behavior and to realize a parametric study.

Parametric study

Fig. 12 shows the relation between the collapse pressures (P_c), for expansion ratios ranging from 5% to 20%, and the collapse pressure (P_{co}) of the nonexpanded tubulars.

For each expansion ratio, we carried out different analyses, varying the tubular diameter-to-thickness ratio (D/t) between 14 and 26. Table 4 shows the collapse pressure (P_{co}) of the nonexpanded tubular for each D/t. The maximum ovalization in the midsection of the model was 0.5%, and the material properties were the same as used for model T2SFE-02.

We observed a considerable reduction in collapse pressure with increasing expansion ratio. This reduction is related primarily to changes in geometry (D/t ratio) and, as mentioned on the preceding page under the *Numerical results* sidehead, to the stress induced anisotropy caused by strain-hardening (Bauschinger effect). Interestingly, expansion has an overall very similar detrimental effect in tubulars with different D/t ratios. On average, an expansion of 5% results in a 29% decrease in collapse pressure (P_c/P_{co} = 71%). For expansion ratios of 10%, 15%, and 20%, the average values of P_c/P_{co} are 58%, 52%, and 48%, respectively.

This parametric study allows determination of the D/t ratio needed to obtain a specific collapse pressure for a tubular after it has been expanded to different magnitudes. In order to find the necessary diameter-to-thickness ratio, the original collapse pressure (P_{co}) of the tube must be calculated.

TUBULAR COLLAPSE PRESSURES Table 4

D/t*	P_{co}, Mpa
26	21.54
23	27.57
20	35.70
17	46.50
14	62.10

*Diameter-to-thickness ratio.

For example, if in a given scenario the minimum collapse pressure required is 15 MPa, one can choose different combinations of D/t and expansion rates as follows: D/t = 26 (P_{co} = 2.54 MPa) with an expansion of 5% (P_c/P_{co} = 71%); D/t = 23 (P_{co} = 27.57 MPa) with an expansion of 10% (P_c/P_{co} = 58%); or D/t = 20(P_{co} = 35.7 MPa) with an expansion of 15% (P_c/P_{co} = 52%). If the D/t ratio is fixed, one can choose a suitable expansion rate for a specific design pressure.

Learnings, future

After carrying out uniaxial tension tests, for material characterization, then expansion and collapse tests on three solid tubes in a hyperbaric vessel, we found:

- Insignificant elastic strain recovery after the expansion.
- Tubular expansion results in geometry and material changes.
- Initial ovalization did not reduce with the expansion for all specimens tested.
- Collapse pressure of pipes after 10% expansion was, on average, 50% of the original pipe collapse pressure for the geometries and material tested.

Different pipe and cone geometries, expansion rates, and boundary conditions must be tested in future studies to further analyze the behavior of solid expanded tubes. ✦

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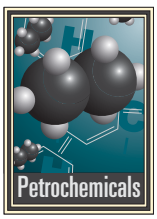

Downstream industry struggles with fewer resources, study says

The global engineering contractor industry is experiencing a shortage of qualified manpower, according to a biennial survey of refiners and petrochemical producers.

Operating companies rank qualifications of key personnel as the most important consideration in choosing engineering contractors. Other important factors include detailed engineering capability, experience with similar work, and construction capability of the contractor.

These are some of the conclusions of a survey of the global downstream engineering, procurement, and construction (EPC) industry conducted by Transmar Consult Inc., Houston.

The study, sponsored by the senior management of most of the leading EPC contractors, is based on 109 interviews with key decision makers in refining and chemical companies. During January-April 2005, Transmar conducted interviews in North America, China, Europe, Southeast Asia, and most of the producing countries in the Middle East.

The interviewees' areas of responsibility include:

- Engineering, 20%.
- Construction, 15%.
- Project management, 16%.
- Planning, 13%.
- Procurement, 17%.
- Senior management, 19%.

"The downstream hydrocarbon industry is in a state of dramatic transition," the study said. "This transition is marked by a diminishing availability of experienced technical manpower resources and equipment."

The study said that this downward trend is occurring at a time when the demand for project resources is reaching unprecedented levels. The study therefore attempted to:

- Provide insights into the changing forces affecting the global EPC marketplace.
- Review the performance of specific EPC companies and identify any regional differences.
- Provide the opinion of plant owners on specific issues that may influence the global EPC marketplace.
- Identify and analyze the key buying factors that owners use to select an engineering contractor.
- Identify "rising stars" amongst the different EPC companies.

Global refining outlook

The vast majority of owner interviewees were optimistic about the 5-year outlook for the global refining industry, the study said. Refiners see most refinery investments occurring in the Middle East and Asia due to abundant inexpensive crude feedstocks and a growing middle-class consumer group, respectively. The owner interviewees projected that refining capacity will grow about 10-14 million b/d during the next 5 years. Most of new capacity will be built in the Middle East and Asia, and 1.5-2.0 million b/d of capacity will be added in developed countries via capacity creep in order to handle heavier and more sour crudes.

"The new production coming out of the Middle East or for that matter Canada, thanks to the oil sands, means a lot more sour crude to process," said a strategic planning executive for a large refiner. "I see a lot of upgrading work to handle the heavy crude and a diminishing of the crack spread between heavy and lighter crude. Our internal forecasters are planning on a global refining capacity increase of 10-11 million b/d."

According to the study, interviewees felt that future refining margins would be sufficient to support $15-25 billion/year of capital spending during the next 5 years.

"Without doubt, the Middle East will be the number one spot for capital investment," said a senior manager for Saudi Aramco. "We see growing capital

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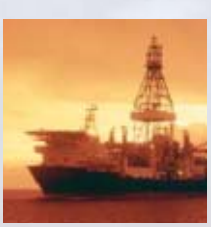

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spending throughout the world for refining. In 2008, it should surpass $18 billion globally."

Also, study interviewees believe that the crack spread between lighter and heavier crudes will significantly diminish in the future.

"Over recent years much capital was expended on deep conversion, hydrocracking, to take advantage of the hefty crack spread; however, the crack spread is narrowing and that money stream will close out," said a vice-president of operations for an independent refiner. "There will be less of this type of investing in the future."

The study said that the one downward force on capital spending is "the technical manpower and equipment shortages that may make it difficult to efficiently spend the capital funds allocated for the refining industry."

Global petrochemicals

The study found that petrochemicals are a third priority for most owners, as far as capital spending is concerned. Operators claim that increasing production and reserves are the first priority and that refining is the second. This is because most company managers appear to be less certain about petrochemical profitability than for production or refining.

International oil companies are less interested in investing in petrochemicals in their traditional geographic areas, preferring to invest in the Middle East and Asia due to low-cost feedstocks and booming consumer markets. The study interviewees predicted that capital investment spending for petrochemicals will be about $15-20 billion in 2008, with similar amounts spent in the next few years.

The study said that owners see a "bifurcated" petrochemical market in that there will be several world-class mega projects and many smaller projects in the $10-100 million category.

"There will be 300 or more petrochemical projects in the Middle East for some time to come. There will be a few very large ones and many smaller ones. There will be even more projects going on in Southeast Asia, but generally smaller," according to a senior technical executive for Total Atochem. "By contrast, the US, the largest consumer of chemical products, will see its installed base of petrochemical plants shrink significantly." The study noted a few other trends from the interviews:

- Developed-country petrochemical manufacturers are consolidating among themselves for competitive and financial reasons.
- Integrating refining and petrochemical manufacturing continues to gain momentum. Standalone world-class petrochemical plants are becoming rarer.
- Diversification out of basic chemicals by many US and European companies continues. Many of these companies are moving into fine chemicals and pharmaceuticals.
- New Middle Eastern petrochemical companies are increasingly open to using Asian engineering contractors, especially those in South Korea.

Technical resource shortage

The study said that owners are far more aware of the resource shortages than they were in the 2005-06 study (OGJ, Apr. 10, 2006, p. 44). Many operators are currently implementing plans to mitigate manpower shortages.

All the major oil companies are establishing programs to attract more young graduates. And some are starting programs to retain employees beyond retirement age, according to the study.

"For years, we made use of our own technical staff with the support of a few engineering contractors. This worked fine for a long time, but when our projects became larger and then the seller's market for services arrived, we were in trouble," said a senior executive for Air Liquide. "The technical manpower shortage made it difficult for us to compete for good technical people. These circumstances led us to eventually buy Lurgi and acquire more than 2,000 engineers for our needs."

EPC selection criteria

During the past 20 years, Transmar tracked 18 principal factors that an owner considers when evaluating a contractor's bid proposal for a major project. The current study added health, safety, and environment as a factor.

The table shows the critical factors in order of importance as well as scores for 2003 and 2005. With the recent change from a buyer's market to

BUYING FACTOR ASSESSMENTS

Buyer factor	2008 ranking	2008 score	2005 ranking	2005 score	2003 ranking	2003 score
Qualifications of key personnel	1	8.79	1	8.52	3	8.52
Detailed engineering capability	2	8.78	4	7.51	5	8.00
Health, safety, environment	3	8.47	—	—	—	—
Experience with similar work	4	8.18	6	7.22	7	7.83
Construction capability	5	7.87	3	7.76	6	7.88
Project control systems	6	7.79	7	7.22	4	8.24
Project management capability	7	7.75	2	8.35	1	8.82
Quality of senior management	8	7.50	18	3.61	13	6.88
Procurement capability	9	7.34	9	6.84	15	5.07
Quality of proposal	10	7.17	10	6.52	12	6.92
Contractor's price	11	7.12	5	7.50	2	8.54
Conceptual engineering capability	12	7.10	15	5.08	17	4.32
Experience in a geographic area	13	7.05	8	6.97	8	7.39
Responsiveness and flexibility	14	7.04	11	6.23	9	7.24
Size and location of office	15	5.89	12	6.20	11	6.99
Total man-hour estimates	16	5.82	14	5.28	14	5.16
Ability to do work in one office	17	5.48	13	5.49	10	7.11
Start-up, training capability	18	4.71	17	4.11	18	4.00
Capability of sales executive	19	4.29	16	4.57	16	4.76
Industry average	—	7.06	—	6.39	—	6.83

a seller's market, the priorities of the selection criteria changed quite significantly, according to the study.

The study said that the "top seven buying factors are performance and execution-based factors and that execution factors and 'time' are now taking precedence over 'cost or price.'"

Results of the buying factors survey showed some interesting trends, according to the study:

- HSE is the third most important factor that owners consider.
- In 2005, "quality of senior management" was ranked 18 compared with a current ranking of 8. This is because "owners want to forge links with a contractor's senior management in order to assure that it gets the best people from the contractor."
- The "detailed engineering capability" factor was the fourth most important in 2005 and eighth in 2001. Now it is the second most important. According to the study, "in a manpower shortage environment, 'big is better' and owners attach real importance to the depth of engineering capacity of an engineering contractor.
- "Contractor's price" has dropped to 11 from 2 in the 2003 study because "owners are more concerned about getting their project completed than in extracting the very lowest price for the work."
- "Responsiveness and flexibility" have fallen to 14.

Overall contractor trends

The study found that the ratings of the performance of South Korean contractors have been rising. For the first time since 1983, a South Korean engineering contractor is ranked in the "best" list—the top 14 contractors out of 50 reviewed.

In addition, many owner-operators are more willing to use what used to be considered second-tier contractors, according to the study. This is a direct result of the technical manpower shortage.

Owner-operators are working with engineering contractors in new ways. In some instances, this entails paying a premium for access to the best employees in the engineering contractor's company. Other owners are signing multi-project contracts to ensure continuity of the technical resources needed to perform the work.

In general, owner-operators feel that performance standards—quality and capacity of the global engineering contractor industry—have declined significantly. Many owners are therefore increasing their conceptual engineering staffs, which allows them to better supervise and control contractor performance, according to the study. ✦

CRUDE EXPORT RISER—2

Reliable FSHR use requires advance fatigue assessments

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Analyses assessing the possible use of a free-standing hybrid riser (FSHR) as part of an offshore field development export system should both thoroughly address fatigue damage during installation and determine the allowable sea states for deployment. Total damage should consider both installation and operation phases. Buoyancy can (BC) vortex-induced motions (VIM) may also cause fatigue damage and should be investigated.

The first article in this three-part series described the FSHR in detail before examining its design and installed responses (OGJ, Nov. 10, 2008, p. 58). This second article details FSHR in-place fatigue, installation and monitoring, with the concluding article (next week) discussing its integration with the export pipeline.

In-place fatigue

FSHR system and component fatigue-life analyses examining first and second-order motions show damage along the rigid riser components as negligible (in excess of 99,999 years life expectancy), with minimum fatigue life at the top-riser assembly (797 years).

The high first and second-order fatigue lives for FSHR components stem from the flexible jumper's decoupling of the riser from vessel wave-induced motions. The BC's depth below the sea surface also reduces direct wave action on the structure.

Total long-term fatigue damage to the FSHR, however, must consider two additional fatigue sources: riser vortex-induced vibrations (VIV) and BC VIM. In-place fatigue damage also must be combined with installation fatigue damage.

