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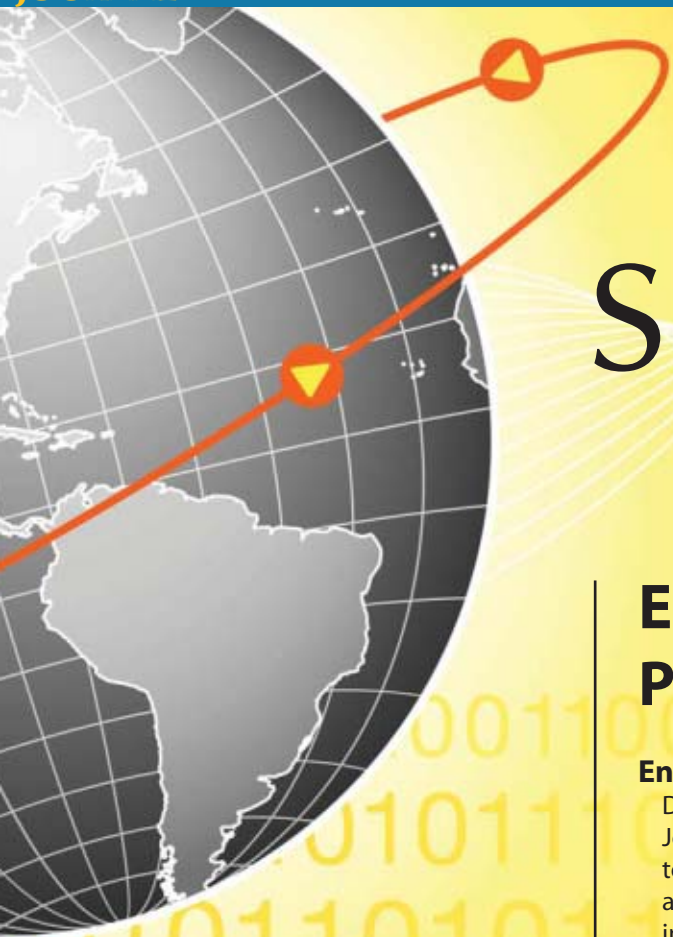
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Downhole Technology Review

***Saudi Arabia, UAE promote domestic sun, wind energy
New tool determines reserves of mature fields
Mideast olefins may—or may not—spell oversupply
Shell completes testing of record-setting tie-in plan***



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Volume 107.12

DOWNHOLE TECHNOLOGY REVIEW

HYDRAULIC FRACTURING—1: Natural fractures influence shear stimulation direction

Ian Palmer, John Cameron, Zissis Moschovidis, Jorge Ponce

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COVER

The rig is drilling Chesapeake Energy Corp's Kerr State 28-35 1H in Winkler County, Tex. (photo by David McNeese), a county in the Delaware basin of West Texas with tight sand prospects. The inset shows a workover in progress for drilling out frac plugs in Chesapeake's Walton 23-2 Haynesville shale completion in Caddo Parish, La. (photo by Bob Redding). Hydraulic fracturing is instrumental for producing from wells completed in tight sands or shales. Beginning on p. 37, OGJ's special report section provides an understanding of hydraulic fracturing in the presence of natural fractures. Photos from Chesapeake.



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DW10

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Mar. 23, 2009

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General Interest – Quick Takes

NGC: Tax proposals would harm gas industry

The Obama administration's proposed tax law changes would seriously damage a domestic gas industry, which is hurting already, the Natural Gas Council warned in a Mar. 17 letter to members of Congress.

The group, which is comprised of trade associations involved in the US gas industry from wellhead to burner tip, explained that investments in new US gas production come from three funding sources: selling the gas, obtaining credit from lenders, and securing private and institutional investors willing to commit capital to high-risk ventures.

"Unfortunately, new US natural gas projects are at risk. Dramatic reductions in natural gas prices this past year have reduced cash flow to producers, while the credit crunch has limited access to capital, and investors are more cautious than ever," the letter continued.

It said the White House's tax proposals, outlined in its proposed fiscal 2010 federal budget, would radically shift incentives for developing domestic gas, some of which have been in place since 1913.

"If these taxes are imposed on the industry, not only will prices rise for consumers, but tax and royalty revenues to the federal and state treasuries will diminish, and well-paying American jobs will be eliminated," the group warned.

Such results would run counter to the Obama administration's stated strategy of developing cleaner energy and reducing US reliance on foreign oil, it continued. "We urge you to reject these unjustified changes to energy tax policy. Congress must develop rational national energy strategies [which] rely on American energy first, including clean-burning, abundant American natural gas," the NGC's letter said.

The letter was signed by Independent Petroleum Association of American Pres. Barry Russell, Natural Gas Supply Association Pres. R. Skip Horvath, Interstate Natural Gas Association of America Pres. Donald F. Santa, and American Gas Association Pres. David N. Parker.

Uganda urged to 'audit' IOCs

Members of Uganda's parliament have been urged to keep a close eye on international oil companies operating in the country,

with a view to ensuring that oil revenues are properly revealed and shared.

"The government should regularly audit oil companies," said Sarah Wykes, an activist and researcher on oil and transparency issues with the London-based human rights organization, International Alert (IA).

"There should also be a parliamentary committee to ensure that the oil revenue was properly managed," said Wykes, who was arrested in Angola 2 years ago while attempting to assess the transparency of its oil sector.

Wykes told Ugandan parliamentarians that although revenue from oil had potential to lift people out of poverty, it could also bring suffering to the masses as it benefited just a handful of people.

"It is [incumbent] upon you to make sure that the common man benefits and that oil does not turn into a curse," said Wykes, who added that there is also a tendency of investors to exploit countries by giving them little revenue.

Wykes' remarks struck a chord with Uganda Member of Parliament Stephen Mukitale, who called on the government to carry out consultations on oil production. "We should know the prospective and production costs so that we are not cheated," Mukitale said.

Meanwhile, Ugandan rebels known as the Lord's Resistance Army (LRA) also are eyeing the country's oil resources.

