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Our worldwide construction surveys are updated regularly

The PennEnergy editors and the OGJ Online Research Center are regularly conducting intensive survey efforts tracking new energy construction projects worldwide, keying the details into a spreadsheet and making them ready for your use!

Worldwide Construction Surveys

Semi-annual construction updates are provided in the following areas:

- Petrochemical
- Refining
- Pipeline
- Gas Processing
- LNG
- Sulfur

The Excel format enables efficient and rapid analysis of planned construction projects. The data collected includes Company, Location, Capacity, Expected Competition Date and Current Status, Contractor, Cost, Engineering and Process Design (when available). Some of these surveys are also available in historical version going back to 1996.

Updates in April and November.

Offshore Drilling Rig Construction Survey

We also offer the annual **Offshore Drilling Rig Construction Survey**, in which four types of vessels are tracked.

Jack-Up Rigs Under Construction 2006-2009

Semi-Submersibles Under Construction 2007-2011

Drillships Under Construction 2007-2010

Tender Assist Vessels Under Construction 2007-2010

The rig construction surveys contain the following fields:

- Rig Name
- Owner
- Design
- Shipyard & Country
- Delivery Date
- Cost in \$ million

Updates in October.

www.ogjresearch.com

Production Projects Worldwide

Major upstream mega-projects throughout the world: location, project name, peak year, production volume, operator company, and development type. Updates annually in June.

Oil Sands Projects

Planned Canadian Oil Sands development projects in four Excel worksheets. Includes: mining upgrading projects, in situ projects, reserves estimate of initial in-place bitumen, and historical table with wells drilled from 1985 through 2006 – commercial, experimental and exploration wells. Updates annually in July.

For more information

Visit the web site:

www.ogjresearch.com

Look under the heading Energy Industry Surveys in Excel

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Worldwide Construction Update

***Extended laterals under study in Arkoma shale gas play
Shell drills gas project in China
Russian refining tax structure fails to promote investment
Raster-based GIS data guide economic pipeline spread***



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Apr. 7, 2008
Volume 106.13

WORLDWIDE CONSTRUCTION UPDATE

Rise seen in sulfur, refining construction projects
Leena Koottungal

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COVER

Construction progresses on Placid Refining Co.'s \$300 million expansion in Port Allen, La. The project will expand the refinery's crude capacity to 80,000 b/d from 55,100 b/d while reducing total air emissions by 50%. All existing process units are being expanded and upgraded. In addition, a fluid catalytic cracker gasoline hydrotreater, sulfur extraction capacity, tankage, and other environmental improvements are being constructed to enable the refinery to meet all applicable clean fuel standards for its products. Details of the expansion and other projects are in Oil & Gas Journal's Worldwide Construction Update tables at www.ogjonline.com. This semiannual special report begins on p. 24. Photos from Placid; top, right photo by Joey Hagmann, Port Allen.



OIL & GAS JOURNAL
—online research center.

The full text of Oil & Gas Journal is available through OGJ Online, Oil & Gas Journal's internet-based energy information service, at <http://www.ogjonline.com>. For information, send an e-mail message to webmaster@ogjonline.com.

Is CP worthless?

What kind of question is this?

Most in the pipeline industry agree that cathodic protection (CP) is the smart way to provide backup corrosion protection on underground pipelines.

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

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

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

view a 10 minute explanation of the cathodic shielding process.

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

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

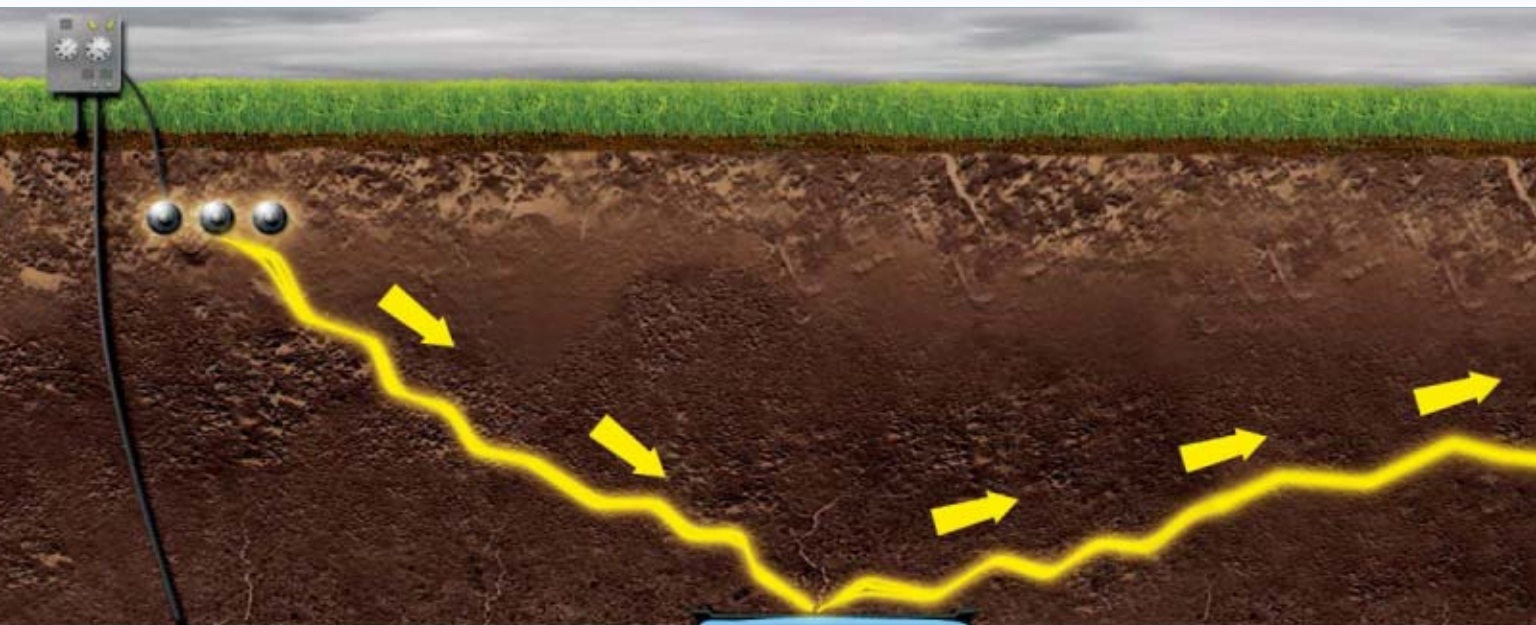
NACE SP0169-2007 states: "*Materials ... that create electrical shielding should not be used on the pipeline*"¹.

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

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

1. Visit polyguardproducts.com/failsafecoating.htm and review the large body of information about shielding problems.
2. Talk to operators who have used Polyguard's RD-6 system. (*There are many*) Ask them if they know of any serious corrosion or SCC ever found under RD-6. (*We don't, even after 19 years and thousands of installations.*)
3. Have someone in your organization attend the NACE course "*Coatings in Conjunction with Cathodic Protection*".

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



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Polyguard has been ISO 9000 certified since 1996.
Current certifications are:
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- Dutch Council for Certification
- Deutscher Akkreditierungs Rat

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OGJ
Newsletter

Apr. 7, 2008

International news for oil and gas professionals
For up-to-the-minute news, visit www.ogjonline.com**General Interest — Quick Takes****MMS issues production, royalty reporting rules**

The US Minerals Management Service published on Mar. 26 amended final regulations for reporting production and royalties of oil, gas, coal, and geothermal resources from federal and Native American lands.

The new rules are designed to align the reports with current MMS business practice, MMS said. They reflect changes implemented after the agency's financial systems were largely reengineered in 2001, as well as other changes required by law, it said.

Among other changes, the new rules align regulations with updated reporting forms, eliminate references to forms and codes that no longer apply, update other references, and move up the due date for production reports submitted electronically.

They also clarify the requirement for reporting production inventory, eliminate references to some electronic reporting options that no longer exist, and clarify the reporting requirement for taxpayer identification numbers, MMS said.

The new rules will take effect in 30 days, it said.

Alberta: first oil sands reclamation certificate

The Alberta government presented its first oil sands reclamation certificate to Syncrude Canada Ltd. for converting a 104-hectare area known as Gateway Hill into forest and wetlands 35 km north of Fort McMurray.

Syncrude began planting trees and shrubs in 1983 to create a forest interspersed by several wetlands and a 4.5-km hiking trail. The company is committed to overall sustainability, said Syncrude Pres. and Chief Executive Officer Tom Katinas.

Under Alberta's reclamation standards, companies must remediate and reclaim Alberta's land so it can be productive again. Alberta requires reclaimed land to be able to support a range of activities similar to its previous use.

Alberta Environment Minister Rob Renner said it takes time to confirm a successful reclamation. "Both operators and government want to ensure that the reclamation is successful before a certificate is granted."

Typically, oil sands mining requires the use of land for several decades. The reclamation process occurs throughout a project's life, and reclamation certification occurs when the land has been fully reclaimed.

Overburden material removed during oil sands mining was put on Gateway Hill. By the early 1980s, the area was no longer needed, and Syncrude began replacing topsoil and planting trees and shrubs.

Katinas said Syncrude reclaimed more than 80 additional hectares in 2007 and plans on reclaiming another 100 hectares this year. In 2006 alone, the company reported spending \$30.5 million on reclamation activities.

Syncrude is a joint venture operated by Syncrude Canada Ltd. and owned by Canadian Oil Sands Ltd., ConocoPhillips Oilsands Partnership II, Imperial Oil Resources, Mocal Energy Ltd., Murphy Oil Co. Ltd., Nexen Oil Sands Partnership, and Petro-Canada Oil & Gas.

Colombia offers 43 blocks in licensing round

Colombia has invited operators to bid for 43 blocks in its latest licensing round, with contracts expected to be signed with successful applicants by October.

The acreage, spanning over 7 million hectares, is in the natural gas-prone Sinu North area; Cesar Rancheria area, which is also gas prone and holds the potential for unconventional gas; Cordillera area, a frontier province; and Crudos Pesados West, a heavy oil region.

Armando Zamora, director general of Colombia's National Hydrocarbons Agency (ANH), told delegates at the London roadshow that 17 blocks were on offer in the heavy oil zone. "According to a study by Halliburton, it is estimated to hold 20 billion bbl of oil in place." Seventeen fields have been discovered near the blocks and three petroleum systems have been found in the basin.

About 122 wells have been drilled on the San Jacinto basin in the Sinu North area with 17 wells in the Guajira basin in Cesar Rancheria; four in the Eastern Cordillera basin, and 61 in the Llanos basin in Crudos Pesados West.

Separately, Colombia is offering operators the chance to develop 8 frontier heavy oil blocks in the East Llanos basin.

Colombia also is keen to attract small and medium-sized operators for its mini bidding round that will be launched shortly, Zamora added. "There will be 100 blocks available, and we will offer those that have been surrendered to the ANH in productive areas. The round will close in September."

Foreign investment in Colombia's petroleum sector is expected to be more than \$5 billion this year compared with \$3.5 billion in 2007. Colombia hopes to sign 70-80 exploration and production contracts by yearend compared with 56 last year.

Operators drilled more than 70 wildcat wells in 2007, and Colombia wants this to increase to 90 in 2008. Technical success rates were over 40%.

Carolina García, licensing coordinator at ANH, told delegates that operators must be prequalified before they can submit applications for acreage. Production will last 24 years unless operators seek an extension. They must acquire seismic data under the first phase of the exploration program and drill wells or shoot 3D seismic during later stages.

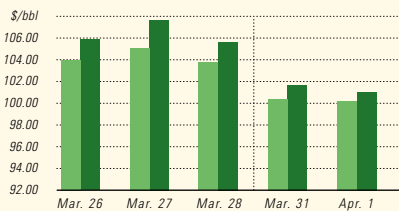
"In the '90s, people were worried about Colombia's sufficiency in oil, but now that's stabilized, and the outlook is for increased

Industry

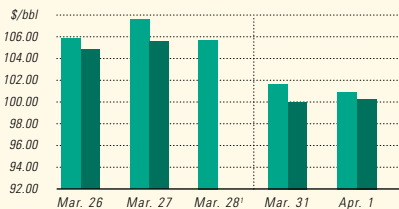
Scoreboard

US INDUSTRY SCOREBOARD — 4/7

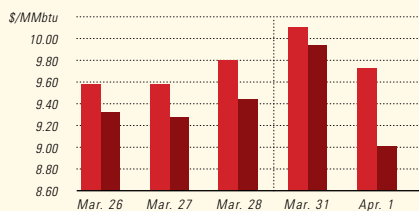
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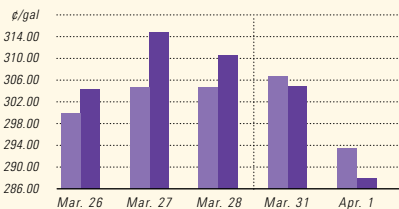
WTI CUSHING / BRENT SPOT



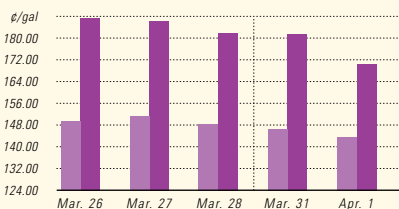
NYMEX NATURAL GAS / SPOT GAS - HENRY HUB



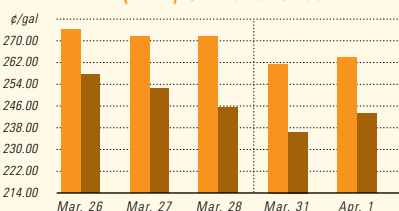
IPE GAS OIL / NYMEX HEATING OIL



PROPANE - MT. BELVIEU / BUTANE - MT. BELVIEU



NYMEX GASOLINE (RBOB)² / NY SPOT GASOLINE³



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

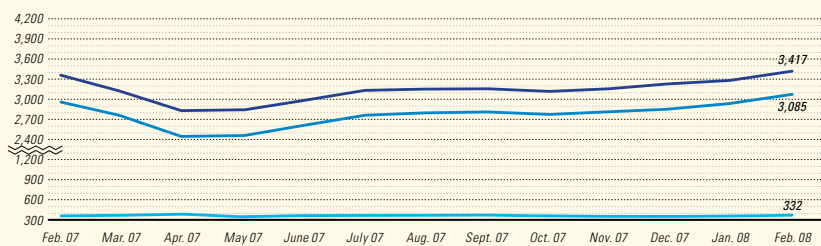
Latest week 3/21	4 wk. average	4 wk. avg. year ago ¹	Change, %	YTD average ¹	YTD avg. year ago ¹	Change, %
Demand, 1,000 b/d						
Motor gasoline	9,097	9,192	-1.0	9,068	9,028	0.4
Distillate	4,228	4,406	-4.0	4,279	4,399	-2.7
Jet fuel	1,603	1,577	1.6	1,571	1,602	-1.9
Residual	639	814	-21.5	686	820	-16.3
Other products	4,711	4,752	-0.9	4,957	4,938	0.4
TOTAL DEMAND	20,278	20,741	-2.2	20,561	20,786	-1.1
Supply, 1,000 b/d						
Crude production	5,088	5,169	-1.6	5,049	5,174	-2.4
NGL production ²	2,518	2,371	6.2	2,521	2,303	9.5
Crude imports	9,588	9,965	-3.8	9,922	9,890	0.3
Product imports	3,202	3,424	-6.5	3,390	3,373	0.5
Other supply ³	951	774	22.9	964	909	6.0
TOTAL SUPPLY	21,347	21,703	-1.6	21,846	21,649	0.9
Refining, 1,000 b/d						
Crude runs to stills	14,709	14,763	-0.4	14,709	14,757	-0.3
Input to crude stills	14,884	15,093	-1.4	14,884	15,123	-1.6
% utilization	85.4	86.4	—	85.4	86.6	—

Latest week 3/21	Latest week	Previous week ¹	Change	Same week year ago ¹	Change	Change, %
Stocks, 1,000 bbl						
Crude oil	311,847	311,759	88	328,414	-16,567	-5.0
Motor gasoline	229,235	232,520	-3,285	210,231	19,004	9.0
Distillate	111,349	113,490	-2,141	119,029	-6,680	-5.7
Jet fuel-kerosine	38,006	39,373	-1,367	40,130	-2,124	-5.3
Residual	38,638	37,939	699	36,274	2,364	6.5
Stock cover (days)⁴						
			Change, %		Change, %	
Crude	21.5	21.3	0.9	22.2	-3.2	
Motor gasoline	25.2	25.6	-1.6	22.8	10.5	
Distillate	26.3	26.8	-1.9	26.5	-0.8	
Propane	17.5	18.1	-3.3	17.5	—	

Futures prices ⁵ 3/28	Change	Change	%			
Light sweet crude, \$/bbl	104.24	105.36	-1.12	60.08	44.16	73.5
Natural gas, \$/MMBtu	9.54	9.15	0.39	7.10	2.44	34.3

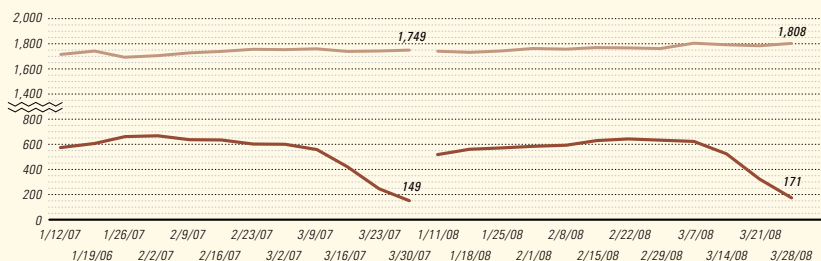
¹Based on revised figures. ²Includes adjustments for fuel ethanol and motor gasoline blending components. ³Includes other hydrocarbons and alcohol, refinery processing gain, and unaccounted for crude oil. ⁴Stocks divided by average daily product supplied for the prior 4 weeks. ⁵Weekly average of daily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

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



Note: Monthly average count

BAKER HUGHES RIG COUNT: US / CANADA



Note: End of week average count

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growth," Zamora said. "We want to produce 1 million b/d of oil within the next 10-15 years, and we have enough reserves to be self-sufficient for the next 20 years."

Despite having only 7 tcf of proven gas reserves, Colombia has started exporting up to 150 MMcfd of gas to its gas-rich neighbor Venezuela. ♦

Exploration & Development — Quick Takes

Kazakh field gets deeper pool gas find

Tethys Petroleum Ltd., Guernsey, Channel Islands, UK, gauged an apparent Cretaceous deeper pool gas discovery on the Akkulka Block in Kazakhstan's North Ustyurt basin.

The AKK-14 exploration well, drilled on a prospect between the AKK-13 and AKK-04 discoveries, flowed a combined 13.3 MMcfd of gas from two intervals. The company's highest-rate test on the block, it appears to be the first commercial discovery in Cretaceous Tasaran sand.

The Tasaran sand stabilized at 7.5 MMcfd with 163 psig flowing tubinghead pressure on a 30-mm choke, while the overlying Paleocene Kyzylloi sand stabilized at 5.8 MMcfd with 152 psig flowing tubinghead pressure on the same size choke.

The Tasaran is made up of several units of up to 20 ft of blocky, medium-grained sandstones and are more conventional reservoirs than the generally thinner and finer-grained Kyzylloi sandstone, the company said.

The company plans to examine existing seismic for potential untested Tasaran zones in several older wells and for new leads. The discovery opens a new play on both the Akkulka and Kul-Bas blocks.

Sapex begins first Arkaringa push in 25 years

Adelaide-based Sapex Ltd. has signed a contract with Terrex Seismic to shoot a seismic survey in the Arkaringa basin in South Australia beginning in late April.

The 6-week program, comprising 428 km of 2D survey on-shore, will be the first seismic work in the basin since the early 1980s when the Santos-Delhi group held permits in the region.

Sapex said that half of the program will provide detailed coverage over two key portions of the Boorthanna Trough, where interpretation of previous data indicated several prospects and leads. The company anticipates that the work will identify locations suitable for exploration drilling. Sapex plans to spud two wells before the end of this year, subject to the seismic results and its ability to secure a suitable rig.

The second part of the survey will be a regional program to determine the southward extension of the Boorthanna Trough.

Sapex holds 100% interest in seven permits totaling 65,000 sq km and covering virtually the entire Arkaringa basin. In addition to conventional petroleum work, Sapex has announced a farmin by Sydney-based Eastern Star Gas Ltd. to undertake the first coal seam methane investigation in the basin's coal measures. ♦

Drilling & Production — Quick Takes

Crew returns to Neptune TLP; analysis continues

BHP Billiton Ltd. said Mar. 27 that it is continuing its structural analysis of a hull anomaly identified on the Neptune tension-leg platform.

The anomaly was discovered during the TLP's commissioning (OGJ Online, Mar. 26, 2008). Personnel working on the TLP were removed temporarily, but they have returned to work on the platform, BHP Billiton said.

A BHP Billiton spokeswoman told OGJ Mar. 27 that it is still too early to answer questions regarding if or how the anomaly might impact future production. Previously, BHP Billiton said production was expected to start "during the March quarter."

No details have been released yet regarding the nature of the anomaly.

"We do intend to update our schedule for first production as we know more. We believe the impact to fiscal year 2008 production will be minimal," she said.

The 5,900-ton TLP was equipped to produce as much as 50,000 b/d of oil and 50 MMscfd of natural gas from an initial seven sub-sea wells. The TLP was installed June 5, 2007, and the topsides processing facility was set atop the hull later that same month (OGJ, Aug. 3, 2007, Newsletter).

BHP Billiton is the operator and holds 30% interest. Its partners are Marathon Oil Corp. 30%, Woodside Energy 20%, and Repsol-YPF SA subsidiary Maxus (US) Exploration 15%.

Workers' strike shuts in Shell Gabon production

Gabon last week asked Shell Gabon to restart 6,000 b/d of oil production at its Gamba site, leaving around 54,000 b/d of production still shut in amid an oil workers' strike.

Shell Gabon, a joint venture of Royal Dutch Shell PLC 75% and the government of Gabon 25%, shut in 60,000 b/d of production Mar. 20 following the start of the workers' strike.

An additional 30,000 b/d of production from Total Gabon and Perenco SA, which passes through the Gamba terminal, also has been curtailed.

Shell managed to undertake some maintenance work at its strike-hit operations in Gabon on Mar. 31, as union officials threatened to extend the worker protest to the whole of the country's oil industry.

"Some vital equipment has been restarted [on Mar. 31] to prevent damage to our infrastructure," Shell Gabon reported in a statement.

Gabon's National Organization of Petroleum Workers (ONEP) is demanding various labor concessions from the oil industry on working hours and time off. Marathon Oil workers notified the union that they would be joining Shell Gabon workers on strike.

Gabon produced about 270,000 b/d in 2007, according to the US Energy Information Administration.

NWS to develop North Rankin off W. Australia

The Woodside Petroleum-led North West Shelf gas project joint venture has made its final investment decision to go ahead with the North Rankin B platform development off Western Australia.

The \$5 billion (Aus.) project is aimed at recovering the remaining low-pressure gas from the North Rankin and Perseus gas fields and includes installation of a second steel platform at North Rankin. The structure, with a topsides weight of 23,600 tonnes, will house gas compression facilities, utilities, and a living quarters module.

The platform will be placed in 125 m of water close to the existing North Rankin A platform and connected by to it via a 100-m bridge and walkway.

The development work will also include systems tie-ins between the two platforms plus a complete refurbishment for North Rankin A, which has been in place since the mid-1980s.

Once the work is completed, both platforms will be operated as a single integrated facility.

The North Rankin B project will extend the life of the North Rankin and Perseus fields and will support the JV's onshore gas commitments to supply customers past 2013. The announcement also follows approval of a fifth LNG train on the Burrup Peninsula fed by the NWS gas project fields.

This train will produce 4.4 million tonnes/year of LNG, bring-

ing the total project output to 16.3 million tpy.

The North Rankin B Project is expected to come on stream in 2012.

Chevron lets Platong platform work contract

Chevron Thailand let a contract to J. Ray McDermott SA to build a central production-processing platform, living quarters, and associated facilities for the Platong Gas II project, Gulf of Thailand.

The value of the engineering, procurement, construction, and installation contract was not disclosed.

However, executives said it represents a major part of the \$3.1 billion investment required for developing the gas structure, which is about 200 km offshore.

Engineering for this project has commenced at J. Ray's Singapore office, and installation is expected by the end of 2010.

Platong Gas II's offshore facilities are designed to produce 420 MMcfd of gas.

The field is scheduled to come on stream in 2011 and to produce more than 330 MMcfd of gas, which will be piped to the Thai eastern coast for domestic consumption.

Chevron operates Platong Gas II in which it has a 69.8% share. Other stakeholders are Mitsui Oil Exploration Co. 27.4% and PTT Exploration & Production PLC 2.8%. ♦

Processing — Quick Takes

China faces diesel, gasoline shortages

China is facing shortages of diesel and gasoline as the gap widens between rising international crude prices and centrally controlled fuel markets.

Shortages first reported in southern and inland China apparently are spreading to the wealthier areas in the north and east as filling stations struggle to obtain fuel shipments from refiners.

In Beijing, workers at 20 retail outlets said they were either rationing or had run out of diesel because of shortages. Four outlets in Shanghai said their daily diesel shipments had not arrived. Staff at another outlet said they were on duty all day and night, waiting for diesel shipments.

Shanghai authorities played down the shortages and urged drivers not to hoard fuel. The municipal economic commission said the city has enough diesel to last 10 days. Shanghai and other major cities experienced brief shortages in the second half of last year, but those shortfalls disappeared after the government ordered oil companies to ensure supplies and then raised fuel prices by about 10%. Now with inflation at its highest level in a dozen years, Chinese officials are resisting pressure from refiners for price increases.

After decades of supplying its own energy needs, China became a net importer in the 1990s as its economy boomed. Imports rose 12.3% last year to 1.1 billion bbl, and they now supply nearly half of China's demand.

With crude priced close to or above \$100/bbl on the world market, independent refiners have reduced or stopped production. Under orders to ensure supplies to major cities and key sectors such as farming and public transport, state-owned major oil companies such as Sinopec and PetroChina reportedly limited sales to independent retail outlets in some regions.

Petrobras buys into, will upgrade Nishihara plant

Brazil's state-owned Petroleo Brasileiro SA (Petrobras) has acquired an 87.5% stake in the 100,000 b/d Nishihara refinery in Okinawa owned by Japan TonenGeneral Sekiyu KK, the Japanese subsidiary of ExxonMobil Corp.

Nansei Sekiyu, in partnership with Petrobras, has Sumitomo Corp. as a shareholder that will retain its 12.5% stake in the company.

Sumitomo and Petrobras are expected to spend as much as ¥100 billion to upgrade the Nishihara facilities and boost the cost competitiveness of the refinery as an export base.

Much of the output from the refinery is said to be low-value heavy oil, so Petrobras will build facilities for producing high-value gasoline and kerosine along with a variety of petrochemical materials.

The refinery has an oil and derivative terminal capable of storing as much as 9.6 million bbl, three piers with potential to receive large vessels, and a monofloat for very large crude carriers.

Petrobras said the agreement, valued at some \$50 million, marks an important first step in its strategy to launch downstream operations in Asia.

Petrobras, which has discovered fields in Central and South America as well as Africa, is trying to boost exports. This latest move illustrates its plan to be involved in the refinery process and to secure refineries in proximity to markets.

In February, TonenGeneral Sekiyu KK said its net profit plummeted 82.4% last year. The company blamed the earnings erosion on its inability to pass on higher oil prices and shipping charges to its oil products.

Cienfuegos refinery on line; expansion mulled

Processing at Cuba's 65,000 b/d Cienfuegos refinery is on schedule 2 months into operations with gasoline output beginning in March and expansion plans on the drawing board, according to a senior official.

PDV-Cupet SA—a joint venture of Venezuela's state-run Petroleos de Venezuela SA and CubaPetroleo—owns the refinery, which is in the port city of Cienfuegos, 155 miles southeast of Havana.

Julio Sanchez, director of refinery expansion, said the facility began processing crude Jan. 8. It has reached its initial capacity and was to begin producing gasoline Mar. 21, he said.

He said the refinery is expected to produce 48% fuel oil, 18% diesel, 12% gasoline, 10% jet fuel, and 10% LNG for the domestic market and for export to other countries in the Caribbean region.

Further development plans call for the refinery eventually to process 150,000 b/d of crude and supply feedstock for a planned petrochemical industry in the area (OGJ Online, Feb. 3, 2008). Sanchez said the \$1.3 billion expansion of the facility would get under way in 2009 and begin operation in 2013.

Cuba has two other refineries, Nico Lopez in Havana and Her-

manos Diaz in Santiago de Cuba, 860 km east of the capital. The two facilities have a combined capacity of 65,000 b/d.

World biofuels demand rising, report says

World biofuels demand is expected to expand at 19.5%/year to 92 million tonnes in 2011 despite concerns about the impact of biofuels on the environment and food supplies, Freedonia Group Inc. said in a report.

The Cleveland market research firm said 2006 world biofuels demand was 37.7 million tonnes, and that the annual growth rate was 19.9% during 2001-06.

Future market expansion will come from a more-than-doubling of ethanol demand and even faster increases in global biodiesel demand. Other biofuels also will experience strong growth but at a slower pace than ethanol or biodiesel, Freedonia said.

The annual growth rate for biofuels demand from 2006-11 is forecast at 35.3% in Asia Pacific, 22.1% in Western Europe, and 19.5% across North America. In terms of absolute gains in expanding biofuels demand, North America will be the leader, Freedonia said. ♦

Transportation — Quick Takes

First LNG cargo for Sabine Pass terminal

A carrier is bound from Nigeria with the first cargo of LNG for Cheniere Energy Inc.'s Sabine Pass LNG terminal in Cameron Parish, La.

The 145,000 cu m-capacity Celestine River LNG vessel, owned and operated by Kawasaki Kisen Kaisha Ltd. ("K" Line) is scheduled to arrive Apr. 12 at the Sabine Pass LNG terminal.

Sabine Pass LNG, under construction for 3 years, is the largest US regasification facility with an initial send-out capacity of 2.6 bcf/d and peak capacity of 4.3 bcf/d. It has 16.8 bcf of LNG storage capacity and two berths capable of handling the largest LNG vessels.

In February, Cheniere Energy hired Credit Suisse as its financial advisor in evaluating the future of the Sabine Pass LNG terminal. Options include taking on partners or selling Cheniere's 2 bcf/d portion of the terminal's 4 bcf/d capacity. Total SA and Chevron Corp. each hold 20-year agreements for 1 bcf/d capacity (OGJ Online, Feb. 28, 2008).

Tepco plans LNG import terminal at Sendai

Japan's Tohoku Electric Power Co. (Tepco) will build a new LNG import terminal at Sendai, aiming to disperse its LNG sites in order to minimize the risk of supply disruptions from earthquakes and other problems.

Tepco, which currently receives all of its LNG at its Niigata terminal, said the new facility will have storage capacity of 1 million tonnes of LNG and is expected to begin operations around 2016.

On Mar. 6, Tohoku Electric received some 70,000 tonnes of LNG on a spot basis from Qatar that arrived at the Niigata terminal aboard a Q-Flex vessel. It was the second Q-Flex cargo to arrive in Japan after the first shipment in January (OGJ Online, Jan. 11, 2008). In December 2007 Tepco signed an 8-year agreement to purchase gas from North West Shelf Australia LNG. Tepco would

purchase about a million tonnes/year from 2010.

Tepco's territory covers seven prefectures in the Tohoku region of northeastern Japan, providing gas to electric machinery makers and other large-lot electricity users.

Japanese LNG buyers make deal with Indonesia

Japanese buyers have agreed to forgive Indonesia's failures to supply 72 cargoes of LNG as part of a 10-year extension to supply contracts that were due to expire in 2010 and 2011.

Iin Arifin Takhyhan, deputy director of Indonesia's state-run PT Pertamina, said his country has been released from liability for failing to deliver 72 LNG shipments to Japan last year and causing a gas shortage.

The new contracts are for 3 million tonnes/year over the first 5 years of the contract and 2 million tpy over the next 5 years. The extensions represent a significant cut over the current contracts, which call for 12 million tpy.

The reduced supplies follow earlier announcements by the Indonesian government that it was planning to reduce LNG exports to Japan because it wants to use more gas for domestic purposes.

Iin said LNG will be sold at \$15-16/MMBtu fob and that the price of the gas is linked to the worldwide price for oil. If the crude price drops, the price of the LNG could also be lowered.

Analysts said that Indonesia's deal to raise LNG prices to Japan sets a new benchmark for Asian term contracts and increases the pressure on other gas deals currently under negotiation. ♦

Correction

In the GTL-CTL article Mar. 24, 2008, a callout in the illustration on p. 25 denoting a GTL project in Trinidad and Tobago should have been: World GTL Petrotrin.

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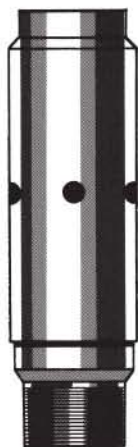


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L e t t e r s

Problems with hydrogen

This letter responds to the article "Shell Oil executive outlines 12-point energy plan" (OGJ, Mar. 10, 2008, p. 35).

Step 8 of Shell's 12-point program in the referenced article is "Developing a hydrogen fleet and fueling infrastructure." Shell's statement is made without any reference to the source of molecular hydrogen, H₂, for vehicle fuel. H₂ is not found significantly in nature; therefore, it must be manufactured by very energy-intensive processes. H₂ production involves unburning water. That fact means it is necessary to input energy into H₂ manufacture. That input energy is subsequently made available when the H₂ is used to power a vehicle.

Water can be unburned with electricity by electrolysis for H₂ production, but today most hydrogen is manufactured by the reaction of water at high temperatures with the carbon and hydrogen contained in fossil fuels, although biomass could also be reacted with water for H₂ production. Domestic coal could be used for H₂ production and reduce our dependence on imported petroleum and natural gas. The resulting coproduced CO₂ from H₂ manufacture could be sequestered in geologic formations, if desired.

A better use for manufactured H₂ is to upgrade heavy oil and residues plus distillates containing sulfur and nitrogen into transportation fuels. In this manner, one pound of hydrogen would provide considerable amounts of specification transportation fuels using proven, large-scale processes. These fuels would enter the present fueling infrastructure and not require a new infrastructure that would be necessary for retail distribution of H₂.

Shell scientists and engineers certainly understand the above circumstances concerning H₂ and much more. It is a great disservice for the public formulation of our nation's long-term energy policies for Shell and other oil companies' PR personnel to make public pacifying, simplistic statements, as per the example of their Step 8—"Developing a hydrogen fleet and fueling infrastructure."

Harry W. Parker, PhD

Lake Jackson, Tex.

Professor of chemical engineering, emeritus

Texas Tech University

97-7

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

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hibition, Perth, +61 2 9553 1260, +61 2 9553 4830 (fax), e-mail: appea2008@sanevent.com.au, website: www.appea2008.com.au. 6-9

ACS National Meeting & Exposition, New Orleans, 1 (800) 227-5558, e-mail: natmtgs@acs.org, website: www.acs.org. 6-10.

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GPA Midcontinent Annual Meeting, Okla. City, (918) 493-3872, (918) 493-3875 (fax), e-mail: pmirkin@gasprocessors.com, website: www.gasprocessors.com. 17.

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International School of Hydrocarbon Measurement, Oklahoma City, (405) 325-1217, (405) 325-1388 (fax), e-mail: lcrowley@ou.edu, website: www.ishm.info. 13-15.

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Caspian Oil & Gas Exhibition & Conference, Baku, +44 207 596 5016, e-mail: oilgas@ite-exhibitions.com, website: www.ite-exhibitions.com/og. 3-6.

Oklahoma Independent Petroleum Association (OIPA) Annual Meeting, Dallas, (405) 942-2334, (405) 942-4636 (fax), website: www.oipa.com. 6-10.

SPEE Society of Petroleum Evaluation Engineers Annual Meeting, Hot Springs, Va., (713) 651-1639, (713) 951-9659 (fax), e-mail: bkspee@aol.com, website: www.spee.org. 7-10

PIRA Scenario Planning Conference, London, (212) 686-6808, (212) 686-6628 (fax), e-mail: sales@pira.com, website: www.pira.com. 9.

Asian Geosciences Conference & Exhibition, Kuala Lumpur,

+44 (0) 20 7862 2136, +44 (0) 20 7862 2119, e-mail: geosasia@oesallworld.com, website: www.geo-asia.com. 9-11.

Independent Liquid Terminals Association (ILTA) Annual Operating Conference & Trade Show, Houston, (202) 842-9200, (202) 326-8660 (fax), e-mail: info@ilta.org, website: www.ilta.org. 9-11.

SPE Tight Gas Completions Conference, San Antonio, (972) 952-9393, (972) 952-9435 (fax), e-mail: spedal@spe.org, website: www.spe.org. 9-11.

EAGE/SPE EUROPEC Conference & Exhibition, Rome, +31 30 6354055, +31 30 6343524 (fax), e-mail: eage@eage.org, website: www.eage.nl. 9-12.

ASME Turbo Expo, Berlin, (973) 882-1170, (973) 882-1717 (fax), e-mail: infocentral@asme.org, website: www.asme.org. 9-13.

PIRA London Energy Conference, London, (212) 686-6808, (212) 686-6628 (fax), e-mail: sales@pira.com, website: www.pira.com. 10.

Asian Oil, Gas & Petrochemical Engineering Exhibition, Kuala Lumpur, +44 (0)20 7840 2100, +44 (0)20 7840 2111 (fax), e-mail: oga@oesallworld.com, website: www.allworldexhibitions.com. 10-12.

Global Petroleum Show, Calgary, Alta., (403) 209-3555, (403) 245-8649 (fax), website: www.petroleumshow.com. 10-12.

IADC World Drilling Conference & Exhibition, Berlin,

(713) 292-1945, (713) 292-1946 (fax); e-mail: conferences@iadc.org, website: www.iadc.org. 11-12.

PIRA Understanding Global Oil Markets Conference, London, (212) 686-6808, (212) 686-6628 (fax), e-mail: sales@pira.com, website: www.pira.com. 11-12.

Asia's Subsea Conference & Exhibition, Kuala Lumpur, +44 (0)20 7840 2100, +44 (0)20 7840 2111 (fax), e-mail: subsea@oesallworld.com, website: www.subseasia.org. 11-13.

CIPC/SPE GTS Joint Conference, Calgary, (972) 952-9393, (972) 952-9435 (fax), e-mail: spedal@spe.org, website: www.spe.org. 16-19.

American Association of Professional Landmen (AAPL) Annual Meeting, Chicago, (817) 847-7700, (817) 847-7704 (fax), e-mail: aapl@landman.org, website: www.landman.org. 18-21.

LNG North America Summit, Houston, (416) 214-3400, (416) 214-3403 (fax), website: www.lngevent.com. 19-20.

IPAA Midyear Meeting, Colorado Springs, Colo., (202) 857-4722, (202) 857-4799 (fax), website: www.ipaa.org. 19-21.

PIRA Scenario Planning Conference, Houston, (212) 686-6808, (212) 686-6628 (fax), e-mail: sales@pira.com, website: www.pira.com. 23.

API Tanker Conference, San Diego, (202) 682-8000, (202) 682-8222 (fax), website: www.api.org/events. 23-24.

API Exploration & Production Standards on Oilfield Equipment & Materials Conference, Calgary, Alta., (202) 682-8000, (202) 682-8222 (fax), website: www.api.org/events. 23-27.

PIRA Understanding Global Oil Markets Conference, Houston, (212) 686-6808, (212) 686-6628 (fax), e-mail: sales@pira.com, website: www.pira.com. 24-25.

Russian Petroleum & Gas Congress, Moscow, +44 207 596 5016, e-mail: oilgas@ite-exhibitions.com, website: www.ite-exhibitions.com/og. 24-26.

NEFTEGAZ Exhibition, Moscow, +44 207 596 5016, e-mail: oilgas@ite-exhibitions.com, website: www.ite-exhibitions.com/og. 24-26.

PIRA's Globalization of Gas Study Conference, Houston, (212) 686-6808, (212) 686-6628 (fax), e-mail: sales@pira.com, website: www.pira.com. 25.

PIRA Understanding Natural Gas Markets Conference, Houston, (212) 686-6808, (212) 686-6628 (fax), e-mail: sales@pira.com, website: www.pira.com. 26-27.

World Petroleum Congress, Madrid, +34 91 745 3008, +34 91 563 8496 (fax), e-mail: info@19wpc.com, website: www.19wpc.com. June 29- July 3.

JULY

International Offshore & Polar Engineering Conference, Vancouver, (650) 254 2038, (650) 254 1871 (fax), e-mail: meetings@isope.org, website: www.isope.org. 6-11.

Annual Rocky Mountain Natural Gas Strategy Confer-

ence & Investment Forum, Denver, (303) 861-0362, (303) 861-0373 (fax), e-mail: conference@coga.org, website: www.coga.org. 9-11.

IADC Lifting & Mechanical Handling Conference & Exhibition, Houston, (713) 292-1945, (713) 292-1946 (fax); e-mail: conferences@iadc.org, website: www.iadc.org. 15-16.

Oil Sands and Heavy Oil Technology Conference & Exhibition, Calgary, Alta., (918) 831-9160, (918) 831-9161 (fax), e-mail: registration@pennwell.com, website: www.oilsandstechnologies.com. 15-17.

AUGUST

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

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

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

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

SEPTEMBER

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

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

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

Rocky Mountain GPA Annual Meeting, Denver,

(918) 493-3872, (918) 493-3875 (fax), email: pmirkin@gasprocessors.com, website: www.gasprocessors.com. 10.

API Fall Refining & Equipment Standards Meeting, Los Angeles, (202) 682-8000, (202)

682-8222 (fax), website: www.api.org/events. 15-17.

Rio Oil & Gas Conference & Expo, Rio de Janeiro, 55 21 2112 9078, 55 21 2220 1596 (fax), e-mail: rioil2008@ibp.org.br, website: www.rioilegas.com.br. 15-18.

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

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

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

ERTC Petrochemical Conference, Cannes, +44 1737 365100, +44 1737

365101 (fax), e-mail: events@gtforum.com, website: www.gtforum.com. Sept. 29-Oct. 1.

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

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

OCTOBER

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

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

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

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

International Gas Union Research Conference, Paris,

+31 50 521 30 78, +31 50 521 19 46 (fax), e-mail: igr2008@gasunie.nl, website: www.igr2008.com. 8-10.

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

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

API Fall Petroleum Measurement Standards Meeting, Long Beach, (202) 682-8000,

(202) 682-8222 (fax), website: www.api.org/events. 13-17.

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

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

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

theenergyexchange.co.uk/cispipes10register.html. 14-16.

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

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

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

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

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

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

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

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

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

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

NOVEMBER

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

Abu Dhabi International Petroleum Exhibition & Conference (ADIPEC), Abu Dhabi, website: www.adipec.com. 3-6.

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

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

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

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

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

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

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

Houston Energy Financial Forum, Houston, (918)

831-9160, (918) 831-9161 (fax), e-mail: registration@pennwell.com, website: www.accessanlyst.net. 11-13.

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

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

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

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

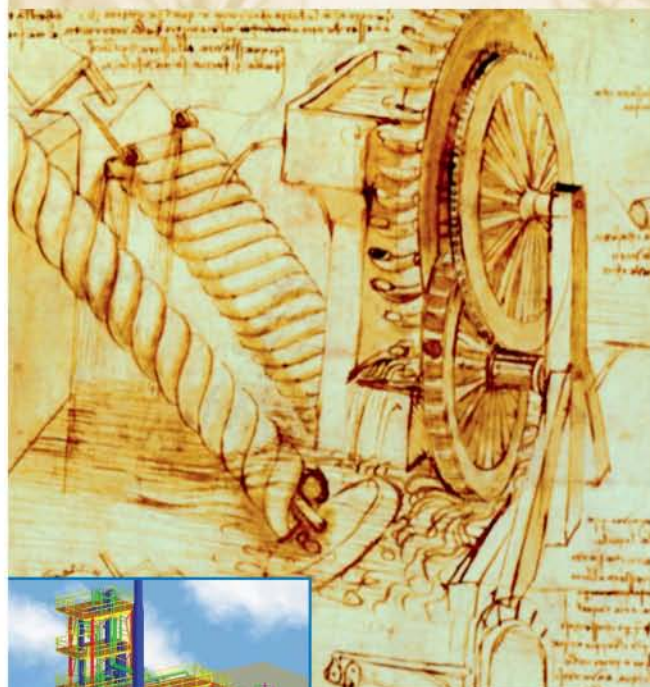
DECEMBER

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.

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Windmills in paradise



Bob Tippee
Editor

To drive regularly between Abilene and Lubbock, Tex., is to witness the industrialization of the Llano Estacado.

This Houston resident and his wife make the trip frequently thanks to daughters who attend Texas Tech University.

Each time, we see more wind turbines than we saw the trip before. Thousands of the structures now spike the landscape westward from just outside Abilene along Interstate 20 and northwestward along Highway 84 toward Lubbock.

They used to sit mostly atop the crooked red ridges that make the vast, mostly tree-free flatness out there interesting. Now they're sprouting everywhere, in many places right next to the road.

My wife dislikes what the proliferation of wind turbines does to the view. It seems to me there's plenty of view to go around in West Texas, but I don't argue.

I just wonder why so many of the things don't spin, even when the wind blows.

Wind research

These observations, voiced during a conversation in Houston, inspired Tom Standing, a San Francisco engineer and energy analyst, to conduct a little research.

Actually, a lot of research. Standing, who has written articles for Oil & Gas

Journal, squeezes a subject hard when it gets his attention.

Standing says new and expanded wind ranches planned for the next few years will "add about 10,000 new turbines across the Texas prairie, all of which would be visible from up to 7 miles distant."

A certain Houston lady won't like hearing that. But Standing has different concerns: how much power all those propellered units actually will produce and variability of the power profile.

He points out that nameplate capacities of wind turbines are rated at wind speeds of 30-32 mph, that power output is proportional to the third power of wind speed, and that the capacity factor of a turbine is defined as instantaneous power output divided by the rated power output. Capacity factor can be calculated from the ratio of instantaneous wind speed divided by the wind speed at which the turbine is rated, raised to the third power.

Standing says a turbine needs a wind speed of 80% of the rated speed to register a capacity factor of 50%. At the 9-10 mph of wind needed to overcome inertia, a turbine generates power at about 3% of rated capacity.

Standing uses these relationships and wind-speed data from the University of Wyoming, interpolated to 80 m above the surface to account for the hub height of large turbines, to calculate capacity factors for hypothetical wind turbines in windy US locations.

He observes that the largest area with the strongest winds in the Lower 48 stretches between Amarillo and Dodge City, Kan. To the north and south, wind speeds decline gradually. To the east and west, they fall rapidly.

Standing's calculated capacity factors

are for windy March and April and calm August 2003 in seven cities in the high-wind corridor.

The highest capacity factor is 50% for Dodge City in April, the second 43% for Amarillo in the same month. That means a 100 Mw wind ranch near Dodge City would have produced 50 Mw of power, and a comparable facility near Amarillo, 43 Mw, when winds were strongest. Calculated capacity factors are much lower for Midland and Fort Worth, other cities demarcating the area of fast wind construction in Texas.

"Far more important than monthly averages is that capacity factors are erratic with respect to time, constantly gyrating from a low end of 0-10% when winds are light to brief periods at the high end when windy conditions give capacity factors between 50% and 100%," Standing says.

Surges and lulls

Calculated capacity factors can remain at 0-20% for 2-3 days then jump to nearly 100% in barely 12 hr. Contrary to assurances of wind-power proponents, Standing adds, surges in some areas usually don't offset lulls in others; the surges and lulls tend to happen at the same time across the windy corridor.

Between Amarillo and Midland, capacity factors can rise or fall by 60% within 12 hr. So by 2011, when Texas has about 10,000 Mw of installed wind capacity, power generation might rise or fall by 6,000 Mw in half a day, requiring the sudden start-up or shut-down of 15-20 peaking plants to balance load.

This might create more problems than the sight of windmills in rattle-snake pasture, but please don't tell a certain Houston lady that you encountered that judgment here. ♦

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E d i t o r i a l

Spurning unconventional oil

An energy-craving country obsessed by fear of oil from the Middle East should welcome prospects for a new 7-8 million b/d from North America. Not the US. Not as long as congressional leaders remain blind to how they boost oil prices when they limit supply.

Without question, the Middle East will dominate supply of conventional oil for the next several decades. Important supplementary production will grow from countries of the former Soviet Union and Africa. Notwithstanding exceptions such as Brazil, future growth in conventional oil production will occur mainly in the Eastern Hemisphere.

Unconventional oil

On the other side of the planet, production nevertheless can grow. But the Western Hemisphere's potential is mainly unconventional oil—heavy fluid hydrocarbons dependent on large inputs of energy for production and processing. While output now is relatively low, it is growing from resources of enticing scale.

Production exceeds 1 million b/d and will approach 4 million b/d by 2020 from 170 billion bbl of reserves of bitumen and heavy oil in Alberta. Venezuela has capacity to produce 580,000 b/d of synthetic crude from its huge resource of extra-heavy crude. And the US has more than 2 trillion bbl of shale oil in place and resources of heavy oil for which development is advanced in California and just beginning elsewhere.

Political leaders who motivate energy policy with panic over Middle Eastern oil should at least want to know how much oil supply might be possible from the massive unconventional resources of Canada and the US. Instead, congressional luminaries are foreclosing the potential.

Last December, Congress voted to deny funding for federal oil shale lease sales approved in the Energy Policy Act of 2005. On Mar. 13, the Senate passed an outright moratorium on oil shale leasing (OGJ, Mar. 24, 2008, p. 34). Unlike bitumen and heavy oil in Alberta, production of shale oil isn't commercial; by refusing to allow access to the resource, Congress keeps it that way. It ensures that technology never advances and that no part of a huge domestic resource can be developed.

Last year, a study required by the 2005 energy bill said the US might be able to produce 2.5 million b/d of shale oil by 2035 (OGJ, Nov. 5, 2007, p. 20). The study further envisioned production in that year of 530,000 b/d from US tar sands and 750,000 b/d of heavy oil, up from the current 2,700 b/d in California. Achieving those levels of production, representing together nearly 40% of the recent import rate for crude oil, would require government help such as price floors and a \$5/bbl production tax credit until investment payout, the study said.

Congress, however, is in no mood to support anything related to oil. In fact, its Energy Independence and Security Act of 2007 explicitly limits US imports of oil from unconventional sources. According to Sec. 526, "No federal agency shall enter into a contract for procurement of an alternative or synthetic fuel, including a fuel produced from nonconventional petroleum sources...unless the contract specifies that the life-cycle greenhouse gas emissions associated with the production and combustion of the fuel supplied under the contract must, on an ongoing basis, be less than or equal to such emissions from conventional petroleum sources."

Intentional limit

Congress mainly wanted this provision to prevent the US Air Force from developing liquid fuels from coal. But after the Canadian ambassador voiced concern that an "expansive interpretation" might crimp oil exports to the US from Canada, the author of the measure said his handiwork applies to oil sands, too. Because of greenhouse gas emissions, said Rep. Henry A. Waxman (D-Calif.), "It is important to ensure that the federal government does not subsidize or otherwise support the expanded use of these fuels through government purchasing decisions."

An elective body that professes concern about oil from sources deemed hostile to US interests thus precludes assessment of a huge, secure, domestic resource while acting to limit imports from a friendly neighbor. This is colossal self-contradiction, the continuation of which will become colossally costly to energy users. ♦

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The Brazilian model of concessions guarantees the attractiveness of investments in the country

The success of the 9th Exploration and Production Areas Bidding Round, which was held on November 27th, consolidates the Brazilian upstream regulatory framework, now completing its 10th anniversary.

In the 9th Brazilian Exploration and Production Areas Bidding Round, which was run in November 2007 by the ANP (National Agency of Petroleum, Natural Gas and Biofuels), 54% out of the 217 areas offered were awarded: 117 blocks comprising of a total area of 45,600 km².

It was the largest percentage to be sold off since 2003. Thirty six out of the 67 companies qualified to participate in the round this year acquired blocks. Eight of these companies were newcomers to the sector. The investments to be made by the winners are expected to reach R\$ 1.4 billion (around US\$ 780 million) solely for the exploration phase.



As a result of the bidding rounds for areas promoted by ANP since 1999, there are around

290,000 km² under concession for exploration and production in Brazil today. This area is divided into nearly 500 blocks and covers 4% of the total territory of the 29 Brazilian sedimentary basins with oil and natural gas potential. Hence, there is a huge area yet to be explored.

Only five out of the 50 major oil and natural gas companies in the world have not participated in at least one of the Brazilian rounds. The minimum investments declared by the present concessionaires to the ANP for 2008/2012 period amount to US\$ 69.3 billion, a number that will certainly grow, due to possible new discoveries.

Since the setting up of the present regulatory regime, the Brazilian oil and gas industry had

Brazil: a country in unrestrained development

Brazil maintains continuous growth and improvement in all its macroeconomic indices.

- The GNP growth for 2007 surpassed 5%.
- The Brazil-risk, measured by the Emerging Markets Bond Index (EMBI) dropped to an unheard of 137 points in June 2007, a level that has never been reached before and the Brazilian Government bonds came close to the "investment grade".
- In 2007, the country had received US\$ 34.6 billion from foreign companies, the highest amount in a year.
- The commercial balance of 2006 reached US\$ 46.4 billion, a record in the history of the country. From 2003 to 2006, Brazilian exports more than doubled (a growth of 127%).
- The growth over the last five years has allowed 20 million Brazilians from classes D and E (an average monthly family income of up to R\$ 485, or US\$ 270) to migrate to class C (an average family income of between US\$ 403 and US\$ 664).

an important growth.

Today, more than 70 economic groups, 30 from 18 foreign countries (Angola, Argentina, Australia, Bahamas, Canada, Colombia, Denmark, France, Holland, Italy, Japan, Norway, Portugal, South Korea, Spain, United Kingdom and United States) are players in Brazil's E&P industry. The operations covered by the concession contracts are supervised by ANP, following transparent and established rules, based on laws and the best international practices. In order to carry out their activities, the concessionaires can rely on a vast network of suppliers of equipment, components, materials and services in Brazil, as well as qualified workforce within the sector.

The National Agency of Petroleum, Natural Gas and

“Only five out of the 50 major oil and natural gas companies in the world have not participated in at least one of the Brazilian rounds.”

Biofuels, now completing its 10th anniversary, has had a prominent role in this leap into the Brazilian proven reserves as a result of the bidding rounds (including the so-called Round Zero, dated as of 1998, which ratified the rights of Petrobras over producing areas under its possession and over blocks in which the company had made investments in exploration and development).

From the setting up of the ANP (1998) to 2007, 5.5 billion barrels of oil and around 137 billion m³ of

natural gas have been incorporated to Brazilian proven reserves. Consequently, by 2007 the proven reserves of oil in the country had reached 12.6 billion barrels. The annual production of crude oil grew from 866,000 barrels a day in early 1998 to 1,833 million barrels a day in 2007.

The proven reserves of natural gas reached 365 billion m³ in 2007. The natural gas participation on the internal energy market was 1% in 1980, increasing to 3.1% in 1990 and reaching 9.3% in 2005. In 2007, Brazil also celebrated the success of light oil discoveries in pre-salt layers of Campos and Santos basins.

This favorable scenario presents an even greater challenge to the country and the petroleum industry: the incorporation of new reserves that will keep the rhythm of production growth in order to sustain self-sufficiency in petroleum, as well as meet the growing demand for natural gas. Such a challenge can only be satisfactorily faced by means of investments that are expected from the present and future concessionaires in exploration, development and production, resulting from the bidding rounds and concession contracts.

The Role of the ANP

The Constitutional Amendment no. 9 (1995) and the Law 9478 (1997) modified the model of management of the State monopoly applied to the activities of exploration and production in Brazil. Until then, the State monopoly was exercised by the state controlled company Petrobras on an exclusive basis.

The legal framework now in force allows the participation of private and state companies in activities related to oil and gas exploration, development and production, and oil, gas and their byproducts' imports and exports. This legislation has been seen in many countries as a reference for studies and discussion about the State's duties in this industry.

ANP exercises its regulating role by means of directives and resolutions, which cover all segments in the industrial chain. In the upstream, ANP is responsible for promoting geophysical and geological studies required to delimitate the blocks to be included in the bidding rounds. ANP is also in charge of the management of technical data resulting from those studies and from the exploration and production activities. The Agency has the primary duty of promoting the bidding rounds, to sign the concession contracts, as well as supervising the compliance of these contracts.



Ministry of
Mines and Energy



GENERAL INTEREST

Oil & Gas Journal's semiannual Worldwide Construction Update shows a slight increase in refining and sulfur projects in the engineering stage as well as gas processing construction activity compared with the previous edition of the update (OGJ, Nov. 19, 2007, p. 18).

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

Rise seen in sulfur, refining construction projects

Leena Koottungal
Survey Editor

Refining

Total SA announced plans to build a 50,000-b/d coker and desulfurization, vacuum distillation, and related

units at its 231,000-b/d refinery in Port Arthur, Tex. The \$2.2 billion increase in the refinery's deep-conversion capacity will boost output of ultralow-sulfur automotive diesel by 3 million tonnes/year (OGJ Online, Mar. 11, 2008). The project will be completed in 2011.

In January, Marathon Oil Corp. let an engineering, procurement, and con-

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.



struction contract to Fluor Corp. for the \$1.9 billion expansion and upgrade of its 100,000-b/cd Detroit refinery. The project will include a 28,000-b/d delayed coker, a 280-tonne/day sulfur-recovery complex, and a 33,000-b/d distillate hydrotreater. Completion is scheduled for late 2010.

Newfoundland & Labrador Refining Corp. selected UOP LLC to supply technology, basic engineering services, and equipment for a 300,000-b/d refinery to be built in the Placentia Bay area of Newfoundland and Labrador. It will be the first refinery built in North America since 1984. Completion is scheduled for 2011.

Ivory Coast started construction on its second refinery, a 60,000-b/d facility in the Vridi district of Abidjan. It is being funded by US energy firms Energy Allied International and WCW International, and Ivory Coast's state-owned Petroci.

Meanwhile, Repsol-YPF SA plans to double the capacity of its 100,000-b/d Cartagena refinery in Spain. It awarded a \$1.3 billion project management



The expansion of Frontier Oil Corp.'s El Dorado, Kan., refinery will increase oil capacity by 15,000 b/d. CB&I is contractor on the project. Completion is due this year. Photo from CB&I.

contract to Fluor.

"This is a milestone project for both Repsol-YPF and Fluor as it is the largest refinery upgrade and expansion project in Spain in the past 30 years," said David Seaton, president of Fluor's energy and chemicals group.

The \$4.8 billion project includes the design and construction of new units and the refurbishment and expansion of existing units, as well as construction of utilities and offsites. Commissioning is scheduled for 2011.

Vietnam's central Phu Yen Province licensed a joint venture of the UK's Techno Star Management and Russia's Telloil to build a 4-million tonne/year refinery (OGJ Online, Nov. 21, 2007). Capitalized at more than \$1.7 billion, the Vung Ro refinery in the province's Dong Hoa district will be the country's first wholly foreign-owned refinery. It will be operational in 2012.

Petrochemicals

Jurong Aromatics Corp. let a contract to UOP for the basic engineering and design for an aromatics plant to be built on Jurong Island in Singapore. When completed in 2011, the complex will produce 800,000 tonnes/year of paraxylene, 200,000 tonnes/year of orthoxylene, and 450,000 tonnes/year of benzene (OGJ Online, Jan. 31, 2008). It will be one of the largest privately owned petrochemical facilities in Singapore.

Total and Sonatrach signed a framework agreement to build a \$3 billion petrochemical complex with a 1.4 million tonne/year ethane cracker in Arzew. The signing follows a memorandum of understanding signed in July (OGJ Online, July 19, 2007).

The facility will produce 1.1 million tonnes/year of ethylene, which will be processed into polyethylene (two units with a total capacity of 800,000 tonnes/year) and monoethylene glycol

(550,000 tonnes/year). Total holds a 51% stake in the joint venture and Sonatrach 49%. Commissioning is scheduled for 2012.

Other petrochemical projects are in the engineering stage and under construction in China, Iran, Saudi Arabia, and Thailand.

LNG

Nigeria LNG Ltd.'s Train 6 on Bonny Island was completed in January. It has a design capacity of 4 million tonnes/year. NLNG awarded KBR the lump sum EPC contract in July 2004.

Meanwhile, Excelerate Energy began commissioning the Northeast Gateway LNG receiving facility in Massachusetts Bay (OGJ Online, Feb. 21, 2008). It will be able to handle peak deliveries of 800 MMcfd of gas through two turret buoys and under normal operations will deliver about 500 MMcfd (OGJ, June 4, 2007, Newsletter).

LNG projects are under construction

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Work continues on tanks for Sempra Energy's Cameron LNG terminal near Lake Charles, La. The tanks are capable of storing 160,000 cu m each. Construction is 77% complete and is slated to conclude late this year. Photo from Sempra.

tively. The projects will use Ortloff Engineers' licensing technology.

GTL, other gas

Great Northern Power Development LP and Allied Syngas Corp. developed a \$1.4 billion coal gasification project in southwestern



World GTL Trinidad Ltd., a joint venture of World GTL Inc. and Petrotrin, is constructing a gas-to-liquids plant in Pointe-a-Pierre. It will be the first commercial GTL facility in the Americas. The plant will produce 2,250 b/d of GTL and be fully operational later this year. Photo from World GTL.

in the US, China, and Qatar.

Gas processing

Enterprise Products Partners' Pioneer natural gas processing plant in Sublette County, Wyo., began operating on Feb. 1. The plant will process up to 750 MMcfd of gas and extract as much as 30,000 b/d of natural gas liquids.

Currently under construction are cryogenic LPG recovery projects for QatarGas III and QatarGas IV in Ras Laffan. These two projects, each with capacity of 1.45 bcf/d, will be

completed in 2009 and 2010 respec-

North Dakota (OGJ Online, Nov. 26, 2007). The South Heart project will use coal in a chemical process to create substitute gas. It involves seven British Gas Lurgi gasifiers that will use North Dakota lignite to produce as much as 100 MMcfd of pipeline-quality synthetic gas. Existing pipelines will transport the gas throughout North America, GNPD reported.

The BGL technology is jointly owned by Envirotherm and Advantica Ltd., both of which will provide the technology license, process design, and related technical support for the gasification process.

Sulfur

In India, Black & Veatch is working with several new sulfur projects in the engineering stage. A project for Indian Oil Corp. in Panipat will process 225 tonnes/day of sulfur from refinery acid gas. The project will be completed in 2009. A similar project is being completed in Gujarat.

Other sulfur projects under construction and in the engineering stage are in Italy, China, and the US.

Special Report

Pipelines

Oneok Partners LP plans to construct a 78-mile NGL gathering pipeline to connect a gas processing plant being built by Devon Energy Corp. in Hughes Co., Okla., and a recently constructed gas processing plant owned by Antero Resources Midstream Corp. in Coal Co., Okla. It is scheduled for completion in the second quarter. Project cost is \$25 million.

Aspen Aerogels was awarded a contract to supply its advanced Spaceloft aerogel insulation for a 13-mile, subsea gas pipeline being built by Technip for Petroleo Brasileiro SA (Petrobras) in Brazil. The pipeline will connect the Canapu field (in 1,700 m of water) to the Cidade de Vitoria floating production facility (in 1,400 m of water). This will be the first pipeline in Brazil to use a pipe-in-pipe design (production pipe surrounded by carrier pipe with insulation in between). It will be completed in the fourth quarter.

Maritimes & Northeast Pipeline plans to invest \$240 million to expand the capacity of the 330-mile US mainline portion of its gas pipeline system (OGJ Online, Feb. 7, 2008). The decision followed a successful open season for the additional capacity.

M&NP will install additional compression at existing compressor stations and lay about 4.5 miles of 24-in. loop on its existing 24-in. mainline to enable transmission of as much as 170 MMcfd year-round and an additional 30 MMcfd during winter months. The expanded system will be in service in November 2010. ♦

Lawmaker urges majors to spend more on alternatives

Nick Snow
Washington Editor

Saying that the poorest US families now spend 10% of their annual incomes on gasoline because of high oil prices, a US House committee chairman said that major oil companies should direct a similar portion of their profits to alternate energy research and development.

"There's been a windfall of revenue which has fallen to these oil companies the last few years, and it is expected to continue. They are the world's leading oil companies and we can't solve these problems without their help," said Rep. Edward J. Markey (D-Mass.) as he ended a nearly 3-hr hearing of the House Select Committee on Energy Independence and Global Warming Apr. 1.

He was particularly critical of ExxonMobil Corp., which he said plans to spend only \$100 million over 10 years on alternate and renewable energy research and development when several of its competitors individually plan to spend billions.

Oil & Gas Journal / Apr. 7, 2008



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GENERAL INTEREST

API: Oil costs remain key gasoline price influence

Nick Snow
Washington Editor

Oil costs, and not refinery turnarounds, are primarily responsible for higher gasoline prices, American Petroleum Institute officials said.

"We have significant gasoline inventories on hand. We also have relatively soft demand. So it's no great surprise that turnarounds are taking place," API Pres. Red Cavaney told reporters during a Mar. 31 teleconference.

Diesel fuel prices may be climbing more rapidly because governments in Europe have created greater demand, and imports from there are harder to find, Cavaney said. "The increase from Jan. 1 through [Mar. 28] was 95¢. Unlike gasoline, which is about 20¢/gal less, it seems to be in lock-step with crude," he said.

"You have a tighter market for diesel than for gasoline," added John C.

Felmy, API chief economist, who also participated in the teleconference.

Their remarks came 3 days before the Senate Energy and Natural Resources Committee's scheduled hearing to examine whether nonoil institutional investors are influencing crude prices. They also followed a Mar. 26 Consumer Federation of America report that alleged that refiners are performing maintenance now to reduce inventories and increase profits during the summer driving season.

Turnarounds normally take place as refiners deplete inventories of winter fuel blends and before they begin to produce fuels with summer formulations, Felmy explained.

"The reason we've seen increased gasoline prices has been higher crude costs. Refiners' returns aren't good right now. On [Mar. 28], the price of crude was \$2.51/gal. Add in about 47¢ for taxes, then consider the costs of re-

fining and distribution, and the profits don't look great," Felmy said.

Unlike 2007, when there were several unplanned US refinery outages, maintenance is following normal seasonal patterns early in 2008, Felmy said. "I think higher prices are starting to have an impact on demand, but the change is at the margin. We learned in the early 1980s that permanent changes occur when consumers change the kind of cars they drive and the number of trips they take. There's no question that fuel's share of total household expenditures has gone up from 4.6% in November 2006 to around 5% now, with gasoline representing about 20-25% of the increase," he said.

He and Cavaney also questioned whether institutional investors are driving oil prices higher. "Alan Greenspan, when he was chairman of the Federal Reserve, said it about as well as anybody. When people buy oil for noncommercial accounts, they provide liquidity for the markets," Cavaney said.

ExxonMobil Senior Vice-Pres. J. Stephen Simon, one of five major oil company executives who testified, said, "After we put the brightest minds in the company to work addressing the prospects for renewable energy prospects, we determined that current technologies won't do the job. Consequently, we are examining ways to develop future technologies."

He subsequently said ExxonMobil is concentrating its research on ways to mitigate carbon and other climate impacts of burning fossil fuels, which the multinational oil and gas firm believes will remain the dominant near and mid-term energy source.

Markey said, "You can't have it both ways, Mr. Simon. You can't nickel-and-dime renewable energy R&D when your company made \$40 billion in profits last year and paid several billion dollars in dividends and executive compensation."

Other steps

Markey said the companies also should support, instead of oppose, HR 5351 which would shift \$18 billion in financial incentives from the biggest US oil companies to alternate and renewable energy research and development programs as a way to give consumers some relief from high prices.

"Finally, the [President George W.] Bush administration must stop filling the Strategic Petroleum Reserve during periods of high prices to send a signal to the market and oil speculators that Americans won't be held hostage," Markey said.

Shell Oil Co. Pres. John D. Hofmeister, BP America Inc. Chairman and Pres. Robert A. Malone, Chevron Corp. Vice-Chairman Peter J. Robertson, and ConocoPhillips Executive Vice-Pres. John E. Lowe also testified at the hearing, "Drilling for Answers: Oil Company Profits, Runaway Prices, and the Pursuit of Alternatives."

Hofmeister said in his written statement that crude prices have climbed past \$100/bbl because global oil demand growth has accelerated in recent years from rapid economic expansion and industrialization of China, India, and other countries. Geopolitical events in Nigeria and other producing nations; higher costs for labor and engineering services amid scarce supplies; increasing difficult access to oil and gas resources worldwide, and available supplies increasingly being found in areas that are more technically challenging, more remote from markets, and more costly to develop also have contributed, he said.

The US dollar's declining value and global investment firms rebalancing their portfolios to include more commodities, including oil and gas, were also factors contributing to the higher prices, he said.

"Most of these factors are not controlled by or even much influenced by the actions of oil companies. However,

WATCHING GOVERNMENT

Nick Snow, Washington Editor

our business is developing energy and delivering to consumers in the most efficient and cost-effective manner we can. We will continue to strive to contain costs and to deliver these energy products to consumers at competitive prices in a secure and reliable manner," Hofmeister said.

More sensitive markets

Global oil demand's accelerated increase since 2004 has reduced spare capacity, creating a tighter relationship between supply and demand and heightening market concerns, said Robertson. "This new reality and the impact on oil prices are compounded by the weakening of the US dollar. The higher oil price is in part a market adjustment that reflects weakening purchasing power of oil exporting countries that sell their oil in US dollars but buy goods with stronger currencies such as the euro," he said in his written testimony.

While biofuels potentially could play an important transportation role, they still face commercial challenges, Robertson said. "One of the country's largest biodiesel facilities in Washington state, for instance, has an annual production capacity of 100 million gal. This amount would serve the country's demand for transportation fuels for about 6 hours of 1 day, and it roughly equals the amount of transportation fuel that Chevron's refinery in Pascagoula, Miss., produces in a single week," he said.

Worldwide investments in renewable and alternate fuels have increased nearly fourfold since 2004, and nearly \$150 billion has been poured into the sector in the past 12 months, he continued. Their total volume is expected to increase by about 45% by 2030 to meet demand but still will represent only about 10% of the total energy mix, their current share, because overall global demand is growing so quickly, Robertson said.

"Energy efficiency is the most immediate and important action that each of us can take to start to reduce energy



US law targets Canada's oil sands

A provision that was inserted into the Energy Independence and Security Act of 2007 (EISA 2007) to keep the US Air Force from developing coal-to-liquids (CTL) fuels could limit imports of Canadian oil produced from tar sands.

While the requirement in Section 526 of EISA 2007 applies only to federal fuel contracts, it would be significant. US military services are the biggest single domestic purchaser of petroleum products. During fiscal 2007, they bought nearly 136.1 million bbl worldwide, according to data from the Defense Energy Supply Center.

Canadian Ambassador to the US Michael Wilson expressed his concern on Feb. 22. "Canada would not want to see an expansive interpretation of Section 526, which would then include commercially available fuel made in part from oil derived from Canadian oil sands," he said in a letter to US Sec. of Defense Robert M. Gates.

Noting that the two countries operate under the North American Free Trade Agreement, and that Canada is the largest, safest, and most secure source of imported energy for the US, Wilson said: "Canadian oil production and Canada's share of US oil supply are increasing, mainly because of oil sands production in Alberta."

Not alternative fuel

Wilson's main point was that Canada does not consider oil extracted from oil sands an alternative fuel because it is processed in conventional facilities and is produced commercially. The US Energy Information Administration has classified 174

billion bbl of Canadian oil sands as proved reserves since 2003, he said.

"There is little fuel on the US market that is 100% petroleum extracted only by conventional methodology. Oil sands-derived petroleum represents approximately 5% of US supply and is not segregated from other petroleum," unlike biofuels, the ambassador said.

House Oversight and Government Reform Committee Chairman Henry A. Waxman (D-Calif.), who was the provision's author, disagreed. While it was originally a response to Air Force CTL development proposals, Section 526 also applies to tar sands, "which produce significantly higher greenhouse gas emissions than are produced by comparable fuel from conventional petroleum sources," Waxman said.

Implied subsidies

Waxman maintained, "The development and expanded use of these fuels could significantly exacerbate global warming, with highly dangerous effects. Thus, it is important to ensure that the federal government does not subsidize or otherwise support the expanded use of these fuels through government purchasing decisions."

Section 526 was not intended to keep federal agencies from buying generally available fuels, such as diesel or jet fuel, that may contain incidental amounts from unconventional petroleum sources, Waxman said. But it would apply to any contract for a CTL or other alternative fuel, or for "a fuel produced from a nonconventional petroleum source such as tar sands," he added. ♦

GENERAL INTEREST

prices. The United States must become a nation of energy savers. In short, we need a 'Made in America' solution enabled by everything from human ingenuity to 'smart' buildings to advanced vehicles and transportation systems. Markets are indicating that consumers are already taking action. You and your committee have a critical role to play to engage the US public and put the United States at the forefront of responsible energy use," he told Markey.

Recognizes negative effects

Malone said the US faces tremendous energy challenges now because of short-sighted government policies, poor market dynamics, and decisions that limited access to resources, discouraged development, and constrained investments to meet growing demand. "BP recognizes the negative effects high prices have on the economy and the consumer. We alone can't change the conditions that brought us here. Energy companies, policymakers, and consumers all have a role to play in creating a

new US energy future," he said.

The company strongly supports renewing incentives for wind, solar, and biofuels R&D, he continued. "They are an important part of why the US has been so successful in developing its renewable energy sector, but we cannot support a tax package that discourages efforts to bring on other much-needed energy sources such as oil and gas production," Malone said.

"Despite the growth and development activity we are experiencing in alternatives, they cannot close the supply gap that is projected to occur over the next 20-year period. Fossil fuels such as coal, oil, and natural gas will be critical to meet expected energy demand growth," he continued. The US must also produce more of the energy it consumes and increase its energy efficiency, Malone said.

Lowe said Congress should encourage development of more domestic conventional supplies, optimize biofuels production, and encourage development of both alternate and uncon-

ventional sources. "Although oil sands and unconventional fossil fuels such as oil shale and coal gasification are more energy and carbon-intensive than conventional sources today, they could substantially improve energy security because these resources are abundant in the United States and Canada," he said.

He noted that ConocoPhillips is test-marketing unbranded E-85 in a number of states with more than 2,500 potential sites, provided participating marketers meet certain image, safety, and fuel quality guidelines. "Results from our test are pending, but industry data have shown that the consumer response to E-85 to date has not been very good. Many retailers who have installed E-85 dispensers report insufficient consumer demand to justify the expense of the conversion," he said.

"We have a pilot project testing E-85 at some of our company-owned subjects in the Chicago area. So far, consumer response has been poor," added BP America's Malone. ♦

Shell officials outline routes to world's energy future

Nick Snow
Washington Editor

The world's energy producers, consumers, and governments could either cooperate or "scramble" as they try to solve major energy and environment problems, two Royal Dutch Shell PLC executives said on Apr. 1.

The multinational oil company has developed new scenarios that reflect growing climate concerns and increased energy demand from emerging economies, they explained during a presentation at the Center for Strategic and International Studies. The new scenarios, called TANIA ("There Are No Ideal Answers"), run to 2050. They replace an outlook known as TINA ("There Is No Alternative") that Shell strategists introduced in the 1990s.

"You can still have good world eco-

nomics with less carbon dioxide. Shell sees its future as an energy entrepreneur in this context," Chief Executive Jeroen van der Veer said.

The next 32 years could be an era of revolutionary transitions, according to Jeremy B. Bentham, Shell's vice-president of global business environment. TANIA's two scenarios are called "Scramble," in which policymakers simply react to problems, and "Blueprints," in which stakeholders form coalitions in advance.

"This is a world where people recognize complexity and realize fear. They delegate complexity to governments which develop supply-side responses that eventually hit constraints. China, for instance, has begun to import coal instead of increasing its domestic production," Bentham said.

Draconian steps by 2020

Under a strategy that simply uses immediately expedient solutions, there could be an even bigger squeeze on oil and gas supplies and imposition of draconian measures by 2020, he warned. Growth of wind, solar, and other alternates could take place locally but would be limited, he said.

Under the "blueprints" scenario, new coalitions emerge, initially within cities or regions and sometimes across national borders, Bentham continued. "Meaningful CO₂ pricing may emerge around 2012, not due to political altruism but from local responses to emergency situations," he said.

The growth of alternates and carbon capture-and-storage could result in most new power plants—50% in emerging economies and 80% in industrialized nations—incorporating carbon



from parts to...

complete facility

water storage tank

pig launcher

methanol injection unit

glycol dehydration unit

slug-catcher

pig receiver

Profiles:

- Crude oil and natural gas plants
- LNG liquefaction plants
- LNG degasification satellite stations
- Nitrogen rejection units
- LPG separation plants
- CNG stations
- Underground natural gas storage facilities
- Natural gas, crude oil and water pipelines
- Natural gas blending stations
- Natural gas compressor stations



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GENERAL INTEREST

capture and storage (CCS) by 2012, he said. By 2020, 50% of vehicle miles traveled could still be with liquid fuels but the engines would be much more efficient, he added.

"A patchwork of standards would cause national governments to step in and try to harmonize strategies to keep trade rational," Bentham said. Pursuing a strategy of blueprints through coalitions would be difficult but preferable to the "scramble" scenario, he maintained.

'Blueprints' tools

That approach basically will result in governments fighting for supplies

with little regard for carbon and other environmental impacts, which are acknowledged and addressed under the "blueprints" scenario, Van der Veer said. The tools for doing this include cap and trade programs, CCS, more-efficient transportation, credible wind and storage targets, and more-efficient building and appliance standards, he emphasized.

"Europe may be having some problems as it implements its cap and trade system. But it's based on the US sulfur dioxide trading system from the 1980s, which was very successful and provides a good model," Shell's chief executive said.

He said Shell has tried to take the lead by putting high CO₂ penalties on new construction the last 8 years. The company also has become the world's largest biofuels distiller, benchmarks operations to be in the top environmental quartile, and works with other companies to conserve energy. "There's still a lot of low-hanging fruit on the energy conservation tree," Van der Veer said.

The two executives made a similar presentation a day earlier in New York. The company also plans to hold a webcast on its new energy scenarios with a live online question and answer session in May. ♦

RMI: Challenges affecting many US energy elements

Judy R. Clark
Senior Associate Editor

National oil companies (NOCs), which now have "superior access to resources and booming domestic markets," made two thirds of the largest oil and gas discoveries in 2007, said Parker Drilling Co. Chairman and Chief Executive Robert L. Parker Jr. at the RMI Oilfield Breakfast Forum in Houston Mar. 28.

"The game is changing," Parker said, from the 1960s, when international oil companies (IOCs) had full access to 85% of world resources, NOCs controlled 1%, and the Soviet Union held 14%.

"Nationalizations in the 1970s and 1980s and tougher terms in the 1990s and 2000s have changed the power balance, with NOCs controlling 65% of reserves in 2005 and 77% today," Parker said. IOCs now have full access to only 10% of global oil and gas reserves and limited access to 13%.

This change in dynamics has also transformed the role of international service providers (ISPs), which now supply technology and technical expertise for NOCs without owning production, thereby competing with IOCs.

"This has enabled NOCs to make major finds in complex geologic formations, in remote locations and under harsh conditions," said Parker.

"IOCs still have unique combination of technology, financial backing, market access, and operational expertise," he said, yet "ISP technology is expected to take the lead in the next few decades."

Service providers

Nevertheless, service providers also face challenges, said Richard K. Mitchell, Devon Energy Corp.'s vice-president for worldwide drilling and E&P services.

When the utilization of rigs is 100%, equipment reliability and maintenance difficulties surface, with concern about the capacity for spares and no time for long-term maintenance, Mitchell said.

"The constantly varying rig counts and activity levels make it difficult to meet the requirements of E&P companies" as well, he added.

Health, safety, and the environment also present challenges when there is a shortage of trained personnel who may be too "young and inexperienced," Mitchell said.

With reduced reserves per well drilled, service providers need to improve recoveries per well, communicate

better, and work to create win-win contracting strategies, he said.

Mitchell emphasized the technology Devon needs from service providers: a continued focus on training, an expanded workforce, and more reliable equipment, including improved drill bit-reamer designs to reduce stick-slip loading; more rugged mud-while-drilling, logging-while-drilling, and rotary steerable systems; and continued improvements in open hole completion systems, stimulation technology, and subsea artificial lift equipment.

In addition, Devon would like to see more economic water management cleanup systems, minimal erosive propants, and reliability engineering and failure mode effects analysis on service provider equipment.

Market challenges

With oil and gas price volatility continuing, it is difficult to plan in the North American markets, commented Jim Wicklund, principal and portfolio manager of Carlson Capital LLC. "The market is on a roller coaster," he said.

"Energy stocks are most closely aligned with the markets than with supply and demand," he said. "Last week the commodities market almost

crashed, and credit markets today are worse than in a decade.”

Oil prices hit \$112/bbl on Mar. 17 and natural gas prices rose to \$10.30/MMbtu—the highest since January 2006. Wickland thinks the upward trend in oil and gas prices will continue, as did most of the attendees, who thought oil would reach \$120/bbl before it would reach \$90/bbl.

Exploration continues to thrive, with drillers experiencing a 54% increase in revenue per rig since the second quarter of 2004. The international rig count is up 14% since January 2006 and the US rig count up 21%. Canada is the exception with its rig count down 46% in that 2-year period.

Wicklund predicted that offshore drilling growth will continue. It has increased operation income by 700%, more than triple that of onshore drilling.

Wicklund also sees caveats ahead, however. Political instability and restricted access will continue to plague the industry.

Oil companies face the prospect of peak oil—with what he called “twilight in the desert” (the Middle East)—and Russian oil production is down for the first time ever. Mexico is considering changing its constitution to allow international investment to offset its production drop in Canterell field, Wicklund said.

Gas companies will see more cost competition with substitutes as prices continue to move up. LNG imports will decline due to global competition, Canadian production is declining, and conservation is biting into demand. For example, US production has increased 3.8% in 2008, but demand is up only 1.7%.

Government challenges

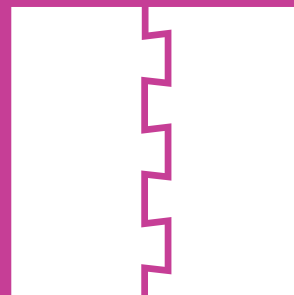
According to the National Petroleum Council, to meet future energy demand to 2030 without jeopardizing economic growth, the US must take five actions: moderate demand by increasing energy efficiency, expand and diversify US energy supplies, strengthen global and US energy security, reinforce US technology and capabilities to meet new challenges, and address carbon constraints, said Rod Nelson, Schlumberger Ltd.’s vice-president for innovation and collaboration. He also served as chairman of the technology task group for the NPC study.

NPC gave the recommendations to Secretary of Energy Samuel Bodman last July in response to his 2005 query regarding such strategies (www.npc.org).

Nelson said NPC’s in-depth study reported that global energy demand would grow 50-60% by 2030 because of improving living standards in a growing global population and that coal, oil, and natural gas will remain indispensable in meeting that demand growth because, although the use of alternates will grow during that time, so would fossil fuels proportionately, and the energy “pie” would retain the same proportions.

“Coal is not the flavor of the day,” Nelson said. “Maybe [it

Oil & Gas Journal / Apr. 7, 2008



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GENERAL INTEREST

is] in India and China, but not in the US" because the technology for "cleaning" it is not yet economically feasible.

Two thirds of the study participants were not from the energy industry, Nelson said, but from such diverse entities as universities and environmental and financial groups.

Other findings from the study, Nelson said, were that although the world is not running out of energy resources, there are growing risks to continued expansion of oil and gas production from conventional resources and that these risks present major challenges to meeting total demand.

Mitigating those risks will require expanding all economic energy sources, including biofuels and other renewables, nuclear, coal, and unconventional oil and gas. Each of these in turn will face such challenges as safety and environmental, technical, political, economic, and feasibility hurdles, Nelson said.

Moreover, Nelson said, the study emphasized that "energy independence" is not realistic in the foreseeable future, but US energy security can be enhanced by strengthening global trade and investment, diversifying domestic supplies, and moderating demand.

For instance, Nelson said, new

corporate automobile fuel efficiency standards could save 1 million b/d for each increased mile per gallon gained nationwide.

The study, which gave specific methods for accomplishing the goals identified, said that the workforce must also be replenished and trained, and that policies aimed at curbing carbon emissions will alter the energy mix, increase energy-related costs, and require reduction in demand growth.

Nelson said Schlumberger is working on methods for sequestering carbon dioxide in the ground but it hasn't been done on a large scale. ♦

IEA: Non-OPEC output decline rates lower than believed

The combined production decline rate for countries outside the Organization of Petroleum Exporting Countries is steadier and less steep than is generally believed, according to the International Energy Agency, Paris.

Failure since 2004 of non-OPEC production to achieve predicted output gains has created the impression that decline rates are accelerating.