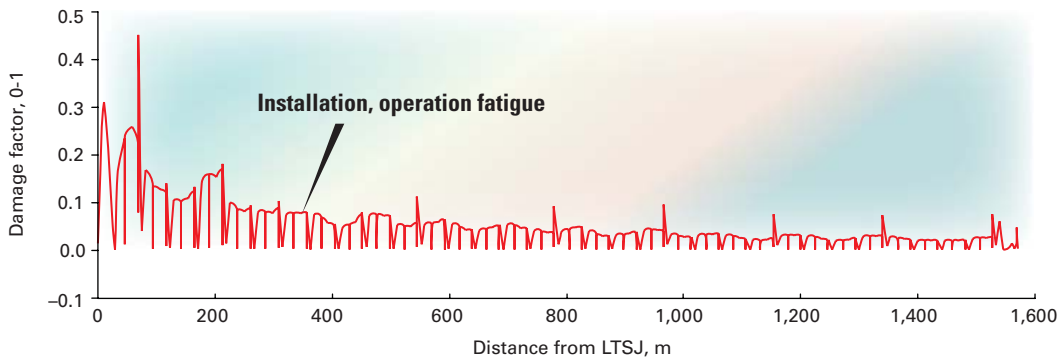
Shear7, version 4.4, performed VIV analysis, projecting each current velocity profile both onto the flexible jumper plane (in-plane velocities) and perpendicular to that plane (cross velocities) and considering the angle of the current's direction with regard to the plane. The out-of-plane damage is the sum of damages due to projected in-plane current velocities, while in-plane damage is the sum of the damages due to the projected cross-current velocities. The sum of the in-plane and out-of-plane damages equals total damage.

FSHR system and components fatigue life analysis due to long-term and extreme current profiles shows the highest VIV fatigue damage at the riser base and the minimum fatigue life at the lower-taper stress joint (LTSJ); 976 years at the weld between the LTSJ and the lower-adapter stress joint (LASJ). Storm currents contribute 6% of the fatigue damage at this critical point. Out-of-plane damage (due to in-plane current velocities) is higher than in-plane damage (due to cross current velocities). The use of strakes is not necessary.

A typical figure-eight VIM crosses the BC center-of-gravity in the horizontal plane for the various load cases. The figure-eight's maximum amplitude typically runs perpendicular to

TOTAL FACTORED FATIGUE DAMAGE

Fig. 1



the current direction and is defined as the cross-flow amplitude. The in-line amplitude is smaller than the cross-flow amplitude, but occurs at twice the frequency of the later. The minimum fatigue life on the riser string (4,549 years) occurs at the weld between the LTSJ and the LASJ. The TRA's minimum fatigue life is 808 years.

FSHR deployment

The fatigue damage the system incurs during installation must be limited to leave most allowable damage for when the riser is in-place. Toward this end engineers considered a 45-tonne clump weight attached to the pull-down bar of the offtake spool to reduce VIV-fatigue damage should current speed go beyond the 80% nonexceedence limit during installation.

Summing maximum damage from each step (after the correction based on the duration of each step) along the riser length yields total fatigue damage during deployment due to wave motion. Maximum damage equals 0.0234 (without safety factor), close to the riser base (within the lowermost quad joint).

Fatigue damage peaks along riser length correspond to pipe held in the hang-off module (HOM) during welding. Fatigue concerns during welding limit the time pipe can be held in HOM. Analysis considered 1.5-2.5 m wave height, depending on the specific welding step of deployment.

The objective at each stage of deployment and installation is to verify fatigue damage due to current-induced VIV is within acceptable limits for:

- Riser J-lay deployment.
- Riser free-hanging from moon pool.
- Riser stand-by (in-place riser system without flexible jumper).

J-lay deployment considered 70-80% nonexceedance current profiles were considered, while 95% and 98% nonexceedance current profiles were considered for the riser free-hanging and riser stand-by cases respectively. The maximum VIV fatigue damage along the riser equaled 0.0129 (without safety factor), occurring at the girth weld between the lower pup piece and the first riser quad joint.

Allowable sea-states (current and wave) during the riser J-Lay deployment limiting the maximum bending moment at the HOM and the von Mises stress in the riser elements within allowable criteria depend on the welding stage of deployment. Current profiles of 80% nonexceedance and wave heights of 1.75-3.25 m fulfilled the acceptance criteria.

The rigid-base jumper's (RBJ) pipe measures 18 in. OD and 1.125 in.WT. Cyclic loads from thermal expansion caused by shutdown and offtake spool motions must also be assessed to gauge RBJ fatigue damage (Fig. 2).

Total damage

Fig. 1 shows total fatigue damage, including the safety factor (considering contributions from installation and operation) for the riser string, from the LTSJ to the upper-taper stress joint (UTSJ). Maximum allowable fatigue damage = 1.0.

Minimum fatigue life at the wellhead housing is 891 years. The minimum fatigue life at the uppermost Merlin connector body is 419 years, whereas at the connector to pipe weld the minimum fatigue life is 420 years for the 25-m cement shortfall. Using the zero-cement shortfall case increases fatigue lives more than twofold. First and second-order motions contribute little to fatigue damage, but contributions from VIV (both long-term and storm) and BC VIM are large.

The rigid-base jumper's (RBJ) pipe measures 18 in. OD and 1.125 in. WT. ASME B31.8 design code governed RBJ design. Maximum stresses follow the acceptance criteria defined in ASME for the hydrotest, installation, and operational load cases, considering fabrication and measurement tolerances. Pipeline end termination (PLET) expansion and contraction measure 0.6 and 0.5 m, respectively. Offtake spool displacements combined with PLET displacements define maximum stress load cases.

Cyclic loads from thermal expansion caused by shutdown and offtake spool motions must also be assessed to gauge RBJ fatigue damage. Fatigue analysis also considered damage from VIV, for both long-term and storm-current profiles. The RBJ's approximate air weight is

45 tonnes. It is 38.7 m long, 13.9 m high, and does not require strakes (Fig. 2).

Monitoring system

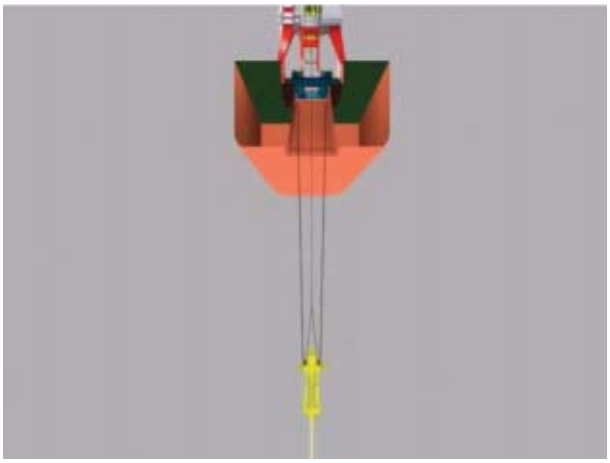
The accompanying table outlines the FSHR monitoring system.

The load-monitoring spool sits at the lower end of the tether chain and provides a real time indication of the tension supplied by the BC. The 18-in. OD spool measures axial strain at six equidistant locations around its circumference with pressure-balanced oil filled linear variable differential transformer-based extensometers.

The FSHR's positioning package stands independent from the rest of the monitoring system, consisting of two ROV-retrievable acoustic beacons mounted on the TRA. An acoustic phased-array transceiver on the FPU's acoustic Doppler current profiling carriage interrogates the beacons. The line of sight between the acoustic transceiver and the beacons on the TRA is unobstructed.

Petrobras' Petronav software calculates final earth-fixed position relative to the FSHR base and related raw data. An Octans III standard motion package measures the 6 Degree of Freedom Motions (6DOF) and earth-fixed heading

FSHR, TEMPORARY MOON POOL HANG-OFF Fig. 3



MEASUREMENT SUBSYSTEMS

Subsystem	Measurement objective
Strain-sensing assemblies (load-monitoring spool)	Static, dynamic tether-chain tension estimates
FSHR-top acoustic positioning system	Static (average) X, Y, Z position of riser top relative to its base
Motions measurement system, FSHR top	Static heading dynamic surge, sway, heave, roll, pitch, and yaw

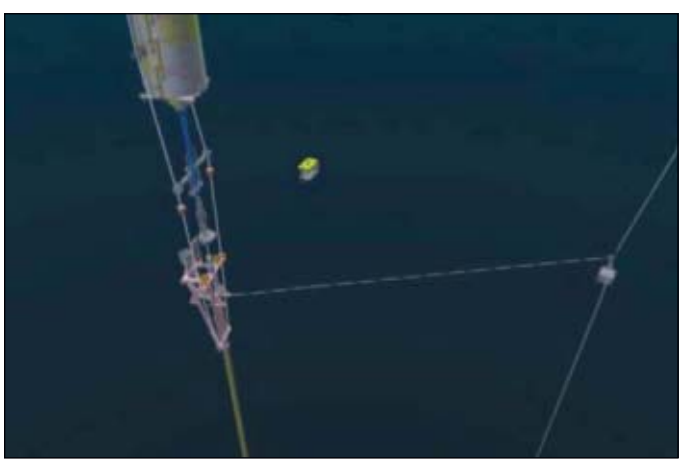
of the TRA. This package contains three high-quality linear accelerometers, three IXSEA fiberoptic rate sensors, and a compact microprocessor-based data acquisition system with embedded software to filter and integrate the sensor's raw data.

FSHR installation

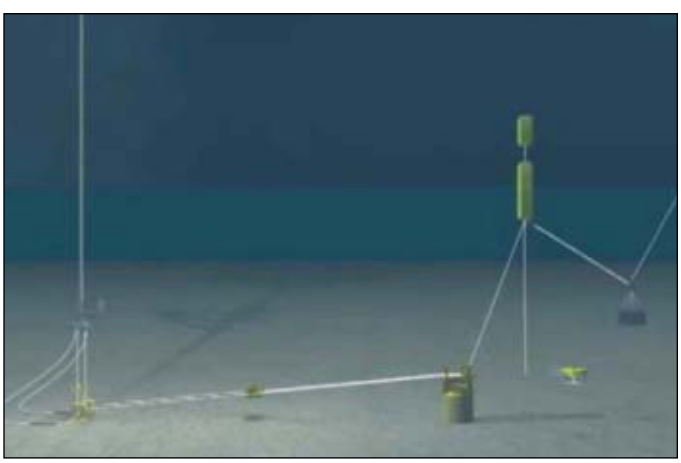
Technip's Deep Blue performed the bulk of installation work on the FSHR system, with several other vessels in support. The riser remained partially flooded throughout installation. Full flooding occurred only after connecting the riser to the foundation. Flooding the entire riser took place before full dewatering of remaining BC compartments.

The heavy-lift vessel BBC Australia transported the BC from the Gulf of Mexico to Arraial do Cabo in the Campos basin. Preparation for the upending and tow of the BC occurred onboard, including installation of fairleads, umbilicals and tether chain, hydraulic connector, and a soft-landing device. The Australia's two cranes lifted the BC and positioned it to float horizontally in the water.

Technip's survey vessel Geoholm and the anchor-handling vessel (AHV) Geonisio Barroso assisted in upending the BC. Umbilicals and a manifold onboard the AHV controlled the upending operation. Flooding compartments 7 through 15 resulted in about 6 m of the BC remaining above water at the end of the upending process.



This illustration shows the subsea connection between the buoyancy can (BC) to the top-riser assembly (Fig. 4).



This illustration shows the orientation of the BC and clump weights during the free-standing hybrid riser's pull down (Fig. 5).

Towing the BC in this state took 66 hr to cross the 267 km to P-52's location.

Deep Blue performed the following tasks while the BC was being readied:

- Keelhauling the LRA and suspending it on the HOM.
- Welding 32 riser quad joints.
- Transfer and welding of the UTSJ to the riser string.
- Temporary lowering and suspension of the riser string beneath the hull.
- Transfer and flange connection of the TRA to the riser string.
- Lowering and temporary hang-off of the riser assembly from moon pool pad eyes (Fig. 3).

Completing this work readied the riser for subsea connection of the BC.

The following occurred upon arrival of the BC at the installation site:

- Installation of guidelines to the TRA.
- Pendulum of the BC.
- Keelhaul of the BC from outriggers to moon pool.
- Connection of BC fairleads to the guidelines.
- Removal of riser suspension slings
- Subsea connection of the BC to the TRA (Fig. 4).
- Deballasting the BC.

Offshore activities performed to connect the FSHR to its foundation included:

- Installation of the pull-down suction pile on seabed by the DB (the pile was later retrieved).
- Installation of the pull-down system on top of the suction pile by the DB.
- Installation of the pull-down buoys on the pull-down system by the DB.
- Transfer of buoyancy: preliminary deballasting to get the FSHR positively buoyant.
- Pull-down operations and locking the riser onto its base (Fig. 5).
- Final deballasting to in-place conditions.
- Cleaning all installation aids.

The deballasted FSHR floats at 50 tonnes positive buoyancy above the foundation before pull-down. The 45-tonne clump weight (CW) used by the DB to control the orientation of the BC also orientated the FSHR to the appropriate heading and controlled the buoys during pull-down. The DB deployed the CW to depth and connected it to the pull-down buoys. A 16-tonne CW connected to the bottom of the TRA allowed the Geoholm to maintain FSHR position in the current during pull-down.