LRA's chief negotiator David Matsanga told a news conference in Nairobi that the discovery of oil in Uganda's northern region could ignite a fresh war in the region.

"There might be a fight motivated by the need to protect the oil fields," said Matsanga, referring to oil discoveries around Uganda's Lake Albert that have been reported to be among the largest finds around the region.

Earlier this week, international oil companies operating in Uganda, who confirmed the discoveries, announced plans for stepped up production from the fields.

Tullow Chief Operating Officer Paul McDade said the company recently discovered more oil in the lakes region. He said first oil production would commence in 2010, with production rising to 20,000 b/d in 3-5 years and to 100,000-150,000 b/d in 10 years (OGJ, Mar. 16, 2009, p. 40). ♦

Exploration & Development – Quick Takes

StatoilHydro finds gas on Asterix prospect

StatoilHydro has made a natural gas discovery on its Asterix prospect, which lies in 1,360 m of water 345 km west of Sandnessjoen in the Norwegian Sea. The resources lie in Upper Cretaceous reservoir rocks, the company said, adding that preliminary

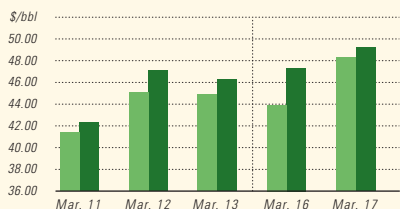
estimates put proved reserves at 16 billion cu m (about 100 million boe).

The Transocean Leader semisubmersible rig drilled wildcat well 6705/10-1 to a vertical depth of 3,775 m below sea level. The well is the first in production license 327B, awarded in 2007. Licens-

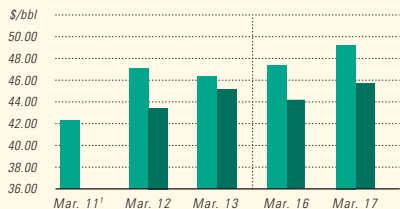
Industry Scoreboard

US INDUSTRY SCOREBOARD — 3/23

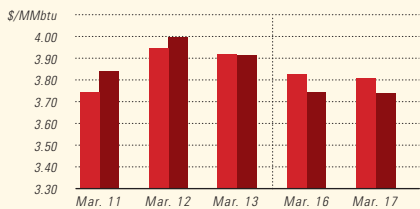
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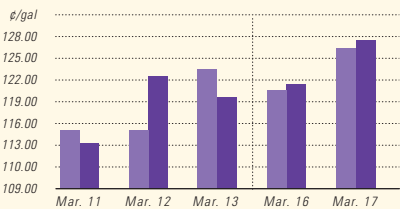
WTI CUSHING / BRENT SPOT



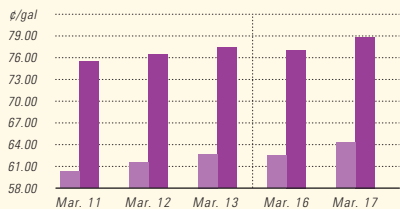
NYMEX NATURAL GAS / SPOT GAS - HENRY HUB



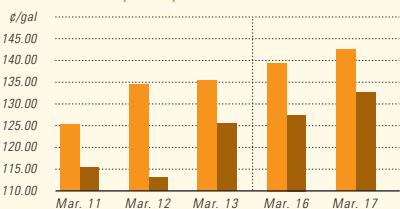
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PROPANE - MT. BELVIEU / BUTANE - MT. BELVIEU



NYMEX GASOLINE (RBOB)² / NY SPOT GASOLINE³



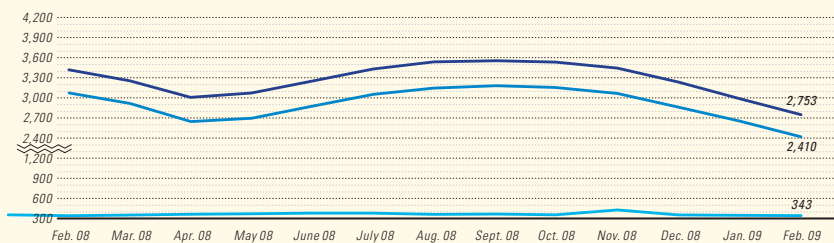
¹Not available ²Reformulated gasoline blendstock for oxygen blending. ³Nonoxygenated regular unleaded.

	Latest week 3/6	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	9,024	8,883	8,883	1.6	8,915	8,908	0.1
Distillate	3,974	4,231	4,231	-6.1	4,054	4,209	-3.7
Jet fuel	1,349	1,536	1,536	-12.2	1,347	1,546	-12.9
Residual	472	556	556	-15.1	591	672	-12.1
Other products	4,529	4,567	4,567	-0.8	4,602	4,631	-0.6
TOTAL DEMAND	19,348	19,773	19,773	-2.1	19,508	19,966	-2.3
Supply, 1,000 b/d							
Crude production	5,349	5,118	5,118	4.5	5,191	5,115	1.5
NGL production ²	2,118	2,208	2,208	-4.1	2,173	2,180	-0.3
Crude imports	8,928	9,602	9,602	-7.0	9,519	9,744	-2.3
Product imports	3,069	2,986	2,986	2.8	3,206	3,144	2.0
Other supply ³	1,364	1,422	1,422	-4.1	1,489	984	51.3
TOTAL SUPPLY	20,828	21,336	21,336	-2.4	21,578	21,167	1.9
Refining, 1,000 b/d							
Crude runs to stills	14,240	13,930	13,930	2.2	14,240	14,594	-2.4
Input to crude stills	14,625	14,883	14,883	-1.7	14,625	14,891	-1.8
% utilization	83.0	84.6	84.6	—	83.0	84.7	—