In fact, IEA says in its March Oil Market Report, the aggregate decline rate for mature non-OPEC fields already in steady decline averaged 7.7%/year

during 2000-07 and did not "accelerate markedly" during the study period.

IEA's analysis focuses on production of conventional crude oil and condensate from fields with sustained, yearly output declines for at least 12-18 months.

The agency believes the net decline rate for non-OPEC production, accounting for fields not in decline as well as those that are, is 4-5%/year.

"We believe that sluggish non-OPEC performance is being driven by other, largely aboveground constraints, not solely by resource depletion, important

though this is for the longer term," IEA says.

The agency says decline-rate surges in 2005 and 2006 reflect distortions such as those caused by hurricane damage in the Gulf of Mexico, extended shut-ins in the North Sea, and asset divestments in Russia.

Decline rates are greatest in mature producing regions of the Organization for Economic Cooperation and Development, exceeding 15%/year in the North Sea, Australia, and offshore US (Fig. 1).

Decline rates generally are greater for OECD than for non-OECD producers (Fig. 2).

In the US onshore and Canada, excluding mining and upgrading operations, they are about 5%/year.

"The surprisingly static overall profile of decline in OECD basins may actually suggest the beginnings of a price response on the supply side," IEA says. Renewed drilling and enhanced oil recovery might be starting to offset natural declines, it adds, although the effect may be limited by engineering shortages.

Average 2000-07 decline rates outside the OECD and in OECD Mexico vary from lows of 2.5%/year in the Former Soviet Union and 4%/year in

AVERAGE NON-OPEC DECLINE RATES, 2000-07*

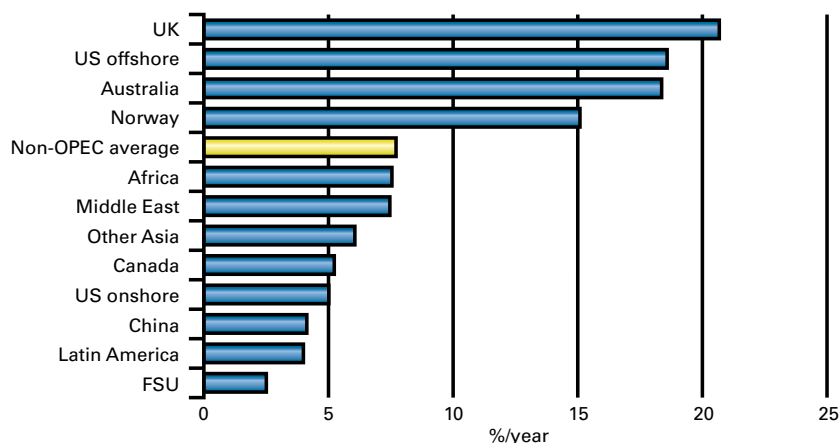
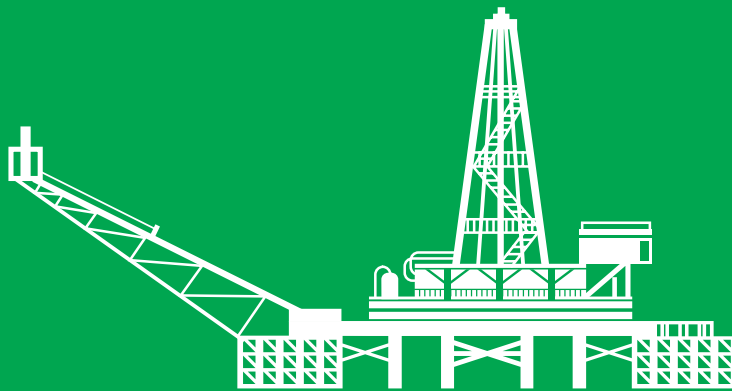


Fig. 1

*Conventional crude and condensate production from mature fields in sustained decline.
Source: International Energy Agency



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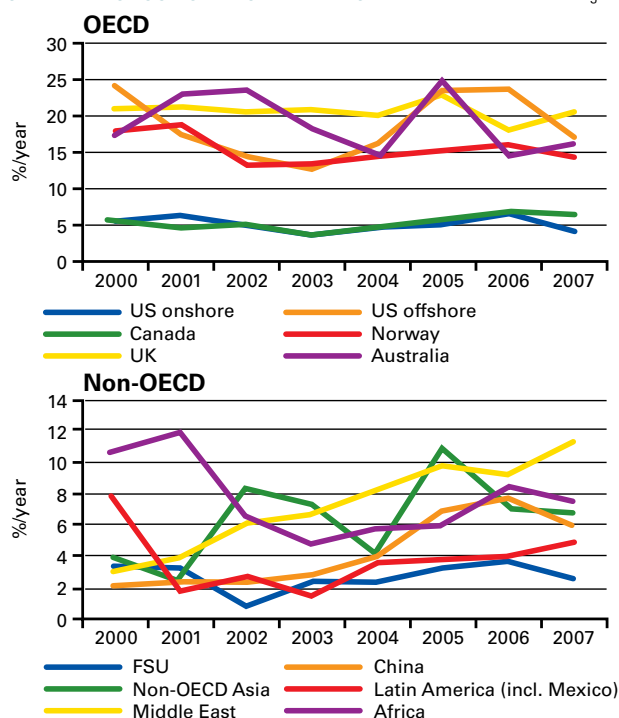
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OBSERVED PRODUCTION DECLINE RATES*

Fig. 2



*Conventional crude and condensate from mature fields in steady decline. OECD is Organization for Economic Cooperation and Development. Source: International Energy Agency

China and Africa to 6-7.5%/year for Asia, the Middle East, and Africa.

The low aggregate FSU decline rate largely reflects the dominance of onshore production in Russian performance and heavy investment in mature Russian fields early in the decade.

And while Latin American declines are relatively shallow, IEA expects them to increase as declines accelerate in Mexico's offshore Canterrell field and deepwater fields in Brazil's Campos basin.

The agency also notes acceleration of declines in mature fields of China, other Asia, and the Middle East.

Despite trends of individual fields and variations over the study period in data quality, IEA says it sees "no compelling evidence that aggregate decline is picking up speed after nongeological factors have been accounted for." ♦

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EPA signs more-stringent air quality standard

The US Environmental Protection Agency on Mar. 12 signed its most stringent standard for ground-level ozone, revising the standards for the first time in more than a decade.

As widely anticipated, the new National Ambient Air Quality Standard (NAAQS) is 0.075 ppm. That compares with the previous standard of 0.08 ppm.

EPA said the change was based on the most recent scientific evidence about the effects of ozone, the primary component of smog.

The American Petroleum Institute said it was disappointed with the EPA decision.

"The uncertainty in the latest science does not support tightening the standards," API said. "Changing the ozone standards (NAAQS) will not, by itself, improve air quality, but will result in unnecessary negative economic conse-

quences for the American people."

The National Petrochemical and Refiners Association said the change was unnecessary and could have a negative impact on some communities.

Charles T. Drevna, NPRA president, said, "At a time when analysts are warning of an impending recession, the last thing the federal government should do is impose a standard that would reduce growth and result in higher costs for consumers without requisite health benefits."

EPA Administrator Stephen L. Johnson announced the decision from Washington, DC. "By meeting the requirement of the Clean Air Act and strengthening the national standard for ozone, EPA is keeping our clean air progress moving forward," he said.

Johnson also recommended four principles for the CAA and the NAAQS:

- They must protect the public

health and improve the overall well-being of citizens.

- They should allow decision-makers to consider benefits, costs, risk tradeoffs, and feasibility in making decisions about how to clean the air.
- They should provide greater accountability and effective enforcement to ensure that not only paper requirements but also air quality requirements are met, especially in areas with the furthest to go in meeting these standards.
- They should allow the schedule for addressing NAAQS standards to be driven by the available science and the prioritization of health and environmental concerns, taking into account the multipollutant nature of air pollution.

Various public health organizations argued for a 0.060 ppm, based on scientific studies of ozone and its impact on health. ♦

Colorado state agency releases draft oil, gas rules

Paula Dittrick
Senior Staff Writer

The Colorado Oil & Gas Conservation Commission (OGCC) released a set of proposed rules Mar. 31 that are open to public comment, and a final OGCC decision on the rules is expected in July.

The proposals “strike a responsible balance between expanding energy development and environmental and wildlife protection,” said David Neslin, OGCC acting director. The draft rules have a tentative effective date of Nov. 1. OGCC could change the date.

The draft rules reflect some changes from OGCC’s initial proposals that were discussed in five public meetings during January. Industry representatives previously asked OGCC to consider the

economic costs while contemplating greater environmental protections.

The Colorado legislature last year passed two laws requiring OGCC to consider the impacts to human health, safety, welfare, and the environment stemming from an ongoing oil and gas boom.

OGCC approved 6,368 drilling permit applications last year compared with 1,010 applications in 1999. Neslin said the state wants the oil and gas industry to thrive while at the same time ensuring the protection of Colorado’s mountains, streams, air, and wildlife.

The draft rules would update state environmental standards, many of which are more than 10 years old. The draft rules would be applied differently in different parts of the state.

New environmental standards under the draft rules would require operators to use “green completion” practices to reduce odors, Neslin said. Certain equipment in the Piceance and San Juan basins would utilize odor-control devices if within a half mile of occupied buildings.

Existing rules do not specifically address odors but require operators to maintain sites “so as to reasonably control dust.”

The draft rules outline drilling restrictions for areas near designated tributaries upstream of public water supply intakes. The proposed restrictions include mandatory setbacks.

The draft rules contain several new wildlife standards, which will be applied differently in different counties

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WATCHING THE WORLD

Eric Watkins, Senior Correspondent



Colombia's 2020 oil vision

Colombia hopes to raise its oil production to 1 million b/d by 2020—if its neighbors Ecuador, Venezuela, and Nicaragua will allow it.

Colombia's state-owned oil company Ecopetrol SA recently resumed sending oil through its trans-Andean oil pipeline after operations were suspended following several attacks in the southern provinces of Narino and Putumayo near the border with Ecuador.

Ecopetrol normally sends about 60,000 b/d of oil through the pipeline from oil fields in the southern province of Putumayo to the Pacific port of Tumaco. The left-wing Revolutionary Armed Forces of Colombia, or FARC, are suspects in the multiple attacks on the pipeline.

Attacks on pipelines by hostile forces are hardly an irregular occurrence anywhere in the world. But this attack is suspect due to the fact that the FARC forces—although Colombian—are actually based in Ecuador.

Green cheese

Naturally, the Ecuadoran government claims no responsibility for the attack and even proclaims its innocence as regards any support for the FARC forces. But if you believe that, you'll doubtlessly accept that the moon is made of green cheese.

The Colombians surely don't believe it as evidenced by their preemptive strike on the FARC forces a few weeks back. That certainly raised the hackles of the Ecuadoran government, as well as its allies in Venezuela and Nicaragua.

Indeed, the three neighbors undertook a number of hostile gestures—both military and diplomatic—in an effort to intimidate

the Colombian government. Not least, they tried to make out that the Colombian president is a lackey of Washington—an accusation that often plays well to the crowd.

Why are the three nations opposed to Colombia? That's not hard to say, and no one doubts that oil is involved. Colombia produced about 540,000 b/d of oil last year, and much of its output was exported, primarily to the US.

High aims

But it would certainly like to increase those figures, according to Armando Zamora, chief of Colombia's oil licensing agency ANH, who said Ecopetrol aims to raise output first to 700,000 b/d by 2015 and to 1 million b/d by 2020.

"Our goal is no longer just to maintain self-sufficiency. We will be able to continue exporting the same surpluses as now or more," said Zamora, who added that his country offers "one of the most attractive concession contracts in the world, certainly in Latin America."

Zamora told a road show in London last week: "Colombia has never expropriated, has never changed contracts unilaterally."

In fact, Colombia seems to have emerged as an increasingly attractive option in the region as neighboring producers like Venezuela, Ecuador, and Bolivia have rewritten contracts to impose tighter terms on international oil and gas companies.

There is evidently good reason for those neighbors to be envious of Colombia and, as a result, to try and sabotage its efforts to improve its oil and gas industry. ♦

depending on the wildlife present. Existing rules do not address provisions to protect wildlife.

Neslin called the proposed wildlife standards "less extensive than originally contemplated." Draft rules include 90-day periods for restricted drilling in designated wildlife areas (primarily in western Colorado).

If an operator or surface owner finds a timing restriction to be unacceptable, they can consult with OGCC to find a mutually agreeable solution to allow drilling in exchange for alternative mitigation.

Operators also may receive an exemption by limiting the density of their development to two pads per section (one pad per section in sage grouse habitat), the draft rules said. ♦

Europaia: EU must issue policies that help refiners compete

Doris Leblond
OGJ Correspondent

The European Union should provide its refining companies with "a globally competitive level playing field" to help them face the "important" challenges of the next years and make the needed investments, said Panos E. Cavoulacos, president of the 17-member refining trade group Europaia. He spoke at the ninth annual meeting of the European Fuels Conference held in Paris Mar. 11-12 and organized by the World Refining Association and The Energy Exchange Ltd.

Of special concern for Europaia are the EU's environmental and energy policies which are not being matched by any other region in the world. They are increasing constraints and uncertainties and are creating "unequal cost burdens for our industry," insisted Cavoulacos.

Stable policies needed

"We need a stable and predictable

policy framework that does not expose the European refining industry to unfair competition and supports long-term investments," he said, adding that EU policies "impact heavily on our industry and profitability."

These policies include cutting greenhouse gas emissions (GHG) by 20% of 1990 levels by 2020, possibly by 30% as urged by the current Slovenian EU presidency in a recent draft statement. The policies also require that 20% renewables be used for power production and 10% biofuels be incorporated in transport fuels by 2020.

Central to the EU's climate change efforts is an emissions-trading scheme under which auctioning of CO₂ emissions permits will become compulsory by 2013. Full auctioning, points out Europaia, at €30/tonne of CO₂ will substantially narrow refining margins and may cause imports to increase if CO₂ costs exceed freight costs to the EU.

Europaia also warned that, while cleaner fuels help improve air quality when burned, their production emits more CO₂ so that market demand and cleaner fuels imply that European refineries will emit more—not less—CO₂.

Europaia further warns that the Inte-

grated Pollution Prevention Control will render industrial operations more costly "with negligible additional human health benefits.

The fuel quality directive, which aims to regulate GHG emissions from liquid road fuels and proposes a target of 1%/year reduction during 2010-20, will impose new constraints on products, fears Cavoulacos, who believes that in the 2020 time frame, the only way to lower GHG emissions is by increasing biofuels content.

An additional concern is the global marine fuel specifications proposals, which he says are not sufficiently well-targeted to achieve public health benefits at a reasonable cost.

Investments vital

These unequal cost burdens create hurdles for vital investments that the EU refining industry must make to remain globally competitive, Cavoulacos added. Refining investments are escalating worldwide, and strong diesel demand and the decline of gasoline in Europe are increasing trade flows of diesel into Europe and gasoline to the US.

Major refining investment is taking place in the Middle East, India, and

China, where capacity could exceed demand in 2012. This will lead to competing gasoline exports to the US and jet fuel and diesel into Europe. At the same time there is an emphasis on distillation capacity investments and upgrading worldwide, the former to reach nearly 240 million tonnes/year over 2007-12 and the latter to exceed 75 million tonnes/year within the same period.

There also are diesel and kerosine hydrotreating capacity investments during 2007-12 which will reach 120 million tonnes/year. All of which means that "conversion capacity investment will be significantly higher outside Europe," cautioned Cavoulacos.

Europaia also is concerned about the evolving refining landscape in Europe as independents, Russian majors, and petrochemical players arrive on the scene.

To meet these challenges, Europaia is asking the EU to follow "predictable policies that do not introduce unequal cost burdens" that would prevent investment decisions in European refining.

Europaia represents the majority of downstream companies in Europe that cover 80% of the EU refining capacity. ♦



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The most experienced operator in the Arkoma basin Woodford shale gas play is demonstrating that longer horizontal lateral drilling will lead to higher estimated ultimate recoveries and improved rates of return just as in the Barnett shale.

Newfield Exploration Co., Houston, said more drilling and recent 3D seismic will help determine where

pate in 60-70 nonoperated horizontal wells in the Arkoma Woodford this year with half those wells apt to involve extended laterals of more than 3,000 ft.

Dunn said more than half of the total wells Newfield will operate in 2008 will be extended laterals. More than half of the total wells will be drilled from multiwell pads, and 90% of the operated wells will be drilled based upon 3D seismic information.

"We continue to optimize development and completion, both from a standpoint of recovery and costs," Dunn said. "Our target finding and development cost is \$2/Mcf gas equivalent or less, and the extended laterals are looking like they will be able to do that."

The current F&D cost is \$2.30-2.40/Mcf.

Newfield had drilled 14 laterals longer than 3,000 ft by mid-March. The last 10 lateral completions were drilled and completed for an average of \$7 million gross, and the average EUR is at least 4.5 bcf of gas equivalent gross.

Standard lateral length is 2,500 ft. Newfield drilled 66 standard laterals with a 2,397-ft average and 12 extended laterals with an average of 3,864 ft.

Newfield's total lateral footage drilled in the Woodford last year was 234,000 ft and it expects to drill more than 300,000 lateral feet in 2008 by utilizing extended laterals. The Houston independent produces 170 MMcfd from the Woodford, double its flow this time last year. Early this year, 10 operators ran 43 rigs in the play, spudding about 90 horizontal wells per quarter. Currently, Newfield has 11 operated rigs

Longer legs, multilaterals under study in Arkoma Woodford shale gas play

Paula Dittrick
Senior Staff Writer

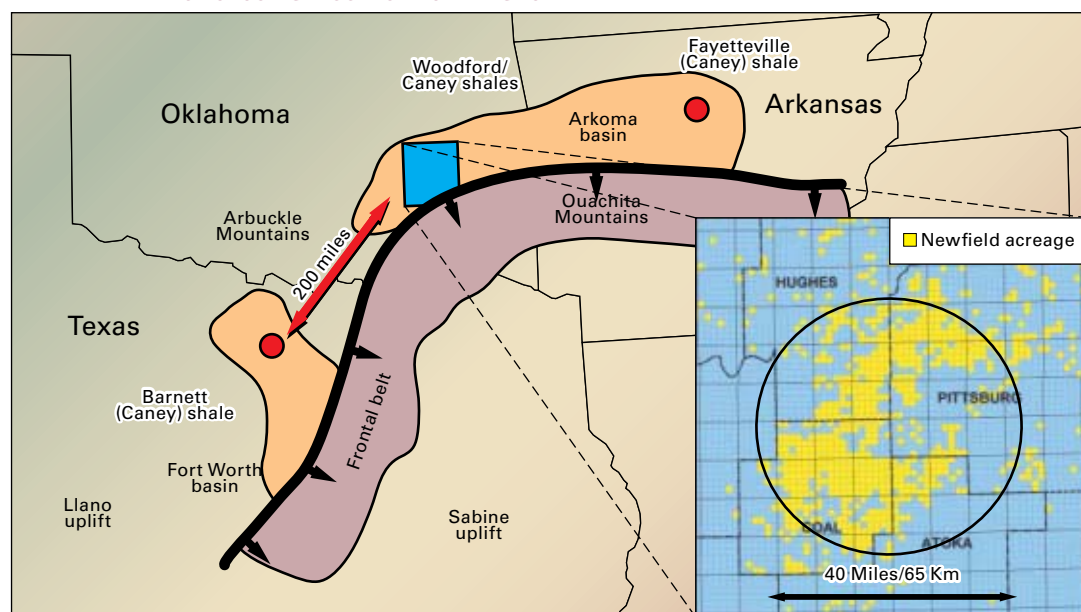
extended lateral completions can be used across its 165,000 net acres, said George Dunn, Midcontinent vice-president.

Dunn also looks forward to trying multilateral drilling later in 2008.

The company believes its Woodford acreage in southeastern Oklahoma could be as prolific as the Barnett shale has proven to be for other operators in North Texas.

Newfield plans to drill about 100 operated horizontal wells and partici-

WHERE NEWFIELD IS PURSUING WOODFORD SHALE GAS



Source: Newfield Exploration Co.



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working in the play.

Dunn wants to develop new resource plays elsewhere in the Midcontinent although he could not elaborate yet on specifics.

"There are a couple of tests we will be doing this year to see if we can find some more areas other than just the Woodford," Dunn said.

Development evolving

Newfield, first to drill horizontal wells in the Woodford, has drilled 170 of industry's 460 horizontal wells in the play. The company remains the area's most active driller.

"The play is a low-risk, long-life, large-reserve exposure play with foreseeable growth," Dunn said. "Horizontal wells are providing good economic results, and that makes the Woodford an emphasis for Newfield."

Newfield anticipates recovery factors of greater than 50% of original gas in place because of high total organic carbon content and high silica content. Silica, the primary constituent in glass, makes the Woodford shale brittle, which is an advantage in frac jobs and subsequent gas production.

Dunn is encouraged with improved efficiencies gained through extended laterals, including capital efficiencies and resulting cost reductions. Newfield is testing different completion techniques in the Woodford, which Dunn considers to be in its early development.

"It's not a cookie-cutter operation. It's a very large area, about 2,000 sq miles, so the geology changes within it. There is some trial and error within different areas," Dunn said, noting that technology and high commodity prices have accelerated drilling there.

He is hopeful the Woodford shale—which stretches from Kansas to West Texas—will prove as successful as the Barnett shale. The Woodford is present in a variety of areas in the US (see map). The extent/prevalence of the Woodford is true as stated, but to date the formation is not "proven" to be highly productive except in eastern Oklahoma.



Newfield's George Dunn
Extended laterals will help cut the Woodford finding and development cost.

Dunn compares Newfield's learning experiences in the emerging play with the learning curve that other operators already climbed in the Barnett shale.

Both the Barnett and the Woodford started with testing of vertical wells that commonly penetrated multiple productive zones, which then led to horizontal drilling. Wells in both the Barnett and Woodford are stimulated with large hydraulic fracs.

Newfield is working to improve frac effectiveness through the testing of various stimulation sizes, the number of stages involved, and perforation clusters. A frac stage is carried out about every 500 ft along a lateral.

"We've been optimizing fracture completion with proper spacing, number of perforations, and distances between the fracs," Dunn said.

"Our focus is to reduce F&D costs and to increase our rate of return," Dunn said. "This play is big enough that cost optimization is a never-ending process."

Newfield is drilling as many as four wells per pad. The concentrated activity creates multiple efficiencies on completions and logistical savings.

"There is an efficiency and learning process to drill each well," Dunn said.

"We found ways to reduce total fluid volume, i.e. costs, and still get the same recoveries. We continue to work with fracture stimulations to cut costs."

The company declined to give specifics, citing proprietary information.

Newfield expects large cost savings from using common pads. Pad size ranges from 1 to 2½ acres depending on the number of wells to be drilled.

In the Morris pilot, located in the Township 4 North Area, three wells were drilled from a common pad. Construction cost was expected to drop \$100,000/well through the use of pads.

Fewer rig moves could save \$80,000/well. Using a simultaneous frac (pumping a frac at two wells at the same time) could help cut costs. Newfield estimates a savings of \$200,000-400,000 from all sources, and the efficiencies are believed possible in all areas, Dunn said.

Seismic information enables Newfield to define wells, identify the location of extended laterals, and reduce costs. The company now drills only in areas of the Woodford where 3D seismic information is available, he said.

More than 60% of Newfield's Woodford acreage is now covered by 3D, and that is expected to rise to 95% by yearend 2008.

Dunn sees the drilling of longer laterals as key to Woodford drilling economics. The longer the lateral, the better its impact on F&D costs.

"We started with horizontal wells at 2,000-3,000 ft laterals," Dunn said. "After testing different completion techniques, we moved to drilling 3,000-4,700 ft laterals where we can. The length of the lateral is predominantly controlled by the geology and the location of faults."

By drilling a 4,500-ft lateral instead of two 2,250-ft laterals, Newfield eliminates one vertical section, which reduces cost. True vertical depth of the Woodford is 8,000-11,000 ft.

Dunn foresees a limit to the length of extended laterals in the Woodford, although that limit has yet to be deter-

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mined. Geology is one limit, and regulatory or unit issues are another limit.

"There is nothing (mechanical) stopping us at 5,000 ft, and that is really the only answer I can give right now," Dunn said. "Other companies in other geologic provinces have drilled farther than that. But nothing in the Woodford yet has told us how far we can go."

Spacing for the Woodford shale to date is 640 acres. Oklahoma regulations limit a company to producing a lateral within that unit. Counting standoffs on either end, that means about 4,700 ft in terms of the portion being produced, which Newfield has done, Dunn said.

Multilateral testing planned

Newfield's next major step will be to test multilateral technology, which it plans to do later this year. Multilateral drilling hasn't been tried in the Woodford shale, but the technology has been tested in the Bakken shale in North Dakota and Montana.

"What we will test initially is just trying to get two laterals in," Dunn said. "There is certainly the technical ability within the service industry to do more than that."

For instance, in areas where Newfield cannot drill extended laterals, it might be able to drill two laterals at whatever spacing, 40-acres or 80-acres, apart down the same vertical well bore, Dunn said, adding that could have the same effect as drilling extended laterals.

Meanwhile, Newfield has several 40-acre and 80-acre pilot programs under way to determine its ultimate development well spacing.

Newfield has cut its drilling time for Woodford wells in the last 2½ years through using combined technology advances for both the vertical and horizontal sections.

Drilling time for vertical sections was cut by learning where to set casing strings and by using air drilling in some areas, he said.

"In certain areas, our horizontal sections have utilized things like rotary steerable," Dunn said. "Just learning the

geology helps us to design the well and cut time."

Drilling time varies considerably

New Zealand

Solid Energy New Zealand Ltd., Christchurch, NZ, is flaring gas to test the commercial viability of flow rates from four appraisal wells at its Huntly coal seam gas project on New Zealand's North Island 100 km south of Auckland.

Solid Energy, in a joint venture with Resource Development Technology of Colorado, drilled the wells to the Kupakupa and Renown subbituminous coal seams at a depth of 400 m 10 km west of Huntly. The resource at Huntly is estimated to be 300 PJ, as large as that at Kupe gas field.

California

Foothills Resources Inc., Bakersfield, set production liner to 9,530 ft and

depending on which Woodford area is involved, but the time to rig release has been reduced 5 to 10 days. ♦

plans to test the GB-4 exploratory well in Grizzly Bluff gas field in the Eel River basin.

The Humboldt County well, the first to have taken cores from the basin's Pliocene Lower Rio Dell sands, has intermediate strings set at 5,400 ft and 8,200 ft.

GB-4 is 25 ft from the Zephyr well, which averaged 5 MMcfd of gas from Lower Rio Dell zones for 4 days in 1964. GB-4 encountered gas in the same zones. It is 3,000 ft west of a 1971 well that went to TD 10,300 ft and flowed gas from several deeper intervals. No gas market existed, and neither well was hooked up.

A completion unit will be brought in from the Sacramento basin to test GB-4, which encountered extensive gas shows and electric log indications of gas from the deeper formations.

Correction

Text in the three callouts in the following illustration was misplaced in the original publication (OGJ, Mar. 17, 2008, p. 36). Here is the corrected version.

DIAGRAM FOR IDENTIFYING AND COMPUTING DELINEATED PROSPECTIVE AREA

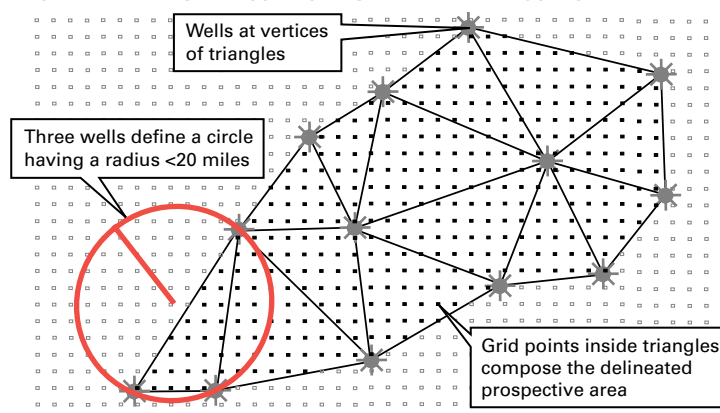


Fig. 1

Grid points are corners of square cells with area 8 sq miles. If three noncolinear wells define a circle having a radius of less than 20 miles, then the triangle connecting the wells defines the delineated prospective area that consists of grid points that lie within the triangles.

DRILLING & PRODUCTION

To supply gas for the Olympics, Shell is drilling the longest horizontal wells ever attempted in mainland China. In the process, the company has had to assess and overcome significant cultural differences in working procedures, establish a sound local organization committed to stringent HSE standards and improve preventive maintenance scheduling and drillstring management.



Cultural differences between West and East often create problems or tensions for a western company like Shell when carrying out projects in very remote regions, such as the Changbei project in China's Ordos basin (Fig. 1).

Shell had drilling experience in the area, including Subei (1993-94), Qingshui (1998-99), and the recent Bonan (offshore, Bohai Bay) and Chang projects; but nevertheless, the company could not underestimate the huge difference in culture.

The Changbei project is Shell's largest onshore foreign investment and the company's first operated development project in China, with a total capital expense final investment decision (FID) of \$644 million. The 1,588 sq km field lies

on a remote, semiarid plateau, 1,200 m above the sea in rural China, raising issues about the working temperatures, logistics, and material availability. The typical land climate makes for hot, dry summers with dust storms and long, very cold winters with winds that cut right through personal protective equipment, due to the lack of natural barriers. The local farming community is well adapted to the conditions.

Amid this, Shell has managed to drill and complete six high-producing, multilateral, horizontal, extended reach gas wells. The company built gas processing facilities to export the gas to Beijing.

In this project—the largest onshore Sino-foreign exploration and production venture to date—Shell partnered with Petrochina, one of the world's biggest oil companies, which contracts three rigs from local drilling companies. Two rigs come from Liaocheng Petroleum Exploration Bureau, based in Panjin, and the third from Changqing Petroleum Exploration Bureau, based in Xian (Fig. 2).

Within the Petrochina tree of companies, these two drilling companies are rivals, generating a competition to operate the best-performing rig in Changbei. The local drilling contractors aim to gain a strategic advantage through the experience gained working with an interna-

CHANGBEI WELLS—1

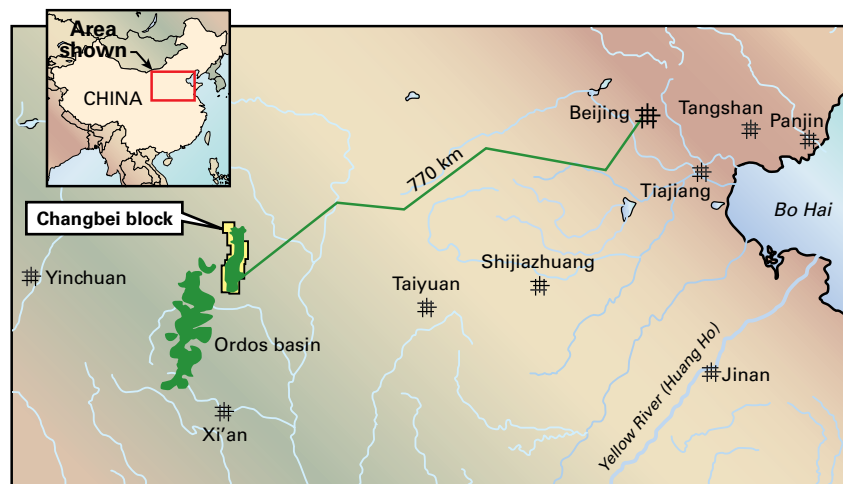
Shell drills gas project in China

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Shell Exploration & Production Co.
Beijing

This article has been modified from Shell's EP Journal of Technology, Dec. 2007.

CHANGBEI FIELD, CHINA

Fig. 1



DRILLING & PRODUCTION



Rig 3 drills in Changbei field in the early morning (Fig. 2).

tional oil company such as Shell.

The Chinese-built rigs under contract to Shell are the best-specified rigs available onshore China. These local rigs come with local crews that have an operational hierarchy very different from that of international drilling contractors. The so-called 'Ling Tau' system (literally 'master') weaves in a difficult political angle for Westerners that is common in state-owned companies. Nevertheless, everyone in the Changbei team is proud to claim success in reaping the benefits of both cultures to improve drilling performance and HSE standards.

Development plan

Changbei field is part of the immense Ordos basin, in the southern Gobi desert. This is the world's third largest desert and the coldest, where various operators are developing oil and gas fields. The area is also known for its vast coal deposits. This is brought to light on a regular basis, when heavily overloaded coal trucks are seen passing through Shell's concession area, or when the winter cold makes the villagers fire up coal-burning ovens, covering the sky with a thick mist or smoke.

The Changbei field covers a very large area, but the tight reservoir sand is only 0-40 m thick. This factor drove the design and installation of 54 long-reach, single and dual horizontal wells, drilled from 23 clusters that contain up to 3 wells each (Fig. 3).

Due to the hard overburden, costly land acquisition and facility installation, and to minimize surface impact in a protected area, two 2,000 m horizontal laterals were drilled in order to optimize the drainage area in proportion to the number of clusters. The base casing scheme that was adopted for the project includes driving a 20-in. conductor to refusal and drilling a 16-in. hole into the Yangchang formation. This is strong enough to take a gas kick from the reservoir. After setting 13 $\frac{3}{8}$ -in. casing

vertically around 700 m depth, a very long 12 $\frac{1}{4}$ -in. section is drilled, kicking off deep and building up through various clay and coal sequences. This section lands horizontally in the Shanxi formation sandstone (pay zone), around 3,450 m along hole (about 2,900 m TVD).

The 9 $\frac{5}{8}$ -in. production casing safeguards the overburden for drilling the two 2,000 m laterals that are completed barefoot. The 13-chrome completion is a relatively simple one, including a tubing retrievable subsurface safety valve (TRSSSV) on 4 $\frac{1}{2}$ -in. tubing and a packer at wireline-capable depth (Fig. 4).

The well services team in Changbei runs the completions, and when the rig has left, it carries out nitrogen lifting with coiled tubing. Subsequently, the well is cleaned up at the site before it is hooked up to flow it to the central production facilities.

Reservoir

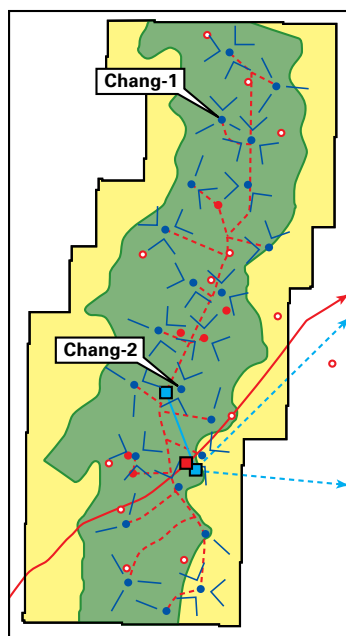
The pay zone is a Permian braided river deposit, very heterogeneous, and hence difficult to correlate between new well and existing vertical wells (previously drilled by Petrochina). Although the sands are relatively clean, baffles of claystone are regularly encountered, which cause concern for wellbore stability during drilling and production.

Currently, two simple but effective strategies have been adopted to deal with the often very hard but sometimes fragile claystone formations. If the carbonaceous content is high and hole problems are expected, an openhole sidetrack is drilled and the well path ducks under the claystone to continue drilling better sands. If, however, the claystone cannot be avoided, and is deemed unlikely to collapse during drilling, but could be at risk of collapsing during the production phase, the team installs a predrilled liner, either dropped off over the interval at risk, or hung off the production casing.

Early development plans included underbalanced drilling (UBD) as a way to minimize reservoir impairment.

CHANGBEI DEVELOPMENT PLAN

Fig. 3



Theoretically, this would be a good technology to use in Changbei's tight sandstones, but plans were put on hold due to certain findings. There was good production from the first wells, borehole stability problems with the claystone in the reservoir, and the company studied potential problems with emulsions that can form between reservoir fluids and nonaqueous drilling fluids.

The early dual-lateral wells flowed about five times better than the vertical, hydraulically fractured wells. More recently drilled dual-laterals show even better production rates.

Organization

The Changbei Wells project started in 2004. The team was based in Beijing with operational planning support from Shell's E&P Asia hub in Miri. The start-up of the three rigs and subsequent operations were successfully run from Miri, Malaysia taking full benefit of the newly opened real-time operations center (RTOC) until summer 2007, when the operations team was moved to Beijing.

Working with local drilling contractors, and the need to maintain HSE as the first priority, led to Shell's decision to provide very senior staff, since on-site HSE and operational supervision was considered paramount in this environment. This was done both for drilling supervisors on the first rig and in-field superintendents (IFS) in the field-based drilling office. The senior drilling supervisors were later moved to Rigs 2 and 3 to transfer their knowledge and experience in starting up the drilling.

Recognizing the inadequate service received from some local contractors, several expert consultants were hired in 2006-07. By mid-2007, a sizable project improvement team had been established, including top-drive sys-

CHANGBEI WELL DESIGN

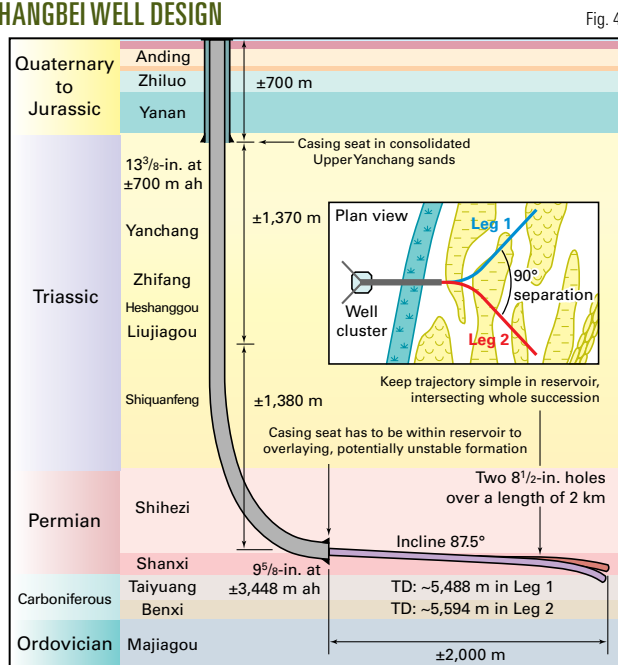


Fig. 4

tem, drilling fluids, quality assurance, and coaching experts from China and abroad.

HSE performance, success

From the beginning, the team decided to focus on HSE.

First, an expatriate HSE manager was hired 18 months before start-up to ensure that the HSE framework was in place. Then 6 months before start-up, local HSE people were hired and sent to Miri, for training.

Through large campaigns regarding safety on the job, the crews have realized how seriously Shell takes safety. This becomes very obvious when one watches other jobs being carried out by local contractors that do not work for Shell. There is a clear difference.

The result of this emphasis on safety and environment is a real success story. Each of the three rigs have operated without any harm to a person for more than a year. In fact, over the combined 5 years of drilling activity in Changbei, only two minor lost-time incidents have occurred. The STOP card system has been fully adopted and a number of 20-40 quality cards per rig-day is

not an exception, showing that interventions are a daily routine. The crews carry out toolbox talks before a job without being asked, and the permit-to-work system is kept at a high standard. The total recordable case frequency (TRCF) is below target, as shown in Fig. 5.

Recently, the "Goal-Zero" target has been achieved for Changbei, a tremendous accomplishment. Initially, the local workers were not forthcoming with information about incidents or unsafe conditions. The drilling team now feels that it is succeeding in transforming the culture to one where people report unsafe conditions and acts and are even proud and eager to do so. The number of near-

miss reports is now much higher than it was at the start of the project and at a level that can be expected from such an operation like this.

The illegal copying of successful equipment is well known in this country and can decrease the rig's safety standard due to the use of inferior materials or inadequate specifications for rig equipment. Very often, substandard equipment and practices are the cause of major incidents in China. Today the rigs have a combination of western and Chinese equipment, but every piece is in good shape and tested and inspected according to Shell requirements. Implementing the Shell HSE culture and management systems has made a positive impact in China, as the HSE plan has been distributed to other industries in the country.

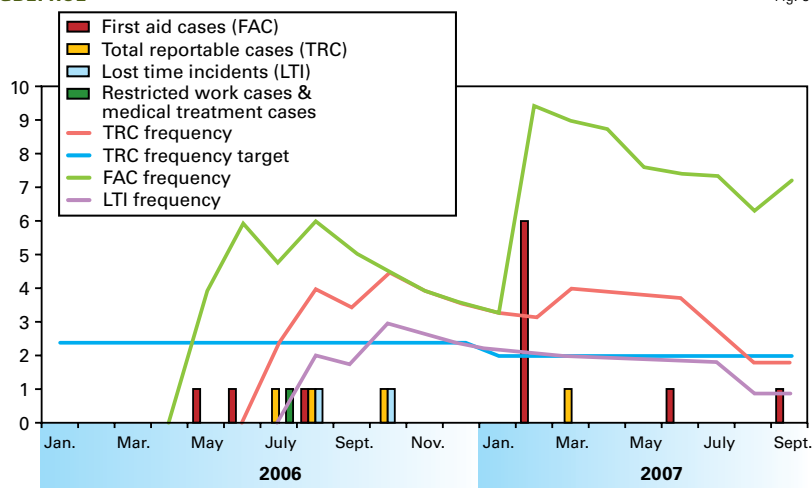
Prevention

An aspect that is frequently a cause for concern is preventative maintenance.

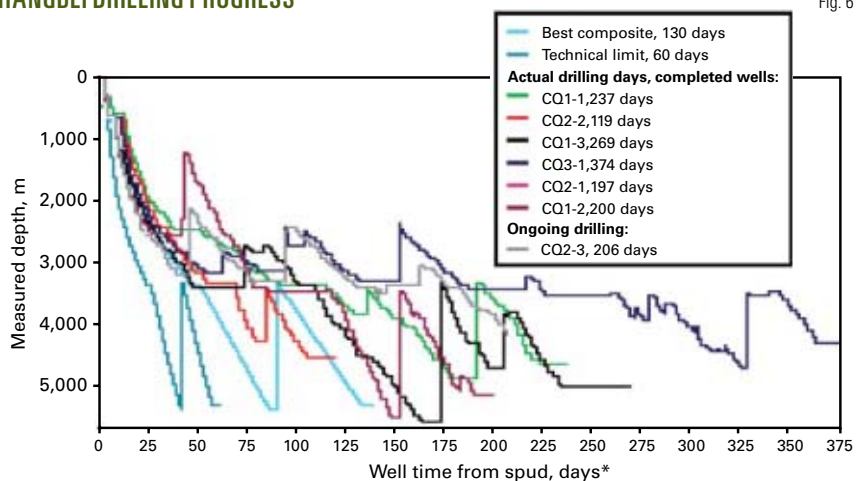
After stabilizing the basic HSE requirements, the drilling team focused on installing a working computerized system that could do preventive maintenance scheduling (PMS), as well

DRILLING & PRODUCTION

CHANGBEI HSE



CHANGBEI DRILLING PROGRESS



*Excludes rig move and rigup.

as spare-part inventory tracking. The systems are in place now and working, although they require rigorous double-checking to make sure nothing is missed.

The PMS is now being installed on other rigs owned by local drilling contractors, working internationally, aiding their competitive advantage.

Another cause for initial concern among the local people was the way the Wells team handled environmental aspects of the project. Correct cutting disposal, for example, is very important, since the region is a major water catchment area and fresh water in most

places can be found as shallow as 10 m below the surface. The subcontractors that handled transport had to be educated to upgrade their standards, including be it the use of safety belts or sealing trucks with tarpaulins to prevent drilling fluids leaking onto the road.

Setting drilling records

It was clear that the first well target duration was going to be hard to reach, but carrying out several trials in the first well was essential, especially on BHA and bit design. It became quickly obvious that the biggest problem areas

are the 12¼-in. buildup section, landing the surface casing, and the speed of drilling in the hard and abrasive 8½-in. laterals.

The first well, CB1-1 took 239 days to complete versus 135 days planned. The production of the first wells clearly showed the importance of drilling long reservoir sections (Fig. 6). Tortuosity was quite severe in the first well due to the large variety of bits and tools that were used and the geosteering used to find the sweet spots in the reservoir. For this reason the torque kept creeping up, resulting in having to call total depth early.

While drilling the second leg in the first well, Shell established the RTOC in Miri. Here, with help of the well planners, torque and drag were modeled and monitored, and well paths were optimized.

Communications with the rig were intensified, and the crews successfully tried various torque-reducing agents. They were successful, especially using the Cosmo lubricant made in China for Shell under license. With these technologies, it was possible to drill the legs of well CB3-2, to a record length of 2,251 m. Steerability improved drastically as well. After the first goal was achieved, it was time to try to bring down the number of bit runs and increase the rates of penetration (ROP) without compromising safety and drilling tool integrity.

Operation delays

Two issues created operational delays while the first six wells were drilled, despite improvements in ROP and operational efficiency:

1. The bottom section of the 12¼-in. buildup section penetrated several carbonaceous layers that were prone to caving, resulting in an oversized hole. In this environment, the drillstring cannot be adequately stabilized and excessive side loading may occur, leading to BHA failures, particularly with the mud motors.

2. Drillers made the unpleasant discovery while drilling the reservoir

sections that the sands proved to be a lot more abrasive than initially thought. The sand in Changbei consists primarily of coarse quartz arenite, the worst rock for wearing out bits and tools. Although the bit runs and ROP were increasing over time, all drilling tools, and especially the drillstring, started to show serious wear.

As a result, several drillstring failures happened, including parted motors, connection washouts, under-gauge sleeves and stabilizers, and undergauge bits with dropped cones.

The solutions included improving drillstring management and adding good-quality hardbanding. After studying the production casing wear and concluding that the protrusion was acceptable, the 7-in. tool joints on the 5½-in. drill pipe had four rows of Arnco 300 hardbanding applied.

Crew training is key to improving drillstring management and a lot of effort has gone into making sure that the drillstring was treated 'like a queen.' Drilling parameters had to be adapted to suit a minimum wear policy and slow speed motors were applied. Tricone bits have been successfully designed under the guidance of a bit expert in Miri, with a maximum volume of carbide and diamonds on the gauge. Failures in bottomhole assembly components also led to a decrease in aggressiveness of drilling parameters, resulting in reduced ROP, but an overall improvement in well delivery.

Similarly, it has been a challenge to run the production casing to bottom, requiring large running loads with the risk of damaging the casing in the process. The Changbei drilling team implemented stronger casing connections and developed special coal drilling procedures to prevent these problems in the future. In parallel, new casing schemes are being studied.

Currently, the target is a 170-day well, with a stretch target of 140 days. From the time-depth graph in Fig. 6, we see the wells have flat spots indicating nonproductive time (NPT). The top of the learning curve is still far away, but

the best composite curve indicates the target can be beaten.

Start-up

The Changbei drilling project has started up on time with minimal HSE impact, while the exposure has been large due to the local culture and the harsh and remote environment. Drilling has continued through two harsh winters without a noticeable increase in incidents and without much invisible lost time. The multilateral well design with 2 km horizontal laterals has proven to be superior in terms of productivity. The Shell team has grown to 65 from 24 employees and is delivering first-class drilling practices. It is only a question of time before the first 140-day well will be drilled.

In the next issue, part two of the Changbei wells story: technical details, working toward the planned learning curve, and key points gleaned during the start-up.

Acknowledgments

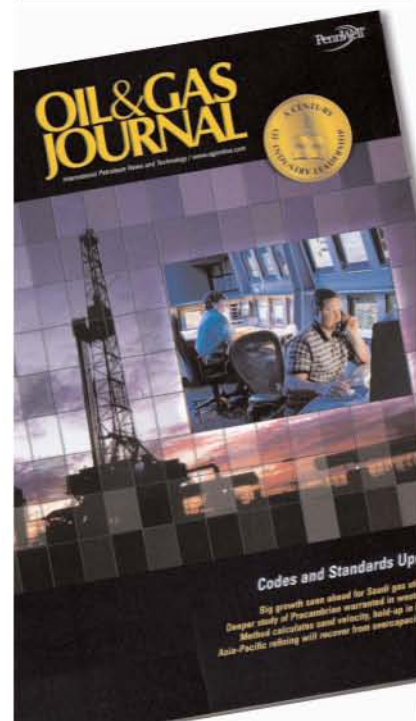
The author acknowledges contributions from Changbei team members: Adrian Wevers, infield superintendent; Taco Hoekstra, wells team leader; Frans van Hoorn, infield superintendent; and Luc van Son, China subsurface team leader. ♦

The author

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Why just
tell them
you're an
expert when
you can
show them?



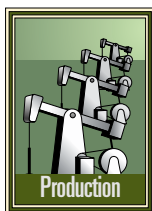
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Jubarte downhole ESP required extensive qualification, testing

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Rio de Janeiro

Ignacio Martinez
Leandro Neves
Baker Hughes Centrilift
Rio de Janeiro



Extensive qualification and testing proved out the electric submersible pump (ESP) installed downhole in the JUB-6 well in Jubarte field off Brazil.

This concluding part of a two-part series discusses the tests and installation procedures for running the pump. The first part in OGI, Mar. 24, 2008, p. 43, described the system.

Dimensional conformance

The quality control and inspection of the ESP started with dimensional conformance tests. These ensured that the components complied with the manu-

facturer's specifications and did not have dimensional deviations that could reduce operating life. The tests also provided documented base line conditions for analyzing returned units.

The work involved the 100% inspection of the critical features and key component dimensions of the pump, seals, and motor.

Key pump features included the dynamic impeller balance and the pump assembly. Features inspected in the seals included shaft manufacturing, straightness, machining, and seal assembly (Vanguard). Motor features tested included the rotor assembly (Vanguard), shaft straightness, assembly and stator winding, stator straightness, and upper and lower tandem assembly (Vanguard).

The pump, seals, and motor included factory acceptance and vibration tests.

For the pump, the acceptable toler-

DEEPWATER ESP— Conclusion

ances are those set by API for horsepower, head, and efficiency.

Factory acceptance tests

Pumps tests in the vertical position verified that the pumps performed as shown in published performance curves within the tolerances specified in API (RP1 1S2). Vibration tests were according to API (RP1 1S8) at three points: base, middle, and top of pump.

The standard NEMA testing procedures for motors do not apply to downhole submersible motors because of their unique design. The basic test procedure used was as follows:

- Insulation test, including a phase-to-ground and a phase-to-phase resistance test.
- Phase check for verifying the correct motor rotation.
- Spin test for determining the motor's operation performance, including a check of oil properties and inspec-



A pull and push test verified the forces needed to move the line in the 10³/₄-in. clamp and move the clamp against the pipe (Fig. 1).



Rotating cable protectors shield the lines at the gas lift mandrel and downhole safety valve (Fig. 2).

tion for internal wear. Each phase was monitored for idle current, voltage, and imbalance. Also monitored were motor rpm, input kw, and temperature rise time.

- Coast time, measured from the point of power cut off to zero rpm, verified the mechanical condition of the motor bearings and rotating parts. A long coast time indicates a possible bad rotor bearing, rotor interference, or thrust bearing problems.

- Vibration test, according to API RP 11S8, were taken at three points on the motor: the head, base, and mid point.

The seal tests included pressure, power, and vibration tests. The seal section contains many mechanical seals, elastomer seals, and in some models an elastomer bladder. Seal testing used nitrogen for verifying that the mechanical seals, elastomer components, and check valves had no leaks.

During the power test for determining rotational integrity and filling, the motor connected to the seal ran for 5 min while the drive motor kw was recorded and compared with acceptable limits.

Seal vibration tests were according to API RP 11S8.

Clamps

The installation has two lines clamped to the production string.

The ESP power cable with chemical injection line runs from the tubing hanger to the 10³/₄-in. shroud. The T-wire line for transmitting downhole pressure gauge signals extends below the ESP. The same cable clamps hold both the 11×11 mm T-wire and the ESP power cable to all tubing joints, but specially designed clamps are needed for passing the T-line through the capsule.

Stamp clamps for 7-in. VAM tubing hold the T-wire and the double-armor round cable with ³/₈-in. capillary line

(1.64 × 2.015 in.) to each collar of the tubing string.

All tools in the string (gas lift mandrel, downhole safety valve, etc.) have 4¹/₂-in. connections and require 4¹/₂-in. joints in the string to connect these tools.

Cable metal bands (1¹/₄ in., SS304) hold the cable and T-wire line together. Metal bands had restricted use and are used only to pass through these tools

TUBING HANGER

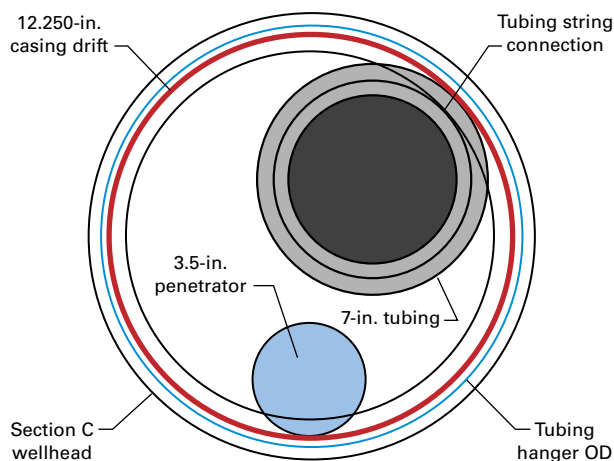


Fig. 3

and above the 10³/₄-in. capsule and below the wellhead hanger. In all places, the larger diameter components in the string provide good protection for the bands, making it difficult to lose the bands.

Specially designed stamp clamps pass the cable through the capsule. The space between the casing and capsule is tight. The drift of the 13⁵/₈ in., 88.2 lb/ft casing is 12.25-in., the equivalent diameter of the 10³/₄-in. capsule and 11 × 11 mm line is 11.18 in., and the equivalent diameter of the assembly clamp protector is 11.83 in.

At the bottom of the capsule, on the 10³/₄ × 4¹/₂-in. crossover, is a special long 40-ft clamp that matches the profile of the crossover and protects the T-wire.

A pull and push test verified the forces needed to move the line in the 10³/₄-in. clamp and move the clamp

against the pipe (Fig. 1).

The pull test determined that forces needed for moving the line in the clamp were 410 lb_f for the initial movement and 688 lb_f for sustained movement.

The push test measures the forces for moving the clamp against the pipe. These forces were 3,954 lb_f to move the clamp less than ¹/₄ in. and 5,964 lb_f for sustained movement of the entire protector over ±1 in. of travel.

If any protector hung up, clamp movement undoubtedly would occur and could damage the T-wire. Analysis of all riser, lower riser packer, bussing, etc. profiles determined that the profiles were adequate and risk of hanging up the clamp was low. Also, the capsule would be set vertically, so that the frictional forces would be low during installation.

Frictional losses are the perpendicular component of the weight against the surface, and these losses are low when running the capsule in a vertical section. To date,

this configuration has been run in four installations with no T-wire failures.

Power cable protection

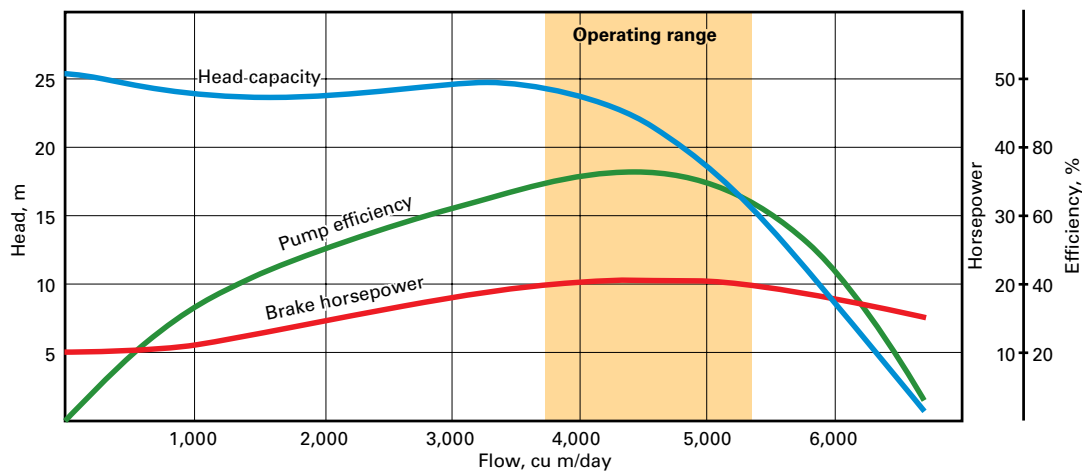
The installation required the design of rotating cable protectors that would pass the lines through the gas lift mandrel and downhole safety valve (DHSV). Those points have a larger diameter than the tubing string (7-in. VAM top), especially the DHSV.

The integrated protectors shield the lines and allow for a 360° orientation adjustment (Fig. 2). The critical point is the DHSV because of the string's eccentricity at the tubing hanger (Fig. 3).

The adjustable union just above the DHSV allows for orienting the cable with the hole of the hanger for the subsea penetrator. This by default orients the protector and cable through the DHSV.

DRILLING & PRODUCTION

PUMP CURVE



Note: One stage, HC27000, SG 1.0, 3,500 rpm = 60 hz

Fig. 4

frequency of 65 hz. Because this is a 4,160-v motor at 60 hz and the maximum current has 178 amp, the calculated maximum output voltage from the drive is 5,456 v. The maximum output drive is 5,500 v.

The medium-voltage drive selected is a multi-step filtered pulse-width-modulated (PWM) drive that has the following

basic specifications of 4,160-v input, 5,500-v maximum output, 200-amp maximum current, and 1,550-kv-amp maximum.

The VSD connects to the main control system on the platform and is part of the command and control ESP system.

The VSD also is hardwired to the platform emergency shutdown system (ESD).

Drive string test

The medium-voltage drive string test confirmed the operability of the complete system (included umbilical and ESP power cable) and the stability of the VSD and ESP system and set up the drive properly for the well.

The test involved connecting cable drums with an appropriate length of cable and capacitance-inductive matching networks to the drive and ESP to form a system representative of the subsea cable and power cable.

This was the third string test performed with multistep filtered PWM drives on ESPs with long step-outs. The first two tests showed that tuning of the drive to the actual system is essential.

The reasons for the string test included:

1. Although much was learned from the first two string tests, the Jubarte ESP had 1.3 times more hp, 1,200 hp,

Subsea tree

For intervention reasons, Petrobras has standardized on 16¼-in. bore wet trees. But to maximize production from heavy-oil Jubarte field and to accommodate a power connector in the tubing hanger, Petrobras selected an 18¼-in. bore and wellhead design for Jubarte wells.

The JUB-6 tree needed to be qualified for 2,500 m of water, although the tree had been already qualified for 2,000 m of water. The qualifying did not delay the project.

The tree incorporates a new tree cap actuated by a 100-hp remotely operated vehicle (ROV) and has new subsea connector designs. Landing of tubing hangers in horizontal subsea trees involves the rotation of a key through a helix to land in a keyway.

This wellhead hanger has the same configuration; proper landing during installation is critical for preventing damage of the lines.

Subsea penetrator

The project qualified a 3.5-in. subsea power penetrator for 8-5 kv and 200 amp.

The well has gas lift backup in case of ESP failure, so that the tubing-hanger power connector has to block gas flow.

Umbilical, flowline, riser

The well is about 2,900 m from the floating production, storage, offloading (FPSO) vessel. All production flowlines are insulated, flexible 6-in. diameter pipes, with a thermal exchange coefficient (TEC) of 8 w/m-K.

The project required development of a special umbilical integrated with the power cable. Beyond its conventional functions as hydraulic control, chemical injection, and electric signal carrier (including pressure and temperature sensors) for the subsea tree, the umbilical contains an electrical supply cable.

The field development concept allows for a minimal number of risers to the FPSO, as well as an optimized subsea layout.

The ESP power cable conductor size is 240 sq mm and designed for 8 kv and a maximum 200 amp. The maximum temperature limit of the umbilical is 43° C. because of the polymeric hydraulic duct limitations. The umbilical has a 4-km length.

Medium voltage drive

The electrical generator (4.16 kv) feeds into a solid 4.16 kv, 800-amp switchboard. During system operations, the ESP has a maximum required 1,500 kv-amp feed. This is also the front-end variable-speed drive transformer rating.

The VSD has a maximum operating

than had been used previously with this drive. This could result in variances in the setup. Although the step-out was relatively short, the VSD parameter settings for the higher rated ESP were unknown.

2. The interaction of the VSD with the pump and how the higher rating would affect system performance resonances were unknown.

3. The cost of replacing a damaged ESP after installation in the well is extremely high, particularly when compared with the cost of the test. In previous tests, the setting of the drive damaged the downhole ESP equipment. The test eliminated the risk of damage due to incorrect VSD parameter settings.

Table 1 lists the instruments and the parameters monitored.

Several issues arose from the string tests. In the locked rotor test, the motor shaft is locked while attempts are made to start the motor. During the test, the drive did not give a message to differentiate this status from starting against a short circuit at the motor terminals. This was solved with minor modifications in the setting parameters of the drive.

Otherwise few other modifications were necessary to the drive because of what had previously been learned from previous tests.

This was the first time the string test included a vibration test. This test was in accordance with API RP 11S8 and performed simultaneously with tests recommended in the API RP 11S2. The tests included accelerometers attached:

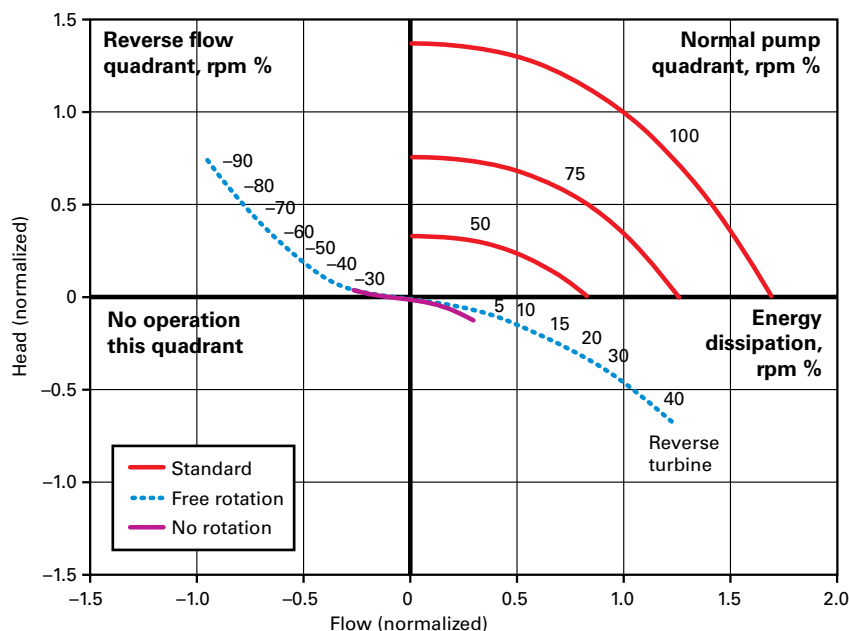
- On the middle of the lower and upper motor.
- Next to the thrust bearing on each seal section.
- On the base and middle of each pump.
- On the pump discharge.

A computer stored all the data for later analysis. For each stabilized operating condition, the test collected about ½ million data points at a sampling frequency of 4,096 hz for generating each spectrum.

An issue arising from the vibration tests was that when both sets of equip-

ESP FOUR QUADRANT PERFORMANCE

Fig. 5



ment were tested, the upper pump from the second ESP system had high vibration peaks. After disassembly of the ESP, it was found that the shaft straightness was not to specifications.

The shaft was straightened and the pump was assembled and retested.

Installation procedure

A semisubmersible rig installed the pump in the well that is in about 1,300 m of water. The maximum offset movement from the rig was in the range of 5 m in any direction. Above this value, the riser disconnect package would disconnect.

This offset results in a maximum 0.2° riser inclination, which is low and presents no problems for running of the ESP. ESPs have been installed with semisubmersible or floating rigs in a

horizontal position.

The installation sequence was:

- Assemble tools below the capsule, included pressure and temperature gauge sensor.
- Run tubing string with T-wire, clamping the line in all tubing joints.
- Assemble the capsule with the T-wire clamped with stamp clamps (10¾-in. flush-joint capsule).
- Run standing valve into capsule. Pressure test capsule body at 3,500 psi.
- Assemble ESP equipment into the capsule.
- Run string clamping the cable and T-line in each tubing joint.
- Assemble subsea hanger with adjustable union and DHSV.
- Align ESP power cable with hanger with adjustable union.
- Connect subsea penetrator on

STRING TEST MEASUREMENTS

Table 1

Instrument	Parameters monitored
Oscilloscope Oscilloscope	VSD output and motor terminal voltage and current Torque at the motor output shaft. A strain gauge connected between the motor and the seal section recorded motor torque values. This is essential for checking tensional vibration and mechanical power transmitted to the pump. Motor efficiency was calculated knowing torque and rpm.
Oscilloscope and digital meters Oscilloscope and digital meters	Wellhead pressure and flow Motor speed

DRILLING & PRODUCTION

subsea hanger.

- Adjust slack of ESP cable with adjustable union.
- Run string with hanger-running tools that use drill pipe. An umbilical cable was run to check integrity of the cable and digital pressure-gauge sensor while landing of the string in the well.

Lessons learned

Several problems occurred during installation:

- The standing valve run to pressure test the capsule did not seat on the test nipple. The reason was that the cross-over below of the nipple had a smaller diameter than the centralizer of the standing valve. Running the standing valve without the guide (distance from the rig floor to the setting nipple was only around 50 m and totally vertical) solved the problem.

- The chemical injection line thread was damaged while it was passed through the shroud hanger. The $\frac{3}{8}$ -in. NPT threads needed to be redone.

- The umbilical to run the drill pipe showed a good electrical reading, but when the umbilical started to be introduced into the seawater the insulation went down. A new umbilical was brought in to continue the installation.

Because the time to tie back the well to the FPSO was unknown and for preserving the ESP downhole set, the project called for filling the capsule with a plug of oil-based n-paraffin that had a density similar to diesel.

The n-paraffin is friendlier than diesel or brine for the ESP elastomers. The elastomer's metallic materials were selected for the completion fluid and could survive for some time immersed in diesel or brine. But these fluids are not recommended for extended periods such as months.

The installation was run in December 2005, and the start up was on Mar. 24, 2007, 495 days after installation.

ESP control

Due to the nature of the ESP, its vulnerable position in the production well, and associated equipment, diligent ESP

CAPSULE BYPASS

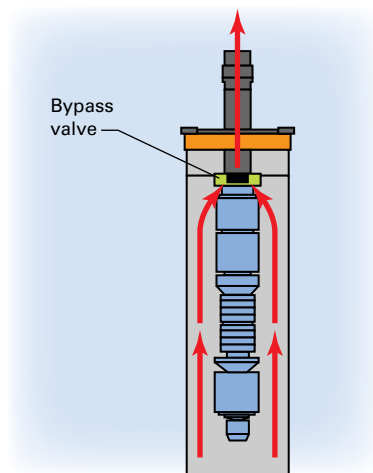


Fig. 6

control will prolong the ESP run life. Damage to the ESP can occur from back flow, dead heading of the pump, or motor overload.

The ESP control system (ECS) provides for monitoring, protection, start permissive, run permissive, alarm and trip logic, and interface with the FPSO distributed control system (DCS). A simple and robust architecture is important for this task and appropriate communications with the other systems is essential (ESD/SPCS/ESP control system).

Most important systems that interact with the ECS are HPU (hydraulic power unit), variable-speed drive, and downhole monitoring surface panel to monitor and protect the ESP:

The variable-speed drive controls the ESP operating amps and is the primary method of monitoring the ESP. This is the most valuable parameter for controlling the ESP.

The downhole monitoring surface panel shows the intake and discharge pressure, motor temperature, and vibrations. All are useful for checking the health of the ESP.

The HPU opens, closes, and monitors the condition of subsea valves and downhole safety valve (DHSV). The interface with HPU is set for permission to start up. For example, if any valve is closed and needs to be open, no

permission to start up the system will be given until the valve opens. If any valve is closed, the system will shut off the ESP.

Also, the drive is hardwired to the ESD system. For any ESD the drive would trip the ESP.

The ECS also will shut down the ESP for flowline pressures below the maximum differential pressure capabilities of the ESP to protect the system against flowline leak.

Natural flow, gas lift

ESP pump performance traditionally is shown on a curve with the flow as the abscissa and the head is the ordinate (Fig. 4). This representation is intended for normal pump operations, that is, the pump turning in the correct direction at an appropriate speed, producing positive head (higher at the discharge than the intake), and positive flow (flowing from the intake to the discharge).

When a pump stops, and if the fluid weight is greater than the intake pressure, the flow will fall back through the pump, and in that case the fluid is negative (flowing from discharge to intake) and pressure is also negative (higher at the discharge than the intake).

At certain flow the pump will start to rotate. The fluid volume to start to move the ESP must be sufficient to break the inertia of the pump and motor. The system acts like a generator. If flow rate is sufficient to rotate the ESP, one needs to take into consideration two issues:

- The bearings of the operating ESP acquire a lubrication film between runner and bearing. Fluid viscosity and rotational speed create this film. At low speed, there is the metal-to-metal contact that wears out the bearings.

- In a flowing well, the flow through the pump is still in the positive direction, but since the pump is not energized, it impedes the flow and creates a pressure drop. This places the operation of the unit in the second quadrant (Fig. 5) and affects the thrust forces in the pump. The pressure-created down thrust is now negative and acts with rather than balances the up thrust

forces. The stages can be damaged due to the heavy up thrust forces.

Petrobras did not operate the ESP after connection of the flowline to the FPSO. Initially the well produced with natural flow about 10,000 b/d for 2 months. This is harmful for the ESP and several precautions were taken.

Each pump has its own four-quadrant curve. As an example, Fig. 5 shows the limits to start rotating the stages. As a general rule, a -25-30% flow rate of the best efficiency point (BEP) at 60 hz will generate enough energy to start rotating the pump.

The pump in Well JUB-06 has a BEP of 27,000 b/d, and the well produced around 10,000 b/d natural flow (+37% of BEP). This is above the maximum recommended. But each pump and motor has a different curve and therefore should be tested to ensure the correct production range through the pump from natural flow or gas lift production.

A damaged pump requires a work-over; so it is recommend to control from surface the flow rate with a choke if the well is on gas lift or flows naturally.

Another way to avoid damage is a Y-tool (Fig. 6). These tools have been used for dual completions, and also to produce the well through an ESP pump. In the case of a capsule, or even a packer above the ESP, the tool act is as a shrouded hydraulic sliding sleeve that helps to bypass the pump when it is stopped. This could maximize production because it would not be limited to producing the well through gas lift or natural flow.

Using this tool is still under study because the tool could fail. Reliability must be the first concern in subsea installation.

ESP start-up

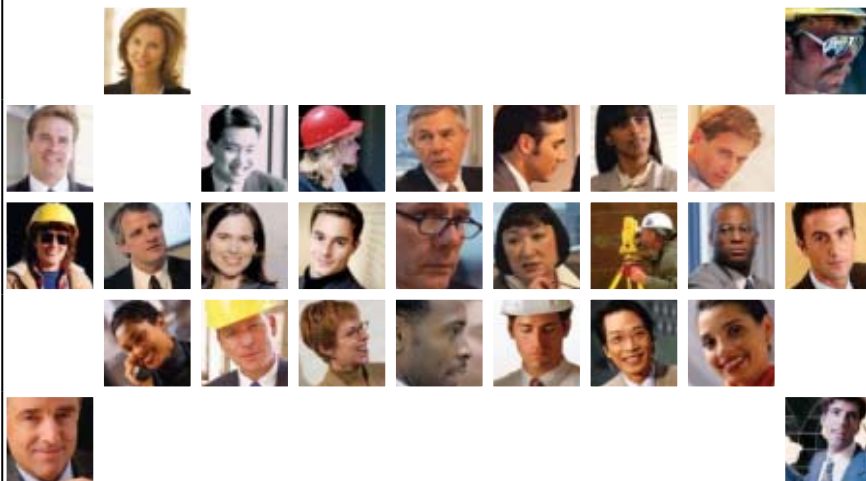
The well began producing with an ESP on Apr. 24, 2007, and produced as expected. No major operating problems have occurred since start-up.

Acknowledgment

The authors thank Petrobras for allowing publication of this article. ♦

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PROCESSING

The Russian petroleum tax structure encourages the country's operators to export refined products rather than crude oil; therefore Russian crude throughput averaged 4.6 million b/d in 2007, a new post-Soviet era record, according to the International



Energy Agency's "Oil Market Report," published on Feb. 13, 2008.

The crude processing rate was an increase

of 4% compared with 2006 and 15% more than the 5-year average (Fig. 1), according to IEA.

Although this strategy is common among oil-producing countries, Russian tax structures may result in strategies that fail to promote long-term investment in the industry.

Tax codes
The 2004 change to the tax code contributed to sharply higher product exports, concentrated in six refineries

(Table 1), which accounted for more than half the increase in Russian crude throughput in 2007, according to IEA. Because upstream producers own these refineries, they face a clear choice between selling crude domestically, exporting it, or refining it.

The factors that influence this decision include:

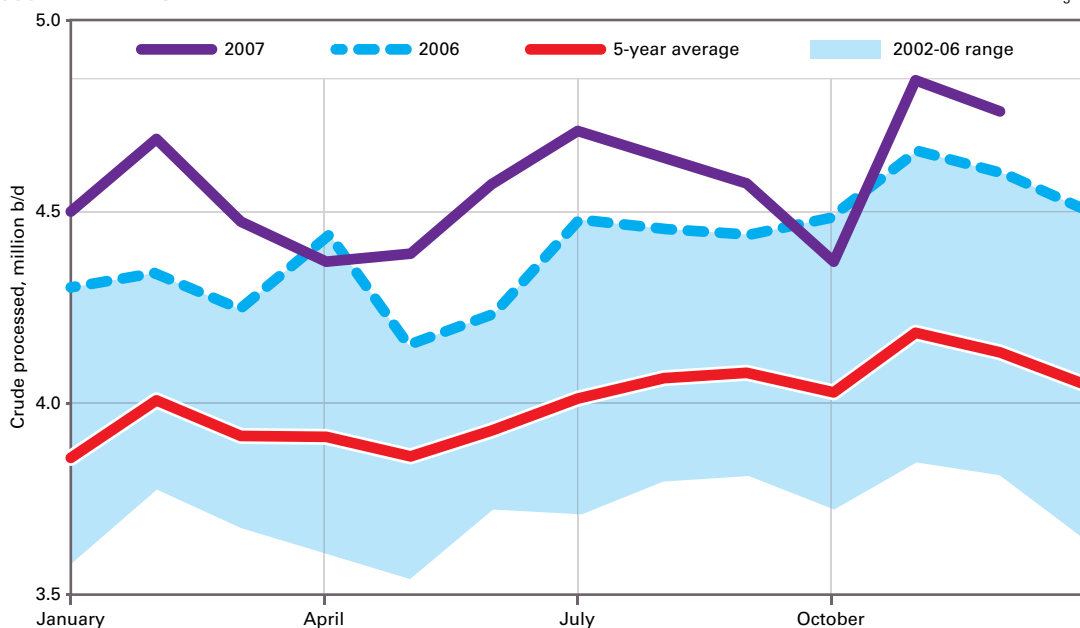
- Domestic refining capacity and domestic product sales.
- Crude and product pipeline capacity, both domestic and export.
- Access to alternative export infrastructure, e.g., rail or barge shipments.
- The incentive that the Russian tax code provides to optimize between domestic and export sales of both crude and products.

According to IEA, the Russian tax code heavily influences these companies' revenues, which can change dramatically depending on world oil prices, providing significant incentives to integrated Russian oil companies to adjust their sales methods. Russian oil companies pay three separate taxes on their activities:

1. Royalties on crude production; taxed at 22% after certain allowances.
2. Export tax; based on the market

Russian refining tax structure fails to promote investment

RUSSIAN REFINING



PROCESSING

2007 RUSSIAN INCREASED
CRUDE PROCESSING

Table 1

Refinery	Owner	Additional crude processed in 2007, 1,000 b/d
Nizhegorod	Lukoil	84
Kirishi	Surgutneftgas	58
Ryazan	TNK-BP	49
Omsk	GazpromNeft	42
Afipsky	Rosneft	34
Komsomolsk	Rosneft	28
Subtotal		295
Others		289
Total		584

price of Urals crude in the preceding 2 months. Light products have a 30% discount on the tax charged and fuel exports benefit from a 60% discount.

3. Corporate profit tax of 24%, charged on net income, which is similar to other industries.

When the IEA report was written, Russian government tax revenues were around \$65/bbl and integrated oil companies reported net income of about \$10/bbl. The lagged nature of the current tax structure can also distort significantly the economic incentive to refine crude oil and, at times, sell products into the domestic market, rather than export them, according to IEA.

The lower tax burden on fuel oil reduces the incentive to invest in upgrading capacity, with the posttax margin between hydroskimming and cracking refineries much narrower than in Europe.

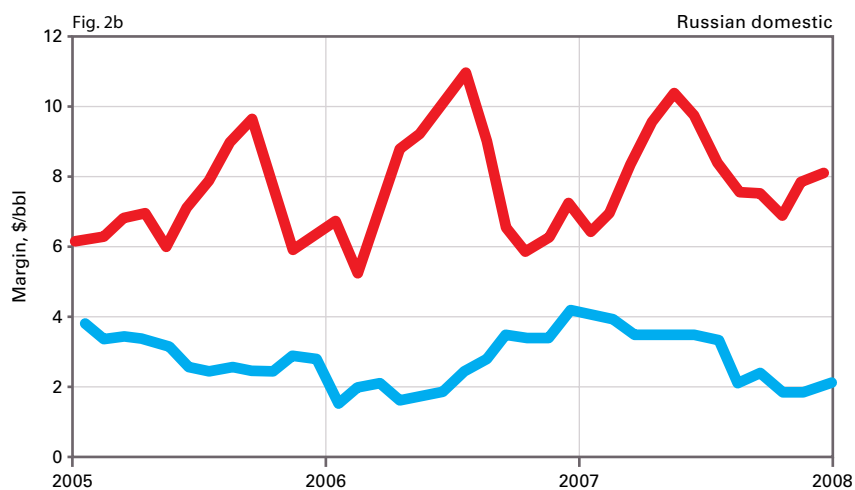
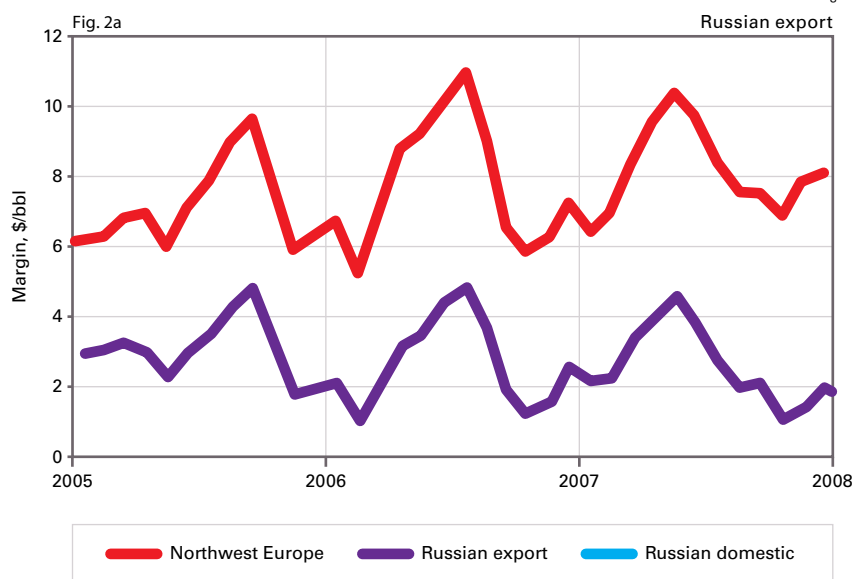
Figs. 2a and 2b show the incentives created by the tax system.

According to IEA, the Russian tax structure clearly encourages running crude through a refinery, targeting the products either for domestic or export sale, vs. the alternative of exporting the crude. The increase in refining crude runs, however, has also been influenced by other factors such as pipeline capacity constraints, local demand for transportation fuels, and the imperative to sustain gas availability for export.

The overall price trend dramatically affects the net income per barrel that companies achieve—in a falling market the lagged nature of the export tax can

UPGRADING SPREAD

Fig. 2



materially depress net income. Similarly, in a rising market, the impact of the export tax is offset as revenues rise ahead of the calculated tax burden, according to IEA.

Global refining

In Europe, throughput has increased in complex refineries and simple refineries have been upgraded to a more sophisticated configuration; however, in Russia more than half of the refiners who have increased runs are hydroskimming operators rather than catalytic cracking, based on fuel oil yields.

According to IEA, this is partly due

to the current tax structure, which appears to reduce a refiner's incentive to invest in upgrading equipment in the medium term. In the short term, this is not necessarily a problem as long as the market is able to absorb or reprocess partly refined fuel elsewhere.

The tighter fuel specifications taking effect in many countries around the world may make it harder for importing countries to readily process partly refined fuel. In particular, given the uncertainty of sustainable supplies from Russia in a fluctuating oil market and the high cost of installing upgrading and desulfurization equipment, Euro-

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pean or American refiners may not want to install surplus additional capacity to handle Russian exports, according to IEA.

The potential for Russia to require greater domestic fuel oil use as a substitute for tightening gas supplies complicates matters further.

In the future, the Russian tax

structure as it currently stands may fail to deliver long-term benefits to the refining industry. A simpler tax system could have provided Russian refiners with the same incentive to boost crude throughput, while investing in upgrading capacity, as has been seen in the OECD and that has delivered significant results. ♦

NELSON-FARRAR COST INDEXES

Refinery construction (1946 Basis)

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

	1962	1980	2005	2006	2007	Dec. 2006	Nov. 2007	Dec. 2007
<i>Pumps, compressors, etc.</i>	222.5	777.3	1,685.5	1,758.2	1,844.4	1,791.7	1,862.6	1,867.3
<i>Electrical machinery</i>	189.5	394.7	513.6	520.2	517.3	528.2	511.9	513.2
<i>Internal-comb. engines</i>	183.4	512.6	931.1	959.7	974.6	963.8	977.7	978.3
<i>Instruments</i>	214.8	587.3	1,108.0	1,166.0	1,267.9	1,224.8	1,281.4	1,293.8
<i>Heat exchangers</i>	183.6	618.7	1,072.3	1,162.7	1,342.2	1,179.4	1,374.7	1,374.7
<i>Misc. equip. average</i>	198.8	578.1	1,062.1	1,113.3	1,189.3	1,137.6	1,201.6	1,205.5
<i>Materials component</i>	205.9	629.2	1,179.8	1,273.5	1,364.8	1,297.1	1,356.9	1,369.1
<i>Labor component</i>	258.8	951.9	2,411.6	2,497.8	2,601.4	2,557.1	2,661.3	2,661.3
<i>Refinery (Inflation) Index</i>	237.6	822.8	1,918.8	2,008.1	2,106.7	2,053.1	2,139.5	2,144.4

Refinery operating (1956 Basis)

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

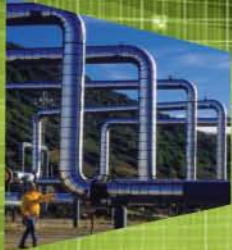
	1962	1980	2005	2006	2007	Dec. 2006	Nov. 2007	Dec. 2007
<i>Fuel cost</i>	100.9	810.5	1,360.2	1,569.0	1,530.7	1,474.0	1,647.5	1,671.6
<i>Labor cost</i>	93.9	200.5	201.9	204.2	215.8	198.4	230.5	208.8
<i>Wages</i>	123.9	439.9	1,007.4	1,015.4	1,042.8	1,003.6	1,106.9	1,030.6
<i>Productivity</i>	131.8	226.3	501.1	497.5	483.4	505.9	480.3	493.7
<i>Invest., maint., etc.</i>	121.7	324.8	716.0	743.7	777.4	760.4	789.5	791.3
<i>Chemical costs</i>	96.7	229.2	310.5	365.4	385.9	365.7	415.1	413.5
Operating indexes								
<i>Refinery</i>	103.7	312.7	542.1	579.0	596.5	575.5	620.6	615.2
<i>Process units*</i>	103.6	457.5	787.2	870.7	872.6	841.5	922.1	924.6

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

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

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

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NELSON-FARRAR QUARTERLY

INDEXES FOR SELECTED EQUIPMENT ITEMS

Changes in indexes for selected equipment items

Gary Farrar
Contributing Editor

Continuing a trend starting in 1983, the Nelson-Farrar refinery construction index rose quickly to 2,144.4 in December 2007 from 1,961.6 in January 2006. The labor component of the index increased, as did the material component, at a rapid rate. The labor index rose to 2,661.3 from 2,469.3 during the 2-year period, while the materials index increased to 1,369.1 from 1,200.3.

The miscellaneous equipment index varied more than 100 points in the

2-year comparison. The category includes pumps and compressors, electrical equipment, heat exchangers, instrument, and engines. They are therefore manufactured items, and their costs are a measure of manufacturing efficiency. The Nelson-Farrar refinery operations index increased 40 points during 2007. The process unit index dropped during

2006 and then gained during 2007, starting at 890.2 and ending at 924.6.