Lay vessel Sunrise 2000 installed the flexible jumper. The vessel required modifications to install the 16-in. ID flexible jumper. An ROV-actuated hydraulic connector attached the gooseneck to the flexible jumper's end at the FSHR side and vertically connected it to the mandrel at the TRA. Unreeling of the flexible jumper then allowed it to be pulled-in to the slot on the P-52. An installed closing spool connected the FJ to the P-52's piping facility.

Installation HAZID

A hazard identification (HAZID) review preceded FSHR installation. Its results detailed the hazards identified, associated risks, and mitigating measures. The review also provided a summary of the action items arising from it. Each manager-engineer in charge of a particular process or task then took responsibility for ensuring all items under his supervision were closed out, completing action items prior to the commencement of installation operations whenever possible. Some actions, however, required on-site remediation.

Once work was under way, changes to scope, limits, etc. could affect the HAZID findings. The responsible engineer, therefore, would continually monitor any changes to the project and assess the need for any updates to the HAZID. An offshore management change procedure managed new work developed offshore or on site and performed risk assessment. ✦

New diversion service for shale-fracturing operations

The new StimMORE fluid diversion service diverts fracture treatments along a wellbore in cemented or openhole completions. The service is especially suited for use in shale formations.

Used in combination with the StimMAP LIVE hydraulic fracture stimulation diagnostics service, which delivers microseismic data while the fracture treatment is pumped, the StimMORE service allows real-time optimization of fracture treatments.

StimMORE can be used in most well geometries and is suited to horizontal wellbores, cased hole and open hole, up to a maximum temperature of 121° C.

The diversion slurries can be pumped on the fly as part of the main treating fluid, diverting the fracture as needed based on the real-time integration of microseismic data. The slurries are based on standard fracturing fluids and proppants, with the addition of a proprietary mix of materials that enable fracture diversion.

The StimMORE service is part of the Contact portfolio of staged fracturing and completion services. These technologies allow the company to create complex drainage patterns within the reservoir that enable access to reserves that may have otherwise been left in place.

The StimMORE refracturing treatment was recently applied to one operator's horizontal well in the Barnett shale. Initial gas production of 2.2 MMcfd had declined to less than 500 Mcfd during a 4-year period. The StimMORE service, coupled with the StimMAP LIVE real-time fracture monitoring service, enabled efficient and cost-effective coverage of previously unstimulated well sections, resulting in a net increase in estimated ultimate recovery of 0.7 bcf, the company notes.

Source: **Schlumberger,** 5599 San Felipe, 17th Floor, Houston, TX 77056.

New data management tool supports exploration uses

TIGRESS Live!, a new data management tool, supports the entire exploration life cycle with an integrated, real-time framework.

The firm says the tool offers a more streamlined approach for managing capital and expertise in locating and producing hydrocarbons in the shortest time possible.

The software sifts data from available sources, such as existing physical and digital archives, interpretation systems, and geostreaming services, and loads it via this firm's drop box technology. Production reporting, well performance, and analysis data are available, updated, and distributed in real time.

The software comes with its own feature-rich tools covering all aspects of the exploration process from seismic survey through geology, petrophysics, and mapping, to production and reservoir engineering.

Source: **Geotrace Technologies Inc.,** 1011 Highway 6 South, Suite 100, Houston, TX 77077.

Rowan Cos. Inc.,

Houston, has announced that its CEO and Chairman Daniel F. McNease will retire at yearend. Rowan's board of directors is conducting a search process to consider internal and external candidates to fill McNease's positions. He joined the company in 1974 and served in many capacities over his long tenure with the company. McNease was appointed president in 2002 and CEO in 2003 and elected chairman in 2004, having served on the company's board since 1998. He plans to retire from all positions with Rowan.


McNease

Rowan is major provider of international and US contract drilling services.

Transocean Inc.,

Houston, will hold a shareholders meeting on Dec. 8, 2008, in connection with the proposal to move the place of incorporation of its group holding company from the Cayman Islands to Switzerland. Transocean's shareholders will be asked to vote in favor of the transaction at the meeting. Upon shareholder approval, the Grand Court of the Cayman Islands will hold a hearing on Dec. 16, 2008, to approve the move. The transaction is expected to close as soon as practicable following court approval. Thereafter, Transocean would move its executive offices and 14 officers to Geneva.

Transocean Inc. is the world's largest offshore drilling contractor and a leading provider of drilling management services worldwide.

BJ Services Co.,

Houston, has announced that Dan Daulton, its US technical marketing manager, will help advise US Energy Sec. Samuel Bodman on new and better ways to develop deepwater oil and gas reserves while serving on the government's 2008–2010 Ultra-Deepwater Advisory Committee. The US Department of Energy appointed Daulton to the committee to help review and report the progress of the nation's oil and gas research and development program. Established under the Energy Policy Act of 2005, the program includes an annual plan that outlines activities to expand the nation's crude oil and natural gas supply from extreme deepwater fields. As part of the appointment, Daulton serves on subcommittees for research programs and program benefits and value, as well as the group's editing committee, which reviews and consolidates all subcommittee reports into a final report for the energy secretary. The advisory committee is managed by the Office of Fossil Energy and includes 14 members representing major and independent operating companies, service companies, academia, and consulting firms. Daulton joined BJ Services in 1980. In his current job, he supports the completion services and chemical services product lines. In addition, Daulton leads a dedicated deepwater business development team that promotes operations in the Gulf of Mexico, as well as offshore South America, West Africa, and Asia.


Daulton

BJ Services is a leading provider of field development and production enhancement services to the energy industry.

MPR Associates,

Alexandria, Va., has appointed Robert Chapman director of marketing for its product development business sector. Based in California, he has than 20 years of experience in corporate development, domestic and international marketing, strategic planning, operations, and financial management with emerging and global technology corporations. Chapman has served in various executive management positions, including those of CEO and general manager with various emerging-technology companies, where he directed corporate operations, research, corporate governance, marketing, sales, and channel distribution. He graduated from the University of Oklahoma with a BS in engineering physics. Chapman also has training in sales and marketing from Stanford University and executive management training from the Sloan School of Management at MIT. He holds certification in nanotechnology through the California Institute of Nanotechnology.

MPR Associates is an employee-owned engineering services firm that was founded in 1964. It serves the refining, petrochemicals, and power sectors, among others.

Douglas-Westwood,

Aberdeen, has opened an office in New York City to better serve its US clients and expand its North American business. The company has also appointed Steven Kopits managing director of the New York office. He has more than 20 years' experience in strategic consulting and investment banking. He earlier worked as an investment banker for an energy supply chain boutique firm in New York and was a director of financial advisory services at Deloitte & Touche in Central Europe.


Kopits

Douglas-Westwood is a leader in market analysis and transaction support in the energy sector, with recognized expertise in offshore oil and gas exploration and production, as well as wind and tidal power.

TSC Offshore Group Ltd.,

Hong Kong, has agreed to acquire the offshore platform equipment manufacturer Center Mark International Ltd. from Lewiside Investments Ltd. in a deal valued at $14.2 million (H.K.). The acquisition will provide TSC with access to Center Mark's innovative jacking gear box, which together with TSC's jacking control system, allows the company to offer a complete jacking system. Center Mark's sole business is the holding of a wholly owned subsidiary, Zhengzhou Jier Technology Ltd.

TSC is principally engaged in the provision of drilling rig products and technology (such as drilling rig control systems, mud pumps, etc.), oil field supplies (such as expendables and accessories for drilling

rigs), and turnkey solutions to offshore rigs. In addition, the company provides marketing and consultancy services.

Sulphco Inc.,

Houston, developer of a patented ultrasound process to desulfurize and hydrogenate sour, heavy crude oils, has announced that it successfully duplicated on a commercial scale the positive results recently produced in its Houston laboratory. The company's latest, 5,000 b/d Sonocracking unit performed in a stable and reliable manner while reducing sulfur content in line with lab results, Sulphco said. Additional technical iterations and analysis will continue as Sulphco identifies, executes, and evaluates the multiple processes necessary to comply with future customer requirements. The company also is focused on minimizing costs associated with the Sonocracking chemical package and the overall material and mass balance to achieve targeted economic thresholds.

Baker & O'Brien Inc.,

Dallas and Houston, has named William R. Donnell managing director, Europe, Middle East, and Africa. To be based in London, Donnell heads the firm's new European subsidiary, Baker & O'Brien UK LLP, where he will be responsible for expanding the firm's global consulting practice, especially in the core areas of lenders' engineering for major construction projects, incident investigation and insurance claim analysis, and energy-related litigation support, arbitration, and dispute resolution services. Joining Baker & O'Brien in 1998, Donnell previously was vice-president and manager of the firm's Houston office. Prior to that, he worked for Brown & Root Inc., where he last served as managing director, engineering consulting services, and R.B. Lewis Co. Donnell has a BBA and MBA from the University of Texas at Austin.


Donnell

Baker & O'Brien is an independent professional consulting firm specializing in technology, economics, and management practice for the international oil, gas, chemical, and related industries. The firm also provides technical expertise and advice to industry service providers, such as insurance, legal, and investment firms.

Seismic Micro-Technology Inc. (SMT),

Houston, has announced that Talisman Energy Inc., Calgary, chose SMT KINGDOM geoscientific interpretation software for exploration under the latter's global new ventures team. SMT KINGDOM is used for screening farm-in opportunities and conducting acreage evaluations; identifying and assessing key strengths and values of opportunities; evaluating key risks and uncertainties; filtering and importing/exporting of data; data loading, well loading, and seismic loading; and fully assessing and appraising new opportunities, often within short timeframes.

SMT is a market leader for PC-based geoscientific interpretation. In addition to its Houston headquarters, the company also has offices in Calgary; Croydon, UK; Moscow; and Singapore.

CGGVeritas,

Paris, has announced that Brian Russell, vice president of CGGVeritas subsidiary Hampson-Russell Software, was to be awarded SEG Honorary Membership at the Society of Exploration Geophysicists' International Exposition and 78th annual meeting in Las Vegas, Nev., during Nov. 9-14, 2008. Russell is receiving SEG's second-highest honor for his distinguished contributions to the society and to the SEG Foundation over the past 2 decades. He is an internationally recognized expert in seismic inversion, amplitude variations with offset, and seismic attribute analysis. Russell started his career with Chevron Corp. in 1976 as an exploration geophysicist. He then worked for both Teknica Resource Development and Veritas Seismic in Calgary before cofounding Hampson-Russell Software Ltd. in 1987 with Dan Hampson. In 2002 Hampson-Russell became a wholly-owned subsidiary of VeritasDGC Inc., and in 2007 became a subsidiary of CGGVeritas. Russell is also an adjunct professor in the Department of Geoscience at the University of Calgary and is chairman of the board of the Pacific Institute of the Mathematical Sciences. He has a BS in geophysics from the University of Saskatchewan, an MS in geophysics from Durham University in the UK, and a PhD in geophysics from the University of Calgary.


Russell

CGGVeritas is a leading international pure-play geophysical company, delivering a wide range of technologies, services, and equipment to its broad base of customers mainly throughout the global oil and gas industry.

Offshore Marine Service Association (OMSA),

Hanrahan, La., has appointed Joe Kavanaugh to the newly created position of manager of Jones Act compliance. In doing so, OMSA, a trade association that is the voice for the US-flag workboat industry, has taken the unusual step of hiring an experienced investigator to collect evidence on foreign vessels that violate the Jones Act. The law requires that vessels involved in US transportation be owned by Americans, crewed by Americans, and built in America. Kavanaugh will be responsible for tracking the activities of foreign vessels working in the US offshore oil and gas industry, determining whether those vessels are cheating on the Jones Act, and working with enforcement agencies to punish violators. Kavanaugh has many years of experience in enforcing Coast Guard and Customs regulations, working for the US Coast Guard, Immigration and Customs Enforcement, and others. He has been actively involved in investigating smuggling, immigration, and drug cases, as well as maritime law violations. He also has also worked as a vessel captain.

OMSA is the national trade association representing more than 250 member companies, including 100 firms that own and operate marine service vessels operating offshore. It is the leading association for the US offshore transportation service industry.

Alliance Engineering,

Houston, has promoted Wayne Mueller to vice-president of its deepwater business unit. He has more than 16 years' experience in project management and design/construction engineering of numerous offshore fixed structures and floating topsides facilities worldwide. Mueller has been with Alliance since 2004, and was most recently project manager, FPSO developments. With a degree in mechanical engineering and a master's in petroleum engineering, Mueller is a member of the American Society of Mechanical Engineers, Society of Petroleum Engineers, and Marine Technology Society.


Mueller

Alliance, part of the international energy services company John Wood Group PLC, is an independent services provider to the worldwide oil and gas industry. Alliance specializes in engineering, design, procurement, project management, and construction management of onshore and offshore upstream oil and gas facilities and structures. Capabilities range from feasibility studies through complete turnkey installations.

Wood Group is an international energy services company operating in 46 countries. The group has three businesses: engineering and production facilities, well support, and gas turbine services.