	Latest week 3/6	Latest week	Previous week ¹	Change	Same week year ago ¹	Change	Change, %
Stocks, 1,000 bbl							
Crude oil	351,339	351,339	350,590	749	311,626	39,713	12.7
Motor gasoline	212,517	212,517	215,510	-2,993	235,967	-23,450	-9.9
Distillate	145,404	145,404	143,296	2,108	116,400	29,004	24.9
Jet fuel-kerosine	41,564	41,564	41,692	-128	38,925	2,639	6.8
Residual	38,132	38,132	36,636	1,496	36,564	1,568	4.3
Stock cover (days)⁴							
				Change, %			Change, %
Crude	24.9	24.9	24.8	0.4	21.3	16.9	
Motor gasoline	23.6	23.6	23.9	-1.3	26.0	-9.2	
Distillate	36.6	36.6	35.3	3.7	26.7	37.1	
Propane	25.6	25.6	25.0	2.4	17.5	46.3	
Futures prices⁵ 3/13							
				Change		Change	%
Light sweet crude (\$/bbl)	45.68	45.68	43.26	2.42	103.42	-57.74	-55.8
Natural gas, \$/MMBtu	3.89	3.89	4.16	-0.27	9.59	-5.70	-59.5

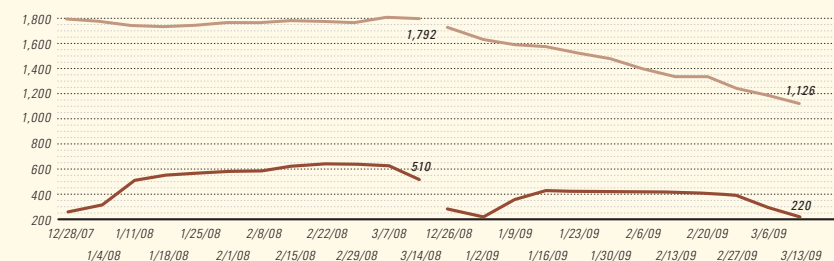
¹Based on revised figures. ²Includes adjustments for fuel ethanol and motor gasoline blending components. ³Includes other hydrocarbons and alcohol, refinery processing gain, and unaccounted for crude oil. ⁴Stocks divided by average daily product supplied for the prior 4 weeks. ⁵Weekly average of daily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

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Note: End of week average count



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ees are operator StatoilHydro 70%, Petoro 20%, and Norske Shell 10%.

No formation test was carried out, the company said, but extensive data gathering and coring took place in the reservoir before well 6705/10-1 was permanently plugged and abandoned.

The find represents "one of the bigger discoveries off Norway in recent years," said Tove Stuhr Sjoblom, StatoilHydro's head of Norwegian exploration.

Frode Fasteland, exploration manager for the Norwegian Sea, said, "Asterix will be considered for development together with Luva and the other nearby discoveries of Haklang and Snefrid South. That could help to lay the basis for a deepwater gas infrastructure in the Norwegian Sea." Asterix is 80 km west of Luva (OGJ, Apr. 3, 2006, p. 33).

StatoilHydro will now redeploy the Transocean Leader to production license 035B/362 in the North Sea to drill a delineation well on the Fulla structure.

Nexus places Crux project on short-term hold

Nexus Energy Ltd., Melbourne, operator of the proposed Crux field liquids-gas recycling project in the Browse basin off Western Australia, has put the project in temporary abeyance following failed attempts to sell down its interest in the development. The sales process has been managed by Deutsche Bank.

Nexus plans to minimizing future capital expenditures until market conditions improve. Nevertheless the company adds that it hopes negotiations over asset sales, debt raising alternatives, and

contractual obligations will be completed by the end of March.

Nexus says attempts to sell a stake in Crux have not resulted in an acceptable offer and, although it will continue to consider offers, the sale will not be actively marketed. It owns 85%, with Osaka Gas owning 15%. Nexus has been trying to sell as much as 30% of the project since the Japanese firm Mitsui walked away from a purchase deal in October 2008. Mitsui had planned to buy a 25% interest for \$255 million, but global financial problems interfered.

Crux has an estimated 75.2 million bbl of condensate.

Currently it is negotiating to secure funding for the drilling of the Auriga prospect, which has estimated potential reserves of 42 million bbl of liquids within tie-back range of Crux field.

Drilling on Auriga is expected to begin in late May. A success would greatly enhance the economics of the Crux project.

In the same Browse basin region, Nexus is preparing to farm out a stake in its Echuca Shoals field in permit WA-377-P.A successful farmout could result in a well's being drilled later this year to test the full potential of the field, which holds possibilities for an LNG-scale development.

Elsewhere, the company is pushing ahead with its Longtom gas development in Bass Strait and expects to bring the field on stream to fulfill its supply contract with Santos through the Patricia-Baleen production plant on Victoria's east Gippsland coast by mid-2009.

Nexus says its key priority is finding funding solutions, while ensuring that Longtom achieves a cash-flow positive position as soon as possible. ♦

Drilling & Production — Quick Takes

Shell completes Perdido topsides installation

Shell Oil Co. has completed installation of the drilling and production platform atop a 555-ft cylindrical spar at its Perdido development in 8,000 ft of water 200 miles from Houston in an isolated section of the Gulf of Mexico.

It is the deepest such facility in the world, company officials claimed (OGJ Online, Dec. 3, 2008).

Russ Ford, Shell's technology vice-president for the Americas, said, "Perdido is a technological tour de force that is opening up a new frontier for global oil and gas production." He said, "Producing oil safely and responsibly this far out and this deep should allay concerns about industry access to the 85% of the US Outer Continental Shelf that remains undeveloped."

Shell operates the Perdido project; its partners are BP PLC and Chevron Corp. Shell acquired the lease in 1996 and had to pioneer several technologies and operational



Shell Oil Co. recently completed installation of the drilling and production platform at its Perdido development in the Gulf of Mexico. Photo from Shell.

innovations before commercial development in 2006.

Over the next several months, 270 workers living on the platform and on an adjacent "flotel" will complete the commissioning and hookup to begin producing oil and gas. The platform is capable of producing 130,000 boe/d. Oil will be transported through 77 miles of pipelines, while gas will move through 107 miles of pipelines over the rugged sea floor to connect with existing offshore pipeline.