These two indexes varied during 2006 and then rose continuously during 2007. Changes in the cost of refinery fuels accounted for much of the oscillation. Continuing increases in refinery operating efficiency helped stabilize values of both indexes. ♦

	Material component	Refinery construction Labor component	Inflation index	Miscellaneous equipment	Refinery operations	Process units
2006						
Jan.	1,200.3	2,469.3	1,961.6	1,075.6	576.5	890.2
Feb.	1,215.1	2,475.5	1,971.3	1,078.8	574.9	875.9
Mar.	1,228.4	2,477.9	1,978.1	1,102.8	577.8	879.8
Apr.	1,241.5	2,478.6	1,983.7	1,104.2	582.9	887.3
May	1,262.8	2,478.6	1,992.3	1,109.3	584.0	903.0
June	1,289.1	2,479.3	2,003.2	1,113.7	575.3	871.5
July	1,309.4	2,480.7	2,012.2	1,117.8	579.5	873.4
Aug.	1,301.9	2,482.1	2,010.0	1,121.3	583.7	896.7
Sept.	1,321.4	2,497.2	2,026.9	1,130.5	576.6	846.8
Oct.	1,319.4	2,547.9	2,056.5	1,133.0	580.8	834.5
Nov.	1,295.7	2,550.0	2,048.3	1,135.6	580.0	845.0
Dec.	1,297.1	2,557.1	2,053.1	1,137.6	575.5	841.5
Year	1,273.5	2,497.8	2,008.1	1,113.3	579.0	870.7
2007						
Jan.	1,310.0	2,558.6	2,059.1	1,143.2	574.7	816.6
Feb.	1,335.2	2,558.6	2,069.2	1,150.4	600.6	906.4
Mar.	1,388.7	2,559.6	2,091.2	1,189.2	609.7	932.4
Apr.	1,409.7	2,560.7	2,100.3	1,193.0	596.9	872.6
May	1,385.5	2,576.2	2,099.9	1,193.1	604.0	905.8
June	1,389.2	2,593.6	2,111.8	1,196.1	605.4	901.8
July	1,368.2	2,596.4	2,105.1	1,197.1	594.6	872.3
Aug.	1,356.9	2,615.7	2,112.2	1,198.6	579.1	817.5
Sept.	1,357.7	2,628.7	2,120.3	1,201.0	576.8	782.5
Oct.	1,350.6	2,645.8	2,127.7	1,202.3	581.0	816.4
Nov.	1,356.9	2,661.3	2,139.5	1,201.6	620.6	922.1
Dec.	1,369.1	2,661.3	2,144.4	1,205.5	615.2	924.6
Year	1,364.8	2,601.4	2,106.7	1,189.3	596.5	872.6

ITEMIZED REFINING COST INDEXES

The cost indexes may be used to convert prices at any date to prices at other dates by ratios to the cost indexes of the same date. Item indexes are published each quarter (first week issue of January, April, July, and October). In addition the Nelson Construction and Operating Cost Indexes are published in the first issue of each month of Oil and Gas Journal.

Operating cost (based on 1956 = 100.0):	1954	1972	2005	2006	2007	Nov. 2007	*References	Index for earlier year in Costimating and Questions on Technology issues
Power, industrial electrical	98.5	131.2	771.3	850.2	897.3	903.0	Code 0543	No. 13, May 19, 1958
Fuel, refinery price	85.5	152.0	1,288.9	1,523.6	1,497.0	1,567.9	OGJ	No. 4, Mar. 17, 1958
Gulf cargoes	85.0	130.4	1,635.4	2,023.9	1,968.0	2,247.2	OGJ	No. 4, Mar. 17, 1958
NY barges	82.6	169.6	1,539.6	1,837.5	2,066.9	2,705.7	OGJ	No. 4, Mar. 17, 1958
Chicago low sulfur	—	—	1,478.4	1,765.8	2,046.7	2,763.7	OGJ	July 7, 1975
Western US	84.3	168.1	1,941.5	2,358.1	2,704.2	3,494.2	OGJ	No. 4, Mar. 17, 1958
Central US	60.2	128.1	1,274.0	1,765.9	1,886.9	1,857.9	OGJ	No. 4, Mar. 17, 1958
Natural gas at wellhead	83.5	190.3	7,010.6	6,306.5	6,118.7	6,175.5	Code 531-10-1	No. 4, Mar. 17, 1958
Inorganic chemicals	96.0	123.1	562.9	686.8	743.6	782.2	Code 613	Oct. 5, 1964
Acid, hydrofluoric	95.5	144.4	414.9	414.9	414.9	414.9	Code 613-0222	Apr. 3, 1963
Acid, sulfuric	100.0	140.7	397.4	397.4	397.4	397.4	Code 613-0281	No. 94, May 15, 1961
Platinum	92.9	121.1	819.3	1,344.5	1,557.8	1,610.3	Code 1022-02-73	July 5, 1965, p. 117
Sodium carbonate	90.9	119.4	357.3	452.4	490.1	515.4	Code 613-01-03	No. 58, Oct. 12, 1959
Sodium hydroxide	95.5	136.2	529.6	620.1	671.6	706.6	Code 613-01-04	No. 94, May 15, 1961
Sodium phosphate	97.4	107.0	733.7	733.7	733.7	733.7	Code 613-0267	No. 58, Oct. 12, 1959
Organic chemicals	100.0	87.4	666.5	764.5	799.9	871.5	Code 614	Oct. 5, 1964
Furfural	94.5	137.5	961.9	1,103.1	1,174.1	1,257.5	Chemical Marketing Reporter	No. 58, Oct. 12, 1959
MEK, tank-car lots	82.6	87.5	625.0	625.0	625.0	625.0	Reporter	
Phenol	90.4	47.1	411.3	374.9	413.0	416.9	Code 614-0241	No. 58, Oct. 12, 1959

C O S T I M A T I N G

ITEMIZED REFINING COST INDEXES

Operating cost (based on 1956 = 100.0):	1954	1972	2005	2006	2007	Nov. 2007	*References	Index for earlier year in Costimating and Questions on Technology issues
<i>Operating labor cost (1956 = 100)</i>								
Wages & benefits	88.7	210.0	1,007.0	1,015.4	1,042.8	1,106.9	Employ & Earn	No. 41, Feb. 16, 1969
Productivity	97.2	197.0	501.1	497.5	483.4	480.3	Employ & Earn	No. 41, Feb. 16, 1969
<i>Construction labor cost (1946 = 100)</i>								
Skilled const.	174.6	499.9	2,170.8	2,240.7	2,344.4	2,402.2	Eng. News Record	No. 55, Nov. 3, 1949
Common labor	192.1	630.6	2,863.5	2,971.7	3,083.0	3,142.3	Eng. News Record	No. 55, Nov. 3, 1949
Refinery cost	183.3	545.9	2,411.6	2,497.8	2,601.4	2,661.3	OGJ	May 15, 1967
<i>Equipment or materials (1946 = 100):</i>								
Bubble tray	161.4	324.4	1,409.4	1,484.0	1,561.4	1,570.9	Computed	July 8, 1962, p. 113
Building materials (nonmetallic)	143.6	212.4	886.4	969.6	1,003.2	1,003.2	Code 13	No. 61, Dec. 15, 1949
Brick—building	144.7	252.5	1,301.7	1,408.6	1,429.1	1,421.6	Code 1342	No. 20, Mar. 3, 1949
Brick—fireclay	193.1	322.8	1,441.1	1,540.5	1,616.2	1,633.5	Code 135	May 30, 1955
Castings, iron	188.1	274.9	1,290.0	1,351.3	1,414.3	1,424.6	Code 1015	Apr. 1, 1963
Clay products (structural, etc.)	159.1	342.0	893.8	951.6	963.2	961.4	Code 134	No. 20, Mar. 3, 1949
Concrete ingredients	141.1	218.4	985.5	1,092.0	1,172.2	1,186.2	Code 132	No. 22, March 17, 1949
Concrete products	138.5	199.6	841.3	921.1	961.6	967.9	Code 133	Oct. 2, 1967, p. 112
Electrical machinery	159.9	216.3	513.6	520.2	517.3	511.9	Code 117	May 2, 1955
Motors and generators	157.7	211.0	839.2	880.3	917.1	927.6	Code 1173	May 2, 1955
Switchgear	171.2	271.0	1,090.0	1,147.3	1,212.2	1,223.8	Code 1175	May 2, 1955
Transformers	161.9	149.3	537.1	612.5	696.9	709.4	Code 1174	No. 31, May 19, 1949
Engines (combustion)	150.5	233.3	931.1	959.7	974.6	977.7	Code 1194	No. 36, June 23, 1949
Exchangers (composite)	171.7	274.3	1,072.3	1,162.7	1,342.2	1,374.7	Manufacturer	Mar. 16, 1964
Copper base	190.7	266.7	992.1	1,059.4	1,201.8	1,241.9	Manufacturer	Mar. 16, 1964
Carbon steel	156.8	281.9	1,080.2	1,162.1	1,344.7	1,396.5	Manufacturer	Mar. 16, 1964
Stainless steel (304)	—	—	1,119.3	1,174.8	1,322.1	1,365.0	Manufacturer	July 1, 1991
Fractionating towers	151.0	278.5	1,157.2	1,207.2	1,274.3	1,293.4	Computed	June 8, 1963, p. 133
Hand tools	173.8	346.5	1,722.1	1,792.5	1,830.6	1,836.8	Code 1042	June 27, 1955
Instruments (composite)	154.6	328.4	1,108.0	1,166.0	1,267.9	1,281.4	Computed	No. 34, June 9, 1949
Insulation (composite)	198.5	272.4	2,228.6	2,257.4	2,258.6	2,229.1	Manufacturer	July 4, 1988, p. 193
Lumber (composite):	197.8	353.4	1,359.6	1,309.8	1,204.1	1,148.2	Code 81	No. 7, Dec. 2, 1948
Southern pine	181.2	303.9	998.6	984.3	846.4	791.5	Code 81102	No. 7, Dec. 2, 1948
Redwood, all heart	238.0	310.6	2,057.9	1,948.1	1,744.3	1,630.2	Code 811-0332	July 5, 1965, p. 117
Machinery								
General purpose	159.9	278.5	1,163.6	1,213.7	1,271.8	1,283.6	Code 114	Feb. 17, 1949
Construction	165.9	324.4	1,499.2	1,559.7	1,594.4	1,603.9	Code 112	Apr. 1, 1968, p. 184
Oil field	161.9	269.1	1,454.8	1,599.1	1,715.8	1,735.1	Code 1191	Oct. 10, 1955
Paints—prepared	159.0	231.8	975.3	1,040.8	1,078.5	1,086.0	Code 621	May 16, 1955
Pipe								
Gray iron pressure	195.0	346.9	2,580.2	2,687.9	2,730.8	2,772.5	Code 1015-0239	Jan. 3, 1983
Standard carbon	182.7	319.9	2,217.3	2,306.9	2,299.2	2,281.2	Code 1017-0611	Jan. 3, 1983
Pumps, compressors, etc.	166.5	337.5	1,685.5	1,758.2	1,844.4	1,862.6	Code 1141	No. 29, May 5, 1949
Steel-mill products	187.1	330.6	1,409.1	1,527.5	1,620.0	1,587.5	Code 1017	Jan. 3, 1983
Alloy bars	198.7	349.4	1,146.8	1,311.8	1,239.7	1,246.4	Code 1017-0831	Apr. 1, 1963
Cold-rolled sheets	187.0	365.5	1,462.5	1,658.4	1,916.6	1,772.7	Code 1017-0711	Jan. 3, 1983
Alloy sheets	177.0	225.9	760.3	862.4	996.7	922.0	Code 1017-0733	Jan. 3, 1983
Stainless strip	169.0	221.2	811.6	920.7	1,064.2	984.3	Code 1017-0755	Jan. 3, 1983
Structural carbon, plates	193.4	386.7	1,654.5	1,766.6	1,945.3	1,946.6	Code 1017-0400	Jan. 3, 1983
Welded carbon tubing	180.0	265.5	2,246.8	2,337.3	2,329.6	2,311.6	Code 1017-0622	Jan. 3, 1983
Tanks and pressure vessels	147.3	246.4	974.4	1,014.3	1,076.4	1,095.2	Code 1072	No. 5, Nov. 18, 1949
Tube stills	123.0	125.3	540.5	579.9	612.0	606.7	Computed	Oct. 1, 1962
Valves and fittings	197.0	350.9	1,738.2	1,839.6	1,943.9	1,971.9	Code 1149	No. 46, Sept. 1, 1940
<i>Nelson-Farrar Refinery (Inflation Index) (1946)</i>								
	179.8	438.5	1,918.8	2,008.1	2,106.7	2,139.5	OGJ	May 15, 1969
<i>Nelson-Farrar Refinery Operation (1956)</i>								
	88.7	118.5	542.1	579.0	596.5	620.6	OGJ	No. 2, Mar. 3, 1958
<i>Nelson-Farrar Refinery Process (1956)</i>								
	88.4	147.0	787.2	870.7	872.6	922.1	OGJ	No. 2, Mar. 3, 1958

*Code refers to the index number of the Bureau of Statistics, US Department of Labor, "Wholesale Prices" Itemized Cost Indexes, Oil & Gas Journal.

TRANSPORTATION

Raster-based GIS routing models prevent pipelines from becoming an economic burden on the companies and countries involved in their construction and operation by minimizing not just the economic costs, but also the environmental and social costs of any new project.



based on raster data models can efficiently manage and analyze this data.

This article presents the raster-based GIS model developed for pipeline routing and lists the model's advantages in pipeline implementation. Routes defined with network analysis techniques over raster-based GIS models minimize economic, environmental, and time costs, depending on the quality of data used.

Raster-based GIS data guide economic pipeline construction

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Reducing pipeline construction costs, potential environmental damage,

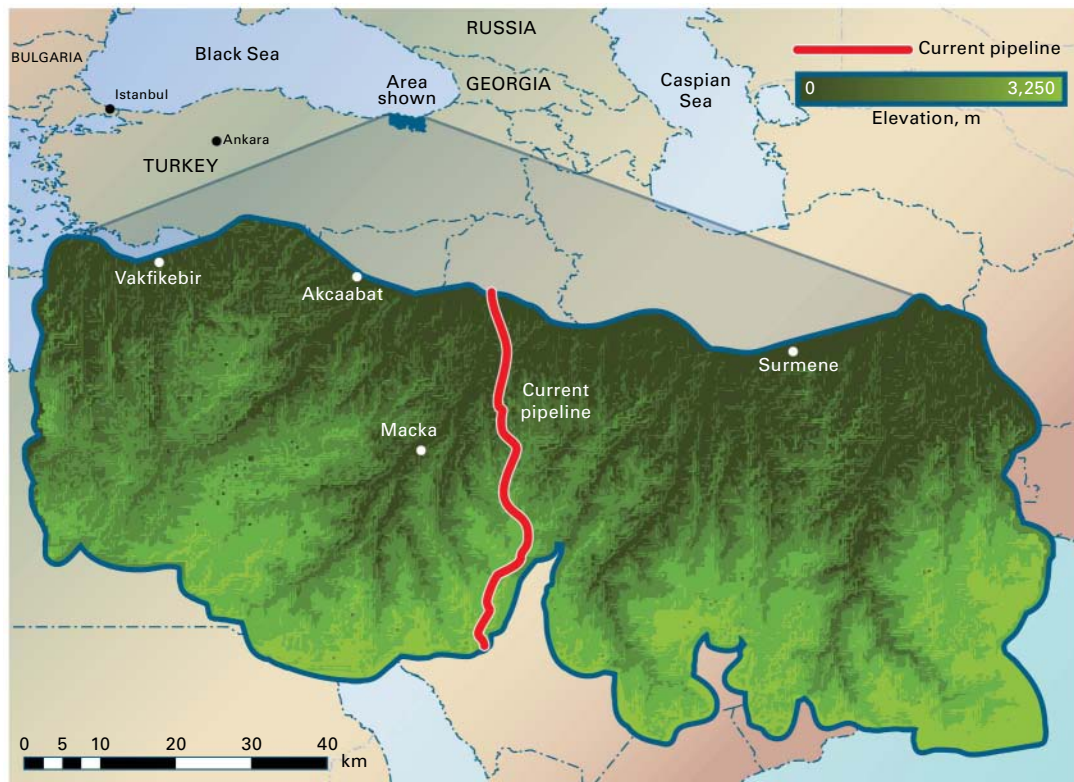
and construction time requires appropriate route planning. Planning should analyze all factors that will affect the route. Frequent changes of surface (land use, topography, streams, etc.) and underground (soil, geology, etc.) characteristics result in a dense data set. Geographical information systems

Background

Route selection is the most important step in the pipeline planning process; affecting technical, economic, sociological, and time components of the project as a whole.¹ This primacy requires defining the factors affecting route selection and weighing these factors, organizing the resulting data into a usable database. GIS technologies allow these steps to be taken in the integral manner required to make accurate routing decisions (OGJ, June 22, 1998, p. 63).

EASTERN BLACK SEA REGION NATURAL GAS TRANSMISSION LINE

Fig. 1



Studies using GIS technologies to examine the physical, environmental, political, social, economic, and legal factors affecting the planning and operation of pipelines have used the factor and weight principle.^{2,3}

Some studies compare the cost of routes selected using conventional methods (economic, social, and time costs) with the costs of routes selected using GIS-based models.² Other studies have selected the most appropriate route among several alternatives by using GIS techniques. Studies have also used only one or a few of the important factors affecting pipeline route selection, ranging from fault lines⁴ to landslide areas (OGJ, Jan. 1, 2007, p. 58).

Turkey offers important pipeline passage opportunities in terms of both operational guarantees and geographical location. The acceleration of natural gas pipeline construction activities in recent years has also expanded the use of natural gas in Turkey. Despite the high level of activity, however, pipeline routing has remained largely non-automated.

Turkish pipelines have so far used conventional methods and standard topographic maps. Manual routing defines the straight line between the reserve and the target destination. Topographic maps guide when the line is allowed to depart from the straight line within limits of a corridor. Such processes can slow or even stop pipeline projects, particularly if an unexpected sharp turn, excavation, or other labor-intensive maneuver is required (OGJ, Aug. 21, 2006, p. 57).

Unnecessary stream, highway, or railway crossings increase the construc-

MODEL WORK FLOW

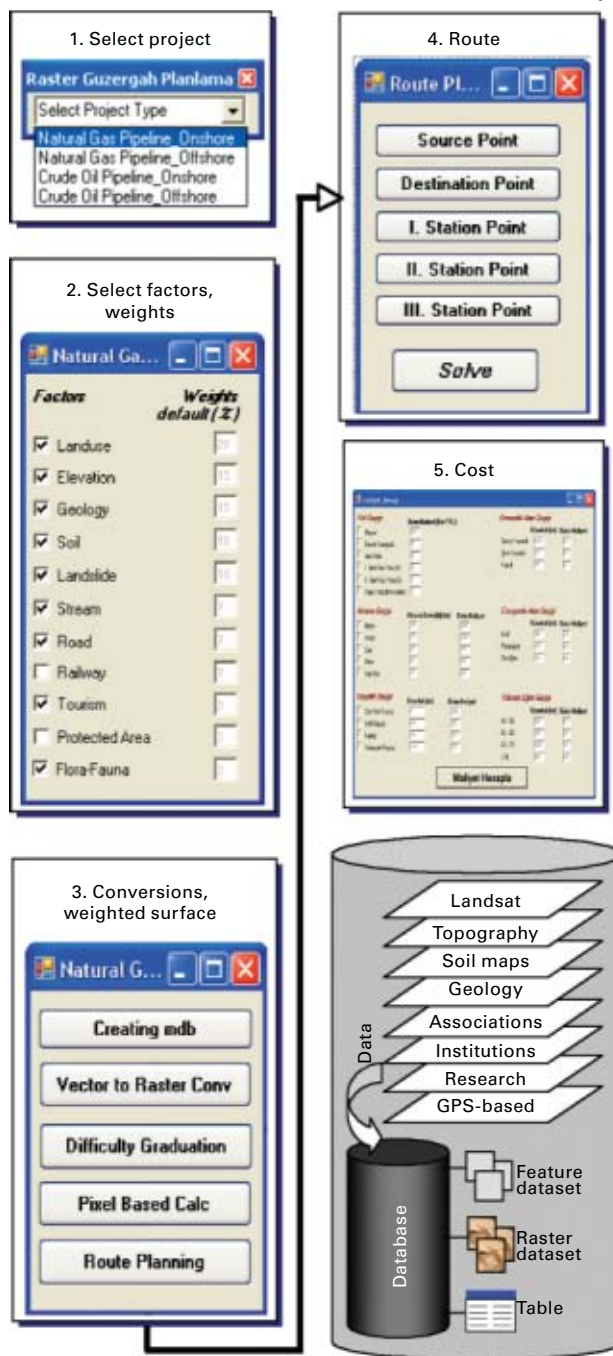


Fig. 2

repair earlier than had been anticipated in design (OGJ, May 29, 2000, p. 68).

Failure to account for factors affecting routing can negatively affect construction activities, operation, and life cycles of the pipelines. Avoiding these negative outcomes required that Turkey develop an efficient GIS-supported routing method for pipelines.

Two different processes—using vector or raster data models—guide GIS routing. Thematic cost calculation, design and modeling simplicity, and ease of incorporating remote sensing data make raster-based routing the preferred process.^{3,5,6} Raster-based network analyses can also guide routing on surfaces where no defined routes exist, in networks composed of layers lacking attributes of the concerned features, and in artificial directional limitations. Scientific research demonstrates that raster-based methods more effectively address surface routing problems when compared to vector-based networks because surface routing is performed as a cell-to-cell connection, not as a straight line.⁷⁻¹⁰

This article first examines the applicability of current raster-based analysis models to routing pipelines in Turkey, exploring the models' simplicity and flexibility be-

fore turning to an example of its use in pipeline routing. Research determined subjects of study area and their weight before transferring the required data for processing and analysis.

A case study shows advantages of the model when compared with classical routing methods, comparing the route

tion costs, duration, and operational costs of the project. Safety costs, including those brought about by unexpected landslide zones, are foremost among those associated with the last. Undetected environmental factors (underground waters, soil type, geological structures, etc.) may also require maintenance and

TRANSPORTATION

of a current natural gas pipeline with the optimal route defined by the model in terms of cost and environmental exposure.

Materials, methods

Trabzon province, in Turkey's Black Sea region, served as the study area (Fig. 1). The province measures 4,660 sq km and has a population of 975,137. It has a rough topographic structure, with areas other than agricultural lands either covered with forest or barren.

Botas built the Eastern Black Sea region natural gas transmission line, using conventional routing. The studied length of pipeline measures 46 km. Routing the pipeline through landslide areas, as well as unnecessary streams and road crossings, caused a budget overrun and failure to complete the project according to the schedule.

A Landsat ETM+ satellite image dated Sept. 19, 2000, defined land cover¹¹ with a controlled classification method

RASTER-BASED ROUTE SELECTION LAYERS, WEIGHTS

Layers	Scale	Data source	Weight, %
Land use	1/25,000	Landsat ETM Topographic maps	20
Elevation	1/25,000	General Command of Mapping	15
Geology	1/25,000	General Directorate of Mineral Research & Exploration	15
Soil	1/50,000	General Directorate of Rural Services	10
Stream	1/50,000	Landsat ETM, GDMR	10
Road	1/25,000	Landsat ETM, Topographic maps (GCM)	10
Landslide	1/25,000	GDMR, Landsat ETM	10
Tourism	1/50,000	Topographic maps (GCM), Ministry of Culture and Tourism	3
Protected area	1/50,000	Topographic maps (GCM), Ministry of Culture and Tourism	3
Flora, fauna	1/25,000	General Directorate of Forestry	—
Administrative unit	1/25,000	General Directorate of Cadastre	—

Table 1

that used a maximum likelihood algorithm, producing 10 land cover classification maps. These maps include areas with pasture, water, deciduous and coniferous trees, mixed wood trees, green tea fields, hazelnut orchards, rocky areas, settlements, and agricultural areas. Standard topographical maps of 1/25,000 scale produced by the General Command of Mapping provided digital height data for the region. Table 1 shows other data used, with scales, data sources, and weighting.

lowing criteria:

- Due to diversity of flora and fauna, a pipeline should not pass through any area that is the habitat or breeding place of a threatened species.
- To ensure optimal use of resources, the number of passages over highways, streams, lakes, and rocky places should be minimized.
- To minimize sociological problems, pipelines should be kept away from highly-populated areas and recreational areas.

• To extend operational life and decrease maintenance and repair costs, pipelines should not pass through geologically unfavorable areas or landslide areas.

• To optimize construction and operation, the pipeline should be close to main roads and easily meet its own energy needs.

Table 1 lists data layers created in raster format and their weights; the material necessary to perform an

RASTER-WEIGHTED SURFACE

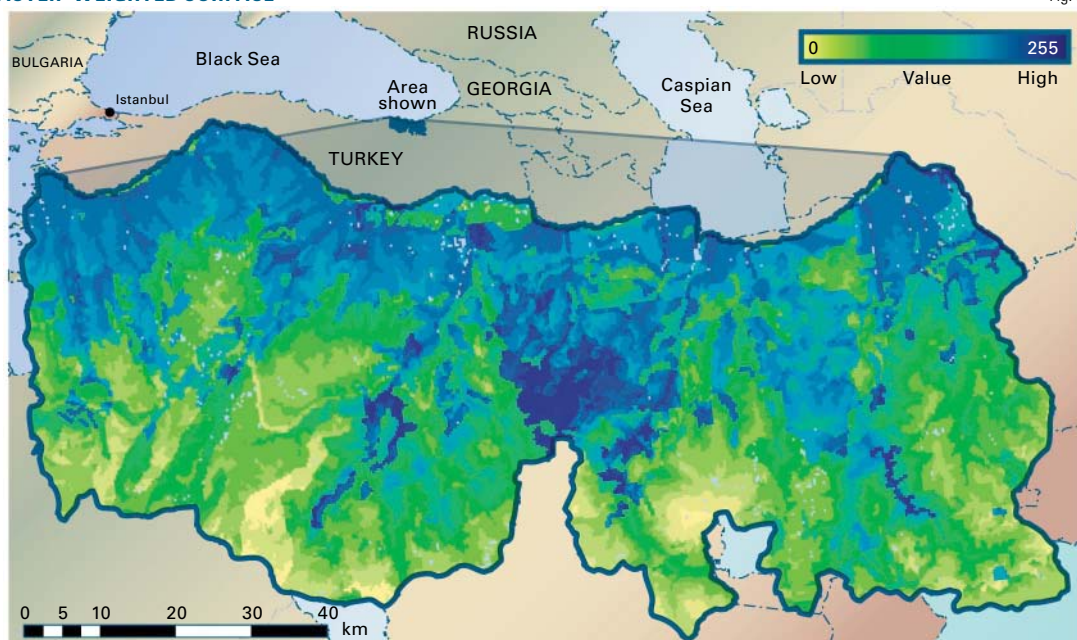


Fig. 3

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integrated route analysis.

Raster-based routing

Optimal pipeline routing rests on an integrated examination and analysis of all data. A raster-based GIS model depends on collecting all factors that would affect routing on a single raster-based surface. Each pixel on this surface has a digital value representing cost of pipeline works. These digital values and direction-distance data determine optimal pipeline routing.

An interface based on the proposed model examined its applicability. Development of the interface used the C# software language and ArcGIS 9.2 software, allowing the user to choose which factors determined route selection. Users can increase or decrease the weight of any factor on the basis of cost criteria. The user can enter areas that will definitely act as barriers (flora and fauna areas to be preserved, active erosion areas, fault lines, etc.) in advance, effectively defining the route. The user can also define stops between the start and end of the route.

The interface then allows calculating the cost of alternative routes. Finished pipeline projects and their cost reports provide unit costs. Fig. 2 shows the work flow of the model and the process steps of the database.

Case study

Basic steps for finding a minimum cost path over a surface partitioned into regions of different resistances include:^{12 13}

OPTIMAL ROUTING

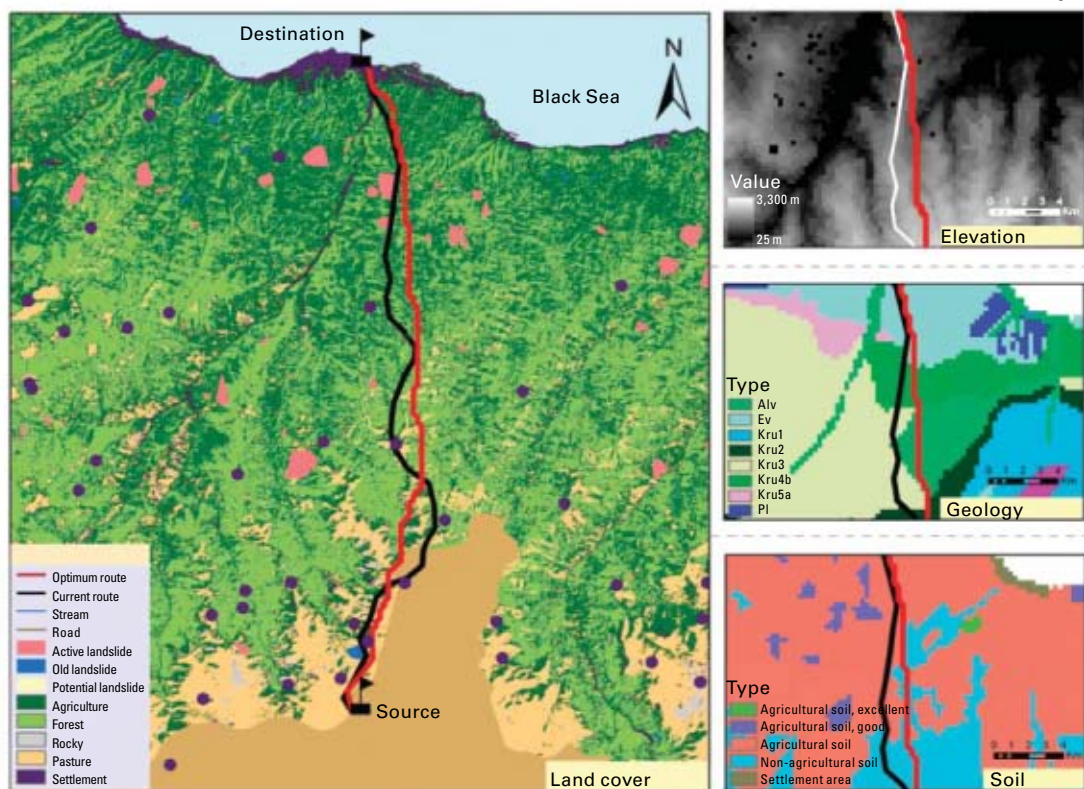


Fig. 4

- Creating a friction surface for each evaluation criterion, where each cell in the grid is assigned a value based on the relative cost of traversing that cell.

- Weighing and combining multiple friction surfaces to create a cost-of-passage surface, representing the total cost associated with traversing each cell.

- Using a spreading function to combine separate grids representing source points and destination points with the cost-of-passage grid to calculate an accumulated cost surface.

- Tracing the lowest cost line down the accumulated-cost-surface from a departure point to a destination.¹⁴

Testing the model required attempting to optimize the route of current gas pipeline with it. Process steps for the optimum route defined over the model include:

- *Type of project, factor selection.* The first process step is defining the type of pipeline planned. According to the type of project selected, the user receives factors that affect the route and factor

weights as defaults. The user can select any of the factors over this interface on the basis of the existing data and can change factor weights according to the details of the project. Classifying data into a geo-database organizes them for use in this step.

- *Raster conversions, classification.* The model then makes projection conversions for the vector-based positional data organized in a database and converts data into raster format. The data scale (pixels of the pipeline used equalled 50×50 m) allows adjustment of the required pixel dimension identification. Sub-factor classifications (complexity grading) required for the data converted into raster format occur automatically in line with data obtained from current engineering activities and operations (Table 2).

- *Pixel-based calculation, weighted surface.* Factor weights and classified raster data layers enable pixel-based mathematical calculations, obtaining the weighted surface showing pipeline construction

costs (Fig. 3).

- **Absolute-relative barriers.** Obtaining the weighted surface allows the areas

absolutely impossible to be passed and the areas with high passage costs to be modeled as barriers on the surface. This step used ∞ value in subunit classification for absolute barriers (earthquake areas, flora and fauna areas, etc.). An algorithm prevents the route from passing over pixels to which this value is assigned. A value of 9, assigned to places with high passage cost (roads, streams, and erosion areas), means passage is quite difficult.

- **Source, destination, stops.** A user can model the route's source, destination, and stops on a weighted surface. The model marks related points for this procedure and records them in the database as a separate file. This process step allows the route points over the interface to be shown (Fig. 2).

- **Optimal routing.** After these interim procedures, a cost distance algorithm using ArcGIS 9.2 software generates the final route. Fig. 4 shows the optimum route defined by these steps.

Route examination

Model development first subjected the current route to evaluation of economic, sociologic, and environmental factors affecting route selection. Route

data guided passage characteristics increasing cost (Table 2). Distance and population data provided the basis for examining environmental damage caused by the route and social problems resulting from proximity to settlement areas.

Calculations on the 10 m either side of the pipeline route determined 22 hectares of forest and 15 hectares of agricultural field (hazel nut and green tea) were damaged and detected three passages over landslide areas, 13 passages over highways, and 9 passages over streams. The average distance from the pipeline of 18 settlements measured 470 m. The optimal route would damage 20 hectares of forest and 15 hectares of agricultural fields, crossing 11 highways and 6 streams. It lies 870 m from settlement areas (Table 3).

Results

Construction costs of the optimal route run nearly 23% lower than construction costs of the constructed route. The lower number of streams, highway passages, and passages over landslide areas in OR than in CR drives the cost difference. Other factors affecting cost include elevation differences, geological elements, and soil structure. OR passes through fewer forests and biologically important fauna areas than CR. The shorter route length also causes less damage to the environment. OR also maintains a 1,430-m distance from tourist areas. ♦

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SUBFACTOR WEIGHTS

Table 2

Land use		Soil	
Agriculture	6	Agriculture, excellent	9
Forest	7	Agriculture, good	8
Rocky	8	Agriculture	7
Pasture	3	Nonagriculture	3
Settlement	9	Stream	
Elevation, %		River	9
<20	1	Stream	7
20-30	2	Wide-Brook	5
30-40	3	Brook	3
40-50	4	Branch	1
50-60	5	Road	
60-70	7	Level I, highway	9
>70	9	Level II, express way	8
Geology		Level III, district road	7
Alv, v,pl	3	Level IV, asphalt county road	6
Kru5a, kru5b	5	Level V, dirt county road	3
Ev, jkr, jlh	6	Level VI, seasonal road	1
Kru1, kru3	7	Protected area	
Kru2, kru4	8	Level I	∞
Gama2, gama3	9	Level II	7
Landslide		Level III	5
Active	9	Flora, fauna	
Old	8	Flora	∞
Potential	7	Fauna	∞

ROUTE EVALUATION

Table 3

Cost type	Examination criteria	Current route	Optimal route
Economic	Pipeline length	46,121 m	44,735 m
	Study area (10 m either side of line)	92.24 hectares	89.11 hectares
	Road passages	13	11
	Stream passages	9	6
	Active landslide passages	2	0
	Inactive landslide passages	1	0
	Protected fauna passages	3	1
	Rocky area passages	9,812 m	2,620 m
Environment	Pasture, grassland, brush passages	12,300 m	19,420 m
	Agricultural field passages (hazel nut, green tea, etc.)	7,700 m	7,900 m
	Forest passages	11,210 m	10,090 m
	Other	5,099 m	4,705 m
Sociologic	Average distance to settlement	470 m	870 m
	Archaeological site passages	0	0
	Average distance to tourism center	640 m	1,430 m
	Cost, US \$	4.52 million	3.48 million

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The company says its database provides coverage of all the deepwater reservoirs currently either in production or sanctioned for development. And it provides continually updated reservoir performance metrics, analogs, lessons learned, and regional knowledge.

Reservoir KB is provided on a subscription service as a hosted portal to a group of 18 operators in the region. Updates are presently provided on an annual basis, this



date including fresh data and information covering 2007 as well as updated analysis. Reservoir KB has grown, together with deepwater activity in general, to 182 fields and 379 reservoirs from an initial coverage of 26 fields.

The database features a map-based interface that lets users select a field then drill down to reservoir and well information or navigate into the system using a search engine. The photo above shows a zoomable user interface.

Source: **Knowledge Reservoir LLC**, 1800 West Loop South, Suite 1000, Houston, TX 77027.

New laser range measuring, tracking tool

The new PD 4 laser range meter measuring device provides accurate measurements at the push of a button.

With a sensor-automated backlight and simple, one-button operation for measuring and tracking functionality, the PD 4 measures distances with laser precision of $\pm 1/2$ in. from 7.8 in. up to 230 ft. Requiring only one person to operate, the laser range meter is able to measure quickly and safely in places where access is difficult, the firm points out.

The unit has durable rubber protection surrounding its edges, creating a dust-tight, water-resistant casing. Tested in up to 2 ft of water for up to 8 hr, the durability of the PD 4 allows the meter to withstand the harshest of job site conditions, the company says.

Under lifetime service, the PD 4 will be serviced quickly and reliably, if needed, with no additional cost for 2 years.

Source: **Hilti Inc.**, 5400 S. 122nd E. Ave., Tulsa, OK 74146.

S e r v i c e s / S u p p l i e r s

Enventure Global Technology LLC,

Houston, has named Joseph Waiter vice-president, general counsel, and secretary, and Kevin Knight vice-president and chief financial officer. Waiter brings more than 25 years of legal experience with private-equity and publicly held companies. He has been involved in commercial transactions, business alliances, and mergers and acquisitions on a global basis throughout his career. He also has significant experience in managing intellectual property matters and litigation. Waiter earned his bachelor's



Waiter



Knight

degree from King's College in Wilkes-Barre, Pa. and his law degree from George Mason University School of Law in Virginia. Knight's career spans more than 20 years of financial and accounting experience in many industries,

including oil and gas, food, and construction businesses. A British citizen with permanent US residency privileges, he is a graduate of Durham University and was qualified as a Chartered Accountant in 1988 by the Institute of Chartered Accountants in England & Wales. Knight is an international affiliate member of the Texas Society of Certified Public Accountants.

Enventure is a leading provider of solid expandable technology solutions for the energy industry. The company has operations in North America, the Middle East, Asia-Pacific, South America, Europe, and the Far East.

Chart Industries Inc.,

Cleveland, has appointed James H. Hoppel Jr. to the newly created position of vice-president, corporate development. Previously, Hoppel was chief accounting officer and controller. He will be responsible for identifying and evaluating potential acquisitions as well as developing and implementing integration strategies.

Hoppel joined Chart in 2004 as corporate controller and became its chief accounting officer in 2006, in connection with the company's initial public offering. He has previous mergers and acquisitions experience with W.W. Holdings LLC, PricewaterhouseCoopers LLP, and Century Business Services Inc. Kenneth J. Webster has taken over as chief accounting officer and controller at Chart. Previously, he was director, internal audit. In his new role, Webster will be responsible for all accounting, internal and external reporting, as well as forecasting and analysis. In his previous role, he was closely involved in Chart's 2007 successful implementation of the required Sarbanes-Oxley 404 regulations. Prior to joining Chart in 2006, Webster was assistant controller at Mittal Steel USA Inc. and predecessor steel companies. He began his career at Arthur Andersen LLP in 1985 and is a Certified Public Accountant.

Chart is a leading global manufacturer of highly engineered equipment used in the production, storage, and end-use of hydrocarbon and industrial gases.

Statistics

IMPORTS OF CRUDE AND PRODUCTS

	— Districts 1-4 —		— District 5 —		— Total US —		
	3-14 2008	3-7 2008	3-14 2008	3-7 2008	3-14 2008	3-7 2008	*3-16 2007
	1,000 b/d						
Total motor gasoline	901	710	—	35	901	745	803
Mo. gas. blending comp.....	579	341	—	35	579	376	351
Distillate	289	123	5	10	294	133	221
Residual	418	264	—	—	418	264	595
Jet fuel-kerosine	323	258	66	—	298	258	238
Propane-propylene	259	164	26	23	285	187	193
Other	353	1,309	(14)	44	339	1,353	968
Total products.....	3,031	3,169	83	147	3,114	3,316	3,369
Total crude	8,468	9,614	1,000	934	9,468	10,548	10,418
Total imports.....	11,499	12,783	1,083	1,081	12,582	13,864	13,787

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

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



OGJ CRACK SPREAD

	*3-21-08	*3-23-07	Change	Change,
	\$/bbl			%
SPOT PRICES				
Product value	118.95	77.04	41.91	54.4
Brent crude	105.09	60.85	44.24	72.7
Crack spread	13.87	16.19	-2.32	-14.3

FUTURES MARKET PRICES

	*3-21-08	*3-23-07	Change	Change,
	\$/bbl			%
One month				
Product value	116.32	77.74	38.58	49.6
Light sweet crude	105.36	59.38	45.98	77.4
Crack spread	10.96	16.36	-7.40	-40.3
Six month				
Product value	114.07	76.69	37.38	48.7
Light sweet crude	101.05	64.30	36.78	57.2
Crack spread	13.02	12.39	0.63	5.1

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

PURVIN & GERTZ LNG NETBACKS—MAR. 21, 2008

Receiving terminal	Liquefaction plant					
	Algeria	Malaysia	Nigeria	Austr. NW Shelf \$/MMbtu	Qatar	Trinidad
Barcelona	8.49	6.21	7.58	6.10	6.87	7.50
Everett	8.59	6.28	8.17	6.34	6.89	8.93
Isle of Grain	9.07	6.58	8.80	6.45	7.27	8.36
Lake Charles	6.67	4.55	6.42	4.74	5.07	7.37
Sodegaura	6.69	8.42	6.63	8.43	7.68	5.64
Zeebrugge	7.88	6.39	7.46	6.32	6.77	7.43

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 —			— Fuel oils —		Propane-propylene
		Total	Blending comp. ¹	Jet fuel, kerosine 1,000 bbl	Distillate	Residual	
PADD 1	12,459	65,000	34,093	8,656	37,291	15,137	2,764
PADD 2	64,123	59,004	19,775	7,905	30,941	1,297	7,964
PADD 3	167,336	69,799	33,514	13,456	29,081	16,264	15,613
PADD 4	13,168	6,667	2,071	450	2,649	285	1,849
PADD 5	54,673	32,040	25,864	8,906	13,528	4,956	—
Mar. 14, 2008.....	311,759	232,520	115,317	39,373	113,490	37,939	27,190
Mar. 7, 2008.....	311,626	235,967	117,287	38,925	116,400	36,564	27,609
Mar. 16, 2007².....	329,260	210,489	94,829	39,397	118,729	35,072	25,863

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

REFINERY REPORT—MAR. 14, 2008

District	REFINERY OPERATIONS		REFINERY OUTPUT				
	Gross inputs 1,000 b/d	Crude oil inputs 1,000 b/d	Total motor gasoline	Jet fuel, kerosine	Fuel oils		Propane-propylene
					Distillate 1,000 b/d	Residual	
PADD 1	1,373	1,372	1,625	89	498	108	59
PADD 2	2,732	2,709	2,284	172	754	47	201
PADD 3	7,287	7,207	3,038	641	1,912	305	649
PADD 4	524	521	276	14	149	9	1126
PADD 5	2,703	2,618	1,455	467	498	162	—
Mar. 14, 2008.....	14,619	14,427	8,678	1,383	3,811	631	1,035
Mar. 7, 2008.....	14,818	14,622	9,030	1,479	3,891	707	1,165
Mar. 16, 2007².....	15,023	14,789	8,803	1,367	4,145	558	1,079
	17,436 operable capacity		83.8% utilization rate				

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

OGJ GASOLINE PRICES

	Price ex tax 3-19-08	Pump price* 3-19-08 c/gal	Pump price 3-21-07
(Approx. prices for self-service unleaded gasoline)			
Atlanta.....	288.0	327.7	253.7
Baltimore.....	275.7	317.6	251.8
Boston.....	270.9	312.8	248.9
Buffalo.....	274.8	334.9	267.1
Miami.....	290.4	340.7	268.9
Newark.....	265.9	298.8	242.2
New York.....	254.7	314.8	259.8
Norfolk.....	277.0	314.6	241.1
Philadelphia.....	270.1	320.8	266.1
Pittsburgh.....	268.4	319.1	255.8
Wash., DC.....	284.3	322.7	254.1
PAD I avg.....	274.6	320.4	255.4
Chicago.....	299.0	349.9	278.1
Cleveland.....	267.4	313.8	246.4
Des Moines.....	277.4	317.8	244.2
Detroit.....	266.7	315.9	255.1
Indianapolis.....	275.9	320.9	251.5
Kansas City.....	277.7	313.7	243.2
Louisville.....	298.7	335.6	248.4
Memphis.....	277.9	317.7	241.1
Milwaukee.....	262.6	313.9	254.2
Minn.-St. Paul.....	269.4	309.8	252.1
Oklahoma City.....	278.3	313.7	242.2
Omaha.....	273.5	319.9	253.4
St. Louis.....	269.1	305.1	241.6
Tulsa.....	269.9	305.3	240.1
Wichita.....	260.9	304.3	244.3
PAD II avg.....	275.0	317.1	249.2
Albuquerque.....	272.4	308.8	247.0
Birmingham.....	280.0	318.7	242.1
Dallas-Fort Worth.....	274.2	312.6	243.1
Houston.....	273.3	311.7	241.0
Little Rock.....	275.4	315.6	243.1
New Orleans.....	273.3	311.7	242.4
San Antonio.....	267.3	305.7	234.2
PAD III avg.....	273.7	312.1	241.9
Cheyenne.....	271.1	303.5	228.4
Denver.....	277.2	317.6	242.4
Salt Lake City.....	272.3	315.2	230.6
PAD IV avg.....	273.5	312.1	233.6
Los Angeles.....	288.0	346.5	307.7
Phoenix.....	264.3	301.7	259.1
Portland.....	298.1	341.4	283.8
San Diego.....	299.9	358.4	315.5
San Francisco.....	312.1	370.6	335.4
Seattle.....	298.0	350.4	283.2
PAD V avg.....	293.4	344.8	297.4
Week's avg.....	277.2	320.8	255.4
Feb. avg.....	259.5	303.1	228.0
Jan. avg.....	260.9	304.5	225.3
2008 to date.....	264.0	307.6	—
2007 to date.....	189.5	233.1	—

*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

	3-14-07 c/gal	3-14-07 c/gal	
Spot market product prices			
Motor gasoline		Heating oil	
(Conventional-regular)		No. 2	
New York Harbor.....	251.34	New York Harbor.....	322.13
Gulf Coast.....	257.72	Gulf Coast.....	317.08
Los Angeles.....	273.45	ARA.....	318.58
Amsterdam-Rotterdam- Antwerp (ARA).....	234.72	Singapore.....	316.90
Singapore.....	268.36	Residual fuel oil	
Motor gasoline		New York Harbor.....	174.12
(Reformulated-regular)		Gulf Coast.....	178.29
New York Harbor.....	250.59	Los Angeles.....	214.84
Gulf Coast.....	280.20	ARA.....	192.16
Los Angeles.....	277.45	Singapore.....	188.35

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

BAKER HUGHES RIG COUNT

	3-21-08	3-23-07
Alabama.....	5	3
Alaska.....	7	12
Arkansas.....	40	44
California.....	35	31
Land.....	34	30
Offshore.....	1	1
Colorado.....	117	101
Florida.....	0	0
Illinois.....	0	0
Indiana.....	2	2
Kansas.....	12	15
Kentucky.....	11	11
Louisiana.....	139	191
N. Land.....	46	57
S. Inland waters.....	17	26
S. Land.....	27	43
Offshore.....	49	65
Maryland.....	0	0
Michigan.....	1	2
Mississippi.....	13	19
Montana.....	10	22
Nebraska.....	0	0
New Mexico.....	73	72
New York.....	7	8
North Dakota.....	56	32
Ohio.....	12	15
Oklahoma.....	205	178
Pennsylvania.....	21	14
South Dakota.....	2	1
Texas.....	879	818
Offshore.....	7	8
Inland waters.....	2	1
Dist. 1.....	30	26
Dist. 2.....	39	35
Dist. 3.....	57	56
Dist. 4.....	84	91
Dist. 5.....	190	160
Dist. 6.....	125	125
Dist. 7B.....	35	47
Dist. 7C.....	53	52
Dist. 8.....	123	102
Dist. 8A.....	23	27
Dist. 9.....	35	29
Dist. 10.....	76	59
Utah.....	40	44
West Virginia.....	23	27
Wyoming.....	63	74
Others—NV-4; TN-3; VA-4.....	11	99
Total US.....	1,784	1,745
Total Canada.....	328	246
Grand total.....	2,112	1,991
Oil rigs.....	341	281
Gas rigs.....	1,433	1,459
Total offshore.....	57	74
Total cum. avg. YTD.....	1,767	1,733

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	3-21-08		3-23-07	
		Percent footage*	Rig count	Percent footage*	Rig count
0-2,500	84	3.5	65	4.6	66
2,501-5,000	108	52.7	108	62.9	108
5,001-7,500	202	22.2	227	21.5	215
7,501-10,000	438	2.7	425	3.2	425
10,001-12,500	426	4.4	419	3.5	419
12,501-15,000	302	0.3	270	0.3	270
15,001-17,500	102	—	103	0.9	103
17,501-20,000	77	—	74	—	74
20,001-over	37	—	35	—	35
Total	1,776	7.7	1,726	8.7	8.7
INLAND	30		41		41
LAND	1,691		1,631		1,631
OFFSHORE	55		54		54

*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

	'3-21-08	'3-23-07
	1,000 b/d	
(Crude oil and lease condensate)		
Alabama.....	16	20
Alaska.....	707	747
California.....	658	665
Colorado.....	45	39
Florida.....	6	5
Illinois.....	27	27
Kansas.....	97	97
Louisiana.....	1,353	1,307
Michigan.....	14	16
Mississippi.....	51	61
Montana.....	94	92
New Mexico.....	164	163
North Dakota.....	114	114
Oklahoma.....	172	171
Texas.....	1,348	1,336
Utah.....	45	51
Wyoming.....	144	146
All others.....	63	72
Total.....	5,118	5,129

¹OGJ estimate. ²Revised.

Source: Oil & Gas Journal.
Data available in OGJ Online Research Center.

US CRUDE PRICES

\$/bbl*	3-21-08
Alaska-North Slope 27°.....	85.76
South Louisiana Sweet.....	105.00
California-Kern River 13°.....	95.45
Lost Hills 30°.....	97.70
Southwest Wyoming Sweet.....	93.34
East Texas Sweet.....	97.75
West Texas Sour 34°.....	90.75
West Texas Intermediate.....	95.25
Oklahoma Sweet.....	98.25
Texas Upper Gulf Coast.....	94.75
Michigan Sour.....	91.25
Kansas Common.....	97.25
North Dakota Sweet.....	91.75

*Current major refiner's posted prices except North Slope lags 2 months. 40° gravity crude unless differing gravity is shown.

Source: Oil & Gas Journal.
Data available in OGJ Online Research Center.

WORLD CRUDE PRICES

\$/bbl ¹	3-14-08
United Kingdom-Brent 38°.....	107.94
Russia-Urals 32°.....	103.39
Saudi Light 34°.....	102.64
Dubai Fateh 32°.....	97.11
Algeria Saharan 44°.....	107.79
Nigeria-Bonny Light 37°.....	108.37
Indonesia-Minas 34°.....	106.56
Venezuela-Tia Juana Light 31°.....	103.11
Mexico-Isthmus 33°.....	103.00
OPEC basket.....	104.08
Total OPEC ²	102.28
Total non-OPEC ²	102.90
Total world ²	102.56
US imports ³	99.76

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

US NATURAL GAS STORAGE¹

	3-14-08	3-7-08 bcf	3-14-07	Change, %
Producing region.....	490	512	578	-15.2
Consuming region east.....	640	706	721	-11.2
Consuming region west.....	183	180	229	-20.1
Total US.....	1,313	1,398	1,528	-14.1
Dec. 07.....	Dec. 06.....	Dec. 06.....	Change, %	
Total US².....	2,879	3,070	-6.2	

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

Statistics

IMPORTS OF CRUDE AND PRODUCTS

	— Districts 1-4 —		— District 5 —		— Total US —		
	3-21 2007	3-14 2007	3-21 2007	3-14 2007	3-21 2007	3-14 2007	*3-23 2006
	1,000 b/d						
Total motor gasoline	931	901	32	—	963	901	1,134
Mo. gas. blending comp.....	578	579	32	—	610	579	726
Distillate	237	289	5	5	242	294	349
Residual	425	418	—	—	425	418	571
Jet fuel-kerosine	41	232	—	66	41	298	263
Propane-propylene	135	259	22	26	157	285	188
Other	787	353	11	(14)	798	339	577
Total products.....	3,134	3,031	102	83	3,236	3,114	3,808
Total crude	7,976	8,468	922	1,000	8,898	9,468	9,632
Total imports.....	11,110	11,499	1,024	1,083	12,134	12,582	13,440

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

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



OGJ CRACK SPREAD

	*3-28-08	*3-30-07	Change	Change,
	\$/bbl			%
SPOT PRICES				
Product value	117.07	81.45	35.61	43.7
Brent crude	103.99	66.03	37.96	57.5
Crack spread	13.08	15.42	-2.34	-15.2

FUTURES MARKET PRICES

	*3-28-08	*3-30-07	Change	Change,
One month				
Product value	119.05	83.38	35.67	42.8
Light sweet crude	104.24	64.36	39.88	62.0
Crack spread	14.81	19.01	-4.20	-22.1
Six month				
Product value	115.02	81.65	33.37	40.9
Light sweet crude	101.28	68.32	32.96	48.2
Crack spread	13.74	13.33	0.42	3.1

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

PURVIN & GERTZ LNG NETBACKS—MAR. 28, 2008

Receiving terminal	Liquefaction plant					
	Algeria	Malaysia	Nigeria	Austr. NW Shelf	Qatar	Trinidad
Barcelona	8.49	6.23	7.58	6.11	6.87	7.49
Everett	8.54	6.28	8.11	6.33	6.94	8.87
Isle of Grain	8.83	6.39	8.56	6.28	7.06	8.12
Lake Charles	6.68	4.54	6.44	4.74	5.07	7.33
Sodegaura	6.76	8.42	6.63	8.43	7.68	5.64
Zeebrugge	8.22	6.49	7.80	6.37	7.11	7.77

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

CRUDE AND PRODUCT STOCKS

	Crude oil	— Motor gasoline —		Jet fuel, kerosine 1,000 bbl	— Fuel oils —		Propane-propylene
		Total	Blending comp. ¹		Distillate	Residual	
PADD 1	14,161	62,622	33,720	8,048	35,085	14,811	2,888
PADD 2	65,510	56,376	19,361	7,953	30,355	1,245	8,006
PADD 3	165,006	70,743	33,432	12,462	29,398	17,243	14,026
PADD 4	13,088	6,355	2,046	478	2,745	287	1,795
PADD 5	54,082	33,139	26,023	9,065	13,766	5,052	—
Mar. 21, 2008	311,847	229,235	114,582	38,006	111,349	38,638	25,715
Mar. 14, 2008	311,759	232,520	115,317	39,373	113,490	37,939	27,314
Mar. 23, 2007²	328,414	210,231	94,897	40,130	118,029	36,274	25,225

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

REFINERY REPORT—MAR. 21, 2008

District	REFINERY OPERATIONS		REFINERY OUTPUT				
	Gross inputs	Crude oil inputs	Total motor gasoline	Jet fuel, kerosine	Fuel oils		Propane-propylene
	1,000 b/d				Distillate	Residual	
					1,000 b/d		
PADD 1	1,399	1,397	1,621	79	477	130	58
PADD 2	2,808	2,789	2,165	183	804	32	180
PADD 3	7,002	6,945	2,906	643	1,887	318	661
PADD 4	542	539	292	17	164	13	112
PADD 5	2,575	2,465	1,555	440	526	150	—
Mar. 21, 2008	14,326	14,135	8,539	1,362	3,858	643	1,011
Mar. 14, 2008	14,619	14,427	8,678	1,383	3,811	631	1,035
Mar. 23, 2007²	15,139	14,956	8,928	1,399	4,047	662	1,061
	17,436 operable capacity		82.2% utilization rate				

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

Statistics

PACE REFINING MARGINS

	Jan. 2008	Feb. 2008	Mar. 2008	Mar. 2007	Change	Change, %
	\$/bbl					
US Gulf Coast						
West Texas Sour	9.20	11.78	12.34	16.43	-4.08	-24.8
Composite US Gulf Refinery	9.94	12.28	14.94	16.83	-1.89	-11.2
Arabian Light	10.04	9.17	11.69	17.50	-5.82	-33.2
Bonny Light	1.81	4.04	6.38	9.70	-3.32	-34.3
US PADD II						
Chicago (WTI)	5.32	5.02	9.65	16.48	-6.84	-41.5
US East Coast						
NY Harbor (Arab Med)	10.68	8.20	8.17	13.26	-5.09	-38.4
East Coast Comp-RFG	7.58	7.73	10.39	13.34	-2.96	-22.1
US West Coast						
Los Angeles (ANS)	6.36	12.69	13.18	29.31	-16.13	-55.0
NW Europe						
Rotterdam (Brent)	0.43	1.46	0.85	2.20	-1.35	-61.4
Mediterranean						
Italy (Urals)	1.75	4.32	6.17	6.13	0.04	0.7
Far East						
Singapore (Dubai)	1.89	2.73	2.70	4.05	-1.35	-33.3

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

US NATURAL GAS BALANCE DEMAND/SUPPLY SCOREBOARD

	Jan. 2008	Dec. 2007	Jan. 2007	Jan. 2008-2007 change	Total YTD 2008	Total YTD 2007	YTD 2008-2007 change
	bcf						
DEMAND							
Consumption	2,613	2,393	2,456	157	2,613	2,393	220
Addition to storage	68	64	56	12	68	56	12
Exports	78	93	70	8	78	70	8
Canada	50	64	41	9	50	41	9
Mexico	25	25	24	1	25	24	1
LNG	3	4	5	-2	3	5	-2
Total demand	2,759	2,550	2,582	177	2,759	2,519	240
SUPPLY							
Production (dry gas)	1,695	1,713	1,590	105	1,695	1,713	-18
Supplemental gas	2	4	6	-4	2	6	-4
Storage withdrawal	892	633	740	152	892	740	152
Imports	380	394	394	-14	380	394	-14
Canada	352	369	337	15	352	337	15
Mexico	NA	4	4	-4	NA	4	-4
LNG	28	21	53	-25	28	53	-25
Total supply	2,969	2,744	2,730	239	2,969	2,853	116

NATURAL GAS IN UNDERGROUND STORAGE

	Jan. 2008	Dec. 2007	Nov. 2007	Jan. 2007	Change
	bcf				
Base gas	4,232	4,234	4,238	4,215	17
Working gas	2,055	2,879	3,456	2,379	-324
Total gas	6,287	7,113	7,694	6,594	-307

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

US HEATING DEGREE-DAYS

	Feb. 2008	Feb. 2007	Normal	2008 % change from normal	Total degree-days July 1 through Feb. 29			% change from normal
					2008	2007	Normal	
New England	1,052	1,244	1,094	-3.8	4,555	4,471	4,802	-5.1
Middle Atlantic	976	1,190	1,015	-3.8	3,939	3,968	4,364	-9.7
East North Central	1,185	1,347	1,095	8.2	4,662	4,725	4,869	-4.3
West North Central	1,247	1,286	1,112	12.1	5,147	5,026	5,197	-1.0
South Atlantic	455	619	522	-12.8	1,958	2,096	2,248	-12.9
East South Central	606	765	642	-5.6	2,596	2,811	2,872	-9.6
West South Central	354	457	426	-16.9	1,718	1,907	1,924	-10.7
Mountain	77	745	760	-89.9	3,718	3,830	3,858	-3.6
Pacific	478	464	454	5.3	2,327	2,212	2,271	2.5
US average*	753	869	755	-0.3	3,208	3,259	3,411	-6.0

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

WORLDWIDE NGL PRODUCTION

	Dec. 2007	Nov. 2007	12 month average		Change vs. previous year	Change vs. previous Volume, %
			2007	2006		
	1,000 b/d					
Brazil	88	88	85	86	-2	-2
Canada	656	668	689	676	12	1.8
Mexico	379	364	396	427	-32	-7.4
United States	1,823	1,868	1,776	1,738	38	2.2
Venezuela	200	200	200	200	—	—
Other Western Hemisphere	205	207	205	216	-11	-4.9
Western Hemisphere	3,351	3,394	3,350	3,344	6	0.2
Norway	298	316	285	287	-3	-0.9
United Kingdom	188	174	146	153	-7	-4.5
Other Western Europe	10	10	10	10	—	-2.1
Western Europe	496	500	441	450	-10	-2.1
Russia	423	424	426	417	9	2.3
Other FSU	160	160	160	160	—	—
Other Eastern Europe	15	14	15	17	-3	-15.2
Eastern Europe	598	599	604	594	7	1.1
Algeria	349	347	342	310	32	10.3
Egypt	70	70	70	73	-3	-4.1
Libya	80	80	80	86	-6	-7.0
Other Africa	188	188	187	191	-5	-2.4
Africa	687	685	679	660	18	2.8
Saudi Arabia	1,427	1,427	1,427	1,427	—	—
United Arab Emirates	250	250	250	250	—	—
Other Middle East	871	871	870	905	-35	-3.8
Middle East	2,548	2,548	2,547	2,582	-35	-1.3
Australia	65	68	74	81	-7	-9
China	180	180	180	180	—	—
India	—	—	3	41	-37	-92.2
Other Asia-Pacific	173	174	176	185	-9	-4.6
Asia-Pacific	417	422	433	486	-53	-11
TOTAL WORLD	8,098	8,148	8,050	8,116	-6.7	-0.8

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

OXYGENATES

	Jan. 2008	Dec. 2007	Change	YTD 2008	YTD 2007	Change
	1,000 bbl					
Fuel ethanol						
Production	15,818	15,161	657	15,818	11,621	4,197
Stocks	10,674	10,509	165	10,674	8,593	2,081
MTBE						
Production	1,731	1,823	-92	1,731	1,797	-66
Stocks	1,342	1,015	327	1,342	2,215	-873

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

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Climate bill seen raising gas use, lowering supply

Climate-change legislation in the US Senate would boost demand for natural gas while limiting supply, according to analyses by two industry groups.

The Climate Stewardship and Innovation Act sponsored by Sens. Joseph Lieberman (I-Conn.) and John McCain (R-Ariz.) would raise gas demand by an average 14%/year against reference-case levels during 2020-30, warned the Natural Gas Council in

The Editor's Perspective

by Bob Tippee, Editor

a Mar. 11 letter to lawmakers (OGJ Online, Mar. 12, 2008).

NGC challenged a US Energy Information Administration assertion that the legislation could lower gas use. It said EIA assumed construction of 145 nuclear plants by 2030 and argued the number more likely would be 25.

Since the council began its study, the Lieberman-McCain bill has evolved into the Climate Security Act, with Sen. John Warner (R-Va.) replacing McCain as lead cosponsor.

Like its predecessor, the newer bill would impose a declining cap for greenhouse gas emissions, enforced with tradable allowances. Emission targets are more aggressive in the newer version of the legislation, which the Environment and Public Works Committee passed last December.

If NGC is right, the new legislation, with its toughened emissions targets, would raise gas demand by more than its study projects.

But the measure also would discourage investment in gas supply, warns the American Exploration & Production Council (AXPC).

The new law would require gas producers and processors to buy allowances for emissions by gas end-users, AXPC says. Contract and market structures would keep them from passing through all the new costs.

The effects: Lower profits on production, lower spending on gas drilling and development and, therefore, lower supply.

"Less natural gas supply in the face of increased demand will drive consumer prices sharply higher," the council says.

Political pressure is strong to cut emissions of greenhouse gases without regard to cost. But the costs, according to recent studies of climate-change legislation by the Environmental Protection Agency and National Association of Manufacturers working with the American Council for Capital Formation, are high.

The simultaneous if unintended suppression of gas supply and stimulation of demand can only drive overall costs even higher.

(Online Mar. 21, 2008; author's e-mail: bobt@ogjonline.com)

Market Journal

by Sam Fletcher, Senior Writer

Dollar value, crude prices fluctuate

The May benchmark US crude contract jumped above \$107/bbl Mar. 27 in the New York market following the bombing of a primary export oil pipeline in southern Iraq. It fell nearly \$2/bbl Mar. 28 when Iraqi officials said shipments through that system were back to normal. However, the price rebounded above \$106/bbl in early trading Mar. 31 as the US dollar slipped to a low of \$1.5895 against the euro. Long-term weakness of the dollar encouraged investors to hedge against the tumbling currency by buying crude and gold futures.

The attack was the first since 2004 on one of two main pipelines to Iraq's primary oil export terminal. Consequently, Paul Horsnell, Barclays Capital Inc., London, said, "We see events in Iraq as having taken a dangerous turn, with the stability of the southern oil system now starting to become a potential concern." He said, "Arguably considerations of the current geopolitical context have been playing a very minor role in oil trading strategies in recent months. Equally arguably, they perhaps should now be playing a larger role, given that the key geopolitical issues have remained raw and unresolved, and because the reduction in global crude inventories has meant less cover and more potential for volatility."

Although traders previously focused on the disruption of Iraq's oil exports from its northern fields, Horsnell said, "In the short term, the main danger has always been an unraveling of the precarious balance between competing factions and other interest groups in the south of Iraq. What has occurred so far is not yet a full unraveling, but it certainly represents a series of steps towards some potentially dangerous outcomes."

Oil at 'turning point'

Oil is "at a turning point" for a \$10/bbl move in either direction, depending on the strength or weakness of the dollar, said Olivier Jakob, Mar. 28, at Petromatrix, Zug, Switzerland. "The dollar index is now back to testing the record low support, and it will remain the trigger for West Texas Intermediate to test the record-high resistance. If the euro manages to climb towards \$1.60, WTI will break \$110/bbl towards \$115/bbl, and if the dollar manages to rebound like in mid-March, WTI will break \$100/bbl towards \$95/bbl." He said, "The gasoline crack is falling back to counter-seasonal values and will remain under pressure in any dollar rally."


As the dollar index gave back its gains during the week of Mar. 23-29, the May crude contract also "gave back its losses," Jakob said Mar. 31. "The euro is now facing a strong resistance line and the fate of crude oil will depend very much on whether the euro manages to break the \$1.585 resistance towards \$1.60. If the euro was to break towards \$1.60, then the correlation trade should push West Texas Intermediate to break \$110/bbl towards \$115/bbl. There is nothing really fundamental about that, but it is a prevailing technical trade."

Meanwhile, Paul Sankey, senior energy analyst for Deutsche Bank, New York, said it's not the speculators who are pushing up oil prices as many claim. "Oil supply is weak and global demand is strong, so the oil price is high," he said. "Supply spare capacity is terribly weak, almost scarily so." Sankey noted, "Spot delivery global gas (LNG) is trading at \$20/MMbtu, or \$200/bbl of oil equivalent. There are no 'speculators' in that market."

On Mar. 28, Adam Sieminski, global energy economist for Deutsche Bank, lifted his average price estimates to \$95.75/bbl for crude and \$9.25/MMbtu for natural gas in 2008 and to \$102.50/bbl and \$10.75/MMbtu in 2009. "These 2009 forecasts still leave upside room to prior peaks in both oil and gas when adjusted for inflation and income growth," he said.

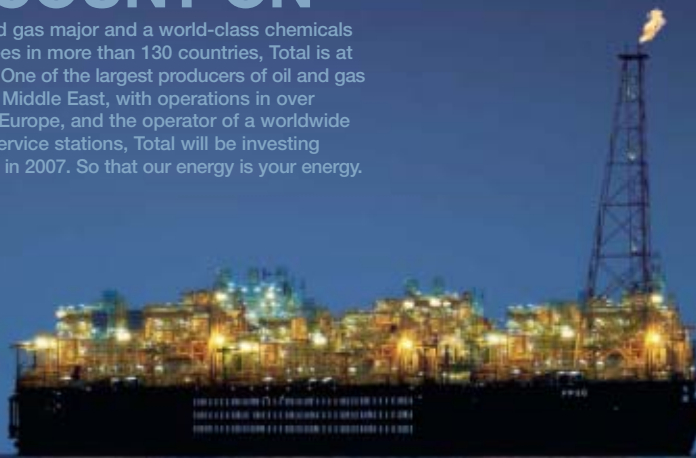
Sieminski said, "World oil markets are starting to loosen up 'fundamentally,' but the degree of tempering does not appear to be acute and corrective forces are taking time." His latest forecast for the global economy puts world gross domestic product growth for 2008 at 3.5%— "significantly less than the 4.6% forecast in December 2007, but not a recession," he said. "Higher prices and slower GDP are starting to erode demand; nevertheless, oil demand is expected to rise by at least 1 million b/d in 2008 and by even more than this in 2009," said Sieminski. "Current non-OPEC supply growth forecasts look for a rise of 1 million b/d for 2008 and 2009. This suggests that the 'call on OPEC' for 2008 and 2009 will not be under much, if any, downward pressure. Markets remain tight while geopolitical forces and asset allocation factors provide support."

(Online Mar. 31, 2008; author's e-mail: samf@ogjonline.com)



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Pipeline Protection Equipment & Services

Supplement to *Oil & Gas Journal* • April 7, 2008



Technology Forum



Is CP worthless?

What kind of question is this?

Most in the pipeline industry agree that cathodic protection (CP) is the smart way to provide backup corrosion protection on underground pipelines.

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

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

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

view a 10 minute explanation of the cathodic shielding process.

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

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

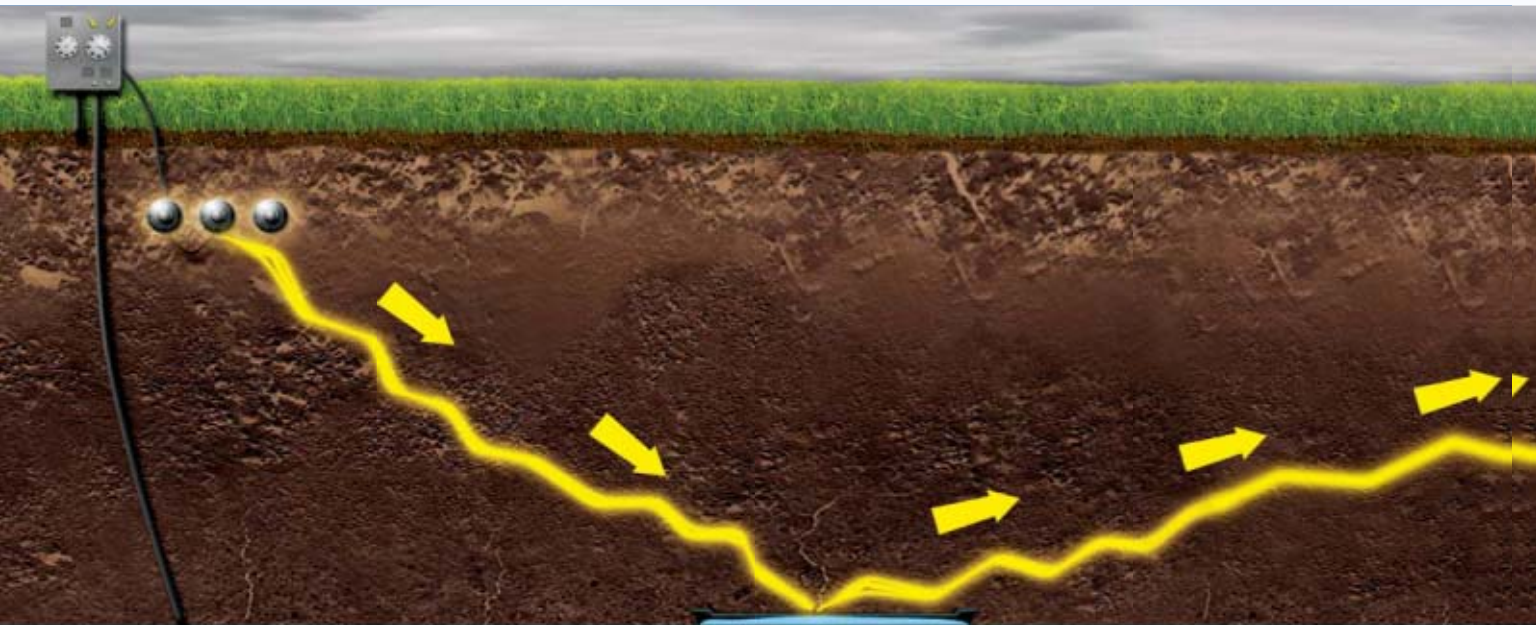
NACE SP0169-2007 states: "*Materials ... that create electrical shielding should not be used on the pipeline*"¹.

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

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

1. Visit polyguardproducts.com/failsafecoating.htm and review the large body of information about shielding problems.
2. Talk to operators who have used Polyguard's RD-6 system. (*There are many*) Ask them if they know of any serious corrosion or SCC ever found under RD-6. (*We don't, even after 19 years and thousands of installations.*)
3. Have someone in your organization attend the NACE course "*Coatings in Conjunction with Cathodic Protection*".

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



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Technology Forum

Pipeline Protection Equipment & Services

Supplement to *Oil & Gas Journal* • April 7, 2008

4 Capacities and new regulations top pipeline protection concerns

8 Pipeline protection technology challenges center on corrosion, inspection



Public concerns over pipeline integrity and safety flared anew following the March 2006 spill of 5,000 bbl of crude oil—the largest ever on Alaska's North Slope—from a gathering line, operated by BP Exploration (Alaska) Inc., that delivered North Slope crude to a gathering center for ultimate delivery to market via the Trans-Alaska Pipeline System (TAPS), shown on the cover. The gathering line leak was attributed to undetected corrosion, the No. 1 concern of industry's efforts to protect pipelines. TAPS photo courtesy of BP.

Oil & Gas Journal's Technology Forum series, produced by the O&G Group Publisher, supplements the magazine with topical features on cutting-edge technology, services, and equipment, all expertly written from the technology provider's perspective. Inquiries should be directed to Bill Wägenack, Group Publisher, at billw@pennwell.com.

Capacities and new regulations top pipeline protection concerns

Service and supply companies dedicated to pipeline protection are coping well with an array of concerns facing their industry.

Uncertainty over the initial impact of recent pipeline integrity and safety regulations is largely resolved, and industry has stepped up to the challenge, according to pipeline protection specialists interviewed for this supplement.

However, a new wave of regulatory standards looms, and questions have arisen anew.

But capacity remains a bigger question, in terms of adequate capacity for supplies and equipment and in human terms.

Regulatory concerns

Most noteworthy among regulatory concerns for the pipeline industry in recent years is the 2002 US Pipeline Safety Improvement Act (PSIA), which has ushered in a daunting new set of challenges for industry to meet in maintaining pipeline integrity.

PSIA requires enhanced maintenance programs and continuing integrity inspections of all pipelines in so-called high-consequence areas (HCAs). Initially, the industry had voiced concerns about its ability to meet PSIA deadlines for implementing effective pipeline integrity management programs. Of special concern are mandates to ascertain and maintain the integrity of the US's vast network of aging pipelines—much of it unpiggable.

Pipeline companies were required to identify all HCAs by Dec. 17, 2004, and to submit specific integrity management programs

to the Office of Pipeline Safety, a part of the US Department of Transportation's Research and Special Projects Administration.

All pipeline segments within HCAs must be inspected by Dec. 17, 2008, and, if required, remediation plans must be completed within that same timeframe. Non-HCA segments must be inspected by 2012. With certain exceptions, all pipeline segments must be reinspected at least every 7 years.

"While not specifically impacting pipeline protection, one of the biggest issues that is [impacting] and will impact the pipeline industry is the need to reduce emissions. This will affect many facets of the pipeline industry—from reducing emissions of compressor and pump drivers to prohibiting the venting of hydrocarbons to the atmosphere and eliminating fugitive emissions from pipelines."



— Andy Barden, BJ Process & Pipeline Services

"With the implementation of regulations requiring integrity management plans for pipeline operators, most operators have completed their first round of assessments and addressed any problems observed," notes Tom Bubenik, director of pipeline integrity for CC Technologies, a DNV company. "The second round of assessments is coming up in the near future and will bring a whole new set of questions and concerns, leaving operators wondering how to quantify the changes and how to proceed with this new set of data.

"If an assessment finds corrosion has increased or decreased 15%, operators need to know how this information affects the integrity of their system and what changes should be made to their integrity management program given this information.

"In order to properly serve pipeline operators, it is the challenge of consultants, such as CC Technologies...to find solutions for integrating all of this data and interpreting the meaning and effects, as well as degradation rates,

"With the implementation of regulations requiring integrity management plans for pipeline operators, most operators have completed their first round of assessments and addressed any problems observed. The second round of assessments is coming up in the near future and will bring a whole new set of questions and concerns, leaving operators wondering how to quantify the changes and how to proceed with this new set of data."

— Tom Bubenik, CC Technologies

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which is what we are continually striving to do.”

But for the moment, there are no major regulatory issues facing the pipeline industry, according to Andy Barden, division technical manager, BJ Process & Pipeline Services Co. “On a global basis, the inspection of pipelines is not typically regulated, but rather controlled by the individual pipeline operators,” he says. “In the US, the regulations concerning pipeline inspection are now well established and by and large are being met satisfactorily by the inspection companies.”

On the environmental front, however, Barden cites a significant concern regarding pipeline emissions.

“While not specifically impacting pipeline protection, one of the biggest issues that is [impacting] and will impact the pipeline industry is the need to reduce emissions,” he says. “This will affect many facets of the pipeline industry—from reducing emissions of compressor and pump drivers to prohibiting the venting of hydrocarbons to the atmosphere and eliminating fugitive emissions from pipelines.”

Education and training

The greatest concern regarding regulatory and environmental issues really is the education and training of pipeline service companies and regulators alike, contends Richard Norsworthy, director, Lone Star Corrosion Services division of Polyguard Products Inc.

“The industry has grown so rapidly in recent years, the experienced folks are being hired by the new companies so quickly that it is difficult to find experienced replacements,” he points out. “Service companies have been especially hard hit by this problem, as major companies are hiring the better service company employees, which leaves them in a continuous training mode.”

Educating and training their employees, as well as the education of regulators and those using these services and supplies, should be of the utmost concern, Norsworthy claims.

“I see companies ignoring the real causes of external corrosion, while embracing certain technology that only allows the problem to continue. In some cases, companies simply do not want to spend the money and time to correct the external corrosion problems before they require more expensive repairs, leaks, or more serious complications.”

— Richard Norsworthy, Polyguard Products

“There are many topics not properly taught, understood, or [are] influenced by commercial advantage,” he says. “The basic principles of pipeline protection from external corrosion are many times overlooked for what is considered to be newer, faster, or more technically advanced.”

“I see companies ignoring the real causes of external corrosion, while embracing certain technology that only allows the problem to continue. In some cases, companies simply do not want to spend the money and time to correct the external corrosion problems before they require more expensive repairs, leaks, or more serious complications.”

“The ILLI industry is required not only to meet these demands [for services created by aging infrastructure]—i.e., successfully managing to navigate through this hostile environment without incident, all the time collecting integrity data—but do so under the constant and continuous scrutiny that is today’s regulatory environment.”

— Keith O’Connor, Weatherford Pipeline & Specialty Services



Skills gap

The lack of qualified personnel is having an impact on construction of new pipelines, according to Barden.

“In the new construction business, the demand for new pipelines is certainly stretching the industry beyond its existing capacity,” he says. “The big issue is a shortage of skilled labor rather than equipment.”

Bubenik believes that industry can keep up with growing demand for skilled workers, “but only through well-planned recruitment, training, and retention programs.”

“The workforce is aging, and there is fierce competition for talent. It is important to recruit, train, and retain this talent in order to be able to continue to supply the best possible service to our customers and keep up with growing demands.”

“It is also important to transfer the knowledge and experience gained by more-experienced staff members to less-experienced staff members.”



Other capacity concerns

Beyond the human element, there remain other concerns about capacity of the pipeline protection service and supply industry, especially given an outlook for growing demand for new pipeline mileage, while simultaneously trying to address the heightened emphasis on pipeline integrity and safety of the existing aging infrastructure.

“The plant coating capacity worldwide is under severe strain, which can delay or threaten the quality of some projects.”

— John Muncaster, Polyguard Products



His colleague at Polyguard, John Muncaster, president, Polyguard Products Inc., takes that view a step further, adding, “The plant coating capacity worldwide is under severe strain, which can delay or threaten the quality of some projects.

“To a limited extent, corrosion coatings such as Polyguard’s can relieve this shortage. Our products are mostly used on girth

welds/field joints but can be used on the full line and indeed have been on large rehabilitation projects.”

“For the pipeline inspection business, the big surge in activity was caused by the introduction of new regulations governing pipeline integrity in the US several years ago,” Barden notes. “For a couple of years this caused a shortfall in availability of tools to meet the increased demand.

“Recently, several new players have entered the market, and all the major players have increased their capacity to the point that supply is now able to meet the demand in the market.

“The addition of new mileage in terms of new construction will not have a major impact on the inspection business, as these will not typically be inspected for 5 years, and the market will be able to keep pace with this advance notice.”

Nevertheless, it is the demand for inline inspection (ILI) services for the existing—and aging—infrastructure that is a primary concern to Keith O’Connor, vice-president, Weatherford’s Pipeline & Specialty Services group, which provides magnetic flux leakage and ultrasonic ILI services.

“Not only does this infrastructure exert tremendous demands on the actual physical tool design process—due in part to the inherent construction practices of the past, where fitting type, bend radius, and consistent pipe diameter were not seen as issues—but also the myriad types and morphologies of anomalies resident in these pipelines,” he says.

“The ILI industry is required not only to meet these demands—i.e., successfully managing to navigate through this hostile environment without incident, all the time collecting integrity data—but do so under the constant and continuous scrutiny that is today’s regulatory environment.”

Norsworthy notes that the pipe coating industry is also having a problem with keeping up with demand, especially with pipe needed quickly.

“Coating suppliers such as ours will be placed under demands to keep up with supply, which means more shifts, etc.,” he points out. “With the aging infrastructure, field-applied coating systems will be much more in demand, especially if more stringent regulations are placed in effect.”

Readiness

Donald Brown, president, CC Technologies, couches the debate over the skills gap and capacity shortages weighed against increased demand and heightened environmental and safety concerns in a big-picture context.

“In addition to what has been discussed, it must be noted that a pipeline is generally one small, yet significant, part of a large, complicated supply chain transporting valuable raw materials, products, or fuel from the supplier to the consumers,” he says. “The loss of availability or reliability of the line may be detrimental to more than the operator, but how often are the potential consequences on the whole supply chain considered? How are the suppliers affected, and what about the consumers at the other end of the network?

“This is a concern for the future, as many of these networks are at capacity. Redundancy costs money, and the ultimate impact of an outage may be felt by more than those directly affected.

“With this in mind, are we ready for failure? If it happens, do we know how to recover, by what means, and how quickly? How prepared is the industry to continue operating in a demonstrably safe and responsible way? These are factors that go beyond technology, but all the same, are real concerns of operators, shareholders, stakeholders and society alike.”]

Pipeline system reliability “is a concern for the future, as many of these networks are at capacity. Redundancy costs money, and the ultimate impact of an outage may be felt by more than those directly affected. With this in mind, are we ready for failure? If it happens, do we know how to recover, by what means, and how quickly? How prepared is the industry to continue operating in a demonstrably safe and responsible way? These are factors that go beyond technology, but all the same, are real concerns of operators, shareholders, stakeholders and society alike.”

— Donald Brown, CC Technologies

Pipeline protection technology challenges center on corrosion, inspection

Technology challenges in the area of pipeline protection are centered on the areas of corrosion detection and inhibition, remote monitoring and risk assessment, and inspecting unpiggable lines.

There are many issues to be addressed in pipeline inspection and integrity management, notes Andy Barden, division technical manager, BJ Process & Pipeline Services Co. "Although the detection of general corrosion in standard wall thickness pipe is generally well understood, with several different technologies available to detect this, there are many other issues that cause pipeline failure where solutions are not so readily available or the technology is not yet reliable enough" he says. "Stress corrosion cracking, corrosion around the weld area, and the interaction of corrosion and other defects with mechanical damage are all challenging areas requiring new development and better understanding."

Barden also points out that in the offshore pipeline sector, the inspection of very heavy wall pipes using tools that have to be launched and received from subsea systems in ultradeep water "will provide a whole host of additional challenges over and above those we see in the onshore industry."

In addition, "The inability to pig many pipelines is still a major issue, and new technologies that can address this problem are still required, whether this be multidiameter tools, tethered tools, crawling tools, or other, completely new technology."

Cathodic protection

Industry is delivering innovations in the area of cathodic protection (CP), according to Steve Schroder, General Manager of Baker Hughes's Pipeline Management Group (PMG). "Historically, pipeline operators have relied on aboveground surveys to validate the effectiveness of their cathodic protection systems," he notes. "This year, Baker Hughes PMG is introducing a new technology that allows operators to measure the effectiveness of their cathodic protection systems from inside the pipeline with an inline inspection tool.