Offshore Solutions BV,

a joint venture of AMEC and GTI NV, has been awarded a contract by Qatar Shell to provide its Offshore Access System that allows the safe transfer of personnel from a vessel to an offshore installation. The system will be used for the Pearl gas-to-liquids project being developed at Ras Laffan, Qatar. Pearl will be the world's largest GTL project. The Offshore Access System, due to be delivered in Qatar in second quarter 2010, is a heave-compensated telescopic gangway designed to connect and disconnect in 2.5-m Hs (significant wave height) sea states. The award of this contract resulted from the operational success of the first Offshore Access System leased by Shell, working daily in the southern North Sea for over 30 months without a lost-time incident.

Offshore Solutions is a leader in the invention, development, manufacture, and safe operation of the industry's most advanced marine access systems.

GTI is part of GDF SUEZ Energy Services, a leader in multitechnical services that offers design, realization, and maintenance of installations to energy and utilities management and long-term multitechnical management.

AMEC is a focused supplier of high-value consultancy, engineering, and project management services to the world's energy and process industries.

Well Control School (WCS),

Houston, has named David Rooker account manager for the Oklahoma/Mid-continent area. He will be responsible for consulting with clients relating to their competency-based training requirements, along with presenting various options of integrated well control training programs offered by WCS.

With over 25 years in the oil and gas industry, WCS, a division of RPC's Cudd Pressure Control Inc., provides high-quality well control training at its many permanent and traveling schools in the US and internationally.

RPC provides a broad range of specialized oil field services and equipment throughout the US and in selected international markets. RPC's Oil and Gas Services' operating business units also include Patterson Services and Bronco Oilfield Services.

Compressco Ltd.,

Oklahoma City, has named Ron Foster president. Previously, he served as Compressco's senior vice-president of sales and marketing since 2002. Foster brings more than 30 years of executive management, operations, marketing, and sales management experience. Prior to Compressco, he held senior management positions with Wood Group ESP and the Wheatley Gaso pump group of Halliburton. Before that he spent 10 years with Goulds Pumps in sales and marketing positions. Foster is an active member of several regional industry trade organizations that include the American Petroleum Institute, Society of Petroleum Engineers, and the Oklahoma Independent Petroleum Association. He has a BS in economics from Oklahoma State University.


Foster

Compressco, a TETRA Technologies company, is a leading provider of production enhancement solutions for marginal and low-pressure oil and gas wells.

Bourbon Offshore Asia,

Singapore, has inaugurated its Bourbon Training Center Asia and its anchor handling tug supply (AHTS) vessel simulator in Singapore. It is the company's second such training center in Asia, following the opening of its Manila center, dedicated to dynamic positioning, in October 2007. The Singapore center includes a fully equipped bridge, the deck portion of the vessel, and the classrooms needed for theoretical courses and debriefing. Bourbon launched an AHTS simulator in Marseilles in November 2007.

These simulators have been developed by Offshore Simulator Center (OSC) in Norway and are an integral component of the Bourbon internal training policy. They will train crews in anchor handling operations under real conditions, thus ensuring acquisition of the skills required for new employees, those already working on vessels, as well as employees promoted to AHTS vessels.

Bourbon Offshore Asia, incorporated in 2005, is a joint venture company that is part of Bourbon's offshore division. It manages 10 offshore supply vessels in Southeast Asia, with another 10 units to be delivered in 2009.

OSC is the creator and owner of the first anchor handling simulator for offshore oil and gas service vessels. It is held by Farstad Shipping ASA, Rolls-Royce Marine AS, Norwegian Marine Technology Research Institute, and Aalesund University College.

Imports of crude and products

	Districts 1-4		District 5		Total US		
	10-31 2008	10-24 2008	10-31 2008	10-24 2008	10-31 2008	10-24 2008	*11-2 2007
	1,000 b/d						
Total motor gasoline	1,040	823	0	8	1,040	831	1,131
Mo. gas. blending comp.	835	625	0	0	835	625	611
Distillate	149	273	0	0	149	273	270
Residual	352	345	0	0	352	345	384
Jet fuel-kerosine	79	34	57	4	136	38	191
Propane-propylene	232	137	13	8	245	145	136
Other	375	642	93	84	468	726	944
Total products	**3,062**	**2,879**	**163**	**104**	**3,225**	**2,983**	**3,667**
Total crude	**8,852**	**9,224**	**1,120**	**1,113**	**9,972**	**10,337**	**9,656**
Total imports	**11,914**	**12,103**	**1,283**	**1,217**	**13,197**	**13,320**	**13,323**

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

Purvin & Gertz LNG netbacks—Nov. 7, 2008

Receiving terminal	Liquefaction plant					
	Algeria	Malaysia	Nigeria	Austr. NW Shelf	Qatar	Trinidad
	$/MMbtu					
Barcelona	10.92	9.72	11.00	9.61	10.30	10.92
Everett	6.27	4.32	5.94	4.42	4.82	6.54
Isle of Grain	10.84	8.68	10.20	8.57	9.24	10.23
Lake Charles	4.43	2.79	4.22	2.91	3.04	4.99
Sodegaura	9.77	12.54	10.04	11.75	11.00	9.11
Zeebrugge	11.80	9.65	11.21	9.54	10.22	11.22

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

Crude and product stocks

District	Crude oil	Motor gasoline		Jet fuel, kerosine	Fuel oils		Propane-propylene
		Total	Blending comp.[1]		Distillate	Residual	
	1,000 bbl						
PADD 1	13,446	48,645	27,253	8,363	50,766	13,344	4,660
PADD 2	64,263	47,890	18,174	6,956	27,614	1,324	23,122
PADD 3	166,663	66,590	32,264	11,786	34,226	18,764	30,345
PADD 4	14,694	7,348	2,828	501	2,792	329	[1]2,783
PADD 5	52,861	25,640	20,569	9,046	12,437	5,081	—
Oct. 31, 2008	**311,927**	**196,113**	**101,088**	**36,652**	**127,835**	**38,842**	**60,910**
Oct. 24, 2008	**311,873**	**194,990**	**100,517**	**35,991**	**126,629**	**38,622**	**60,404**
Nov. 2, 2007[2]	**311,862**	**194,313**	**89,772**	**41,505**	**135,377**	**38,471**	**61,489**

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

Refinery report—Oct. 31, 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	1,460	1,471	2,177	67	459	97	65
PADD 2	3,264	3,239	2,024	169	1,027	53	223
PADD 3	6,964	6,782	3,042	632	2,141	280	594
PADD 4	532	530	328	21	181	12	[1]182
PADD 5	2,797	2,595	1,539	424	581	93	—
Oct. 31, 2008	**15,017**	**14,617**	**9,110**	**1,313**	**4,389**	**535**	**1,064**
Oct. 24, 2008	**15,029**	**14,851**	**8,848**	**1,290**	**4,432**	**600**	**989**
Nov. 2, 2007[2]	**15,046**	**14,884**	**8,893**	**1,454**	**4,170**	**660**	**1,183**
	17,610 Operable capacity		**85.3% utilization rate**				

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

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

OIL&GAS JOURNAL online research center

OGJ crack spread

	*11-7-08	*11-9-07	Change	Change, %
	$/bbl			
SPOT PRICES				
Product value	72.16	104.90	–32.74	–31.2
Brent crude	60.44	93.56	–33.13	–35.4
Crack spread	11.72	11.34	0.38	3.4
FUTURES MARKET PRICES				
One month				
Product value	69.31	104.90	–35.59	–33.9
Light sweet crude	64.31	95.77	–31.46	–32.8
Crack spread	5.00	9.13	–4.13	–45.3
Six month				
Product value	77.84	106.08	–28.24	–26.6
Light sweet crude	68.47	91.69	–23.22	–25.3
Crack spread	9.37	14.39	–5.02	–34.9

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

OGJ GASOLINE PRICES

	Price ex tax 11-5-08	Pump price* 11-5-08	Pump price 11-7-07
	¢/gal		
(Approx. prices for self-service unleaded gasoline)			
Atlanta	191.7	238.2	304.5
Baltimore	204.6	246.5	295.1
Boston	195.8	237.7	292.1
Buffalo	165.3	226.2	313.2
Miami	187.4	239.0	320.2
Newark	198.4	231.0	287.0
New York	185.0	245.9	301.1
Norfolk	187.8	226.2	288.1
Philadelphia	193.0	243.7	302.2
Pittsburgh	194.8	245.5	302.1
Wash., DC	208.1	246.5	303.1
PAD I avg	192.0	238.8	300.8
Chicago	179.7	244.1	328.4
Cleveland	182.3	228.7	305.3
Des Moines	183.8	224.2	296.2
Detroit	179.6	239.0	315.3
Indianapolis	174.6	234.0	307.3
Kansas City	173.5	209.5	291.9
Louisville	193.3	234.2	303.3
Memphis	178.4	218.2	288.8
Milwaukee	183.1	234.4	310.3
Minn.-St. Paul	183.5	227.5	302.3
Oklahoma City	161.5	196.9	295.2
Omaha	161.8	207.1	303.7
St. Louis	183.1	219.1	285.5
Tulsa	161.4	196.8	289.3
Wichita	166.8	210.2	289.9
PAD II avg	176.4	221.6	300.8
Albuquerque	191.2	227.6	300.4
Birmingham	175.5	214.8	295.7
Dallas-Fort Worth	174.9	213.3	289.2
Houston	163.9	202.3	285.5
Little Rock	176.6	216.8	294.1
New Orleans	193.5	231.9	289.5
San Antonio	187.6	226.0	285.8
PAD III avg	180.5	219.0	291.5
Cheyenne	199.7	232.1	289.9
Denver	219.5	259.9	300.4
Salt Lake City	205.9	248.8	296.3
PAD IV avg	208.4	246.9	295.5
Los Angeles	208.8	275.9	326.9
Phoenix	227.5	264.9	287.9
Portland	235.4	278.8	312.8
San Diego	217.8	284.9	336.9
San Francisco	222.9	290.0	352.4
Seattle	219.0	274.9	325.3
PAD V avg	221.9	278.3	323.7
Week's avg.	**190.0**	**235.6**	**302.2**
Oct. avg.	**272.3**	**317.6**	**280.9**
Sept. avg.	**322.7**	**367.2**	**280.4**
2008 to date	**303.5**	**347.6**	—
2007 to date	**231.0**	**274.6**	—

*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

	10-31-08 ¢/gal		10-31-08 ¢/gal
Spot market product prices			
Motor gasoline (Conventional-regular)		Heating oil No. 2	
New York Harbor	156.65	New York Harbor	208.50
Gulf Coast	143.40	Gulf Coast	200.25
Los Angeles	147.90	Gas oil	
Amsterdam-Rotterdam-Antwerp (ARA)	135.83	ARA	204.65
Singapore	142.00	Singapore	172.26
Motor gasoline (Reformulated-regular)		Residual fuel oil	
New York Harbor	153.65	New York Harbor	114.95
Gulf Coast	144.15	Gulf Coast	113.40
Los Angeles	153.90	Los Angeles	175.26
		ARA	130.86
		Singapore	101.08

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

BAKER HUGHES RIG COUNT

	11-7-08	11-9-07
Alabama	5	7
Alaska	10	11
Arkansas	57	48
California	46	39
Land	46	38
Offshore	0	1
Colorado	124	116
Florida	1	0
Illinois	1	0
Indiana	2	2
Kansas	10	15
Kentucky	12	8
Louisiana	191	165
N. Land	94	60
S. Inland waters	20	28
S. Land	26	28
Offshore	51	49
Maryland	0	1
Michigan	1	1
Mississippi	13	8
Montana	6	10
Nebraska	0	0
New Mexico	92	69
New York	5	6
North Dakota	90	49
Ohio	12	14
Oklahoma	195	198
Pennsylvania	30	18
South Dakota	1	0
Texas	922	860
Offshore	7	6
Inland waters	2	2
Dist. 1	26	23
Dist. 2	33	36
Dist. 3	65	65
Dist. 4	93	93
Dist. 5	175	176
Dist. 6	134	113
Dist. 7B	29	39
Dist. 7C	70	62
Dist. 8	124	113
Dist. 8A	26	21
Dist. 9	47	41
Dist. 10	91	70
Utah	43	40
West Virginia	31	33
Wyoming	77	71
Others—NV-4; OR-1; TN-3; VA-6; WA-1	15	12
Total US	**1,992**	**1,801**
Total Canada	**445**	**361**
Grand total	**2,437**	**2,162**
Oil rigs	442	337
Gas rigs	1,539	1,459
Total offshore	63	57
Total cum. avg. YTD	**1,885**	**1,762**

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	11-7-08 Percent footage*	Rig count	11-9-07 Percent footage*
0–2,500	88	3.4	60	5.0
2,501-5,000	144	52.0	103	59.2
5,001-7,500	268	13.4	231	23.8
7,501-10,000	454	2.2	430	1.1
10,001-12,500	430	1.1	441	2.4
12,501-15,000	382	—	283	—
15,001-17,500	167	—	114	—
17,501-20,000	72	—	68	—
20,001-over	32	—	35	—
Total	**2,037**	**6.3**	**1,765**	**7.6**
INLAND	33		38	
LAND	1,950		1,672	
OFFSHORE	54		55	