The Perdido subsea well was drilled to 9,356 ft below the water's surface and completed. The project intends to drill an even deeper well at 9,627 ft.

Nine polyester mooring lines more than 2 miles in length now hold the 50,000-ton floating structure in place. The facility includes a common processing hub to gather, process, and export production within a 30-mile radius. It is designed to provide regional synergies, reduce costs, and lower risk as well as minimizing the environmental impact in this frontier area. Officials said 10 innovative systems were designed to make Perdido a leader in health and safety.

In connection with its work on Perdido, Technip claimed two water-depth records. The Paris company installed a reeled flowline in 9,731 ft of water and a reeled steel catenary riser in 8,100 ft.

Under separate contracts, Technip supplied Perdido umbilicals and the hull and mooring system for the spar.

Roc Oil revises plan for Bass Strait project

Sydney-based Roc Oil Co. Ltd.—operator of the Basker-Manta-Gummy (BMG) oil and natural gas project in the Bass Strait—has revised its development plan and schedule to introduce several cost-saving measures.

During 2009 and 2010, the joint venture will focus on enhancing the production performance of the Phase 1 oil stage, at the same time reducing its development commitments for the Phase 2 gas development.

Roc has swapped its contracted use of the Songa Venus semisubmersible drilling rig with Shell Development Australia for use of the Ocean Patriot semi. Songa Venus is contracted to Shell for work in the Browse basin off Western Australia and to cover the Roc work in Bass Strait in July would have meant a long and expensive mobilization. Ocean Patriot is already in the strait. It will now carry out the planned 60-90 day program for Roc in May.

In addition, Roc has reduced its commitment for use of the Kan Tan IV jack up rig to 30 days from 143 days (originally to begin in March; now to begin in late 2010). This has been achieved through assignments of the rig to existing consortium members for work elsewhere.

Roc also says the gas flaring conditions for the BMG project have been revised to allow production to continue while modifications are made to the Crystal Ocean floating production, storage, and offloading vessel, which will remove the need for flaring during normal operations.

New topside facilities on the vessel include a low-pressure flare recovery compressor package to supplement the reinjection of produced gas. Cost of the new facilities, due for completion during the fourth quarter of this year, will be \$10 million (Aus.).

The aim of all these measures is to reduce overall development costs and ensure investments for the project are carefully managed in the time of lower oil prices and unsteady financial markets.

Interests holders in the project are Roc (through its ownership of Anzon Australia) 40%, Beach Petroleum 30%, Cieco Exploration & Production 20%, and Sojitz Energy 10%. ♦

Processing — Quick Takes

Motiva delays Port Arthur refinery expansion

Motiva Enterprises LLC has delayed until first-quarter 2012 the completion target for a project that will make its 285,000-b/d refinery at Port Arthur, Tex., the largest in the US.

Motiva, a joint venture of Shell Oil Co. and Saudi Refining Inc., originally planned to complete the \$7 billion expansion in late 2010.

The project will add a single-train crude distillation unit with a capacity of 325,000 b/d.

Other new units include an 85,000-b/d catalytic reformer with associated isomerization and hydrotreating units, a sulfur recovery facility, a 75,000-b/d hydrocracker integrated with a new 60,000-b/d diesel hydrotreater, a 50,000-b/d hydrotreater for feed to the existing catalytic cracker, and a 95,000-b/d coker.

Motiva also is adding a 150-Mw electric power station that will produce 2 million lb/hr of steam.

The expanded Port Arthur facility will be the country's largest refinery producer of sulfur and largest producer of petroleum coke.

The main project contractor is a joint venture of Bechtel and Jacobs Engineering Group.

The largest US refinery now is ExxonMobil's 572,500-b/d facility in Baytown, Tex.

Enterprise starts Meeker II gas plant service

Enterprise Products Partners LP reported the start of operations at its Meeker II natural gas processing plant in Colorado's Piceance basin.

The Meeker II expansion doubles the gas processing capacity at the Meeker complex to 1.5 bcf/d with the capability to extract as much as 70,000 b/d of natural gas liquids (NGL).

Enterprise also has started operations at its recently expanded Shilling and Thompsonville gas processing plants in South Texas, and the company expects the partnership's relocated Chaparral facility in the Permian basin to begin processing gas later this month.

The Meeker complex is supported by long-term commitments from 10 of the largest producers in the Piceance basin. Current inlet volume at Meeker is 750 MMcfd, with 38,000 b/d of NGL being extracted. Gas volumes are projected to reach 1.1 bcf/d by yearend, when NGL production is expected to reach 60,000 b/d.

“This expansion will facilitate the continuing growth in natural gas production from the Piceance basin that is expected in 2009 and 2010 despite the effects of the recent decrease in drilling activity,” said A.J. Teague, Enterprise executive vice-president and chief commercial officer.

Teague noted that, based on producer estimates, there are more than 300 wells that have been completed in the basin that are waiting for pipeline connections. Meeker, through its connection with the White River natural gas hub, affords producers access to markets through connections with six interstate pipelines having 2.5 bcf/d of total takeaway capacity, he said.

The Chaparral facility was an idle plant acquired in 2004 in the merger with GulfTerra Energy Partners LP and recently relocated from southeast Texas to serve producers in the Permian basin. The facility, which can handle as much as 40 MMcf/d of gas and extract more than 2,000 b/d of NGL, complements the partnership’s 900-mile Carlsbad gathering system in southeast New Mexico.

As part of the project, Enterprise constructed 13 miles of 4-in. NGL pipeline. It links the processing plant to Teppco Partners LP’s Chaparral pipeline, which transports NGL to the world’s largest fractionation complex at Mont Belvieu, Tex.

Expansion projects also have been completed and placed into service at two gas processing facilities that are part of Enterprise’s South Texas system. At the Shilling plant in Webb County, capacity has been increased to 110 MMcf/d from 60 MMcf/d as part of a project relocating equipment from idle plants and modifying existing infrastructure.