"This innovative technology—CPCM™ In-line inspection services—allows operators to gather actual CP current readings from the internal pipe surface and actually 'see' how it is being distributed.

"Making sure that your system design and operation is optimized, as well as identifying exactly where future monitoring should be performed, maximizes efficiency and lowers the overall cost of ownership. Since the CPCM™ tool travels through the pipeline, this innovative approach also removes the barrier of right-of-way access. This is a truly revolutionary technology that is a game-changer in the field of cathodic protection monitoring."

"The inability to pig many pipelines is still a major issue, and new technologies that can address this problem are still required, whether this be multidiameter tools, tethered tools, crawling tools, or other, completely new technology."

— Andy Barden, BJ Process & Pipeline Services



CP and coatings

John Muncaster, president, Polyguard Products Inc., takes issue with a common industry practice he considers an example of "basic corrosion principles being overlooked": the widespread use of "shielding corrosion coatings" (solid polyethylene or polypropylene film backings) on pipelines with cathodic protection systems.

"It seems, frankly, stupid to invest large amounts of money in cathodic protection systems, then to use as the primary corrosion coating a solid film backed material that blocks—because of its high electrical resistance properties—the protective current supplied by the CP system," he claims.

"It sounds stupid to do that, but it is being done worldwide, particularly outside of North America. Maybe it continues because nobody outside of authors in technical journals (until Polyguard) has tried to point out this contradiction."

The basic nonshielding corrosion coating is fusion bonded epoxy (FBE), which is used worldwide for main line coating, Muncaster notes. "Polyguard has a product (RD-6) that is a nonshielding corrosion coating and that is a CP-compatible alternative to FBE for use on girth welds, rehabilitation, and repair areas of new or existing pipelines."

Muncaster would like to see pipeline coatings that can truly resist high line operating temperatures: "Over the years, line operating temperatures have been rising as wells become deeper."



STEPPING UP

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— John Muncaster, Polyguard Products



he says. "'Big Oil' has already used these products on insulated arctic pipelines, and for other oil and gas corrosion applications."

Inline inspection

Assessing the physical properties of the pipeline by way of inline inspection surveys will continue to evolve, notes Schroder.

"At this time, it is usually the most efficient means to collect

metal-loss data," he says. "As with the CPCM™ technology... it is quite possible that measurements made from within the pipeline will be extended to include other data sets, which should assist the operator's ability to proactively detect possible threats to pipeline integrity other than metal loss.

Schroder also believes that while collecting metal loss data will remain a key requirement to assess pipeline integrity, the industry will begin to move toward monitoring changes to pipeline properties over time.

"Products such as corrosion growth studies will improve the effectiveness of mitigation activities for both internal and external threats," he says.

Barden thinks that a reliable tool for stress corrosion cracking monitoring will have a big impact on the market, especially in North America.

"Although several tools are available to detect this, none has achieved the level of accuracy and reliability required by the industry," he points out. "In addition, analytical models that can look at the interaction of many different features and issues—be they corrosion, cracking, geometric, or the operating parameters of the pipeline—could have a significant impact on reducing pipeline failures."

Smart pigs will be critical in locating areas of internal and external pipeline corrosion and stress corrosion cracking to help meet more-stringent regulations and for enhanced public safety, contends Norsworthy.

"These tools, along with the proper use of cathodic protection and coatings, will be critical in saving the existing infrastructures and preserving the new systems," he says. "These tools will also show us the results of the coating decisions we made in the past and are making today and confirm if that decision was correct or not."

Remote monitoring

Remote monitoring via sensors is another key area of technology innovation in the business of protecting pipelines.

CC Technologies (CCT), a DNV company, has partnered with Southwest Research Institute, Aginova, pipeline operators, and the US government to research sensors that will flow in the gas stream and detect the location of water, allowing for proper treatment at proper areas without the need for costly inspections and unnecessary treatment programs. The sensors are

His colleague at Polyguard, Richard Norsworthy, director, Lone Star Corrosion Services division of Polyguard Products Inc., sees a bright future for coatings that provide the end user with nonshielding properties if there is loss of adhesion, or disbondment.

"Disbonded coatings that shield cathodic protection from being effective is now the major cause of external corrosion on pipelines," he contends.

Muncaster notes that "there are some quite good coatings, such as two-part epoxies, which are widely used on pipelines but have not yet proven that they do not shield cathodic protection.

"Once again, since almost all lines now receive cathodic protection, it follows that all corrosion coatings should be compatible with CP. This means 'nonshielding.' There is mixed evidence as to whether two-part epoxies are compatible with CP.

"Certainly, an agreed-upon industry standard for determining CP compatibility of corrosion coatings is needed."

Norsworthy thinks that the most significant issue with cathodic protection will be the proposed revision of the NACE SP0169 document that covers external corrosion control of underground or submerged pipelines.

"If changed as proposed by some, the cost and implementation will be a significant cost for the industry, with very little gain in safety or corrosion control," he contends. "Most are only concerned about the CP criteria and seem to forget the other sections of the document that cover coatings and electrical isolation."

Muncaster adds, "It might be added that, because of Richard's concern that the pipeline operating companies are not, for several possible reasons, making their voice heard on the SP0169 update, Polyguard is sponsoring a blog where all interested parties can come together on equal terms and debate the issues."

The blog, at www.SP0169.com, was activated Mar. 17, in time for the National Association of Corrosion Engineers' Corrosion 2008 conference and exhibition in New Orleans, Mar. 16–20.

Another major corrosion challenge, Muncaster notes, involves insulated pipelines: corrosion under insulation.

"Polyguard is introducing a cutting-edge answer to this in our RG2400 series of patented corrosion gel pipeline treatments,"

PIPELINE PROTECTION EQUIPMENT & SERVICES

small spheres with wireless microcomputer and memory storage. A prototype of this sensor is in the development phase.

"Remote monitoring combined with risk assessment will also have great impact," contends Narasi Sridhar, director of DNV Research & Innovation USA. "As wireless technologies advance and sensors are becoming common, it is inevitable that remote monitoring will be used more and more in all phases of pipeline operations and maintenance.

However, remote monitoring by itself is insufficient, Sridhar points out, because the results of monitoring need to be converted to actionable decisions.

"Risk assessment is performed practically routinely these days, and risk assessment/management tools of various flavors are widely available to the industry," he says. "However, risk assessment alone is insufficient since there are often too many assumptions and uncertainties that go into risk assessment.

"Furthermore, many risk assessment techniques, especially risk-ranking techniques, cannot anticipate new failures since they are based on experiences of previous failures. The combined technologies of remote monitoring and risk assessment can overcome these difficulties.

"Along the same lines, we believe that inline inspection tools will have more sensors and different types of sensors, allowing for the integration of different types of data to help detect the condition of and thereby protect the pipeline."

Other innovations

Service and supply companies catering to the pipeline protection needs of operators cite other areas of technology innovation on the horizon.

Currently, CCT says it is leading research in several pipeline protection areas that it believes is cutting-edge and will have great future impact. One area of research for the company is the development of more environmentally friendly corrosion inhibitors that will help protect the pipeline while still meeting environmental regulations and garnering public approval.

Keith O'Connor, vice-president, Weatherford's Pipeline & Specialty Services group, cites as the frontier of pipeline protection those technologies that enable pipeline owners to identify anomalies and the effect they have on pipeline integrity.

"Weatherford is producing a direct stress measure tool, MAPS, that will not only allow the pipeline owners to see anomalies in the pipeline but to see stress caused by these anomalies," he says. "Today, such stresses cannot be detected by inline inspection tools."

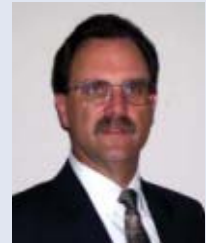
Weatherford promotes running baselines for all new pipeline construction projects. "These types of inspections can

provide the necessary 'as-is' condition overview of the pipeline as-laid and thus be a check on the pipeline contractor, but more importantly, they can be the foundation for any Integrity Management Plan.

"They can prove to be invaluable when comparing future inspections runs to each other so that anomalies that were pre-extant can be distinguished from those that are new; thus the anomaly classification and characterization process benefits greatly, creating a much better pipeline integrity picture."

While collecting metal loss data through inline inspection will remain a key requirement to assess pipeline integrity, the industry will begin to move toward monitoring changes to pipeline properties over time: "Products such as corrosion growth studies will improve the effectiveness of mitigation activities for both internal and external threats."

— Steve Schroder, Baker Hughes Pipeline Management Group



One of the most significant technical challenges facing providers of pipeline protection services is integrating the massive amounts of data, much of which has uncertainties, created from inspection and assessment programs and interpreting it in a useful fashion, according to Tom Bubenik, CCT director of pipeline integrity.

"We need to be able to manipulate and learn from this data in order to be able to predict future performance and design appropriate integrity management programs," he contends.

Another area of concern that has long bedeviled pipeline operators, detection and prevention of third-party damage, has become more important as the public increasingly encroaches on pipelines originally located in remote areas, says Sridhar.

"In fact, this has become such a concern that CCT/DNV is currently completing a study for the Pipeline Research Council International on possible prevention strategies for third-party damage," he points out. "Combining this issue with the fact that not all pipelines can be pigged and excavations are increasingly difficult means that various tools and techniques have to be developed to protect the pipeline and the public.

"Such technologies are being developed by CCT/DNV and others, including mobile sensors for locating water drop-out locations and fiber optic sensors to detect third-party damage or corrosion. But none of these tools are yet widely implemented.

"The various direct assessment methods address unpiggable pipelines, but they alone are insufficient. Sensors and monitoring methods are needed to confirm direct assessment."]

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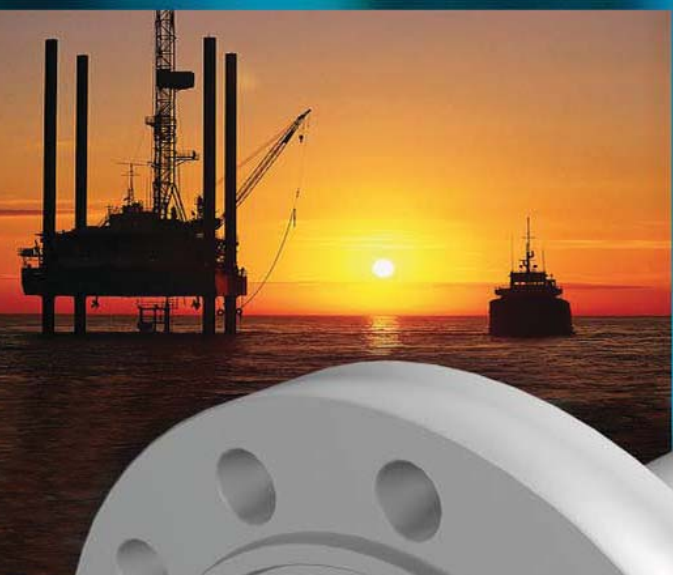
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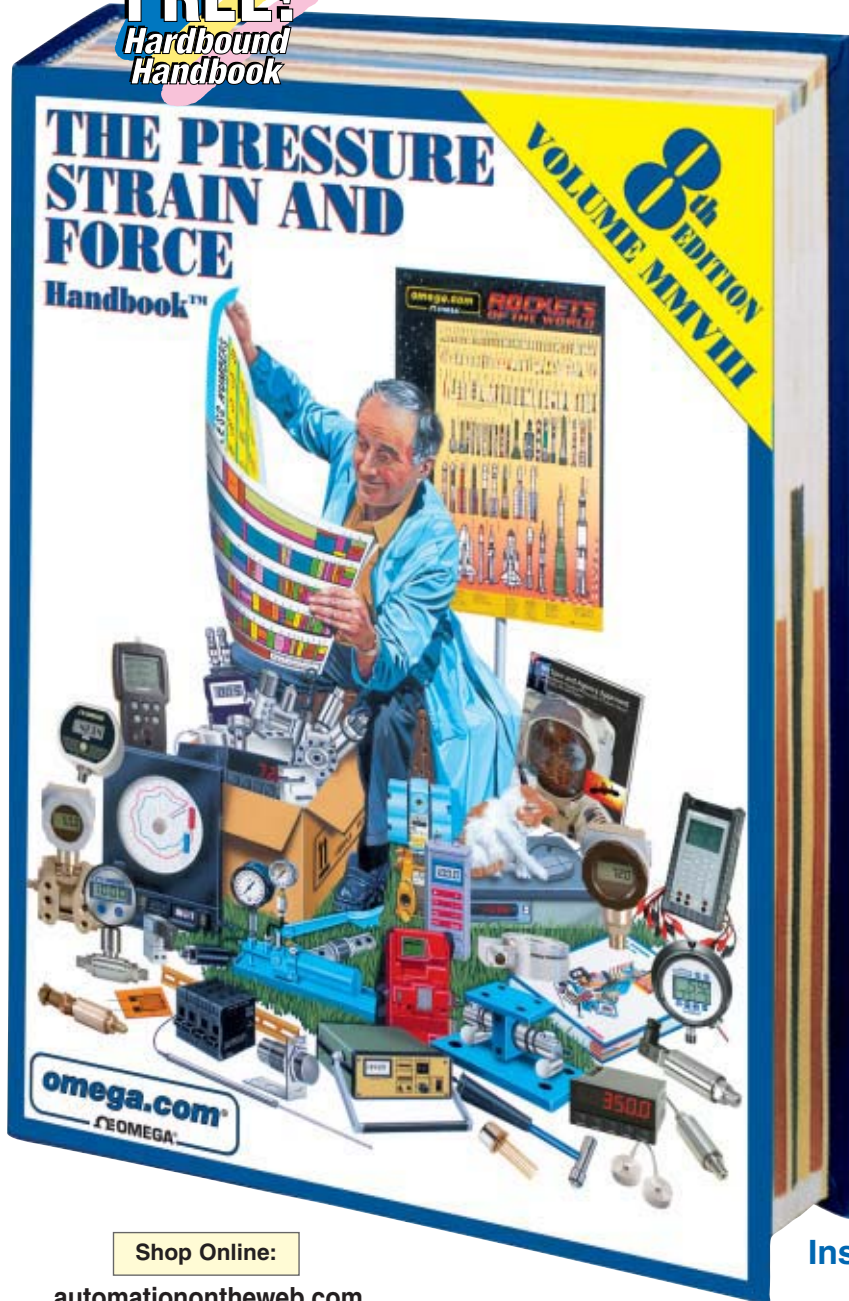
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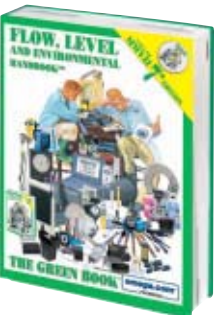
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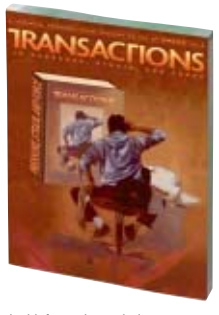


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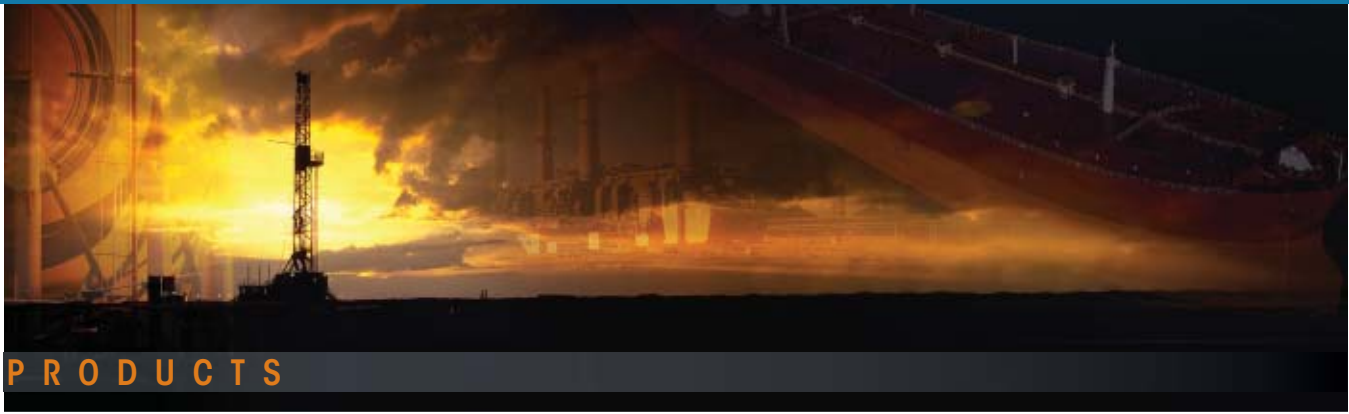
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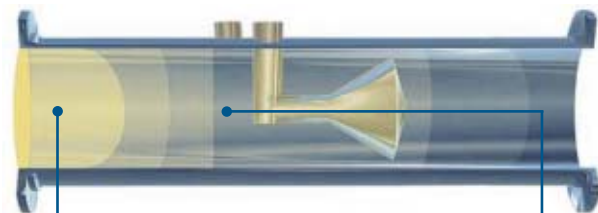
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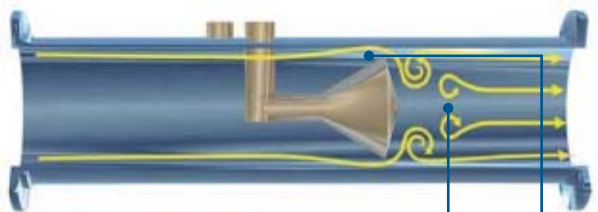
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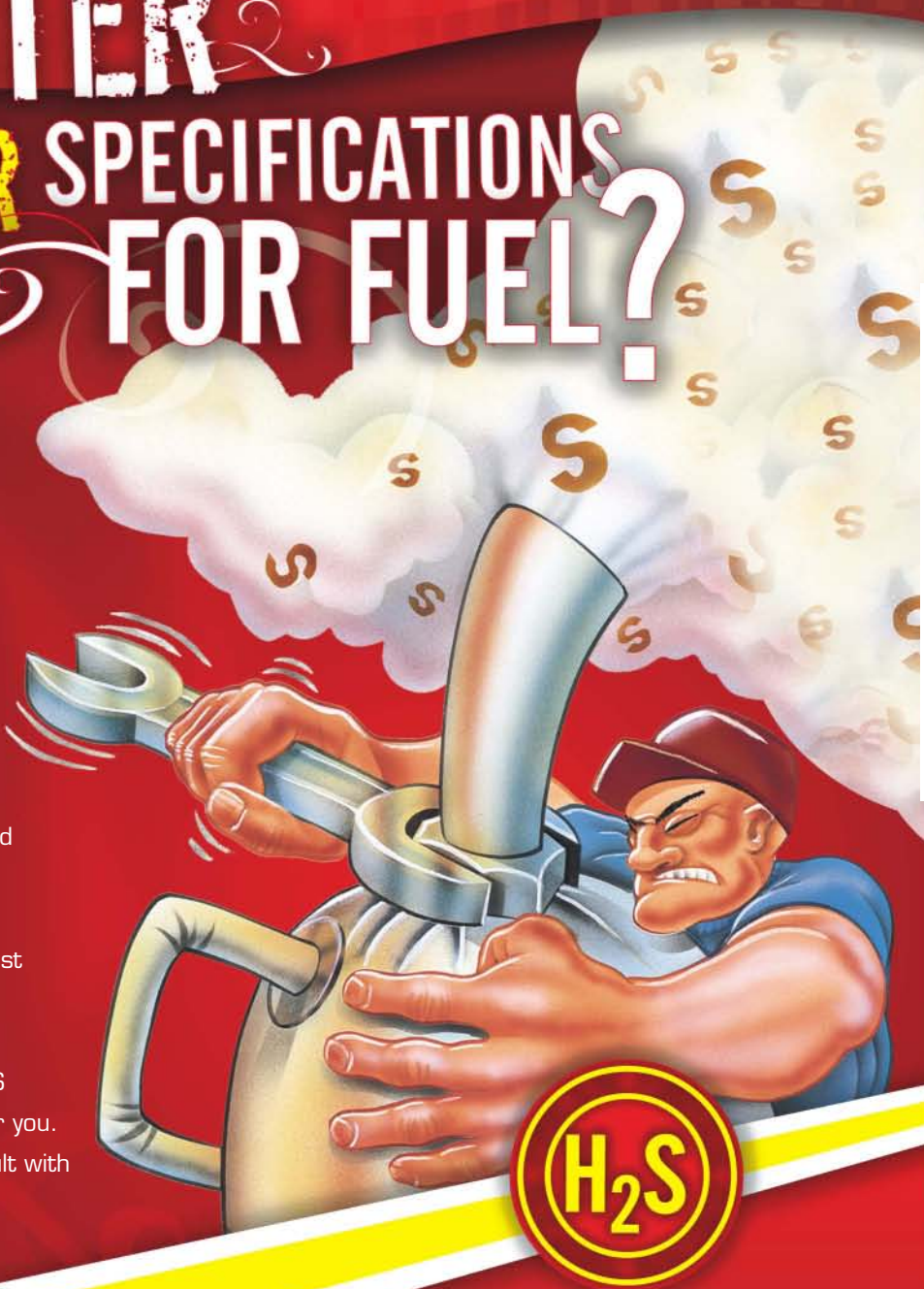
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Hi-Flow™ Control Valves

The Hi-Flow™ Series control valve is perfect for steam or flow control. The control valve features a removable seat for low cost replacement of wearing parts. Models are available from 1/2" to 4" in bronze, cast iron, or 316 SS and in 2-way or 3-way configurations.



from \$199.00

Series DPG-100 Digital Pressure Gage

Replace your outdated analog gages with the new DPG-100 Digital Pressure Gage. This unit possesses ±0.25% full scale accuracy, a 4-digit digital display with push-button backlight, stores peak and valley readings, auto-zero, and conversion of eleven engineering units simply by pushing a button. With all these features the DPG-100 is FM approved and comes in a robust NEMA 4X housing.

from \$139.00



Series SFI-100T Sight Flow Indicator/Transmitter

The SFI-100T incorporates a brass body and glass windowed sight flow indicator with optional outputs for flow indication. Available outputs are pulsed output proportional to flow, a push button field set flow switch, and a linear flow transmitter.



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Industrial Gage Line

Complete offering of industrial gages in stainless steel or Polypropylene housings. The full line includes gages for almost all industrial applications from dial sizes as small as 1" all the way up to 10" with several mounting and connection configurations. Full scale ranges available from 10 inches of water column all the way up to 20,000 psig.



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Series SAV-BT Angle Seat Valve

W. E. Anderson offers a broad range of angle bodied valves. Angle body valves offer a higher cycle life, are more compact, and less expensive than comparable ball valves. The SAV Series is available in brass or 316 SS with NPT, flanged, or sanitary clamp connections.



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Series CRF2 Capacitance Level Switch

The CLS2 provides a two-wire 4 to 20 mA output to indicate level of liquids, powders, and bulk materials. Unit comes with either a rigid or flexible probe depending application installation need and probe length required. Featured in the CRF2 is easy push button calibration of zero and span and an FEP covered probe ideal for use with corrosive media.



from \$79.00

Series 626/628 Industrial Pressure Transmitter

Accuracies of 1% or 0.25% full scale. Industrial housing allows easy wiring and installation by removing top and piping conduit to the 1/2" female NPT. Optional valve depressor, as the process connection, is perfect for preventing refrigerant loss.

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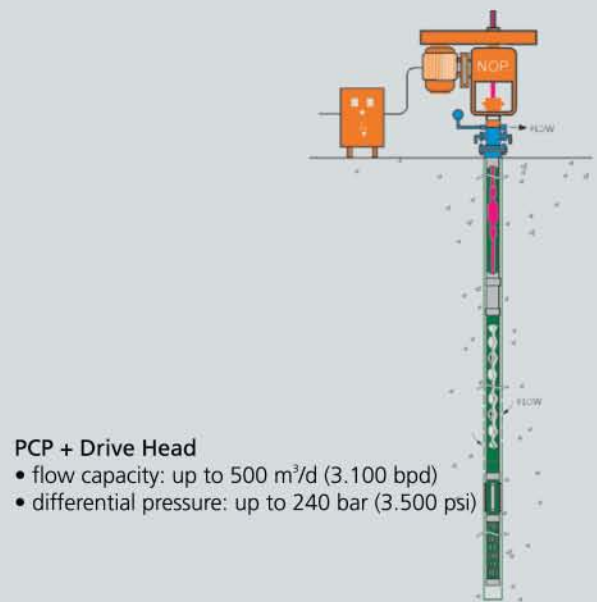
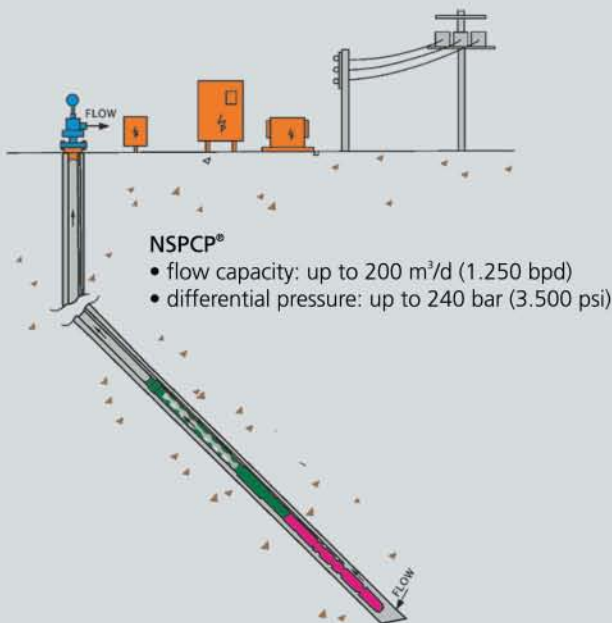
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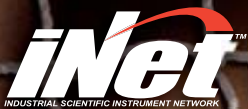
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www.babbittsteam.com
(See ad p 61)

■ **BellowsTech LLC**
386-615-7530
www.bellowstech.com
(See ad p 7)

Ceradyne Inc
714-549-0421
www.ceradyne.com

Circor Instrumentation Ltd
44-1895-206780

DREHMO (EMG) GmbH
49-7634-551320
www.drehmo.com

Emerson Process Management
641-754-3011
www.emersonprocess.com/fisher

Inserta Products Inc
215-643-0192
www.inserta.com

Ronk Electrical Industries Inc
217-563-8333
www.ronkelectrical.com

Smith Flow Control (USA)
859-578-2395
www.smithflowcontrol.com

Westlock Controls
201-794-7650
www.westlockcontrols.com

BALL VALVES

Alco Valves Inc
519-767-6655
www.alco-valves.com

Asahi/America Inc
781-321-5409
www.asahi-america.com

Autoclave Engineers
814-860-5706
www.autoclave.com

BORSIG Boiler Systems GmbH
49-40-303726-0
www.borsig.de

BORSIG Service GmbH
49-30-4301-01
www.borsig.de

Brush Wellman Inc
216-486-4200
www.brushwellman.com

Caddis Drilling Services Corp
780-955-3224
www.caddisdrillingservices.com

CoorsTek Inc
303-271-7000
www.coorstek.com

CORTEC Fluid Control
985-223-1966
www.uscortec.com

Emerson Process Management
641-754-3011
www.emersonprocess.com/fisher

Fluid Power Inc
215-643-0350

GF Piping Systems
714-731-8800
www.gfpiping.com

Hammond Valve
262-432-2702
www.hammondvalve.com

Hydac International
610-266-0100
www.hydacusa.com

Inserta Products Inc
215-643-0192
www.inserta.com

KF Industries
405-631-1533
www.circorenergy.com

Louisiana Valve Source Inc
337-216-8929
www.lavalve.com

Milwaukee Valve Co
262-432-2700
www.milwaukeevalve.com

■ **Omega Engineering Inc**
203-359-1660
www.omega.com
(See ad p 2, 3)

PBM Inc
724-863-0550
www.pbmvalve.com

Stewarts-USA
713-643-1022
www.stewartsusa.com

Swagelok Co
440-349-5934
www.swagelok.com

T3 Energy Services
713-996-4110
www.t3energy.com

TubeFit Engineers
91-22-28766982
www.tubefiteng.com

Tyco Flow Control
281-274-4400
www.tycoflowcontrol.com

Velan Inc
514-748-7743
www.velan.com

BLOCK-AND-BLEED VALVES

Alco Valves Inc
519-767-6655
www.alco-valves.com

BUTTERFLY VALVES

Asahi/America Inc
781-321-5409
www.asahi-america.com

Caddis Drilling Services Corp
780-955-3224
www.caddisdrillingservices.com

GF Piping Systems
714-731-8800
www.gfpiping.com

Hammond Valve
262-432-2702
www.hammondvalve.com

KF Industries
405-631-1533
www.circorenergy.com

Linde AG
49-89-7445-0
www.linde-engineering.com

Milwaukee Valve Co
262-432-2700
www.milwaukeevalve.com

Norriseal
713-466-3552
www.norriseal.com

■ **Omega Engineering Inc**
203-359-1660
www.omega.com
(See ad p 2, 3)

Spence Engineering Co
845-778-5566
www.spenceengineering.com

Tyco Flow Control
281-274-4400
www.tycoflowcontrol.com

Velan Inc
514-748-7743
www.velan.com

CHANGE-OVER VALVES

LESER GmbH & Co Kg
49-40-25165-100
www.leser.com

CHECK VALVES

Ceradyne Inc
714-549-0421
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Circor Instrumentation Ltd
44-1895-206780

CORTEC Fluid Control
985-223-1966
www.uscortec.com

Fluid Power Inc
215-643-0350

GF Piping Systems
714-731-8800
www.gfpiping.com

Hammond Valve
262-432-2702
www.hammondvalve.com

Hydac International
610-266-0100
www.hydacusa.com

Inserta Products Inc
215-643-0192
www.inserta.com

KF Industries
405-631-1533
www.circorenergy.com

Lexair Inc
859-255-5001
www.lexairinc.com

Milwaukee Valve Co
262-432-2700
www.milwaukeevalve.com

M&J Valve
281-469-0550
www.mandjvalve.com

Norriseal
713-466-3552
www.norriseal.com

PBM Inc
724-863-0550
www.pbmvalve.com

Schutte & Koerting
215-639-0900
www.s-k.com

Snap Tite Inc
814-438-3821
www.snap-titequickdisconnects.com

Spence Engineering Co
845-778-5566
www.spenceengineering.com

Velan Inc
514-748-7743
www.velan.com

CHOKES VALVES

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949-858-1877
www.ccivalve.com

CORTEC Fluid Control
985-223-1966
www.uscortec.com

GW Lisk Co
315-462-2611
www.gwlisk.com

Superior Technical Ceramics Corp
802-527-7726
www.ceramics.net

COMPRESSOR VALVES

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949-858-1877
www.ccivalve.com

ClearDrain
215-781-0500
www.cleardrainusa.com

Lexair Inc
859-255-5001
www.lexairinc.com

Pump Engineering Ltd
44-1903-730900
www.pumpeng.co.uk

CONTROL VALVES

Amot Controls
281-940-1800
www.amot.com

CCI-Control Components Inc
949-858-1877
www.ccivalve.com

Emerson Process Management
641-754-3011
www.emersonprocess.com/fisher

KOSO America
508-584-1199
www.kosoamerica.com

Lexair Inc
859-255-5001
www.lexairinc.com

Louisiana Valve Source Inc
337-216-8929
www.lavalve.com

M&J Valve
281-469-0550
www.mandjvalve.com

Motion Industries
205-956-1122
www.motionindustries.com

Norriseal
713-466-3552
www.norriseal.com

■ **Omega Engineering Inc**
203-359-1660
www.omega.com
(See ad p 2, 3)

Parker Fluid Control Division
860-827-2300
www.parker.com/fcd

Spence Engineering Co
845-778-5566
www.spenceengineering.com

T3 Energy Services
713-996-4110
www.t3energy.com

CRYOGENIC VALVES

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www.ccivalve.com

Clark-Cooper Division
856-829-4580
www.clarkcooper.com

Gems Sensors & Controls
860-747-3000
www.gemssensors.com

KOSO America
508-584-1199
www.kosoamerica.com

■ **Omega Engineering Inc**
203-359-1660
www.omega.com
(See ad p 2, 3)

Pump Engineering Ltd
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www.pumpeng.co.uk

Spence Engineering Co
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www.spenceengineering.com

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■ **BellowsTech LLC**
386-615-7530
www.bellowstech.com
(See ad p 7)

Burkert
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www.burkert-usa.com

■ **Omega Engineering Inc**
203-359-1660
www.omega.com
(See ad p 2, 3)

DIVERTER VALVES

Alco Valves Inc
519-767-6655
www.alco-valves.com

Everlasting Valve Co
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www.everlastingvalveusa.com

MAC Equipment
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www.macequipment.com

M&J Valve
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www.mandjvalve.com

PBM Inc
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www.pbmvalve.com

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856-829-4580
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GF Piping Systems
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Precision Engine Controls Corp
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www.precisioneng.com

EMERGENCY SHUTOFF VALVES

Amot Controls
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www.clarkcooper.com

KF Industries
405-631-1533
www.circorenergy.com

Morrison Bros Co
563-583-5701
www.morbros.com

Parker Fluid Control Division
860-827-2300
www.parker.com/fcd

FLOW CONTROL VALVES

Burkert
949-223-3177
www.burkert-usa.com

CORTEC Fluid Control
985-223-1966
www.uscortec.com

Fluid Line Products Inc
440-946-9470
www.fluidline.com

GW Lisk Co
315-462-2611
www.gwlisk.com

Hydac International
610-266-0100
www.hydacusa.com

■ **Omega Engineering Inc**
203-359-1660
www.omega.com
(See ad p 2, 3)

Parker Fluid Control Division
860-827-2300
www.parker.com/fcd

Precision Engine Controls Corp
858-792-3217
www.precisioneng.com

Pump Engineering Ltd
44-1903-730900
www.pumpeng.co.uk

Richter Chemie-Technik GmbH
49-2152-146-0
www.richter-ct.com

Spirax Sarco Inc
803-714-2000
www.spiraxsarco.com/us

GAS PROCESS VALVES

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859-255-5001
www.lexairinc.com

GATE VALVES
Alco Valves Inc
519-767-6655
www.alco-valves.com

Asahi/America Inc
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www.asahi-america.com

Caddis Drilling Services Corp
780-955-3224
www.caddisdrillingservices.com

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Hammond Valve
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Valves

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Milwaukee Valve Co
262-432-2700
www.milwaukeevalve.com

M&J Valve
281-469-0550
www.mandjvalve.com

SPX Process Equipment
262-728-1900
www.spxprocessequipment.com

Velan Inc
514-748-7743
www.velan.com

GLOBE VALVES

Alco Valves Inc
519-767-6655
www.alco-valves.com

Burkert
949-223-3177
www.burkert-usa.com

Caddis Drilling Services Corp
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www.caddisdrillingservices.com

Emerson Process Management
641-754-3011
www.emersonprocess.com/fisher

Hammond Valve
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Velan Inc
514-748-7743
www.velan.com

INSTRUMENT VALVES

Alco Valves Inc
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Autoclave Engineers
814-860-5706
www.autoclave.com

■ **Omega Engineering Inc**
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www.omega.com
(See ad p 2, 3)

PBM Inc
724-863-0550
www.pbmvalve.com

TubeFit Engineers
91-22-28766982
www.tubefiteng.com

KNIFE GATE VALVES

Tyco Flow Control
281-274-4400
www.tycoflowcontrol.com

LOCK-OUT/TAG-OUT

Smith Flow Control (USA)
859-578-2395
www.smithflowcontrol.com

Tech Products Inc
718-442-4900
www.techproducts.com

MANIFOLD VALVES

Alco Valves Inc
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www.alco-valves.com

CORTEC Fluid Control
985-223-1966
www.uscortec.com

Fluid Line Products Inc
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www.fluidline.com

GW Lisk Co
315-462-2611
www.gwlisk.com

TubeFit Engineers
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www.tubefiteng.com

NATURAL GAS

Asco Valve Canada
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www.ascovalve.ca

GW Lisk Co
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www.gwlisk.com

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www.autoclave.com

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KF Industries
405-631-1533
www.circorenergy.com

SPiR Star Ltd
281-664-7800
www.spirstar.com

TubeFit Engineers
91-22-28766982
www.tubefiteng.com

PETROCHEMICAL VALVES

Alco Valves Inc
519-767-6655
www.alco-valves.com

Clark-Cooper Division
856-829-4580
www.clarkcooper.com

Everlasting Valve Co
908-769-0700
www.everlastingvalveusa.com

Richter Chemie-Technik GmbH
49-2152-146-0
www.richter-ct.com

SWEDPARTS HAMBURG
49-40-319-60-28
www.hashem.de/swedparts

PINCH VALVES

Lexair Inc
859-255-5001
www.lexairinc.com

PIPELINE

Sub-one Technology
925-924-1020
www.sub-one.com

PISTON VALVES

Asco Valve Canada
519-758-2700
www.ascovalve.ca

PRODUCTION VALVES

Everlasting Valve Co
908-769-0700
www.everlastingvalveusa.com

Louisiana Valve Source Inc
337-216-8929
www.lavalve.com

REFINING VALVES

CCI-Control Components Inc
949-858-1877
www.ccivalve.com

DeltaValve
801-984-1000
www.deltavalve.com

Everlasting Valve Co
908-769-0700
www.everlastingvalveusa.com

RELIEF VALVES

■ **Cashco Inc**
785-472-4461
www.valveconcepts.com
(See ad p 55)

Circor Instrumentation Ltd
44-1895-206780

Enardo
918-622-6161
www.enardo.com

Farris Engineering
780-465-2262
www.cwfc.com

Fluid Line Products Inc
440-946-9470
www.fluidline.com

Graham Corp
585-343-2216
www.graham-mfg.com

LESER GmbH & Co Kg
49-40-25165-100
www.leser.com

Louisiana Valve Source Inc
337-216-8929
www.lavalve.com

Mercer Valve Co Inc
405-495-6533
www.mercervalve.net

Scott Specialty Gases
215-766-8860
www.scottgas.com

SAFETY VALVES

Advance Products & Systems Inc
337-233-6116
www.apsonline.com

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785-472-4461
www.valveconcepts.com
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Chalwyn Ltd
44-1202-715200
www.chalwyn.co.uk

DeltaValve
801-984-1000
www.deltavalve.com

Dexter Magnetic Technologies Inc
847-956-1140
www.dextermag.com/oil-gas.aspx

Farris Engineering
780-465-2262
www.cwfc.com

LESER GmbH & Co Kg
49-40-25165-100
www.leser.com

Mercer Valve Co Inc
405-495-6533
www.mercervalve.net

Richter Chemie-Technik GmbH
49-2152-146-0
www.richter-ct.com

Spence Engineering Co
845-778-5566
www.spenceengineering.com

Spirax Sarco Inc
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www.spiraxsarco.com/us

Westech Industrial Ltd
403-525-8803
www.westech-ind.com

SAMPLING VALVES

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www.everlastingvalveusa.com

Fluid Line Products Inc
440-946-9470
www.fluidline.com

PBM Inc
724-863-0550
www.pbmvalve.com

SOLENOID VALVES

Asco Valve Canada
519-758-2700
www.ascovalve.ca

Burkert
949-223-3177
www.burkert-usa.com

Clark-Cooper Division
856-829-4580
www.clarkcooper.com



Gems Sensors & Controls
860-747-3000
www.gemssensors.com

GW Lisk Co
315-462-2611
www.gwlisk.com

Hydac International
610-266-0100
www.hydacusa.com

Parker Fluid Control Division
860-827-2300
www.parker.com/fcd

SUBSEA VALVES

Snap Tite Inc
814-438-3821
www.snap-litequickdisconnects.com

SWING-CHECK VALVES

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281-469-0550
www.mandjvalve.com

Morrison Bros Co
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www.morbros.com

SPX Process Equipment
262-728-1900
www.spxprocessequipment.com

TANK BLANKETING VALVES

■ **Cashco Inc**
785-472-4461
www.valveconcepts.com
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Groth Corp
281-295-6800
www.grothcorp.com

TESTERS, VALVES

■ **Omega Engineering Inc**
203-359-1660
www.omega.com
(See ad p 2, 3)

VALVE CHAINWHEELS

■ **Babbitt Steam Specialty Co**
508-995-9534
www.babbittsteam.com
(See ad p 61)

Roto Hammer Industries Inc
918-446-3500
www.thomasregister.com/rotohammer

Smith Flow Control (USA)
859-578-2395
www.smithflowcontrol.com

SERVICES

Section lists companies offering one or more of 37 oil and gas-applicable specialties. A broad range of upstream, midstream, downstream, engineering, construction, and financial services are highlighted.

Like the Products section, the Guide's Services grouping lists companies alphabetically under each category. Quick-reference format with web addresses and telephone numbers is also provided in this section. Complete additional service company information is provided in the Companies section.

AIRCRAFT, CHARTER

Alta Flights Charters Inc
780-890-1330
www.altaflights.com

ASSET MANAGEMENT,
TRACKING

Robert J Beck and Associates
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Blue Sky Network
858-551-3894
www.blueskynetwork.com

Cantest Solutions Inc
403-912-9129
www.cantest.net

Equipment Maintenance Innovators
303-809-8663
www.emi-global.com

Harwood Capital Inc
510-658-6398
www.harwoodcapital.com

Insensys Oil and Gas Ltd
281-646-7400
www.subseasurveillance.com

Oil & Gas Petroleum Corp
212-222-1900
www.ogpetroleum.com

SkyWave Mobile Communications
613-836-4844
www.skywave.com

Western Land Services Inc
307-673-1817
www.westernls.com

BRAZING, HEATING
TREATING

TCR Engineering Services
91-22-65168200
www.tcreng.com

Wall Colmonoy Corp
248-585-6400
www.wallcolmonoy.com

CONSTRUCTION
SERVICES

Bender Shipbuilding & Repair Co
251-431-8000
www.bendership.com

CB&I
832-513-1000
www.cbi.com

CB&I Lummus
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www.lummus.cbi.com

CCI Inspection Services Inc
281-367-6740
www.cciinspection.com

■ **CH2M HILL**
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www.ch2mhill.com
(See ad Back Cover)

Deep Marine Technology Inc
713-896-8555
www.deepmarinotech.com

Eiffel
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www.eiffel.fr

IHC Hydrohammer Bv
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J Ray McDermott
281-870-5000
www.jraymcdermott.com

J Ray McDermott Asia Pacific Pte Ltd
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www.jraymcdermott.com

J Ray McDermott Middle East Inc
971-4-8835200
www.jraymcdermott.com

Linde AG
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www.linde-engineering.com

Matrix Service Co
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www.matrixservice.com

MENCK GmbH
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www.menck.com

Phoenix International Inc
985-399-0606
www.phnx-international.com

ROSEN Group
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www.roseninspection.net

Saipem America Inc
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www.saipem.eni.it

SCIMO BV European Representatives
31-186-693358
www.europeanrepresentatives.com

Seaway Heavy Lifting Engineering BV
31-793-63-77-00
www.shl.nl

Service Engenharia da Qualidade Ltda
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www.serviceengenharia.com

Smart Drilling GmbH
49-201-172-1454
www.smart-drilling.de

■ **Stallion Oilfield Service**
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www.stallionoilfield.com
(See ad p 9)

Subsea 7
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www.subsea7.com

Ultraflote Corp
713-461-2100
www.ultraflote.com

United Pipeline Systems
970-259-0354
www.unitedpipeline.com

Voith Industrial Services Engineering GmbH
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www.engineering.voithindustrial-services.de

CONSULTING SERVICES

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Crowley Marine Services Inc
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Diverse Technologies
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www.diverse-technologies.net

DNV Energy
44-1224-335000
www.dnv.com

Exploration Logistics Group plc
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www.exlogs.com

Lightning Eliminators & Consultants Inc
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Oil Plus Ltd
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Westlock Controls
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Wfn Strategies
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www.ectoffshore.se

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www.enventuregt.com

Geoservices SA
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Harwood Capital Inc
510-658-6398
www.harwoodcapital.com

IFP
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Namtvdt SealMaker Services A/S
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www.namtvdt.no

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www.ogpetroleum.com

Peterhead Port Authority
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www.peterheadport.co.uk

Phoenix International Inc
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www.phnx-international.com

■ **Stallion Oilfield Service**
713-528-5544
www.stallionoilfield.com
(See ad p 9)

Talen's Marine & Fuel
337-774-5480
www.talensmarine.com

Weatherford International Ltd
713-693-4000
www.weatherford.com

EDUCATION

Marinfloc Ab
46-304-606-300
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ENGINEERING SERVICES

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403-693-7530
www.advgeotech.com

ARLA Maschinenteknik GmbH
49-2267-6585-0
www.arla.de

BARTEC GmbH
49-7931-597-0
www.bartec-group.com

■ **BellowsTech LLC**
386-615-7530
www.bellowstech.com
(See ad p 7)

Boots & Coots International Well Control Inc
281-931-8884

CB&I
832-513-1000
www.cbi.com

CB&I Lummus
31-70-373-2010
www.lummus.cbi.com

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www.crowley.com

CYBERNETIX SA
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Deepwater Corrosion Services Inc
713-983-7117
www.stoprust.com

Deltamarin Ltd/Deltamarin Contracting Ltd
358-2-4336-300
www.deltamarin.com

Deutsch
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www.deutsch.net

DNV Energy
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www.dnv.com

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49-7634-551320
www.drehmo.com

ECT Offshore Service AB
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www.ectoffshore.se

Electrochem Commercial Power
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www.electrochempower.com

Engineering Software
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GeoCompany Tecnologia Engenharia & Meio Ambiente Ltda
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Oil Plus Ltd
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Servometer
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Solutia
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ESS
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■ **Gas Technology Products LLC**
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Ramboll Oil & Gas
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Rotronic Instrument Corp
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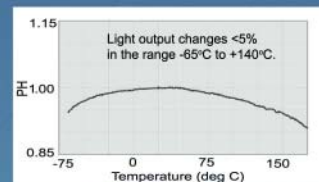
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IMT Partnership
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www.imtcorporation.com

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Namtded SealMaker Services A/S
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www.namtdedt.no

Nordseetaucher GmbH
49-4102-23180
www.nordseetaucher.de

Peterhead Port Authority
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www.peterheadport.co.uk

Phoenix International Inc
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www.phnx-international.com

Rig Consultoria e Treinamento Ltda
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ROSEN Group
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R STAHL Schaltgeräte GmbH
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www.stahl.de

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Submar Inc
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PETROCHEMICAL SERVICES

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Section carries the most extensive individual manufacturer or service supplier information, as provided by those firms. Nearly 1,000 companies are listed alphabetically with address, telephone, fax, email, web address, key personnel, and short company description.

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HVDC Div

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info.hvdc@se.abb.com, www.abb.com/hvdc

Contact: Sls/Mktg Mgr, Staffan Andersson
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918-338-4607, www.abb.com/totalflow

Contact: Inside Sls, Patty Asher
Offers measurement and automation technologies that enable oil and gas production, transmission and distribution customers improve their performance while lowering environmental impact. Operates in around 100 countries and employs about 109,000 people.

AC Dandy Products Ltd

4012-49 St, Wetaskiwin, Alberta, Canada T9A
2K1, 780-261-5300, toll-free: 800-642-2952,
FAX: 780-352-2249

Contact: Sls Mgr, Ray Hurcomb
Manufactures a line of electrical distribution products, such as standard and custom enclosures, phase converters, unit substations, oil well and parking lot controllers and power distribution gear, as well as pedestals for parking lots, marinas and RV parks. Offers rentals of quality custom electrical products through the Temp Power Division.

ACData Solutions

806 W Clearwater Loop, Suite C, Post Falls, ID
83854, 208-777-1166, toll-free: 800-890-2569,
FAX: 208-777-4466, info@acdata.com,
www.acdata.com

Contact: VP Sls/Mktg, Kelly Richards
Specializes in industrial grade surge suppression solutions that protect AC power, DC, OEM, Telco/Data and industrial Ethernet from power spikes caused by transient voltage currents and lightning. The on-site test facility, Ryan Labs, allows the company to design suppression products to meet customer needs worldwide.

Aclaro Softworks Inc

Suite 180, 11000 Richmond Ave, Houston, TX
77042, 713-781-2000, toll-free: 877-222-5276,
FAX: 713-781-2049, info@aclaro.com,
www.aclaro.com

Contact: Dir Sls/Mktg, Dale Morgan
Provides enterprise oil and gas software solutions for reserves reporting, planning, budgeting, capital allocation, financial reporting, operational reporting and performance management through its industry-leading petroLOOK systems. Has offices in Houston, Calgary and Aberdeen and clients in North America, South America, Europe and Africa.

Acromag Inc

30765 S Wixom Rd, PO Box 437, Wixom, MI
48393-7037, 248-295-0880, FAX: 248-624-9234,
sales@acromag.com, www.acromag.com

Contact: Inside Sales
Designs and manufactures measurements and control instrumentation products for manufacturing, military, transportation, utilities and scientific research industries. Signal conditioning products include transmitters, converters, isolators, alarms and computation modules. Network I/O modules support Ethernet, Modbus, LonWorks, 4-20 mA and Profibus protocols.

ACSA Underwater GPS

9 Europarc, 13590 Meyreuil, France,
33-442-58-54-52, FAX: 33-442-58-65-46,
www.underwater-gps.com

Contact: Pres, Hubert Thomas
Specializes in underwater applications of GPS. Developed the GIB (GPS Intelligent Buoys) systems, the only systems to offer true real-time D-GPS underwater tracking. Also develops underwater robots (gliders) oriented towards supervised concepts.

Actenum Corp

Suite 410 The Landing, 375 Water St, Vancouver,
British Columbia, Canada V5B 5C6,
604-681-1262, FAX: 604-687-1256,
info@actenum.com, www.actenum.com

Contact: VP Bus Dev, Owen Plowman
Provides software applications that optimize scheduling of equipment and activities. Maximize uptime and minimize costs by creating reliable schedules that are linked to key operational metrics. Interactively reschedule during daily operations to maximize the utility of assets and get the right equipment in the right place at the right time.

Action Instruments Inc

(sub of Eurotherm)

741 Miller Dr, Suite F1, Leesburg, VA 20175,
703-443-0000, FAX: 703-669-1300,
info@eurotherm.com,

www.eurotherm.com/actionio

Provides devices that set the standard in signal conditioning and provide solutions to manage and protect the integrity of process control signals.

ADACONN

538 Township Line Rd, Blue Bell, PA 19422,
215-643-1900, FAX: 215-643-4017,
mries@adaconn.com, www.adaconn.com

Offers products that include proprietary line of adapters and connectors. These products are used in industrial and mobile integrated hydraulic systems to save space, time and money, eliminate piping leaks and add value and integrity to a system.

Adalet

(div of Berkshire Hathaway)

Scott Fetzer Div

4801 W 150th St, Cleveland, OH 44135,
216-267-9000, FAX: 216-267-1681,
info@adalet.com, www.adalet.com

Contact: Mktg Mgr, Matthew R. Piecuch
Offers a line of enclosures and fittings to the hazardous and nonhazardous environment markets. Engineered enclosure systems include explosion-proof and stainless-steel junction boxes, motor-control enclosures, meter and instrument housings, increased safety terminal and control enclosures and thermal management systems.

Advanced Geotechnology*Weatherford Div*

1100 333-5th Ave SW, Calgary, Alberta, Canada
T2P 3T3, 403-693-7530, FAX: 403-693-7541,
info@advgeotech.com, www.advgeotech.com

Contact: Gen Mgr, Patrick McLellan

Provides consulting, software and training in Petroleum Geomechanics, including wellbore stability, sand production, casing and caprock integrity, fractured reservoir characterization and numerical modeling. Products include STABView well planning software and ROCKSBank, a worldwide rock mechanical and petrophysical database.

Advance Products & Systems Inc

PO Box 60399, Lafayette, LA 70596-0399,
337-233-6116, toll-free: 800-315-6009, FAX:
337-232-3860, sales@apsonline.com,
www.apsonline.com

Contact: Mktg/Sls Mgr, Darla Steinborn

Manufactures pipeline products and accessories with distributors throughout the world. Specializes in cathodic and corrosion protection for the water/wastewater and oil and gas industries.

Advantica

Holywell Park, New Ashby Rd, Loughborough, Leicestershire, LE11 3GR UK, 44-1509-282000, FAX: 44-1509-283131, info.uk@advanticagroup.com, www.advanticagroup.com

Contact: Exec Dir, Paul Shrieve

Provides a range of technical expertise, engineering services and software solutions designed to enhance safety and performance in the energy and water sectors. Deployed from regional headquarters in Europe, North America, the Middle East and China, the company's 6 employees serve client operations in more than 60 countries.

AEC Design Group/CADPIPE*(div of Orange Technologies)*

401 Professional Dr, Gaithersburg, MD 20879,
301-840-6938, toll-free: 888-239-9004, FAX:
301-840-7370, sales@cadpipe.com,
www.cadpipe.com

Contact: Sls Mgr, Jeff Winans

Develops CADPIPE and distributes AutoCAD-based software products for the process piping, commercial piping, HVAC and steel construction industries. Clients are involved in petrochemical, commercial, pulp and paper, utility, marine, biotechnology, pharmaceutical, food and beverage and the semiconductor markets.

Aecometric Corp

374 Ohio Rd, Richmond Hill, Ontario, Canada L4C 2Z9, 905-883-9555, FAX: 905-883-9578, sales@aecometric.com, www.aecometric.com

Contact: Sls Mgr, Mike Fenton

Designs and supplies industrial combustion equipment. Custom designs each application allowing the equipment to be tailored for the application. Common applications include sulphur recovery unit burners, petrochemical furnace burners, hot gas generators, rotary kiln burners, fuel handling systems, valve trains and integrated systems.

AEMC Instruments

200 Foxborough Blvd, Foxborough, MA 02035,
508-698-2115, FAX: 508-698-2118,
sales@aemc.com, www.aemc.com

Contact: App Eng, Howard Myers

Manufactures electrical test and measurement instruments, including power quality and harmonic meters, ground resistance testers, megohmmeters and insulation resistance testers, transformer ratiometers, digital and clamp-on multimeters, Data Loggers, current measurement probes, environmental testers and many more.

Aeration Industries International Inc

4100 Peavey Rd, Chaska, MN 55318,
952-448-6789, toll-free: 800-328-8287, FAX:
952-448-7293, aii@aireo2.com, www.aireo2.com

Contact: VP Mktg, Cheri Cohen

Manufactures surface aeration equipment; supplies high quality treatment systems and AIRE-O₂ Triton aerators and mixers to provide solutions for the challenging industrial wastewater industry, including the petroleum segment. Aerators have been delivered throughout the USA and in more than 92 countries.

AE Solutions

1200 Woodruff Rd, A21, PO Box 26566,
Greenville, SC 29607, 407-324-9389,
bud.adler@aesolns.com, www.aesolns.com

Contact: Dir Bus Dev, Bud Adler

Provides a process automation turnkey solutions company with experience in petroleum, petrochemical, chemical and paper industries. Specializing in safety instrumented systems (SIS) solutions including risk analysis and SIL determination. The company also has extensive experience in control system upgrades and platform migration with many major platforms. FM certified and UL approved panel shop.

Airgas Inc

259 N Radnor-Chester Rd, Suite 100, Radnor, PA 19087, 610-902-6033, FAX: 610-687-3187, customer.service@airgas.com, <http://airgas.com>

Contact: Airgas Product Information

Distributes industrial, medical and specialty gases, welding safety and related products.

Air Pollution Control*London Engineering Div*

8766 Tulare Dr, Huntington Beach, CA 92646,
714-536-6310, apcco@verizon.net,
<http://mysite.verizon.net/restkgfn/airpolcontrol>

Contact: Pres, Alex London

Provides full service engineering, from preliminary planning to design and construction for industry, allows serving individually and cost-effectively. Manufacturing patented efficiency London Falls scrubbers. Design/build engineering for industrial air pollution control systems, fire suppression and explosion prevention, energy conservation and recovery, noise-vibration attenuation, hygiene and safety.

Aker Kvaerner MH AA*(div of Aker Kvaerner)*

Dvergsnes, 4639 Kristiansand, Norway,
47-380-57000, FAX: 47-380-57250,
mh@akerkvaerner.com, www.akerkvaerner.com

Contact: VP Sls Dept, Olav Kvaale

Supplies and designs drilling equipment and drilling facilities. Full range of itemized equipment. Well intervention packages, drilling and mud control systems, landrags packages, workover rigs and products.

Alco Valves Inc*(div of Alco Valves Group)*

27 Monarch Rd, Unit 1, Guelph, Ontario, Canada N1K 1N4, 519-767-6655, FAX: 519-767-6740, canada@alco-valves.com, www.alco-valves.com

Contact: Sls Mgr, Mark Roberts

Manufactures industrial and instrumentation valves, such as ball, needle, gauge, check valves and instrument manifolds, as well as double block and bleed and process piping valves, mainly used in the oil and gas industry.

Alfa Laval Inc

Bow Valley Square IV #1800, 250-6th Ave SW, Calgary, Alberta, Canada T2P 3H7,
403-269-5300, FAX: 403-264-1470,
www.alfalaval.ca

Contact: Tech Sls Mgr, Stanley Foster

Provides specialized products and engineering solutions to help heat, cool and separate products, such as oil, water and chemicals.

Alignment Supplies Inc

1681 Lance Pointe Rd, Suite 2, Maumee, OH 43537, 419-887-5890, toll-free: 800-997-4467, FAX: 419-887-5893,

gknitz@alignmentsupplies.com,
www.alignmentsupplies.com

Contact: Sls Mgr, Paul Berberian
Distributes Easy-Laser alignment and measurement systems for shaft, pulley, bore, roll parallel and machine alignment, such as flatness, straight, square and spindle pointing direction.

Allegro Development

1445 Ross Ave, Suite 2200, Dallas, TX 75202,
214-237-8000, FAX: 214-526-7076,
info@allegrodev.com, www.allegrodev.com

Contact: Nat'l Sls Mgr, Jonathan English
Designs and delivers multicommodity energy trading, transaction and risk management software that gives refiners, petrochemical producers and risk managers fully scalable, flexible solutions that are easy to integrate, deploy and modify. Solutions help energy companies streamline operations, ensure regulatory compliance and improve decision-making across the front, middle and back office.

Allen Gears Ltd

Atlas Works, Station Rd, Pershore, WR10 2BZ UK, 44-1386-552211, FAX: 44-1386-554491, sales@allengears.com, www.allengears.com

Contact: Sls Mgr, David Freeman

Designs, manufactures and services epicyclic (planetary) and parallel shaft gearboxes for the petroleum, energy, oil and gas industries. Provides speed reduction or speed increasing solutions to drive pumps, compressors and generators worldwide.

Allied Fluid Conditioners Inc

536 Township Line Rd, Bldg B, Blue Bell, PA 19422, 215-643-0350, FAX: 215-643-4017, mries@alliedfluidconditioners.com, www.alliedfluidconditioners.com

Offers mobile heat exchanger solutions that are reliable, have quiet operation, long life, low cost and are lightweight. Standard units provide to 180,000 BTU/hr heat rejection. Compact aluminum cores with flat tube design and internal turbulators greatly improve heat transfer. Sealed DC fans are standard.

Allied Transmissions Ltd

235149 Ryan Rd, RR #5, Calgary, Alberta, Canada T2P 2G6, 403-279-9505, toll-free: 888-232-2203, FAX: 403-279-7362, sales@allied-transmission.com, www.allied-transmission.com

Contact: Purch, Virginia Smith-Jones

Serves as dealers for Allison automatic transmissions. Provides parts, sales and service.

Alloy Engineering Co*HQ Div*

844 Thacker St, Berea, OH 44017,
440-243-6800, FAX: 440-243-6489,
sales@alloyengineering.com,
www.alloyengineering.com

Fabricates quality stainless steel and high nickel alloy products that maximizes output. Fabricates replacement equipment, such as mufflers, re-torts, radiant tubes, fans, recuperator bundles, grids, racks, hooks, grates, inner covers, fixtures, tubes, code vessels, base rebuilds, very large fabrications and more.

Alloy Screen Works

18102 E Hardy Rd, Houston, TX 77073,
281-233-0214, toll-free: 800-577-5068, FAX:
281-233-0487, info@alloymachineworks.com,
www.alloymachineworks.com

Contact: Pres, James Jackson

Offers well screens for sand control in oil and gas wells. Prepacks, laminants and all-welded screens. Perforated and slotted pipes.

All Tech Industries LLC

All Tech Industries LLC

325 M33 Hwy, Suite A, PO Box 1031, Mio, MI 48647, 432-923-9323, toll-free: 989-826-9999, FAX: 989-826-1313, info@alltechindustries.com, www.alltechindustries.com

Provides professional installations of advanced foams, sealants and coatings using state-of-the-art equipment and techniques that benefit customers in the commercial and industrial markets.

ALLWEILER AG

(sub of Colfax Corp)

Allweilerstr 1, 78315 Radolfzell, Germany, 49-7732-86-0, FAX: 49-7732-86-436, service@allweiler.de, www.allweiler.com

Contact: Bus Dev/Mktg, Edwin Braun
Manufactures centrifugal, propeller, screw, progressing cavity, gear and peristaltic pumps and macerators especially for marine, offshore, water and wastewater, power generation, process technology and chemistry, food and pharmaceutical, building industry, tool machinery, pulp and paper, oil and gas, bioenergy and heat transfer.

Almetek Industries Inc

2 Joy Dr, Hackettstown, NJ 07840, 908-850-9700, toll-free: 800-248-2080, FAX: 908-850-9618, csr@almetek.com, www.almetek.com

Contact: Mktg Coord, Linda Presto
Manufactures signs and identification and marking systems. The range of materials includes metals and state-of-the-art plastics. Provides products, including storm drain markers, fuel markers, pressure-sensitive markers and labels, wraparound cable/pipe markers, barcode systems, specialty tags, nameplates and signs.

Alcotic & Enviropeel

(div of A&E Systems Ltd)

3 Charles Wood Rd, Dereham, NR19 1SX UK, 44-1362-694915, FAX: 44-1362-695350, contact@ae-sys.com, www.alcoticgroup.co.uk

Contact: Sls Coord, Chris Harrey
Produces anticorrosion coatings and systems for difficult offshore and marine environments. Enviropeel for protection of all bolted systems, and Alcotic for coating on oily, damp and wet concrete or steel.

Alpha Wire Co

711 Lidgerwood Ave, Elizabeth, NJ 07207, 908-925-8000, toll-free: 800-522-5742, FAX: 908-925-6923, info@alphawire.com, www.alphawire.com

Provides solutions in wire, cable and tubing, featuring XTRA.Cables for the most hostile environments, XRTA.GUARD flexible cable, FIT preferred heat shrink products and a host of other wire, cable and tubing products for use in applications ranging from the office to the factory floor.

Alta Flights Charters Inc

9th Ave, Service Rd, EDM Int'l Airport, PO Box 9831, Edmonton, Alberta, Canada T5J 2T2, 780-890-1330, toll-free: 800-668-4766, FAX: 780-890-1331, dmccool@altaflights.com, www.altafights.com

Contact: Sls Exec, Don McCool
Operates a fleet of approximately 28 charter aircraft, jet and turbo prop, for 2 to 18 passengers. The prime market is linked to the oil and gas industry for which the company provides executive VIP, crew changes, cargo flights and hot shot services throughout North America. Bases in Edmonton and Calgary.

Altronic Inc

712 Trumbull Ave, Girard, OH 44420, 330-545-9768, FAX: 330-545-9005, sales@altronicinc.com, www.altronicinc.com

Contact: David Bell
Manufactures ignition systems, instrumentation, controls and fuel delivery systems for natural gas-fueled engines. Offers both mechanical and digital ignition systems; electronic instrumentation for sensing temperature, pressure and speed; engine speed governing; starting systems; and engine control systems for optimizing engine performance and compressor throughput.

Amercoat Canada

1174 S Service Rd W, Oakville, Ontario, Canada L6L 5T7, 905-847-1500, toll-free: 800-387-7151, FAX: 905-847-5899, amercoat@allcolour.com, www.amercoatcanada.com

Contact: Pres, Daniel Agnew
Manufactures Ameron Protective and Marine Coatings in Canada. Products are manufactured in an ISO:9001 certified plant in Oakville, Ontario. Product lines include Dimetecote, Amerlock, Amershield, Tideguard and PSX Engineered Siloxane.

American Alloy Steel

6230 N Houston Rd, PO Box 40469, Houston, TX 77091, 713-462-8081, toll-free: 800-231-3502, FAX: 713-462-8342, jpm@asteel.com, www.asteel.com

Contact: Exec VP, Pat Moore
Distributes pressure vessel carbon and chrome-moly plate and round bar. Also stocks abrasion resistant waveplate and marine and offshore plate grades.

American Innovations

12112 Technology Blvd, Suite 100, Austin, TX 78727, 512-249-3400, FAX: 512-249-3444, fdsales@amerinnovations.com, www.amerinnovations.com

Contact: Mktg Comms Mgr, Anna Breshears
Provides products and services for the oil and gas and the water pipeline industries, including web-based remote monitoring and equipment control, total survey solutions for corrosion monitoring and integrity management. Offers bullhorn remote monitoring, micromax interrupters, CP loggers, allegro field computers, pipeline compliance system and integrity management.

AMETEK

Technical & Industrial Products Div
627 Lake St, Kent, OH 44240, 330-673-3452, FAX: 330-677-3306, www.ametektip.com
Supplies brush and brushless DC motors, pumps, controllers, blower systems and ROTRON regenerative blowers for a range of applications.

AMETEK

Calibration Instruments Div
8600 Somerset Dr, Largo, FL 33773, 727-536-7831, toll-free: 800-527-9999, FAX: 727-539-6882, www.ametekcalibration.com
Offers the M&G product line, which includes primary standards, pneumatic deadweight testers, hydraulic deadweight testers, digital pressure calibrators, dial gauge comparators, digital handheld test systems and pneumatic and hydraulic pumps.

AMETEK

US Gauge Div
820 Pennsylvania Blvd, Feasterville, PA 19053, 215-355-6900, toll-free: 888-625-5895, FAX: 215-354-1802, www.ametekusg.com
Supplies high-quality, competitively priced pressure and temperature measurement products. Products include Bourdon tube and diaphragm capsule pressure gauges, ranging in size from 1/2 to 6 in. with brass, stainless-steel, alloy steel or Monel internals.

AMETEK

Trace Analytical Div
455 Corporate Blvd, Newark, DE 19702, 302-456-4400, toll-free: 800-222-6789, FAX: 302-456-4444, www.ametekpi.com

AMETEK

Process Instruments Div
150 Freeport Rd, Pittsburgh, PA 15238, 412-828-9040, FAX: 412-826-0399, www.ametekpi.com
Manufactures and supplies process analyzers and instrumentation globally.

AMETEK

Test & Calibration Instruments (Petrolab) Div
1220 Washington Ave, Harriman Bldg 7A, Suite 300, Albany, NY 12226, 518-689-0222, FAX: 518-689-0225, tcj.sales@ametek.com, www.petrolab.com

Contact: Mgr Mktg/Comms, Angel Schell
Distributes for Grabner, Petrotest, Lovibond, Tamson, Lloyds, Jofra, Lawler and Spectro analytical instrumentation. Offers an extensive selection of products for the petroleum, environmental, food, flavors, fragrances, pharmaceuticals, packaging and plastic industries. On-line and laboratory products include vapor pressure, viscosity, flash point, density, color, penetration, material testing, temperature, pressure and more.

AMETEK

Drexelbrook Div
205 Keith Valley Rd, Horsham, PA 19044, 215-674-1234, FAX: 215-674-2731, www.drexelbrook.com
Offers eight different technologies, including radar, ultrasonic, RF admittance, TDR, magnetostrictive, hydrostatic and vibration technology.

Ametek Petrolab

7A Harriman Campus Rd, Albany, NY 12206, 518-689-0222, FAX: 518-689-0225, angel.schell@ametek.com, www.petrolab.com
Contact: Mktg/Comms Mgr, Angel Schell
Distributes for Grabner, Petrotest, Lovibond, Tamson, Lloyds, Jofra, Lawler and Spectro Analytical Instrumentation, offering a selection of products for the petroleum, environmental, food, flavors, fragrances, pharmaceuticals, packaging and plastic industries. The on-line and laboratory products include vapor pressure, viscosity, flash point, density, color, penetration, material testing, temperature and more.

AMETEK Solidstate Controls

875 Dearborn Dr, Columbus, OH 43085, 614-846-7500, FAX: 614-885-3990, nick.yarnell@ametek.com, www.solidstatecontrolsinc.com
Contact: Mktg Comms Mgr, Nick Yarnell
Designs and manufactures Uninterruptible Power Supply systems and related electrical distribution equipment, such as inverters, battery chargers, AC and DC panelboards and switchboards for industrial power generation and petrochemical markets. Also manufactures Cathodic Protection Rectifiers for oil and gas pipeline applications.

Amiad Filtration Systems

2220 Celsius Ave, Oxnard, CA 93030, 805-988-3323, toll-free: 800-969-4055, FAX: 805-988-3313, info@amiadusa.com, www.amiadusa.com
Contact: VP Sls/Mktg, Jim Lauria
Offers a line of filtration products with inlet/outlet sizes from 3/4 to 24 in., flows to 18,000 gpm per single unit and filtration degrees ranging from 5000 to 2 microns. The systems can be built to ASME code and a multitude of construction materials suitable for any application.

AMKO Systems Inc

250 W Beaver Creek Rd, Unit 6, Richmond Hill, Ontario, Canada L4B 1C7, 905-771-1444, FAX: 905-771-1616, amko@direct.com, www.amkosystems.com

Contact: Pres, Doris Kosch

Provides monitoring solutions for the supply of in-situ and extractive continuous emission monitoring systems (CEMS) for gas turbines, SAGD plants, refineries, coal-fired G.S. pulp and paper mills, cement plants, incinerators and more. Turn-key CEMS process and ambient air monitoring systems incorporate advances from SICK-MAIHAK, Eco-Physics, ASI, KNF Neuberger and Testo.

Amot Controls

(div of Roper Industries)

8824 Fallbrook Dr, Houston, TX 77064, 281-940-1800, FAX: 281-668-8802, sales@amotusa.com, www.amot.com

Contact: Channel Mgr, Clif Gentle

Provides the oil and gas, rail, marine, power generation and many other markets with tailored design solutions for the control and monitoring of process packages, engines, compressors and pumps. Manufactures thermostatic valves, pressure sensing valves, level switches, fuel control valves and other products for total engine protection.

Analytical Systems International

Keco R&D

Suite B, 1400 Graham Dr, Tomball, TX 77375, 281-516-3950, FAX: 281-351-8925, sales@asiwebpage.com, www.asiwebpage.com

Analytic Systems

#207-12448 82nd Ave, Surrey, British Columbia, Canada V3W 3E9, 604-543-7378, toll-free: 800-668-3884, FAX: 604-543-7354, info@analyticssystem.com, www.analyticssystem.com

Contact: Sls Mgr, Will Tomkinson

Manufactures power supplies and power conversion products of oil and gas that meet Class 1 Div 1 requirements for hazardous environments. Products include AC/DC power supplies, voltage converters, DC/AC battery chargers, AC/AC frequency converters and DC/AC inverters. Specializes in custom manufacturing, including ruggedization features.

Analytik Jena AG

Konrad-Zuse-Str 1, 07745 Jena, Germany, 49-3641-7770, FAX: 49-3641-779279, info@analytik-jena.com, www.analytik-jena.com

Contact: Int'l Sls Mgmt, Andrea Glomb

Develops high quality and precision analytical instruments. The company's core competencies include atomic absorption spectroscopy, molecular spectroscopy, elemental analysis and sum parameter analysis for industrial and scientific applications in the fields of environment, life science, chemical industry and energy.

Ansul/Tyco

One Stanton St, Marinette, WI 54143, 800-346-3626, FAX: 888-510-3880, www.ansulinfo.com/99

Contact: Admin Asst Mktg, Cathy LaPerriere
Offers a line of special hazard fire protection products, including fire extinguishers and hand-line units; pre-engineered restaurant, vehicle and industrial systems; fire detection/suppression systems; and a line of dry chemical, foam and clean extinguishing agents.

ANT Applied New Technologies AG

Hinter den Kirschkatzen 32, 23560 Lubeck, Germany, 49-451-58380-0, FAX: 49-451-58380-99, info@ant-ag.com, www.ant-ag.com

Contact: CEO, Franz Eder

Manufactures specialized equipment for well servicing operations and for cutting and dismantling tasks within the offshore oil and gas industries. The company supplies the proprietary Water Abrasive Suspension (WAS) jet cutting equipment and cutting devices, such as cutting tables and manipulation systems

Apex Engineering Products Corp

1241 Shoreline Dr, Aurora, IL 60504, 630-820-8888, toll-free: 800-451-6291, FAX: 630-820-8886, mrudland@rydlyme.com, www.rydlyme.com

Contact: Sls Mgr, Michael Rudland

Offers a biodegradable descaler to dissolve water scale, lime, mud and rust from water operated equipment, including heat exchangers, chillers, condensers and many others. Can clean water-side without disassembling the equipment safely, quickly and economically.

Appleton Electric

(sub of Emerson)

EGS Electrical Group Div
9377 W Higgins Rd, Rosemont, IL 60018, 847-268-6000, toll-free: 800-621-1506, FAX: 847-268-6016, sales@appletonelec.com, www.egseg.com

Contact: VP Int'l Sls, John Peterson

Manufactures IEC and NEC electrical products for virtually every type of environment. Industrial products include conduit and cable fittings, plugs and receptacles, enclosures, controls, conduit boxes and industrial lighting.

Aquatech International Corp

One Four Coins Dr, Canonsburg, PA 15317, 724-746-5300, FAX: 724-746-5359, aic@aquatech.com, www.aquatech.com

Contact: Dir Sls NA, Devesh Mittal

Provides water purification technology for industrial and infrastructure markets with a focus on desalination, water reuse and zero liquid discharge. Groups include Raw Water Treatment, Ion Exchange, Membrane Processes (UF/RO/MBR), Thermal Desalination (MED/MSF), Wastewater/Effluent Treatment and Zero Liquid Discharge.

Arde Barinco Inc

500 Walnut St, Norwood, NJ 7648, 201-784-9880, FAX: 201-784-9710, r.scott@ardeinc.com, www.abmixer.com

Manufactures high shear mixing equipment that is utilized in the dispersion of powders into liquids for the making of drilling fluids.

Arizona Instrument LLC

1912 W 4th St, Tempe, AZ 85281, 602-470-1414, toll-free: 800-528-7411, FAX: 480-480-0656, sales@azic.com, www.azic.com

Contact: Dir Sls, Rick Ervin

Designs, manufactures and markets a line of Computrac precision moisture/solids/ash analysis instruments, including the Computrac Vapor Pro Fx moisture analyzer, which accurately measures moisture levels in liquids and most oils down to 10 ppm in as few as three minutes without using toxic reagents or glass.

Arkema Inc

2000 Market St, Philadelphia, PA 19130, 215-419-7000, FAX: 215-419-7930, info.chemicals@atofina.com, www.arkema-inc.com

Provides industrial chemicals, including acrylics, PMMA, thiochemicals, fluorochemicals and hydrogen peroxide and performance products, such as technical polymers, specialty chemicals organic provider, additives, formaldehyde resins and agrochemicals.

ARLA Maschinentechnik GmbH

Hansestr 2, D-51688 Wipperfuerth, Germany, 49-2267-6585-0, FAX: 49-2267-6585-70, info@arla.de, www.arla.de

Contact: Man Dir, Andreas Laschet

Specializes in engineering services to improve and detect the dynamic behavior of drivelines in rotating machinery. This includes the analysis of torsional and lateral vibrations as they occur in drive systems. The rotordynamic optimization contains the analysis of bearings as well. Also offers simulation software.

Armstrong Monitoring Corp

215 Colonnade Rd S, Ottawa, Ontario, Canada K2E 7K3, 613-225-9531, toll-free: 800-465-5777, FAX: 613-225-6965, gas@armstrongmonitoring.com, www.armstrongmonitoring.com

Contact: Sls Mgr, Robert Kealey

Manufactures and provides service for gas detection systems. The products service a dynamic list of hazardous chemicals, including CO, NO₂, O₂ combustibles and refrigerants. Customer service, flexibility, cost effectiveness and dependability are factors at the company, ensuring health, safety and energy efficiency of clients.

Arrow Engine Co

(div of Trimas)

2301 E Independence, Tulsa, OK 74110, 800-331-3662, FAX: 918-388-3202, sales@arrowengine.com, www.arrowengine.com

Contact: Sls Mgr, Kevin Boucher

Manufactures Arrow C-series (continental-climax) engines, VR engines, Lufkin engines, chemical injector pumps and gas engine automation equipment. Supplies replacement parts for Ajax, Fairbanks Morris, Gemini, Ford, Hercules, Caterpillar and Waukesha Intermediate and VHP lines.

Asahi/America Inc

35 Green St, PO Box 653, Malden, MA 02148, 781-321-5409, toll-free: 800-343-3618, FAX: 781-321-4421, asahi@asahi-america.com, www.asahi-america.com

Contact: VP Engr, Leo Lester

Manufactures and supplies a compliment of corrosion-resistant fluid flow products, including thermoplastic valves, pneumatic and electric actuators, high-purity pipe systems and welding equipment. Products are sold throughout the USA and Latin America, with nearly 1000 locations. ISO 9001 certified.

Asco Valve Canada

17 Airport Rd, PO Box 160, Brantford, Ontario, Canada N3T 5MB, 519-758-2700, FAX: 519-758-554, ascomail@asco.ca, www.ascovalve.ca

Contact: Nat'l Sls Mgr, Stan Kotewicz

Manufactures 2, 3 and 4 way solenoid valves, temperature and pressure switches, pressure sensors, combustion products, fluid power products and valve position indicators.

Ashcroft Inc

Ashcroft Inc

250 E Main St, Stratford, CT 06614-5145, 203-385-0480, FAX: 203-385-0408
Manufactures pressure and temperature monitoring devices for oil and gas processing and distribution. Best known by the brand names Ashcroft, Heise and Weksler. Specializes in pressure gauges, instrument isolators, pressure switches, thermometers, pressure transducers/transmitters and calibration equipment, including intrinsically safe and explosion-proof designs.

Ashtead Technology Rentals

Unit 3, The Technology Bldg, Kirkton Ave, Pitmedden Rd In Est, Dyce, Aberdeen, AB21 0BF UK, 44-1224-771888, FAX: 44-1224-770129, rentals@ashtead-technology.com, www.ashtead-technology.com

Contact: Sls Mgr, Colin Erskine
Rents equipment that represents the best in the industry, starting with fiberoptic multiplexers, NDT equipment, inspection equipment, long- and ultrashort baseline (LBL and USBL) positioning systems and accessories, surface positioning equipment that features global positioning systems and gyrocompasses and bathymetric, side-scan and sub-bottom profiling systems.

Aspectrics Inc

6900 Koll Center Pkwy, Suite 401, Pleasanton, CA 94566, 925-931-9270, FAX: 925-931-9272, info@aspectrics.com, www.aspectrics.com

Contact: VP Mktg, Jim Yano
Develops and manufactures new generations of on-line and remotely deployable process monitoring instruments based on patented, revolutionary technologies, EP-IR (Encoded Photometric IR) and EP-NIR (Encoded Photometric Near IR). EP-IR/NIR is faster than traditional (FT-IR) systems, providing more information and does not require consumables like a process-based GC.

Atkins Advantage Technical Consulting

(sub of Atkins Plc)

Oil and Gas Div

Eastgate House Dogflud Way, Farnham Surrey, GU9 7UD UK, 44-1252-899667, FAX: 44-7917-261522, john.kent@atkinsglobal.com, www.atkinsglobal.com

Provides professional, technologically-based consulting, support services and has been providing engineering support to the oil and gas industry since 1975. Has acquired a vast amount of experience in delivering practical engineering and support solutions throughout the value chain, from exploration through to retail.

Atlas Copco

Drilling Solutions Div

2100 N First St, Garland, TX 75040, 972-496-7240, FAX: 972-496-7425, joanna.jester@us.atlascopco.com, www.atlascopco.com

Contact: Mktg/Comms Mgr, Joanna Jester
Manufactures rotary drills specifically designed for the oil and gas, deep hole and mining industries.

Atlas Copco Compressors LLC

1800 Overview Dr, Rock Hill, SC 29730, 413-536-0600, FAX: 803-817-7036, information@us.atlascopco.com, www.atlascopco.us

Contact: Dir Mktg/Comms, Jennifer Tremblay
Supplies air compressors, selling one of every three compressors and serving more than a quarter of a million customers on six continents.

Atlas Incinerators A/S

Masnedoevej 73, PO Box 143, DK-4760 Vordingborg, Denmark, 45-55-34-66-55, FAX: 45-55-37-66-33, atlas@atlasinc.dk, www.atlasinc.dk

Contact: Dir Sls/Mktg, Erik Vilhelmsen
Offers prevention of oil and garbage pollution at sea. Product line has been on the market since 1974 and more than 5000 incinerators have been installed worldwide within the marine and off-shore industry and on power plants and more.

Auburn Environmental

24850 Aurora Rd, Units C&D, Cleveland, OH 44146, 440-786-1943, toll-free: 800-218-1828, FAX: 440-786-1945, info@auburn-environmental.com, www.auburn-environmental.com

Provides gas/Voc leak detection with passive IR camera. Also provides professional safety and industrial hygiene services, training and consulting service nationwide.

Autelec

25 Bd Charles De Gaulle, PO Box 50, 91542 Mennecy, France, 33-1-64-57-04-55, FAX: 33-1-69-90-00-79, autelec@autelec-drill.com, www.autelec-drill.com

Contact: CEO, Bernard Imbault
Manufactures high-quality drilling equipment, monitoring and control systems for more than 30 years. Specializes in powerful but easy-to-use drilling instrumentation and related equipment such as level sensors and graphical interface software. Additional systems include CCTV, rig data acquisition/processing and travelling block speed limit.

Autoclave Engineers

(div of Snap-tite Inc)

Fluid Components Div

8325 Hessinger Dr, Erie, PA 16509, 814-860-5706, FAX: 814-860-5811, ae_sales@snap-tite.com, www.autoclave.com
Manufactures high pressure valves, relief and check valves, thin and thick wall tubing, fittings, tube bending equipment, adapters and gauges for pressure to 150,000 psi. Serving the petrochemical, chemical, waterblast, waterjet and oil and gas industries. ISO 9001:2000 certified.

Auto Crane

(sub of Ramsey Winch)

PO Box 580697, Tulsa, OK 74158-0697, 918-836-0463, FAX: 918-834-5979, info@autocrane.com, www.autocrane.com

Contact: Prod Mgr, Kyle Whiteis
Manufactures electric and hydraulic cranes, crane service bodies and hydraulic air compressors. The company markets their products in more than 65 countries worldwide.

Automation Products Inc

Dynatrol Div

3030 Maxroy St, Houston, TX 77008, 713-869-0361, toll-free: 800-231-2062, FAX: 713-869-7332, sales@dynatrolusa.com, www.dynatrolusa.com

Manufactures Dynatrol on-line systems for measurement of density, specific gravity, percent solids, percent concentration and viscosity for use in the petroleum industry. The Dynatrol level switches provide liquid and slurries level detection and bulk solids level detection for a wide range of product applications.

Babbitt Steam Specialty Co

800 Mt Pleasant St, PO Box 51208, New Bedford, MA 02745, 508-995-9534, FAX: 508-995-2701, sprocket@babbittsteam.com, www.babbittsteam.com

Contact: Sls/Mktg Mgr, Judith Mulrooney
Manufactures manual valve actuators. Manual valve actuators operate overhead valves from the floor, making instant valve opening or closing by means of a slight pull on the manual actuator chain. Products include the Babbitt safety wheel, the Hammerblow impact-style chainwheel, Solid Hub chainwheel, a range of corrosion resistant chainwheels and more.
(See ad p 61)

Baker Energy

Northbelt Office Center II, 785 Greens Pkwy, Suite 100, Houston, TX 77067, 281-579-7850, toll-free: 800-235-5290, FAX: 281-579-4545, energy@mbakercorp.com, www.bakerenergy.com

Contact: Mktg Dir, Gary Phillips
Provides total asset management solutions, including operations engineering, competency-based recruiting and training, operations and maintenance personnel, HSE&C program management and supply chain and logistics management.

Baldwin Filters

A Clarcor Co

4400 E Highway 30, PO Box 6010, Kearney, NE 68848-6010, 308-234-1951, toll-free: 800-822-5394, FAX: 800-828-4453, info@baldwinfilter.com, www.baldwinfilter.com

Contact: Mktg/Comms Coord, Jean Seitz
Manufactures air, coolant, fuel, hydraulic and lube filters.

Balmac Inc

8205 Estates Pkwy, Unit-N, Plain City, OH 43064, 614-873-8222, FAX: 614-873-2519, sales@balmacinc.com, www.balmacinc.com

Contact: VP, Steve Crawford
Manufactures vibration measurement instrumentation used in applications or rotating machinery. Products include vibration analyzers, meters, monitors, vibration switches, transmitters and sensors.