*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]11-7-08	[2]11-9-07
	1,000 b/d	
(Crude oil and lease condensate)		
Alabama	20	19
Alaska	688	718
California	663	661
Colorado	62	67
Florida	6	6
Illinois	28	27
Kansas	105	107
Louisiana	1,123	1,188
Michigan	15	15
Mississippi	60	60
Montana	97	93
New Mexico	164	162
North Dakota	127	129
Oklahoma	175	173
Texas	1,289	1,331
Utah	53	53
Wyoming	149	149
All others	66	74
Total	**4,890**	**5,032**

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

US CRUDE PRICES

	11-7-08 $/bbl*
Alaska-North Slope 27°	93.39
South Louisiana Sweet	63.25
California-Kern River 13°	47.60
Lost Hills 30°	55.75
Wyoming Sweet	46.04
East Texas Sweet	57.00
West Texas Sour 34°	50.00
West Texas Intermediate	57.50
Oklahoma Sweet	57.50
Texas Upper Gulf Coast	54.00
Michigan Sour	50.50
Kansas Common	63.25
North Dakota Sweet	44.50

*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]	10-31-08
United Kingdom-Brent 38°	60.71
Russia-Urals 32°	59.83
Saudi Light 34°	58.26
Dubai Fateh 32°	56.80
Algeria Saharan 44°	62.75
Nigeria-Bonny Light 37°	65.12
Indonesia-Minas 34°	66.35
Venezuela-Tia Juana Light 31°	59.75
Mexico-Isthmus 33°	59.64
OPEC basket	61.24
Total OPEC[2]	59.18
Total non-OPEC[2]	59.45
Total world[2]	59.30
US imports[3]	57.53

[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]

	10-31-08	10-24-08	10-31-07	Change, %
	bcf			
Producing region	938	938	1,058	–11.3
Consuming region east	2,010	2,004	2,013	–0.1
Consuming region west	457	451	463	–1.3
Total US	**3,405**	**3,393**	**3,534**	**–3.7**
	Aug. 08	**Aug. 07**	**Change, %**	
Total US[2]	**2,867**	**3,017**	**–5.0**	

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

Statistics

International rig count

Region	Oct. 2008 Land	Oct. 2008 Off.	Oct. 2008 Total	Oct. 07 Total
WESTERN HEMISPHERE				
Argentina	83	1	84	73
Bolivia	3	—	3	3
Brazil	29	29	58	41
Canada	444	2	446	338
Chile	4	—	4	2
Colombia	43	—	43	37
Ecuador	13	—	13	11
Mexico	70	29	99	99
Peru	9	1	10	10
Trinidad	1	3	4	5
United States	1,903	73	1,976	1,762
Venezuela	69	15	84	72
Other	1	—	1	2
Subtotal	**2,672**	**153**	**2,825**	**2,454**
ASIA-PACIFIC				
Australia	14	14	28	23
Brunei	—	2	2	6
China-offshore	—	21	21	21
India	54	25	79	86
Indonesia	48	16	64	63
Japan	2	—	2	1
Malaysia	—	12	12	12
Myanmar	4	1	5	7
New Zealand	4	2	6	6
Papua New Guinea	2	—	2	2
Philippines	3	—	3	—
Taiwan	—	—	—	—
Thailand	2	10	12	12
Vietnam	—	5	5	7
Other	—	3	3	4
Subtotal	**133**	**111**	**244**	**250**
AFRICA				
Algeria	25	—	25	27
Angola	—	2	2	4
Congo	2	1	3	2
Gabon	—	—	—	2
Kenya	—	—	—	1
Libya	15	1	16	14
Nigeria	2	4	6	10
South Africa	—	—	—	—
Tunisia	2	1	3	3
Other	2	3	5	6
Subtotal	**48**	**12**	**60**	**69**
MIDDLE EAST				
Abu Dhabi	8	2	10	13
Dubai	1	—	1	1
Egypt	48	12	60	48
Iran	—	—	—	—
Iraq	—	—	—	—
Jordan	2	—	2	1
Kuwait	13	—	13	9
Oman	54	—	54	50
Pakistan	24	—	24	19
Qatar	2	9	11	14
Saudi Arabia	65	12	77	79
Sudan	—	—	—	—
Syria	20	—	20	18
Yemen	15	—	15	16
Other	1	—	1	—
Subtotal	**253**	**35**	**288**	**268**
EUROPE				
Croatia	—	—	—	1
Denmark	—	3	3	2
France	—	—	—	1
Germany	10	—	10	5
Hungary	5	—	5	2
Italy	2	1	3	5
Netherlands	—	3	3	4
Norway	—	16	16	17
Poland	2	—	2	2
Romania	18	4	22	3
Turkey	6	—	6	5
UK	3	21	24	27
Other	7	—	7	8
Subtotal	**53**	**48**	**101**	**82**
Total	**3,159**	**359**	**3,518**	**3,123**

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

Oil import freight costs*

Source	Discharge	Cargo	Cargo size, 1,000 bbl	Freight (Spot rate) worldscale	$/bbl
Caribbean	New York	Dist.	200	200	1.70
Caribbean	Houston	Resid.	380	222	2.11
Caribbean	Houston	Resid.	500	192	1.83
N. Europe	New York	Dist.	200	235	3.21
N. Europe	Houston	Crude	400	241	4.87
W. Africa	Houston	Crude	910	150	3.32
Persian Gulf	Houston	Crude	1,900	98	4.04
W. Africa	N. Europe	Crude	910	164	2.70
Persian Gulf	N. Europe	Crude	1,900	67	2.00
Persian Gulf	Japan	Crude	1,750	89	2.17

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

Waterborne Energy Inc. US LNG imports

Country	Oct. 2008	Sept. 2008	Oct. 2007	Change from a year ago, %
	MMcf			
Algeria	—	—	—	—
Egypt	3,030	2,980	3,020	0.3
Equatorial Guinea	—	—	—	—
Nigeria	—	2,690	—	—
Norway	—	—	—	—
Qatar	—	—	—	—
Trinidad and Tobago	24,330	20,760	28,840	–15.6
Total	**27,360**	**26,430**	**31,860**	**–14.1**

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

No new data at press time.

Propane prices

	Sept. 2008	Oct. 2008	Sept. 2007	Oct. 2007
	¢/gal			
Mont Belvieu	153.00	104.47	129.50	143.15
Conway	149.72	103.83	128.76	140.36
Northwest Europe	162.01	108.89	124.72	143.66

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

Muse, Stancil & Co. refining margins

	US Gulf Coast	US East Coast	US Mid-west	US West Coast	North-west Europe	South-east Asia
	$/bbl					
Oct. 2008						
Product revenues	85.91	84.32	90.77	90.00	85.43	78.30
Feedstock costs	–75.11	–75.93	–70.85	–71.70	–73.70	–67.83
Gross margin	10.80	8.39	19.92	18.30	11.73	10.47
Fixed costs	–2.11	–2.44	–2.37	–2.76	–2.37	–1.84
Variable costs	–1.98	–1.34	–1.76	–3.00	–2.79	–0.91
Cash operating margin	**6.71**	**4.61**	**15.79**	**12.54**	**6.57**	**7.72**
Sept. 2008	21.29	11.58	25.82	15.83	9.16	5.47
YTD avg.	9.85	3.41	12.52	14.17	6.50	3.82
2007 avg.	12.60	6.65	18.66	20.89	5.75	2.26
2006 avg.	12.54	6.38	14.97	23.69	5.88	1.06
2005 avg.	12.53	6.98	12.31	20.55	5.51	1.52

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

Muse, Stancil & Co. gasoline marketing margins

Sept. 2008	Chicago*	Houston	Los Angeles	New York
	¢/gal			
Retail price	400.29	354.23	374.35	372.80
Taxes	63.65	38.40	64.97	54.61
Wholesale price	318.30	294.70	296.26	293.29
Spot price	306.98	299.79	284.29	278.43
Retail margin	18.38	21.13	13.12	24.90
Wholesale margin	11.32	–5.09	11.97	14.86
Gross marketing margin	**29.70**	**16.04**	**25.09**	**39.76**
Aug. 2008	23.86	42.62	35.29	50.89
YTD avg.	24.76	23.98	20.73	34.35
2007 avg.	26.96	23.12	19.05	31.10
2006 avg.	19.74	20.34	18.03	27.90
2005 avg.	19.77	16.26	20.39	27.13

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

Muse, Stancil & Co. ethylene margins

	Ethane	Propane	Naphtha
	¢/lb ethylene		
Oct. 2008			
Product revenues	61.69	105.50	127.63
Feedstock costs	–20.49	–59.36	–92.41
Gross margin	41.20	46.14	35.22
Fixed costs	–5.38	–6.36	–7.19
Variable costs	–5.49	–6.48	–8.74
Cash operating margin	**30.33**	**33.30**	**19.29**
Sept. 2008	42.83	37.66	–1.17
YTD avg.	22.13	23.99	–9.32
2007 avg.	14.41	14.14	–7.42
2006 avg.	19.53	22.44	1.34
2005 avg.	14.43	20.68	1.28

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

Muse, Stancil & Co. US gas processing margins

Oct. 2008	Gulf Coast	Mid-continent
	$/Mcf	
Gross revenue		
Gas	6.44	3.10
Liquids	1.01	2.63
Gas purchase cost	7.18	4.16
Operating costs	0.07	0.15
Cash operating margin	**0.20**	**1.42**
Sept. 2008	0.62	2.41
YTD avg.	0.56	1.89
2007 avg.	0.44	1.47
2006 avg.	0.26	0.97
2005 avg.	–0.06	0.25
Breakeven producer payment, % of liquids	77%	44%

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

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Waxman challenge might be a climate change power play

A chairmanship challenge at the House Energy and Commerce Committee may be the first step in a power play over climate change.

Rep. Henry A. Waxman (D-Calif.) confirmed in a Nov. 5 statement that he will seek to become chairman of the committee, now headed by John D. Dingell (D-Mich.).

Waxman is chairman of the Committee on Oversight and Government Reform, a position that has enabled him to exercise his considerable talent for embarrassing witnesses, mostly Republicans.

When the Executive Branch moves into Democratic hands in January, leadership of the oversight panel won't be much fun for a gotchameister. So it's no surprise that the very liberal and fiercely partisan Waxman is looking for new dragons to slay.

Challenging Dingell, who has held office since 1955, longer than anyone else in the House, is especially brazen.

For the oil and gas industry, the change would mean the difference between mere antagonism and outright hostility.

The motive may be climate change. Supporting this suspicion is a rumor about another power move among House Democrats.

Ed Markey of Massachusetts might challenge Rick Boucher of Virginia for chairmanship of the energy committee's Energy and Air Quality Subcommittee.

Markey is chairman of the Select Committee on Energy Independence and Global Warming, a position that expires in January. Like Waxman, Markey dislikes oil and gas and supports aggressive measures on global warming.

Dingell and Boucher have in fact been working on global-warming legislation and circulated a draft bill last month.

Environmental groups, however, have criticized them for being lenient with automakers and the coal industry—important constituencies for congressmen from Michigan and Virginia. If the Markey rumor comes true, the two-front insurgency will look like payback to the environmental groups that supported Democrats in this month's election but that dislike the Dingell-Boucher approach to climate change.

And if the challenges succeed, the only resistance left against the costliest possible response to an uncertain threat will be worry over harm to a slumping economy.

An important question then would be who might remain willing to call a rush to futile sacrifice the folly that it is.

(Online Nov. 7, 2008; author's e-mail: bobt@ogjonline.com)

The Editor's Perspective

by Bob Tippee, Editor

Market Journal

by Sam Fletcher, Senior Writer

OPEC's compliance should tighten markets

If the Organization of Petroleum Exporting Countries can achieve just 60% compliance with the 1.5 million b/d production reduction voted at its Oct. 24 meeting, there would be at least a "small" reduction in consumer oil inventories through 2009, said analysts at KBC Market Services, a division of KBC Process Technology Ltd. in Surrey, UK. "Greater OPEC compliance or further setbacks to non-OPEC supplies could leave the market quite tight," they said.

As it stands, the proposed 1.5 million b/d cut "would, allowing for Iraq and Indonesia, take total OPEC crude output to about 30.5 million b/d," said Paul Horsnell, Barclays Capital Inc., London. He said, "That is 2 million b/d less than current output. It is also 700,000 b/d less than the latest OPEC Secretariat forecast of the call on OPEC crude across 2009; 400,000 b/d less than the International Energy Agency's forecast of the call; and 1.5 million b/d less than the US Department of Energy forecast." Horsnell said, "There is then some slack built into the decision, in that it would still represent a significant market tightening after any further large downgrades in demand expectations."

Rapid fall of oil prices in October produced "a meeting of minds" among OPEC members not evident at its Sept. 9 session, said KBC analysts. Crude futures sales in October represented the biggest monthly loss for front-month crude prices since that commodity began trading in 1983 on the New York Mercantile Exchange. The front-month contract was down 32.6% or $32.83/bbl during October and finished the month 54% below a record-high of $147.27/bbl in July. Panic in both the equity and commodity markets over deteriorating demand for energy prompted OPEC's Oct. 24 decision to cut production effective Nov. 1, after taking no action at its Sept. 9 session.