The partnership also modified existing equipment rather than building new systems to expand its Thompsonville gas processing plant in Jim Hogg County. Repiping and other efforts designed to enhance efficiency increased capacity at the facility to 330 MMcf/d from 300 MMcf/d while maintaining ethane and propane recovery percentages.

Chevron to sell stake in India refinery

Reliance Industries Ltd. will buy back Chevron Corp.’s 5% stake in a 580,000 b/d refinery in Jamnagar, India, at the original price of \$300 million.

Under the initial 2006 deal, Chevron had the option to raise its stake to 29%. Chevron, Reliance Industries, and the refinery’s operating company jointly decided not to consummate those agreements.

Chevron cited “attractive investment alternatives and continuing low global demand for refined products” as the reasons for its sale. ♦

Transportation — Quick Takes

Algeria’s Skikda LNG plant start-up delayed again

Algeria’s Skikda LNG plant will not come online until 2013, 2 years later than its earlier announced completion date, according to Chakib Khelil, Algeria’s oil minister.

“It’s being built, it’s advancing really well,” Khelil told Bloomberg News, adding that construction of the plant is about 20% complete and procurement of 70% of materials has been carried out.

Khelil’s announcement, which gave no explanation for the delay, marks a change in earlier statements about the plant’s projected start-up date.

In January 2008, Khelil told OGJ: “We are building another LNG plant in Skikda, and the contract was awarded to KBR so that will also be ready in 2011 (OGJ Online, Jan. 7, 2008).

Earlier, in April 2006, Khelil said that work on the facility was still under negotiation but he insisted that “the plant in any case will be ready in 2009, as scheduled.”

Three of the plant’s six trains were destroyed and another one was badly damaged when a boiler in one of the units exploded in January 2004, killing some 23 people and injured nearly 80.

In 2007, KBR said it won an engineering, procurement, and construction contract for the Skikda LNG project, valued at some \$2.8 billion.

In addition to performing the EPC work for the 4.5 million tonnes/year LNG train along with associated LPG and condensate recovery, KBR said it would execute the precommissioning and commissioning portion of the contract.

Colombia to acquire Enbridge’s share of oil line

Colombia’s Ecopetrol has entered into an agreement with En-

bridge Inc. to buy the latter’s 24.7% interest in the Oleoducto Central SA (Ocesa) oil pipeline, which extends from the country’s interior to the Caribbean coast, for \$417.8 million.

The transaction increases Ecopetrol’s stake in Ocesa to 60%. The company says the deal will allow it to more readily increase oil production in Colombia’s Eastern Plains region.

Enbridge became an owner and operator of Ocesa in 1995, with the pipeline entering service in 1996. The 525-mile Ocesa system can transport as much as 650,000 b/d of crude through 30-in. and 36-in. OD pipe from Cuisiana and Cupiagua fields to the port of Covenas. The system also includes five pumping stations, tankage, and marine loading facilities.

Other initial stakeholders in Ocesa were BP Pipelines 15.2%, Total Pipeline 15.2%, and Triton Pipeline Colombia 9.6%.

The agreement follows Ecopetrol’s announcement that it would acquire producer Hocol Petroleum Ltd. from Maurel & Prom, Paris, for \$748 million (OGJ Online, Mar. 10, 2009). ♦

Correction

In coverage of the 88th Annual Convention of the Gas Processors Association, OGJ incorrectly reported that Devon Energy Corp.’s 2009 capital budget was larger than its 2008 budget (OGJ, Mar. 16, 2009, Newsletter). Devon has cut its 2009 budget to “match reduced cash flow expectations,” it said.

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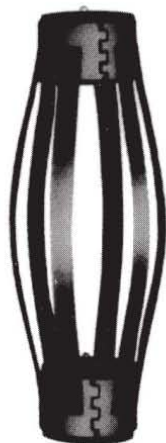


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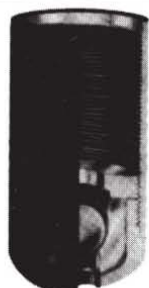
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L e t t e r s

Don't hike ethanol cap

I am strongly opposed to allowing even more ethanol in automotive gasoline for several sound technical reasons (OGJ Online, Mar. 9, 2009):

1. Production of ethanol from edible crops is not additive to energy supplies and increases food costs the world over.

2. We, The People, are heavily subsidizing ethanol use in gasoline. It is not energy additive or financially attractive without a gift from the US in the form of a tax credit.

3. Present "splash blending" of ethanol results in some batches greatly above 10%, causing vehicle damage. My son is a technician at a BMW/Mercedes/Volvo dealership. They have measured ethanol levels over 20%. Those levels caused failure of the catalytic muffler system of a new MBZ—not covered by warranty, requiring over \$5,000 to replace. When the shop adds 50 ml of water to 100 ml of the suspect fuel and gets 70 ml of water layer, that is conclusive proof of more than 20% ethanol.

4. Many people have experienced and are continuing to experience very costly (and polluting) fuel injector malfunction and failure caused by ethanol. The plastic used in the injector parts in many cars up to about 1998 are attacked by ethanol and swell and crack. Replacement parts are made of the same plastic and also fail. On some cars subject to this failure, it can cost over \$1,000 to replace a single failed injector, and the new part may fail in just a few months from the same condition.

Statements by the ethanol industry about 30 years of experience with the additive are valid concerning time but omit the known problems caused by high ethanol levels in many cars. Nor do they consider the decrease in engine efficiency (5-15% more fuel use) caused by ethanol blends in many cars and trucks.

I am a chemical engineer with 35 years of good experience in refining, consulting, and energy alternative development.

Keith E. Bowers
Consultant
Houston

C a l e n d a r

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

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Making a difference



Judy R. Clark
Senior Associate Editor

Malaria kills an African child every 30 sec and more than 1 million people a year, said Rex W. Tillerson, chairman and chief executive officer of Exxon-Mobil Corp., as he explained on “World Malaria Day” last April how the company is fighting the preventable disease.