Balmoral Offshore Engineering

Balmoral Group Div

Balmoral Park, Lirston Aberdeen, AB12 3GY UK, 44-1224-859-000, FAX: 44-1224-859-059, group@balmoral.co.uk, www.balmoral-group.com

Contact: Group Dir, Jim Hamilton
Provides products, including rigid and dynamic riser buoyancy, ROV/AUV and subsurface buoyancy, elastomer cable protectors, bend restrictors, stiffeners, clamps and riser protection guards. Operates its own hydrostatic test center which accommodates a variety of products from small systems through to the largest rigid riser modules.

Bal Seal Engineering Inc

19650 Pauling, Foothill Ranch, CA 92610-2610, 949-460-2100, toll-free: 800-366-1006, FAX: 949-460-2300, sales@balseal.com, www.balseal.com

Banner Engineering Corp

9714 Tenth Ave N, Minneapolis, MN 55441,
763-544-3164, toll-free: 888-373-6767, FAX:
763-544-3213, sensors@bannerengineering.com,
www.bannerengineering.com

Contact: Mktg Mgr, Bob Durkee

Manufactures electronic machine guarding systems, photoelectric and ultrasonic sensors, fiberoptic assemblies, vision sensors, precision measurement systems and wireless systems. Serves a variety of industries, such as petroleum, automotive, packaging, pharmaceutical, semiconductor, carwash, metalforming, food processing, printing and material handling.

Barco n v

Presentation and Simulation Div
Noordlaan 5, B8520 Kuurne, Belgium,
32-56-36-84-15, FAX: 32-56-368-486,
yoav.nir@barco.com,
www.barco.com/virtualreality

Contact: Mktg Dir V&AR, Yoav Nir

Enables oil and gas specialists to collaborate in more efficient ways and inspire better and faster decision making. Unique product features are: multiwindowing, displaying mono and stereo sources on one screen, a common familiar user interface, easy central control and maintenance of the entire projection network.

Barkman Concrete Ltd

Con-Duct Trench Div
909 Gateway Rd, Winnipeg, Manitoba, Canada
R2K 3L1, 204-667-3310, toll-free: 800-342-2879,
FAX: 204-663-4854,
wpgsales@backmanconcrete.com,
www.con-duct.com

Contact: Prod Consultant, Wayne Fehr

Offers precast concrete utility trenches and covers for locations requiring fast, easy location and access of in-ground cables. Available in high strength cast concrete and/or lightweight glass fiber reinforced concrete (GFRC). Installed throughout North America, engineered to provide the ultimate in durability.

BARTEC GmbH

Max-Eyth Str 16, PO Box 1166, D-97980 Bad Mergentheim, Baden-Württemberg, Germany, 49-7931-597-0, FAX: 49-7931-597-119, info@bartec.de, www.bartec-group.com
Functions as an internationally acting company in the field of safety technology. The protection of people and the environment by the safety of components, systems and plants is the trendsetting corporate mission statement. Provides innovative components and systems tested to international standards and has acquired an international position among safety technology suppliers.

Baseline-MOCON Inc

(div of MOCON Inc)
19661 Highway 36, PO Box 649, Lyons, CO
80540, 303-823-6661, FAX: 303-823-5151,
sales@baselineindustries.com,
www.baseline-mocon.com

Contact: Hank Braly

Provides automated gas analysis for indoor air quality monitoring of toxic gases in the workplace, outdoor air quality monitoring of emission sources and in ambient air networks, mud logging during oil and gas exploration and detection of trace impurities in specialty gases. Products include detectors and analyzers.

Battery Operated Barriers

(sub of DE Ent LLC)
7054 C r 521, Bayfield, CO 81122, 970-946-4180,
evers@frontier.net,
www.batteryoperatedbarrier.com

Contact: Owner, Dennis Evers

Offers the American-made Towable Utility Gate, which is towed by all vehicles and used for well, plant security and during emergencies. TUG cycles the swinging arm thousands of times per charge and comes with a 12 ft. segmented arm, charger, highway rated tires, levelers, stop sign and optional retractable tire shredders.

BAYCO Products Inc

640 S Sanden Blvd, Wylie, TX 75098,
469-326-9400, toll-free: 800-233-2155, FAX:
469-326-9401, info@baycoproducts.com,
www.baycoproducts.com
Provides intrinsically safe cordless worklights, UL
CL 1, C&D and T4.

BC TRADE - Commercial Importadora e Exportadora Ltda

Rua Santa Quitéria, 541, Carlos Prates, Belo Horizonte MG, 30710-460 Brazil,
55-31-3462-5668, FAX: 55-31-3462-5668,
bctrade@bctrade.com.br, www.bctrade.com.br

Contact: Gen Mgr, Scheila Jorge Pires

Manufactures ultrasound equipment, including the latest range of Flaw Detectors 150.250.350.380. All the equipment is rated IP67, with all the latest software features included, such as AP15EU, Curvature Correction, AWSDD1.1 and more.

Robert J Beck and Associates

5377 S Irvington Ave, Tulsa, OK 74135,
918-630-2891, rbeck1@cox.net
Provides economic analysis and planning for the energy industry, including investment analysis.

Beckhoff New Automation

12150 Nicollet Ave S, Burnsville, MN 55337,
952-890-0000, toll-free: 877-894-6228, FAX:
952-890-2888, s.novacek@beckhoff.com,
www.beckhoffautomation.com

Contact: Mktg Comms Mgr, Shane Novacek

Provides open automation products based upon proven technologies, enabling customers to implement high performance control systems faster and at a lower overall cost than traditional PLC and motion control systems. Product range includes PC-based control, industrial PCs, automation controllers, operator interface, I/O and servo technology.

BEI Industrial Encoders

7230 Hollister Ave, Goleta, CA 93117,
805-968-0782, toll-free: 800-350-2727, FAX:
805-968-3154, encoders@beiiied.com,
www.beiiied.com

Contact: Mktg Mgr, Scott Orlosky

Manufactures rugged ATEX compliant rotary optical encoders for oil and gas services. Well sealed and rated for hazardous environments per international standards. Explosion-proof, intrinsically safe models used with the isolated barriers, eliminating configuration and compatibility concerns. Used in coiled tubing, drawworks, slickline, top drive, wireline and other oilfield applications.

Belden

2200 US Highway 27 S, Richmond, IN 47374,
765-983-5200, toll-free: 800-235-3361, FAX:
765-983-5294, info@belden.com,
www.belden.com

Manufactures cabling solutions for the industrial market, including DataTuff cables for industrial Ethernet, as well as DataBus, DeviceBus and ControlBus cables that support numerous fieldbus networks. Other products are Blue Hose for PLC systems, cables for variable frequency drives, instrumentation and control and flexible automation applications.

BelGAS

(div of Marsh Bellofram)
8019 Ohio River Blvd, State Rt 2, PO Box 305,
Newell, WV 26050, 304-387-1200, toll-free:
800-727-5646, FAX: 304-387-1212,
www.belgas.net

Contact: Sls/Mktg, Jack Frese

Offers pressure regulator designs for the oil, gas and pipeline industry. Fulfills gas control requirements from high-pressure regulators to precision-pressure gauges.

Belgian Oil & Gas Group (BOG)

Belgian Oil & Gas Group (BOG) Div
Reyers LN 80, Diamant Bldg, B-1030 Brussels,
Belgium, 32-2-706-81-47, FAX: 32-2-706-79-43,
pieterjan.provost@agoria.be, www.agoria.be/bog

Contact: Mgr, Pieter-Jan Provoost

Provides an association of about 100 companies, grouping engineering contractors, systems integrators and services-related companies.

Belgian Trade Commission

5300 Memorial Dr, Suite 625, Houston, TX 77007,
713-863-1110, FAX: 713-863-1112,
beltradehouston@covad.net

Promotes trade, investment and focus on the following sectors for the whole US market: energy (oil, gas and power generation), petrochemicals, port equipment and services, engineering, aviation and aerospace. The Belgian Trade Commission in Houston is a government office of the Wallonia Region of Belgium.

■ BellowsTech LLC

Precision Manufacturing Group LLC Div
1289 N US Highway 1, Suite 1, Ormond Beach,
FL 32174, 386-615-7530, FAX: 386-615-7973,
bellows@bellowstech.com,
www.bellowstech.com

Contact: Bus Dev Mgr, Jim Barkand

Develops custom designed edge welded bellows, specializing in the design and manufacture of precision edge welded bellows and assemblies encompassing an array of alloys and dimensional configurations serving the oil machinery, vacuum, semiconductor, mining, welding and commercial industries.
(See ad p 7)

Belzona

2000 NW 88th Ct, Miami, FL 33172,
305-594-4994, FAX: 305-599-1140,
belzona@belzona.com, www.belzona.com
Provides industrial repair composites and protective coatings. Also offers solutions to repair and maintenance needs.

Bender Shipbuilding & Repair Co

265 S Water St, Mobile, AL 36603,
251-431-8000, FAX: 251-432-2260,
corporate@bendership.com,
www.bendership.com

Contact: VP Sls/Mktg, Frank G. Terrell Jr

Provides new construction and ship repair/conversion.

Ben-Mor

Ben-Mor

1105 Lemire St, Saint-Hyacinthe, Quebec, Canada J2T 1L8, 800-481-0022, FAX: 800-498-0022, info@ben-mor.com, www.ben-mor.com

Contact: VP Sls/Mktg, Richard Plante
Manufactures and distributes wire rope, coated wire rope, slings, chains and fittings.

Bettis Canada Ltd

(div of Emerson Process Management)
4112-91a St, Edmonton, Alberta, Canada T6E 5V2, 780-440-8410, FAX: 780-450-1400, hugh.fletcher@emersonprocess.com

Contact: Canada Sls Mgr, Jerry Edwards
Manufactures valve actuators and controls and is part of the Emerson Process Management division of Emerson Electric.

Beverlin Manufacturing Co

3515 Raleigh Dr SE, Grand Rapids, MI 49572, 616-949-5990, FAX: 616-949-0873, info@beverlinmfg.com, www.beverlinmfg.com

Contact: Dir Sls, John Watson
Manufactures perforated tubes and steel tube products.

BHS Getriebe GmbH

Hans-Boeckler-Strasse 7, 87527 Sonthofen, Germany, 49-8321-802-0, FAX: 49-8321-802-685, info@bhs-getriebe.de, www.bhs-getriebe.de

Contact: VP Sls, Jean-Claude Debout
Offers a spectrum of power transmission products to meet the needs of the oil and gas industry for upstream, midstream and downstream applications. Manufactures gear boxes, spare parts, high-speed couplings, rotor turning units and accessory gearboxes. Has been manufacturing turbo gears for more than 70 years.

SALES OFFICES:**BHS Getriebe Inc**

Cincinnati, OH 513-797-8101, FAX: 513-797-8103, info@bhsgear-inc.com, www.bhsgear-inc.com

Voith Turbo Ltd Middle East

Sharjah, United Arab Emirates
971-6-5570994, FAX: 971-6-5570996, voith@voithcy.com

Biglift Shipping BV

Radarweg 36, PO Box 2599, 1000 CN Amsterdam, The Netherlands, 31-20-4488300, FAX: 31-20-4488333, management@bigliftshipping.com, www.bigliftshipping.com
Specializes in heavy lift and project cargo transportation worldwide.

BJ Services Co

11211 FM 2920, Tomball, TX 77375, 713-683-3400, FAX: 713-683-4100, sales@bjservices.com, www.bjservices.com

Contact: COO, David Dunlap
Provides technology and customer-focused services to oil and gas operators. The eight service lines include pumping services, coiled tubing, completions and more. The company's core business, the wellbore, improves clients' productivity and ROI through reliable proven solutions.

Blackmer

(div of A Dover Co)
1809 Century Ave SW, Grand Rapids, MI 49503-1530, 616-241-1611, FAX: 616-241-3752, customerrequests@blackmer.com, www.blackmer.com

Contact: Dir Sls, Jim Becker

Blue Sky Network

1298 Prospect St, Suite 1D, La Jolla, CA 92037, 858-551-3894, FAX: 858-551-3891, support@blueskynetwork.com, www.blueskynetwork.com

Contact: Founder/CEO, Jon Gilbert
Provides global satellite logistics solutions for two-way linking and managing remote transportation assets. Using its interactive Web portal with detailed mapping and Google Earth integration, the company links enterprises to assets anywhere on earth over the Iridium satellite network. The FAA-certified products enable users to customize features, including safety and event reporting.

Bollfilter Uk Ltd

(sub of Boll & Kirch)
UK Technical Sales & Support Div
Commerce Park, Whitehall Rd, Colchester, Essex, CO2 8AH UK, 44-1206-792234, FAX: 44-1206-793004, sales@bollfilter.co.uk, www.bollfilter.co.uk

Contact: Dir, John Dow
Offers sales, service, spares and technical advice on a range of fully automatic, manual simplex and duplex filters and strainers in the product range of liquid separation, gas particle filters and coalescers.

Bollinger Shipyards Inc

PO Box 250, Lockport, LA 70374, 985-532-2554, FAX: 985-532-7225, sales@bollingershipyards.com, www.bollingershipyards.com

Contact: Exec VP Sls/Mktg, Robert A. Socha
Provides shipbuilding and repair.

BOLTIGHT Ltd

Unit 2, Junction 10 Business Park, Walsall W Midlands, WS2 0LE UK, 44-8707-744-661, FAX: 44-8707-744-662, sales@boltight.com, www.boltight.com

Contact: Dir, Fred Heaton
Designs and manufactures hydraulic bolt tensioning equipment on quick delivery, including bolt tensioners, hydraulic nuts (including high-temperature, HydraNut), hydraulic pumps (air, electric and hand models), ultrasonic bolt elongation measurement, thread protection caps, flexible hoses and quick connectors.

**Boots & Coots International Well Control Inc**

7908 N Sam Houston Pkwy W, 5th Floor, Houston, TX 77064-3513, 281-931-8884, FAX: 281-931-8302, jtweeton@boots-coots.com

Contact: VP Bus Dev, Larry Burleson
Provides pressure control services to oil and gas companies around the world. The company's well intervention services are designed to enhance well production and reduce the number and severity of critical well events. The response segment consists of emergency services utilized during a critical well event.

BORSIG Boiler Systems GmbH

Schellerdamm 16, D-21079 Hamburg, Germany, 49-40-303726-0, FAX: 49-40-303726-4050, info@bs.borsig.de, www.borsig.de
Offers fixed boilers, heat recovery boilers, power plant engineering and power plant services.

BORSIG Membrane Technology

(sub of BORSIG GmbH)
Bottroper Str 279, 45964 Gladbeck, Nordrhein, Westfalen, Germany, 49-2043-4006-71, FAX: 49-2043-4006-89, info@mt.borsig.de, www.borsig.de

Contact: Man Dir, Stegger
Provides membranes, membrane modules and membrane systems for VOC emission control systems, such as vapour recovery units. Offers product recovery units, membrane separation systems for fuel gas conditioning and new separation technologies.

BORSIG Process Heat Exchangers GmbH

(div of Borsig GmbH)
Egellsstr 21, 13507 Berlin, Germany, 49-30-4301-01, FAX: 49-4301-2447, info@pro.borsig.de, www.borsig.de

Contact: Man Dir, Nassauer
Offers process gas waste heat recovery systems for ammonia, caprolactam, formaldehyde, hydrogen, methanol, nitric acid and coal gasification plants and for plants partial oxidation of oil and natural gas. Also offers quench coolers (tunnelflow and linear design) and scraped surface exchangers.

BORSIG Service GmbH

(sub of BORSIG GmbH)
Egellsstrasse 21, D-13507 Berlin, Germany, 49-30-4301-01, FAX: 49-30-4301-2236, info@is.borsig.de, www.borsig.de

Contact: Man Industrial Svcs, Adehahr
Provides industrial services for power plants, chemical and petrochemical plants, refineries, general industries and district supply plants. Offers new fabrication of spares. Offers machines, ball valves, pressure vessels, valves, power plants, refrigeration plants, pipe work, pumps and blowers.

BORSIG ZM Compression GmbH

(div of Borsig GmbH)
Seiferitzer Allee 26, 08393 Meerane, Germany, 49-3764-5390-0, FAX: 49-3764-5390-5090, info@zm.borsig.de, www.borsig.de

Contact: Sls Mgr, Gast
Offers reciprocating compressors for process gases, reciprocating compressors for CNG filling stations, centrifugal compressors for process gas blowers and blower systems. Service for compressors and blowers.

Brederos Shaw Norge AS

Thermotite Div
Gronora Industriomrade, PO Box 214, NO-7301 Orkanger, Norway, 477-246-6060, toll-free: 972-372-358, FAX: 477-246-6070, hsmevoll@brederoshaw.shawcor.no, www.brederoshaw.com

Contact: Mktg Mgr, Eirik Simonsen
Develops and manufactures pipe coating solutions for the oil, gas and water industries. More than 250,000 kms of pipelines around the world have been protected using the company's technology and services.

Broadpoint

5901 Earhart Expwy, New Orleans, LA 70123, 504-736-9400, toll-free: 800-233-8372, FAX: 504-734-6100, sales@broadpointinc.com, www.broadpointinc.com

Contact: Pres/COO, Ken Wright
Offers telecommunications and network solutions. Provides voice, data, video and asset tracking solutions for the domestic and international energy services marketplace via its satellite and cellular based infrastructure. Offers state-of-the-art technology for bandwidth sharing via both fixed and stabilized platforms.

SALES OFFICES:

Petrocom Houston
Houston, TX
Petrocom Lafayette
Lafayette, LA

Broadpoint

11335 Clay Rd, Suite 190, Houston, TX 77041,
713-580-4100, FAX: 713-580-4150,
sales@broadpointinc.com,
www.broadpointinc.com

Contact: VP, Jennifer Medcalf

Provides communications leadership in cellular and satellite services for the oil and gas industry. Has the right solutions to meet customer needs.

Brookfield Engineering Laboratories Inc

11 Commerce Blvd, Middleboro, MA 02324,
508-946-6200, FAX: 508-946-6262,
sales@brookfieldengineering.com,
www.brookfieldengineering.com

Contact: Gen Mgr Process Sis, Steven Cicchese

Manufactures laboratory and process viscometers and rheometers. Manufactures the DV II+ and PVS viscometers used in the development of fracturing and drilling fluids. The TT100 in-line viscometer is used in monitoring these fluids in the field.

Brush Wellman Inc*Alloy Div*

17876 St Clair Ave, Cleveland, OH 44110,
216-486-4200, toll-free: 800-443-7731, FAX:
216-383-4005,
alloy_tech_svc@brushwellman.com,
www.brushwellman.com

Contact: Mktg Dir Ind'l Components/New, Bill Nielsen

Manufactures nonmagnetic, high strength, corrosion-resistant copper alloys. Products include rod, bar, tube, instrument housings, subs, forgings, near net shape casting and machined components. Alloys include: Brush Alloy 25 (CuBe) for thread spacers; ToughMet (CuNiSn Spinodal Bronze Alloy) for exploration and completion tools and valves, umbilicals, capillary tubes and polished rods.

BullEx Digital Safety

85 Broadway, Albany, NY 12204, 518-689-2023,
toll-free: 888-428-5539, FAX: 518-689-2034,
info@bullexsafety.com, www.bullexsafety.com

Contact: Sis Mgr, Jeffrey Kennedy

Utilizes patented smart technology to develop life-saving products for the global workforce, manufacturing both live-fire and digital extinguisher training systems. Serves a diverse customer base from its corporate and manufacturing headquarters.

Burckhardt Compression AG

Im Link 5, PO Box 65, CH-8404 Winterthur,
Switzerland, 41-52-262-55-00, FAX:
41-52-262-00-51,

info@burckhardtcompression.com,
www.burckhardtcompression.com

Provides reciprocating compressor technology and manufactures a series of Laby, process gas and hyper compressors. Worldwide service network provides a range of customer support services, from supply of quality compressor components over valve service, to complete plant overhauls and from engineering, to the fulfillment of extensive modular service contracts.

Burkert

2602 McGaw Ave, Irvine, CA 92614,
949-223-3177, toll-free: 800-325-1405, FAX:
949-223-3198, marketing-usa@burkert.com,
www.burkert.com

Contact: Mktg/Comms, Brian Malley

Designs and manufactures integrated fluid control systems comprised of innovative, intelligent solenoid, pneumatic and air-actuated valves, fluid flow sensors, analytical fluid sensors, temperature and pressure controllers and liquid level sensors and switches.

Burns Engineering Inc

10201 Bren Rd E, Minnetonka, MN 55343,
952-935-4400, toll-free: 800-328-3871, FAX:
952-935-8782, info@burnsengineering.com,
www.burnsengineering.com

Contact: Pres, Jim Burns

Provides temperature sensing and process interface solutions for industry applications where the measurement is important for product quality, efficiency and/or safety.

H BUTTING GmbH & Co KG

Gifhorner Strasse 59, 29379 Knesebeck,
Germany, 49-5834-50-0, FAX: 49-5834-50-320,
info@butting.de, www.butting.de

Contact: Sis Mgr Oil/Gas Downstream, Lutz Nieberg

Produces stainless-steel materials in Europe. Product range includes longitudinally welded stainless-steel pipes and fittings, vessels and special piping components in stainless-steel, titanium, nickel, copper alloys and clad material.

BW Technologies by Honeywell

3279 W Pioneer Pkwy, Arlington, TX 76013,
817-274-2487, toll-free: 888-749-8878, FAX:
817-274-8321, info@gasmonitors.com,
www.gasmonitors.com

Contact: Cust Svc Supv, Jimmy Blount

Manufactures a line of gas detection instrumentation for protection from a range of toxic gases, combustibles and oxygen hazards. The company's instrumentation is designed for personal and facility protection, includes person portable instrumentation, flow systems and stand-alone systems.

Caddis Drilling Services Corp

#2 703-11 Ave, Nisku, Alberta, Canada T9E 7R2,
780-955-3224, FAX: 780-955-3225,
info@caddisdrillingservices.com,
www.caddisdrillingservices.com

Contact: Pres/CEO, Gareth M. Wood

Sells and services a line of linear motion shakers and solids control equipment. Also rents high G cuttings dryers, pumps, shale tanks and other tanks. Shaker screens for all makes. Butterfly valves, gate valves, ball valves, globe valves and check valves available.

Caldwell Tanks Inc

4000 Tower Rd, Louisville, KY 40219,
502-964-3361, FAX: 502-964-7444,
sales@caldwelltanks.com,
www.caldwelltanks.com

Contact: VP, John Kraft

Provides turnkey EPC elevated and ground level storage tanks for water and petroleum industries.

Caledus Ltd

4 Rubislaw Terrace, Aberdeen, AB10 1XE UK,
44-1224-659000, FAX: 44-1224-659001,
info@caledus.com, www.caledus.com

Contact: CEO, Paul Howlett

Provides innovative, proven technology on a global basis. Offers SlimWELL, which is a well construction technology based on close-clearance, flush-jointed liners; and TD Solutions which offers a range of products and services to ensure all oilfield tubulars reach total depth in challenging well environments.

Calibron Systems Inc

7861 E Gray Rd, Scottsdale, AZ 85260,
480-991-3550

Cameron*Measurement Systems Div*

1000 McClaren Woods Dr, Coraopolis, PA
15108-7766, 724-273-9300, FAX: 724-273-9301,
don.ginesi@c-a-m.com, www.c-a-m.com

Contact: O&G Product Lead Caldon Ultras,
Christopher Laird

Manufactures ultrasonic products at the Caldon Ultrasonics Technology Center in Pennsylvania. Caldon brand LEFM ultrasonic products measure mass or volumetric flowrate, temperature, density and viscosity. Offers complete turnkey services, including engineering, design, manufacturing, technical support, in-house maintenance and remote monitoring.

**Cameron's Measurement Systems Division**

(div of Cameron)

Measurement Systems Div

14450 JFK Blvd, Houston, TX 77032,
281-582-9500, toll-free: 800-654-3760, FAX:
281-582-9599, ms-us@c-a-m.com,
www.c-a-m.com/flo

Contact: Dir US Sis, Gary Delander

Provides basic sensors to sophisticated electronic subsystems. The Company's solutions are in use across the globe in applications requiring the measurement, monitoring, analysis and control of gas and fluid processes.

SALES OFFICES:

Duncan Sales & Tech Center
Duncan, OK 580-470-9600

Caldon Ultrasonics Sales & Tech Center
Coraopolis, PA 724-273-9300

Odessa Sales & Tech Center
Odessa, TX 432-363-8185

Industrial Products Tech Center
City of Industry, CA 562-222-8440

California Sales Office
Bakersfield, CA 661-387-6813

Colorado Sales Office
Denver, CO 720-887-1654

Louisiana
Houma, LA 985-868-1514

Louisiana
Lafayette, LA 337-234-1824

Louisiana
Marrero, LA 504-348-4619

Mississippi
Laurel, MS 601-452-2377

Oklahoma
Tulsa, OK 918-296-9397

Texas
Aledo, TX 817-441-8989

Texas
Corpus Christi, TX 361-883-4489

Texas
Kilgore, TX 903-984-8651

West Virginia
Charleston, WV 304-389-4930

West Virginia
Dunbar, WV 304-720-6207

Canada Pipeline Accessories

10653 46 St SE, Calgary, Alberta, Canada T2C
5C2, 403-236-4480, FAX: 403-236-0019,
dalesawchuk@telus.net,
www.flowconditioner.com

Contact: Pres, Dale Sawchuk

Manufactures the industry recognized CPA 50E flow conditioner. The CPA 50E flow conditioner isolates meters from upstream flow disturbances, improving measurement accuracy and repeatability.

Canada Tech Corp

Canada Tech Corp

105-1437 47th Ave NE, Calgary, Alberta, Canada T2E 6N7, 403-232-1400, FAX: 403-232-1401, jeff.scott@canadatech.com, www.canadatech.com

Contact: Sls Mgr, Jeff Scott

Develops and manufactures innovative tools and instruments. These accurate instruments measure, log, transmit and display reservoir and surface pressure and temperature data in real time or memory.

Canadian Linen & Uniform Service*Factory Outlet Div*

4525 Manilla Rd SE, Calgary, Alberta, Canada T2G 4B6, 403-243-8080, FAX: 403-214-4325, calgary@cdnuniforms.org, www.canadianuniform.com

Contact: Sls Mgr, Peter Robinson

Offers a line of fire retardant wear, safety wear, hi-visibility wear and summer and insulated winter work wear. Contractual rental and cleaning services available. Towels, washroom facility services, entrance and company logo mat rentals available. Will design custom uniforms and rental programs. Complete line of Napery and Linen rentals.

Cannon Instrument Co

2139 High Tech Rd, State College, PA 16803, 800-676-6232, FAX: 814-353-8007, cannon@cannoninstrument.com, www.cannoninstrument.com

Contact: VP Sls/Mktg, Frank Saylor

Manufactures automatic and manual glass capillary viscometers (including the Cannon Automatic Viscometer, for petroleum products), cold-cranking simulator, Cannon mini-rotary viscometer, high-temperature high-shear viscometer, thermo-electric bending-beam rheometer, constant temperature baths, and viscosity standards. North American distributor for Tanaka Automated Flash Point testers, pour/cloud point testers and other automated petroleum testers.

Canongate Technology Inc

2045 S Arlington Heights Rd, Arlington Heights, IL 60005, 847-593-1832, FAX: 847-593-1629, sales@canongatetechnology.co.uk, www.canongatetechnology.com

Contact: VP, Ron McRae

Provides continuous and point level instruments for noninvasive sensing of liquid level. No tank penetration is required by these devices.

Cantest Solutions Inc

23 Eastlake Crescent NE, #2, Airdrie, Alberta, Canada T4A 2H5, 403-912-9129, toll-free: 800-318-1441, FAX: 403-912-9337, www.cantest.net

Contact: Oilfield Svcs Mgr, Lee Krause

Provides third party evaluation services to the oilfield storage tank industry. The skilled workforce and technologies and high corporate standards have earned the company a solid reputation for delivering quality precision leak detection testing for both underground and aboveground storage tanks and external visual inspection services.

Canusa-CPS*(div of Shawcor Ltd)*

25 Bethridge Rd, Toronto, Ontario, Canada M9W 1M7, 416-743-7111, FAX: 416-743-5927, info@canusacps.com, www.canusacps.com

Contact: Mktg Mgr, Robert Buchanan

Supplies a variety of products and systems used for onshore and offshore pipeline corrosion and thermal protection. Products are available for applications that range from ambient to extremely high pipeline temperatures, small to large pipeline diameters and for a variety of pipeline coatings.

CapRock Communications

4400 S Sam Houston Pkwy E, Houston, TX 77048, 832-668-2300, toll-free: 888-482-0289, FAX: 832-668-2377, info@caprock.com, www.caprock.com

Contact: Sls Dir, Vaughn Crisp

Delivers communications to the world's harshest and most remote locations. Satellite-based services enable clients to communicate in real time virtually anywhere in the world. More than 25 years of experience providing mission-critical communications, reliable solutions and unparalleled customer service.

CA Richards & Associates Inc

777 N Eldridge, #280, Houston, TX 77079-4400, 281-531-7417, FAX: 281-531-7456, chuck@carichards.com, www.carichards.com

Contact: Pres, Chuck Richards

Represents Kongsberg, Nexans, Didson Sonar, Syntech Technologies, Seebyte, CRE Ltd and SunStar Motors.

Carmanah Technologies Corp*Power Systems Group Div*

4900 64th Ave SE, Bay 60, Calgary, Alberta, Canada T2C 4V3, 403-291-9039, toll-free: 888-291-9039, FAX: 403-291-9049, oil-gas@carmanah.com, www.solarforindustry.com

Contact: Gen Mgr, Greg Clark

Manufactures customized Class I Div II/Zone II stand-alone solar power systems for remote oil and gas applications, including mineral exploration camps, cathodic protection for pipelines, SCADA and RTU stations and satellite communications.

Carrack LTD

Badentoy Crescent, Portlethen, Aberdeen, Scotland, AB12 4YD UK, 44-1224-783100, FAX: 44-1224-783400, sandym@carrackltd.com, www.carrackltd.com

Contact: Sls Mgr, Sandy McBain

Buys and sells new and surplus certified casing, tubing drill pipe, drill collars, handling equipment, pumps, subsea equipment and general oilfield equipment.

■ Cashco Inc*Valve Concepts Div*

607 W 15th St, Ellsworth, KS 67439, 785-472-4461, FAX: 785-472-3539, www.valveconcepts.com

Manufactures weight-loaded, spring-loaded and pilot operated vent valves, gauge hatches, emergency relief vents, flame arresters, detonation arresters, self contained and pilot operated tank blanketing valves. Manufactures a line of customer tank manifolds allowing entire blanketing and venting systems to be mounted into a single tank nozzle. ISO 9001 registered company.

(See ad p 55)

Caterpillar Inc

PO Box 610 AC 6156, Mossville, IL 61552, 309-578-6444, FAX: 309-578-6466, christmas_robert_l@cat.com, www.cat.com
Manufactures construction and mining equipment, clean diesel, natural gas engines and industrial gas turbines. For more than 80 years, the company has been making progress possible and driving positive and sustainable change on every continent.

**CB&I**

One CB&I Plaza, 2103 Research Forest Dr, The Woodlands, TX 77380, 832-513-1000, FAX: 832-513-1005, info@cbi.com, www.cbi.com
Offers a fully integrated engineering, procurement and construction (EPC) company, specializing in projects for customers that produce, process, store and distribute the world's natural resources. With more than 60 locations worldwide, the company capitalizes on its global expertise and local knowledge to safely and reliably deliver projects virtually anywhere.

CB&I Lummus*(sub of CB&I)*

Oostduinlaan 75, 2596 JJ The Hague, The Netherlands, 31-70-373-2010, FAX: 31-70-373-2750, www.lummus.cbi.com

Contact: Mktg Comms Rep, Maria Principe
Combines proven process technology with global EPC capabilities to deliver comprehensive solutions to customers in the energy and natural resource industries. Offers engineering, procurement and construction with approximately 17,000 employees in more than 80 locations worldwide.

CCI-Control Components Inc*(sub of IMI Plc Ltd)*

22591 Avenida Empresa, Rancho Santa Margarita, CA 92688, 949-858-1877, FAX: 949-858-1878, info@ccivalve.com, www.ccivalve.com

Contact: Sls Mgr, Ricardo Simeoni

Specializes in the design and manufacture of engineered control valves and associated equipment for critical service applications for all aspects of oil and gas operations, including production, LNG liquefaction/regasification, transportation, storage and processing.

CCI Inspection Services Inc

2210 N Frazier, Suite 200, Conroe, TX 77303, 281-367-6740, toll-free: 800-521-8879, FAX: 936-441-4974, jnixon@cci-inspection.com, www.cciinspection.com

Distributes Elcometer, Extach and Monipower MBX. Services include: coating (NACEMA—trained and certified), construction (project management), existing condition surveys (API 653), maintenance (site supervision), NDT (VT, PT, MT, UT, x-ray interpretation), pipeline (utility, weld, chief, drill, tie-ins, stringing) and welding (AWS—trained and certified).

C-CORE

Captain RA Bartlett Bldg, Morrissey Rd, St Johns, Newfoundland, Canada A1B 3X5, 709-737-8354, FAX: 709-737-4706, info@c-core.ca, www.c-core.ca

Contact: Bus Mgr, Dave Gullage

Provides engineering solutions to national and international clients. The dynamic team of more than 60 engineering and business experts provide technology solutions to production issues and market challenges encountered in a variety of areas related to ice engineering, geotechnical engineering, remote sensing and intelligent sensors.

CCS-inc Comprehensive Computer Solutions

105 Industrial Dr, Christiansburg, VA 24073,
540-382-4234, toll-free: 800-277-3077, FAX:
540-382-4701, young@ccs-inc.com,
www.ccs-inc.com

Contact: Sls Coord, Willa Caldwell
Manufactures and integrates industrial computer systems and NEMA-rated computer and printer enclosures Qualtrax, a wholly-owned subsidiary; offers compliance software solutions. The company's products and services cater especially to clients operating within harsh environments and/or regulated industries, including manufacturing, food and beverage, pharmaceutical, energy and telecommunications.

CEA Instruments Inc

16 Chestnut St, Emerson, NJ 07630,
201-967-5660, toll-free: 888-893-9640, FAX:
201-967-8450, ceainstr@aol.com,
www.ceainstr.com

Contact: VP Sls/Mktg, Steven Adelman
Manufactures and supplies portable and wall-mounted gas monitors, analyzers and sensors as single- and multichannel units for hydrogen sulfide, ammonia, hydrocarbons and hundreds of other toxic and combustible gases.

CEC Vibration Products Inc

746 Arrow Grand Cir, Covina, CA 91722,
626-938-0200, toll-free: 800-468-1345, FAX:
626-938-0202, info@cecvp.com,
www.cecvp.com

Contact: Sls/Mktg Mgr, Richard Rogers
Manufactures vibration sensors and condition monitoring equipment specialized for use in harsh environment applications. Manufactures a line of velocity sensors, accelerometers, digital switches, transmitters, signal conditioners, cable assemblies and vibration monitoring systems used in predictive maintenance, qualification and test cell applications.

CEJN Industrial

212 Ambrogio Dr, Gurnee, IL 60031,
847-263-7200, FAX: 847-263-7207,
customer.service@cejnusa.com, www.cejn.com

Contact: Dist Prods Div Mgr, Andy Wasielewski
Offers products, including quick coupling styles for applications involving the transfer of compressed air, hydraulic oils, fluids, gases and other media and a new quick response work cell on site that offers expedient turn around ultrahigh pressure hose assemblies and specialty engineered products for short-run custom coupling applications.

Central Aviation Inc

Hanger #17 Springbank Airport, 152 MacLaurin Dr, Calgary, Alberta, Canada T2L 1A3,
403-242-9130, FAX: 403-242-9988,
info@centralaviation.ca, www.centralaviation.ca

Contact: Oper Mgr, Colin MacLeod
Provides professional aircraft charter services.

Centrilift

(div of Baker Hughes)
200 W Stuart Roosa, Claremore, OK 74017,
918-342-8374, johnm.thompson@centrilift.com,
www.bakerhughesdirect.com

Contact: Mktg/Comms Mgr, John Thompson
Designs, manufactures and markets artificial lift solutions primarily to the oil and gas industry. Product lines include electrical submersible pumping (ESP) systems; progressing cavity pumping (PCP) systems; and horizontal surface pumping systems.

Century Dynamics

(sub of ANSYS Inc)
16350 Park Ten Pl, Suite 204, Houston, TX
77084, 281-398-6113,
sales@century-dynamics.co.uk,
www.century-dynamics.com

Contact: Bus Mgr, Paul Schofield
Provides simulation software for the offshore community. AQWA performs multibody hydrodynamics analysis, ASAS is designed to simulate all types of offshore structures and AutoReaGas performs explosion and blast studies for topsides and similar configurations. The products form part of the ANSYS portfolio of simulations for the offshore community.

Century Dynamics Ltd

Suit 1, 3 Horsham Gates North St, Horsham, West Sussex, RH13 5PJ UK, 44-1403-270066,
FAX: 44-1403-270099,
info@century-dynamics.com, www.ansys.com

Contact: Dir, Norman Robertson
Offers products that include AQWA for multibody hydrodynamic analysis of all types of structures, ASAS for the structural assessment of offshore structures; AutoResGas for accurate simulation of gas explosion and subsequent blast and AUTODYN, to simulate structural response in ultrashort time frames. Also provides consulting services.



Ceradyne Inc
3169 Red Hill Ave, Costa Mesa, CA 92626,
714-549-0421, toll-free: 800-839-2189, FAX:
714-549-5787, sales@ceradyne.com,
www.ceradyne.com
Contact: Sls Mgr/Ind'l Wear, Hollis Morris
Develops and manufactures technical ceramics. With worldwide production facilities, the company's ceramics are sought for demanding applications in the automotive, aerospace, oil exploration and recovery, electronic, nuclear and defense industries. Plentiful raw materials are coupled with time-tested processes producing high quality and cost-effective components.

Cerno Bioscience

14 Commerce Dr, Danbury, CT 06810,
203-312-1150, FAX: 203-312-1159,
info@cernobioscience.com,
www.cernobioscience.com

Contact: VP Mktg/Prod Dev, Don Kuehl
Develops patented post acquisition software that can greatly extend the utility of mass spectrometry in a number of established and evolving application areas. The technologies also reduce the amount of time required on many MS experiments.

Cetek Ltd

(div of Fosbel)
20600 Sheldon Rd, Brook Park, OH 44142,
216-362-3900, FAX: 216-362-3901,
ctek@fosbel.com, www.cteklimited.com

Contact: Bus Dir, Steve Cherico
Provides a range of services to improve the efficiency of fired heaters, including high-emissivity coatings for process tubes and refractory surfaces, online tube descaling, hot refractory repair and inspections. The coating technology includes a full technical evaluation of the fired heater before the application to estimate the benefit that will be derived.

■ CH2M HILL

9191 S Jamaica St, Englewood, CO 80112,
303-771-0900, toll-free: 888-2426-4455, FAX:
720-286-9250, www.ch2mhill.com

Provides engineering, construction and operations for public and private clients.

(See ad Back Cover)

Chalwyn Ltd

Chalwyn Ind Estate Parkstone, Poole Dorset, BH12 4PF UK, 44-1202-715200, FAX:
44-1202-715600, sales@chalwyn.co.uk,
www.chalwyn.co.uk

Contact: Sls Mgr, Steve Gale
Provides diesel engine safety and flame protection products. These include air intake shut down valves (automatic, mechanical, electrical, hydraulic or air pressure actuation), automatic fuel shut-down valves, frameproof 12 and 24V alternators, exhaust spark arrestors, complete engine monitoring and shut-down safety systems.

Chaparral Automation LLC

2221 McVoid, Springtown, TX 76082,
817-946-5005, ldbest@msn.com,
www.chaparralauto.com

Specializes in precision pumping and control equipment. Manufactures the Dura-Lift long stroke hydraulic pumping unit and the Dura-Mag speed pumpdown control system.

Chemetrics Inc

4295 Catlett Rd, Calverton, VA 20138,
540-788-9026, toll-free: 800-356-3072, FAX:
540-788-4856, marketing@chemetrics.com,
www.chemetrics.com

Manufactures portable water quality test kits and instruments. Test analytes include ammonia, COD, iron, phenols, phosphate and sulfide. Each ampoule has a unit dose of liquid reagent sealed under vacuum, which eliminates the need to measure and mix chemicals and simplifies testing.

Chemtura Corp

(formerly Crompton and Great Lakes)
199 Benson Rd, Middlebury, CT 06749,
203-573-2000, FAX: 203-573-3393,
www.chemtura.com

Contact: Chemtura Product Info
Provides corrosion inhibition in greases, polymers and wear resistant elastomers.

Cheng Fluid Systems

480 San Antonio Rd, Suite 120, Mountain View, CA 94040, 650-559-9292 x103, FAX:
650-947-9273, rjg@chengfluid.com,
www.chengfluid.com

Contact: VP Sls/Mktg, Richard J. Golomb
Manufactures two products that control flow turbulence in piping systems created by elbows, tees and sudden expansions.

CI Actuation

1619 E Richey Rd, Houston, TX 77073,
800-575-6687, FAX: 281-209-9155,
stevec@ciactuation.com, www.ciactuation.com
Supplies new, repaired parts and valves for electrical actuators. Also provides field services and training.

CiDRA Corp

50 Barnes Park N, Wallingford, CT 06492,
203-265-0035, toll-free: 877-243-7277, FAX:
203-294-4211, sales@cidra.com, www.cidra.com

Contact: VP/Gen Mgr Oil/Gas, Paul Khuri
Provides clamp-on flowmeters that are versatile process monitoring systems capable of providing multivariable measurements, such as volumetric flow and entrained air in a variety of fluid regimes—liquids, gases, slurries and multiphase fluids. SONARtrac flowmeters utilize passive sonar techniques, are robust, full bore clamp-on solution and scaleable to large pipe diameters.

Circor Instrumentation Ltd

Frays Mill Works, Crowley Rd, Uxbridge Middx, UK UB8 2AF UK, 44-1895-206780,
aratna@circor.co.uk

CITEL Inc

CITEL Inc

1515 NW 167th St, Suite 6-303, Miami, FL 33169, 305-621-0022, FAX: 305-621-0766, citel@citelprotection.com, www.citelprotection.com

Contact: Sls/Mktg Mgr, Patrick Coyle
Manufactures surge suppressors for AC power, telephone and data lines. They are ideal to protect amplifiers, PLCs, GPS, RTUs and SCADA systems against lightning surges and electrical transients. Many models are offered for RS-232, RS-422, 4-20 mA, RS-485, T1/E1, ISDN, 56k/DDS, leased lines, telephone lines; for coaxial cable and twisted pairs.

Clariant Oil Services

(div of Clariant Corp)

Functional Chemicals Div

8701 New Trails Dr, Suite 100, The Woodlands, TX 77381, 281-465-9100, FAX: 281-465-9200, oilservices@clariant.com, www.clariantoil.com

Contact: US Sls Mgr, Tom Swanson
Provides chemicals to the oil and gas industry. The company has built a reputation for providing added value throughout the oil and gas lifecycle: from exploration, extraction, processing, transportation and refining and for providing a rapid global response to customers.

Clark-Cooper Division

(sub of Magnatrol Valve Corp)

Unit 4, 855 Industrial Hwy, Cinnaminson, NJ 08077, 856-829-4580, FAX: 856-829-7303, techsupport@clarkcooper.com, www.clarkcooper.com

Manufactures process solenoid valves for the gas, power, petrochemical, chemical, military, marine and other industries. Valves are available in 1/4 through 6 in. pipe sizes and a variety of construction materials to accommodate highly corrosive fluids. Options include position switches, manual override, latching/manual reset and many others.

Clark-Reliance

Jerguson Gage & Valve Div

16633 Foltz Pkwy, Strongsville, OH 44149, 440-572-1500, FAX: 440-238-8828, sales@clark-reliance.com, www.clark-reliance.com

Contact: Sls Mgr, Chris Fadden
Manufactures instrumentation and filtration products serving the global market. Instrumentation group includes: Jerguson level indication and control products, Jacoby-Tarbox sight-flow indicators and Clark-Reliance Boiler-Trim products. Filtration group includes: Aftermarket Filtration Elements, Anderson Separator, HYCOA (Hydraulic Company of America) and National Filtration systems-providing air, gas and liquid separators.

ClearDrain

An Advent Design Co

265 Canal St and Jefferson Ave, Bristol, PA 19007, 215-781-0500, toll-free: 800-990-6163, FAX: 215-781-0508, cleardrain@hotmail.com, www.cleardrainusa.com

Manufactures the ClearDrain system, a complete replacement for air dryers for oil rigs and heavy equipment. ClearDrain is a desiccant-free system, self-cleaning, self-defrosting and self-lubricating. Temperature range is -100°F to 185°F. Has been installed on HRI (k/n/a Loadcraft) mobile oil rigs since 1996. Installations worldwide. Six year unlimited hour product warranty.

Cognis Oleochemicals GmbH

Oilfield Chemicals Div

PO Box 13 01 64, 40551 Dusseldorf, Germany, 49-211-7940-3363, FAX: 49-211-2006-13363, dirk.steinbeck@cognis-oleochemicals.com, www.cognis-oleochemicals.com

Contact: Bus Dir, Stephan von Tapavicza
Offers drilling fluid additives and vegetable ester-based carrier fluids for SBM.

Columbia Research Labs

1925 Mac Dade Blvd, Woodlyn, PA 19094, 610-872-3900, toll-free: 800-813-8471, FAX: 610-872-3882,

breyamos@columbiaresearchlab.com, www.columbiaresearchlab.com

Contact: Cust Svc, Robert Raymos
Specializes in the design and manufacture of sensors and associated signal conditioning electronics, including force balance inertial-grade accelerometers and inclinometers, piezoelectric vibration and pressure sensors, strain gauge aircraft mainframe fatigue sensors, precision linear variable transducers for military aerospace, commercial and industrial markets.

Comerica Bank

(div of Comerica Inc)

Energy Finance Div

MC 6593, PO Box 650282, Dallas, TX 75265-0282, 214-969-6562, FAX: 214-969-6561, mfuqua@comerica.com, www.comerica.com

Contact: Sr VP/Group Mgr, Mark Fuqua
Provides a range of specialized energy lending products and services: oil and gas reserve-based development financing, oil and gas property acquisition financing, corporate merger/consolidation and recapitalization financing, financing for energy infrastructure assets, corporate working capital financing, capital markets "bridge" financing and commodity hedging.

Commercial Solutions Inc

4203 95 St, Edmonton, Alberta, Canada T6E 5R6, 780-432-1611, FAX: 780-433-5176, info@csinet.ca, www.csinet.ca

Contact: CEO/Pres, Jim Barker
Provides drilling, well testing and well servicing to plant turnarounds and fabrication. The company provides product knowledge and service. Offers a complete product mix in survey, forestry, bearings/PT, safety and industrial supply applications. The oilfield division includes: Cando Oilfield Supplies & Rentals Ltd./Impact Oilfield Supply Inc./Rig Products Inc.

Compur Monitors GmbH & Co KG

Weissenseestr 101, D-81539 Muenchen, Germany, 49-89-62-038-0, FAX: 49-89-62-038-184, compur@compur.de, www.compur.com

Contact: GF, Bernd Rist
Manufactures, sells and services high quality gas detectors. Product range includes fixed and portable detectors for toxic and flammable gases.

Computer Dynamics

(sub of GE Fanuc Automation Americas)

GE Fanuc Embedded Systems Div

7640 Pelham Rd, Greenville, SC 29615, 864-627-8800, FAX: 864-675-0106, cdsales@gefanc.com, www.cdynamics.com

Contact: Sls/Oil/Gas, Ken Rambler
Manufactures enclosed and open-frame flat-panel display systems, both computers and monitors, for the OEM and end-users in an array of industries, including hazardous outdoor and indoor environments. Custom or semicustom design capabilities to fulfill demanding applications.

Conforma Clad

(div of Kennametal Inc)

501 Park East Blvd, New Albany, IN 47150, 812-948-2118, FAX: 812-944-3254, newalbany.contact@kennametal.com, www.conformaclad.com

Contact: Sr Appl Eng, Doug Kimball
Supplies radial bearings used in directional drilling for oil and gas. The proprietary tungsten carbide technology offers resistance to erosion, impact and abrasion during drilling. This extends the life of critical parts, translating to lower operating costs and higher profits.

CON-SPACE Communications

1160 Yew Ave, Blaine, WA 98231, 800-546-3405, FAX: 800-546-3410, sales@con-space.com, www.con-space.com

Contact: Inside Sls Coord, Linda Hall
Offers two way voice communication for hazardous environments.

Continental Controls Corp

8845 Rehco Rd, San Diego, CA 92121, 858-453-9880, FAX: 858-453-5078, rfisher@continentalcontrols.com, www.continentalcontrols.com

Contact: VP Sls/Mktg, Richard Fisher
Supplies fuel valves for gas turbines and air fuel ratio controllers for gas engines. A new product for small gas engines is the Electronic Gas Carburetor EGC 2. This replaces the traditional mechanical carburetor and provides improved mixing, lower emissions and improved fuel economy.

Continental Disc Corp

3160 W Heartland Dr, Liberty, MO 64068-3385, 816-792-1500, FAX: 816-792-2277, pressure@contdisc.com, www.contdisc.com

Contact: Sales Department
Manufactures rupture discs, disc holders and vent panels to protect against damaging overpressure/vacuum conditions. Designs, sizes, burst pressures and materials to fit a variety of applications. Products have certified flow resistance values and bear the ASME UD Code symbol stamp. An ISO 9001 certified quality system manufacturer.

Continental Procurement Services Ltd

29 Alhaji Bashorun St, SW Ikoyi, Lagos, Nigeria, 234-1-2710780, FAX: 234-1-2710780, sales@continentalprocurement.com, www.continentalprocurement.com

Represents oil and gas equipment manufacturers. Manpower services, operations, maintenance and offshore services.

Control Center LLC

(sub of a GTE Co)

300 Sunport Ln, Suite 100, Orlando, FL 32809, 407-304-5200, FAX: 407-304-5201, info@gtefficiency.com, www.controlcenter.net

Contact: Pres, Michael S. Thomas
Offers integrated process control solutions for industrial plants, OEMs and EPCs. The company's history of providing quality solutions has resulted in thousands of installations.

Control Co

4455 Rex Rd, Friendswood, TX 77546,, sales@control3.com, www.control3.com
Offers New Traceable Instruments for food, pharmaceutical, petroleum, paper, metal and chemical labs. ISO:9001 certified. Instruments are supplied with a Traceable Calibration Certificate, traceable to NIST. Calibration complies with ISO/IEC 17025 requirements and is A2LA (American Association for Laboratory) accredited.

Control Instruments Corp

25 Law Dr, Fairfield, NJ 07004, 973-575-9114, FAX: 973-575-0013, sales@controlinstruments.com, www.controlinstruments.com

Contact: Dir Sls, Debra Woods-Haley
Offers cost-effective monitoring for safety and quality in applications worldwide. The family of products includes continuous process analyzers, flammable gas, toxic gas and oxygen monitors, emissions monitors for VOCs and remote access and control devices for all gas and vapor monitoring needs.

CONTROS Systems & Solutions GmbH

Wischofstr 1-3, 24148 Kiel, Germany,
49-431-260-959-00, FAX: 49-431-260-959-01,
info@contros.eu, www.contros.eu

Contact: Man Dir, Daniel Esser
Provides offshore pipeline inspection and long-term monitoring solutions for hydrocarbons, CO₂ and oil in water in accordance with data management systems. The HydroC system, field experience and data management systems meet increasingly straight regulatory requirements while enhancing the safety and productivity of pipelines and subsea systems.

Converteam SAS

Oil & Gas Div
1 Square John H Patterson, 91345 Massy Cedex,
France, 33-177-31-20-00, FAX: 33-177-31-21-21,
www.converteam.com

Contact: Oil/Gas SIs Dept Mgr, Christian Bozec
Develops and provides solutions built around three core components: rotating machines, drives and process automation. Proposes to the oil and gas industry a set of optimized solutions built with innovative and reliable technologies.

CoorsTek Inc

16000 Table Mountain Pkwy, Golden, CO 80403,
303-271-7000, toll-free: 800-821-6110, FAX:
303-271-7009, oilgas@coorstek.com,
www.coorstek.com

Contact: Prod Mgr, Rusty Denney
Serves the global oil and gas industry with severe-service pump plungers, centrifugal pump components, pulsation dampeners, surge protection equipment and replacement bladders. The oilfield experts help optimize system performance and extend system life.

**Corrpro**

1090 Enterprise Dr, Medina, OH 44256,
330-723-5082, toll-free: 866-267-7776, FAX:
330-723-0244, www.corrpro.com

Contact: Dir Mktg, Terri Beck
Provider of corrosion services, including engineering, pipeline integrity, construction, coating inspection and cathodic protection materials. We offer corrosion solutions for every market, including pipeline, refinery, water, wastewater, concrete, infrastructure, offshore, marine, above and underground storage tanks. With operating facilities and warehouses worldwide, we will be there when you need us.

CORTEC Fluid Control

208 Equity Blvd, PO Box 2217, Houma, LA
70361, 985-223-1966, FAX: 985-223-1936,
sales@uscortec.com, www.uscortec.com

Contact: Pres/CEO, Bobby Corte Jr
Designs, manufactures, sells and services, specializes in valve applications intended for high pressure, high temperature or other critical service applications. Licensed API Spec 6A-0700 to PSL 1, 2, 3, 3G, 4. Registered ISO 9001-2000. Adjustable and positive chokes, manual and actuated; ball and check and compact manifold valves.

COSA Instrument

84G Horseblock Rd, Yaphank, NY 11980,
631-345-3434, cosa@cosaic.com,
www.cosa-instrument.com

Specializes in high technology analyzers for a range of applications in many industries, including petrochemical, energy, environmental, pharmaceutical, semiconductor and plastics. The focus is in moisture analysis, elemental analysis, combustion control, emissions monitoring, heating value analysis, Karl Fischer products, hydrogen analyzers, portable emissions analyzers and gas calorimeters.

Cosense Inc

155 Ricefield Ln, Hauppauge, NY 11788,
631-231-0735, FAX: 631-231-0838,
sales@cosense.com, www.cosense.com

Designs and manufactures ultrasonic fluid detection sensors for various types of OEM equipment. Sensors include continuous and point liquid level in various tanks, reservoirs, vessels and more. Also, noninvasive detection of air bubbles, air-in-line, foam and particles in various sizes and types of tubing. Custom design available for OEM applications.

The Crosby Group Inc

2801 Dawson Rd, Tulsa, OK 74110,
918-834-4611, FAX: 918-832-0940,
crosbygroup@thecrosbygroup.com,
www.thecrosbygroup.com

Contact: Dir Cust Svc, Pat Howerton
Manufactures fitting and hardware used with wire rope, chain and synthetics. Products include hooks, shackles, clips, wedge sockets, swage fittings, turnbuckles, plate clamps, hoist rings, overhaul balls, blocks and sheaves.

Crowley Marine Services Inc

(sub of Crowley Maritime Corp)
16701 Greenspoint Park Dr, Suite 195, Houston,
TX 77060, 281-774-5400, FAX: 281-774-5497,
jim.shettig@crowley.com, www.crowley.com

Contact: VP, Jim Shettig
Engages in a diverse group of energy support services, including shipping, logistics and marine services-related businesses. Operates a fleet of more than 300 vessels. Services provided with terminal tugs, offshore deck barges, rig/ocean towing, arctic all-terrain transportation vehicles, salvage vessels and equipment.

CS Unitec Inc

22 Harbor Ave, Norwalk, CT 06850,
203-853-9522, toll-free: 800-700-5919, FAX:
203-853-9521, info@csunitec.com,
www.csunitec.com

Contact: Pres, Tom Carroll
Provides industrial power tools for oil, gas and petrochemical applications, offering air and hydraulic tools for safe operation in hazardous areas, as well as electric tools. ATEX-approved tools make working with pipe and structural steel easier and safer. Portable hacksaws, magnetic drills, band saws and more.

CTI Industries Inc

283 Indian River Rd, Orange, CT 06477,
203-795-0070, FAX: 203-795-7061,
ctius@cti-ind.com

Contact: Gen Mgr, Peter Tallman
Provides sleeving for heat exchanger tubes. The shield/seal thin-walled metallic tube insert and the full length tube liner allow cost savings over rubbing or replacement. Customers include Aramco, BP, ChevronTexaco, ConocoPhillips, ExxonMobil, PDVSA, Shell and more.

Cummins Filtration

Cummin Inc Div
2931 Elm Hill Pike, Nashville, TN 37214,
615-514-7368, toll-free: 800-777-7064, FAX:
615-366-9760, www.cumminsfiltration.com

Contact: Dir Oil/Gas NA, Ken Swalls
Designs and manufactures air, fuel, hydraulic and lube filtration, chemicals, coolants and exhaust system technology products for diesel and natural gas engines. Global manufacturing sales and service.

Curtiss-Wright Flow Control Sprague Division

10195 Brecksville Rd, Brecksville, OH 44141,
440-838-7690, FAX: 440-838-7528,
mgreene@sprague.curtisswright.com,
www.cwfc.com/sprague

Contact: Dir Mktg/Sls, Michael Greene
Manufactures a range of high pressure air-driven hydraulic pumps, gas boosters, power units, specialty valves and accessories. Products are simple in design, providing the user with cost-effective and energy saving benefits for many industrial and research applications.

CYBERNETIX SA

(div of Oil and Gas Unit)
Technopole de Chateau Gombert, Rue Albert
Einstein BP 94, F13382 Marseille, France,
33-4-91-21-77-20, FAX: 33-4-91-21-77-01,
offshore@cybernetix.fr, www.cybernetix.fr

Contact: Oil/Gas Mgr, Jean-Jacques Quesnel
Provides subsea solutions for the offshore oil and gas industry. Through the design, fabrication and operation of autonomous vehicles and remote operated equipment, delivers cost-effective IRM (inspection repair and maintenance) services and instrumentation and monitoring systems, particularly in deep and ultradeep waters.

Data Comm For Business Inc

2249 CR 1000E, Dewey, IL 61840,
217-897-6600, toll-free: 800-432-2638, FAX:
217-897-1331, cschutz@dcbnet.com,
www.dcbnet.com

Contact: Tech Sls, Dan Smith
Manufactures and distributes a line of communications equipment specifically designed for SCADA, AMR, load management and remote access applications. Other equipment includes etherseries, T1E1 extenders, RS-422 to RS-232 converters, modems, radios, SCADA protocol over IP, DSUs, FRADs, gateways, routers, bit error rate tester, serial data encryption and more.

Davis & Davis Co

2249 W College Ave, Englewood, CO 80110,
303-935-4694, toll-free: 800-251-0867, FAX:
303-935-1762, sales@daviddavisco.com,
www.daviddavisco.com

Contact: Sls, Daniel Poppleton
Provides sales and support services for the following manufactures and products: Daniel Industries flowmeter and chromatographs, Magnetrol International flow and level switches, SpectraSensors laser moisture analyzers, CPA flow conditioner, Badger Meter, Apollo strainers, R&M Energy closures, YZ samplers, Teledyne sensors and many other measurement equipment products.

Deep Marine Technology Inc

9000 Jameel Rd, Suite 190, Houston, TX
77040-5061, 713-896-8555, FAX: 713-849-4021,
info@deepmarinetech.com,
www.deepmarinetech.com

Specializes in four major service lines: multi and dive service vessels and remotely operated vehicles, commercial diving services, directly operated vehicles and intervention systems.

Deepwater Corrosion Services Inc



Deepwater Corrosion Services Inc
(sub of Wah Seong Corp Berhad)
10851 Train Ct, Houston, TX 77041,
713-983-7117, FAX: 713-983-8858,
sales@stoprust.com, www.stoprust.com

Contact: Mktg Mgr, Timothy Britton
Specializes in offshore corrosion control products and services. Offers engineered systems that provide quality and cost-efficient installation. The company provides cathodic protection, including anodes, CP monitoring and more. Provides inspection services, CP probes and the well known I-Rod brand pipe supports.

DeFelsko Corp

802 Proctor Ave, Ogdensburg, NY 13669,
315-393-4450, FAX: 315-393-8471,
techsale@defelsko.com, www.defelsko.com

Contact: Gen Mgr, David Beamish
Manufactures coating thickness gauges and inspection instruments.

Degerfors Formings AB DEFORM

PO Box 25, SE-69321 Degerfors, Sweden,
46-586-47300, FAX: 46-586-44914,
info@deform.se, www.deform.se

Contact: Export Mgr, Conny Lundstedt
Provides forming of pressure vessels, spheres, tanks, heads, hemiheads, dished ends, cones and other 3-D forming in all steel grades; quenched and tempered, stainless, carbon, clad and titanium. Hot and cold forming with additional heat treatment.

Deloro Stellite Inc

(sub of Deloro Stellite Group)
471 Dundas St E, PO Box 5300, Belleville,
Ontario, Canada K8N 5C4, 613-968-3481, FAX:
613-966-8269, jcoughlan@stellite.com,
www.stellite.com

Contact: Southern Reg Off Sls Mgr, Mike Wartko

Provides components that are made to customer specifications, last longer, have less down time, fewer maintenance related trips and lower operating costs.

SALES OFFICES:

Deloro Stellite Southern Regional Office
Houston, TX 281-579-9447,
mwartko@stellite.com, www.stellite.com



Deltamarin Ltd/Deltamarin Contracting Ltd

Purokatu 1, FIN-21200 Raisio, Finland,
358-2-4336-300, FAX: 358-2-4380-378,
info@deltamarin.com, www.deltamarin.com

Contact: Proj Mgr Offshore, Timo Granberg
Consults and engineers, specializing in marine and offshore projects. Worldwide services for new buildings and conversions, including feasibility, FEED, basic and coordination design, detail engineering, supervision and commissioning. Extensive use of 3-D computer modeling tools throughout the engineering process since 1986, the latest innovation being the early phase 3-D coordination-interface model.

DeltaValve

(div of Curtiss-Wright Flow Control Corp)
857 W South Jordan Pkwy, Suite 100, South Jordan, UT 84092, 801-984-1000, FAX:
801-984-1001, info@deltavalve.com,
www.deltavalve.com

Contact: VP WW Sls, Steven J. Wilkie
Designs, engineers and manufactures industrial equipment for delayed coking within the oil and gas industry. Products include the DeltaGuard coke drum unheading device for both the top and bottom of the coke drum, the innovative in-line repairable isolation valves and their auto-switch coke cutting tool.

Dematic Corp

507 Plymouth Ave NE, Grand Rapids, MI 49505-6029, 616-913-7700, toll-free:
800-530-9153, FAX: 616-913-7701,
usinfo@dematic.com, www.dematic.us

Offers material handling systems, supply chain analysis, system design, project management, implementation of integrated solutions, paperless picking technologies, automated storage/retrieval, material flow conveyors and high-speed sortation systems.

Det-tronics

6901 W 110th St, Minneapolis, MN 55438,
952-941-5665, FAX: 952-941-5665,
dave.gohman@detronics.com

Provides optical fire detection, gas detection and hazard mitigation systems. Designs, builds, tests and commissions safety systems that range from conventional panels to fault-tolerant, addressable systems. Flame and gas detectors are globally certified to the latest product approval standards, including critical SIL-2 industrial applications.

Deutsch

(div of Industrial Connectors)
Oil & Gas Div

8 Blvd Pierre Lefauchaux, ZI Sud, 72100 Le Mans, France, 33-243-61-45-45, FAX:
33-243-61-73-80, msmith@deutsch.net,
www.deutsch.net

Contact: Global Mktg/Proj Mgr, Matthew Smith
Offers wet and dry mateable electrical power, signal and optical connectors for topside, subsea, downhole and custom designs. Topside splash-zone/dry/Eexd connectors for FPSOs, turbines, SPMS, support vessels and platforms. Subsea connectors for power distribution, SCMs, tubing hangers, Xmas trees, hermetic penetrators and seismic. Downhole connectors for logging and reservoir monitoring.



Dexter Magnetic Technologies Inc
2007 Industrial Blvd, Suite D, Rockwall, TX 75087, 847-956-1140, toll-free: 800-345-4082,
FAX: 800-345-8193, info@dextermag.com,
www.dextermag.com/oil-gas.aspx

Contact: Bus Mgr Oil/Gas Prods, Tim Price
Offers undercurrent, commercial downhole turbine generator systems for LWD, MWD and rotary steerable. Complete design, fabrication and assembly of magnetic systems, including NMR source magnet assemblies, nondestructive MFL source assemblies, rotary and linear magnetic couplings and actuators, 3-D magnetic modeling, field mapping, testing and calibration.

Ditch Witch

PO Box 66, Perry, OK 73077-0066, toll-free:
800-654-6481, FAX: 580-572-3523,
info@ditchwitch.com, www.ditchwitch.com

Diverse Technologies

Kingfisher House, High Green, Gt Shelford Cambridge, CB22 5EG UK, 44-1223-844-444,
FAX: 44-1223-844-944,
sales@diverse-technologies.net,
www.diverse-technologies.net

Provides equipment and support for overcoming magnetic arc blow when welding. The company's equipment and services are used by petroleum, oil and gas corporations worldwide. The company's premiere product is Zeromag that instantly removes magnetism from pipe and plate components.

DMT GmbH

Exploration & Geosurvey Div
Am Technologiepark 1, PO Box 130101, 45307 Essen, Germany, 49-201-172-1970, FAX:
49-201-172-1971, exploration@dmtd.de,
www.dmt.de

Contact: Sls Mgr, Thorsten Mueller
Provides engineering services in the fields of mining and deposit exploration, infrastructure, mechanical and systems engineering, as well as technical safety for buildings and plants. Develops, produces and sells geophysical, geodetic and other measuring equipment worldwide, including DMT CoreScan II, a digital drill core imaging system.

DNV Energy

(sub of Det Norske Veritas)
Cromarty House, 67-72 Regent Quay, Aberdeen, AB11 5AR UK, 44-1224-335000, FAX:
44-1224-593311, team@dnv.com, www.dnv.com

Contact: Mktg Mgr, Roslyn Williamson
Provides services for managing risk. Established in 1864, the company is an independent foundation with the objective of safeguarding life, property and the environment.

Dockwise Shipping Bv

Lage Mosten 21, PO Box 3209 4800 De, 4822 NJ Breda, The Netherlands, 31-76-548-41, FAX:
31-76-548-42, Gerard.jansen@dockwise.com
Specializes in heavy transport shipping operating a fleet of 15 semi-submersible vessels primarily servicing clients in the marine and oil and gas industry.

Dolphin Energy Equipment

4104 Highway 90 W, New Iberia, LA 70560,
337-369-7098, FAX: 337-364-0102,
chad@dolphincompactors.com

Contact: Sls, Chad Vidrine

Donaldson Company Inc

Gas Turbine Systems Div
1400 W 94th St, PO Box 1299, Minneapolis, MN 55440, 952-887-3131, FAX: 952-887-3843,
filterinfo@mail.donaldson.com,
www.donaldson.com

Contact: Sls Mgr Oil/Gas, Susan Rohricht
Provides air filtration systems and replacement filters, hydraulic filters, retrofit services on air inlet systems for turbines and compressors. Sales and service worldwide.

Dovianus BV

PO Box 76, 2660AB Bergschenhoek, The Netherlands, 31-10-420-6011, info@dopak.nl,
www.dopak.com

Supplies DOPAK samplers for liquids and gases to the international markets in chemical and petrochemical industries. Simple and representative samplers: safer for the environment, operator and process.

DPS (Bristol) Ltd

Serbert Way, Portishead, Bristol, BS20 7GF UK, 44-1275-841300, FAX: 44-1275-841301, info@dps-global.com, www.dps-global.com

Contact: Sls Dir, Jon Moseley
Designs and supplies process systems, both on-shore and offshore. Specializes in marginal field and fast track developments. Associate company, DPS Delta, provides a range of process equipment and designs.

Draeger Safety Inc

101 Technology Dr, Pittsburgh, PA 15275, 412-787-8383, FAX: 412-787-2207, prodinfo@draeger.com, www.draeger.com

Contact: Mktg/Comms Mgr, Shelli Cosmides
Manufactures quality gas detection instrumentation and respiratory protection products. Complete range of gas detection products using the company's own sensor technology and complete offerings of respiratory protection from disposable air purifying products to SCBA and four hour rebreathers.

Dreggen Crane AS

PO Box 3434, N-5815 Bergen, Norway, 47-553-33650, FAX: 47-553-33651, mailbox@dreggen.no, www.dreggen.com

Contact: Mktg Mgr, Eric Gullestad
Delivers a range of cranes and lifting equipment for the offshore and petrochemical industry, such as deck cranes, BOP cranes, EOT cranes, Christmas tree cranes, service cranes and pipe handling/riser handling cranes. All cranes delivered to ATEX and other relevant regulations.

DREHMO (EMG) GmbH

(sub of EMG)
Valve Automation Systems Div
Industrie Strasse 1, 57482 Wenden, NRW, Germany, 49-7634-551320, FAX: 49-7634-551325, drehmo@drehmo.com, www.drehmo.com

Contact: Export Mgr, Karl Natterer
Offers experience in valve automation, with a global sales and service network and customer base. Supplies electric actuator, gearboxes and other equipment and accessories for valve operation and automation. Products include DREHMO Standard, DREHMO Matic C, DREHMO I Matic for multiturn, parturn and linear valve operation in normal and hazardous areas.

Dresser-Rand Co

1200 W Sam Houston Pkwy N, Houston, TX 77043, 713-467-2221, FAX: 713-935-3490, info@dresser-rand.com, www.dresser-rand.com

Supplies rotating equipment solutions, with field-proven centrifugal and reciprocating compressors, steam turbines, expanders, gas turbine packages and control systems. Delivers a complete package of solutions for the worldwide oil and gas, chemical, petrochemical and process industries.

DSG-Canusa

(div of ShawCor Ltd)
25 Bethridge Rd, Toronto, Ontario, Canada M9W 1M7, 416-743-7111, FAX: 416-743-7752, sales@dsgcanusa.com, www.dsgcanusa.com

Contact: Mktg Mgr, Glen Brehaut
Provides heat shrink products and related technology. Product offerings include polyolefin, fluoropolymer, elastomer and PVC heat shrink in thin, medium and heavy-walled tubing; accessories and equipment. Committed to developing unique solutions for customer applications.

Dunlop Oil & Marine Ltd

Moody Ln, Pyewipe, Grimsby, NE Lincolnshire, DN31 2SY UK, 44-1472-359281, FAX: 44-1472-362948, dunlop.sales@dunloil.com, www.dunlop-oil-marine.co.uk

Contact: Comm Mgr, Chris Slater
Designs, manufactures and supplies hoses for the oil, gas, petrochemical and dredging industries, for both onshore and offshore based operations (OCIMF).

Durex Industries

190 Detroit St, Cary, IL 60013, 847-639-5600, toll-free: 800-762-3468, FAX: 847-639-2199, sales@durexindustries.com, www.durexindustries.com

Contact: Sls Rep, Mike Forbes
Manufactures a variety of electric heaters and temperature sensors for the thermal process requirements of the petroleum industry, including custom designed thermocouples, multipoint sensors, circulation heating systems, pipe trace heaters and temperature controls.

■ Dwyer Instruments Inc

PO Box 373, Michigan City, IN 46361, 219-879-8000, toll-free: 800-872-9141, FAX: 219-872-9057, lit@dwyer-inst.com, www.dwyer-inst.com

Contact: Prod Mgr, Craig Martin
Produces a range of competitively priced precision instruments for measuring, transmitting and controlling pressure, temperature, level and flow. Committed to a standard of customer service, including competitive prices and knowledgeable technical support that generates and sustains long-term relationships.

(See ad p 29)

Dynamic Flow Computers Inc

12603 S W Freeway, Suite 320, Stafford, TX 77477, 281-565-1118, FAX: 281-565-1119, dyn.com@dynamicflowcomputers.com, www.dynamicflowcomputers.com

Contact: Int'l Sls, Ray Sarabi
Manufactures field and panel mount flow computers. Products are used for both gas and liquid industries. Flow computer is capable of interfacing with most meter types, such as V-cone, turbine, ultrasonic, wedge and more.

Dynex Rivett Inc

770 Capitol Dr, Pewaukee, WI 53072, 262-691-2222, FAX: 262-691-0312, sales@dynexhydraulics.com, www.dynexhydraulics.com

Contact: Dir Global Sls, Jim Celmer
Manufactures pumps for wellhead safety control systems. Maintenance-free water glycol pumps operate at 15,000 psi. A single-fluid design avoids the cost of a separate lubrication circuit and prevents potential fluid cross-contamination. One hp mineral oil pumps are used for remote land-based panel systems and portable torque-tool power units.

Dynisco

38 Forge Pkwy, Franklin, MA 02038, 508-541-9400, FAX: 508-541-6206, sales@dynisco.com, www.dynisco.com

Contact: VP Mktg, Douglas Joy
Supplies a variety of pressure and temperature measurement sensors for the oil/gas services industry.

e3a3 Ltd

Riverside Business Centre, Riverside Rd, Lowestoft, NR33 0NQ UK, 44-870-892-1166, FAX: 44-1502-500-522, sales@e3a3.com, www.e3a3.com

Contact: Stephen Scales
Offers compact and powerful Wells Head controllers and Data Loggers utilizing microprocessor technology specifically for artificial lift systems. Controllers and drives with optimization algorithms for rod, progressive cavity and electrical submersible pumps will prevent damage while maximizing the production output of the well.

EagleBurgmann Industries LP

10035 Brookriver Dr, Houston, TX 77040, 713-939-9515, FAX: 713-939-9091

Contact: Dir Mktg, Ray Poltorak
Manufactures mechanical seals, supply systems, packings, expansion joints and provides enhanced reliability services, MRO inventory management, seal repair and training.

Eagle Technology Inc

10500 N Port Washington Rd, Mequon, WI 53092, 262-241-3845, toll-free: 800-388-3268, FAX: 262-241-5248, www.eaglecmms.com
Develops computerized maintenance management systems (CMMS) and enterprise asset management (EAM). Helps companies increase efficiency by allowing facilities and production equipment to run smoothly and comfortably with minimum downtime through the ProTeus software solution. A unique feature in ProTeus is the ability to interface with building automation systems.

Easi-Set Industries

5119 Catlett Rd, PO Box 400, Midland, VA 22728, 540-439-3266, toll-free: 866-252-8210, FAX: 540-439-1232, adventures@easiset.com, www.precastbuildings.com

Provides pre-engineered transportable precast concrete buildings (from producers nationwide): maintenance-free, weather-tight, secure, durable, post tensioned roof and floor, no foundation required, quick installation, preassembled and field erected. Buildings for hazmat, shelters, mechanical/electrical control, utility equipment and storage. Clear-span sizes from 10 x 12 ft. to 40 x 200 ft.

East Penn Canada

(sub of East Penn Manufacturing Co Inc)
165 Harwood Ave N, Ajax, Ontario, Canada L1Z 1L9, 905-427-2718, toll-free: 800-961-4931, FAX: 905-427-0854, sales@eastpenncanada.com, www.eastpenncanada.com

Contact: Nat'l Sls Mgr, Jim DeCoste
Provides sales and service of lead acid batteries for all applications, including telecommunications, switchgear controls, cellular radio, photovoltaics, uninterruptible power supplies, industrial motive power, commercial equipment, passenger automobile and other small engine applications. Fully licensed recycler of lead acid batteries.

Easy-Laser/Damalini AB

Abacksgatan 6b, 43167 Molndal, Sweden, 46-31-708-6300, FAX: 46-31-708-6350, easy-laser@damalini.se, www.easy-laser.com

Contact: Man Dir, Anders Edenhämmar
Provides measurement and alignment systems for shaft alignment, sheave/pulley alignment, geometric measurements, such as straightness, flatness, squareness, parallelism and spindle direction. Durable intrinsically safe ATEX/Ex/IECEx approved shaft alignment system (also both IP66 and IP67 approved) and sheave/pulley alignment system.

Eaton Filtration LLC

Eaton Filtration LLC

900 Fairmount Ave, Elizabeth, NJ 07207,
908-787-1000, toll-free: 800-859-9212, FAX:
908-351-7893, eaton.com,
www.filtration.eaton.com

Contact: Dir Mktg Comms, Don Treslar

Ebo Systems SAS

(sub of Hager Group)

Zone Industrielle, PO Box BP5, 54920 Villers La
Montagne, France, 33-3-82-44-01-07, FAX:
33-3-82-26-10-41, info@ebo-systems.com,
www.ebo-systems.com

Contact: Commercial Dir, Pascal Muller
Manufactures FRP/LGRP cable trays, racks, lad-
ders, ducts and light structures. More than 45
years of experience worldwide.

ECA

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33-494-0890-00, FAX: 33-494-0890-70,
offshore@eca.fr, www.eca.fr

Contact: Offshore Sls Mgr, Thierry Copros
Provides innovative solutions for autonomous
and remote controlled inspection and interven-
tion: automated systems, AUVs (autonomous un-
derwater vehicles), such as ALISTAR 3000,
inspection AUV, USVs (unmanned surface vehi-
cles), ROVs (remotely operated vehicles), ship
hull inspection ROV, subsea and explosion-proof
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Echometer Co

5001 Ditto Ln, Wichita Falls, TX 76302,
940-767-4334, FAX: 940-723-7507,
info@echometer.com, www.echometer.com

Contact: Sls Oper, Jenny Pruner
Manufactures oil field acoustic liquid level instru-
ments, dynamometers and motor power measur-
ing equipment for optimizing a well's production.

Eclipse Scientific

60 Baffin Pl, Unit 4, Waterloo, Ontario, Canada
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www.ecophysics-us.com

Contact: Tech Sls Spec, Tom Ander
Provides chemiluminescence NOx and NH₃ ana-
lyzers.

ECS GmbH & Co KG

Sollbrueggenstr 76, 47800 Krefeld, Germany,
49-2151-5088-0, FAX: 49-2151-5088-50,
info@eservice.de, www.eservice.de

Contact: Dipl Eng, Klaus Suiter
Provides pipeline supervision and protection sys-
tem against assault, terrorism acts and theft,
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els, transducer, protection relay, instruments,
diesel controller, battery charger and regulators,
pipeline monitoring system and leakage detec-
tion.

ECT Offshore Service AB

Ovädersgatan 14, SE-41834 Gothenburg,
Sweden, 46-31-530040, FAX: 46-31-530045,
info@ectoffshore.se, www.ectoffshore.se

Contact: Svc Mgr, Johan Axelsson
Develops drinking water treatment systems that
will secure the water quality and fulfill the require-
ments from any government and has extensive
experience of decontaminate Legionella bacteria
within the marine/offshore sector. In cooperation
with ECT Water Academy AB, the company edu-
cates offshore personnel in drinking water han-
dling.

Eiffel

Offshore Div

48-50 rue de Seine, 92707 Colombes, France,
33-1-47-60-4754, FAX: 33-1-47-60-4705,
offshore@eiffel.eiffage.fr, www.eiffel.fr

Contact: Offshore Div Dir, Arnaud De Villepin
Provides an EPCI contractor for offshore pro-
jects. Able to construct technical modules, living
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EIM Controls Inc

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sales@elcometerusa.com, www.elcometer.com

Contact: VP, Joseph J. Walker
Manufactures and distributes instruments for the
quality control of surface coatings, since 1947.
Offers a line of coating, concrete and physical
test inspection instruments for both field and lab-
oratory use.

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(div of Greatbatch Ltd)

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716-759-2562, sales@electrochempower.com,
www.electrochempower.com

Contact: Sls/Dist Mgr, David Wald
Manufactures lithium batteries for extreme
environments. Electrochemical products pro-
vide dependable power on demand, high reli-
ability and peak performance in harsh
environments. Major oil services companies
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more.

Electrochemical Devices

PO Box 355, Belmont, MA 02478-003,
617-484-9085, FAX: 617-484-3923,
john@edi-cp.com, www.edi-cp.com

Contact: VP Mktg/Sls, John Olson
Manufactures permanently installed reference
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for all applications. Also offers linear distributed
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with other innovative cathodic protection prod-
ucts.

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901 N Fourth St, Jeannette, PA 15644,
724-527-2811, FAX: 724-600-8442,
info@elliott-turbo.com, www.elliott-turbo.com

Contact: VP Americas Sls, Kevin Eads
Designs, manufactures and services
turbomachinery, including centrifugal compres-
sors and steam turbines used in oil and gas, pet-
rochemical and LNG markets and other industrial
and power applications.

Emco Wheaton GmbH

Emcostrasse 24, D-35274 Kirchheim, Germany,
49-6422-840, FAX: 49-6422-5100,
info@emcowheaton.de, www.emcowheaton.com

Contact: Jean-Philippe Hudelot
Develops and manufactures total solutions for
loading liquid products. Synonymous with marine
loading arms, loading arms for road and rail tank-
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tion systems, floating suction and safe access
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toll-free: 800-998-3632, FAX: 978-386-0002,
mark.slusher@emecamericas.com,
www.emecamericas.com

Contact: Pres, Joseph A. Novelli
Manufactures metering pumps, controllers and
sensors. Provides quality for the oil and gas in-
dustry. Achieves product performance through
application of proprietary manufacturing tech-
niques and product engineering that permits the
company to meet rigorous industry applications.
Pump technology solutions include solenoid,
centrifugal and motor-driven metering pumps.

Emerson Process Management

Mobrey Measurement Div

158 Edinburgh Ave, Slough, SL1 4UE UK,
44-1753-756600, FAX: 44-1753-823589,
mobrey.enquiries@emersonprocess.com,
www.mobrey.com

Contact: Int'l Sls Mgr, Stuart Rattidge
Manufactures measurement and control instru-
mentation, offering single-source supply for a
range of level, flow, pressure, density and viscos-
ity and other measurement solutions.

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Fisher Div

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641-754-3011, FAX: 641-754-2830,
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sales.srt@emerson.com,
www.rosemount-tankradar.com

Contact: Sls Mgr, Johan Sandberg
Offers tank management with noncontact, reli-
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vides the tool for inventory and custody transfer
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water interface detection.

**Emerson Process Management
Rosemount Tank Gauging North
America Inc**

10700 Hammerly Blvd, Suite 115, Houston, TX 77043, 713-722-9199, sales.srt.hou@emersonprocess.com, www.rosemount-tg.com

Contact: SIs, Tom Whittington
Provides tank management with noncontact, reliable, maintenance-free radar level gauges. Provides the tool for inventory and custody transfer tank gauging. The tank gauging system includes level, temperature, pressure, mass, volume and water interface selection.

Emerson Process Management

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6565 P Davis Industrial Pkwy, Solon, OH 44139, 440-914-1261, toll-free: 800-433-6076, FAX: 440-914-1271, gas.csc@emersonprocess.com, www.raihome.com

Contact: Customer Support Center

Emerson Process Management

Remote Automation Solutions Div
1100 Buckingham St, Watertown, CT 06795, 860-945-2200, toll-free: 800-395-5497, FAX: 860-945-2278, binfo@emersonprocess.com, www.emersonprocess.com/remotediv

Supplies flow computers, RTUs, presets, instruments and engineering services under the Bristol, Control Wave, FloBoss, ROC and Danload brands.

Emirates Truck Factory

Rak FTZ Industrial Park, #17-23, Ras Al Khaimah, United Arab Emirates, 971-7-2668456, FAX: 971-7-2668117, www.eft.ae

Manufactures off-highway trucks, 2-way off-highway road trains, scrapers and large wheel loaders suitable for slippery conditions.

Enardo

4470 S 70th E Ave, Tulsa, OK 74145, 918-622-6161, toll-free: 800-336-2736, FAX: 918-622-0004, sales@enardo.com, www.enardo.com

Contact: VP SIs/Mktg, Bruce Isentol
Manufactures pressure/vacuum relief valves, flame arrestors and emergency relief vents for storage tanks and vapor recovery. Arrestors feature a patented design which is less prone to plugging. Valves provide cold weather performance and resistance to sticky substances. Approvals include US Coast Guard, Factory Mutual, ATEX and ISO:9001.

Energy Institute

61 New Cavendish St, London, WIG 7AR UK, 44-20-7467-7100, FAX: 44-20-7255-1472, nwilkinson@energyinst.org.uk, www.energyinst.org.uk

Contact: Training Mgr, Nick Wilkinson
Provides training for oil and gas industries.

Engineering Software

PO Box 1180, Germantown, MD 20875, 301-540-3605, FAX: 301-540-3605, engware@aol.com,

www.members.aol.com/engware

Contact: R&D Eng, Gordon Feric
Provides engineering high performance computing e-solutions and online continuing education courses for energy conversion systems (power and propulsion)—physical properties, steam approximations, analysis of power cycles, power cycle components/processes and compressible flow.

Enidine Inc

7 Centre Dr, Orchard Park, NY 14127-2293, 716-662-1900, FAX: 716-662-1909, technicalsales@enidine.com, www.enidine.com

Contact: VP SIs/Mktg/Ind'l, Tom Zemanek
Designs and manufactures energy absorption and vibration isolation products, including shock absorbers, gas springs, rate controls, air springs, wire rop isolators and heavy industry buffers.