OPEC's October meeting "was a quantum leap in cohesion" from its September session, especially since the October meet was called at short notice, emphasizing OPEC's urgency to put a floor under oil prices. Moreover, it was fully supported by all OPEC members, including Saudi Arabia. OPEC's cutback announcement was quickly followed by actual reductions by the UAE, Kuwait, Iran, Qatar, Nigeria, and "crucially" by Saudi Arabia, making it "clear on this occasion that the producer group means business. OPEC has a proven track record as a highly effective price defensive cartel," said KBC.

Previously, oil price movements were closely correlated to other financial indicators, especially to exchange rates and strength of the US dollar vs. the euro. Since August, said KBC analysts, oil prices have closely followed equity markets, with both falling sharply as leading Organization for Economic Cooperation and Development economies entered recession, while growth slowed markedly in developing countries. However, they said, "The fundamentals of the oil market itself have begun to play a much more important role, with oil demand destruction a major driver of the recent collapse in oil prices."

Price volatility

According to KBC Market Services, OPEC now has the opportunity to reduce harmful oil price volatility resulting from the financial sector's domination of futures markets. Oil market volatility has increased exponentially since 2004 when OPEC lost control of the ceiling oil prices because of its lack of spare production capacity. "This will increase next year to above 4 million b/d as cutbacks coincide with additions to capacity," KBC analysts reported.

Earlier suspension of OPEC's price band mechanism indicating a target range for crude prices "invited speculators to explore the boundaries to oil prices," analysts said. It also prevented OPEC from responding quickly to price changes. KBC analysts said, "OPEC should now reintroduce a price band of $70-90/bbl, around the level of $80/bbl, which is close to the current maximum sustainable level for producers. It also provides sufficient incentive for consumers to exploit marginal sources of supply. There would be benefits to both producers and consumers in terms of security of demand and supply and also a sharp reduction in volatility."

With front-month crude trading below $63/bbl in late October, KBC reported speculators have taken a net short position of 8,000 contracts in NYMEX. "This is an unusual foray to the short side, leaving some potential for speculative short covering to provide support to any reversal in oil price direction," KBC said.

Meanwhile, KBC analysts said, "OPEC has done enough to provide a floor to oil prices at above $60/bbl, while concerns over the global economy may restrain oil prices from moving substantially above $70/bbl into the first quarter of 2009."

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

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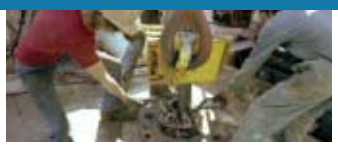
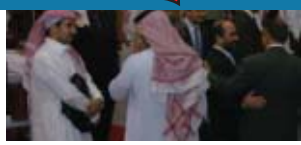

Contents

Welcome to

Oil & Gas Maintenance Technology Conference and Exhibition

Maintenance means money. In the world-class, global-scale oil and gas operations of the Middle East, maintenance means big money.

The Oil & Gas Maintenance Technology Conference and Exhibition brings together professionals from the Middle East and around the world to discuss practical solutions to real problems. It includes sessions on predictive and preventive maintenance, reliability and asset management and maintenance management. From vibration analysis to corrosion control to contracting practice, the conference addresses maintenance and inspection issues affecting tanks, compressors, rotating equipment, pipelines, gas plants, refineries, instrumentation and more. The exhibition represents a showcase of technical innovation.

Because harsh conditions and operational scale make the Middle East a proving ground for maintenance practice, the Oil & Gas Maintenance Technology Conference and Exhibition will attract worldwide attention. PennWell Corporation and Oil & Gas Journal are pleased to offer industry leaders this rich opportunity to exchange ideas and to learn.

Bob Tippee
Editor, Oil & Gas Journal

Welcome to

Pipeline Rehabilitation & Maintenance Technology Conference and Exhibition

Current high oil and gas commodity prices make oil spills and vapor escapes from operating pipelines more costly than ever before. At the same time, public and governmental pressures on pipeline operators to protect air, water, and ground environments have never been greater.

The convergence of these factors heightens the need for pipeline operators to share experiences in monitoring and controlling system flows and diagnosing and rehabilitating lapses in line integrity. As Middle East producers and processors ramp up their operations to meet greater hydrocarbon energy demand, this conference stands as an established and leading forum in bringing together operating and service companies and their technical and management personnel to learn the latest and best in pipeline rehabilitation and maintenance.

The previous nine conferences have firmly established the value and need for an international specialised meeting to examine issues centered on the fitness for purpose question of oil and natural gas transmission lines.

Frances Webb
Event Director, PennWell Petroleum Group

Event Schedule

Saturday 17 January

Registration	07:00 – 10:00
	14:00 – 17:00
Workshop 1	08:00 – 17:00

Sunday 18 January

Registration	07:00 – 10:00
	14:00 – 17:00
Workshop 2	08:00 – 17:00

Monday 19 January

Registration	08:00 – 18:00
Opening Session	09:00 – 10:30
Opening Ceremony	10:30
Exhibition	10:30 – 18.30
Coffee Break	**10:30 – 11:00**
Conference Sessions	11:00 – 12:00
Lunch (Hosted by BAPCO)	**12:00 – 13:45**
Conference Sessions	13:45 – 15:00
Coffee Break	**15:00 – 15:30**
Conference Sessions	15:30 – 16:30
Networking Reception (Sponsored by TC Gulf)	16:30 – 18:30

Tuesday 20 January

Registration	08:00 – 17:30
Conference Session	09:00 – 10:00
Exhibition	10:00 – 17:30
Coffee Break	**10:00 – 10:30**
Conference Session	10:30 – 12:00
Lunch (hosted by Saudi Aramco)	**12:00 – 13:45**
Conference Session	13:45 – 15:00
Coffee Break	**15:00 – 15:30**
Conference Session	15:30 – 16:30

Wednesday 21 January

Conference Sessions	09:00 – 10:00
Exhibition	10:00 – 17:30
Coffee Break	**10:00 – 10:30**
Conference Sessions	10:30 – 11:45
Lunch	**11:45 – 13:45**
Conference Sessions	13:45 – 15:30
Coffee Break	**15:00 – 15:30**
Conference Sessions	15:30 – 16:30

About OGMT/PRM

Oil & Gas Maintenance Technology and Pipeline Rehabilitation & Maintenance are co-hosted by **Saudi Aramco** and **Bahrain Petroleum Company (BAPCO)** and the combined events offer UNRIVALLED ACCESS to buyers and specifiers in the key national oil companies in the Middle East. Attending this forum will provide opportunities to meet key decision makers relating to oil, gas and pipeline maintenance investment programmes throughout the Gulf and further a field.

Who will attend?

- Senior executive decision makers from international and regional oil and gas companies
- Inspection and maintenance engineers and managers
- Pipeline operators
- Operations managers and supervisors involved in planning and scheduling pipeline transmission
- Coating and corrosion engineers
- Service and equipment suppliers

About Bahrain

Petroleum production and processing in Bahrain accounts for about 60% of export earnings, 60% of government revenues and 30% of the country's GDP (currently $25,300 per capita). Source: FCO, UK

Bahrain is strategically located at the heart of the key oil and gas markets in the Gulf, in particular Saudi Arabia and Qatar, making it an attractive location to host this annual event. With its highly developed communication and transport facilities, Bahrain is home to many multinational companies.

How do I register?

- Register FREE for the exhibition at **www.oilandgasmaintenance.com** / **www.pipeline-rehab.com**
- Register yourself and your colleagues as Conference Delegates by 19 December and benefit from a **$200 EARLY BIRD DISCOUNT**
- Either register online at **www.oilandgasmaintenance.com**, fax back the form on outside back cover to +1 918 831 9161 or mail the form to: PennWell C&E Registration (OGMT/PRM) P.O. Box 973059, Dallas, TX 75397-3059 US

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PennWell Corporation would like to thank the advisory board members of OGMT/PRM Conference 2009.

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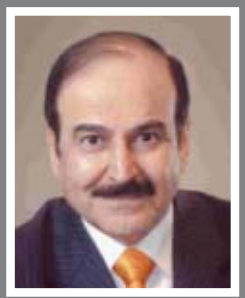
Keynote Speakers

Monday 19th January 2009
09.00 – 10.30



H.E. Dr. Abdul-Hussain Bin Ali Mirza

Minister of Oil & Gas Affairs and Chairman of National Oil & Gas Authority, Kingdom of Bahrain

09:00, Monday 19 January

H.E. Dr. Mirza was appointed Minister of Oil and Gas Affairs in December 2006. Before that he was appointed Minister of State in 2002 and Minister of Cabinet Affairs in 2004. Prior to naming him a Cabinet Minister he was Chief Executive of Bapco. Dr. Mirza hold a PhD in Change Management from the U.K. Dr. Mirza is still Chairman of the NOGA and was previously Minister of State (Cabinet Affairs).

Mr. Abdulkarim Jaffer Al-Sayed

Chief Executive – The Bahrain Petroleum Company "BAPCO"

Mr. Al-Sayed was appointed to the position of Chief Executive of the Bahrain Petroleum Company (BAPCO) in January, 2008. Joined the Bahrain Petroleum Company (BAPCO) in 1965. Was Appointed Manager Power & Utilities Department in 1981. 1982 – 1986 assigned to the Engineering Division and filled several senior positions. In 1986 was appointed as General Manager – Engineering until 1988. Appointed as General Manager - Maintenance in 1988 and then appointed as General Manager – Refining in 1989. From 1990 to 2003 was again appointed as General Manager – Engineering. Was the Chairman of Gulf Area Oil Companies Mutual Aid Organization (GAOCMAO) From November, 2003 to April, 2006 was General Manager Major Engineering Projects. In charge of several Major Strategic and Modernisation Investment Projects In November, 2005 appointed as Chairman of the National Committee for Negotiations of Gas Imports to the Kingdom of Bahrain.In April 2006 appointed as Acting Chief Executive (Downstream) and in September 2006 was appointed to the position of Senior Deputy Chief Executive prior to his appointment as Chief Executive of BAPCO in January, 2008. Fellow of the Bahrain Society of Engineers and was serving at the Board as a General Secretary and Vice President.

Mr Amer Al Sulaim

Executive Director of Industrial Services, Saudi Aramco

Mr Al-Sulaim holds a B.S. degree in Civil Engineering from KFUPM and an M.S. degree in Construction Management from the University of Washington. He attended the Executives Management Program at Cornell University in 1989. Mr Al-Sulaim started his career with Saudi Aramco back in 1976. He held several management positions in the areas of Engineering, Inspection, Oil Producing, Pipelines, Project Management, Quality Management, Marine, Mechanical Services, Training and his current position is The Executive Director of Saudi Aramco's Industrial Services organization. Mr Al-Sulaim is also the Chairman of the Saudi Quality Council. He chaired two international Quality conferences and is very active in change management.

Training Course Bahrain 2009

Pipeline Inspection (modular)

17th January 2009
08.00 – 17.00

Module 1: Duration 1 day

Latest Developments in In-Line Inspection of Pipelines

Summary: This module will provide a 1-day comprehensive workshop on the latest developments in in-line inspection technology, introducing trends in the industry, new non-destructive testing technologies being currently introduced or developed. It builds on information covered in the "Introduction to in-line inspection course". Basics will not be explained again. It is assumed that delegates have a basic understanding on the subject.

1. Introduction

1.0 Welcome

1.1 Why use in-line inspection tools

2. Flaws and Defects in Pipelines

2.1 Geometric Anomalies

2.2 Metal Loss

2.3 Cracks and Crack-Like Defects

2.4 Leaks

2.5 Failure Modes

3. In-Line Inspection Technologies: Free Swimming Tools

3.1 Short recap on MFL and UT

3.1.1 Physical principle

3.2 Comparison on MFL and UT

3.3 Evolving inspection technologies

3.3.1 EMAT

3.3.2 Phased Array

3.3.3 Combo-Tools

3.3.4 Multi Technology Tools

3.4 Which information can they deliver?

3.5 Sizing and sizing accuracies

3.6 Special configurations

3.6.1 Extra High Resolution

3.6.2 Pitting Configurations

3.6.3 Bi-directional Tools

3.6.4 Deep Water Application

4. In-Line Inspection Technologies: Cable Operated Tools

4.1 Cable (tethered) tools

4.2 Crawler tools

4.3 Overview: available tools

5. Inspection Issues

5.1 Resolution

5.2 Cleaning

5.3 Using data for integrity assessment

5.4 Corrosion growth analysis

5.5 Trends in crack assessment

6. Reporting

6.1 The data analysis process

6.2 Data quality and completeness

6.3 Data visualization

6.4 Data management and archiving

Training Course Bahrain 2009

Pipeline Inspection (modular)

18th January 2009
08.00 – 17.00

Module 2: Duration 1 day

External Pipeline Inspection Methods and Special Applications

Summary: This module will provide a 1-day comprehensive workshop on the latest developments in external pipeline inspection technologies, introducing trends in the industry, new non-destructive testing technologies being currently introduced or developed. It introduces and explains non-destructive testing principles and technologies applied externally for detecting, sizing and locating flaws and defects in pipelines.