ExxonMobil is the largest nonpharmaceutical corporate donor toward malaria research and development in Africa, it says. Through its Africa Health Initiative founded in 2000, ExxonMobil has committed \$50 million, partnering with and supporting such organizations as the Abuja Declaration on Roll Back Malaria in Africa, which has a goal of cutting the number of deaths from the disease by half by 2010.

The company, which has thousands of employees in Africa, is helping to develop new drugs, distribute insecticide-treated nets to places where they are needed, and educate people through health education sessions and a \$10 million donation in 2008 toward malaria research and development through the organization, Malaria No More. It also is raising international awareness and support for defeating the disease.

Chevron Corp. has a strong presence in Africa as well and is partnering with other private companies, such as Coca Cola, and local and national governments to combat malaria, tuberculosis, and another deadly disease, AIDS, especially in Africa. Chevron has made a \$30 million, 3-year commitment to the Global Fund to Fight AIDS. Partner initiatives present classes on awareness

and prevention, aggressively seek cures, support clinics, and provide testing, counseling, and training.

Companies giving back

In addition to supplying energy, which enables civilizations to advance in comfort, travel, engage in commerce, and prosper, most oil and gas companies also endow local communities with support advancing health, education, and training; schools, roads, housing, and other infrastructure; and culture and the arts.

Some companies donate funds to United Way-type umbrella groups or match funds their employees donate to their favorite charities. Some sponsor marathons, golf tournaments, or other major community activities to raise millions of dollars for various causes that make a considerable difference in the lives of people in some way every day.

The employees of many companies get involved in a personal way.

For example, for most of the 10 years that ConocoPhillips has operated in Vietnam, it has supported—through donations and employee time—an endeavor called “Operation Smile.” In this program, doctors perform free surgeries on children with cleft palates and other facial deformities that can present difficulties when eating and drinking and can cause respiratory problems. The doctors have performed more than 12,000 surgeries over 20 years to correct such deformities, making a tremendous difference in the lives and futures of these children.

ConocoPhillips also supports InFOCUS, which treats and prevents blindness in residents of developing countries. InFOCUS trains primary eye-care providers and promotes eye care for those who otherwise would not have such access.

“Worldwide, 35 million people suf-

fer from blindness that is either preventable or treatable,” ConocoPhillips says, “Studies show the leading cause of blindness is uncorrected visual refractive error—the lack of eyeglasses.”

In the Bohai Bay area of China, where nearsightedness (myopia) is especially prevalent, ConocoPhillips’s contribution to InFOCUS in 2005 helped 450 schoolchildren see better with eye care and new prescription glasses.

Education and art

Apache Corp., among its contributions, has donated to the rebuilding of a burned-out shelter-school for 200 boys and girls in Neuquen Province, Argentina, and through its Girls’ Education Initiative, it raised funds and supervised the building of 200 one-room school buildings in Egypt in areas having high rates of out-of-school girls. It also built two schools for Bedouin children.

The company’s Ucross Foundation, established by Apache founder Raymond Plank in 1981, is an artists’ colony on a 20,000-acre working cattle ranch the foundation leases in Wyoming. It has provided residencies, work space, and uninterrupted time to more than 1,300 visual artists, writers, and composers, Apache says. Works written there include Annie Proulx’s Pulitzer Prize-winning novel, “The Shipping News;” Liz Gilbert’s international best-seller, “Eat, Pray, Love;” Adam Guettel’s Tony Award-winning musical, “The Light in the Piazza;” and Doug Wright’s Pulitzer-Prize-winning play, “I Am My Own Wife.”

Through its Apache Foundation, the company also is distributing 1 million trees across the US. “One acre of forest puts out four tons of oxygen...and removes six tons of carbon dioxide,” the company says. “So we expect that 1 million trees will take 1 million tons of CO₂ out of the air.” ♦



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Offshore

E d i t o r i a l

Ethanol's new rescue cry

Every time fuel ethanol blows off its economic moorings, as state-sponsored energy always does, Congress obliges with new support. The latest rescue, enacted in 2007, is looking expensive and probably unfeasible. Plant economics, meanwhile, have soured. Predictably, the ethanol industry wants new help.

Ethanol's history should make fans of government support for noncommercial energy cautious. Since 1978, fuel ethanol made from grain has enjoyed various, generous tax breaks, without which it would not be commercial. Because ethanol boosts octane, it already had a natural market after federal regulations phased lead out of gasoline in the mid-1970s. But that wasn't enough.

In the 1980s Congress passed several inducements to ethanol plant construction, imposed a protectionist import fee, and increased the gasoline excise exemption and income tax credit for blenders. In the 1990s, new requirements of oxygen in gasoline played to an ethanol advantage, although the additive required yet more special help in the form of relaxation of volatility limits. It also had to compete with methyl tertiary butyl ether, which could be processed into gasoline at the refinery and didn't need subsidization.

Fortunes brighten

Ethanol's fortunes brightened with passage of the Energy Policy Act of 2005 (EPACT). The law removed the oxygenate requirement for reformulated gasoline but compensated ethanol producers in two important ways. It didn't limit MTBE suppliers' damage exposure in lawsuits over water supplies found to contain the oxygenate. And it set a mandate for renewable fuels, mainly ethanol, phasing up to 7.5 billion gal in 2012.

MTBE quickly exited the market, replaced by ethanol. Construction of ethanol plants boomed. By 2007 overcapacity and a predictable leap in grain prices were squeezing plant economics. So Congress rescued ethanol again with the Energy Independence and Security Act, raising the renewable fuel standard immediately to sop up the surplus and escalating it to 36 billion gal by 2022, of which 15 billion gal can be from grain. Much of the balance is expected to be ethanol made from cellulose. But that material has yet to be produced

commercially despite governmental research assistance in effect since the 1970s.

The governmental help ethanol has received is unprecedented. Ethanol boosters habitually argue that subsidization is a matter of fairness, given historic subsidies for oil and gas. In fact, oil and gas never have received help approaching levels enjoyed by ethanol on a per-energy-unit basis (OGJ, Mar. 2, 2009, p. 18). Their use certainly isn't mandated by Washington, DC.