With manufacturing and distribution facilities located throughout the globe, the company provides unparalleled customer service and engineering support.



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Contact: Sls Mgr, Ray Kelley
Manufactures hazardous gas and vapor detection systems for industrial health and safety applications and portable instruments for confined space entry. Manufactures toxic, combustible and oxygen detectors, compressed breathing air monitors, portable and fixed multipoint systems for a range of hazardous gases.

ENSYS Energy

1775 Massachusetts Ave, Suite 3, Lexington, MA 02420, 781-274-8454, FAX: 888-453-1270, info@ensysenergy.com, www.ensysenergy.com

Contact: Pres, Martin Tallett
Specializes in analysis and modeling of refining and oil markets; also specializes in software and services for oil field production management and multiphase flow computation.

Enventure Global Technology

15995 N Barkers Landing, Suite 350, Houston, TX 77079, 281-552-2200, FAX: 281-552-2201, info@enventuregt.com, www.enventuregt.com

Contact: Global Bus Dev Mgr, Gary Prehoda
Provides solid expandable tubular (SET) technology. The global presence includes operations in the Americas, Middle East, Asia Pacific, Europe and Far East. The work in open-hole and cased-hole applications helps operators develop the most value possible from drilling and workover wells.

Enviroline Group

1831 Blount Rd, Pompano Beach, FL 33069, 800-449-6525, FAX: 954-978-3913, info@envirolinegroup.com, www.envirolinegroup.com

Contact: Cust Svc Coord, Lourde Matos
Manufactures Enviroline series products, providing long term durability, as well as corrosion, high temperature and chemical resistance through high solids and fast cure technology. Delivers innovative technical solutions for a variety of aggressive applications in high performance coatings and linings with 50 years experience.

Environetics Inc

1201 Commerce St, Lockport, IL 60441, 815-838-8331, toll-free: 866-483-8300, FAX: 815-838-8336, info@environeticsinc.com, www.environeticsinc.com

Contact: Mktg Mgr, Richard Winters
Manufactures environmental control products that contain or divert liquid. Porta Tank is a portable tank used for water or chemical storage. Oil booms are used for oil spills. E-Berm is used for secondary containment.

Environmental Energy Services Inc

(EES)
5 Turnberry Ln, Sandy Hook, CT 06482, 203-270-0337, FAX: 203-426-0150, twolferseder@eescorp.com, www.eescorp.com
Provides specialty fuel treatment programs, advanced online application systems and diagnostic support services for utility boilers and other facilities burning oil and coal. Proactive combustion and emission solutions controls slagging/fouling, reduces emissions (PM SO₃, NO_x) and increases overall operating efficiency.

eProduction Solutions Inc

(div of Weather International)
Production Optimization Div
22001 N Park Dr, Kingwood, TX 77339, 281-348-1000, FAX: 281-348-1280, info@ep-solutions.com, www.ep-solutions.com

Contact: VP Mktg/Commercialization, Karl Sakocius
Provides real-time production optimization solutions for flowing wells and all forms of artificial lift. Helps operators increase production rates and reduce operating costs. Solutions include artificial lift optimization, control systems and subsea, reservoir monitoring, software and flow metering. Each of the systems provide benefits alone, but coupled together create customized, comprehensive optimization solutions.

Equipment Maintenance Innovators

7114 W Jefferson Ave, #100, PO Box 494, Morrison, CO 80465-3222, 303-809-8663, FAX: 303-904-9875, richlf@emi-global.com, www.emi-global.com

Contact: Pres, Richard LeFrancois
Provides technology integration and its product, Mobile-SCADA, which encompasses a suite of technology product offerings for the management and maintenance of truck fleets. Mobile-SCADA addresses fuel management, diesel idle reduction technology, driver management, machine access control, risk management and data recorders for tracking operational characteristics of trucks.

ESS

Suite 100, 1620 W Fountainhead Pkwy, Tempe, AZ 85282, 480-346-5500, toll-free: 800-289-6116, FAX: 480-346-5599, info@ess-home.com, www.ess-home.com

Contact: CRO, Ian Achterkirch
Provides environmental, health/safety (EH&S) and crisis management software for governance, risk and compliance. The company has provided global and local software solutions for more than 17,000 businesses, government agencies and other organizations worldwide. Headquartered in Tempe, AZ, with offices in Denver, Washington, Houston and Calgary, Alberta.

EUROPIPE GmbH

Pilgerstr 2, PO Box 100504, 45473 Mülheim an der Ruhr, Germany, 49-208-976-0, FAX: 49-208-976-30-00, europipe@europipe.com, www.europipe.com

Contact: Mktg Mgr, Marlene Stille
Manufactures SAW longitudinally welded large-diameter steel pipe for oil- gas- and water-pipelines; onshore/offshore, sizes O.D. 20-60 in., W.T. 7-40 mm, pipe lengths to 18 m, for sour and nonsour service. Also for other applications, such as structural pipes, large diameter pipes for optimizing pipelines and various linings and coatings.

Eurotherm Ltd

(div of Invensys Plc)
Faraday Close, Durrington, West Sussex, BN13 3PL UK, 44-1903-268500, FAX: 44-1903-695666, info@eurotherm.co.uk, www.eurotherm.com

Contact: Promo Mktg Asst, Kerrie Peskett
Develops quality "fit-for-purpose" products and solutions. Each of the solutions provided is drawn from a comprehensive family of configurable process control, data management and scalable automation systems.

Everight Postion Technologies Corp

102 Commerce Dr, Unit 8, Moorestown, PA 19072, 856-727-9500, FAX: 610-672-9663, info@everightsensors.com, www.everightsensors.com

Contact: Sls Mgr, Lester Schaevitz
Develops and distributes linear and angular position sensors for use in valve position and other process control functions. Specialists in sensors for use in hazardous locations (Class 1, Div 1 Gr.ABCD). Custom sensors for deep sea well head valve position applications.

Everlasting Valve Co

108 Somogyi Ct, South Plainfield, NJ 07080, 908-769-0700, FAX: 908-769-8697, info@everlastingvalvesusa.com, www.everlastingvalvesusa.com

Contact: Reg Sls Mgr, David Jenkins
Develops the self-lapping flat rotating disk metal seated valve to handle abrasive slurries. The company's valves replace installed valves that are repaired more than once a year to increase production and profit. Valve capabilities are vacuum to 10,000 psig, temperatures to 1500°F and sizes to 18 in.

Exploration Logistics Group plc

Bldg 8 Floor 3, Vantage Point Business Village, Mitcheldean, Gloucestershire, GL17 0DD UK, 44-1594-545100, FAX: 44-1594-545101, jo.morgan@exlogs.com, www.exlogs.com

Contact: Mktg Mgr, Johanna Morgan
Provides remote site medical and safety solutions. With 700 staff worldwide, the organization specializes in HSE services, medical support and supplies, driver training, steep terrain support, demining and ordnance disposal providing people, equipment and effective project management and serving organizations in hazardous and remote environments worldwide.

Expro Americas Inc Downhole Video Services

738 Highway 6 S, Suite 500, Houston, TX 77079, 281-587-8866, FAX: 281-587-8833, jwhittaker@dhvi.com, www.dhvi.com

eyevis

In Laisen 76, DE-72766 Reutlingen, Germany, 49-712-143-3030, FAX: 49-712-143-30322, info@eyevis.de, www.eyevis.de

Contact: Dir Mktg/Int'l Sls, Eric Hénique
Manufactures large screen systems for control rooms, information, communications, simulation and virtual reality. Offers a range of products for visualization of information and sensible data.

Fabricated Plastics Ltd

2175 Teston Rd, Maple, Ontario, Canada L6A 1T3, 905-832-8161, FAX: 905-832-2111, info@fabricatedplastics.com, www.fabricatedplastics.com

Contact: VP Sls, Greg Landry
Designs, engineers and custom fabricates high quality piping systems, pollution control and chemical processing equipment from FRP or thermoplastic lined FRP materials for the mining, chemical processing, semiconductor, metal finishing, iron and steel, food, pulp and paper and pollution control industries. Products include pipe, tanks, vessels, scrubbers, mist eliminators and more.

FAFNIR GmbH

Bahrenfelder Strasse 19, 22765 Hamburg, Germany, 49-40-3982070, FAX: 49-40-3906339, info@fafnir.de, www.fafnir.com

Contact: Dir Bus Dev, Wolfgang Pein
Develops and produces filling sensors, overflow prevention devices, limit signal controls, vapor flow sensors and continuous level measurement systems for the oil, chemical, pharmaceutical and food industries. The close cooperation with customers is an important factor for putting innovative ideas into practice and ensuring the functionality of products.

FAG Bearings

Schaeffler Group USA Inc Div
200 Park Ave, Danbury, CT 06813,
203-830-8123, FAX: 203-830-8171,
djana.dibartolomeo@schaeffler.com,
www.fag.com

Designs and produces high quality bearings for mud pumps, rotary pumps, swivels and block hooks. Offers products and services for mounting, alignment, lubrication, condition monitoring and vibration analysis, bearing maintenance and measurement equipment, heater products and field services.

Farris Engineering

(div of Curtiss Wright Flow Control)
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Canada T6A 0L4, 780-465-2262, FAX:
780-469-6662, dthompson@curtisswright.com,
www.cwfc.com

Contact: W/NA Mgr, Don Thompson
Provides pressure relief valves with automatic and positive protection against overpressure. Innovations combined with progressive engineering provide sound design and high quality production, with industry-leading sizing and selection software.

FasTest Inc

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651-645-6266, toll-free: 800-444-2373, FAX:
651-645-7390, fastsales@fastestinc.com,
www.fastestinc.com

Contact: VP Mktg, Grant Bistrum
Supplies engineered connectors. The company is a dedicated manufacturer of productivity and quality improvement tools for pressure and vacuum testing, including a line of specialty connectors that provide leak-tight, reliable connections for industrial applications via temporary connections that mate and seal with proprietary and/or standard interface of customers' products.

Fibergrate Composite Structures Inc

5151 Beltline Rd, Suite 700, Dallas, TX 75254,
972-250-1633, FAX: 972-250-1530,
info@fibergrate.com, www.fibergrate.com

Contact: Mktg Mgr, Tina Marr
Manufactures fiberglass reinforced plastic (FRP) products, including grating, structural shapes, handrails and ladders. Key product features, such as corrosion resistance, slip resistance, flame retardancy, impact resistance and low maintenance, qualify these products for use in all types of marine vessels and offshore structures.

Fibox Enclosures

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Contact: Mgr, Diane Souffie

Fireye Inc

(div of UTC)
Fire & Safety Div
3 Manchester Rd, Derry, NH 03038,
603-432-4100, FAX: 603-432-1570,
sales@fireye.com, www.fireye.com
Manufactures flame, safeguard and burner controls for industrial and commercial applications.

Fischer Technology Inc

750 Marshall Phelps Rd, Windsor, CT 06095,
860-683-0781, toll-free: 800-243-8417, FAX:
860-688-8496, info@fischer-technology.com,
www.fischer-technology.com

Contact: Mktg Coord, Juliann Goodwill
Manufactures coating thickness, ferrite content, and material analysis measurement instruments. Various measurement principles are incorporated into handheld and bench top modules. Thickness measurement includes anodization, paint, precious metals with single, double or alloy coatings. Other product offerings include porosity testers, conductivity meters, x-ray fluorescence, certified standards and foils.

**Fixturlaser AB**

PO Box 7, SE-43121 Molndal, Sweden,
46-31-706-2800, FAX: 46-31-706-2850,
info@fixturlaser.se, www.fixturlaser.com

Contact: Man Dir, Hans Svensson
Offers the Fixturlaser XA alignment system, which is filled with new technical features, such as CCD-technology for better measurement results, animated displays that show the customer exactly what to do and optional wireless connections. The combined features make the system unique in the market.

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Turbo-Fans Div
1110 Main Place Tower, Buffalo, NY 14202,
716-845-0900, FAX: 716-845-5055,
jason.r.stoklosa@flaktwoods.com,
www.flaktwoods.com

Contact: Mkt Mgr, Jason Stoklosa
Manufactures fans and turbofans for air and gas handling.

Flir Systems Inc

25 Esquire Rd, North Billerica, MA 01862,
978-901-8000, FAX: 978-901-8887,
info@flir.com, www.goinfraed.com

Contact: Mktg Mgr, John Sotirakos
Offers GasFindIR IR camera that detects VOC gas leaks quickly and easily. Capable of rapidly scanning large areas and miles of piping, the rugged GasFindIR delivers real-time thermal images of gas leaks. GasFindIR operates within a temperature range of 5°F to 122°F (-15°C to +50°C) and maintains a 40 G industrial shock rating.

Flottweg Separations

(div of KPMT USA)
8070 Production Ave, Florence, KY 41042,
203-838-6120, FAX: 203-838-6098,
esweeney@kmpt.net, www.flottweg.com

Contact: NA Sls Mgr, Ed Sweeney
Manufactures two and three phase decanter and tricanter centrifuges, which are used in petrochemical and other process industries worldwide.

Fluid Components International (FCI)

1755 La Costa Meadows Dr, San Marco, CA 92078-5187, 760-744-6950, toll-free: 800-854-1993, FAX: 760-736-6250, fcimarcom@fluidcomponents.com, www.fluidcomponents.com

Contact: Mktg/Comms Mgr, Mary Pund
Offers a selection of thermal dispersion mass flowmeters, flow switches and level switches for the oil and gas industry. Direct mass flow is ideal for monitoring complex mixed, variable flare gas applications.

Fluid Dynamics

PO Box 576, Lansdale, PA 19446, 215-699-8700, FAX: 215-699-0370, info@dynamblend.com, www.dynamblend.com

Contact: Sls Mgr, Greg Kriebel
Manufactures liquid and dry polymer and dry blending activation systems from 100 gph to 30,000 gph of prepared solutions. Explosion proof units available.

Fluid Line Products Inc

38273 Western Pkwy, PO Box 1000, Willoughby, OH 44096, 440-946-9470, FAX: 440-946-9472, flp@fluidline.com, www.fluidline.com

Contact: Mktg Mgr, John Hetzer
Designs, manufactures and tests fluid power components, fittings, valves and manifolds.

Fluid Metering Inc

5 Aerial Way, Suite 500, Syosset, NY 11791, 516-922-6050, toll-free: 800-223-3388, FAX: 516-624-8261, pumps@fmipump.com, www.fmipump.com

Contact: Mktg Mgr, Herb Werner
Manufactures metering pumps and dispensers with valveless positive displacement design. Features include ceramic/fluorocarbon fluid path, low dead volume, flows from 0 to 2500 ml/min, pressures to 100 psig, accuracy better than 1%.

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Supplies hydraulic, pneumatic and lubrication products and services representing 75 manufacturers. Designs and manufactures custom hydraulic fluid power systems, cooling systems, lubrication systems and valve packages.

FMC Technologies

Measurement Solutions Div
1602 Wagner Ave, Erie, PA 16510,
814-898-5000, FAX: 814-899-9349,
measurement.solutions@fmcti.com,
www.fmctechnologies.com

Contact: Sls Mgr W Hemisphere, Don Jackson
Provides gas and liquid petroleum production and pipeline operations, refining, terminal loading rack and tank truck service applications, featuring: PD, orifice and turbine meters, ultrasonic and Coriolis flowmeters. Global engineering, project management and after-sales support in all segments of the petroleum industry. The right solution for the customers' custody transfer application.

Foremost Industries LP

1225-64th Ave NE, Calgary, Alberta, Canada T2E 8P9, 403-295-5800, FAX: 403-295-5810, sales@foremost.ca, www.foremost.ca

Contact: Tech Sls, Al Pleskie
Designs and manufactures oilfield equipment, coiled tubing drills, hybrid coiled tubing units, joint pipe drilling units to the line of tracked and wheeled all-terrain vehicles. Top drives, pipe handling systems, surface casing rigs and floating cushion subs for maximum productivity.

FORTA Corp

Drilling Products Div
100 Forta Dr, Grove City, PA 16127-6399,
724-458-5221, toll-free: 800-245-0306, FAX:
724-458-8331, info@super-sweep.com,
www.super-sweep.com

Contact: Drilling Products Mgr, Keith Davis
Provides several premium performance products within the drilling products division, including the Super-Sweep fiber hole-cleaning agent and the PhenoSeal loss circulation material.

FOSS NIRSystems Inc

FOSS NIRSystems Inc

7703 Montpelier Rd, Laurel, MD 20723,
301-680-9600, toll-free: 800-343-2036, FAX:
301-236-0134, info@foss-nirsystems.com,
www.foss-nirsystems.com

Supplies laboratory, at-line and process near-IR (NIR) solutions for use in the pharmaceutical, chemical and petrochemical industries. Has more than 40 years of industry experience and more than 18,000 successful installations worldwide. Committed to providing accurate and precise rapid test and measurement products to meet the customer's needs.

FRIATEC Rheinuhette GmbH & Co KG*Pumps Div*

Rheingastr 96-98, PO Box 120545, 65203
Wiesbaden, Germany, 49-611-604-0, FAX:
49-611-604-328, info@rheinuhette.de,
www.rheinuhette.de

Contact: Sls Dir/Export Dept, Manfred Kamme
Supplies the chemical, petrochemical, fertilizer and related industries with a range of vertical and horizontal pumps in metal, plastic and ceramic materials. Offers vertical and horizontal pumps for molten sulphur, vertical and horizontal pumps for sulphuric and phosphoric acid at all concentrations and temperatures.

Future Pipe Industries

11811 Proctor Rd, Houston, TX 77038,
281-847-2987, FAX: 281-847-4216,
d.poshard@us.future-pipe.com,
www.futurepipe.com/usa

Contact: Mktg/Sls Mgr, David Poshard
Manufactures fiberglass line pipe, tubing and casing. Introduces new technology of spoolable reinforced composites. SRC is available in diameters to 4 1/2 in., pressures to 3000 psig and lengths to 15,000 ft.

Gardner Denver

1800 Gardner Expwy, Quincy, IL 62305,
217-222-5400, FAX: 217-228-8243,
maggie@gardnerdenver.com,
www.gardnerdenver.com

Contact: Mgr Mktg Svc, Jane Inman
Produces blowers, air compressors, petroleum pumps, water jetting pumps and accessories, fluid transfer equipment and liquid ring pumps. Designs, manufactures, markets and services a diverse group of pumps used in oil and natural gas drilling production, well servicing and stimulation.

Garlock Sealing Technologies

1666 Division St, Palmyra, NY 14522,
315-597-4811, FAX: 315-597-3039,
www.garlock.com

Contact: VP Global Mktg, John Mosko
Provides more than 100,000 products in the market. Offers fluid sealing technology. The product lines include metallic gaskets, compresses nonasbestos and GYLON gasketing, valve and pump packing, mechanical seals, hydraulic components, oil seals, bearing isolators and expansion joints.

Gas & Air Systems Inc

1304 Whitaker St, Hellertown, PA 18055,
610-838-9625, FAX: 610-838-9650,
info@gasair.net, www.gasair.net

Contact: VP Sls/Mktg, Robert O'Brien
Offers factory authorized compressor packaging and distributing. Provides application and package design engineering and fabricates packages incorporating high quality compressors manufactured by GD Belliss and Morcom, Burton Corblin and Howden. Maintains a large inventory of genuine, factory approved spare parts and provides field services.

Gas Measurement Instruments Ltd

Inchinnan Business Park, Renfrew, PA4 9RG UK,
44-141-812-3211, FAX: 44-141-812-7820,
sales@gmiuk.com, www.gmiuk.com

Contact: Sls Mgr, David McLafferty
Manufactures portable and fixed gas detection for personal protection, leak location and purging/inerting operations.

Gas Technology Products LLC

(sub of Merichem Chemicals & Refinery Services LLC)

846 E Algonquin Rd, Suite A100, Schaumburg, IL 60173, 847-285-3850, FAX: 847-285-3888,
wrouleau@merichem.com,
www.gtp-merichem.com

Contact: Sls/Mktg Mgr, William Rouleau
Offers both liquid and solid media desulfurization products and technologies to sweeten gas streams and ventilation air containing virtually any levels of hydrogen sulfide or mercaptans for systems of widely ranging capacities. Provides media equipment, engineering, installation and service to create a flexible process that operates easily, safely and economically.

(See ad p 15, 25, 26)

Gas Turbine Efficiency Inc

300 Sunport Ln, Suite 100, Orlando, FL 32809,
407-304-5200, FAX: 407-304-5201,
info@gtefficiency.com, www.gtefficiency.com

Contact: Pres, Michael S. Thomas
Delivers integrated solutions for environmental, process and asset optimization. The focus is on improved performance and availability, fuel efficiency, restoration of optimal design and parts life extension, resulting in increased profits for clients and a cleaner environment.

GEA Jet Pumps GmbH

Einsteinstrasse 9-15, 76275 Ettlingen, Germany,
49-7243-7050, FAX: 49-7243-705351,
info@geajet.de, www.geajet.com

Contact: Gen Mgr, Alberto Riatti
Provides jet pumps, jet vacuum pumps, steam jet cooling systems, vacuum degassing units, vacuum condensation systems; jet gas and Venturi scrubbers for the chemical industry, refineries, steel degassing, polyester production and sea water desalination. Has its own R&D center with test benches and numerous test plants.

GE Analytical Instruments

(div of GE)

6060 Spine Rd, Boulder, CO 80301,
303-444-2009, toll-free: 800-255-6964, FAX:
303-527-1797, geal@ge.com,
www.geinstruments.com

Contact: Sls, Sandy Barber
Provides Sievers total organic carbon (TOC) analyzers and can handle the pure water to brine and cellulose samples using design and ease-of-use to reliably monitor your water. Leakwise Oil-on-Water Monitoring Systems will automate your water analysis by detecting hydrocarbons in water and alarming at your specific limits.

Gearench

(div of Orbix Corp)

PO Box 192, Clifton, TX 76634, 254-675-8651,
FAX: 254-675-6100, sales@gearench.com,
www.gearench.com

Manufactures quality Petrol and Titan tools used throughout the drilling, production, refining, pipeline and petrochemical industries.

GE Fanuc Automation

Route 29 N and Route 606, PO Box 8106,
Charlottesville, VA 22911, 434-978-5200,
toll-free: 800-433-2682, FAX: 434-978-5205,
www.gefanuc.com

Delivers automation hardware and software designed to help users reduce costs, increase efficiency and enhance profitability. With solutions and services for virtually every industrial segment, the company provides a diverse array of capabilities and products, including controllers, embedded systems, software, motion control, CNCs, operator interfaces, industrial computers and lasers.

GE MDS LLC

175 Science Pkwy, Rochester, NY 14620,
585-242-9600, FAX: 585-242-9620,
www.gemds.com

Contact: Sls Rep, Kim Covey
Provides wireless communications with a combination of range and speed for fixed and mobile services on one infrastructure. The company's secure networking solutions for point-to-point and point-to-multipoint architectures support serial and IP/Ethernet interfaces. Features durable packaging and quick system response times, even in harsh environments.

**Gems Sensors & Controls**

One Cowles Rd, Plainville, CT 06062,
860-747-3000, toll-free: 800-378-1600, FAX:
860-747-4244, info@gemssensors.com,
www.gemssensors.com

Designs and manufactures a portfolio of liquid level, flow and pressure sensors, miniature solenoid valves and preassembled fluidic systems to exact customer application and manufacturing requirements. Offers the right solution through personal attention, extensive application knowledge, engineering expertise and lean manufacturing methodologies.

General Monitors

26776 Simpatica Cir, Lake Forest, CA 92630,
949-581-4464, toll-free: 800-330-9161, FAX:
949-581-1151, sales@generalmonitors.com,
www.generalmonitors.com

Contact: Regional Sales Manager
Manufactures gas monitoring and flame detection instruments. Products include combustible gas detectors; hydrogen sulfide (H₂S) gas detectors, flame detectors, toxic gas detectors, oxygen deficiency detectors and fire and gas systems. With more than 45 years experience, the company is committed to protecting life and property.

General Paint Co

(div of Professional Paint Inc)

950 Raymur Ave, Vancouver, British Columbia, Canada V6A-3L5, 604-253-3131, FAX:
604-253-1169, www.generalpaint.com

Contact: Ind'l Sls Mgr, Robbin Martinson
Manufactures architectural and industrial coatings. Exclusive distributor of Coronado industrial coatings and Ameron industrial coatings in western Canada.

Genoil Inc

2020, 633 6th Ave SW, Calgary, Alberta, Canada T2P 245, 403-750-3450, FAX: 403-290-0592,
sales@genoil.net, www.genoil.net

Contact: COO/Exec VP, James Runyan
Develops technologies in hydrocarbon, oil and water separation and marine technologies; the Hydroconversion Upgrader GHU upgrades and increases yields of heavy crudes and refinery feedstocks into light, clean transportation fuels; the Crystal Sea bilge water treatment system met US Coast Guard standards and International Maritime Organization's MEPC Resolution 107 (49) MEP.

GeoCompany Tecnologia Engenharia & Meio Ambiente Ltda

Praca dos Crisântemos, 26, Barueri, SP,
06453-020 Brazil, 55-11-4195-4435,
geocompany@geocompany.com.br,
www.geocompany.com.br

Contact: Dir, Roberto Kochen
Specializes in environmental, geotechnical and civil solutions for infrastructure. Its mission is to bring modern techniques of civil and environmental engineering to Brazilian clients. Activities include oil and gas, transportation, water systems, environment and energy following.

Geoservices SA

7 Rue Isaac Newton, PO Box 20, 93151 Le Blanc-Mesnil, France, 33-14-814-8383, FAX: 33-14-814-8585, mail@geoservices.com, www.geoservices.com

Contact: Comms Mgr, Keith Ross
Provides a range of oil field services that help operators evaluate hydrocarbon reservoirs and optimize field exploration, development and production. Serves the oil and gas industry worldwide through a network of district offices and bases in more than 50 countries, providing mud logging, well intervention (slickline) and field surveillance.

Geovariances

49 bis Ave Franklin Roosevelt, PO Box BP 91, 77212 Avon, France, 33-1-60-74-90-90, FAX: 33-1-64-22-87-28, info@geovariances.com, www.geovariances.com

Contact: Sis Mgr, Patrick Magne
Develops and provides geostatistics-related software packages, including ISATIS, training and consulting services to the oil and gas industry, mining companies, environmental agencies and consultancy offices around the world. Expertise lies in resource classification, time-to-depth conversion, risk assessment and seismic QC.

Gerlinger Carrier Co/GC

665 Murlack Ave NW, PO Box 5288, Salem, OR 97304, 503-585-4191, FAX: 503-364-1398, info@gerlingercarrier.com, www.gerlingercarrier.com

Contact: Mark Lyman
Designs and manufactures straddle carriers. Fast and efficient handling of long, heavy loads. Lift capacities from 30,000 to 90,000 lbs. Available in a range of package sizes. Helps solve tough material handling problems in a range of applications.

GE Sensing

(div of GE)

GE Industrial Div

1100 Technology Park, Billerica, MA 01821, 978-437-1736, toll-free: 800-833-9438, FAX: 502-479-6722, sensing@ge.com, www.gesensing.com

Contact: VP Americas/SIs, Kermit Hoffman
Provides precision sensor-based products for measuring temperature, pressure, liquid level, humidity, gas concentration and flow rate for environmental, medical, pharmaceutical, automotive, aerospace, chemical and petrochemical applications. Silicon micromachining, IR detection and ultrasonic technologies help customers monitor, control and validate critical applications and processes.

GE Water & Process Technologies

4636 Somerton Rd, Trevose, PA 19053, 215-355-3300, toll-free: 800-869-2837, FAX: 215-953-5524, custhelp@ge.com, www.ge.com/water

Supplies water, wastewater, desalination and process systems solutions. Delivers value by improving performance and product quality, reducing operating costs and extending equipment life. Offers solutions to optimize system performance, safeguard customer assets from corrosion, fouling and scaling and protect the environment through conservation.



GfG Instrumentation

GfG Instrumentation Inc

1194 Oak Valley Dr, Suite 20, Ann Arbor, MI 48108, 734-769-0573, toll-free: 800-959-0329, FAX: 734-769-1888, info@gfg-inc.com, www.gfg-inc.com

Contact: Pres, Bob Henderson
Offers a range of portable monitors, fixed systems and respiratory airline monitors. Provides diverse solutions for explosive, toxic and oxygen gas detection in air.

GF Piping Systems

2882 Dow Ave, Tustin, CA 92780, 714-731-8800, toll-free: 800-854-4090, FAX: 714-731-6201, us.ps@georgfischer.com, www.gfpiping.com

Provides high quality piping systems products, offering specific system solutions in a range of industries. Specific products include plastic pipe and fittings, valves, actuators, rotameters, fabrications, fusion joining technology, heat exchangers, secondary containment, flow monitoring and process control instrumentation and training programs.

G&G International NV

Molenweg 109, 2830 Willebroek, Belgium, 32-3-860-20-11, FAX: 32-3-886-58-04, info@ggi.be, www.ggi.be

Contact: Sis/Mktg Dir, Pieter van Acker
Engineers and constructs large pressure vessels, columns, reactors, drums, bullets, spheres and storage tanks to all international standards. Serves the petrochemical industries. Processes carbon and stainless steel and special alloys to 150 mm thickness. Items to 2000 tons, 20 m diameter can be shipped worldwide in one piece.

Global Drilling Fluids and Chemicals

12/6 Mathura Rd, Faridabad, Haryana, 121003 India, 91-129-4155501, FAX: 91-129-4155502, global@globaldrilling.in, www.globaldrilling.in
Manufactures and supplies a range of drilling fluids and chemicals. Chemicals are sold on all five continents.

Global Supplier ApS

(div of Global Supplier Holding)

Skagensvej 334a, 9800 Hjørring, Denmark, 45-98-920-656, FAX: 45-98-900-656, an@globalsupplier.dk, www.globalsupplier.eu
Offers a supreme network in the marine and offshore sector to secure customers' safe delivery of finished machine forgings, castings and steel parts from China. Certificates 3.1 and 3.2 from DNV, ABS and others. Helps with everything, from drawings to assembly and delivery. Also is an agent for EZ-OilClean oil test equipment.

Global Wire Cloth

1550 N 105th E Ave, Tulsa, OK 74116, 918-836-7211, FAX: 918-836-7249, sales@globalwirecloth.com, www.globalwirecloth.com

Contact: Dir Sis, Tom Remy
Manufactures and sells replacement shaker screens for Derrick, Brandt, Fluid Systems, Swaco and more. Offers service and pricing to meet any and all of your screening, sifting and sizing needs. The company's screens are designed to deliver high performance to a variety of industries.

Godwin Pumps

One Floodgate Rd, Bridgeport, NJ 08014, 856-467-3636, FAX: 856-467-4841, sales@godwinpumps.com, www.godwinpumps.com

Contact: Nat'l Sis Mgr, Joseph L. Abbott Jr
Sells, rents and designs dumping systems. Automatic self-priming pumps in sizes 2 to 18 in. with flows to 10,000 gpm and heads to 600 ft. More than 24 US rental offices, global network of distributors, rental fleet more than 5000 pumps, complete parts inventory and manufacturing facilities on two continents.

Goulds Pumps

(sub of ITT)

240 Fall St, Seneca Falls, NY 13148, 315-568-2811, toll-free: 800-734-7867, FAX: 315-568-7759, gpsales@itt.com, www.gouldspumps.com

Contact: Dir HPI Global Mktg, Chad Tuttle
Provides pumps, parts and integrated service solutions for the hydrocarbon processing industries. Pumpsmart control and ProSmart predictive condition monitoring solutions enhance life cycle and lower costs of industrial rotating equipment.

GOW-MAC Instrument Co

277 Brodhead Rd, Bethlehem, PA 18017, 610-954-9000, FAX: 610-954-0599, sales@gow-mac.com, www.gow-mac.com

Contact: Nat'l Sis Mgr, Michael Pardovich
Manufactures gas chromatographs, gas analyzer packages and specialty gas handling equipment for user-specified industrial gas applications, as well as laboratory and educational purposes. Instruments include GCs and detectors, gas analyzers, gas leak detectors, total hydrocarbon gas analyzers, moisture analyzers and specialty gas handling systems.

Graham Corp

20 Florence Ave, Batavia, NY 14020, 585-343-2216, FAX: 585-343-1097, equipment@graham-mfg.com, www.graham-mfg.com

Contact: Global Sis Mgr, Robert Hagen
Provides engineering in vacuum and heat transfer technology, designs, manufactures and global supplies ejectors, pumps, condensers, vacuum systems and heat exchangers sold either as components or complete systems. Major markets include petrochemical, oil refining and power generation industries.

Granco Manufacturing Inc

2010 Crow Canyon Pl, Suite 100, San Ramon, CA 94583, 925-359-3290, FAX: 925-359-3291, ird@grancopump.com, www.grancopump.com

Contact: Pres, Ivan R. Dimcheff
Offers fluid transfer pumps, moving all petroleum products from diesel fuel to #2 grease. Truck mounted pumps for diesel fuel dispensing and other petroleum products. Stationary pumps for refineries and blenders. Total packaged systems designed for each application.

Graphite Metallizing Corp

Graphalloy Div

1050 Nepperhan Ave, Yonkers, NY 10703, 914-968-8400, FAX: 914-968-8468, sales@graphalloy.com, www.graphalloy.com

Contact: Gen Mgr, Eben Walker
Manufactures bearing material used commonly in high temperature and submerged applications. The company's self lubricating properties make it the upgrade of choice for dry run and other tough pump applications.

GrayWolf Sensing Solutions

GrayWolf Sensing Solutions

12 Cambridge Dr, Trumbull, CT 06611,
203-416-0005, FAX: 203-416-0002,
salesteam@wolfsense.com, www.wolfsense.com

Contact: Sls/Mktg Mgr, Rick Stonier
Offers portable, mobile-PC based monitors for indoor air quality, toxic gas, VOC and airspeed. Classic line instruments for IAQ pressure and general HVAC applications. On board sensor tips include government and industry guidelines. Snapshot or continuous Data Logging. Stores data with text, graphic and audio notes. Inquire for purchase, lease or rental.

Groth Corp

13650 N Promenade Blvd, Stafford, TX 77477,
281-295-6800, toll-free: 800-354-7684, FAX:
281-295-6999, sales@grothgroup.com,
www.grothcorp.com

Manufactures pressure/vacuum relief valves, pilot operated relief valves, blanket gas regulators, emergency relief valves, wastewater treatment equipment, flame and detonation arresters.

Groveley Detection

Anchor Works, Groveley Rd, Christchurch,
Dorset, BH23 3HB UK, 44-1202-483497, FAX:
44-1202-486658, sales@groveley.co.uk,
www.groveley.co.uk

Contact: Man Dir, Robert Bennet
Specializes in the supply of gas and flame detection products. Products include instrument air driven sampling systems, IR gas detectors, GDU acoustic/ultrasonic gas leak detectors, toxic detectors and a variety of flame detection products. Provides on-site surveys and services related to all of the company's products.

GSE Systems Inc

7133 Rutherford Rd, Suite 200, Baltimore, MD
21244, 410-277-3740, FAX: 410-277-5287,
mail@gse.com, www.gses.com

Contact: Dir Process Simulation, Majid Mirshah
Provides real time, dynamic, high-fidelity operator training simulators and modeling software for the refining, petrochemical, oil and gas, chemical and power generation industries. A global provider of OTS that offers extensive process modeling experience and complete training solutions.

GS Metals Corp

Grip Strut Safety Grating Div
3764 Longspur Rd, Pinckneyville, IL 62274,
618-357-5353, FAX: 618-357-3605,
marketing@gsmetals.com, www.gsmetals.com

Contact: Dir Mktg, Steven Groner
Offers safety grating, platforms and treads. Cable tray, metal framing and hardware.

GW Lisk Co

2 South St, Clifton Springs, NY 14432,
315-462-2611, FAX: 315-462-7661,
krice@gwlisk.com, www.gwlisk.com

Contact: Reg Sls Mgr, Kevin Rice
Designs and manufactures solenoids and valves for pilot flows of gaseous and hydraulic fluids for both ultradeep subsea and surface applications. In addition to solenoids and valves for hazardous locations, surface applications include the design, development and manufacture of devices such as flame arresters and LVDTS.

Halliburton

2107 City West Bldg 2, Houston, TX 77042,
713-839-3815, laura.schilling@halliburton.com

Hamilton Sundstrand

Applied Instrument Technology Div
2771 N Garey Ave, Pomona, CA 91767,
909-593-3581, john.morrison@hs.utc.com
Manufactures rugged reliable spectroscopy and gas chromatography process analyzers for on-line monitoring and process development. Product lines include: Analect FTIR/NIR, PIONIR NIR, RPM Raman, the MGA line of process mass spectrometer and the FXI process gas chromatograph.

Hammond Valve

16550 W Stratton Dr, New Berlin, WI
53151-7301, 262-432-2702, FAX: 262-432-2703,
info@hammondvalve.com,
www.hammondvalve.com

Hampson-Russell Software

(div of Hampson-Russell)
A CGGVeritas Co
5 Kew Rd, Parkshot House, Richmond, Surrey,
TW9 2PR UK, 44-20-8334-891, FAX:
44-20-8334-8191,
infohrs_london@ccgveritas.com,
www.hampson-russell.com

Contact: Sls/Training, Natasha Hunt
Provides geophysical software, training and technical services. Company owned by CGGVeritas. The London office serves clients in Europe, Africa and the CIS. The software is designed for projects that require reservoir description. These include AVO and fluid inversion, prestack and poststack seismic inversion, seismic attribute analysis, geostatistics, 4-D and multicomponent seismic.

Hamworthy Peabody Combustion

70 Shelton Technology Center, Shelton, CT
06484, 203-922-1199,
sales@hamworthy-peabody.com,
www.hamworthy-peabody.com

Contact: Nat'l Sls Mgr, Bill Gurski
Manufactures and supplies combustion equipment, systems and services for boilers, dryers, air heaters and related systems.

Hardy Instruments

3860 Calle Fortunada, San Diego, CA 92123,
858-278-2900, FAX: 858-278-6700,
hardyinfo@hardyinst.com,
www.hardyinstruments.com

Contact: App Engr, Dennis Drake
Designs and manufactures vibration monitoring products that allow the customer to predict problems, prevent machinery damage and avoid costly downtime and to reduce operation and maintenance costs. Vibration instruments include machine monitors, vibration transmitters, vibration switches, signal conditioners, accelerometers and sensors. Offers nationwide field service for installation, calibration, certification, troubleshooting and more.

Harwood Capital Inc

1255 Treat Blvd, Suite 300, Walnut Creek, CA
94597-7965, 510-658-6398, FAX: 510-658-7743,
tswaney@harwoodcapital.com,
www.harwoodcapital.com

Contact: Pres, Thomas Swaney
Manages and finances oil and gas projects. Works primarily onshore USA, but has Asian experience. Invests its own funds in start-up stages of land and exploration projects. Will finance larger acquisitions using outside sources.

Hayward Gordon Ltd

Calgary, Alberta Branch Div
6143 4th St SE, #8, Calgary, Alberta, Canada
T2H 2H9, 403-253-2737, FAX: 403-253-1353,
calgary@haywardgordon.com,
www.haywardgordon.com

Contact: Central Reg Mgr, Tom Stiles
Offers solids handling pumps, vertical sump pumps, molten sulphur pumps, progressive cavity pumps, positive displacement pumps, drilling fluid pumps, metering pumps, chemical transfer pumps, dynamic mixers or agitators, top and side entering mixers, static mixers, chemical skid packages, methanol injection packages, polymer make up and metering packages, strainers and filters.

Hazmatpac Inc

5301 Polk St, Bldg 18, Houston, TX 77023,
713-923-2222, FAX: 713-923-1111,
hazmatpac@hazmatpac.com,
www.hazmatpac.com

Contact: VP Sls/Mktg, David Loeschner
Manufactures and distributes a line of United Nations certified containers and complete packaging systems for the shipment of hazardous materials by air, ground and water transportation. The UN certified and ISTA tested packaging meets the regulatory requirements for transporting hazardous materials domestically and internationally.



SUBSIDIARY OF HBD INDUSTRIES, INC.

HBD/Thermoid Inc

(sub of HBD Industries Inc)
1301 W Sandusky Ave, Bellefontaine, OH
4331-1082, 937-593-5010, toll-free:
800-543-8070, FAX: 800-423-4354,
info@hbdthermoid.com,
www.hbdthermoid.com

Contact: Gen Sls Mgr, Ed Bookwalter
Manufactures standard application-engineered rubber products, including: conveyor belting, ducting, hose (aviation, automotive, chemical, industrial, marine and petroleum), power transmission V-belts/timing belts, industrial rubber bands and roll/roll coverings.

Hdd Equipment & Services

6830 N Eldridge Pkwy, Unit 102, Houston, TX
77041-2635, 713-849-6825, FAX: 713-849-5638,
info@hddrigs.com, www.hddrigs.com

Contact: Sls Mgr, Don West
Provides equipment developed exclusively for Midi, Maxi and Mega HDD rigs, including rotary motors, travel motors, thrust boxes, pinions, cutters, reamers and complete HDD rigs.

Heatec Inc

5200 Wilson Rd, Chattanooga, TN 37410,
800-235-5200, FAX: 423-821-7673,
heatec@heatec.com, www.heatec.com

Contact: Ind'l Sls Mgr, Buddy Ledford
Provides thermal fluid heaters, process heaters and heat exchangers.

Heatrex Inc

PO Box 515, Meadville, PA 16335,
814-724-1800, FAX: 814-333-6580,
sales@heatrex.com, www.heatrex.com

Contact: Sls/Mktg Mgr, Earl E. Pifer
Manufactures a range of custom tubular heating element based products for the petroleum industry. Products include screw plug, over-the-side and flanged immersion heaters, as well as complete circulation heaters with controls. Also available are finned tubular duct heaters.

Heinen & Hopman Engineering BV

Zuidwenk 45, PO Box 9, 3750 GA Spakenburg,
Utrecht, The Netherlands, 31-33-292500, FAX:
31-33-2992599, pr@heinenhopman.com,
www.heinenhopman.com

Contact: Proj Mgr, A. Brock
Leads in the field of marine air conditioning. Many ships around the world, ranging from ferries to luxury yachts, are equipped with HVAC installations designed, engineered and installed. Provides worldwide service within 24 hours.

Helium Leak Testing Inc

19348 Londelius St, Northridge, CA 91324,
818-349-5690, toll-free: 800-423-1701, FAX:
818-717-8584, info@heliumleaktesting.com,
www.heliumleaktesting.com

Contact: Sls, Les Page

Provides equipment sales and services nationally to multiple industries that require leak detection, test fixtures, production testing, leak standards, vacuum gauge calibration and vacuum pump maintenance. Designs, builds and installs commercial and custom leak detection systems for application in aerospace, automotive, oil, medical, food, semiconductors and power generation markets.

Helix RDS Ltd

(div of Helix ESG)

Peregrine Rd, Westhill Business Park, Aberdeen, AB32 6JL UK, 44-1224-741-400, FAX:
44-1224-741-855, sarah.howard@helixesg.com,
www.helixesg.com

Helix Solutions Group

400 N Sam Houston Pkwy E, #400, Houston, TX 77060-3548, 281-618-0400, FAX: 281-618-0502, jon-buck@caldive.com, www.helixes6.com
Provides subsea construction, inspection, maintenance, repair and salvage services to offshore natural gas and oil industry.

Hercules Industries Inc

PO Box 197, Prospect, OH 43342,
740-494-2620, FAX: 740-494-2274,
dhook@herculock.com, www.herculock.com

Contact: Gen Mgr, Dave Hook

Provides a line of solid brass tumbler pin padlocks. The locks are precision crafted out of solid brass to withstand inclement weather conditions and are available with brass or stainless-steel shackles in a variety of clearances. In addition, locks may be keyed to your present keys.

Herculock

PO Box 197, Prospect, OH 43342,
740-494-2620, toll-free: 800-345-2590, FAX:
740-494-2274, dhook@herculock.com,
www.herculock.com

Bringing you the complete line of HERCULOCK all-brass padlocks. Crafted out of solid brass to withstand harsh environments. Locks can be keyed alike, different, master or grandmaster. Also can be keyed to an existing key.

Hiller GmbH

Schwallbenholzstr 2, 84137 Vilsbiburg, Germany, 49-8741-48-0, FAX: 49-8741-48-710,
petroleum@hillerzentri.de, www.hillerzentri.de

Contact: Sr Process Eng Sls, Arim Hertle

Designs and manufactures decanter centrifuges and associated plants. Typical petroleum industry applications include recovery of oil from oily wastes, dewatering of sludges from waste treatment or sulphur dewatering from gas desulfurization. The centrifuges can be built to various engineering standards and to different levels of explosion-protection.

Hilliard Corp

HILCO Div

100 W 4th St, Elmira, NY 14902, 607-733-7121, FAX: 607-735-0836, hilliard@hilliardcorp.com,
www.hilliardcorp.com

Contact: Mktg Mgr, Rob Doud

Offers a range of motion control products, oil filtration and reclaiming equipment, starters for industrial gas engines, diesel engines and gas turbines and plate and frame filter presses. The filtration systems are sold under the trade names of HILCO and Star Filters.

HIMA Paul Hildebrandt GmbH + Co KG

Albert-Basserman-Str 28, 68782 Bruhel near Mannheim, Germany, 49-6202-709-405, FAX:
49-6202-709-123, info@hima.com,
www.hima.com

Provides safety-related automation systems: safety-related communication via safethernet. Solutions for automation tasks in the process and factory automation for applications to SIL 4 (IEC 61508) or Cat 4 (EN 954-1).

H&M Pipe Beveling Machine Co Inc

311 E Third St, Tulsa, OK 74120, 918-582-9984, FAX: 918-582-9989, info@hmpipe.com,
www.hmpipe.com

Contact: VP Sls/Mktg, Patrick R. Dougal
Manufactures portable pipe cutting and beveling machines for 2–9 in. diameter pipe.

Hoffer Flow Controls Inc

107 Kitty Hawk Ln, PO Box 2145, Elizabeth City, NC 27909, 252-331-1997, toll-free:
800-628-4584, FAX: 252-331-2886,
info@hofferflow.com, www.hofferflow.com

Contact: Mktg Mgr, Janna Critcher
Manufactures turbine flowmeters and electronics for the measurement of clean liquids and gases.

Hoffman

2100 Hoffman Way, Anoka, MN 55303-1745, 763-421-2240, FAX: 763-422-2178,
advertising@hoffmanonline.com,
www.hoffmanonline.com

Provides complete lines of corrosion-resistant and mild steel wall-mount, operator interface, free-standing, disconnect and modular enclosures, accessories for petroleum processing and other industrial control systems.



HoldTight[®]
Salt Remover & Flash Rust Inhibitor 102

HoldTight Solutions Inc

PO Box 27907, Houston, TX 77227,
713-266-9339, toll-free: 800-319-8802, FAX:
713-266-1022, pip@holdtight.com,
www.holdtight.com

Contact: Pres, Peter J. Petkas
Offers HoldTight 102, which prevents flash rust and removes salts. Used in water/wet-abrasive blasting, including UHP and dry blasting; coating-friendly; solvent-free, non-hazardous and non-toxic. Also removes oil, dirt and other contaminants; keeps surfaces rust-free for days. Not film-forming, leaves no residue and is approved by most coating and lining manufacturers.

Howden Buffalo Inc

Gyrol Fluid Drives Div
8111 Tireman Ave, Dearborn, MI 48126,
313-931-4000, FAX: 866-740-3025,
bsteffeck@howdenbuffalo.com,
www.howdenbuffalo.com

Contact: Prod Mgr, Robert Steffeck
Manufactures variable speed hydraulic couplings, provides new equipment, spare parts, rebuilds and offers field service for both plants and pipelines.

HR4 Ltd

PO Box 251, Hereford, Herefordshire, HR2 8ZB UK, 44-1432-353555, FAX: 44-1432-353797,
info@hr4.co.uk, www.hr4.co.uk

Provides driver safety and training support solutions to the energy industry. The driver safety training includes defensive, off-road, desert and specialist vehicle driving. Offers vehicle monitoring and tracking system advice, driving audits and vehicle management consultancy.

Hughes Safety Showers

Whitefield Rd, Bredbury, Stockport, Cheshire, SK6 2SS UK, 44-161-430-6618, FAX:
44-161-430-7928,
info@hughes-safety-showers.co.uk,
www.hughes-safety-showers.co.uk

Contact: Export Sls Mgr, Paul Darlington
Manufactures emergency safety showers, eyebaths/facewash systems and decontamination showers.

Huisman-Itrec

Admiraal Trompstraat 2 3115, PO Box 150, 3100 AD Schiedam, The Netherlands,
31-10-245-22-22, FAX: 31-10-245-22-20,
fkofman@huisman-itrec.com,
www.huisman-itrec.com

Specializes in designing and manufacturing of heavy lifting, drilling, pipe lay, transport and offshore equipment, such as deep sea mast cranes, floating sheers legs and pipe handling systems. The delivered systems are all turnkey projects, well tested and custom built.

Hurricane Compressors

1015 N Hurricane Rd, Franklin, IN 46131,
317-736-3800, toll-free: 800-754-7408, FAX:
317-736-3801,
sales@hurricane-compressors.com,
www.hurricane-compressors.com

Contact: Pres, Richard Baker
Offers high-pressure booster compressors that incorporate technologies, application flexibility and size and weight advantages. Products can be fully customized to meet customers' needs.


Hydac International

2280 City Line Rd, Bethlehem, PA 18017-2146,
610-266-0100, toll-free: 877-464-9322, FAX:
610-264-7529, sales@hydacusa.com,
www.hydacusa.com

Contact: Mktg Mgr, Brian D. Moretz
Supplies hydraulic and lubrication system components for gas and petroleum systems. Products include: bladder and piston accumulators, single and duplex hydraulic and lubrication filters, offline filters, replacement filter cartridge elements, fluid particle counters, vacuum dehydration systems, automatic backflush water filters, air and oil coolers and more.

SALES OFFICES:

HYDAC
Houston, TX 281-579-8100,
sales@hydacusa.com, www.hydacusa.com

Hydramation Ltd

1 York Rd Industrial Park, Malton, York, North Yorkshire, YO17 6YA UK, 44-1653-600294, FAX:
44-1653-693446, robs@hydramation.com,
www.hydramation.com

Contact: Prod Mgr, Danny Morbey
Offers on-line and portable viscosity measurement. All viscometers are high-performance, zero-maintenance instruments that are uniquely easy to use. Measurement is instant, with no expensive accessories. Fully calibrated in the factory, the viscometer is ready to use straight out of the box.

Hydratight

Hydratight

1102 Hall Ct, Deer Park, TX 77536,
713-860-4242, FAX: 713-860-4201,
houston@hydratight.com, www.hydratight.com

Contact: Bus Leader Gulf Region, Kathleen Baker

Provides bolt tightening and machining technologies, including a range of tensioning, torquing, machining, pipe cutting and Morgrip pipe connection equipment for sales and rental. Also offers repair and refurbishment services for onshore and offshore applications.

HYTORC

Unix Corp Div
333 Route 17 N, Mahwah, NJ 07430,
201-512-9500, FAX: 201-512-0530,
joepaul@hytorc.com, www.hytorc.com

Contact: Bolting Specialist, Joe Paul
Manufactures and specializes in new leakage zero flange bolting methods. Guaranteed leak-free start ups. Offers free plant surveys, on-site training and supervision, sales, rentals and consulting.

ICONICS Inc

100 Foxborough Blvd, Foxborough, MA 02035,
508-543-8600, FAX: 508-543-1503,
info@iconics.com, www.iconics.com

Contact: Dir Mktg, Tim Donaldson
Provides OPC, web-enabled, HMI/SCADA and manufacturing intelligence software. Solutions run on all Microsoft Windows operating systems and software products are being used in a variety of applications across many industries.

IFP

1-4 ave de Bois-Preau, 92852 Rueil Malmaison,
Cedex, France, 33-1-47-52-60-00, FAX:
33-1-47-52-70-00, www.ifp.fr

Functions as an international research and training center and is developing the transport energies of the 21st century. Provides public players and industry with innovative solutions for a smooth transition to the energies and materials of tomorrow more efficient, more economical, cleaner and sustainable.

Ifremer

Commercial Department Div
Technopole de Brest-Iroise, BP70, Plouzane,
France, 33-2-98-22-44-89, FAX:
33-2-98-45-38-57, infosc@ifremer.fr,
www.ifremer.fr

Contact: Head Commercial Dept, Sylvie Pichereau

Offers products and services in innovative R&D activities, consultancy, research in partnership for the safe exploration and production of ocean resources. The institute's expertise covers a range of marine sciences and technologies, including underwater vehicles, deep sea monitoring and surveys on geological hazards. Also offers studies in laboratories.

IHC Hydrohammer Bv

6, Smitweg, PO Box 26, 2960 AA Kinderdijk, The Netherlands, 31-7869-10351, FAX:
31-7869-10304, e.vthoof@ihchh.com,
www.ihchh.com

Designs, builds and supplies hydraulic piling hammers, for an on- and offshore use and is known worldwide for its innovative approach.

IMI Sensors

(div of PCB Piezotronics Inc)
3425 Walden Ave, Depew, NY 14043,
716-684-0003, FAX: 716-684-3823,
imi@pcb.com, www.imi-sensors.com

Manufactures a line of industrial piezoelectric vibration sensors for machinery monitoring, diagnostics, predictive and protective maintenance and process control applications. Offers a variety of industrial junction boxes, cable assemblies and mounting accessories that allow for routine measurements in inaccessible or hazardous locations.

Impact Fluid Solutions LLC

2800 Post Oak Blvd, Suite 2000, Houston, TX 77056, 713-964-7736, FAX: 713-551-4614,
preid@impact-es.com, www.impact-es.com

Contact: Pres, Paul Reid
Manufactures and supplies additives to product low invasion drilling and completion fluids. The product FLC2000 provides low damage fluids, less differential sticking, improved wellbore stability and wellbore strengthening. Also markets effective additives for curing lost circulation.

■ **Industrial Scientific Corp**

1001 Oakdale Rd, Oakdale, PA 15071,
412-788-4353, toll-free: 800-338-3287, FAX:
412-788-8353, info@indsoci.com,
www.indsoci.com

Contact: Adv/Promo Mgr, Chris Lange
Designs, manufactures, sells and services gas monitoring instruments, systems and related products. With continuous improvements in engineering and R&D, lean manufacturing operations and expanded service capabilities, the company provides rugged, dependable products that excel in monitoring hazardous gases in the most demanding work environments in the world.
(See ad p 17, 49, 50)

Industrial Textiles & Plastics Ltd

Stillington R, Easingwold, York, YO61 3FA UK,
44-1347-825215, peter.winter@itpltd.com,
www.powerclad.com

Contact: Export Mgr, Peter Winter
Manufactures Powerclad Scaffold Sheeting Systems for weather protection and containment. Sold worldwide for maintenance enclosures in refineries, petrochemical sites and pipeline projects. Specialists in high performance flame retardant grades.

Industrial Tomography Systems

Speakers House, 39 Deansgate, Manchester, M3 2BA UK, 44-161-832-9297, FAX:
44-161-839-5195, sales.support@itoms.com,
www.itoms.com

Industrial Video & Control Co

330 Nevada St, Newton, MA 02460,
617-467-3059, FAX: 617-687-0751,
info@ivcco.com, www.ivcco.com

Contact: Mktg Mgr, Clarke Esler
Manufactures high-performance IP video camera systems for security, surveillance, marine and process control applications. Systems are comprised of enterprise-class video management software and high-quality cameras. Software provides ability to integrate video into SCADA applications. Offers cameras designed for safe use in certified areas.

Infostat Systems Inc

PO Box 214419, Sacramento, CA 95821,
916-649-3244, rmccoy@infostatystems.com,
www.infostatystems.com

Contact: Sls Mgr, Ray McCoy
Develops a suite of proven daily reporting, well information and data distribution solutions for the exploration and development sectors of the oil, gas and geothermal industries. RIMBase is designed to meet the daily reporting needs of well operating companies. RIMDrill is designed for drilling contractors.

Inland Technologies

9 Commercial St, PO Box 253, Truro, Nova Scotia, Canada B2N 5C1, 902-895-6346,
toll-free: 877-633-5263, FAX: 902-895-6349,
marketing@inlandgroup.ca,
www.inlandgroup.ca/meg

Contact: Sls/Mktg Mgr, Teresa Lush
Designs and manufactures the patented Mono-Ethylene Glycol (MEG) Concentrator. The unit is used to reclaim and recycle MEG injected in natural gas pipelines as a hydrate inhibitor.

Insensys Oil and Gas Ltd

16203 Park Row, Suite 150, Houston, TX 77084,
281-646-7400, FAX: 281-646-7009,
insensys@slb.com, www.subseasurveillance.com

Contact: Bus Dev Mgr, Bob Bell
Specializes in integrity monitoring. Provides a range of optical fiber-based, strain measurement systems that can be applied to offshore subsea and topside structures. Products provide a solution to actively manage structural integrity risk, extend asset life and improve the operational effectiveness of key assets

Inserta Products Inc

538 Township Line Rd, Blue Bell, PA 19422,
215-643-0192, FAX: 215-643-4017,
mries@inserta.com, www.inserta.com

Insituform Technologies

17999 Edison Ave, Chesterfield, MO 63005,
toll-free: 800-234-2992, www.insituform.com
Provides innovative and affordable trenchless sewer, water and oil pipe repair.

International Paint

(sub of Akzo Nobel)

Coatings Div

6001 Antoine Dr, Houston, TX 77091,
713-682-1711, toll-free: 800-589-1267, FAX:
713-684-1514, www.international-pc.com

Contact: Mktg Prod Mgr, Chris McMillan
Provides a range of high performance coatings and fireproofing for the oil and gas, chemical processing, mining and marine industries. The company is a part of Akzo Nobel, a market driven, technology-based company specializing in coatings, chemical and pharmaceuticals.

International Protective Coatings

Felling, Stonegate Ln, Gateshead, Tyne & Wear,
NE10 0JY UK, 44-1914-022661, FAX:
44-1914-022630,

ian.fletcher@internationalpaint.com,
www.international-pc.com

Contact: WW Mkt Mgr Oil/Gas, Ian Fletcher
Offers a range of accredited coating systems designed to provide high performance fire and corrosion protection in the toughest environments. From Interfine and Chartek, to Interline and Intertherm, the global products and experience help deliver enhanced solutions for oil and gas assets worldwide.

Interpretext Europe Ltd

Portsmouth Technopole, Kingston Crescent,
Portsmouth, Hampshire, PO2 8FA UK,
44-870-0673916, FAX: 44-870-130-1058,
info@interpretext.com, www.interpretext.com

Contact: Man Dir, Setti Mulari
Offers top-tier language services, such as translation and interpretation, specifically targeted to the oil, gas and energy industries. Technical know-how and years of experience working with prominent companies guarantee the best value for money in the market.

Ion Signature Technology

51 Industrial Dr, North Smithfield, RI 02896,
401-767-4360, FAX: 401-767-3367,
info@ionsigtech.com, www.ionsigtech.com

Contact: Pres/CEO, John Moore
Develops technologies for corporate, independent testing and government laboratories that demand accurate, highly productive chemical analysis. The company's products reduce the time required to prepare and analyze complex chemical samples and interpret data. Result: increased capacity and profitability for quality-driven, high-throughput organizations by providing faster, simpler and more accurate analyses.

IOtech

25971 Cannon Rd, Cleveland, OH 44146,
440-439-4091, toll-free: 888-890-1322, FAX:
440-439-4093, sales@iotech.com,
www.iotech.com

Contact: Reg Sls Mgr, Aaron Schiele
Designs and manufactures PC-based data acquisition and measurement instrumentation. These products are used in a variety of test applications serving a diverse set of industries including automotive, aerospace, chemical, communication, electronics and utilities. The company has applications ranging from research and product development, to production monitoring and quality control.

IRO

Engelandlaan 330, PO Box 7261, 2701 AG
Zoetermeer, The Netherlands, 31-79-3411981,
FAX: 31-79-3419764, info@iro.nl, www.iro.nl

Contact: Man Dir, H. P. De Boer
Associated with Dutch suppliers in the oil and gas industry.

Isotech North America

154 Brentwood Dr, Unit 3, Colchester, VT 05446,
802-863-8050, FAX: 802-863-8125,
sales@isotechna.com, www.isotechna.com

Contact: Pres, Scott Sabourin
Supplies temperature, resistance, pressure measurement and calibration equipment, as well as temperature resistance calibration services. Product lines include Isotech, ASL, Cropico, Crystal Engineering, Practical Instrument Electronics (PIE), Scandura, Ralston and Si Pressure Instruments.

iSys-The Imaging Systems Group Inc

911-28th St NE, Calgary, Alberta, Canada T2A
7X1, 403-204-5200, toll-free: 866-415-4797, FAX:
403-204-1971, sales@isys-group.com,
www.isys-group.com

Contact: Dir Sls, Terry Reese
Manufactures thermal LED and inkjet printers and plotters for the oil and gas industry.

Iwaki America Inc

5 Boynton Rd, Holliston, MA 01746,
508-429-1440, FAX: 508-429-1386,
info@iwakiamerica.com, www.iwakiamerica.com

Contact: Cust Svc Mgr, Peter Brule
Offers a joint venture which combines Walchem's 50 years of chemical injection and control experience with 40 years of Iwaki's pump designs.

James Walker & Co Ltd

1 Millennium Gate, Westmere Dr, Crewe,
Cheshire, CW1 6AY UK, 44-1270-536000, FAX:
44-1270-536100, csc@jameswalker.biz,
www.jameswalker.biz

Supplies high performance technology. The company supplies more than 200,000 different sealing products and provides engineering and refurbishment services. When a stocked item will not do, the company will custom-engineer the optimum solution.

JD Neuhaus GmbH & Co Kg

Werbeleiter, 58449 Witten-Heven, Germany,
49-2302-208-219, FAX: 49-2302-208-286
Manufactures air driven hoists, winches and cranes with worldwide reputation. The main applications are in hazardous areas.

Jet-Lube of Canada Ltd

3820-97th St, Edmonton, Alberta, Canada T6E
5S8, 780-463-7441, toll-free: 888-771-7775, FAX:
780-463-7454, sales@jetlubecanada.com,
www.jetlubecanada.com

Contact: Oilfield Sls Mgr, Rick Crocker
Manufactures oilfield and industrial thread compounds and specialty lubricants, drilling compounds, antiseize compounds, thread sealants, greases, penetrants, cleaners and degreasers and various MRO specialties.

JH Technology Inc

4233 Clark Rd, Unit 9, Sarasota, FL 34233,
941-927-0300, toll-free: 800-808-0300, FAX:
941-925-8774, jhtek@jhtech.com,
www.jhtech.com

Contact: Pres, Harry L. Trietley
Manufactures standard and custom signal conditioners, process transmitters and alarms. Per-requirement minisystems for specific applications. Also offers ultrasonic leak detectors.

John Crane

Mechanical Seals Div
6400 W Oakton St, Morton Grove, IL 60053,
847-967-2400, FAX: 847-967-3915,
seals@johncrane.com, www.johncranetoday.com
Engineers sealing systems, which include mechanical seals, packings, Sealol metal bellows seals, Lemco seal support systems and Metastream couplings.

Johnson Controls Inc

York Process Systems Div
100 CV Ave, Waynesboro, PA 17268,
610-640-0370, toll-free: 800-487-2653, FAX:
610-640-0378, robert.f.fahey@jci.com,
www.yorkprocesssystems.com

Contact: YPS Sls/Mktg Mgr, Robert F. Fahey
Manufactures refrigeration and gas compression equipment used in the petrochemical, gas-processing, pharmaceutical, industrial gases and general refrigeration industries. Designs and manufactures heavy-duty refrigeration and compression systems using Frick-brand rotary screw compressors and York Turbomaster multistage centrifugal compressors.

SALES OFFICES:

Johnson Controls/York Process Systems
Houston, TX 713-934-3394, FAX:
713-934-7854, richard.j.cross@jci.com,
www.yorkprocesssystems.com

Jonas Inc

1113 Faun Rd, Wilmington, DE 19803,
302-478-1375, FAX: 302-478-8173,
jonasinc@steamcycle.com,
www.steamcycle.com

Contact: Pres, Otakar Jonas
Provides engineering consulting services with experience in corrosion, water and steam chemistry, boiler, turbines, materials, instrumentation and failure analysis. Provides nozzles and particle monitors.

Jongia

(div of MPE Group USA LLC)
520 Sharptown Rd, Swedesboro, NJ 08085,
856-241-9970, FAX: 856-241-9975,
mpegroupinfo@earthlink.net,
www.mpegroupusa.com

Contact: VP, Alan Ferraro
Manufactures industrial mixers for liquids and powders, conical vacuum dryers, conical blender mixers, liquid gas mixers, railcar mixers and filtration-separation equipment.

J Ray McDermott

757 N Eldridge Pkwy, Houston, TX 77079,
281-870-5000, FAX: 281-870-5045,
business.development@mcdermott.com,
www.jraymcdermott.com

Contact: Reg Dir Bus Dev, Jim Ermon
Creates the infrastructure necessary to produce and transport offshore oil and gas. Designs, fabricates and installs fixed and floating platforms, FPSO topsides and subsea production systems with operations throughout the Americas, Middle East, Caspian and Asia Pacific.



J Ray McDermott Asia Pacific Pte Ltd
8 Jurong Town Hall Rd, #24-01, The JTC
Summit 609434, Singapore, 65-6561-2288,
FAX: 65-6561-2777, www.jraymcdermott.com
Contact: VP Bus Dev Asia Pacific, Scott Cummins

Offers services, including design, fabrication and installation of spar platforms; design and installation of subsea facilities; design, fabrication and installation of new and refurbished bottom-founded offshore platforms and installation of offshore pipelines for the oil and gas industry. Serves the requirements of the offshore construction market in the Far East.

J Ray McDermott Middle East Inc

PO Box 16961, Jebel Ali, Dubai, United Arab Emirates, 971-4-8835200, FAX: 971-4-8835486,
jray.epic@mcdermott.com,
www.jraymcdermott.com

Contact: VP/Gen Mgr/Bus Dev, Peter Marler
Supplies a range of field development solutions, including fixed and floating platforms, subsea facilities, spars and FPSO topsides. The company has the knowledge, technology, proven in-house resources, development experience and project management expertise to engineer, manage, build, install and commission project facilities anywhere in the world.

JULABO Labortechnik GmbH

Eisenbahnstrasse 45, 77960 Seelback,
Baden-Wuerttemberg, Germany, 49-7823-51-0,
FAX: 49-7823-2491, info@julabo.de,
www.julabo.de

Contact: Dir Mktg/Sls, Mark Bitterwolf
Manufactures precise liquid temperature control instruments for research, science and industry. Provides solutions for temperature control applications from -95°C to +400°C. Subsidiaries in cooperation with distribution and service partners worldwide warrant customer proximity and service.

JW Fishers Manufacturing Inc

1953 County St, East Taunton, MA 02718,
508-822-7330, FAX: 508-880-8949,
info@jwfishers.com, www.jwfishers.com

Contact: Sls Mgr, Christopher Combs
Specializes in the design and manufacture of underwater search equipment. Product line includes underwater metal detectors, marine magnetometers, underwater camera systems, ROVs, sidescan sonars, acoustic pingers, scanning sonar and cable tracking systems.

Kafko International Ltd

3555 W Howard St, Skokie, IL 60076,
847-763-0333, toll-free: 800-528-0334, FAX:
847-763-0334, customerservice@kafkointl.com,
www.oileater.com

Contact: Brand Mgr, Rick Morgando
Manufactures Oil Eater and Oil Eater Orange cleaner/degreaser, truck wash, absorbent pads and aqueous parts washers. Oil Eater is biodegradable, non-toxic and non-corrosive.

Kalsi Engineering Inc

745 Park Two Dr, Sugar Land, TX 77478,
281-240-6500, FAX: 281-240-0255,
www.kalsi.com

Contact: Seals App Engr/Cust Support, Jeffrey D. Gobeli
Provides consulting engineering services, including the design, analysis and testing of mechanical equipment and structures. Oilfield-related and a line of hydrodynamic thrust bearings and a line of hydrodynamic rotary shaft seals that are used in downhole drilling applications for retaining lubricants and excluding abrasives.

Kayden Instruments


Kayden Instruments

3368-114 Ave SE, Calgary, Alberta, Canada
T2Z 3V6, 403-253-1423, FAX: 403-253-1460,
sales@kayden.com, www.kayden.com

Contact: Dir Sls/Mktg, David Parsons
Manufactures flow, level, interface and temperature instruments. Designs feature a proven "no moving parts" design, constant display of function, automatic internal diagnostics, remote communications and many sensor configurations.


Kaydon Filtration

(sub of Kaydon Corp)

1571 Lukken Industrial Dr W, LaGrange, GA
30240, 706-884-3041, toll-free: 800-241-2342,
FAX: 706-884-3835, filtration@kaydon.com,
www.kaydonfiltration.com

Contact: Inside Sls Mgr, Eddi Rowland
Specializes in high-performance filtration and liquid separation technologies for utility, industrial and nonconsumer mobile applications, meeting customer needs through the technical advancement of fuel and oil conditioning products. Offers filtration and liquid/liquid technologies to remove water and particulate from hydrocarbon-based fluids and for specialty applications

KCH GROUP GmbH

Berggarten 1, PO Box 1163, 56425 Siershahn,
Germany, 49-2623-600-0, FAX:
49-2623-600-513, info@kch-group.com,
www.kch-group.com

Specializes in industrial corrosion protection systems. These are suitable for tanks, process equipment, secondary containment areas, transport vessels, piping, industrial flooring systems and pool construction. Manufactures and supplies rubber linings, brick linings and tiling systems, polymer products and components in composite materials and steel.

KEI-TEK Equipamentos Industriais Ltda

Rua Goncalo Fernandes 219, Sao Paulo, Santo
Andre-Sao Paulo, 09041-410 Brazil,
55-11-4433-7600, FAX: 55-11-4433-7630,
kei-tek@kei-tek.com, www.kei-tek.com

Contact: Sls Mgr, Helio Gaeta Rodrigues
Designs, engineers, manufactures and distributes industrial burners and pumps, as well as sophisticated industrial combustion and pumping systems. Its systems have enjoyed widespread use in the steel, chemical, metallurgical, energy, food and pulp and paper industries.

Keller Ag Fur Druckmesstechnik

St Gallerstrasse 119, CH-8404 Winterthur,
Switzerland, 41-52-235-2525, FAX:
41-52-235-2500, j.levitt@keller-druck.com

Manufactures isolated pressure sensors on piezoresistive basis. In Europe the largest manufacturer of industrial transmitters. The company's strengths: High volumes at low prices, high flexibility pressure ranges: 5 mbar to 2000 bar. Certified according to ISO 9001/EN 29001.

Keller Products Inc

PO Box 26, Lexington, MA 02420, 978-264-1911,
toll-free: 800-352-8422, FAX: 978-264-0221,
info@kellerproducts.net, www.kellerproducts.net

Contact: Pres, R. Strauss
Manufactures small (200 gph) packaged portable oil/water separators containing air-operated self-priming pumps (no electrical) and permanent oil coalescer elements.

Kernco Instruments Co Inc

420 S Kenazo Ave, El Paso, TX 79928,
915-852-3375, toll-free: 800-825-3875, FAX:
915-852-4084, contact@kerncoinstr.com,
www.kerncoinstr.com

Contact: CEO/Pres, John P. Kelly
Sells instruments to general manufacturing, R&D facilities and industrial plants. Furnishes a line of instruments for laboratory use for measuring, recording and controlling: equipment for R&D, quality control, maintenance, monitor speed, water quality and environmental parameters, vibration analyzers and multiple gas detectors with alarm capabilities. Products sold worldwide.

LEONI Kerpen GmbH

Business Unit Industrial Products Div
Zweifaller Str 275-287, PO Box 1520, 52249
Stolberg, Germany, 49-2402-17-1, FAX:
49-2402-7-55-90, industrial@leoni-kerpen.com,
www.leoni-industrial-projects.com

Manufactures cables for worldwide industrial project business and structured office cabling. Offers instrumentation cables, thermocouple extension and compensation cables, low- and medium-voltage cables, copper and fiberoptic data and bus cables (industrial Ethernet), including accessories. Also offers customer-specific products manufactured to more than 150 different international and national standards.

KF Industries

(sub of CIRCOR Energy Products Inc)

1500 SE 89th St, Oklahoma City, OK
73149-5249, 405-631-1533, toll-free:
800-654-4842, FAX: 405-631-5034,

sales@circorenergy.com, www.circorenergy.com
Manufactures gas and oil pressure control products. Applications range from the wellhead to the pipeline both onshore and offshore. Products include ball, check, gate, globe, needle, butterfly valves and pipeline closures. Markets served include oil and gas, petrochemical, power generation and industrial.

Kingsbury Inc

10385 Drummond Rd, Philadelphia, PA 19154,
215-824-4000, FAX: 215-824-4999,
sales@kingsbury.com, www.kingsbury.com

Contact: Dir Sls/Mktg, Mick McCann
Offers tilt-pad thrust and journal bearings recognized as the industry standard. It continues to introduce innovative technologies that improve the performance of hydrodynamic thrust and journal bearings.

Kistler Instrument Corp

75 John Glenn Dr, Amherst, NY 14228-2171,
716-691-5100, toll-free: 888-547-8537, FAX:
716-691-5226, don.beehler@kistler.com,
www.kistler.com

Contact: Sls Eng, Rich Marinucci
Manufactures force, pressure, acceleration, torque and material strain instrumentation, including sensors, signal conditioning electronics, calibration equipment, process monitors and test stands. A unit of the Kistler Group, Winterthur, Switzerland, it received ISO 9001 certification in 1994 and subsequently ISO/EIC17025. Sensing technologies include piezoelectric, variable capacitance, strain gage and piezoresistive.

Klein Tools

450 Bond St, PO Box 1418, Lincolnshire, IL
60069, 847-821-5500, toll-free: 800-553-4676,
FAX: 847-478-0625, marketing@kleintools.com,
www.kleintools.com

Contact: Sr Mktg Mgr, Abby Ceppos
Manufactures professional hand tools and occupational protective equipment.

KME Germany AG

SMA Div
Klosterstrasse 29, PO Box 3320, 49074
Osnabrueck, Germany, 49-541-321-3011, FAX:
49-541-321-3020, info-maritime@kme.com,
www.kme-marine-applications.com

Contact: Sls Mgr, Klaus Steinkamp
Manufactures copper and copper alloy products. For the offshore and shipbuilding industry, tubes, flanges and fittings of corrosion resistant alloy CuNi 90/10 for seawater piping systems are offered.

K&M Machine Fabricating Inc

20745 M-60 E, PO Box 218, Cassopolis, MI
49031-218, 269-445-2495, FAX: 269-445-8473,
egourlay@k-mm.com, www.k-mm.com

Contact: Mkt Dev Mgr, Ed Gourlay
Provides contract manufacturing services, including CNC machining to 60 ft, plate steel weldments to 30 ton and assemblies. Has more than 30 CNC machines, horizontal floor type and vertical bridge type, to manage production requirements. ISO certified. Welders certified AWS.

Koch Membrane Systems

850 Main St, Wilmington, MA 01887,
978-694-7000, toll-free: 888-677-5624, FAX:
978-694-7020, www.kochmembrane.com

Provides separation and filtration products for more than 30 years. The company has supplied membranes for more than 15,000 systems installed around the world.

Kohlswa Gjuterei AB

Bruksgatan, PO Box 101, 73030 Kolsva, Sweden,
46-221-83000, FAX: 46-221-83019,
info@kohlswagjuteri.se, www.kohlswagjuteri.se

Contact: Pres, P. H. Thoreson
Manufactures high grade and stainless-steel components, such as mooring chain accessories, shackles, swivels, triplates, ramplates, tow pins, propeller blades, hub bodies and more. Approved by ABS, DNV, LRS, BV, RMS and Achilles.

KOSO America

4 Manley St, West Bridgewater, MA 02379,
508-584-1199, FAX: 508-584-2525,
sales@rexa.com, www.kosoamerica.com

Contact: Mktg Mgr, Mark Gallagher
Produces REXA customized electrohydraulic actuators and drives. The Xpac series has modulating duty cycle, optional spring failure upon loss of power, positioning accuracy, and options to provide execution in demanding applications. Manufactures KOSO HAMMEL DAHL control valves that fulfill many uses in automation markets.

Krueger Engineering Manufacturing Co Inc

12001 Hirsch Rd, PO Box 11308, Houston, TX
77050, 281-442-2537, FAX: 281-442-6668,
www.kemco.net

Contact: VP Sls, Jerry Sylvester
Provides shell and tube heat exchangers.

■ **K-TEK Corp**

18321 Swamp Rd, Prairieville, LA 70769,
225-673-6100, FAX: 225-673-2525,
sales@ktekcorp.com, www.ktekcorp.com

Contact: Dir Mktg/Cust Svc, Kevin Hambrice
Manufactures state-of-the-art level instrumentation for liquid and bulk solids detection. Offers more than 200,000 installations worldwide in such applications as oil and gas production, chemical processing, pulp and paper processing, mining and construction, food and beverage manufacturing, plastics manufacturing and power generation.

(See ad p 33)

KTR Corp

(sub of KTR)
PO Box 9065, Michigan City, IN 46361,
219-872-9100, FAX: 219-872-9150,
ktr-us@ktr.com, www.ktrcorp.com

Contact: Inside Sls/Mktg Mgr, Jeff Krueger
Designs and manufactures curved jaw, nylon gear, steel disk, engine driven and magnetic couplings for industrial power transmission, motion control, construction and gas compression markets, commonly known as ROTEX, BoWex, RADEX, MINEX-S, RIGIFLEX and DATAFLEX (torque-measuring). Couplings conform to ATEX, API-610 and API-671 specifications and are available with torsional analysis when required.

Lamarre Equipment Inc

9419-27 Ave, Edmonton, Alberta, Canada T6N 1C9, 780-438-3493, FAX: 780-438-6655,
mike@lamarreequipment.com,
www.lamarreequipment.com

Distributes asbestos brake blocks, WPT air clutches and pump drives, Kobelt disc brakes, drilling and service rig brake rims and bands; Rexroth air controls and cylinders, parts for all makes of drilling and well servicing, Drawworks, rotary tables, Weatherford triplex drilling and servicing pumps.

Lankhorst Mouldings

(sub of Royal Lankhorst Euronete group bv)

Plastic Products Div
Prinsengracht 2, PO Box 203, 8600 AE Sneek, Friesland, The Netherlands, 31-515-487690, FAX: 31-515-487622,
offshore@lankhorst-mouldings.nl,
www.lankhorst-mouldings.nl

Contact: Bus Mgr Offshore, Martin Esselbrugge

Offers engineered solutions for risers and flowlines using recycled thermoplastic moulding technology that can deal with high loads and heavy impact: Piggy Back Block, VIV Strakes and FJ Infill.

Lautrette Filtration Pipeline Equip

Le Chemin, 61.800 Montsecrét, France,
33-2-33-96-06-97, FAX: 33-2-33-66-33-61,
jean-claude.lautrette@wanadoo.fr

Contact: Gen Mgr, Jean-Claude Lautrette
Represents English and American companies on the French market in gas/petro pipeline equipment. The company is looking for other companies to be represented in France.

Lea-Der Coatings

90 Oswald Dr, PO Box 4086, Spruce Grove, Alberta, Canada T7X 3B3, 780-962-5060, FAX: 780-962-0501, www.lea-der.com
Manufactures traction enhanced rig floor and rotary tablemats and bumper blocks. Canadian distributor of Safeguard Technology, stair tread, walkway pipe and cable covers, traction safety products and coatings, designed and manufactured to meet and exceed the ever changing standards required for personnel safety in the work place.

Leistritz Corp

165 Chestnut St, Allendale, NJ 07401,
201-934-8262, FAX: 201-934-8266,
staff@leistritzcorp.com,
www.leistritzcorp.com/pumps

Contact: Nat'l Sls Mgr, Jeffery DeVaul
Engineers and manufactures screw pumps for multiphase and high pressure crude oil applications. Pumps handle flow rates to 330,000 bpd and differential pressures to 2100 psi. Offers a totally engineered solution, including pump, driver, drive, controls, on-skid piping, liquid knockout boot and instrumentation.

LESER GmbH & Co Kg

Wendenstr 133-135, 20537 Hamburg, Germany,
49-40-25165-100, FAX: 49-40-25165-500,
sales@leser.com, www.leser.com
Manufactures safety valves. Subsidiaries and base stocks in Asia, South Africa, Brazil, India, Poland, France and USA. The product range covers relief, safety relief, full lift safety valves, controlled safety valves, safety valve/bursting disk-combinations, pressure reducing valves and change-over valves.

**LE West Ltd-UK Medical Supplies**

The IO Centre, River Rd, Unit 18 Barking, London, IG11 0DR UK, 44-208-532-7777, FAX: 44-8594-0324, sales@le-west.co.uk, www.le-west.co.uk

Contact: Sls Mgr, David Hatch
Provides remote medical supply solutions for more than 50 years, offering global procurement and worldwide delivery of drugs, pharmaceuticals, surgical supplies, medical equipment, medical consumables, rescue equipment, stretchers, defibs, first-aid and life-raft kits.

Lexair Inc

2025 Mercer Rd, Lexington, KY 40511,
859-255-5001, FAX: 859-255-6656,
jennings@lexairinc.com, www.lexairinc.com

Contact: Nat'l Sls Dir Valves, John Wayne Jennings
Designs and manufactures industrial products. Manufactures fluid power products, valves and machine tool accessories, delivering products for today's global market needs.

Lexycom Technologies Inc

1227 Reserve Dr, Longmont, CO 80501,
303-774-7822, FAX: 303-774-7828,
lisa@lexycominc.com, www.lexycominc.com

Offers a standard product line featuring the Tiamis-800 series of software defined radios. With programmable RF channel bit rates, interchangeable data interfaces, on-board firmware bank, multiple data channels and a variety of user selectable network protocols, the company's transceivers are able to meet the needs of demanding applications.

Liebherr-Werk Nenzing GmbH

Dr Hans Liebherr Str 1, PO Box 10, 6710 Nenzing, Austria, 43-50809-41481, FAX: 43-50809-41625, offshore.crane@liebherr.com, www.liebherr.com

Contact: Prod Dir, Alexander Klimmer
Develops products and sells deck cranes, offshore cranes, harbor mobile cranes, reachstackers, as well as crawler cranes for deep foundation and for lifting purposes. Production exports 99%.

Lightning Eliminators & Consultants, Inc.

HEITCH INDUSTRIES CO. LTD. BUSINESS PARTNER

Lightning Eliminators & Consultants Inc
6687 Arapahoe Rd, Boulder, CO 80303,
303-447-2828, toll-free: 800-521-6101, FAX: 303-447-8122, info@lecglobal.com, www.lecglobal.com

Provides effective, field-tested solutions to complex lighting, grounding and surge problems since 1971.

Linde AG

Linde Engineering Div
Dr Carl von Linde Strasse 6-14, 82049 Pullach, Germany, 49-89-7445-0, FAX: 49-89-7445-4908,
info@linde-le.com, www.linde-engineering.com

Contact: Head Mktg, Volker Gerndt
Designs and builds turnkey process plants for a variety of industrial users and applications: the chemical and petrochemical industries, oil refineries and fertilizer factories, air separation, manufactures of hydrogen and synthesis gases, natural gas treatment and cryoengineering.

Liquid Process Systems Inc

1025-A Technology Dr, Indian Trail, NC 28079-5514, 704-821-1115,
info@lps-filtration.com, www.lps-filtration.com

Contact: Sls, Judy Shums
Manufactures hot oil, thermal fluid, heat transfer fluid filtration systems. Side stream, continuous filtration without disrupting hot oil system operation.

**Logan Oil Tools**

11006 Lucerne St, Houston, TX 77016,
713-219-6613, FAX: 281-219-6638,
sales@loganoiltools.com,
www.loganoiltools.com

Contact: Mktg Dir, Michael C. Brown
Manufactures a line of oil field fishing tools and related products. The company also offers hydraulically driven power swivels used in drilling, fishing and workover operations.

SALES OFFICES:

Logan Oil Tools
Alice, TX 361-396-0139, FAX: 361-396-0112,
miller@loganoiltools.com

Logan Oil Tools
Kilgore, TX 903-984-6700, FAX: 903-984-6755, jdobbs@loganoiltools.com

Logan Oil Tools
Odessa, TX 432-580-7414, FAX: 432-580-7656, jbranum@loganoiltools.com

Logan Oil Tools
Broussard, LA 337-839-2331, FAX: 337-839-2334, cwwall@loganoiltools.com

Logan Oil Tools
Houma, LA 985-868-7333, FAX: 985-868-7007, mark@loganoiltools.com

Logan Oil Tools
Oklahoma City, OK 405-782-0625, FAX: 405-782-0760, lwinn@loganoiltools.com

Logan Oil Tools
Laurel, MS 601-649-0636, FAX: 601-649-6909

Logan Oil Tools
Vernal, UT 435-781-2856, FAX: 435-781-2858,
jpope@loganoiltools.com

Lee Oilfield Fishing Tools Ltd
Edmonton, Alberta, Canada 780-440-6705,
FAX: 780-463-5570, info@leeoiltools.com

Woodhouse International
Dubai, United Arab Emirates 971-4-347-2300,
FAX: 971-4-347-4642,
vlopez@woodhouse-dubai.com

Smith Services HE
Dyce, Aberdeen, UK 44-1224-770707, FAX: 44-1224-724182, j.garden@smith.com

Logan Oil Tools
Bakersfield, CA 661-387-1449, FAX: 661-387-1624, gmiller@loganoiltools.com

Louisiana Valve Source Inc

Louisiana Valve Source Inc

PO Box 130, Milton, LA 70558, 337-216-8929, FAX: 337-857-2969, kirt@lavalve.com, www.lavalve.com

Offers valve reconditioning, repair and can also provide new valves. The company has expanded into the pipeline transmission, petrochemical, refinery, power and pulp and paper industries. ISO 9001:2000 certified. The field services crews can handle valve maintenance needs and minor field repairs and PSV testing. Offers full service locations.