1. Introduction

1.1 Welcome

1.2 Why use external inspection methods?

2. External Pipeline Inspection Technologies

4.1 Electromagnetic methods

4.2 Ultrasound

4.3 Magnetic flux leakage

3. Introducing Tools

3.1 Screening

3.2 Finding and sizing corrosion

3.3 Finding and sizing cracks

4. Special Inspection Issues

5.1 Verifying in-Line inspection results

5.2 Under water application

5.3 Riser inspection

5.4 Future trends

5. Data Management

5.1 Data visualization

5.2 Correlating data

5.3 Data archiving and data management

Course Lecturers:

Dr. Michael Beller, NDT Systems & Services AG, Stutensee, Germany
Dr. Konrad Reber, Innospection GmbH, Stutensee, Germany

Target Group

Pipeline engineers, technicians or other interested personnel from operators. Engineering Consultants active in the field of NDT and integrity assessment. Personnel from the authorities or certification bodies involved with pipeline inspection and assessment.

OGMT Conference Program

Monday 19th January 2009

OPENING PLENARY SESSION & Exhibition Opening

09.00 - 10.30

INTRODUCTION: Bob Tippee, Editor, Oil & Gas Journal, USA

WELCOME KEYNOTE: H.E Dr. Abdul-Hussain Bin Ali Mirza, Minister of Oil & Gas Affairs and Chairman of National Oil & Gas Authority, Kingdom of Bahrain

KEYNOTE ADDRESS: Abdulkarim J. Al-Sayed, Chief Executive, BAPCO, Bahrain

KEYNOTE ADDRESS: Amer Al-Sulaim, Executive Director, Industrial Services, Saudi Aramco, Saudi Arabia

10.30 - 11.00 **REFRESHMENT BREAK**

SESSION 1: Maintenance Programme Management

11.00 - 12.00

Chair: Hussain Al-Fadli, Saudi Aramco, Saudi Arabia
Co-Chair: Bob Tippee, Oil & Gas Journal, USA

Optimised Outage Planning For Upstream Facilities Using Risk-Based Inspection Software
Chris Ablitt, TWI Ltd. UK

Roadmap To World Class Maintenance: Key Learning's From A Global Maintenance Improvement Initiative In The Oil And Gas Industry
Tracy Thomas Strawn, Marshall Institute, USA

12.00 - 13.45 **LUNCH HOSTED BY BAPCO**

13.45 - 15.00 **SESSION 1: Maintenance Programme Management (continued)**

LNG Mega Trains: Maintenance Strategies for New Technologies - Experiences
Abdel Kader Attou, Qatargas Operating Company, Qatar

Conceptual Design, Sustainable Successful Maintenance
Prof. Dr. Kalaitzis, Dr. Walter Hahn, Dr. Kalaitzis & Partner , Germany

15.00 - 15.30 **REFRESHMENT BREAK**

15.30 - 16.30 **SESSION 1: Maintenance Programme Management (continued)**

Are DCVG And ACVG Surveys Cost Effective, Or Is There A Better Alternative.
Peter Nicholson, Cathodic Technology Ltd, Canada

Hard is Not Always Tough Enough
Dr Czech and Drs. JF Doddema, BASF, The Netherlands

Alternate: The Truth About Operations Excellence (OPEX)
James W Davis, Strategic Asset Management, USA

16.30 - 18.30 **NETWORKING RECEPTION SPONSORED BY TC GULF**

OGMT Conference Program

TUESDAY 20TH JANUARY 2009

SESSION 2: Asset Management Strategies

09.00 - 10.00

Chair: Dr. A. Majeed Abdulkareem, Ministry of Electricity, Bahrain

Asset Management in the Arabian Gulf
James W. Davis, Strategic Asset Management, USA

Optimising Performance Through Customised Cleaning Systems And Methods
Mike Watson, Tube Tech International Ltd. UK

Alternate: The Importance Of Effective Asset Managemet & Project Oriented Structure For An Oil Company In The Oil Race
Oguzhan Akyener, Turkish Petroleum Corporation, Turkey

10.00 - 10.30 **COFFEE BREAK**

SESSION 3: Inspection & Monitoring Methods

10.30 - 12.00

Chair: Mohammed Al Najrani, Saudi Aramco, Saudi Arabia

Real Time Integrity & Fitness for Service Monitoring of Piping & Pressure Vessel Integrity in New or Ageing Plant!
Robert Campbell, I.D.E.A.S. Ltd. UK

York Subcooling Skids Reliability Assessment
Muhammad Felemban & Minwer Juhani, Saudi Aramco, Saudi Arabia

From Condition Monitoring to Condition Management as Part of Asset Management
Rolf Panzke, Siemens AG, Germany

12.00 - 13.45 **LUNCH HOSTED BY SAUDI ARAMCO** ارامكو السعودية Saudi Aramco

13.45 - 15.00 **SESSION 3: Inspection & Monitoring Methods (continued)**

To the Question of Productiveness Regulation of the Low-Permeable Carbonate Collectors
O. Ivankiv, I. Zezekalo & I. Sheiko-Ivankiv, Poltava Department of the Ukrainian State Geological Institute, Ukraine

Subsea Condition Monitoring and Leak Detection
Dr. Cato Bjelland, Bjørge Naxys, Norway

Alternate: Vibration Analysis and Diagnosis of Gearbox
Mamdouh B. Al-Aidarous, Saudi Aramco, Saudi Arabia

15.00 - 15.30 **COFFEE BREAK**

SESSION 4: Prevention, Response & Repair

15.30 - 16.30

Chair: Ahmed Ghuloom Abdulla, GPIC, Bahrain
Co-Chair: Bob Tippee, Oil & Gas Journal, USA

Surge Arresters Application in Transmission Lines
Mahmoud Saad Zaher, ADCO, U.A.E.

Eliminating Turning Gear at Ethane Compressor and Enhance Machine Performance and Reliability
Minwer A. Al-Juhani & Abdul Arhman Kwiter, Saudi Aramco, Saudi Arabia

OGMT Conference Program

WEDNESDAY 21ST JANUARY 2009

SESSION 4: Prevention, Response & Repair (continued)

09.00 - 10.00

High Performance Corrosion Resistance – Fluoropolymer / PTFE Coated Fasteners for Offshore and Oil Gas Industries – Coatings for the 21st Centaury
Kirtan Dhami, Blinex Filter Coat PVT Ltd. India

Protective Thin Film Coating Applications for Tubular Equipment
Edward L. Curran, Curran International, USA

10.00 - 10.30 **COFFEE BREAK**

10.30 - 11.45 **SESSION 4: Prevention Response & Repair (continued)**

A Modified ISO 8501-1 St 2 Mechanical Surface Preparation Utilizing Highly Adsorptive Oxy-Polymerizing Rust-Stabilizing Inhibitors Without And In Conjunction With Surface Tolerant Epoxy Coatings
Jean-Louis Gheysens, cto, MG Industries (USA)

Utilization Of Advanced Fiber Composites For Plants And Pipelines Retrofit And Rehabilitation
Hamid Saadatmanesh , Ph.D., P.E. Al-Ruya Power Co.Ltd. Saudi Arabia

11.45 - 13.45 **LUNCH**

13.45 - 15.30 **SESSION 4: Prevention Response & Repair (continued)**

Emergency Pigging Solution at a Refinery
Colin Drysdale, Eric Freeman, T.D. Williamson Inc., USA

A New And Safe Solution To Separating Stuck Flanges
Alastair R MacDonald, Industrial Solutions International Ltd. UK

35 MW Steam Turbine – Blade Failure Remedy
Abdulaziz A. Alshaikh, Saudi Methanol Company (ARRAZI), SABIC affiliate, Saudi Arabia

Alternate: Preparing Metal Tubes for Orbital Welding
Nadia Reicher, PROTEM GmbH, Germany

15.30 - Closing Remarks and Recognition Awards

PRM Conference Program

MONDAY 19TH JANUARY 2009

OPENING PLENARY SESSION & Exhibition Opening

09.00 - 10.30

INTRODUCTION: Bob Tippee, Editor, Oil & Gas Journal, USA

WELCOME KEYNOTE: H.E Dr. Abdul-Hussain Bin Ali Mirza, Minister of Oil & Gas Affairs and Chairman of National Oil & Gas Authority, Kingdom of Bahrain

KEYNOTE ADDRESS: Abdulkarim J. Al-Sayed, Chief Executive, BAPCO, Bahrain

KEYNOTE ADDRESS: Amer Al-Sulaim, Executive Director, Industrial Services, Saudi Aramco, Saudi Arabia

10.30 - 11.00 **REFRESHMENT BREAK**

SESSION 1: Risk & Integrity Management

11.00 - 12.00

Chair: MuhammadAli Trabulsi, Saudi Aramco, Saudi Arabia

Co-Chair: Abdullah M. Al-Ajmi, Saudi Aramco, Saudi Arabia

A New Approach to Risk Based Pipeline Integrity Management
Roland Palmer-Jones, Susannah Turner, Phil Hopkins, Penspen International Limited, U.A.E

Managing Pipeline Safety and Reliability Under High Production and Shipping Demands
Mohammed Jaarah, ROSEN Middle East, U.A.E., & Derek Storey, ROSEN Headquarters, Switzerland

12.00 - 13.45 **LUNCH HOSTED BY BAPCO**

13.45 - 15.00 **SESSION 1: Risk & Integrity Management (continued)**

Fitness-for-Purpose Assessment of Hydrotest Conditions: How to Eliminate Unnecessary Conservatism
Érika Santana M. Nicoletti, Petrobras Transporte S.A., Brazil

Benchmarking To Optimise Pipeline Integrity Management
TBC, GE PII Pipeline Solutions

15.00 - 15.30 **REFRESHMENT BREAK**

15.30 - 16.30 **SESSION 1: Risk & Integrity Management (continued)**

Monotonic Pressure Evaluations to Determine the Maximum Repairable Defect Length by a Composite Overwrap Repair System
Dixit Kadakia, Jeffrey M. Wilson & Alan Morton, TD Williamson Inc. USA

Fitness For Service Assessment for Pipelines API-579
Abdulaziz M.Al-Budabeel, Saudi Aramco, Saudi Arabia

Alternate: SAFE for Pipeline Operations
Eyad Alqadi, Cisco, U.A.E.

16.30 - 18.30 **NETWORKING RECEPTION SPONSORED BY TC GULF**

PRM Conference Program

TUESDAY 20TH JANUARY 2009

SESSION 2: Pipeline Inspection

09.00 - 10.00

Chair: Konrad Reber, Innospection Germany GmbH, Germany

A Survey of Leak Detection & Localization
Prof.Dr. Gerhard Geiger, University of Gelsenkirchen, Germany

Detection of Natural Gas Leaks by Open Path and Ultrasonic Gas Leak Detection
Edward Naranjo, General Monitors, USA

10.00 - 10.30 **COFFEE BREAK**

10.30 - 12.00 **SESSION 2: Pipeline Inspection (continued)**

Challenges To Have A Successful Leak Detection System
Hamdan M. Al-Ghamdi, Saudi Aramco, Saudi Arabia

A New In-Line Inspection Tool For The Quatitative Wall Thickness Measurement of Pipelines: First Results
A. Barbian, M. Beller, N. Thielager, H. Willems, NDT Systems & Services AG, Germany

The Development And Fabrication Of An Intelligent Pig For Cleaning And Detecting Internal Pipeline Defects
Mohamed Shehadeh, Ahmed Arabi, Aymen Elzagh, Arab Academy for Science and Technology/Engineering College, Egypt

Alternate: Embedded Ultrasound Sensors for Improved Asset Integrity and Process Control
Jim Costain, John Cuffe, Chris Caunter and Edwin van der Leden, GE Sensing & Inspection Technologies, UK

12.00 - 13.45 **LUNCH HOSTED BY SAUDI ARAMCO** ارامكو السعودية Saudi Aramco

SESSION 3 : Pipelines: Black Powder

13.45 - 15.00

Chair: Dr. Michael Beller, NDT Systems & Services, Germany

Black Powder In Sales Gas Pipelines
Dr. Abdelmounam Sherik, Nader M. Al-Abdulmohsin and Jaime Perez, Saudi Aramco, Saudi Arabia

Black Powder Removal from Transmission Pipelines: Diagnostic and Solutions
Olivier Trifilieff, Pall Corporation, France

15.00 - 15.30 **COFFEE BREAK**

SESSION 4: Pipeline Related Products

15.30 - 17.00

Chair: Warren True, Oil & Gas Journal, USA

Non-intrusive Pipeline Inspection Techniques for Accurate Measurement of Deposits within Operational Pipelines
Lee Robins and Steven Woolley, Tracerco, UK

Brushes for Pipeline Cleaning
Douglas L. Batzel, Galaxy Brushes, USA

ELASTOPIPE, a flexible corrosion free piping system
Jan-Hugo Nilssen, Trelleborg Viking AS

Alternate: Innovative Double Block and Bleed Method
Colin Drysdale, Frank Dum, T.D. Williamson Inc

PRM Conference Program

WEDNESDAY 21ST JANUARY 2009

SESSION 5: PIPELINES: Operations, Maintenance & Construction

09.00 - 10.00

Chair: Roland Palmer-Jones, Penspen Integrity, UK

Handling External Corrosion of a 16"X108 km Export Pipeline in Irrigated Area in the Desert.
Maher Haddad, Deir Ez-zor Petroleum Company - Syria

SWID Pipelines Treatment Program
Fahad N. Al-Abeedi, Saudi Aramco, Saudi Arabia

10.00 - 10.30 **COFFEE BREAK**

10.30 - 11.45 **SESSION 5: PIPELINES: Operations, Maintenance & Construction (continued)**

Challenges of Pipeline Construction
Nadhir I. Al-Nasri, Saudi Aramco, Saudi Arabia

Sour Gas Corrosion Challenges: Available Mitigation Measures and Their Assessment
Bharat Bhushan, Petrofac international Ltd.