The ethanol industry's new cry for rescue results from failure by Congress to anticipate markets or otherwise think about what it was doing when it hiked the renewable fuel standard to zany levels in 2007. The portion of the gasoline market limited to 10% ethanol blends soon will be saturated. That leaves the fleet of flex-fuel vehicles, which can use the 85:15 ethanol-gasoline mixture known as E85, to absorb incremental volumes as the ethanol mandate rises.

The Energy Policy Research Foundation Inc. (www.eprinc.org) sees problems. The price of E85 must be low enough to overcome mileage disadvantages if flex-fuel motorists are to buy it, EPRINC points out in a study. But the price of ethanol has to be high enough to ensure supply. As mandates rise, refiners will have to push E85 by discounting price. Meanwhile, they'll incur new costs as they cut crude runs and handle growing amounts of ethanol.

EPRINC thinks refiners might have to recoup \$1/gal of ethanol sold in transport fuel. "This cost can only be recovered through higher prices for E10 and distillate and, depending on a wide range of factors, could easily drive gasoline and distillate prices up by 10-25¢/gal over the next 2-3 years as compared to a scenario with the fuel mandates," it says.

Ignoring warnings

Ethanol's friends in Congress have ignored all such warnings when they've rescued ethanol in the past. They'll probably ignore the cost hikes along with warnings about harm to vehicle engines now as they answer the ethanol lobby's appeal for a blend cap in normal gasoline above 10%.

The story has no end. Neither do the costs. ♦



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GENERAL INTEREST

Saudi Arabia, UAE promote energy from sun and wind

Justin Dargin
Harvard University
Cambridge, Mass.

It would seem unlikely that the Persian Gulf region, so commercially dependent on fossil fuel production and exportation, would lead the world's search for the 21st Century's energy source. However, the Gulf Cooperative Council (GCC) nations—Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and the UAE—are planning a multitude of projects to exploit the region's seemingly limitless sun and wind and to pioneer efforts to limit their fossil fuel dependence.

The UAE, particularly Abu Dhabi, leads the race to strategically develop sustainable renewable energy sources—with Saudi Arabia close behind.

At the November 2007 Organization of Petroleum Exporting Countries summit in Riyadh, where one of the core strategies was clean technology development, the Persian Gulf members of OPEC pledged to devote \$750 million to study the viability of clean energy, with a particular focus on carbon capture and storage (CCS) technology. Some incredulous detractors questioned their sincerity, as most of the money was earmarked for CCS, which is designed primarily to extend the viability of hydrocarbon use.¹ However, OPEC and the GCC nations understand that fossil fuels are an exhaustible resource. They also recognize that they can utilize their prodigious amounts of sun and wind power to transition to next-generation renewable technology for both domestic use and for exporting to Europe.

City of the future

While other GCC nations have started the race to green technology, Abu Dhabi has quickly moved ahead. Although Saudi Arabia has made early strides in the study of solar power, and

This is the second of two articles addressing renewable and sustainable energy. The first was written by Harry Parker (OGJ Mar. 16, 2008, p. 24).

Qatar is studying the benefits of wind energy, the next generation of GCC green energy is solidly in the UAE.

Saudi Arabia, one of the first to initiate renewable energy pilot projects in the 1980s, seemed to have rapidly lost its desire as oil prices regained their stability in the late 1980s.

Abu Dhabi intends to build upon the technological progress made since then in economies of scale to catapult itself to the head of an alternative energy boom.

Abu Dhabi, which traditionally is a less-traveled destination in the UAE and much less glitzy than its sister emirate, Dubai, caused predictable mirth in the energy community in 2006 when it announced a \$22 billion, comprehensive, clean energy plan called the Masdar (“Source”) Initiative.

The Masdar Initiative has six logistical components that will function as catalysts to commercially reinvent Abu Dhabi and—by extension—the wider UAE.

When unified, the Masdar Initiative will transform the UAE's energy consumption patterns.

The initiative's six components are construction of the world's first carbon-neutral municipality, Masdar City, and further development of the Masdar Institute of Science and Technology (MIST), the Masdar Research Network, the Innovation and Investment unit, the Carbon Management unit, and the Special Projects unit.

Abu Dhabi hopes the academic and corporate partnership, as exemplified by MIST, will soon enable the exportation of high-grade renewable energy technology.

However, the Masdar Initiative branches that receive the lion's share of attention and funding are Masdar City and the carbon business unit.

Masdar City is designated as a near-zero waste, zero carbon, and automobile-free city to be located in the expansive desert at the edge of Abu Dhabi. Housing about 50,000 inhabitants alongside 1,500 anticipated businesses, it carries a price tag of \$22 billion and will take about 8 years to build. Fig. 1 is

an artist's rendition of the future city.

Plans for Masdar City, which will use only renewable energy resources, would eliminate 99% of the waste stream.² Planners anticipate solar energy as the principal fuel source and foresee residents traveling in magnetic trains that crisscross the city.

However, Masdar City does not lack its chorus of critics as the UAE allegedly has the world's largest carbon emissions per capita. Detractors argue that Masdar City will merely be a showcase city without any substantive work to realign the energy industry.³

Because the UAE sometimes experiences crippling power outages due to its rapid population growth and shortage of gas, others argue that the drive for sustainable energy arises from its own domestic needs, rather than global environmental concerns.⁴ Masdar's carbon business unit is tasked with the triple mandates of setting up carbon emissions trading, taking advantage of the Kyoto protocol's Clean Development Mechanism program, and developing marketable CCS technology. Hydrogen Energy International Ltd., a joint venture of British Petroleum and Rio Tinto, will develop Masdar's CCS project, which will cost \$3 billion and is expected to start operations during the first quarter of 2013.⁵

The initial capture will be 2 million tonnes/year of carbon dioxide to be used for enhanced oil recovery. Every tonne of CO₂ injected would lead to an extra 2.5-3 bbl of oil recovery.⁵ The CO₂ will be captured from heavy-carbon-emitting industries across the UAE, with an aim to monetize it in the form of carbon credits in an eventual regional carbon market set up in the next several years.⁶



Artist's rendition of proposed Masdar City in Abu Dhabi. The carbon-neutral, zero-waste city will be powered solely by renewable energy, including solar and wind energy. Mubadala Development Co. unit Abu Dhabi Future Energy Co. will build the city, with anchor partner GE creating power for the next-generation "smart" electrical grid, water purification technology, and energy-efficient home appliances (Fig. 1).