LUDECA Inc

1425 NW 88th Ave, Doral, FL 33172, 305-591-8935, FAX: 305-591-1537, info@ludeca.com, www.ludeca.com

Contact: Asst Sls Mgr, Niis Heilemann

Provides preventive, predictive and corrective maintenance solutions, including shaft and bore alignment straightness and flatness measurement, monitoring of thermal growth, vibration analysis and balancing equipment, software, services and training.

Lummus Technology

(sub of a CB&I Co)

1515 Broad St, Bloomfield, NJ 07003, 973-893-1515, FAX: 973-893-2000, www.lummus.cbi.com

Contact: Mktg Comms Rep, Maria Principe

Provides a range of technologies and related services to the petrochemical, petroleum refining and oil and gas industries. Offers engineering, procurement and construction with approximately 18,000 employees in more than 80 locations worldwide.

MAC Equipment

7901 NW 107th Terrace, Kansas City, MO 64153-1910, 800-821-2476, FAX: 816-891-8336, sales@macequipment.com, www.macequipment.com

Designs and manufactures a line of pneumatic conveying and air filtration equipment. Offers design build assistance, process control and real world testing. Processing industries served: chemical, food, pet food, grain, ag and feed, wood and wood products, coal fired power plants, ethanol, minerals and mining and petrochemical.

Mad Rock Marine Solutions Inc

77 Alexander St, St Johns, Newfoundland, Canada A1E 2T8, 709-772-7547, FAX: 709-772-2462, dpelley@madrock.ca, www.madrock.ca

Contact: CEO/Pres, Dean Pelley

Provides technology development that provides enhanced marine evacuation system components to solve specific customer problems. Has developed a solution to the problem of premature hook release with a new patented technology (RocLoc). It ensures locking stability with failure warning characteristics and has type approval from Transport Canada.

Magnatech Ltd Partnership

6 Kripes Rd, PO Box 260, E Granby, CT 06026-0260, 860-653-2573, FAX: 860-653-0486, info@magnatech-lp.com, www.lp.com

Contact: Pres, John G. Emmerson

Manufactures specialized equipment for orbital pipe welding using GTAW and FCAW welding processes. The mission is to provide products that will increase welding productivity and quality for customers in the pipeline industry and the fabrication/field erection of petroleum and petrochemical processing pipe work.

Magnetrol International Inc

5300 Belmont Rd, Downers Grove, IL 60515, 630-969-4000, FAX: 630-969-9489, info@magnetrol.com, www.magnetrol.com

Contact: Mktg Comms Mgr, Kathleen J. Cacciato

Provides level and flow instrumentation. Offers multiple technologies, including buoyancy, contact ultrasonic, air sonar, RF capacitance, thermal dispersion, magnetic level indicators, Eclipse and Horizon guided wave radar transmitters, or the Pulsar Pulse Burst radar level transmitter.

Magtrol Inc

70 Gardenville Pkwy, Buffalo, NY 14224, 716-668-5555, FAX: 716-668-8705, magtrol@magtrol.com, www.magtrol.com

Contact: Sls Mgr, Dodge Elkins

Manufactures products to test, measure and control torque-speed-power, land-force-weight tension and displacement. Engineering team can design and build custom motor test systems (CMTS) to meet specific motor test requirements. A typical CMTS integrates motor test equipment with power supplies, adaptable fixtures, custom tables and more.

Marathon Sensors Inc

8904 Beckett Rd, West Chester, OH 45069-7054, 513-772-1000, toll-free: 800-547-1055, FAX: 513-326-7090, sales@marathonsensors.com, www.marathonsensors.com

Contact: VP Sls/Mktg, Yvonne Spooner

Develops and markets atmosphere sensors and instrumentation which address the needs of the heat treating, power generation, glass and ceramic, refining and petrochemical, metals reheat and incineration industries.

Marc Climatic Controls Inc

PO Box 218309, Houston, TX 77218, 713-464-8587, toll-free: 800-397-0131, FAX: 713-468-8810, sales@maroclimatic.com, www.maroclimatic.com

Contact: Inside Sls, Chris Fulmer

Provides CSA (C/US) certified explosion-proof air conditioners, explosion-proof air conditioning systems and other hazardous location equipment for the petrochemical, refining and offshore industries.

Marine Rescue Technologies

539 Cross Creek Cir, Sebastian, FL 32958, 772-388-1326, FAX: 772-594-0157, info@seamarshall-us.com, www.seamarshall-us.com

Contact: Sharon Milliman

Distributes a marine rescue system called Sea Marshall that is designed for an automatic alert, precession direction finding and a locally managed rescue system. The system includes alerts (PLBs or personal locator beacons) and base units or receivers.

Marinfloc Ab

Industrivaegen 10, SE-472 95 Varekil, Sweden, 46-304-606-300, FAX: 46-304-100-51, sales@marinfloc.com, www.marinfloc.com

Contact: Sls Coord, Sandra Forsberg

Provides products that have been developed onboard ships during many years and a flocculation and knowledge of how this is done. Delivers both the equipment and the know-how.

MARINTEK

Marine Technology Centre, Postboks 4125 Valentinlyst, NO-7450 Trondheim, Norway, 47-7359-5500, FAX: 47-7359-5776, kari.stendahl@marintek.sintef.no, www.marintek.com

Contact: Div Dir, Terje Nedreld

Performs research and development for companies in the field of marine technology. Develops and verifies business and operating concepts and technological solutions for the shipping, marine equipment and offshore petroleum industries. Headquarters are in Trondheim, Norway, with subsidiaries in Houston, Texas and Rio de Janeiro, Brazil.

Marioff Corp Oy

PO Box 86, Virmatie 3, FI-01301 Vantaa, Finland, 358-9-870-851, FAX: 358-9-8708-5399, info@marioff.fi, www.marioff.com

Supplies, develops and manufactures the HI-FOG water mist fire protection systems. Applications include industrial gas turbines, machinery spaces, metro and tunnel protection, food processing plants, computer and telecommunication rooms, hotels, offices and heritage buildings and marine-based applications, such as cruise vessels and offshore.

Marketmotion

300 Garden Of The Gods Rd, Suite 205, Colorado Springs, CO 80907, 719-533-1599, toll-free: 866-658-7526, masters@marketmotion.net, www.marketmotion.net

Contact: Pres, Mark Masters

Operates with a work backward approach to audience and prevailing market dynamics for executives desiring a market-driven effort. The company's approach has yielded sustainable market gains and strong growth multiples for companies competing in the oil and gas sector. Clients improve deliberate pursuits to match resources with audiences and opportunities.

MarTech Systems Inc

35 Viburnum Ct, Lawrenceville, NJ 08648, 609-896-4457, FAX: 760-280-9823, huchier@martechsystems.com, www.martechsystems.com

Contact: Pres, Loraine Huchler PE CMC

Provides technical services for water utility systems to reduce corrosion and deposition, maximize reliability, energy efficiency and minimize water usage. Audit water systems, troubleshoot failures, provides oversight to chemical supplier, conducts technology feasibility studies for system expansion or replacement, bid water treatment chemicals and trains engineers and operators.

Maselli Measurements Inc

7746 Lorraine Ave, Suite 201, Stockton, CA 95210, 209-474-9178, toll-free: 800-964-9600, FAX: 209-474-9241, davedodum@maselli.com, www.maselli.com

Contact: Reg Sls Mgr, Dave Odum

Sells and services intrinsically safe process refractometers and laboratory refractometers. Also manufactures automatic titrators.

Master Bond Inc

154 Hobart St, Hackensack, NJ 07601, 201-343-8983, FAX: 201-343-2132, main@masterbond.com, www.masterbond.com

Contact: Mktg Mgr, James Brenner

Manufactures more than 3000 grades of adhesives, sealants and coatings. Offers high strength polymers that withstand thermal cycling and high temperatures. They also exhibit excellent resistance to chemicals, including water, oils, fuels, acids and bases.



Mathey Dearman Inc
4344 S Maybelle Ave, Tulsa, OK 74107,
918-447-1288, toll-free: 800-725-7311, FAX:
918-447-0188, sales@mathey.com,
www.mathey.com

Contact: VP Sls/Mktg, Shannon D. Fanning
Develops, manufactures and markets pat-
ented cutting and beveling machines with nu-
merous accessories for all types of pipe; pipe
alignment and reforming clamps for welders
and pipe fitters requiring fast, accurate fit-up;
welding electrode and flux ovens and smaller
pipe tools for pipe fitting and layout.

Matrix Service Co

Corporate Headquarters Div
10701 E Ute St, Tulsa, OK 74116, 918-838-8822,
FAX: 918-838-8810,
jnewmeister@matrixservice.com,
www.matrixservice.com

Contact: VP Mktg/Bus Dev, John Newmeister
Provides the petroleum industry with construc-
tion, repair and maintenance services. Strate-
gically located throughout the United States the
company provides plant repair, maintenance and
turnaround services and specializes in above-
ground storage tanks and pressure vessels in ac-
cordance with API and ASME standards.

Max Machinery Inc

Flow Meter Div
33 Healdsburg Ave, Healdsburg, CA 95448,
707-433-2662, FAX: 707-433-1818,
sales@maxmachinery.com,
www.maxmachinery.com

Contact: Prod Line Mgr, Dan Turek
Offers precision P-D flowmeters for tough liquid
measurement applications: able to measure flow
rates as low as 1 cc/minute, fluids with viscosi-
ties from 0.2 to 1 million cP, pressure and tem-
perature ratings to 7500 psi and 550°F.
Linearized outputs within 0.2 and 0.3% of read-
ing accuracy.

McCrometer Inc

3255 W Stetson Ave, Hemet, CA 92545,
951-652-6811, toll-free: 800-220-2279, FAX:
951-652-3078, www.mccrometer.com

Contact: V-Cone Customer Service
Manufactures flowmeters for agriculture irri-
gation, water, wastewater, oil and gas, power,
HVAC, universities and other processing mar-
kets. Products include Mc Propeller & Water
Specialties Propeller flowmeters, Ultra Mag,
Marsh Multi-Mag and Single-Mag magnetic
flowmeters, V2 System, V-Cone and Wa-
fer-Cone differential pressure flowmeters.
(See ad Front Cover, p 19, 20)

McLaren Software

10375 Richmond Ave, Suite 825, Houston, TX
77042, 713-357-4710, FAX: 713-357-4711,
marketing@mcclarensoftware.com,
www.mcclarensoftware.com

Contact: VP Mktg, Mike Jones
Develops engineering-centric intellectual work
management applications for the oil and gas, uti-
lities, pharmaceutical and engineering, design and
construction sectors. Helps organizations man-
age the use of engineering documentation, opti-
mize engineering design and asset change
management processes and react to challenges
of globalization and the aging workforce.

McNichols Co Steel Service Centers

2502 N Rocky Point, #950, PO Box 30300,
Tampa, FL 33630, 813-282-3828, toll-free:
800-237-3820, FAX: 813-243-1888,
sales@mcnichols.com, www.mcnichols.com

Contact: Sls Mgr, Ben Carlsson
Specializes in products with holes in them, perfo-
rated and expanded metal, wire mesh and all
types of gratings for same day stock shipment.

MEA Inc

2600 American Ln, Elk Grove Village, IL 60007,
800-523-5491, FAX: 847-350-1951,
meainc@msn.com, www.meaincorporated.com
Offers slide valve actuators-digital control (patent
applied for) plug valve actuators, butterfly valve
actuators, wet gas valve actuators, furnace
damper actuators, pipe line actuators, turnaround
field service and boiler fan damper actuators.



MEDC Ltd

Colliery Rd, Pinxton, Nottingham, NG16 6JF
UK, 44-1773-864-100, FAX: 44-1773-582-800,
sales@medc.com, www.medc.com

Contact: Mktg Mgr, Simon Schofield
Designs and manufactures a range of manual,
visual and audible alarms for use in potentially
explosive atmospheres and harsh indus-
trial/marine environments. Range includes:
break glass/push button call points, status
lights, beacons/strobes, sounders/horns,
loudspeakers, heat detectors and control
products. Worldwide certifications are ATEX,
UL, FM, GOST and many more.

SALES OFFICES:

MEDC International
Houston, TX 713-937-9772,
us.sales@crouse-hinds.com, www.medc.com

Mega_f Motion Systems Ltd

PO Box 540, Yokneam, 20692 Israel,
972-4-9891050, FAX: 972-4-9891080,
mega-f@mega-f.co.il, www.mega-f.com
Develops and markets software intensive pro-
grammable DSP based motion control products:
DSP motion control modules and multi-axis mo-
tion controllers, motion systems, drives, motion
analyzers and motion development tools.

Menardi

One Maxwell Dr, Trenton, SC 29847,
803-663-6551, toll-free: 800-321-3218, FAX:
803-663-4029, info@menardifilters.com,
www.menardifilters.com
Manufactures and supplies all styles of filter bags
for use in pulse-jet, reverse air and shaker
baghouses. The company supplies all styles of
needled felts, as well as special woven fabrics
made from polyester, fiberglass, homopolymer
acrylic, polypropylene, aramid, PPS, Teflon and
many other fibers, most of which are available
with Mikrotex.

MENCK GmbH

(an ACTEON Co)
Am Springmoor 5a, PO Box 1461, 24568
Kaltenkirchen, Germany, 49-4191-911-0, FAX:
49-4191-911-100, info@menck.com,
www.menck.com

Contact: Man Dir, Christoph Daum
Manages complex piling projects for customers
in the oil and gas and civil engineering sectors.
Supplies sophisticated pile-driving hammers,
which can work in water depths to 7000 ft.

Mercer Valve Co Inc

9609 NW 4th St, Oklahoma City, OK 73127,
405-495-6533, toll-free: 800-833-6402, FAX:
405-495-8728, sales@mercervalue.net,
www.mercervalue.net

Contact: VP Sls/Mktg, Kirk Taylor
Manufactures high quality safety relief valves for
more than 20 years. The company's patented
"Auto Seat Technology" increases seat life, re-
duces repairs and gives the valve a consistent
set pressure.



Mesa Rubber Co

(div of Mesa Industries Inc)
4141 Airport Rd, Cincinnati, OH 45226,
513-321-4511, FAX: 513-321-8178,
sales@mesarubber.com,
www.mesarubber.com

Contact: Sls Mgr, David Schafer
Manufactures products for the petroleum in-
dustry and is ISO 9001:2000 certified. The
company has produced quality floating roof
drain systems, skimmer systems, floating roof
seal systems, gauge pole covers, roof leg
boots, geomembranes, collapsible storage
tanks, portable beam systems, vapor collec-
tions systems and a variety of other specialty
applications products and accessories.

SALES OFFICES:

Mesa Rubber Co
Houston, TX 281-469-8098, FAX:
281-469-9524, sales@mesarubber.com,
www.mesarubber.com

Mesa Rubber Co
Monrovia, CA 626-359-9361, FAX:
626-359-7985, sales@mesarubber.com,
www.mesarubber.com

(See ad p 39)

Metrix Instrument Co

(div of Roper Industries)
8824 Fallbrook Dr, Houston, TX 77064,
281-940-1802, toll-free: 800-638-7494, FAX:
281-940-1799, info@metrix1.com,
www.metrix1.com

Contact: Inside Sls/Svc Supv, Carlus Sandlin
Serves customers worldwide with a line of instru-
mentation to measure and monitor vibration and
provide early warning of machinery failure. Prod-
ucts include proximity probes, cables, transduc-
ers, switches, transmitters, sensors,
accelerometers, monitors and portable meters.
Also features direct replacements for GE/Bently
Nevada 3000, 3300 and 7200 Series compo-
nents.

Michell Instruments Ltd

48 Lancaster Way Business Park, Ely,
Cambridgeshire, CB6 3NW UK, 44-1353-658031,
FAX: 44-1353-658199, info@michell.co.uk,
www.michell-instruments.com

Contact: Mktg Coord, Tim Landucci
Manufactures dew point instruments, cooled mir-
ror hygrometers and hydrocarbon dew point in-
struments.

MICO Inc

1911 Lee Blvd, PO Box 8118, North Mankato,
MN 56003, 507-625-6426, FAX: 507-625-3212,
donar@mico.com, www.mico.com

Contact: Applications Department
Designs and manufactures innovative braking
and controls worldwide. Products include: Object
Detection brake interlock system, 691 Brake lock
system, Duallocks, Caliper disc brakes, Multiple
disc brakes, air/hydraulic actuators, hydraulic
throttle controls, hydraulic reservoirs, quadrigage,
switches, accumulator charging valves, hydraulic
brake valves.

Midwest Brake

Midwest Brake

26255 Groesbeck Hwy, Warren, MI 48089,
586-775-3000, toll-free: 800-525-4503, FAX:
586-775-3040, sales@midwestbrake.com,
www.midwestbrake.com

Contact: Sls/Mktg Mgr, Kurt Liebold
Manufactures oil shear clutch and brake systems,
power transmissions and industrial friction mate-
rial. Products include motor brakes, clutches,
clutch/brakes for conveyors, winches, constant
tension winches, drawworks, cranes, hoists and
material handling equipment. Friction material,
brake lining, friction blocks, brake bands, indus-
trial brake bonding and clutch disks for industrial
applications.

Mil-Ram Technology Inc

4135 Business Center Dr, Fremont, CA 94538,
510-656-2001, FAX: 510-656-2004,
sls@mil-ram.com, www.mil-ram.com

Contact: Pres, Carlos Ramirez
Manufactures gas/fire detection instruments,
transmitters, fixed systems, wireless telemetry
systems and a range of chemically selective, pat-
ented sensors, which feature no false alarms.
Products are designed to monitor and detect
hazardous gases, toxic and combustible, oxygen
deficiency and flame detection for personal
safety, environmental protection and process
controls.

**Milton Roy**

201 Ivyland Rd, Ivyland, PA 18974,
215-441-0800, FAX: 215-441-8620,
info@miltonroy.com, www.miltonroy.com

Contact: Prod Mgr, Tom Day
Manufactures engineered metering pumps,
accessories and fluid handling systems. The
product family is specifically designed for the
energy market to address the aggressive envi-
ronments, extreme pressure, variable flow
ranges and unique applications required in the
oil and gas industry.

Milwaukee Valve Co

16550 W Stratton Dr, New Berlin, WI 53151,
262-432-2700, FAX: 262-432-2701,
info@milwaukeevalve.com,
www.milwaukeevalve.com

Mixing & Mass Transfer Technologies

PO Box 315, State College, PA 16804,
410-570-3164, FAX: 814-466-8761,
jschlachter@m2ttech.com, www.m2ttech.com

Contact: Sls/Mktg Mgr, Jim Schlachter
Addresses difficult challenges in single- or
multiphase mixing applications to improve the
processing of Newtonian and non-Newtonian flu-
ids. The company was founded by experts and
leaders in the mixing and mass transfer fields.

Mixing Solutions Ltd

Venture House, Bone Land, Hambridge Rd,
Newbury, Berkshire, RG14 5SH UK,
44-1635-275300, FAX: 44-1635-275375,
sales@mixingsolutions.com,
www.mixingsolutions.com

Contact: Sls/Mktg Mgr, Steve Watkins
Provides mixing equipment and process solu-
tions, with more than 50 years fluid mixing expe-
rience. Offers processing applications with
design, development and manufactures high effi-
ciency, latest technology mixing impellers for
process optimization associated with a global
company.

M&J Valve

19191 Hempstead Hwy, Houston, TX 77065,
281-469-0550, toll-free: 800-231-3690, FAX:
281-894-1332,
courtney.butzine@processequipment.spx.com,
www.mandjvalve.com

Provides valve products to the hydrocarbon pipe-
line, storage and distribution markets for more
than four decades. With a product offering of
slab and expanding through-conduit gate valves,
axial and rotary control valves, piston and swing
valves. Also provides a variety of flow control so-
lutions for liquid, geothermal and gas markets.

MMC International Corp

60 Inip Dr, Inwood, NY 11096-0664,
800-645-7339, FAX: 516-371-3134,
mmcinwd@aol.com

Manufactures vapor control valves, quick con-
nect coupling flanges, product sampling equip-
ment, and a variety of product measurement
instruments. These meet or exceed standards for
"intrinsically safe" equipment set by national gov-
ernments and certifying agencies worldwide. The
primary products include Cam-Lock flanges, tank
gauging station valves, deck covers, oil-water
separators, and more.

MM Newman Corp

24 Tioga Way, PO Box 615, Marblehead, MA
01945, 781-631-7100, toll-free: 800-777-6309,
FAX: 781-631-8887, sales@mmnewman.com,
www.mmnewman.com

Contact: Sls Mgr, Charles Loutrel
Manufactures Heli-Tube spiral cut cable wrap, a
versatile expandable plastic cable harness. Appli-
cations range from organizing wires, hoses and
tubing in industrial, electrical, electronics, avia-
tion, automotive, marine, medical, instrumental,
and automation products to protecting high pres-
sure hoses and electrical power tool cords
against abrasion.

Molli Computer Services Inc

PO Box 6129, Colorado Springs, CO 80934,
719-520-1790, FAX: 719-520-5134,
info@mcsi.com, www.mcsi.com

Contact: Pres, Frank Molli
Provides windows-based petroleum economics
and decline curve analysis program with several
advanced and flexible features. Free production
history data is available from thirteen states: AL,
CA, CO, KS, LA, MI, NM, OK, MS, TX, UT, WV
and WY.

Monitran Ltd

Monitran Ltd Div
Monitor House, Hazlemere Rd, Penn,
Buckinghamshire, HP10 8AD UK,
44-1494-816569, FAX: 44-1494-812256,
info@monitran.co.uk, www.monitran.com

Contact: Mktg Asst, Susan Toyn
Develops and manufactures sensors and sys-
tems for measuring vibration and displacement.
Manufactures a range of piezoelectric accelero-
meters with options that include waterproof, intrin-
sically safe, high- and low-temperature and
radiation resistant versions, eddy current probes,
monitoring systems and portable vibration me-
ters.

Monroe Environmental

810 W Front St, Monroe, MI 48161,
800-992-7707, FAX: 734-242-5275,
sales@mon-env.com, www.mon-env.com

Contact: Sls, Rob Cardella
Designs and manufactures industrial wastewater
treatment equipment, air and gas cleaning equip-
ment, dust collectors and fume scrubbers.
Wastewater treatment products include API sep-
arators and circular and coalescing plate
clarifiers.

Morrison Bros Co

325 E 24th St, Dubuque, IA 52001,
563-583-5701, FAX: 563-583-5028,
custserv@morbros.com, www.morbros.com

Contact: Sls Mgr, Jerry Schollmeyer
Manufactures products for the petroleum market-
ing industry. Product line consists of service sta-
tion equipment, tank truck fittings, aboveground
storage tank fittings, venting equipment, indus-
trial valves, line strainers, monitoring well man-
holes and plugs, vapor recovery, overflow
prevention valves, liquid level gauges and other
valves and fittings.

Motion Industries

(div of Genline Parts Co)
1605 Alton Rd, Birmingham, AL 35210,
205-956-1122, toll-free: 800-526-9328, FAX:
205-957-5290, www.motionindustries.com

Contact: VP Mktg/Adv, Linda Price
Distributes industrial MRO replacement parts, of-
fers more than three million quality replacement
parts to industry, including bearings, mechanical
power transmission, electrical and industrial au-
tation, hydraulic and industrial hose, hydraulic
and pneumatic components, process pumps and
equipment, industrial supply products, material
handling, and seals and accessories.

MPRI

(sub of L3)
Oakhill Rd, Gulls Cry, Isle of Wight, PO34 5AP
UK, 44-1983-567608, FAX: 44-8700-515312,
pchemx@interalpha.co.uk, www.mpri.com

Provides quality training services and equipment
to both military and commercial operators in the
oil and gas industry. Also provides simulators for
the training of personnel in all types of crane,
drilling, liquid cargo/process simulation systems
and vehicles. Range includes marine simulators
for ship handling and engine room use.

MTS Systems Corp

(div of MTS Sensors Div)
3001 Sheldon Dr, Cary, NC 27513,
919-677-0100, FAX: 919-677-0200,
info@mts.com, www.mtssensors.com

Contact: Sr Mktg/Comms Mgr, Janet Rapp
Offers magnetostrictive linear position sensing
technology and is committed to research and de-
velopment, product quality and customer service.
Manufactures rugged and reliable Tomposonics
position sensors, as well as the repeatable and
accurate liquid-level transmitters and gauges.
ISO 9001 certified.

Mustang Engineering

16001 Park Ten Pl, Houston, TX 77084,
713-215-8000, FAX: 713-215-8506,
www.mustangeng.com

Contact: Mktg/Comms Mgr, Dena Lee
Offers an independent services provider to the
global oil, gas and chemical industries. Special-
izing in design, engineering, procurement, project
and construction management through its six
business units: upstream, midstream, pipeline,
automation and control, process plants and in-
dustrial, the company has 17 offices worldwide.

Namtvedt SealMaker Services A/S

169 Eiganesveien, PO Box 414, Madla, 4009
Hafsljord, Stavanger, Norway, 47-932-50-882,
ken@namtvedt.no, www.namtvedt.no

Contact: Partner, Ken Phillips
Offers engineered leak repair solutions from diag-
nostic to remediation. Specialty sealants de-
signed specifically to repair subsea leaks, SCSSV
leaks, control line leaks, umbilical leaks, wellhead
leaks, hanger leaks, casing-tubing connection
leaks and various downhole equipment leaks.

The NanoSteel Company Inc

67 Cedar St, Suite 101, Providence, RI 02903, 401-270-3549, toll-free: 877-293-6266, FAX: 401-270-9306, info@nanosteelco.com, www.nanosteelco.com

Contact: VP Sls/Mktg, Michael Breitsameter
Develops iron-based alloys for welding and thermal spraying with strengths 4x that of current steel. The company's patented Super Hard Steel (SHS) alloys form property-enhancing, nanometer-sized grain structures. SHS provides wear resistance well above conventional steel and into the realm of WC products, but without the high cost.

Nash A Division of Gardner Denver

9 Trefoil Dr, Trumbull, CT 06611, 203-459-3900, toll-free: 800-553-6274, FAX: 203-459-3988, nash@gardnerdenver.com, www.gardnerdenvernash.com

Manufactures liquid ring vacuum pumps, compressors and engineered systems serving the chemical, petroleum, power, paper, mining, environmental and food industries. Provides global service and technical support for its products through its locations worldwide.

National Oilwell Varco

10000 Richmond Ave, Houston, TX 77042, 713-346-7500, FAX: 713-346-7687, corporate.marketing@nov.com, www.nov.com
Designs, manufactures and sells comprehensive systems and components used in oil and gas drilling and production, tubular inspection, internal tubular coatings, integrated systems, downhole tools, lifting and handling equipment and providing supply chain integration to the oil and gas industry.

Neptune Chemical Pump Co Inc

PO Box 247, Lansdale, PA 19446, 215-699-8700, FAX: 215-699-0370, pump@neptune1.com, www.neptune1.com

Contact: Pres, Michael Dowse
Manufactures chemical metering pumps, chemical feed systems, portable mixers for drums, tanks and totes and offers a variety of injection accessories.

Net Safety Monitoring Inc

2721 Hopewell Pl NE, Calgary, Alberta, Canada T1Y 7J7, 403-219-0688, FAX: 403-219-0694, sales@net-safety.com, www.net-safety.com

Contact: Dir Sls Canada, Larry McGee
Designs and manufactures a range of fire and gas detection equipment, systems and safety related accessories since 1994. The company has offices in Calgary, Houston, Dubai and Singapore and a global distribution and service network.

NETZSCH Oilfield Products GmbH

Gebrüder-Netzsch-Str 19, 95100 Selb, Germany, 49-9287-75424, FAX: 49-9287-75427, info@nop.netzsch.com, www.oil.netzsch.com

Contact: Mgmt Sect'y, Anna Naumenko
Manufactures downhole and surface progressing cavity pumps for different applications in the oilfield industry. Strengths include providing the customer with the best solution for each requirement.

(See ad p 43, 44)

Newpark Mats & Integrated Services

2900 Highway 93, Carencro, LA 70520, 337-896-8976, toll-free: 877-628-7623, FAX: 337-896-1971, mrabalais@newpark.com, www.newparkmats.com

Provides prefabricated interlocking mat systems for construction drilling and work sites, on-site and offsite environmental services, including site assessment, pit design, construction and drilling waste management and regulatory compliance services. In addition, the company also provides temporary work site services to the pipeline, electrical utility and highway construction industries.

Newport Electronics Inc

2229 S Yale St, Santa Ana, CA 92704, 714-540-4914, FAX: 203-968-7311, info@newportus.com, www.newportus.com

Contact: Sales Department
Provides a line of signal conditioners, transmitters, controllers and meters that offer state-of-the-art technology, uncompromising accuracy and quality. Covering a selection of signal inputs, including: process/DC voltage and current, strain, temperature from thermocouples, humidity, RTDs and noncontact IR detectors, frequency, pulse, AC voltage and current, analytical measurements including pH and more.

Newson Gale Inc

(div of Newson Gale Ltd)
1072 Madison Ave, Lakewood, NJ 08701, 732-987-7715, FAX: 732-791-2182, info@newson-gale.com, www.newson-gale.com

Contact: Pres/CEO, Graham Tyers
Provides static control equipment for hazardous areas, grounding and bonding clamps and assemblies; intrinsically safe self-testing bond-rite clamps, earth-rite static ground monitoring and indication systems, test equipment and accessories.

Newtons Sas

850 Chemin Du Miton, 84300 Cavillon, France, 33-4-90-71-1320, FAX: 33-4-90-06-1940, mvasseieu@newton-s.com, www.newton-s.com
Offers sodium hydroxide, potassium hydroxide and calcium chloride compacted into walnuts to form soda briquette, potash briquette and calcium chloride briquette. In partnership with French Institute of Petroleum, develops drying units using desiccant deliquescent agents to dry and sweet liquids as solvents, liquified gas, kerosene and VCM.

SALES OFFICES:

Quadrimes
Cavillon, France 33-490787085, FAX: 33-490787081, preisch@quadrimes.com, www.quadrimes.com

New York Mercantile Exchange Inc

World Financial Center, One North End Ave, New York, NY 10282-1101, 212-299-2301, FAX: 212-301-4570, marketing@nymex.com, www.nymex.com

Contact: Sr VP Mktg, Joseph Raia
Offers energy and metals futures marketplace, providing global benchmark prices and comprehensive risk management instruments for hedging in both physical and cash settled markets. All exchange products are available virtually 24 hours a day on the CME Globex electronic platform with its physically delivered contracts also available via open outcry.



"The Name Says It All."

For the world's #1 best selling portable gauging and sampling equipment, just say "MMC." For all your gauging and sampling needs MMC makes it easy, accurate and user friendly.



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MMC (Asia) Ltd. • Fax: (078) 252-0265 • E-mail: mmc.asia@zvcity.com



Flexi-Dip Closed Trimode Gauging Tape with 2" Micro-B Vapor Control Valve



Flexi-Dip Restricted Trimode Gauging Tape with 2" Micro-B Vapor Control Valve

Nextteq LLC

Nextteq LLC

8406 Benjamin Rd, Suite J, Tampa, FL 33634,
813-249-5888, toll-free: 877-312-2333, FAX:
813-249-0188, info@nextteq.com,
www.nextteq.com

Offers strong commitments to advancing safety and R&D enable to pioneer product innovations. Offers six product lines: gas detection, respiratory protection, law enforcement, Homeland Security/first response hazmat, surface and skin chemical detection and water and soil analysis.

Niagara Blower Heat Transfer

673 Ontario St, Buffalo, NY 14207, 716-875-2000,
toll-free: 800-426-5169, FAX: 716-875-1077,
sales@niagarablower.com, www.niagarablower.com
Offers a design-build manufacturer providing engineered solutions to heat and transfer applications at power, process, refinery, food and brewing facilities worldwide since 1904. The company's customized product lines include closed-loop evaporative wet surface air coolers (W SAC) and "No-Frost" liquid desiccant dehumidification systems.

Nicholson Steam Trap

(div of Spence Engineering Co)
150 Coldenham Rd, Walden, NY 12586,
845-778-5566, FAX: 845-778-1072,
sales@nicholsonsteamtrap.com,
www.nicholsonsteamtrap.com

Manufactures thermostatic, thermodynamic, mechanical steam traps, air traps, gasketed pipe unions, condensate pumps, strainers, check valves, control valves, pressure regulating valves, temperature regulating valves, safety relief valves and cryogenic SRV.

N-line Tools Inc

324 E Union, Minden, LA 71055, 318-377-7612,
FAX: 318-377-7612, mccarr75532@aol.com,
www.n-linetools.com

Contact: Pres, Mike Carr
Provides paraffin prevention and heavy crude recovery tools that can be permanently integrated into any piping system. Offers a variety of tools, including down hole tubing heaters, annulus heaters, surface pipeline and tank heaters.

Norcross Corp

255 Newtonville Ave, Newton, MA 02458,
617-969-7020, FAX: 617-969-3260,
sales@viscosity.com, www.viscosity.com

Contact: James Dulong
Provides viscometers and viscosity control expertise from the viscosity cups to integrated viscosity control systems for complete process control. Manufactures viscometers in the United States. Offers Shell cups to powerful PLC-based viscosity control systems and can determine the correct control for your particular application.

Nordisk Højtryk A/S

Vidalsvej 4, DK-9230 Svenstrup, Denmark,
45-98-383-200, FAX: 45-98-383-282,
info@nh-as.dk, www.nh-as.com

Contact: Man Dir, Jesper Lindberg
Designs and builds high-pressure pumping systems to 3000 bar, air compressors for zone 2 to 70 m³/min and air dryers as power packs for the oil and gas, marine and industrial sector for NORSOK, DNV, API and ATEX.

Nordseetaucher GmbH

Bramkampweg 9, 22949 Ammersbek, Germany,
49-4102-23180, FAX: 49-4102-231820,
info@nordseetaucher.de,
www.nordseetaucher.de

Contact: Man Dir, Claus Mayer
Offers offshore and onshore diving operations, underwater-welding, deep tunneling, saturation and nuclear diving. Performance capabilities range from sat- and semi-sat diving to salvage work, underwater welding, cutting, preservation and concreting, as well as documentation by video and television with cameras operated by remote control or by divers.

Norriseal

(a Dover Co)
11122 W Little York, Houston, TX 77041,
713-466-3552, FAX: 713-896-7386,
info@norriseal.com, www.norriseal.com

Contact: Sls Mgr, Gary Kendall
Manufactures pneumatic level controllers, level switches, pressure controllers, dump valves, control valves, piston check valves, and the angle-disc design manual or automated butterfly valve in resilient seat or metal lined to ISO 9001, API 6D, ABS, PED certification.

Norsafe

Tybakken, PO Box 115, N-4852 Faervik, Norway,
47-370-58500, FAX: 47-370-58501,
mail@norsafe.no, www.norsafe.no

Contact: Sls Asst, Benedicte Terjesen
Produces lifeboats, free-fall boats and fast rescue boats with davits. Free-fall boats have an optimized design. Conventional lifeboats are used worldwide on ships and offshore installations. The smallest boats in the lifeboat range are approved as lifeboats and as rescue boats.

Norton Corrosion Ltd

8820 222nd St SE, Woodinville, WA 98077,
425-483-1616, toll-free: 1-800-426-3111, FAX:
425-485-1754, jweiser@nortoncorrosion.com,
www.nortoncorrosion.com

Contact: Tech Mktg, Jerry Weiser
Designs, material supply, O&M and problems solving. Manufacturer of Bayanode Probe Anodes. Protect condenser water boxes, intake structures, trash racks, traveling screens, outlet structures, bulkheads, process, yard piping and other power industry applications from corrosion. More than 600 power projects since 1991; more than 17,000 total projects since 1959.

Nowata Filtration

(member of the amafiltergroup)
Nowata and ProGuard Filtration Div
428 N Elm, PO Box 678, Nowata, OK 74048,
800-259-2204, FAX: 918-273-2101,
sales@nowata.com, www.nowata.com

Contact: Sls Mgr, Steve Franke
Supplies high and low pressure ASME Code cartridge and bag type filter housings. Serving not only the oil production market but also providing general industrial, chemical and petrochemical filter solutions.

Offshore Source LLC

1120 NASA Pkwy, Suite 310, Houston, TX 77058,
281-335-3104, FAX: 281-333-4580,
www.off-shore-source.com

Contact: Pres/Owner, Douglas Hines
Offers product representation and distribution with the oilfield products group, which is unique and generally tailored to the oilfield. Also apply the products represented in the company's designs, giving employees field experience and technical insight as to the capabilities of all products.

OFI Testing Equipment

1006 W 34th St, Houston, TX 77018,
713-880-9885, FAX: 713-880-9886,
mgallamore@ofite.com, www.ofite.com

Contact: Mktg Mgr, Monica Gallamore
Manufactures and supplies testing equipment for the drilling fluids, cementing and wastewater industries. Products include viscometers, mud balances, filter presses, roller ovens, aging cells, mixers, blenders, consistometers, curing chambers, compressive strength testers, portable kits and more. Also provides repairs and custom designed equipment.

OI Analytical

151 Graham Rd, PO Box 9010, College Station, TX 77842, 979-690-1711, toll-free:
800-653-1711, oimail@oico.com, www.oico.com
Manufactures analytical instruments and continuous air monitoring systems for detecting and measuring chemical compounds and elements in petrochemicals and environmental samples.

Oil & Gas Petroleum Corp

14 Wall St, 20th Floor, New York, NY 10005,
212-222-1900, toll-free: 888-692-6472, FAX:
212-300-3528, dc@ogpetroleum.com,
www.ogpetroleum.com

Contact: Sr VP, Jack Russel
Enables us to be affianced in the orchestration of explorations, productions, processing, and refining. Including and not limited to consulting and project management. Global oil and gas traders and distributors.

Oil Plus Ltd

Dominion House, Kennet Side, Newbury, Berkshire, RG14 5PX UK, 44-1635-30226, FAX:
44-1635-49618, c.kingston@oilplus.co.uk,
www.oilplus.co.uk

Provides specialist technical expertise to the international oil and gas industry. The company's technologists, scientists and engineers have extensive operating experience and together with the fully equipped laboratories, provides clients with a practical approach to operational and maintenance requirements.

Oil Skimmers Inc

12800 York Rd, Cleveland, OH 44133,
440-237-4600, toll-free: 800-200-4603, FAX:
440-582-2759, info@oilskim.com,
www.oilskim.com

Contact: VP Sls, Jim Petrucci
Offers long-lasting customized oil skimming equipment and solutions for diverse manufacturing and industrial applications that require dependable, continuous removal of oil from process liquids and wastewater. With thousands of systems in operation, some for more than 35 years, the company provides reliable, cost-saving oil skimmers with excellent customer service and support.

Oil Stop LLC

(div of Ampol)
1208 Peters Rd, Harvey, LA 70058,
504-361-4321, FAX: 504-361-4323,
oilstop@aol.com, www.oilstop.com

Contact: Sls Mgr, Leo Guidroz
Manufactures oil spill control equipment, including inflatable and solid flotation containment booms, temporary liquid storage devices, boom storage and deployment reels and accessories. The company also provides oil skimmers, pumping systems and emergency response vessels. Specializes in permanent protection installations worldwide.

OLEON Nv

Oilfield Chemicals Div
Vaartstraat 130, 2520 Oelegem, Belgium,
32-3-470-6272, FAX: 32-3-470-6200,
info@oleon.com, www.oleon.com

Contact: Bus Mgr Oilfield Chemicals, Michel Janssen
Produces Oleochemicals in Europe. Provides a range of chemicals for the oil and gas industry, which includes drilling and completion additives, as well as chemicals for production.

Olympus-NDT

48 Woerd Ave, Waltham, MA 02453,
781-419-3900, toll-free: 800-225-8330, FAX:
781-419-3980, info@olympusndt.com,
www.olympusndt.com

Contact: Mktg Mgr, Meindert Anderson
Manufactures ultrasonic nondestructive testing equipment, including thickness gauges, flaw detectors and pulser-receivers. These products measure the thickness of parts from just one side, detect voids inside materials and measure sound velocity.

■ Omega Engineering Inc

One Omega Dr, PO Box 4047, Stamford, CT 06907, 203-359-1660, FAX: 203-359-7700, info@omega.com, www.omega.com

Contact: Flow Sales
Processes measurement and control products for flow, level, pressure, temperature, data acquisition and electric heaters.

(See ad p 2, 3)



Omel Bombas E Compressores LTDA
Rua Silvio Manfredi, 213, Guarulhos, 07241 Brazil, 55-11-6413-5400, FAX: 55-11-6412-5056, omel@omel.com.br, www.omel.com.br

Contact: Export Mgr, Marzio Vallo
Manufactures special pumps for a variety of applications: process centrifugal pumps, ANSI and API-610, metering pumps, vacuum pumps, PD blowers, rotameters and pinch valves, all of them with quality assured by NBR-ISO 9001:2000. Offers supervised start up for equipment. More than 55 years of service.



OMNI Flow Computers Inc
12620 W Airport Blvd, Suite 100, Sugar Land, TX 77478-6141, sales@omniflow.com, www.omniflow.com

Contact: Inside Sls Mgr, Don Spain
Provides flow computer manufacturer worldwide. The installed base connects to more than 25,000 liquid and gas meters in more than 70 countries. Servicing exploration and production, pipeline networks, refinery and petrochemical markets, goes further in taking flow measurement to a higher level.

Onset Computer Corp

PO Box 3450, Pocasset, MA 02559, 508-759-9500, FAX: 508-759-9100, sales@onsetcomp.com, www.onsetcomp.com

Contact: Apps Spec, Herman Gustafson
Designs and manufactures battery-operated HOBO Data Loggers for recording temperature, level, pressure, weather parameters, CO₂, CO and inputs from flowmeters or other sensors via 4-20 mA or DC voltage. Easy-to-use software and remote communications options provide convenient data access, with alarms capability for notification of out-of-range conditions.



OpenLink
909 Fannin, Suite 1200, Houston, TX 77010, 713-655-9600, FAX: 713-655-9605, info@olf.com, www.olf.com

Contact: Dir NA Sls, Stephen Lawrence
Provides trading, risk management and operations processing software for energy marketers. Integrated with Endur, the company's proven energy/commodities software is the Producer Services module, which provides a set of valuable features, capable of capturing/managing the division of interest detail and wellhead operator functionality.



optek-Danulat Inc
N118W18748 Bunsen Dr, Germantown, WI 53022, 262-437-3600, toll-free: 888-864-4288, FAX: 262-437-3699, petro@optek.com, www.optek.com

Contact: Prod Spec, Steven Schoenborn
Proves inline, real-time, low-maintenance photometric analyzers to detect trace hydrocarbons and aromatics (BTX) in water, trace water in refined fuels and oils, ASTM, Saybolt/APHA color and total suspended solids concentrations, while meeting all hazardous area classifications. Process efficiency and control is greatly increased, improving product quality while saving money.

Optical Cable Corp

5290 Concourse Dr, Roanoke, VA 24019, 540-265-0690, toll-free: 800-622-7711, FAX: 540-563-9829, marketinginfo@occfiber.com, www.occfiber.com

Contact: Dist Mgr, Steve Terry
Manufactures fiberoptic cables for both indoor and outdoor data communications applications.

■ Orange Research

140 Cascade Blvd, Milford, CT 06460, 203-877-5657, info@orangeresearch.com (See ad p 31)

Oreco A/S

Lejrvej 25, 3500 Vaerloese, Denmark, 45-4332-0200, FAX: 45-4332-0201, info@oreco.com, www.oreco.com

Contact: Mktg Mgr, Christine Qvistorff
Develops and markets automated tank cleaning and oil recovery solutions. The mobile, fully integrated systems combine cleaning of above-ground oil storage tanks with simultaneous sludge separation. The company's non-man-entry solutions make tank cleaning faster, safer and more environmentally-friendly than manual methods while ensuring high cleaning quality.

Owen Oil Tools

(sub of Core Lab)
12001 County Rd 1000, PO Box 568, Godley, TX 76044, 817-551-0540, toll-free: 800-333-6936, FAX: 817-551-0795, mike.miller@corelab.com, www.corelab.com

Contact: Sls/Mktg Mgr, Mike Miller
Manufactures perforating systems for worldwide distribution and provides perforating safety. With more than 37 worldwide locations, maintains a strong focus on performance, quality and deliverability.

PAC

8824 Fallbrook Dr, Houston, TX 77064, 281-940-1803, toll-free: 800-444-8378, FAX: 281-580-0719, sales@pacpl.com, www.pacpl.com

Contact: Area Sls Mgr, Bob Stamp
Offers a diverse catalog of petroleum, petrochemical and pharmaceutical analysis equipment, utilizing exceptional worldwide distribution services for various methods, including total and speciated nitrogen and sulfur, chromatographic detectors for LC and GC, turnkey GC application solutions, viscosity, volatility and cold flow properties.

PAC Stainless Ltd

5259 Brittmoore Rd, Houston, TX 77041, 713-466-6160, FAX: 713-466-6334, houston@pacstainlessltd.com, www.pacstainlessltd.com

Contact: Sls Mgr, Bill Rothermel
Has stocking locations in Seattle, Houston, Baton Rouge and Atlanta. Alloys include 316/L, 304/L, 317L, Monel SAF 2507 and Tungum. Specializes in O.D./Metric O.D. tubular products. Also includes BILOK compression tube fittings, industrial tube fittings and a selection of stainless-steel pipe fittings.

Palantir Solutions

Studio 302, Westbourne Studios, 242 Acklam Rd, London, W105JJ UK, 44-207-524-7560, FAX: 44-845-280-1876, support@palantirsolutions.com, www.palantirsolutions.com

Provides economic and planning solutions to the oil and gas industry. Expertise in fiscal regimes, risk analysis and portfolio management.

Pall Corp

25 Harbor Park Dr, Port Washington, NY 11050, 516-484-3600, toll-free: 888-873-7255, FAX: 516-484-0364, fuelsandchemicals@pall.com, www.pall.com

Manufactures filtration, separations and purification. In the oil and gas market, the company supplies disposable cartridge filters, backwashable filter systems, liquid/liquid and liquid/gas, coalescers, portable water systems, boiler feed water systems and is developing new crude oil desalting solutions.

Palmer Wahl Instrumentation Group

234 Old Weaverville Rd, Asheville, NC 28804, 828-658-3131, FAX: 828-658-0728, info@palmerwahl.com, www.palmerwahl.com

Contact: Sls Mgr, Alan Clark
Manufactures industrial temperature, pressure, humidity, test and calibration instruments, including thermal imaging cameras; IR thermometers; thermowells; pressure gauges; chart records; RTD and TC meters; Data Loggers; megohmmeters and ohmmeters. ISO 9001:2000 certified.

Panduit Corp

17301 S Ridgeland Ave, Tinley Park, IL 60477, 708-532-1800, toll-free: 800-777-3300, FAX: 708-532-1811, cs@panduit.com, www.panduit.com

Contact: Global Mktg/Comms Mgr, Jennifer Pasek
Engineers and manufactures end-to-end networking and electrical solutions that assist customers in deploying the latest technologies. Through commitment to innovative, quality and service, creates competitive advantages earning customer preference.



Paradigm Geophysical Corp
2 Memorial Plaza 820 Gessner, Suite 400, Houston, TX 77024, 713-393-4800, toll-free: 800-888-3273, FAX: 713-393-4801, info@pdgm.com, www.pdgm.com

Contact: Ch Mktg Officer, Andrew Stein
Provides software solutions and integrated services for prospect generation and evaluation which support every stage in the oil and gas E&P process, from data processing and imaging, visualization, interpretation and earth modeling, reservoir characterization and petrophysics, to petroleum engineering, well planning and drilling.

Parco Inc

1801 S Archibald Ave, Ontario, CA 91761, 909-947-3540, FAX: 909-923-0288, mbarley@parcoinc.com

Parker Fluid Control Division

95 Edgewood Ave, New Britain, CT 06051, 860-827-2300, FAX: 860-827-2384, skinnervalve@parker.com, www.parker.com/fcd

Contact: Customer Service
Produces solenoid and process control valves, including Skinner, Gold Ring, R Series, Sinclair Collins and Angle Body.

Parker Hannifin Corp

Parker Hannifin Corp

Hydraulic Filter Div
16810 Fulton County Rd, #2, Metamora, OH 43540, 419-644-4311, toll-free: 800-253-1258, FAX: 419-644-6205, hydraulicfilter@parker.com, www.parker.com/hydraulicfilter
Manufactures hydraulic and lubrication filters. Also offers fluid analysis equipment. The company's technical resources assure you the right filtration technologies, advanced designs, consistent manufacturing and a network of helpful, specialized professionals trained to support your team.

Parker Hannifin Corp

6035 Parkland Blvd, Cleveland, OH 44124-4141, 216-896-3000, toll-free: 800-272-7537, FAX: 440-266-7400, cparker@parker.com, www.parker.com

Contact: Sr Mktg Admin, Sherrill I. Owens
Manufactures motion and control technologies and systems, providing precision engineered solutions for a variety of commercial, mobile, industrial and aerospace markets.

Parker Hannifin-Process Air and Gas

Filtration Div
Hermitage Ct, Hermitage Ln, Maidstone Kent, ME16 9NT UK, 44-1622-723314, FAX: 44-1622-728755, balstonukinfo@parker.com, www.parker.com/pag
Manufactures motion and control technologies and systems, providing precision-engineered solutions for upstream and downstream applications.

Parker/Page International Hose

(sub of Parker Hannifin Corp)
Parflex Div
801 Airway Dr, Suite B, Fort Worth, TX 76106, 817-624-1329, toll-free: 800-847-7280, FAX: 817-624-9095, page@parker.com, www.pageintl.com
Contact: Sls Mgr, Dave Geisel
Designs and manufactures engineered fluoropolymer hose products from PTFE, FEP, PFA, ETFE, PVDF (Kynar) and Halar. Offers specialty braiding, including PEEK or Monel. Also available are custom designed fittings.

IMT Partnership

PC Forge Div
837 Reuter Rd, PO Box 100, Port Colborne, Ontario, Canada L3K 5V7, 905-834-7211, toll-free: 800-663-6743, FAX: 905-834-5094, www.imtcorporation.com
Contact: Canadian Sls, Mel Moore
Supplies forgings in various materials, including carbon, alloy, stainless steel, aluminum, inconel, monel and titanium. Works to the latest NACE and API specifications.

PBM Inc

1070 Sandy Hill Rd, Irwin, PA 15642-9409, 724-863-0550, toll-free: 800-967-4726, FAX: 724-864-9255, info@pbmvalve.com, www.pbmvalve.com
Manufactures ball valves and specialty valves for controlling and automating process lines. Exclusive PBM Adjust-O-Seal allows easy inline maintenance. Sanitary valves available in two-way, flush tank, diverter port and multiport styles, with three different port sizes. Combines specific application requirements with creative engineering and quality manufacturing processes.

PCB Piezotronics Inc

3425 Walden Ave, Depew, NY 14043, 716-684-0001, FAX: 716-684-0987, info@pcb.com, www.pcb.com
Designs and manufactures accelerometers, microphones, pressure and force sensors, torque transducers and load cells, utilizing ICP, charge output, capacitive, strain gage, piezoresistive, TEDS and MEMS sensing technologies. All products are backed by a guarantee.

PdMA Corp

Oil Laboratory Div
5909-C Hampton Oaks Pkwy, Tampa, FL 33610, 813-621-6463, FAX: 813-620-0206, cheryl@pdma.com, www.pdma.com
Contact: Sls/Mktg Coord, Cheryl Huff
Offers a full service laboratory that provides a range of tests on oil, grease, coolants, fuel and transformer oil. Supports clients with quick service, accurate and concisely reported interpretation of data.

Pelican Products Inc

23215 Early Ave, Torrance, CA 90505, 310-326-4700, FAX: 310-326-3311, sales@pelican.com, www.pelican.com
Contact: Mktg/Adv Analyst, Keith Swenson
Manufactures high-impact, watertight equipment Protector Cases and technically advanced, safety-approved flashlights.

Perenne Equipamentos e Sistemas de agua Ltda

Rua da Consolacao 247, Sao Paulo, SP-CEP 01301-903 Brazil, 55-11-3255-6289, FAX: 55-11-3255-5489, perenne@perenne.com.br, www.perenne.com.br
Contact: Int'l Rltns Mgr, Jose Roberto Ramos
Offers systems for municipal and industrial areas. Water purification, desmineralization systems and wastewater systems. Engineering, manufacturing, assembling, erection, installation, training, operation and technical services. Specialized in membrane technology for water and wastewater treatment: reverse osmosis, nanofiltration, ultrafiltration and microfiltration. Equipments design, membranes for replacement and chemicals.

Perma Pure

(sub of Halma plc)
PO Box 2105, Toms River, NJ 08754-2105, 732-244-0010, toll-free: 800-337-3762, FAX: 732-244-8140, info@permasure.com, www.permasure.com
Contact: VP Sls/Mktg, Des Morrissey
Manufactures gas sample conditioning products: dryers, humidifiers, filters, coalescers, specialty scrubbers and complete sampling systems. The Baldwin Series and GASS Series of gas analysis sampling systems extract samples then convert hot, wet and dirty samples into cool, dry and clean samples ready for analyzers.

Permian Production Equipment Inc

PO Box 50725, Midland, TX 79710, 432-563-1266, FAX: 432-694-4532, cmccoy@beamgascompressor.com, www.beamgascompressor.com
Contact: Pres, Charles McCoy
Manufactures the Beam Gas Compressor (BGC), which utilizes energy of the pumping unit on location to compress low pressure gas into the sales line and increases production by reducing formation back pressure.

Peterhead Port Authority

Harbour Office, West Pier, Peterhead Aberdeenshire, AB42 1DW UK, 44-1779-483600, FAX: 44-1779-475715, info@peterheadport.co.uk, www.peterheadport.co.uk
Contact: CFO, Stephen Paterson
Offers fast and efficient turnaround with no quayside or city centre congestion. Deepwater entrance and berths, purpose built facilities and specialist logistics providers cater for all sectors of the industry, from logistics to heavy lift, engineering, storage and fabrication.

Petrotech Inc

141 James Dr W, St Rose, LA 70087, 504-620-6600, FAX: 504-620-6601, info@petrotechinc.com, www.petrotechinc.com
Contact: VP Mktg, David Lavie
Provides controls and instrumentation for rotating machinery such as gas and steam turbines, generators, compressors, reciprocating engines and associated auxillary systems.

Phoenix Contact

PO Box 4100, Harrisburg, PA 17111, 717-944-1300, FAX: 717-944-1625, info@phoenixcon.com, www.phoenixcon.com
Contact: Technical Service Department
Develops and manufactures electronic components and connection systems. Offers a range of products for the process industry, including terminal blocks, power supplies, signal conditioners and surge suppression.

Phoenix International Inc

375 Highway 182, Morgan City, LA 70380, 985-399-0606, FAX: 985-399-0604, ggibbsi@phnx-international.com, www.phnx-international.com
Contact: Bus Dev Mgr, Gary T. Gibbs
Provides manned and unmanned underwater operations design engineering and project management to clients in the offshore oil and gas, defense and other ocean-interest industries worldwide. Expertise is available from six regional offices in the areas of wet and dry hyperbaric welding, conventional and atmospheric diving, robotic systems and tooling.

Pigging Products & Services Association

PO Box 2, Stroud, Gloucestershire, GL6 8YB UK, 44-1285-760597, FAX: 44-1285-760470, ppsa@ppsa-online.com, www.ppsa-online.com
Contact: Exec Sect'y, Gill Hornby
Serves the pipeline industry. Provides information on sourcing pigging equipment and services, technical information service, training courses and pigging seminars.

Pigs Unlimited International Inc

Suite C1, 23802 Fm 2978, Tomball, TX 77375, 281-351-2749, toll-free: 800-578-7436, FAX: 281-351-4658, sales@pigsunlimited.com, www.pigsunlimited.com
Contact: VP, Keith Wagner

piLine Software Development Ltd

Montevideo u 6, 1037 Budapest, Hungary, 36-1-436-7676, FAX: 36-1-436-7699, akta@piline.hu, www.piline.hu
Contact: CEO, Paul Rudas
Provides map-based computer information system (GIS expert software) for high pressure (O and G) pipeline. Supports registry, operation and maintenance, integrity, diagnostics, risk analysis, as well as engineering, HSE (health, safety and environment) and financial management for pipeline. The system uses and works with web-based up-to-date IT technology.

POLARIS LABORATORIOS LLC

7898 Zionsville Rd, Indianapolis, IN 46268-2177, 317-808-3750, toll-free: 877-808-3750, FAX: 317-808-3751, sales@polarislabs.com, www.polarislabs.com
Offers high-quality testing of oils, fuels and coolants for maintenance and reliability purposes. Most routine tests are complete within 24 hours with test results, management reports and the ability to create work orders available immediately through the company's free Internet service, Horizon. ISO 17025:2005 A2LA accredited.

Positron Systems Inc

411 S 5th St, Boise, ID 83702, 208-514-4575,
FAX: 208-338-2659,
sales@positronsystems.com,
www.positronsystems.com

Contact: VP Sls, Michael Scott

Provides characterization of materials from day one. Lifetime analysis for early detection of degradation, spectroscopy at the atomic level and life extension studies.

Postle Industries

PO Box 42037, Cleveland, OH 44142,
216-265-9000, toll-free: 800-321-2978, FAX:
216-265-9030, sparky@postle.com,
www.hardbandingsolutions.com

Contact: Pres, John Postle

Manufactures welding wires for hardbanding, including casing friendly noncracking hardbanding wires.

Power Sources Unlimited

200 Stonewall Blvd, Suite 4, Wrentham, MA
02093, 508-384-1419, toll-free: 800-966-7784,
FAX: 508-384-1896, sales@psui.com,
www.psui.com

Contact: Pres, Ray Newby

Provides individualized customer service to assist engineers and buyers with power conversion needs. Products range from 1W DC/DC converters to 2000W+ AC/DC power supplies for a variety of markets, including medical, industrial, instrumentation, data communications and telecommunications. Informational website includes detailed product specifications and on-line procurement.

PPG Protective & Marine Coatings

JF Kennedylaan 7, PO Box 153, 4190 CD
Geldermalsen, The Netherlands, 31 345 587 200,
FAX: 31 345 587 201, infopc@ppg.com,
www.ppgpmc.com

Manufactures and supplies protective coatings for a variety of uses, including chemical plants, nuclear power plants, oil platforms, ships, barges, rail cars, bridges and stadiums.

Precision Controls Ltd

20 Broadhurst St, Stockport, SK3 8JH UK,
44-161-476-4606, FAX: 44-161-476-5639,
sales@precisioncontrols.co.uk,
www.precisioncontrols.co.uk

Contact: Bus Dev Mgr, Alistair Hickey

Offers support of product sales and provides technical back up, installation, commissioning, sales/repair, site survey and a training program either in-house or on-site.

Precision Engine Controls Corp

11661 Sorrento Valley Rd, San Diego, CA 92121,
858-792-3217, toll-free: 800-200-4404, FAX:
585-792-3200, sales@precisioneng.com,
www.precisioneng.com

Contact: Dir Sls/Mktg, Steve Dingsdale

Manufactures control systems, fuel metering valves and actuators for industrial and marine gas turbine engines in offshore, pipeline, marine and power applications.

Precision Polymer Engineering Ltd

Greenbank Rd, Blackburn, BB1 3EA UK,
44-1254-295400, FAX: 44-1254-680182,
sales@prepol.com, www.endura-seals.com
Specializes in elastomer seal products for downhole and surface applications and high/low temperature explosive decompression grades and Perlast perfluoroelastomers.

SALES OFFICES:

Perlast Ltd

San Jose, CA 408-441-2043, FAX:
408-441-1042

Pressure Systems Inc

34 Research Dr, Hampton, VA 23666,
757-865-1243, toll-free: 800-328-3665, FAX:
757-865-8744, sales@pressuresystems.com,
www.pressuresystems.com

Contact: Sls Mgr, Dale Beardsley

Manufactures submersible and above-ground hydrostatic level transducers. Pressure ranges as low as 0-35 in. of water and includes models designed for pump control, tank level and a variety of storm, potable, waste and groundwater monitoring applications. Offers a line of rugged and precise KPSI transducers.

Primavera Systems Inc

3 Bala Plaza W, Suite 700, Bala Cynwyd, PA
19004, 610-667-8600, toll-free: 800-423-0245,
FAX: 610-667-7894, info@primavera.com,
www.primavera.com

Contact: Inside Sls Rep, Dana Smitka

Provides project, resource and portfolio management software solutions used by oil and gas, power generation, utility and petrochemical companies to dramatically reduce financial risk. Delivers a platform that improves project visibility, accurately manages and forecasts costs, schedule, resources and facilitates collaboration and best practice sharing.

PRINCIPIA

(sub of Areva Ta)

215 Voie Ariane-ZAC Athelia 1, 13705 La Ciotat
Cedex, France, 33-442-98-11-80, FAX:
33-442-98-11-89, www.principia.fr

Contact: Marine Bus Unit Mgr, Philippe Le
Buhan

Offers expertise and assistance for design and analysis of marine structures, pipelines, risers and mooring systems through numerical modeling and tests in the field of hydrodynamics, structural mechanics, fluid flow, thermal analysis, software, development and commercialization for offshore applications and technical assistance and training.

Printrex Inc

276 E Gish Rd, San Jose, CA 95112,
408-573-1200, FAX: 408-573-1600,
info@printrex.com, www.printrex.com

Contact: VP Admin, Mia Bossie

Produces high-performance printers and plotters for well logging and log analysis applications. With the new C930 full color plotter and the recent acquisition of the Atlantek product line, the company now has products for every geophysical application.

Process Technical Services

2615 Calder Ave, Suite 725, Beaumont, TX
77702, 409-833-3990, FAX: 409-833-0643,
admin@processtechnicalservices.com,
www.processtechnicalservices.com

**ProSep Technologies Inc**

(sub of Pure Group)

5353 W Sam Houston Pkwy N, Suite 150,
Houston, TX 77041, 281-504-2040, toll-free:
866-377-8788, FAX: 281-598-2688,
sales@prosep.com, www.prosep.com

Contact: VP Bus Dev, John B. Sabey

Supplies quality equipment packages, systems, services and other customized process solutions to the oil and gas industry. Solutions include proprietary internals, scrubbing and demisting, gas sweetening membrane skids, primary separation complete with compact separation internals, crude dehydration and desalting, H₂S scavengers, produced water treatment systems and sea water treatment systems.

Prospect

Osborne House, 28 Carden Pl, Aberdeen,
Aberdeenshire, AB10 1UP UK, 44-1224-651831,
FAX: 44-1224-633633, info@prospect-fs.co.uk,
www.prospect-fs.co.uk

Contact: Sls/Mktg Dir, Matt Straw

Provides engineering design and analysis solutions specializing in fluid dynamics, thermal management and structural behaviour. The company's fields include subsea and pipelines, flow assurance and thermal management, offshore installation and marine dynamics, equipment design, process and separation system optimization and safety engineering.

PSI-Pipeline Seal & Insulator Inc

6525 Goforth St, Houston, TX 77021,
713-747-6948, toll-free: 800-423-2410, FAX:
713-747-6029, info@psipsi.com,
www.pipeline Seal.com

Contact: Dir Sls, Jay Keldsen

Manufactures quality sealing gaskets, casing isolators and Link-Seal modular seals for the oil and gas industries. Products have been manufactured for more than 40 years, and the company currently manufactures to ISO 9001:2000 standards.

Pump Engineering Ltd

Riverside Industrial Estate, West Sussex,
Littlehampton, BN17 5DF UK, 44-1903-730900,
FAX: 44-1903-730234, sales@pumpeng.co.uk,
www.pumpeng.co.uk

Contact: Man Dir, Chris Newberry

Manufactures and supplies pumps for industrial, chemical, oil and process industries. Distributor for Beder control valves.

Pureaire Monitoring Systems Inc

557 Capital Dr, Lake Zurich, IL 60047,
847-726-6000, toll-free: 888-788-8050, FAX:
847-726-6051, pureaire@dls.net,
www.pureairemonitoring.com

Contact: Pres, Al Carrino

Provides sales and support of stationary and portable hazardous gas detection systems for life safety and emission monitoring applications. Detectable gases include O₂, Cl₂, F₂, HCl, HF, hydrides, NF₃, VOCs and many other toxic and corrosive gases. Renewable sensors provide fast, reliable and economical protections for personnel, abatement scrubber and fence line monitoring.

QBOP Pte Ltd

22 Jalan Terusan, Singapore 619299, Singapore,
65-9232-6607, FAX: 65-6265-8806,
sales@qualitybop.com, www.qualitybop.com
Manufactures 11 to 21 in. blowout preventer.

Quabbin Wire & Cable Co Inc

10 Maple St, Ware, MA 01082-1597,
413-967-6281, toll-free: 800-368-3311, FAX:
413-967-7564, sales@quabbin.com,
www.quabbin.com

Contact: Dir Sls/Mktg, Kevin B. Drummond

Manufactures harsh environment data cables that withstand extreme vibration, crushing and impact. The cable jacket provides resistance to cut through, tears, abrasions, oils and most industrial fluids. The jacket remains round making it possible to pressure over-mold connectors and seal to O-rings and gaskets used with IP67 rated connections.

Quester Tangent Corp

Quester Tangent Corp

9865 W Saanich Rd, Suite 201, Sidney, British Columbia, Canada V8L 5Y8, 250-656-6677, FAX: 250-655-4696, info@questertangent.com, www.questertangent.com

Contact: Mgr Sls/Mktg, Chris Elliott
Designs and manufactures software and hardware products that allow users to acquire, monitor, validate and process large amounts of acoustic sonar data in either historical or real-time. Established as a standard for acoustic seabed classification, the technology is applied to environmental, engineering and site survey requirements.

Quest Trutec Lp

16920 Texas Ave, Suite C-14, Webster, TX 77598, 281-557-2255, FAX: 281-557-0019, m.reynan@questtrutec.com

RACO Manufacturing and Engineering Co

1400 62nd St, Emeryville, CA 94608, 510-658-6713, toll-free: 800-722-6999, FAX: 510-658-3153, sales@racoman.com, www.racoman.com

Contact: VP Sls/Mktg, James Brown
Provides municipalities, industry and government with a variety of high quality, reliable remote communications systems and RTUs for Data Logging, alarm autodialing, remote monitoring, reporting and control.

RAE Systems

3775 N 1st St, San Jose, CA 95134, 408-952-8200, FAX: 408-952-8480, raesales@raesystems.com, www.raesystems.com

Develops and manufactures rapidly deployable, multisensor chemical and radiation detection monitors and networks, for Homeland Security and industrial applications.

Ramboll Oil & Gas

(sub of Ramboll Group)
Teknikerbyen 31, 2830 Virum, Denmark, 45-4598-6000, FAX: 45-4598-8540, oil-gas@ramboll.com, www.ramboll-oilgas.com

Contact: Dir, Henrik Juhl
Provides engineering consultancy services for the off- and onshore industry worldwide. Since the seventies the company has provided engineering services relating to the development, production, treatment, transmission, storage and pipeline distribution of oil and gas offshore, as well as onshore.

Ramboll Oil & Gas

(sub of Ramboll Group)
Willemoesgade 2, 6700 Esbjerg, Denmark, 45-7913-7100, FAX: 45-7913-7280, www.ramboll-oilgas.com

Contact: Dir Mktg/Bus Dev, Kai Birger Olsen
Provides engineering consultant services for the oil and gas industry. The company develops cost-effective and profitable engineering solutions to the industry and has substantial engineering expertise within the areas of production, treatment, storage facilities and transmission of oil and gas.

RCI Technologies Inc

466 W Arrow Hwy, Suite D, San Dimas, CA 91773, 909-305-1241, toll-free: 800-868-2088, FAX: 909-305-1245, info@rcitechnologies.com, www.rcitechnologies.com

Contact: Pres, Robert Randle
Offers a line of universal fuel purifiers for commercial and marine industries, portable tank cleaning units and automatic recirculating systems utilizing the company's patented filterless technology.



READ Well Services

(sub of READ ASA)

1 Claymore Ave, Viking House, Bridge of Don Aberdeen, Aberdeenshire, AB23 8GW UK, 44-1224-336600, FAX: 44-1224-336611, info@readgroupuk.com, www.readgroup.com

Contact: BDM, Jeannette Stewart
Provides downhole technology innovation. Develops and supplies solid expandable tubular HETS technology for well construction or repair—internal and external casing patch, liner hanger and zonal isolation barrier. Offers borehole, seismic and cased hole logging and data processing services; VSP and OBC acquisition 2-D and 3-D and seismic data processing.

Remote Automation Solutions

(div of Emerson Process Management)

Bristol Div

1100 Buckingham St, Watertown, CT 06795, 860-945-2200, toll-free: 800-395-5497, FAX: 860-945-2278, binfo@emersonprocess.com, www.emersonprocess.com/remotec

Contact: Mktg Mgr, Robert Findley
Offers products that have measured, monitored and controlled industrial processes. The goal is to develop innovative products which meet the varied needs of customers in the water, wastewater, oil, gas and process industries, then provide those customers with service and support.

Remote Control Sweden AB

Kontrollvagen 15, PO Box 80, SE 79122 Falun, Sweden, 46-23-58700, FAX: 46-23-58745, info@remotecontrol.se, www.remotecontrol.se

Contact: Sls Mgr, Lars Ersson
Manufactures pneumatic, electric, hydraulic and electro-hydraulic Scotch Yoke actuators for quarter turn and multiturn valve applications for the oil, gas and petrochemical industries.

SALES OFFICES:

Remote Control
Staffordshire, UK 44-1889-576-888, FAX: 44-1889-577-676, info@remotecontrol.co.uk, www.remotecontrol.co.uk

Remote Control
Kaarst-Büttgen, Germany 49-2131-795-760, FAX: 49-2131-795-7615, info@remotecontrol.de, www.remotecontrol.de

Remote Control
North Kingstown, RI 401-294-1400, FAX: 401-294-3388, info@remotecontrol.us, www.rciactuators.com

Remote Control
Singapore, Singapore 65-6848-7150, FAX: 65-6746-5815, info@remotecontrol.com.sg, www.remotecontrol.com.sg

Rheonik Messgerate GmbH

Rudolf-Diesel-Str 5, D-85235 Odelzhausen Munich, Germany,, mail@rheonik.de, www.rheonik.com

Develops and manufactures Coriolis mass flowmeters only. The company can deliver beyond the standard range of mass flowmeters customized meters for most demanding applications, including 900 bar meters, tantalum meters, extra heavy wall thickness meters and more.

Rheonik USA

5254 Crestline Way, Pleasanton, CA 94566, 925-461-5059, FAX: 925-461-8754, sales.america@rheonik.com, www.rheonik.com

Contact: Sls Mgr, John Daly
Manufactures a range of coriolis mass flowmeters. With line sizes ranging from 12 down to 1/6 in., Rheonik meters flow rates from 0.1 oz/min to 1500/hr. Coupled with temperature ratings from -325°F to 750°F and max pressure ratings of 13,050 psi, the company can supply metering for almost any application.

Richter Chemie-Technik GmbH

PO Box 100609, 47883 Kempen, Germany, 49-2152-146-0, FAX: 49-2152-146-190, richter-info@richter-ct.com, www.richter-ct.com

Contact: Mgr Mktg, Manfred Kluge
Manufactures plastic lined process pumps, shut-off, control and safety valves for corrosive, hazardous, contaminated, pure and high purity fluids in chemical, pharmaceutical, petrochemical, industrial, semi-conductor and environmental applications.

RIDGID

(sub of Emerson)

400 Clark St, Elyria, OH 44035, 440-323-5581, toll-free: 800-769-7743, FAX: 440-329-4551, info@ridgid.com, www.ridgid.com

Contact: Dir Mktg Comms, Steve Dyer
Manufactures hand and power tools. Markets products in more than 130 countries. The company's products include threading and drain cleaning machines and more than 300 types of tools serving the rental, plumbing, HVAC/R, industrial, electrical, petroleum, institutional, commercial and hardware markets. Subsidiary of St. Louis, Missouri-based Emerson.



Rig-A-Lite

(div of AZZ Inc)

PO Box 12942, Houston, TX 77217, 713-943-0340, FAX: 713-943-8354, info@rigalite.com, www.rigalite.com

Contact: Dir Petroleum Sls, Lisha Witt
Provides quality lighting for the oil and gas industry.

Rig Consultoria e Treinamento Ltda

Av N Sra de Copacabana, 978 Sala 1003 Copacabana, Rio de Janeiro, 22060-002 Brazil, 55-21-3681-4365, FAX: 55-21-2247-4393, rig@rig.pro.br, www.rig.pro.br

Contact: Mgr, Alberto de Oliveira Jr
Provides consulting and training services to helicopter and helideck operations, flight envelopes, flight safety, accident investigation and prevention and certification by Brazilian authorities.

RigPower LLC

10345 S Perdue Ave, Baton Rouge, LA 70814-4912, 225-272-8800, FAX: 225-272-8830, larry@rigpower.com, www.rigpower.com

Contact: Sls Mgr, Larry Breeland
Provides (1135A) single pole electrical connectors. The RMP and Secure Mount series offer increased safety, reliability and ease-of-use through color coding. Additionally, the Secure Mount series offers a panel mount receptacle, which is designed to eliminate costly melamine panels and installation time.

RKI Instruments Inc

33248 Central Ave, Union City, CA 94587,
510-441-5656, toll-free: 800-754-5165, FAX:
510-441-5650, mail4rki@rkiinstruments.com,
www.rkiinstruments.com

Contact: Pres, Bob Pellissier

Supplies portable and fixed systems gas detection solutions. Markets instruments and sensors as well as actively develops its own product lines. Technologies used include catalytic combustion, thermal conductivity, electrochemical, IR, paper tape, pyrolyzation and metal oxide.

R&M Energy Systems

(sub of Robbins & Myers Inc)
Fluid Management Group Div
10586 US Hwy 75 N, Willis, TX 77378,
936-890-1064, toll-free: 877-465-8600, FAX:
936-890-9595, info@rmenergy.com,
www.rmenergy.com

Contact: VP Sls, Gene Sparkman

Performs field services, such as installation, inspection, troubleshooting and refurbishment on R&M products: progressing cavity pumping systems, stuffing boxes, closures, tubing/rod rotators, rod guide systems, wellheads, valves, swing joints, hammer unions, artificial lift accessories and down-hole tools.

Rolled Alloys

125 W Sterns Rd, Temperance, MI 48182,
734-847-9478, FAX: 734-847-6917,
sales@rolledalloys.com, www.rolledalloys.com

Contact: Shay Tidwell

Offers specialty alloys, materials stocked in plate sheet, bar, pipe, billet, fittings and flanges. Offers in-house processing capabilities, along with a line of corrosion resistant alloys now including the 718 (NACE) round bar.

Rolls-Royce Energy Business

105 N Sandusky St, Mt Vernon, OH 43050,
740-393-8888, FAX: 740-393-8336,
energyinfo@rolls-royce.com,
www.rolls-royce.com

Provides aeroderivative gas turbine power and compression packages from 3.9 to 58 MW for global energy applications, both on- and off-shore. The product line features the reliability of the industrial RB211 and the Trent 60, the most powerful and efficient aeroderivative gas turbine on the market.

RoMaDyn

1711 Orbit Way, Minden, NV 89423,
775-783-4609, FAX: 775-783-4650,
rick.scheuer@bpb-co.com,
www.bentlypressurizedbearing.com

Offers the essential services the customer needs to protect and optimize the operation of rotating machinery assets. The company offers machinery diagnostics, product services, turnkey services and technical training.

Ronk Electrical Industries Inc

106 E State St, PO Box 160, Nokomis, IL
62075-0160, 217-563-8333, toll-free:
800-221-7665, FAX: 217-563-8336,
sales@ronkelectrical.com,
www.ronkelectrical.com

Contact: Sales Department

Manufactures single- to three-phase converters since 1952. Allows operation of three-phase motors from single-phase power sources. Also offers double-throw switches for stand-by power systems and power factor correction capacitors.

Roper Pump Co

(div of Roper Industries)
Oil & Gas Industries Div
3475 Old Maysville Rd, PO Box 269, Commerce,
GA 30529, 706-335-5551,
sales@roperpumps.com, www.roperpumps.com

Contact: Bus Dev Mgr, Lane Peeler
Provides a selection of Mud Motor Power Sections for directional, horizontal, or vertical drilling applications, including the DragonSlayer High Performance (HP) rubber stators can handle applications to 425°F. Also provides gear pumps and progressive cavity pumps for general fluid transfer applications.

Rose+Bopla Enclosures

(div of Phoenix Mecano Inc)
Rose + Bopla Enclosures Div
7330 Executive Way, Frederick, MD 21704,
301-696-9800, FAX: 301-696-9494,
customerservice@rose-bopla.com,
www.rose-bopla.com

Contact: Sls Mgr, Steve Whitmore
Manufactures an array of off-the-shelf and customized enclosures. The product line offers a variety of materials, including cast and extruded aluminum, stainless steel, fiberglass, polyamide, polycarbonate and ABS. Also produces a diverse line of modular tabletop, instrumentation, handheld and wall-mount plastic enclosures meeting aesthetic electronic packaging demands.

**ROSEN Group**

Obere Spichermatt 14, 6370 Stans,
Switzerland, 41-41-618-0300, FAX:
41-41-618-0319, info@roseninspection.net,
www.roseninspection.net

Contact: Corp Mgr Global Mktg, Wolfgang Krieg

Offers a range of products and services to the oil and gas industry covering pipe diameters to 64 in. for any length or configuration, (pipe-line cleaning pigs, customized in-line inspection, optical inspection, robotic inspection, EMAT crack detection and coating disbondment, plant and facility inspection, data services and asset integrity management support).

SALES OFFICES:

**ROSEN Technology & Research Center
Colombia**

Bogota, Colombia 57-1-257-5315, FAX:
57-1-257-5320,
rosen-bogota@roseninspection.net,
www.roseninspection.net

**ROSEN Technology & Research Center
Germany**

Lingen, Germany 49-951-9136-0,
rosen-lingen@roseninspection.net,
www.roseninspection.net

ROSEN Australia
Perth, Australia 61-8-9456-4855,
rosen-perth@roseninspection.net,
www.roseninspection.net

ROSEN Europe
Oldenzaal, The Netherlands 31-541-587-000,
rosen-oldenzaal@roseninspection.net,
www.roseninspection.net

ROSEN Far East
Selangor, Malaysia 60-3-5569-9000,
rosen-kualalumpur@roseninspection.net,
www.roseninspection.net

ROSEN Middle East
Dubai, United Arab Emirates 971-4-881-4495,
rosen-dubai@roseninspection.net,
www.roseninspection.net

ROSEN North America
Houston, TX 281-442-8282,
rosen-houston@roseninspection.net,
www.roseninspection.net

Ros Inc

5618 Copley Dr, San Diego, CA 92111,
858-565-8500, FAX: 858-565-8808,
sales@rosys.com, www.rosys.com

Contact: Dir Sls/Mktg, Ed Petit de Mange
Designs and manufactures reliable, high-tech equipment and systems for the most severe oceanographic, industrial, commercial and military environments. The company's product line includes underwater video cameras, underwater lights, rugged pan and tilts, controllers and video inspection.

Rotating Machinery Technology Inc

4181 Bolivar Rd, Wellsville, NY 14895,
585-593-3700, FAX: 585-593-2693,
jwh@rmt-inc.com, www.rmt-inc.com

Contact: Mktg/Sls Mgr, Joseph Hart
Manufactures bearings and seals; repair compressors, expanders and separators; field service and engineering support 24/7.

Roto Hammer Industries Inc

2804 W 40th St, PO Box 9308, Tulsa, OK
74107-0308, 918-446-3500, toll-free:
800-477-7686, FAX: 918-446-6218,
chwheel@swbell.net,
www.thomasregister.com/rotohammer

Contact: Admin Asst/Off Mgr, Jamie Borth
Manufactures a line of actuators and accessories for manually operated valves. Various series include chainwheels, impact operators, floor stands, worm and gear operators and custom engineered extension controls. Products are sold through a network of domestic and foreign supply stores, manufacturers' agents, export agents and licensees.

Rotronic Instrument Corp

160 E Main St, Huntington, NY 11743,
631-427-3898, FAX: 631-427-3902,
rose@rotronic-usa.com, www.rotronic-usa.com

Contact: Svc/Sls Coord, Michael Foran
Manufactures and distributes high accuracy, high precision instruments for measurement of relative humidity, dew point and moisture in industrial process, semiconductor fabrication and HVAC instrumentation. Also a leader in HVAC instrumentation for precision measurements in semiconductor fabrications and pharmaceutical processing.

Roxar AS

Gamle Forusvei 17, PO Box 112, 4065
Stavanger, Norway, 47-51-81-8800, FAX:
47-51-81-8801, roxarinfo@roxar.com,
www.roxar.com

Contact: Group Mktg Dir, Svenn Haugen
Provides technology services, dedicated to developing effective solutions to reservoir management problems, including high temperature reservoir monitoring to multiphase and wet gas metering, 3-D modeling and simulation and the new oil-in-water monitor, helping companies reduce uncertainty, optimize production and maximize reservoir performance.

Royal Purple Ltd

1 Royal Purple Ln, Porter, TX 77365,
281-354-8600, toll-free: 888-382-6300, FAX:
281-354-7600, rpinformation@royalpurple.com,
www.royalpurple.com

Contact: VP Mktg, Mark McFann
Manufactures high performance lubricants proven to reduce wear, heat and fuel consumption.

R STAHL Schaltgeräte GmbH

R STAHL Schaltgeräte GmbH

Am Bahnhof 30, 74638 Waldenburg, Germany, 49-7942-943-4300, FAX: 49-7942-943-404300, kerstin.wolf@stahl.de, www.stahl.de
Supplies explosion protection products, systems and services worldwide. Whether flammable gas-air mixtures or aerosoled combustible dust creates explosion hazards, the company has dependable, top-quality products to prevent disaster. The range of products covers electrical equipment, such as terminal boxes, plug and sockets, control units and control panels, light fittings and more.

Saint-Gobain Crystals

Scintillation Products Div
12345 Kinsman Rd, Newbury, OH 44065, 440-564-2251, FAX: 440-564-8047, scintillation@saint-gobain.com, www.detectors.saint-gobain.com
Contact: Prod Mgr, Jon Price
Manufactures Bicron brand scintillation detectors and supplies ruggedized sodium iodide gamma ray detectors to the well logging industry. Also offers other high performance scintillators and gas-filled radiation detectors.

Saipem America Inc

15950 Park Row, Houston, TX 77084, 281-552-5600, FAX: 281-552-5904, marco.sclocchi@saipemamerica.com, www.saipem.eni.it
Contact: Comm Mgr, Marco Sclocchi
Provides subsea construction services to the offshore oil and gas industry, specializing in innovative engineering, construction and maintenance services. The company is diversified and international contractors in the oil and gas industry.

Sandvik Process Systems

(div of Sandvik GmbH)
Salierrasse 35, PO Box 4262, D-70736 Fellbach, Germany, 49-711-5105-0, FAX: 49-711-5105-196, info.spsde@sandvik.com, www.processsystems.sandvik.com
Contact: Sls Mgr, Ulrich Nanz
Supplies processing plants, steel belts and associated service support, providing complete installations for the petrochemical, chemical and plastic industries. Special fields include complete granulation systems for sulphur, fertilizer, waxes, resins and fine chemicals. Offers feasibility studies, test and pilot production, engineering/project management, manufacturing, supply and installation, start-up, spares and service.

Sartomer Co Inc

(div of Total SA)
Oaklands Corporate Center, 502 Thomas Jones Way, Exton, PA 19341, 800-727-8663, FAX: 610-363-4140, contact@sartomer.com, www.sartomer.com/sargel

Contact: Dir Mktg Svc/Admin, Bob Green
Offers SAR-GEL water indicating paste detects water levels in fuel tanks, helping prevent costly contamination. White, smooth-flowing paste is easily applied to dipstick and turns red when it comes in contact with water.

Sarva Bio Remed LLC

4235 Beaumont Rd, Dover, PA 17315, 877-717-2782, FAX: 419-710-5831, sales@sarvabioremed.com, www.sarvabioremed.com
Contact: Pres/CEO, Satya Ganti
Manufactures VaporRemed for elimination of heating oil fumes.