Alternate: Boiler and Super Heater Tube Repairs and Maintenance
Mahboubeh Daryapour, Iran.

11.45 - 13.30 **LUNCH**

SESSION 6: PIPELINES: Repair & Rehabilitation

13.30 - 15.00

Chair: Warren True, Oil & Gas Journal, USA

Valve Repair/Replacement Program During a 56" Pipeline Service Conversion to Sales Gas
Rubayan F. Al-Shahrani, Saudi Aramco, Saudi Arabia

Use Of Patches As Safe Method To Repair Pipelines Affected By Illicit Cylindrical Perforations
Gerardo Santos, Arnulfo Gamarra, Guillermo Latorre, Oscar Culman, Ecopetrol S. A., Colombia

15.00 - 15.30 **COFFEE BREAK**

15.30 - 16.30 **SESSION 6: PIPELINES Repair & Rehabilitation (continued)**

Repair of Pipeline Defects Using Composite Repair Systems
Simon Frost, Walker Technical Resources Limited, UK

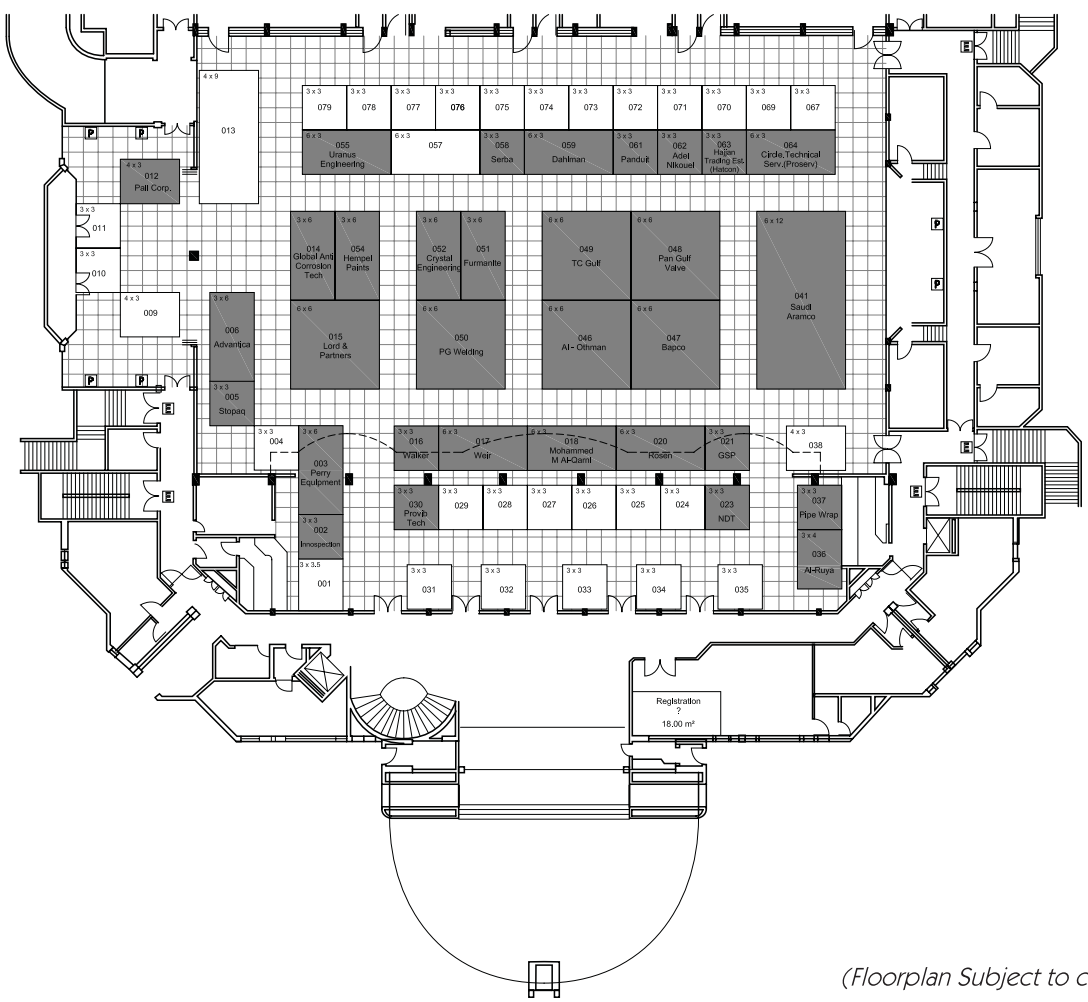
The Development Of An Emergency Repair System, And A Case Study For A Remote Gas Pipeline
Nadia Linkleter, Roland Palmer-Jones, Vishal Minhas, John Hume, Duncan Christie, Penspen Limited, UK

Alteranate: On-Line Pipeline Repairs - Safety & Integrity from Installation to Removal
Adam Thistlethwaite, Furmanite International Ltd., UK

16.30 - Closing Remarks and Recognition Awards

Exhibitor List and Floorplan

OGMT/PRM 2009 - exh. list Oct 18, 2008



(Floorplan Subject to change)

Hotel reservation form 2009

Manama, Kingdom of Bahrain
19 - 21 January 2009

Organization .....

Contact ..... Title .....

Address .....

City..... State/Country ..... Postcode .....

Phone..... Fax ..... Email .....

Room Type

❒ Smoking ❒ Non-Smoking ❒ Other.....

Superior:

❒ Single (80BD) ❒ Double (88BD)

Deluxe:

❒ Single (83BD) ❒ Double (91BD)

Grand Deluxe:

❒ Single (92BD) ❒ Double (100BD)

Luxury:

❒ Single (87BD) ❒ Double (95BD)

Platinum:

❒ Single (120BD) ❒ Double (130BD)

Grand Platinum:

❒ Single (125BD) ❒ Double (135BD)

*Specific room type requests will be noted, however not guaranteed as they are subject to availability

Room reservation details

Arrival Date:.....Departure:.....

Guest name(s):.....

Breakfast (7.000BD per person/per meal)

❒ Yes ❒ No

*Breakfast is subject to 15% service charge & 5% Gov't tax

Airport pick-up details:

Airline:.....

Flight:.....

❒ Shuttle bus 4.000BD/per person

❒ Limousine 8.000BD/per person

Payment details:

❒ AMEX ❒ VISA ❒ MASTERCARD ❒ DISCOVER ❒ OTHER .....

Full name (as it appears on card): .....

Credit card number: ..... Exp. date .....

Signature: .....

*Signature also authorizes that this credit card will be charged for any no-show fees and any cancellations received less than 72 hours from arrival date

Please fax and/or email this completed form to:

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Email: rgc@gulfhotelbahrain.com

Wire transfer payments can be sent to:

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Branch: Main Branch
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Account No: 99067420
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How to Get There

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The Gulf International Convention & Exhibition Centre is just 15 minutes away from Bahrain International Airport and 5 minutes from the City Centre

Contacts

For information about participating at the exhibition or conference, please contact:

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E: francesw@pennwell.com

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Craig W. Moritz
Director Petroleum Events & Sales
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E: isabelle@pennwell.com

For information regarding marketing, press and attendance, please contact:

Simon Kears
Marketing Manager
T: +44 (0) 1992 656 647
F: +44 (0) 1992 656 700
E: simonk@pennwell.com

OIL&GAS OGMT MAINTENANCE TECHNOLOGY

2009 Registration Form

19-21, January 2009
The Gulf International Convention
& Exhibition Centre

PIPELINE REHABILITATION & MAINTENANCE™

PLEASE COMPLETE IN BLOCK CAPITALS ☐ MR ☐ MRS ☐ MISS ☐ OTHER

FIRST NAME.....

LAST NAME.....

JOB TITLE.....

ORGANIZATION.....

ADDRESS.....

.....

.....

COUNTRY.....

POSTAL CODE.....

TELEPHONE.....

TELEFAX.....

E-MAIL.....
confirmations will be sent by email, if a unique email is provided*

Which conference are you registering for? OGMT 2009 (Registration code: OGMT09PRESHOW) ☐ PRM 2009 (Registration code: PRM09PRESHOW) ☐

1. Type of Company or Organization:

- ☐ 10 Oil/Gas company
- ☐ 20 Consulting Company
- ☐ 30 Contractor
- ☐ 40 Engineering/Construction
- ☐ 50 Financial
- ☐ 60 Service/Supply
- ☐ 65 Government/Library/Education
- ☐ 70 Other

2. Job Function:

- ☐ 02 Management (CEO, Pres.VP)
- ☐ 05 Engineering/Technical/Geoscience
- ☐ 06 Superintendent/Field Professional/Foreman
- ☐ 10 Purchasing/Consulting
- ☐ 12 Other

3. Areas of Interest/Involvement:

- ☐ 10 Exploration
- ☐ 01 Production
- ☐ 23 Pipeline/Transportation
- ☐ 15 Refining
- ☐ 39 Financial
- ☐ 05 Drilling
- ☐ 29 Gas Processing
- ☐ 19 Petrochemical
- ☐ 46 Other

4. Purchasing Role: ☐ **Specify** ☐ **Recommend** ☐ **Approve** ☐ **None**

For information on corporate packages for more than 20 attendees contact
Carolyn Hall
Phone: +1 918 831-9513
Email: chall@pennwell.com

3 ways to register:
Pre-register online before 14, January 2009
Register on site after 14, January 2009

1
Fax:
Direct: +1 918 831 9161
Toll-Free (US only): +1 888 299 8057

2
Website:
www.oilandgasmaintenance.com
www.pipeline-rehab.com

3
Mail:
PennWell C&E Registration (OGMT/PIPE)
P.O. Box 973059
Dallas, TX 75397-3059 USA

For questions please call:
Phone: +1 918 831 9160
Toll Free (US only): +1 888 299 8016
OGMT09OGMT PRESHOW

Conference Fees:

1. Individual Delegate (Full Conference Registration)*
Includes:
- Access to conference sessions and proceedings
- Access to Exhibition Hall
- Coffee Breaks in Exhibition Hall
- Delegate Lunch on Monday, Tuesday & Wednesday

☐ Paid by 19 December 2008 $1375
☐ Paid after 19 December 2008 $1575

2. Individual Delegate (Single Day Registration)
Monday 19 ☐ Tuesday 20 ☐ Wednesday 21 ☐
Includes:
- Access to conference sessions on the day
- Access to exhibition hall on the day
- Coffee Breaks in Exhibition Hall
- Delegate Lunch on the day

☐ Paid by 19 December 2008 $825
☐ Paid after 19 December 2008 $945

3. Corporate Plan (Group of 10 Delegates)*
Includes:
- Access to conference sessions and proceedings
- Access to Exhibition Hall
- Coffee Breaks in Exhibition Hall
- Delegate Lunch on Monday, Tuesday & Wednesday

☐ Paid by 19 December 2008 $10,310
☐ Paid after 19 December 2008 $11,810

4. Corporate Plan (Group of 20 Delegates)*
Includes:
- Access to conference sessions and proceedings
- Access to Exhibition Hall
- Coffee Breaks in Exhibition Hall
- Delegate Lunch on Monday, Tuesday & Wednesday

☐ Paid by 19 December 2008 $16,500
☐ Paid after 19 December 2008 $18,900

5. Pipeline Inspection Training Course (Modular)

☐ 17th January 2008 – Latest Developments in In-Line Inspection of Pipelines
☐ 18th January 2008 – External Pipeline Inspection Methods and Special Applications

☐ Single Day Pass $675
☐ Two Day Pass $1250

6. Conference Proceedings (CD-ROM) ☐ $265

7. Exhibit Floor Only (Jan 19 – 21)
Entry to exhibition floor only ☐ FREE

TOTAL PAYMENT AMOUNT

Total payment amount in cash
(in u.s. funds only): = US$ _____

Payment must be received prior to conference. If payment in not received by the conference date, the registration fee must be guaranteed on charge card until proof of payment is provided. Make check payable to PennWell/Pipeline Rehab 2009. Cancellation: Cancellation of registration must be received in writing. Any individual, exhibitor or corporate registrations cancelled before 19 December 2008 will receive a 50% refund of registration fee. After 19 December 2008 no refunds will be permitted. Substitutions may be made at any time by contacting the registration office in writing.

* Your full-price registration fee includes a one-year paid subscription to Oil & Gas Journal (US$ 69.00 value).

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