Satcom Distribution Ltd

The Woodford Centre, Lysander Way Old Sarum, Unit 3, Salisbury Wiltshire, SP4 6BU UK, 44-1722-410-800, FAX: 44-1722-410-777, sales@satcomgroup.com, www.satcomgroup.com
Provides reliable satellite communications equipment and airtime. Based in the UK, USA, Middle East, Australia, Japan, Hong Kong, Thailand and Singapore, providing a strong network of essential market knowledge covering five continents.

Scandinavian Cabin Co A/S

Kirkegaardsvej 29 Kleveland, DK-6200 Aabenraa, Denmark, 45-7468-7701, FAX: 45-7468-7472, scancab@scancab.dk, www.scancab.dk
Contact: Sls Mgr, Martin Eskildsen
Offers cabins for drilling, pipehandling and winch operation. Provides access platforms for cabins and control rooms for engineers and drillers.

Scanrope Subsea As

Banebakken 38, PO Box 295, NO-3101 Tonsberg, Norway, 47-33-35-55-00, FAX: 47-33-35-55-01, mailbox@scanrope.no, www.scanrope.no
Contact: Dir Mooring Div, Stein P. Andersen
Manufactures steel and polyester mooring lines for FPU's and Modus, as well as subsea umbilical- and power transmission cables. Factory located by the sea with own deep water berth. Long list of references from renowned customers worldwide.

Scapa North America

111 Great Pond Dr, Windsor, CT 6095, 860-688-8000, FAX: 860-688-7000, appsupport@scapana.com, www.scapana.com
Contact: App Support, Tony Kibler
Manufactures anticorrosion pipeline protection systems. The efficient, cost-effective Renwrap products are designed for application to new construction pipe in both plant and infield settings, as well as the repair and reconditioning of existing pipelines in the oil, gas and water industries.

S&C Electric Co

6601 N Ridge Blvd, Chicago, IL 60626-3997, 773-338-1000, sstrand@sandc.com

SCFM Compression Systems Inc

3701 S Maybelle Ave, Tulsa, OK 74107-5708, 918-663-1309, toll-free: 866-379-7236, FAX: 918-663-6140, emillard@scfm.com, www.scfm.com

Contact: Dir Sls Support, Andrew Connor
Provides a source for reliable, innovative and cost-effective solutions to complex compression needs. Offers an experienced staff and state-of-the-art technology. Engineers, designs, builds and turnkeys gas compression equipment for gas production, gathering, processing and power generation.

SCFM Constructors Inc

3701 S Maybelle Ave, Tulsa, OK 74107-5708, 918-663-1309, toll-free: 866-379-7236, FAX: 918-663-6140, turnkey@scfm.com, www.scfm.com

Contact: Dir Special Projs, Norman Sloan PE
Provides turnkey solutions for gas compression, gas plants and stations and related projects. Offers complete services, including conceptual design, engineering, procurement, fabrication, field construction, mechanical installation and commissioning to the gas and petrochemical industries.

Schutte & Koerting

2510 Metropolitan Dr, Treviso, PA 19053, 215-639-0900, FAX: 215-639-1597, sales@s-k.com, www.s-k.com
Contact: Sls/Mktg Coord, Caroline Nelson
Manufactures power and process equipment.

Schweitzer Engineering Lab

Suite A-7, 130 Seaboard Ln, Franklin, TN 37067, 615-507-2184, marketing@selindustrial.com
Provides protection and monitoring for power systems, generators and motors, including automation, control and communications products and services. Leads in innovative, reliable systems and products and customer support. Products are proven in a wide temperature range, withstand harsh environments and are covered by a ten-year warranty.

SCIMO BV European Representatives

Molendijk 41, AB 3265 Piershil, The Netherlands, 31-186-693358, FAX: 31-186-692498, scimo_bv@compuserve.com, www.europeanrepresentatives.com
Contact: Ing, P. J. van Hoogstraten
Provides representation in Europe for third party witness, vendor survey, selection and QA system assessment. Also provides inspection and expediting.

Scotgrip UK Ltd

Silverbank Industrial Estate, N Deeside Rd, Banchoy Kincardineshire, AB31 5YR UK, 44-1330-825335, FAX: 44-1330-825260, info@scotgrip.com, www.scotgrip.com
Contact: Man Dir, Ralph Prise
Manufactures high-quality, heavy-duty anti-slip safety products for stairways, walkways, decks, ladders, ramps and gangways. Products are designed to eliminate accidents, even in harsh working environments.

Scotia Waterous

Scotia Capital Div
Scotia Centre, 700-2nd St SW, Suite 1800, Calgary, Alberta, Canada T2P 2W1, 403-265-8077, FAX: 403-269-8355, calgary@scotiawaterous.com, www.scotiawaterous.com
Provides an in-depth knowledge of the oil and gas sector, including a technical understanding of oil and gas assets on a global basis. Offers clients a complete and seamless solution for oil and gas M&A advice and financing.

Scott Health & Safety

4320 Goldmine Rd, Monroe, NC 28110, 704-291-8300, toll-free: 800-247-7257, FAX: 704-291-8330, scottmarketing@tycoint.com, www.scotthealthsafety.com
Manufactures innovative respiratory and other personal protective equipment and safety devices for firefighters, industrial workers, militaries, security teams and rescue squads around the world.

Scott Specialty Gases

6141 Easton Rd, PO Box 310, Plumsteadville, PA 18949, 215-766-8860, toll-free: 800-217-2688, FAX: 215-766-2476, markreq@scottgas.com, www.scottgas.com
Contact: Dir Mktg/Comms, Robert G. Jefferys
Manufactures specialty gases and gas handling equipment for hydrocarbon, natural gas, medical, environmental, semiconductor applications and more.

SealMaker International

PO Box 414 Madla, 4090 Hafstrandsfjord, Norway, 47-464-74-641, ken@namvedt.no, www.sealmaker.net
Contact: Sls Dir, Ken Phillips
Offers sealing solutions, pressure activation-convergent flow technology and leak repair technology.

SEA STEEL Ltd

(sub of Subsea)
Piling Services Div
Unit 3, Hawthorne Farm, Winterborne Stickland, Blandford Forum, Dorset, DT2 7NY UK, 44-1258-88003, FAX: 44-1258-880123, seasteeluk@btinternet.com, www.seasteeluk.com
Contact: Clive Jones MD

Seaway Heavy Lifting Engineering BV

In Lansinghage Indust, Chroomstraat 30, 2718 RR Zoetermeer, The Netherlands, 31-793-63-77-00, FAX: 31-793-63-77-77, aligterink@shl.nl, www.shl.nl
Provides international offshore installation contractor operating a 2500 mt and a 5000 mt revolving crane vessel. The vessels are offered worldwide.

seepex Inc

(sub of seepex GmbH KG & Co)
511 Speedway Dr, Enon, OH 45323, 937-864-7150, FAX: 937-864-7157, sales@seepex.net, www.seepex.com

Contact: CEO/Pres, Michael Dillon
Offers turnkey systems designs and materials for the oil and gas industry. Progressive cavity (pc) pumps handle solid, liquid and gas phases without separation, operate at lower speeds for long service life, available with control packages to prevent dry-run stator damage, handle variable flow conditions, viscous corrosive and abrasive fluids with ease.

Select-Arc Inc

600 Enterprise Dr, PO Box 259, Ft Loramie, OH 45845-0259, 937-295-5215, toll-free: 800-341-5215, FAX: 888-511-5217, jtully@select-arc.com, www.select-arc.com

Contact: Nat'l Sls Mgr, Mike Tecklenburg
Manufactures a line of premium quality flux cored and metal cored electrodes for welding carbon and low alloy steel and for hard surfacing. The company also provides a range of austenitic martensitic and ferritic stainless-steel electrode products.

Sensor Electronics Corp

5500 Lincoln Dr, Minneapolis, MN 55436, 952-938-9486, toll-free: 800-285-3651, FAX: 952-938-9617, sales@sensorelectronics.com, www.sensorelectronics.com

Contact: Pres, Alan Petersen
Manufactures combustible toxic and oxygen deficiency gas detectors. Explosion-proof IR hydrocarbon and CO₂ detectors. Low cost gas sensing transmitter features hot swap sensors and gas free calibration for more than 60 different toxic gases and oxygen depletion.

Sensortech Gmbh

Boschstr 10, 82178 Puchheim, Germany, 49-89-800830, FAX: 49-89-8008333, info@sensortech.com, www.sensortech.com

Offers a range of basic pressure sensors, rugged transmitters and customized pressure sensing systems, as well as liquid level sensors and switches, force, flow and oxygen sensors, high performance solenoid valves, miniature diaphragm pumps and custom specific fluidic control systems.

Sensortech Inc

896 Main St, Walpole, MA 02081, 508-660-8823, FAX: 508-660-8836, info@sensortech.com, www.sensortech.com

Contact: Sls Mgr, James McNeil
Manufactures and distributes a range of sensors and fluidic control systems. The product range includes pressure transmitters to 10,000 psi, liquid level sensors and switches, oxygen and flow sensors. All products can easily be modified according to customer requirements.

Service Engenharia da Qualidade Ltda

Rua Tupinambás 360 conj 1103 - Centro, BH-MG-cep, 30120-070 Brazil, 55-31-3048-0100, FAX: 55-31-3048-0101, serviceengenharia@serviceengenharia.com, www.serviceengenharia.com

Servometer

Precision Manufacturing Group LLC Div
501 Little Falls Rd, Cedar Grove, NJ 07009-1291, 973-785-4630, FAX: 973-785-0756, info@servometer.com, www.servometer.com

Contact: Bus Dev Mgr, Jim Barkand
Manufactures custom miniature metal bellows and bellows assemblies, zero backlash and low windup bellows type flexible shaft couplings, gold plated bellows contact springs and lightweight, structurally rigid electroforms. ISO 9001:2000 certified.

Servomex Group Ltd

Jarvis Brook, Crowborough, East Sussex, TN6 3DU UK, 44-1892-652181, FAX: 44-1892-662253, info@servomex.com, www.servomex.com

Contact: Brian Coates

SETA SA

(div of Aquaquimica Ltda)
Aqua Div

PO Box 1439, Guerrero 5458, 1439 Argentina, 54-11-460-41116, toll-free: 54-91-161-284806, FAX: 54-11-460-41116, cvonsik@yahoo.com.ar, www.setaonline.com

Contact: Dir Chemistry, Charles Vonsik
Offers Biodrill, an environmentally compatible, high performance, multipurpose mud conditioner for rheology control in water-based muds. This product is chrome-free, which makes it suitable for use in areas where there are environmental concerns, is high-temperature resistant (400°F) and contamination resistant to calcium and works in salad water.

Sharpmark USA

(div of Sharpmark UK) (sub of Network Connections USA Inc)

Formerly Network Connections USA Inc
221 Soldiers Creek Pl, Longwood, FL 32750, 407-321-7394, FAX: 407-321-7663, glbarker@sharpmarkusa.com, www.sharpmarkusa.com

Contact: Tech Dir, Graham Barker
Provides labels for data communication and telecommunication installations. Offers a range of cable labels, patch panel labels and module labels that are supplied on A4 sheets and can be printed using a PC and standard office laser printer.

Shell Global Solutions (UK)

Shell Technology Centre Thornton, PO Box 1, Chester, CH1 3SH UK, 44-151-373-5174, FAX: 44-151-373-5844, katie.baverstock@shell.com, www.shell.com/globalsolutions

Contact: Corp Comms Mgr, Katie Baverstock
Provides business and operational consultancy, technical services and research and development expertise to the energy and processing industries worldwide.

Sherwin-Williams

101 Prospect Ave, Cleveland, OH 44115, 800-524-5979, FAX: 440-826-1989, sherwin@ultlead.com, www.sherwin-williams.com/im

Provides high-performance in the harshest environments. The company's products are formulated for a faster return to service, without sacrificing quality. Available in service centers nationwide, the line features ExpressTech technology with productivity advantages to extend tank service life and offers a chemical-resistant waterborne product line.

Shimadzu Scientific Instruments

7102 Riverwood Dr, Columbia, MD 21046, 410-381-1227, toll-free: 800-477-1227, FAX: 410-381-1222, webmaster@shimadzu.com, www.ssi.shimadzu.com

Contact: Mktg/Comms Coord, Kevin McLaughlin

Manufactures scientific instrumentation, including gas and liquid chromatographs, mass spectrometers, UV-Vis, FTIR, ICP and AA spectrophotometers, EDX spectrometers, environmental/TOC analyzers and physical measurement equipment. Industries served include Homeland Security, petroleum, plastics, forensics, environmental and petrochemical.

Sick Maihak Inc

(sub of Sick Maihak GmbH Reute Germany)
6900 W 110th St, Minneapolis, MN 55438, 952-941-6780, FAX: 952-941-9287, information@sickmihak.com, www.sickmihak.com

Offers analyzer and process instrumentation; in-situ and extractive analyzers for single and multiple gases and measurement instrumentation for dust, opacity, volume flow (ultrasonic) and level.

Sidus Solutions Inc

PO Box 60767, San Diego, CA 92166, 619-275-5533, FAX: 619-275-5544, info@sidus-solutions.com, www.sidus-solutions.com

Contact: CEO, Leonard Pool
Provides security and surveillance equipment for industrial clients worldwide. US agent to Hervis scan systems and GE security.

Siemens AG

Oil & Gas Div

47053 Duisburg, Germany, 49-9131-18-7032, FAX: 49-9131-18-7039, oil-gas@siemens.com, www.siemens.com/oil-gas

Contact: PR Mgr, Lynne Anderson
Provides upstream, midstream and downstream solutions for the oil and gas industry. Offers a product and solutions portfolio of power generation and distribution, compression and pumping, automation and control, industrial IT, wafer management and lifecycle services.

Siemens Water Technologies

181 Thorn Hill Rd, Warrendale, PA 15086, 724-772-1402, toll-free: 800-525-0658, FAX: 724-772-1322, information.water@siemens.com, www.siemens.com/water

Delivers cost-effective, reliable water and wastewater treatment systems and services to municipal, industrial, commercial and institutional customers worldwide.

Sierra Instruments Inc

5 Harris Ct, Bldg L, Monterey, CA 93940, 831-373-0200, toll-free: 800-866-0200, FAX: 831-373-4402, info@sierrainstruments.com, www.sierrainstruments.com

Contact: Prod Mgr, Scott Rouse
Manufactures high-performance mass flowmeters and controllers for nearly any gas, liquid, or steam. Also offers short delivery lead time, expert flow advice and long-term support.

Sierra Monitor Corp



Sierra Monitor Corp
1991 Tarob Ct, Milpitas, CA 95035,
408-262-6611, toll-free: 800-727-4377, FAX:
408-262-9042, sales@sierramonitor.com,
www.sierramonitor.com

Contact: Dir Mktg, Steve Ferree
Manufactures hazardous gas detection systems for combustible gas, oxygen deficiency and toxic gases. Offers detectors and systems loaded with communications features that provide the user with the critical safety data in a fast, efficient and usable manner.



SignalGuys.com
(div of RJA Technology LLC)
537 Wrightwood Ave, Elmhurst, IL 60126,
630-993-1928, toll-free: 866-925-2768, FAX:
630-833-6279, sales@signalguys.com,
www.signalguys.com

Contact: Partner, Jim Matuszewski
Offers alarms and signaling products for safety and communication, including explosion-proof strobes, speakers, horns, process status lights and sirens.

Siirtec Nigi SpA

Via Algardi 2, 20148 Milano, Italy, 39-2392-231,
FAX: 39-2392-230-10, sinimail@sini.it, www.sini.it

Contact: Comms Dir, Sergio Milac
Operates worldwide since 1934 in oil and gas production facilities, gas and liquid treatment, acid gas and sulphur recovery, flue gas treatment, gas manufacture, revamping of ammonia/urea plants, process equipment, skid-mounted units and modules. Is ISO 9001:2000 certified and is ISO 14001 certified.

SimplexGrinnell

(div of Tyco)
Tyco Fire & Security Div
5800 Jefferson Hwy, Suite A, Harahan, LA 70123,
504-736-0101, FAX: 504-736-9292,
greggmorgan@tycoint.com,
www.simplexgrinnell.com

Contact: Portable Fire Ext/Suppression, Gregg Morgan

Offers portable fire extinguishers recharge, sell, repair, suppression systems galley hood systems, fixed or wheeled CO₂ systems, wheeled units of any kind, fire alarms, sprinklers and any type of life safety equipment.

Simson Power Tools AB

Nitvagen 3, PO Box 68, 813 22 Hofors, Sweden,
46-290-23080, FAX: 46-290-24403,
info@simsonpowertools.se,
www.simsonpowertools.se

Contact: Pres, Helen Norberg
Produces and sells hydraulic jacks and tools.

Sioux Corp

One Sioux Plaza, Beresford, SD 57004-1500,
605-763-3333, toll-free: 888-763-8833, FAX:
605-763-3334, email@sioux.com,
www.sioux.com

Contact: Mktg Segment Mgr, Mike Wiebers
Manufactures a line of all-electric pressure washers, steam cleaners and combination units that are ideal for use on offshore rigs, FPSO units and platforms. Rugged construction for severe conditions. Units meet NEC, UL 1776, UL 1203-XP and CSA standards. Complete engineering capabilities for application-specific custom design.

Sixnet LLC

331 Ushers Rd, PO Box 767, Clifton Park, NY 12065, 518-877-5173, FAX: 518-877-8346,
mandiek@sixnetio.com, www.sixnetio.com

Contact: Oil/Gas Industry Sls, Howard Greer
Manufactures industrial automation, data acquisition, control and connectivity products, designed for tough environments. Also provides proven, reliable solutions for oil and gas applications.

SKF Magnetic Bearings

(div of SKF Canada Ltd)
928 72 Ave NE, Calgary, Alberta, Canada T2E 8V9, 403-232-9292, FAX: 403-232-9255,
magnetic.bearings@skf.com,
www.skfmagneticbearings.com

Contact: Bus Dev Mgr, Todd Reitsma
Supplies magnetic bearing technology for a range of industrial applications, such as turbo compressors, high-speed motors and generators, turbo expanders, test stands and more.

Skinner Power Systems Llc

8214 Edinboro Rd, Erie, PA 16509,
814-868-8500, FAX: 814-868-5299,
jeff@skinnerpowersystems.net,
www.skinnerpowersystems.net

Contact: Sls Mgr, Jeff Skonieczki
Provides a line of steam turbines, which covers a range from 3 to 2000 HP.

SkyWave Mobile Communications

1145 Innovation Dr, Suite 288, Ottawa, Ontario, Canada K2K 3G8, 613-836-4844, toll-free: 866-202-3762, FAX: 613-836-1088,
info@skywave.com, www.skywave.com

Contact: VP Sls, Dan Poirier
Offers two-way satellite telematics products and services. Products are field-tested and proven reliable for a range of industry applications. Product brands DMR-200, DMR-800 series terminals and SureLinX 8000 series are designed for use with SkyWave D+ or SkyWave IsaM2M network services.

Slick Sleuth

(sub of InterOcean Systems Inc)
Environmental Div
4241 Ponderosa Ave, San Diego, CA 92123,
858-565-8400, sales@slickslueth.com,
www.interoceansystems.com

Contact: Prod Mgr, Chris Chase
Provides environmental and oceanographic sensor/system technology since 1946. InterOcean focuses on innovation, quality and customer support. Manufactures more than 150 products at the company's factory in San Diego (USA) ranging from environmental sensors and instruments to complete integrated systems. Provides remote oil spill detection, which is used in industrial and petrochemical facilities and more.

Smart Drilling GmbH

Am Technologiepark 1, 45305 Essen, Germany,
49-201-172-1454, FAX: 49-201-172-1447,
info@smartdrilling.de, www.smart-drilling.de

Contact: Man Dir, Werner Vorhoff
Provides system solutions for all kinds of drilling applications. In the market for "Rotary Steerable Systems" (RSS), the company provides systems for 6 in. drilling diameter with ZBE 2000 and SCOUT 2000 for vertical and directional drilling projects.

SmartSignal Corp

901 Warrenville Rd, Suite 300, Lisle, IL 60532,
630-829-4042, FAX: 630-829-4001,
www.smartsignal.com

Contact: VP Mktg, Steve Tonissen
Offers advanced asset analytic applications that predict, diagnose and prioritize equipment failures. Unlike traditional condition monitoring tools, SmartSignal treats every piece of equipment as unique. Within weeks of being implemented, SmartSignal delivers operationally relevant insights that eliminate failures that impair availability, profitability and environment-health-safety (EHS) outcomes.

Smith Flow Control (USA)

(sub of Smith Flow Control LTD, UK)
21 Kenton Lands Rd, Erlanger, KY 41018,
859-578-2395, toll-free: 800-800-9422, FAX:
859-341-2302, sales@smithflow.com,
www.smithflowcontrol.com

Contact: Americas Sls Mgr, Martin West
Designs, supplies and installs valve locks and interlocks, Easi-Drive portable valve operating systems and Flexi-Drive remote cable-driven valve operating systems.

Snap Tite Inc

Quick Disconnect and Valve Div
201 Titusville Rd, Union City, PA 16438,
814-438-3821, FAX: 814-438-3069,
qdv_sales@snap-tite.com,
www.snap-titequickdisconnects.com
Manufactures hydraulic quick disconnect hose couplings, hydraulic directional control valves, check, relief, high pressure and flow control valves. ISO 9001:2000 certified.

Society of Petroleum Engineers (SPE)

PO Box 833836, Richardson, TX 75083-3836,,
www.spe.org

Provides a not-for-profit professional association of more than 73,000 members from more than 112 countries worldwide and is a key resource for technical knowledge related to the oil and gas exploration and production industry. Provides knowledge on demand through its global events, publications and website.

Solar Turbines

(sub of Caterpillar Inc)
Mz B-3, 2200 Pacific Hwy, San Diego, CA 92101,
619-544-5352, FAX: 619-544-5669,
powergen@solar-turbines.com,
www.solar-turbines.com

Offers products that play an important role in the development of oil, natural gas and power generation projects around the world. Products include gas turbine engines (rated from 1590 to 20,500 hp), gas compressors and gas turbine-powered compressor sets, mechanical drive packages and generator sets, as well as complete support services.

Solon Manufacturing Co

425 Center St, PO Box 207, Chardon, OH 44024-0207, 440-286-7149, toll-free:
800-323-9717, FAX: 440-286-9047,
amajini@solonmfg.com, www.solonmfg.com

Contact: VP/Ch Eng, George Davet
Offers pressure switches available in a variety of temperature and pressure ranges. The modular design allows combinations of special features to be combined to specify unusual pressure switch functions used in applications, such as process control and monitor flow, maintaining pressure and levels of processes with adjustable pressure ranges.

Solstad Shipping ASA

PO Box 13, N-4297 Skudeneshavn, Norway,
47-52856500, FAX: 47-52856501,
firmapost@solstad.no, www.solstad.no

Provides an integrated shipping company with high specification owned or chartered vessels to offer services to petroleum related offshore activities.

Solutia

Therminol Heat Transfer Fluids Div
575 Maryville Centre Dr, St Louis, MO 63141,
800-433-6997, FAX: 314-674-7907,
team.therminol@solutia.com, www.therminol.com
Contact: Therminol Fluids Spec, Ravi Prakash
Offers Therminol heat transfer fluids, which can meet the operating needs of most single- or multiple-user systems. In properly designed systems, the fluids will perform within their respective temperature ranges for extended periods without breakdown or corrosion. Fluids are available in temperature ranges from -115°C (-175°F) to 400°C (750°F).

Sonardyne International Ltd

Blackbushe Bussiness Park, Yateley, Hampshire, GU46 6GD UK, 44-1252-872288, FAX: 44-1252-876100, sales@sonardyne.com, www.sonardyne.com
Contact: Sls Dir, Richard Binks
Designs and manufactures underwater acoustic positioning, navigation and communication systems for the offshore oil and gas industries. Applications for the company's technology include deepwater construction survey, position referencing for DP vessels, ROV tracking, marine seismic, high speed data telemetry and remote valve control.

Sonneborn LLC

575 Corporate Dr, Suite 415, Mahwah, NJ 07430, 201-760-2940, toll-free: 877-948-2588, FAX: 724-756-9387, www.sonneborn.com
Contact: Information Center
Manufactures a white mineral oil in a highly refined state that consists of saturated aliphatic and alicyclic nonpolar hydrocarbons.

■ SOR Inc

14685 W 105th St, Lenexa, KS 66215, 800-676-6794, FAX: 913-888-0767, marcom@sorinc.com, www.sorinc.com
Contact: Cust Svc Dir, Joel Bradley
Offers a line of pressure, level, temperature and flow instrumentation for a variety of industries and applications. Registered quality system to ISO 9001:2000.
(See ad p 18)

Southernstar Consultants

1506 Crooked Stick Dr, Valrico, FL 33594-7815, 813-653-3090, southernconsult@aol.com, www.southernstar-consultants.com
Provides construction contracts training and claims and disputes resolution. Consulting for US and international above-ground storage tank terminals for crude oil and refined products, spherical pressure vessels and LNG import and export terminals.

Special Equipment Manufacturing LLC

Great White Energy Services 04 Div
3600 S 13th St, Duncan, OK 73533, 580-252-5111, FAX: 580-252-4227, tcollinsworth@specialequipment.net, www.specialequipment.net
Contact: VP, Tom Collinsworth
Offers a line of pressure pumping, blending, mixing, nitrogen and bulk equipment. The company custom designs and builds equipment to the specific needs of each customer. Client training, consulting and commissioning necessary for performing all phases of well installation using state-of-the-art technology are also available.

Specialty Maintenance Products

4908 Linden St, Bellaire, TX 77401-4435, 713-667-4402, FAX: 713-669-8618, mark@smptools.com, www.flangespreaders.com
Contact: Pres, Mark Goodman
Offers specialty tools that provide a safer and more efficient means of spreading and aligning flanges. Also has tools that hold flanges apart to replace valves, meters, regulators and more. Also carries the Piper Hands-Free Back-Up Tool and AMS flow boss bleeder cleaner tools.

Spectro Analytical Instruments GmbH & Co KG

AMETEK Materials Analysis Div
Boschstrasse 10, 47533 Kleve, NRW, Germany, 49-2821-892-0, FAX: 49-2821-892-2200, info@spectro.com, www.spectro.com
Supplies analytical instruments for optical and x-ray fluorescence spectrometry. Manufactures advances instruments, develops solutions for varying applications and provides customer service. Innovation, instrument concerns and customer relations are its main activities. More than 26,000 analytical instruments have been delivered to customers around the world.

Spectronics Corp

956 Brush Hollow Rd, Westbury, NY 11590, 516-333-4840, FAX: 516-333-4859, vscherer@spectroline.com, www.spectroline.com
Contact: Cust Svc Mgr, Gloria Blusk
Provides fluorescent dyes and UV lamps that are used to detect leaks in liquid storage tanks, while high-intensity UV and UV/blue light lamps are used for nondestructive testing to pinpoint flaws and contamination in pipelines worldwide.

Spectrum Metrology Ltd

Unit 8 Ireton Ave, Leics, LE4 9EU, UK, 44-116-276-6262, FAX: 44-116-276-6868, sales@spectrum-metrology.co.uk, www.spectrum-metrology.co.uk
Sells various alignment devices (including both visible and laser) to produce alignment checks from zero to infinity. The range of products allows the company to measure truly vertical and horizontally as well as parallelism. Applications include pipe straightness and squareness, roller alignment and parallelism, die alignment, roller straightness and machine alignment.

Spence Engineering Co

(div of Circor International Inc)
150 Coldenham Rd, Walden, NY 12586, 845-778-5566, toll-free: 800-398-2493, FAX: 845-778-1072, sales@spenceengineering.com, www.spenceengineering.com
Contact: Mktg Coord, Matthew Mullen
Offers ISO 9001, ASME, ASME "U-Stamp" and PED certified manufacturer of pilot and direct operated steam pressure regulators, control valves, safety relief valves, desuperheaters, noise suppressors, industrial steam trap, condensate pumps, gasketed pipe unions, cast strainers, butterfly and check valves, foot valves, suction diffusers, triple duty valves and expansion joints.

Sphinx Adsorbents Inc

53 Progress Ave, Springfield, MA 01104, 413-736-5020, FAX: 413-736-8257, info@sphinxadsorbents.com, www.sphinxadsorbents.com
Contact: Sls, Linda Poery
Provides adsorbents and desiccants for industrial applications.

Spirax Sarco Inc

1150 Northpoint Blvd, Blythewood, SC 29016, 803-714-2000, FAX: 803-714-2222, ssales@spirax.com, www.spiraxsarco.com/us
Contact: Mktg Comms Mgr, Dawn Cartwright
Provides steam system solutions and is dedicated to providing knowledge, service and products for the control and efficient use of steam and other industrial fluids, using both resources and capabilities to meet the system needs of customers.

SPIR Star Ltd

10002 Sam Houston Center Dr, Houston, TX 77064, 281-664-7800, FAX: 281-664-7850, info@spirstar.com, www.spirstar.com
Contact: Sls Mgr, Mark Swinhoe
Provides high-pressure hoses for waterblast cleaning, jet cutting, surface preparation and flex lancing. Made of chemical-resistant thermoplastic and steel wire reinforced. Operating pressures range from 10,000 to 50,000 psi and ID sizes from 1/8 to 1 in.

SPX Process Equipment

(div of SPX)
SPX Flow Technology Segment Div
611 Sugar Creek Rd, Delavan, WI 53115, 262-728-1900, toll-free: 800-252-5200, FAX: 800-252-5012, info@processequipment.spx.com, www.spxprocessequipment.com
Manufactures fluid handling, processing, mixing and blending equipment, closures and pipeline pigging solutions, dispersion equipment, filters, fittings, industrial mixers, pumps and valves for the gas and oil industries, as well as aftermarket support services. Brands serving the oil and gas market include Bran+Luebbe, Copes-Vulcan, DeZURIK, GD Engineering, Johnson Pump and more.

■ Stallion Oilfield Service

950 Corbindale Rd, Houston, TX 77024, 713-528-5544, FAX: 713-528-1276, dsmith@sofs.cc, www.stallionoilfield.com
Contact: VP Sls/Mktg, Mike Moore
Provides wellsite support services and production and logistics services to the oilfield with more than 2400 employees in 55 locations. The range of critical wellsite services includes onshore and offshore workforce accommodations and remote camp complexes, surface rental equipment, solids control, communication services, wellsite construction, rig relocation and more.
(See ad p 9)

Standard Machine

868 60th St E, Saskatoon, Saskatchewan, Canada S7K 8G8, 306-931-3343, toll-free: 800-329-4327, FAX: 306-931-4741, info@hamiltongear.com, www.hamiltongear.com
Contact: CEO/Pres, Greg Porter
Supplies to the oil and gas industries. Designs and manufactures speed increaser/speed reduction gear drives for all types of applications, including top drives and compressor drives. Also manufactures open gearing for mud pumps, draworks, centrifuges and specialty OEM applications.

Stanhope-Seta

London St, Chertsey, Surrey, KT16 8AP UK, 44-1932-564391, FAX: 44-1932-568363, sales@stanhope-seta.co.uk, www.stanhope-seta.co.uk
Contact: Sls, Carole Rawlins
Designs and manufactures quality control instruments used to measure the physical characteristics that determine product quality and consistency. Used by many diverse industries, including petrochemical, pharmaceutical, food, cosmetics, plastics and transport. Measurements include flash point, vapor pressure, viscosity, penetration, contaminants and other quality parameters.

Stellar Technology

237 Commerce Dr, Amherst, NY 14228, 716-250-1900, toll-free: 800-274-1846, FAX: 716-250-1909, info@stellartech.com, www.stellartech.com
Contact: Sls/Mktg Dev, Paul R. Wolff
Manufactures pressure, temperature, load/force sensors and instrumentation. The company offers both analog and digital output. The types of sensors can be combined with the respective outputs or integrated to provide a single output. Units meet CSA and ATEX certifications for I.S. and flameproof areas.

Stewarts-USA

Stewarts-USA

6786 Tipperary, Houston, TX 77061,
713-643-1022, toll-free: 800-901-1316, FAX:
713-643-2855, info@stewartsusa.com,
www.stewartsusa.com

Contact: VP Sis, Thomas Teachworth
Manufactures high-quality pressure gauges.
Lloyds Register, ISO 9001 certified and CE ap-
proved. Products are used internationally
throughout the oil and gas industry. Additionally,
the company offers all related instrumentation, in-
cluding thermometers, valves and accessories,
as well as the liquid-free VibraGauge,
SnubbaGauge and Safety Zone Glow Gauge.

Stewart Tubular Products

1810 Afton St, Houston, TX 77055,
713-682-1486, FAX: 713-682-1489,
mlooper@stewarttubular.com,
www.stewarttubular.com

Contact: Pres, Steve Samuel
Manufactures down-hole tubular accessories, in-
cluding pup joints, blast joints, flow couplings,
crossover connectors and couplings. The com-
pany also provides machining and threading ser-
vices and is licensed to thread Hydriil, VAM,
Tenaris and API connections. Provide high quality
products at competitive prices.

Stork H&E Turbo Blading

334 Comfort Rd, Ithaca, NY 13053,
607-351-7418, FAX: 607-277-1193,
joe.walker@storkhe.com,
www.he-machinery.com

Contact: Bus Dev, Joe Walker
Manufactures gas turbine compressor blades,
vanes, rotors, stators, IGV and inlet guide vanes;
steam turbine blades, buckets, rotors and
stators, blower and axial fan and axial compres-
sor blades. All OEM new replacement parts faster
and at less cost than OEM. Independent manu-
facturer ISO 9001 and AS9000.

Stratos

34 Glencoe Dr, Donovan's Business Park, PO
Box 5754, St Johns, Newfoundland, Canada A1C
5X3, 888-766-1313, FAX: 709-748-4300,
info@stratosglobal.com, www.stratosglobal.com

Provides service and communications, including
mobile and fixed satellite and microwave ser-
vices. Serves US and international government,
military, first responder, NGO, oil and gas, indus-
trial, maritime, aeronautical, enterprise and media
users.

Stratos

6901 Rockledge Dr, Suite 900, Bethesda, MD
20817, 709-748-4233, FAX: 709-748-4300,
info@stratosglobal.com, www.stratosglobal.com

Contact: Sis Mgr Broadband-GOM, Loren
Archer
Provides a range of advanced mobile and
fixed-site remote communications solutions.
Serves the voice and high-speed data connectiv-
ity requirements of a diverse array of markets, in-
cluding energy, industrial and maritime users,
utilizing infrastructure and portfolio of satellite
and microwave technologies.

Streamlight Inc

30 Eagleville Rd, Eagleville, PA 19403,
610-631-0600, FAX: 610-631-0712,
cs@streamlight.com, www.streamlight.com

Contact: Dir Ind'l/Fire Sis, Bill Ward
Manufactures a variety of high-quality portable
lighting products, including a range of recharge-
able and alkaline battery, precision-engineered
flashlights and lanterns for use in professional
markets. ISO 9001:2000 certified.

Strongwell

400 Commonwealth Ave, Bristol, VA 24201,
276-645-8000, FAX: 276-645-8132,
gbarefoot@strongwell.com, www.strongwell.com

Contact: Offshore Sis Mgr, Channing
Durrenberger
Manufactures pultruded FRP shapes, plate, grat-
ing, handrail and custom pultruded FRP systems.
The company introduced the first fire integrity
phenolic grating in 1994 and is a large producer
of fire integrity phenolic grating in the world of
offshore platforms. The phenolic grating is in-
stalled on platforms around the world.

STW Technic LP

3000 Northwoods Pkwy, Suite 260, Norcross,
GA 30071, 770-242-1002, FAX: 770-242-1006,
julia.ceaser@stw-technic.com,
www.stw-technic.com

Contact: Sis/App Engr Mgr, Jon K. Williams
Manufactures and distributes mobile electron-
ics for on- and off-highway vehicles, including
agricultural and construction machinery,
cranes, municipal and military vehicles and
other mobile equipment. Products include
freely programmable controllers, force and
measurement sensors with thin-film, ceramic,
or silicon technology, joysticks and other
electronic equipment.

Submar Inc

805 Dunn St, Houma, LA 70360, 800-978-2627,
FAX: 985-851-0108, submar@submar.com,
www.submar.com

Contact: Sis/Mktg Mgr, Monique Roberts
Manufactures and installs articulated concrete
mat technology. Primarily used for separation,
stabilization and protection of underwater pipe-
lines. Environmentally friendly with revegetation
of the site and is used for bank/shoreline stabili-
zation, pipeline protection and erosion control.

Sub-one Technology

4464 Willow Rd, Bldg 103, Pleasanton, CA
94588, 925-924-1020, FAX: 925-924-1025,
mpaige@sub-one.com, www.sub-one.com

Contact: Mktg/Sis Asst, Megan Paige
Develops InnerArmor, a unique method for de-
positing anti-corrosive, super-hard, smooth, pure
films on the internal surfaces of a spectrum of
products, including pipes, pumps, valves, ves-
sels, cylinders and more. This technology applies
to any industry in which a protective anti-corro-
sive coating can produce substantial cost sav-
ings.

Subsea 7

Westhill Business Park, Peregrine Rd, Aberdeen,
AB32 6JL UK, 44-1224-344300, FAX:
44-1224-344600, jackie.doyle@subsea7.com,
www.subsea7.com

Offers all the expertise and assets that make
Subsea Umbilical, Riser and Flowline (SURF) field
development and operation possible.

Sunbelt Energy

14713 Fm 428, Celina, TX 75009, 972-346-2445,
FAX: 972-346-2445, sabrexp@aol.com

Contact: Pres, Gerald Langford
Provides geological and geophysical-airborne,
magnetic, IR and UV thermal scanners. Produces
oil, gas, geothermal, uranium, copper, silver and
water. Timed appraisal, surveys for oil and chem-
ical spills. Wells in eastern and southern Texas,
Idaho, northwestern Washington, California and
Kentucky.

Superbolt Inc

PO Box 683, Carnegie, PA 15106, 412-279-1149,
toll-free: 800-345-2658, FAX: 412-279-1185,
bolting@superbolt.com, www.superbolt.com

Contact: Pres, Robert Steinbock
Manufactures patented multi-jackbolt tensioners
designed to eliminate unsafe and time consuming
bolting methods. Only hand tools are required for
installation and removal.

Superior Technical Ceramics Corp

600 Industrial Park Rd, St Albans, VT 05478,
802-527-7726, FAX: 802-527-1181,
kletourneau@superiortechceramics.com,
www.ceramics.net

Contact: Sis Mgr, Jeffery Brundage
Manufactures custom-designed oxide-based
technical ceramics for applications requiring ex-
treme wear or corrosion resistance, high temper-
ature capability or insulators for electrical
resistance and withstand. Uses multiple forming
and machining methods to produce components
to the most exacting standards. Also stocks stan-
dard ceramic parts.

Sure Flow Products LLC

2310 Chief Ln, Wixom, MI 48393, 248-960-3685,
FAX: 248-926-9753,
sales@sureflowproducts.com,
www.flowmetersource.com

Contact: Nat'l Sis Mgr, Marty Petrill
Provides flow instrumentation, including sight
flow indicators, switches, transmitters, monitors,
rotameters and totalizers for use in applications
of oils, lubricants, solvents, paints, water, air and
gases. Offer filtration products and new product
release and monitors the amount of water in oil.
Products are cost-effective flow solutions for
OEMs and end users.

Swagelok Co

31500 Aurora Rd, Solon, OH 44139,
440-349-5934, FAX: 440-349-5843,
marketing@swagelok.com, www.swagelok.com

Contact: Sr Mktg/Comms Mgr, Debi Korinek
Develops and manufactures fluid system compo-
nent technologies for a variety of industries, in-
cluding chemical and petrochemical, oil and gas,
sanitary, power generation and semiconductor.
Manufacturing, research and distribution facilities
support a global network of more than 200 inde-
pendent sales and service centers.

SWEDPARTS HAMBURG

Oil Gas & Petrochem Div
Buchheisterstrasse 6, 20457 Hamburg, Germany,
49-40-319-60-28, FAX: 49-40-319-13-95,
swedparts@hashem.de,
www.hashem.de/swedparts

Contact: Bus Dev Mgr, Samir Hashem
Specializes in the provision of system technolo-
gies and integrated engineering supplies for off-
shore and onshore, upstream, midstream and
downstream operations, pertaining to the oil, gas
and petrochem industrial sectors and other re-
lated industrial sectors, providing technical
equipment, components, accessories, spare
parts and expert services.

SymCom Inc

2880 N Plaza Dr, Rapid City, SD 57702,
605-348-5580, FAX: 605-348-5685,
sales@symcom.com, www.symcom.com

Contact: VP Sis, Warren Leopold
Provides products to monitor the power supply
and protect electric motors before damage oc-
curs to the windings of a compressor, pump or
other motor. These products protect against
damage from overvoltage, undervoltage, voltage
unbalance, single-phasing, phase reversal,
overcurrent, undercurrent, current unbalance and
ground fault.

Symmetric Research

9805 NE 116th, #7407, Kirkland, WA 98034,
702-341-9325, info@symres.com,
www.symres.com

Contact: Prod Spec, Kip Wyss
Manufactures high-resolution data acquisition
equipment for the PC at reasonable prices. The
PARxCH family of 24 bit A/D boards include one,
four and eight channel models, sample from DC
to 5 kHz and come with acquisition software.
Terminal boards, amplifiers and GPS timing units
are also available.

Synflex*(div of Eaton Corp)**Synflex Div*1395 Danner Dr, 115 Lena Dr, Aurora, OH 44202, 330-562-3838, FAX: 330-995-5419, michaelarauh@eaton.com, www.synflexhose.com

Contact: Prod Mgr, Mike Rauh

Manufactures high-pressure hoses and control umbilicals. Synflex hoses are known throughout the industry as the original thermoplastic hose and the first to use planetary cabling for subsea applications. Innovator in 17E compliant hoses for flying leads and workover bundles.

**T3 Energy Services**7135 Ardmore St, Houston, TX 77054, 713-996-4110, FAX: 713-440-3210, dfifer@t3energy.com, www.t3energy.com

Contact: VP, James McMullan

Manufactures, remanufactures and services drilling and production sector oilfield products within the oil and gas industry. Products include a range of pressure control, flow control, wellhead equipment and pipeline valves. Publicly traded on NASDAQ (TTES).

Talen's Marine & Fuel225 Pleasant St, PO Box 1040, Lake Arthur, LA 70549, 337-774-5480, FAX: 337-774-3503, info@talensmarine.com, www.talensmarine.com

Contact: Mktg Mgr, Dale Doucet

Supplies fuel and lubricant to the Gulf Coast area (Mississippi to Texas).

TCR Engineering ServicesPlot No EL-182 MIDC-TTC Electronic Zone, Behind Nelco, Mhape, Mumbai, 400 705 India, 91-22-65168200, FAX: 91-22-65168200, sales@tcrceng.com, www.tcrceng.com

Contact: Dir Global Sls, Rohit Bafna

Provides ISO 17025 and NABL accredited independent materials testing laboratory. The core services provided include mechanical testing, chemical analysis, positive material identification (PMI), RoHS compliance testing, nondestructive testing, metallography, corrosion testing, failure analysis, raw material inspection, metallurgical product evaluation and more. Laboratory and NDT services in Kuwait, Saudi Arabia, Trinidad and USA.

TC Technologies6702 Green Stone Ct, Houston, TX 77084, 713-252-1624, FAX: 281-345-1321, tctcom1@pdg.net, www.tctechologieez.com**Technogenia**ZA Les Marais, BP 151, 74410 Saint Jorioz, France, 33-4-50-68-56-60, FAX: 33-4-50-68-62-77, technogenia@technogenia.fr, www.technogenia.com

Contact: Gen Mgr, Herve Maybon

Provides hardfacing solutions for various industries, such as oil drilling, mining foundry, aluminum, iron, steel ceramic and brick. The company's solutions allow easy service for parts, direct on-site intervention without disassembly and a longer parts lifetime.

Tech Products Inc105 Willow Ave, Staten Island, NY 10305, 718-442-4900, toll-free: 800-221-1311, FAX: 718-442-2124, team@techproducts.com, www.techproducts.com

Contact: Sls Mgr, Daniel D. O'Connor

Provides identification products to the petroleum industry since 1948, including Do-Not-Dig signs, pipeline markers and aerial observation markers (A-Frames) for your aboveground and underground pipeline. Using the Everlast technology, the company has made signs that are being used on the Alaskan pipeline and on Tucson Electrical power's transmission towers.

Teledyne RD Instruments*(div of Teledyne Technologies)*14020 Stowe Dr, Poway, CA 92064, 508-539-6960, mnewcombe@teledyne.com, www.rdinstruments.comContact: Mktg/Comms Mgr, Margo Newcombe
Manufactures Acoustic Doppler Current Profilers (ADCPs) and Doppler Velocity Logs (DVLs). Offers ease-of-use, reduced cost, patented broadband technology providing fast, accurate, high-resolution water current profiling in every environment.**Telton Corp**PO Box 945, Bothell, WA 98041-0945, 425-487-1515, toll-free: 800-426-3926, FAX: 425-487-2288, info@telton.com, www.telton.com

Contact: Dir Gauntlet Sls, Burt Hadlock

Provides ruggedly engineered products for secure IP and dial-up access to remote equipment for data collection and maintenance. Products enable companies to maximize the return on their existing infrastructure investment and stay current with changing regulatory and security requirements.

Tel-Tru Manufacturing Co408 St Paul St, Rochester, NY 14605, 585-232-1440, toll-free: 800-232-5335, FAX: 585-232-3857, info@teltru.com, www.teltru.com

Contact: Sales

Manufactures and distributes instrumentation products, including bimetal thermometers, digital thermometers, temperature and pressure transmitters, pressure gauges and accessory products that are designed and manufactured for worldwide distribution to industrial, OEM, commercial, HVAC and food service markets.

Tesco Corp3993 W Sam Houston Pkwy N, Suite 100R, Houston, TX 77043, 713-359-7000, FAX: 713-359-7001, marketing@tescocorp.com, www.tescocorp.com

Contact: VP Mktg/Bus Dev, Nigel Lakey

Designs, manufactures and services technology based solutions for the upstream energy industry. Delivers safer and more efficient solutions to well drilling. Offers the latest technology in casing drilling services, purchase and rental of electric and hydraulic top drives systems, casing running services and more globally.

Tgs NopecSuite 2000, 2500 Citywest Blvd, Houston, TX 77042, 713-860-2100, jada@tgsnopec.com, www.tgsnopec.com

Contact: VP N/S America Sls, Karen El-Tawil

Provides a resource for global geoscientific data products and services in the E&P industry. Specializes in the design, acquisition and processing of multichannel seismic surveys worldwide and delivers high performance seismic imaging and software solutions. The company also provides an on-line well-log database, well data management services and more.

Thermal Instrument Co217 Sterner Mill Rd, Trevose, PA 19053, 215-355-8400, FAX: 215-355-1789, office@thermalinstrument.com, www.thermalinstrument.com

Contact: Sls Engr, Michael Fiantra

Manufactures thermal mass flowmeters and flow switches.

Thermo Fisher Scientific*Environmental Instruments Div*

27 Forge Pkwy, Franklin, MA 02038, 978-232-1037, toll-free: 888-777-1954, FAX: 978-232-6015

ThermoProbe Inc613 E Court St, Jackson, MS 39201, 601-939-9215, FAX: 601-355-1831, ray@thermoprobe.net, www.thermoprobe.net

Contact: Mktg Mgr, Ray Adams

Manufactures intrinsically safe portable electronic thermometers (PETS) for petroleum gauging, handheld precision digital thermometers for laboratory and ThermoTab gauging software for Palm OS.

T H Hill Associates Inc7676 Hillmont, Suite 360, Houston, TX 77040, 713-934-9215, FAX: 713-934-9236, mail@thhill.com, www.thhill.com

Contact: VP Mktg, Shawn Altizer

Specializes in the creation and enforcement of drilling equipment quality standards. The standard DS-1 is used for the inspection of used drill stem components and with engineering and field technician services, the company also offers both the analytical and practical quality of downhole components.

3PS Inc1300 Arrow Point Dr, Cedar Park, TX 78613, 512-610-5200, FAX: 512-610-5201, sales@3psinc.com, www.3psinc.com
Manufactures load cell, specializing in force measurement systems built to customer specifications. Typical applications include on- and offshore drilling, crane load monitoring and other harsh environment applications. Also is a Mipeg distributor.**TI Anode Fabricators Pvt Ltd***Marketing Div*48 Noothanchary Madambakkam, Chennai, Tamil Nadu, 73 India, 91-44-22781148, FAX: 91-44-22781362, info@tianode.com, www.tiande.com

Contact: CEO, Jayekumar V.

Offers MMO titanium anodes, platinized titanium anodes, niobium anodes, DSA anodes, chlorinator, ICCP, cathodic protection, anodes and cathodes, electrolyzer, electrochlorinator, mesh anodes, tubular anodes, desalination, chemical process equipments, tantalum, zirconium, nickel and hastelloy.

Tinker & RasorPO Box 281, San Gabriel, CA 91778-0281, 626-287-5259, leonard@tinker-rasor.com, www.tinker-rasor.com

Manufactures holiday detectors, cathodic protection products and other corrosion mitigation instrumentation. Prides itself in being able to ship all products from stock and service all repairs within 24 hours.

Titan Technologies International Inc9001 Jameel St, Suite 180, Houston, TX 77040, 281-449-9994, toll-free: 866-345-8484, FAX: 281-449-9996, sales@titanti.com, www.titanti.com

Contact: Sls Coord, Gary Piper

Offers sales and rentals of hydraulic torque wrenches, pneumatic torque wrenches, electric torque wrenches, hydraulic stud tensioners, hydraulic power units, hydraulics nuts, flange spreaders, nut splitters, sockets and adapters.

TMS Metalizing Systems Ltd

TMS Metalizing Systems Ltd

9619 Provost Rd, PO Box 2136, Silverdale, WA 98383, 360-692-6656, info@tmsmetalizing.com, www.tmsmetalizing.com

Contact: Pres, Dave Wixson
Manufactures and distributes thermal spray equipment worldwide, including arc spray, flame spray, plasma spray and HVOF systems. Offers the Bridemaster and Handi-Arc systems, a variety of Metallisation systems, metalizing wire sales consumable sales and training. Has been in business since 1988.

Tobul Accumulator Inc

186 Accumulator St, Bamberg, SC 29003, 803-245-5111, FAX: 803-245-2636, tobulmail@tobul.com, www.tobul.com

Contact: Sls/Mktg Mgr, Mark S. West
Provides custom engineered hydraulic piston accumulators to 20,000 psi MAWP, to 300 gallons; gas bottles, bladder accumulators and accessories.

Tool Hound

309 Legget Dr, Kanata, Ontario, Canada K2K 3A3, 613-287-0200, toll-free: 800-387-8665, FAX: 613-592-4296, www.toolhound.com

Provides a powerful tool and equipment management system that allows construction, maintenance and repair organizations to gain control of their tools and equipment inventory.

Topog-e Gasket Co

1224 N Utica, Tulsa, OK 74110, 918-587-6649, FAX: 918-587-6961, sales@topog-e.com, www.topog-e.com

Contact: COO, Edwin Thomas
Provides scaling in steam boilers and other applications.

Tornado Technologies Inc

3236 50th Ave NE, Calgary, Alberta, Canada T2B 3A3, 403-244-3333

Tower Solutions

9814 N 83rd Pl, Scottsdale, AZ 85258, 480-315-8830, FAX: 480-315-8833, akarsen@towersolutionsinc.com, www.towersolutionsinc.com

Contact: Pres, Allen Karson
Offers a multifunctional product for rapid, safe and easy deployment. The product, a self-erecting, totally automatic tower (80 or 34 ft), can be used in more than 20 markets. The company's focus is on the Department of Defense and Emergency Management.

TPS Technitube Röhrenwerke GmbH

(div of OCTG)
PO Box 1509, 54541 Daun, Germany, 49-6592-712-0, FAX: 49-6592-1305, service@tpsd.de, www.tpsd.de

Contact: Mill Dir, Jürgen Brost
Manufactures tubular products and accessories for the oil and gas industry. Main products include tubing and casing, premium joints (TPS-MULTISEAL; TPS-TECHNISEAL; TPS-OPTIFLOW), Pup-Joints, X-Overs, flow couplings, blast-joints, couplings and drill pipes. API certified.

Tracerco

4106 New West Dr, Pasadena, TX 77507, 281-291-7769, toll-free: 800-288-8970, FAX: 281-291-7709, margaret.bletsch@tracerco.com, www.tracerco.com

Contact: NA Sls Mgr, Jim Bramlett
Provides diagnostic and specialist instrumentation to the process industry, which reduce operating costs, optimize production and minimize shutdown periods. Offers an array of services ranging from gamma scanning, flow rates, flow rate meter proving. Desalters to interwell studies in gas and water injection operations.

Tradion Oil & Gas W/A PLC

Marketing Div
203 PTI Rd, Effurun, Warri, Delta, 330003 Nigeria, 234-009-046-250909, tradion.petroleum@yahoo.co.uk, www.tradionplcng.org

Contact: CEO, Nsionu Albert Onuorah
Markets crude oil representing different oil groups and can also take up appointment as refinery mandate/commission agent capable of sourcing product from genuine links. Also welcomes investors for partnership.

Tranter International AB

Oil & Gas Department Div
Maria Skolgata 79 B, SE-11853 Stockholm, Sweden, 46-8-442-49-70, FAX: 46-8-442-49-80, oil&gas@se.tranter.com, www.tranter.com

Contact: Sls Mgr/Oil/Gas, Henrik Johansson
Manufactures gasketed and all-welded plate heat exchangers. Factory sites in Sweden, India and the USA provide worldwide product coverage. From more than 65 years of products supply experience the company has developed an extensive knowledge database that embraces demanding offshore and onshore applications.

Trelleborg CRP Inc

(div of Trelleborg Engineered Systems)
1902 Rankin Rd, Houston, TX 77073, 281-774-2600, FAX: 281-774-2626, crpsales@trelleborg.com, www.trelleborg.com/crp

Contact: Sr Sls Mgr, Doug Marti
Designs, manufactures and supplies engineered solutions for demanding environments with employees who are dedicated to customer service, problem solving and innovation.

Trelleborg Sealing Solutions

2531 Bremer Rd, Ft Wayne, IN 46803, 260-749-9631, FAX: 260-749-4844, tssusa@trelleborg.com, www.tss.trelleborg.com/us

Contact: Oil/Gas Segment Mgr, Eric Bucci
Provides an international network of more than 60 facilities worldwide, including 32 manufacturing sites, strategically-positioned materials and development laboratories and design and application centers. The company provides more than 40,000 sealing and polymer products for aerospace, automotive and industrial sealing and bearing systems to customers worldwide.

TSEC - Tito Silveira Engenharia e Consultoria Ltda

Rua Couto de Magalhaes 744-Benfica, Rio de Janeiro, 20930-090 Brazil, 5521-3860-6739, FAX: 5521-2580-6936, contato@tsec.com.br, www.tsec.com.br

Contact: Eng DSc, Tito Luiz da Silveira
Provides consulting and engineering solutions for life assesment and integrity evaluation management; mechanical analysis and design; compliance on Brazilian mandatory standards; failure analysis and prevention; materials characterization; nondestructive evaluation and inspection; and field and laboratory metallography.

TubeFit Engineers

163C, Oshiwara Industrial Center, Link Rd Goregaon W, Mumbai, Maharashtra, 400 104 India, 91-22-28766982, FAX: 91-22-28766998, tubefit@vsnl.com, www.tubefiteng.com

Contact: CEO, Sanjay Bengali
Manufactures tube, instrumentation and ferrule fittings equivalent to Parker/Swagelok. Offers instrumentation valves, including needle, ball and check for high pressure; manifolds for DP transmitters, such as 2-, 3-, 5-way and multiport; gauge valves; snubbers; air headers and condensate pots. ISO 9001:2000 accredited.

Tulsa Power LLC

3647 Heritage Colony Dr, Missouri City, TX 77459, 281-687-3693, FAX: 281-403-4927, vshirhatti@tulsapower.com, www.tulsapowerog.com

Contact: Dir Sls/Mktg, Vinod Shirhatti
Provides spooling applications, drill line spoolers, wireline units, deep wall reels, multipurpose trailers, umbilical reels, winches, raw water reels, spooling decks, truck/trailer mounted ESP cable spoolers, HPU, coiled pipe drives, measuring accessories and level wind mechanisms, IWOCs.

Twister B V

Einsteinlaan 10, 2289 CC Rijswijk, The Netherlands, 31-70-300-2222, FAX: 31-70-300-2200, office@twisterbv.com, www.twisterbv.com

Contact: Sls Dir, Hugh Epsom
Develops and markets gas treatment packages for the Oil & Gas industry based around unique proprietary supersonic technology. This technology enables high efficiency gas conditioning using compact, unmanned units with no moving parts, chemicals usage or emissions.

Tyco Flow Control

(div of Tyco Engineered Products and Services)
3950 Greenbriar, Stafford, TX 77477, 281-274-4400, www.tycoflowcontrol.com

Manufactures and supplies valves, actuators, controls and instrumentation. The products are used to move, control and sample liquids, gases, powders and other substances in the power generation, oil and gas, petrochemical, pharmaceutical, food and beverage and marine industries.

UE Systems Inc

14 Hayes St, Elmsford, NY 10523, 914-592-1220, toll-free: 800-223-1325, FAX: 914-347-2181, info@uesystems.com, www.uesystems.com

Contact: VP Sls, Gary Mohr
Provides ultrasonic instruments for condition monitoring and energy conservation applications, including leak detection, mechanical inspection, condition-based lubrication and electrical inspection. Handheld, analog and digital models with on-board sound recording and Data Logging; spectral analysis and data management software. Some models rated intrinsically safe.

Ultraflote Corp

8558 Katy Freeway, Suite 100, Houston, TX 77024, 713-461-2100, FAX: 713-462-2213, cover@ultraflote.com, www.ultraflote.com

Contact: Sr VP, Steve Hall
Designs, manufactures and installs internal floating covers and geodesic domes.

United Pipeline Systems

(sub of Insituform)
135 Turner Dr, Durango, CO 81303, 970-259-0354, FAX: 970-259-0356, jschmitz@insituform.com, www.unitedpipeline.com

Contact: Sls Dir, Jim Schmitz
Provides high density polyethylene (HDPE) lining system for protecting 2 to 52 in. diameter pipelines from abrasion and corrosion. The company has the trained manpower, specialized equipment and worldwide expertise to rehabilitate and protect new and existing pipelines both onshore and offshore.

United Products & Instruments

Unico Div
182-e Ridge Rd, Dayton, NJ 08810, 732-274-1155, toll-free: 800-588-9776, FAX: 732-274-1151, sales@unicosci.com, www.unicosci.com

Manufactures visible and UV/visible spectrophotometers and lab equipment for the petroleum and lab research industries.

UOP LLC Honeywell

25 E Alonquin Rd, PO Box 5017, Des Plaines, IL 60017-5017, 847-391-2000,
susan.gross@uop.com, www.uop.com
Supplies and licenses process technology, catalysts, adsorbents, process plants and consulting services to the petroleum refining, petrochemical and gas processing industries.

UPCO Inc

24403 AMAH Pkwy, PO Box 725, Claremore, OK 74018-0725, 918-342-1270, toll-free: 888-364-8726, FAX: 918-341-1278,
dbugg@upcoinc.com, www.upcoinc.com

Contact: VP Sls, Darla Bugg

Provides research and development of products to ensure full utilization of its design capabilities and enhancement in severe applications. Evolved into a company respected for commitment to the industry with ongoing design and performance projects to allow companies a choice.

US Leak Detection

Locate Underground Div
695 Nashville Park, #310, Gallatin, TN 37066, 615-989-1576, FAX: 615-989-1576,
budr@locateunderground.com,
www.locateunderground.com

Contact: Gen Mgr, Bud Reed

Provides leak detection systems for hydro test failure, pig locating, pipe locating, tools and systems.

Vacon Oyj

Runsorintie 7, 65380 Vaasa, Finland,
358-201-2121, FAX: 358-201-212-205,
info@vacoinc.com, www.vacon.com

Contact: Product Mgr/Liquid Cooled Driv, Jussi-Pekka Sampola

Creates, develops and provides AC drives worldwide. Offers AC drives in the power range of 0.25 kW to 5 MW. Since 1993.

Vaisala Inc

10 D Gill St, Woburn, MA 01801, 781-933-4500, toll-free: 888-824-7252, FAX: 781-933-8029,
instruments@vaisala.com, www.vaisala.com

Contact: Sls App Eng, Steve Jiroutek

Develops, manufactures and markets state-of-the-art relative humidity, dewpoint, carbon dioxide, oxygen, moisture in oil and natural gas, barometer pressure and wind transmitters, sensors and portable meters for industrial processes, HVAC/EMCS, R&D and OEM applications. With more than 70 years of experience in environmental measurement, the company is committed to accuracy and safety.

**Vallorec & Mannesmann Tubes**

Oil & Gas Div
27 ave du General Leclerc, 92660
Boulogne-Billancourt Cedex, France,
33-1-49-09-35-83, FAX: 33-1-49-09-37-13,
contact.boulogne@vmtubes.fr,
www.vamservices.com

Contact: Mktg Dev Asst, Hassna Belmalek
Provides premium connections and seamless tubes. Designs and manufactures tubular products (OD 2-3/8 to 16 in.) for the oil and gas industry, including drill-pipe, casing, tubing, accessories and risers. A network of licensees and site-support teams available anytime to provide services worldwide.

Van Air Inc

Van Gas Technologies Div
2950 Mechanic St, Lake City, PA 16423,
814-774-2631, toll-free: 800-840-9906, FAX:
814-774-0778, info@vangastech.com,
www.vanairinc.com

Contact: Mktg Svcs, Kat Yonko
Provides dehydrator production units that meet gas specifications without BTEX emissions. Environmentally friendly units have a low operating cost and offer consistent performance at variable flows and pressures. Originator of desiccant dehydration technology.

**Varec Inc**

5834 Peachtree Corners E, Norcross, GA 30092, 770-447-9202, toll-free: 800-447-4828,
FAX: 770-662-8939, sales@varec.com,
www.varec.com

Delivers automated systems and professional services for most major oil companies worldwide. "Fuels Manager Oil & Gas" is an integrated suite of software applications specifically designed for terminals, refineries and petrochemical plants, integrating with the company's product line of automatic tank gauging (ATG) instrumentation and communications interface devices.

SALES OFFICES:

Varec Inc
Houston, TX 281-498-9202, sales@varec.com,
www.varec.com

Varel International

1434 Patton Pl, Suite 106, Carrollton, TX 75007,
972-242-1160, toll-free: 888-273-5334, FAX:
972-242-8770, info@vareintl.com,
www.vareintl.com

Contact: VP Sls NW Hemisphere, William Burton

Manufactures and sells fixed cutter/PDC bits and roller cone bits to customers in every active oil and gas region in the world. Product sizes range from 2 7/8 to 36 in. The company is committed to delivering customers with quality products that deliver performance and value to its customer base.

Vector International

Baglan Way, Baglan Industrial Park, West Glamorgan, SA12 7BY UK, 44-1639-822555,
FAX: 44-1639-824000, ianr@vectorint.com,
www.vectorint.com

Contact: Bus Dev Mgr, Gary Walford
Designs and manufactures proven sealing technologies for onshore, offshore and subsea piping applications.

Velan

90 Rue C Lacour, F-69367 Lyon, France.,
ndomerc@velan.fr

Velan Inc

7007 Cote De Liesse, Montreal, Quebec, Canada H4T 1G2, 514-748-7743, FAX: 514-748-8635,
dvelan@velanvalve.com, www.velan.com

Contact: VP US Sls SW, Charles Pogue
Manufactures industrial steel valves for many industries, including complete valve solutions for the oil and gas industry. Offers valve solutions for onshore/offshore production, pipelines, refining, petrochemicals and LNG.

Veolia ES Industrial Services

3018 N Highway 146, Baytown, TX 77520-2665,
713-307-2150, FAX: 713-207-7622,
nancy.morris@veoliaes.com, www.veoliaes.com
Provides full service, turnkey industrial cleaning, mechanical and maintenance services and environmental waste management solutions. The company's Special Services Group delivers emergency response, high hazard response, inland and offshore marine diving and ROV services, abatement and remediation services.

VERSABAR Inc

11903 FM529, Houston, TX 77041,
713-937-3100, FAX: 713-937-7222,
sales@vbar.com, www.vbar.com

Provides design, testing, rental and delivery of spreader bars, slings, shackles and custom lift systems. In response to customer needs, provides custom hydraulic winch-based pulling/lifting systems supporting marine construction projects. Integrates engineering, planning, custom fabrication, equipment rental and field personnel to provide solutions to challenging projects.

Videx

1105 NE Circle Blvd, Corvallis, OR 97330,
541-758-0521, FAX: 541-752-5285,
sales@videx.com, www.videx.com

Contact: Sls Channel Mgr, Tish Phillips
Designs and manufactures CyberLock electronic padlocks. The padlocks, tough and intelligent, cannot be picked, and the electronic keys cannot be duplicated. Both the padlock and key store a record of openings and denied entries. Each user's key can be programmed to access selected padlocks during certain days/times.

Viking Life Saving Equipment

1400 NW 159th St, Suite 101, Miami, FL 33169,
305-614-6652, FAX: 305-614-6653,
www.vicking-life.com

Contact: Sls Dir, Keld Valentin
Designs, develops, manufactures, sells and maintains maritime evacuation systems, maritime liferafts, MOB boats and personal protective and safety equipment. ISO 9001 certified. Quality certified according to international DS/EN ISO 9001: 2000.

**Viking Pump Inc**

A Unit of IDEX Corp
406 State St, PO Box 8, Cedar Falls, IA 50613,
319-266-1741, FAX: 319-273-8157,
info.viking@idexcorp.com,
www.vikingpump.com

Contact: Prod Mgr, Jim Albaugh
Provides positive displacement pumping solutions for industrial, OEM and sanitary applications.

Voith Industrial Services Engineering GmbH

(Sub of Voith AG)
Kreuzholzstr 7, 67069 Ludwigshafen, Germany,
49-621-66008-80, FAX: 49-621-66008-53,
engineering-info@voith.com,
www.engineering.voithindustrialservices.de

Contact: Man Dir, Michael Haid
Offers engineering, construction and maintenance services for the oil and gas, petroleum, petrochemical, chemical, pharmaceutical, food, paper and power industry. The company's fields of competence include project management, process design, plant safety, basic and detail engineering, construction maintenance and turn-around planning and supervision.

V-Tech AS

V-Tech AS

Dronningens Gate 3, PO Box 22, N-4661 Kristiansand, Norway, 47-38-05-64-00, FAX: 47-38-05-64-01, post@v-tech.no, www.v-tech.no
Contact: Man Dir, Tor Hodne
Provides topside offshore drilling equipment.

WAGO Corp

N120 W19129 Freistadt Rd, Germantown, WI 53022, 262-255-6222, FAX: 262-255-3232, info.us@wago.com, www.wago.com
Contact: Mktg Mgr, Dean Norton
Provides innovative spring pressure connection technology designed to eliminate loose wires as a result of vibration and temperature cycling. Also provides reliable, corrosion resistant and maintenance-free connections. Product line includes Wall-Nuts, terminal blocks (DIN rail mount, chassis mount and PCB mount), relays, signal-conditioners, power supplies, surge suppressors, the Wago-I/O-System and more.

Walchem Corp

5 Boynton Rd, Holliston, MA 01746, 508-429-1110, FAX: 508-429-7433, info@walchem.com, www.walchem.com
Contact: Cust Svc Supv, Tom Malcolm
Manufactures controllers, metering pumps, sensors and accessories. Offers more than 50 years of experience with a commitment to quality and ingenuity.

Wall Colmonoy Corp

101 W Girard, Madison Heights, MI 48071-1880, 248-585-6400, wcc@wallcolmonoy.com, www.wallcolmonoy.com

Contact: Sls/Mktg Mgr, David Hart
Manufactures nickel alloys for coating and brazing; used for aerospace, petrochemical processing and a range of other industries. Also provides vacuum brazing, heat treating, thermal spray, thermal spray equipment; manufactures aircraft exhaust systems and repairs and overhauls exhaust and turbine engine parts.

Wanner Engineering Inc

Hydra-Cell Div
1204 Chestnut Ave, Minneapolis, MN 55403, 612-332-5681, FAX: 612-332-6937, tstack@wannereng.com, www.wannereng.com
Provides positive displacement hydraulically balanced diaphragm metering pumps, peristaltic hose pumps and non-metallic ANSI mag-drive and mechanically sealed centrifugal pumps.

Wartsila Corp

John Stenbergin Ranta 2, PO Box 196, FI-00531 Helsinki, Finland,

Watlow

12001 Lackland Rd, PO Box 46903, St Louis, MO 63146-4039, 314-878-4600, toll-free: 800-928-5692, FAX: 877-893-1005, info@watlow.com, www.watlow.com
Contact: Application Support
Designs and manufactures industrial heaters, sensors, controllers and software with offices and manufacturing facilities around the world.

Weatherford International Ltd

515 Post Oak Blvd, Suite 600, Houston, TX 77027, 713-693-4000, FAX: 713-693-7994, info@weatherford.com, www.weatherford.com
Operates in more than 100 countries, the company is a diversified upstream oilfield service company. Products and services offer everything for the life cycle of a well, from drilling to elevation to completion to production to intervention.

Weatherford Pipeline and Specialty Services

7721 Pinemont Dr, Houston, TX 77040, 713-580-9747, FAX: 713-580-9797, pss@weatherford.com, www.weatherford.com/pss
Contact: Global Sls/Mktg, Patti L. Meyer
Offers services used throughout the lifecycle of pipelines and process facilities. Pipeline services include cleaning, filling, testing, dewatering, drying, nitrogen purging, inspection and rehabilitation. Process services include leak detection, vacuum drying, bolting, chemical cleaning and pneumatic or hydraulic pressure testing of HP pipework.

WellDynamics

445 Woodline Dr, Spring, TX 77386, 281-297-1200, FAX: 281-297-1201, smartwell@welldynamics.com, www.welldynamics.com
Contact: Reg Mgr Americas, Colin Mckay
Provides intelligent completion technology. The company offers a complement of products and services that range from reservoir engineering studies to advanced completion design, zonal isolation and flow control, reservoir monitoring and surface digital infrastructure solutions. Operates offices around the globe.

Wellstream International Ltd

Wellstream House, Wincombe Rd, Walker Riverside, Newcastle Upon Tyne, NE6 3PF UK, 44-191-295-9000, FAX: 44-191-295-9001, sales@wellstream.com, www.wellstream.com
Contact: Sr Mgr Bus Acquisition, Steve Pywell
Provides quality spoolable pipeline products, systems and solutions to the oil and gas industry. Current portfolio includes offshore dynamic flexible risers and static flowlines for use to 2000 m WD, onshore flowlines (FlexSteel) suited to all onshore conditions and high temperature/high pressure products for drilling and service applications.

SALES OFFICES:

Wellstream Australia Pty Ltd
Perth, Australia 61-8-9278-2437, FAX: 61-8-9278-2727, sales@wellstream.com, www.wellstream.com
Wellstream Canada Ltd
Calgary, Alberta, Canada 403-261-8873, FAX: 403-269-3287, flexsteel@wellstream.com, www.wellstream.com
Wellstream International Ltd
Houston, TX 713-431-0900, FAX: 713-431-0880, sales@wellstream.com, www.wellstream.com
Wellstream DO Brasil Industria & Services Ltd
Rio de Janeiro, Brazil 55-21-2107-6500, FAX: 55-21-2107-6500, sales@wellstream.com, www.wellstream.com
Wellstream International Ltd
Denver, CO 303-537-4606, FAX: 303-357-4623, flexsteel@wellstream.com, www.wellstream.com

Wera Tools

7-710 S Service Rd, Stoney Creek, Ontario, Canada L8E 5S7, 905-643-6600, toll-free: 800-267-5541, FAX: 905-643-6604, info@weratools.com, www.weratools.com
Contact: Gen Mgr NA Oper, Ian Parkhill
Specializes in screwdrivers, screwdriver bits and adaptors. Committed to product innovation. A leading European manufacturer of screw fastening solutions, with offices in Germany, Great Britain, France, Canada, Spain and Singapore.

Westech Industrial Ltd

5636 Burbank Crescent SE, Calgary, Alberta, Canada T2H 1Z6, 403-525-8803, FAX: 403-523-6803, sales-export@westech-ind.com, www.westech-ind.com
Contact: Int'l Sls/Mktg, James Gillespie
Manufactures and distributes process equipment serving the oil, gas and petrochemical industries. Offers research, testing and manufacturing of in-line detonation and deflagration flame arresters. Provides explosion protection for vapor recovery systems (marine, truck and railcar loading), gas flaring, offshore drilling, well testing, storage terminals, processing plants and pharmaceutical.

Western Land Services Inc

54 W Seymour St, Sheridan, WY 82801, 307-673-1817, toll-free: 877-673-1817, FAX: 307-673-1823, wlswest@westernls.com, www.westernls.com
Contact: Dept Mgr, Jim Welch
Services the integrated oil and gas brokerage industry. Offers leasing, abstract preparation, title, curative, project layout, landowner liaison, water management, mapping, permitting, cultural and natural resources, regulatory compliance and baseline monitoring.

SALES OFFICES:

Western Land Services Inc-Corporate Headquarters
Ludington, MI 49431 800-968-4840, FAX: 231-843-3183, www.westernls.com
Western Land Services Inc-Regional Office Iola, KS 66749 620-365-7555, FAX: 620-365-7769, www.westernls.com
Western Land Services Inc-Regional Office Richfield, UT 84701 866-896-5521, FAX: 435-896-5515, www.westernls.com
Western Land Services Inc-Regional Office Gallipolis, OH 740-446-6800, FAX: 740-446-6802, www.westernls.com

Westfalia Separator Mineraloil Systems

Werner-Habig-Str 1, 59302 Oelde, Germany, 49-2522-77-0, FAX: 49-2522-77-1778, mineraloilsystems@gea-westfalia.de, www.westfalia-separator.com
Contact: Head Oilfield, Thomas Perschke
Delivers compact system solutions with high speed centrifugal separators. Main applications: drain water, drilling mud, crude oil, bilgewater, slop oils and even oil sands. Helps to improve return on capital employed and to meet most stringent environmental regulations.

Westlock Controls

(div of Tyco)
280 Midland Ave, Saddle Brook, NJ 07663, 201-794-7650, FAX: 201-794-0913, westlockinfo@westlockcontrols.com, www.westlockcontrols.com
Contact: VP Sls, Jack DiFranco
Provides innovative solutions for the networking, monitoring and control of process valves. Also provides an in-house engineering staff, 24/7 global service, a highly trained and responsive customer service team and products of outstanding quality, reliability and durability.

Westmark Bv

Postbus 82, 3930 EB Woudenberg, The Netherlands, 31-33-461-48-44, FAX: 31-33-461-24-61, westmark@cablesafe.com, www.cablesafe.com
Produces CABLESAFE, an "S" shaped hook made out of very strong nonconductive and heat resistant fiberglass, which is used for suspending cables and hoses during turnaround works in the oil and gas industry.

WFN Strategis

21495 Ridgeway Cir, Suite 201, Sterling, VA 20166, 703-444-2527, FAX: 703-349-5562, info@wfnstrategies.com, www.wfnstrategies.com

Contact: Man Dir, Wayne Nielsen
Provides telecommunications engineering for remote and unique communications requirements, including submarine and terrestrial optical cable, microwave, mobile/WiMAX, satellite and RF technologies for oil and gas company clients. Supports RFP efforts for telecommunications services and the physical deployment and develops the standards for system design, construction and maintenance.

WIKa Alexander Wiegand GmbH & Co KG

Alexander Wiegand Str 30, 63911 Klingenberg, Bayern, Germany, 49-9372-132-0, FAX: 49-9372-132-406, info@wika.de, www.wika.de

Contact: Peter Teich
Offers pressure and temperature measuring solutions worldwide. Delivers individual service and competent technical support through more than 500 experienced distribution employees.

WIKa Instrument Corp

Electrical Temperature Div
950 Hall Ct, Deer Park, TX 77536, 713-475-0022, FAX: 713-475-0011, info@wilaetemp.com, www.wika.com

Manufactures electronic and mechanical pressure and temperature instrumentation. With a line of thermocouples, resistance temperature detectors (RTDs), temperature transmitters, thermowells, IR pyrometers, calibration equipment and associated accessories that the Electrical Temperature Division can provide a solution for any temperature measurement task.

Wika Instrument Corp

1000 Wiegand Blvd, Lawrenceville, GA 30043, 770-513-8200, toll-free: 888-945-2872, FAX: 770-338-8200, info@wika.com, www.wika.com
Manufactures pressure and temperature instrumentation. Offers a line of mechanical and electronic pressure instruments, temperature instruments and diaphragm seals—manufactured under a quality system conforming to ISO 9001.

WIKa Instruments Canada Ltd

3103 Parsons Rd, Edmonton, Alberta, Canada T6N 1C8, 780-463-7035, toll-free: 800-667-6778, FAX: 780-462-0017, info@wika.ca, www.wika.ca

Contact: Sls Mgr, Victor Pawluk
Manufactures electronic and mechanical pressure and temperature instrumentation. With a line of pressure gauges, pressure transmitters, diaphragm seals, thermocouples, resistance temperature detectors (RTDs), thermowells, IR pyrometers, calibration equipment and associated accessories, the company can provide a solution for any measurement task.

Wilks Enterprise Inc

140 Water St, South Norwalk, CT 06854, 203-855-9136, FAX: 203-838-9868, info@wilksir.com, www.wilksir.com

Contact: VP Mktg, Carol K. Tunick
Manufactures a variety of mid-IR instrumentation, including the new handheld InfraSpec VFA spectrometer with no moving parts or optical air path for field, plant or laboratory use; the InfraRan specific vapor analyzer for on-site measurement of specific gases; and the InfraCal TOG/TPH analyzers for oil/grease measurement of produced water, wastewater and soil samples.

William Frick & Co

2600 Commerce Dr, Libertyville, IL 60048, 847-918-3700, FAX: 847-918-3701, sales@fricknet.com, www.fricknet.com

Contact: Mktg Mgr, Andrew Magnuson
Offers labeling, graphics and identification. Specializes in unusual durable and hard to produce labels, decals, signs and designs. Creates products and prototypes for utilities and major manufacturers worldwide. Full line of markers, signs, posts, tags and labels can be viewed at the company's website.

**Williams Milton Roy**

201 Ivyland Rd, Ivyland, PA 18974, 215-293-0415, FAX: 215-293-0498, info@williams.com, www.williamspumps.com

Contact: Prod Mgr, Coogan Cameron
Offers pneumatic pumps that are ATEX-approved and designed specifically for the harshest environments in the oil, gas and petrochemical industries. The pumps accurately inject chemicals, such as methanol, corrosion, paraffin or scale inhibitors, H₂S scavengers and more, in all phases of production both onshore and offshore.

Wood Group

17420 Katy Freeway, Suite 300, Houston, TX 77084, 281-828-3500, FAX: 281-647-3525, www.woodgroup.com

Contact: Dir Corp Comms Americas, Bobbie Ireland
Provides engineering and production facilities, well support and gas turbine services. Also provides a range of engineering, production support, maintenance management and industrial gas turbine overhaul and repair services to the oil and gas and power generation industries worldwide.

Wood Group Field Service

(div of Wood Group HIT Americas)
15600 JFK Blvd, Suite 500, Houston, TX 77032, 281-227-5627, FAX: 281-227-5688, roger.ford@woodgroup.com, www.woodgroup.com

Contact: VP Sis/Mktg, Roger W. Ford
Specializes in gas turbines, steam turbines, centrifugal compressors, recip compressor/engines, gear boxes and all related rotating equipment and auxiliaries. With offices located in Martinez and Los Angeles, CA; Houston, TX; New Orleans, LA; Minneapolis, MN; and Philadelphia, PA.

Wood Group Logging Services

19416 Park Row, Suite 100, Houston, TX 77084, 281-579-9879, FAX: 281-398-3410, wglsl@woodgroup.com, www.wglsl.com

Provides a line of cased hole products and services, including logging, perforating, pipe recovery, mechanical services, production diagnostics and optimization services, reservoir management and interpretation, reliable cased hole services, slickline services and production well testing. Brings a track record of support throughout the life of the well.

Wright Tool Co

One Wright Dr, PO Box 512, Barberton, OH 44203, 330-848-0600, toll-free: 800-321-2902, FAX: 800-543-2095, sales@wrighttool.com, www.wrighttool.com

Contact: VP Sis, Greg Helbing
Offers more than 4000 tools for the industrial, contractor and MRO markets. All Wright-manufactured products are US-made and carry lifetime guarantees against defects in workmanship.

(See ad p 53)

Yamada America Inc

955 E Algonquin Rd, Arlington Heights, IL 60005, 847-631-9200, toll-free: 800-990-7867, FAX: 847-631-9273, sales@yamadapump.com, www.yamadapump.com

Produces industrial equipment and fluid handling products. Air-powered double diaphragm pumps are available in 1/4 through 3 in. port sizes (flows to 214 gpm) with a variety of materials of construction to meet demanding fluid transfer needs.

You Sun Communications Co Ltd

(sub of China You Sun Corp)
2/F Office Bldg, Fulushanzhuang, 576 Shaoshan South Rd, Changsha, Hunan, 410004 People's Republic of China, 86-731-411-1858, FAX: 86-731-414-8719, august_chen@163.com, www.you-sun.com

Contact: Gen Mgr, Joseph Zheng
Serves as a comprehensive media agent and business promotion firm. Helps foreign manufacturers open Chinese markets.

Zok International Group Ltd

Elsted Marsh Midhurst, West Sussex, GU29 0JT UK, 44-1730-811920, FAX: 44-1730-811930, zok@zok.com, www.zok.com

Contact: Office Mgr, Lisa Montgomery
Offers gas turbine compressor cleaning fluids, with corrosion inhibition, approved for use by all major engine manufacturers. Available from global distribution network. Used in onshore and offshore applications, worldwide. Water based and biodegradable. Ensures maximum available power output, improved fuel efficiency and reduced wear and tear on machine components.

Zokman Products Inc

1220 E Gump Rd, Ft Wayne, IN 46845, 260-637-4038, FAX: 260-637-5031, zokman@aol.com, www.zok.com

Contact: Pres, Rick Parker
Distributes the ZOK 27 and ZOK mx gas turbine compressor cleaners, which are water-based, nonflammable, biodegradable cleaners that meet all the major OEM approvals and US MIL PRF 85704C.

Z/Soft Automation

Rua 11 de Junho, 780 - 7 Andar-Centro, Indaiatuba - Sao Paulo, 13.330-050 Brazil, 55-19-3875-1707, FAX: 55-19-3834-3972, zsoft@zsoft.com.br, www.zsoft.com.br

Contact: Bus Mgr, José Alberto Copini Pucci
Specializes in software solutions for industrial automation. Activities and technologies include PLC project and programming, supervisory configuration, tailor made software development as driver and gateway, information system, bottom floor to top floor integration, Internet, training and technical support.



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Fuel engine shutdown devices



Pneumatic panel components



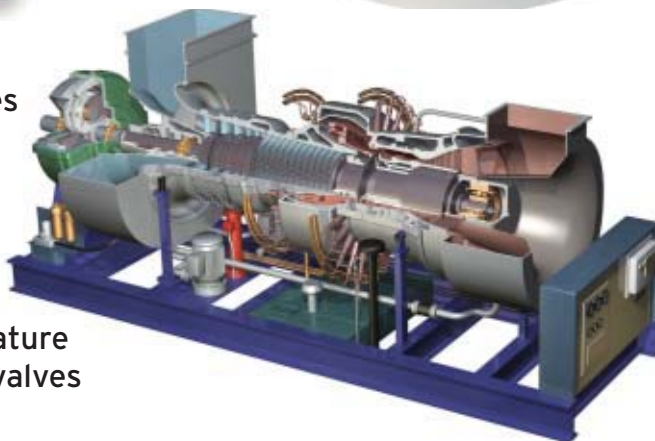
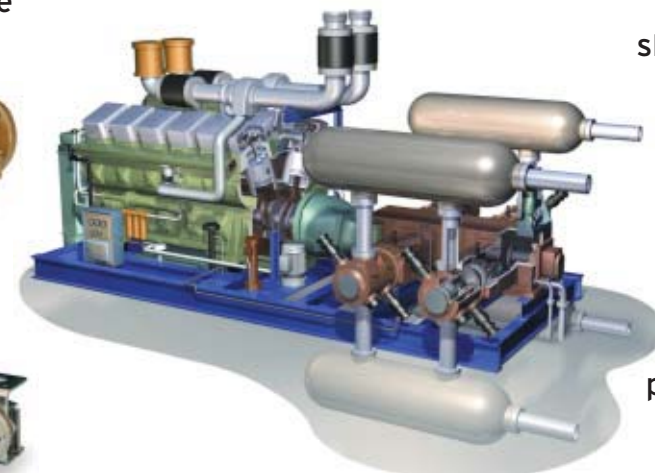
Diesel engine protective systems



Sensors & switches



Integrated temperature & pressure control valves



Oil condition monitoring



...with a small investment

Fuel & starting air valves



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