Oil producing countries are studying CCS technology because they feel it will show that fossil fuels will be viable for many more decades, Kyoto Protocol notwithstanding.

Furthermore, if pumped into aging oil fields, captured carbon could supplant valuable, exportable natural gas in its role of increasing oil field pressure.

Not only does Abu Dhabi aspire to have Masdar be the largest CCS user in the world, it intends to leverage its expertise with financial investment in the global drive for clean energy. The Masdar Clean Tech fund has a \$250 million starting investment budget to develop a wide-ranging portfolio in alternative energy development internationally.⁷

The government of Abu Dhabi, through Abu Dhabi Future Energy, has put \$100 million into the clean tech fund, while Credit Suisse and the Consensus Business Group have put in \$100 million and \$50 million, respectively.⁷

Hydrogen power plant

The Abu Dhabi Masdar Initiative is more advanced by far than its neighbors' clean energy activities. In 2008, Masdar executives announced an ambitious deal with Hydrogen Energy to build one of the world's first commercial hydrogen power plants, which would cost about \$2 billion and would have a generation capacity of about 420 Mw.⁸

The hydrogen plant will capitalize on two emerging technologies—hydrogen manufacture and carbon sequestration.⁹ The objective is to produce hydrogen via steam reforming of natural gas. The resultant CO₂ can be used to increase pressure in mature oil fields or can be simply stored underground.

The planned hydrogen plant, along with the planned construction of a 100 Mw concentrated solar

plant in Medina Zeyad, will add to the UAE's current power generation capacity of 16,670 Mw.¹⁰

Abu Dhabi hopes that its initial investments will be catalysts for international investment when investors recognize renewable energy's potential profitability. Abu Dhabi's objective, of course, is to maintain global energy primacy. Where it now exports oil and gas, it desires to soon export advanced renewable energy technology, coupled with renewable power through an intraregional electrical network, such as the pan-GCC power grid.

Saudi solar strides

Saudi Arabia has taken initial steps to create a solar industry to eventually service a portion of its domestic energy demand.

Sheikh Ahmed Zaki Yamani, the influential former Saudi Minister of petroleum and mineral resources once

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explained the Kingdom's interest in renewable energy by saying, "The oil won't last forever."¹¹

Saudi Arabia is located in the heart of one of the world's most productive solar regions. This region is a large, rain-free area that stretches from Morocco to the eastern edge of Central Asia and receives the most potent kind of sunlight.

Saudi Arabia developed some of the first renewable energy projects in the Middle East as early as the late 1970s and early 1980s. In 1977, the Saudi Arabian National Center for Science and Technology and the US Department of Energy, as part of a joint cooperation agreement, developed the Saudi Solar Village project, which supplied a village 20 miles outside of Riyadh with consistent electricity.¹² While the project was pronounced a success, not much such activity has since occurred.

However, that may soon change.

EU-MENA Supergrid

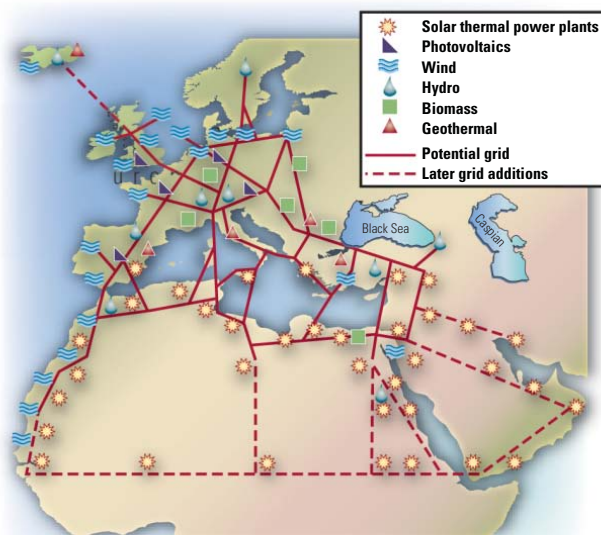
The Middle East-North Africa (MENA) region is gaining new attention, partly because the European Union is considering a transcontinental super energy grid that would harvest the sun's power for export to Europe (Fig. 2).

The Trans-Mediterranean Renewable Energy Cooperation (TREC) is the concept of a consortium led by the Club of Rome, senior members of the German Aerospace Bureau, and several universities in Europe and the Middle East.

TREC is integral to a political initiative that will build a super-grid that spans the MENA region but focuses on Saudi Arabia's being the solar powerhouse. TREC is to be powered by concentrated solar thermal power (CSTP) plants and wind turbines, with the electricity to be carried by high-voltage, direct current, long distance power transmission lines to Europe, while

CONCEPT FOR EU-MENA¹ POWER TRANSMISSION GRID²

Fig. 2



¹Possible sustainable facilities to supply power to Europe, the Middle East, and North Africa (EU-MENA). ²High voltage, direct current electric power grid with power transmission losses to Europe less than 15%. Sources: Trans-Mediterranean Renewable Energy Cooperation (www.desertec.org), the DESERTEC WhiteBook, various studies

powering seawater desalination plants in MENA (Fig. 2).

TREC's primary goals are to develop clean energy that minimizes the carbon imprint of the EU and MENA and to reduce the EU's dependence on Russian natural gas.

One notable difference between the current solar power concepts and the projects dating from the 1980s is that the massive projects of today are intended to provide considerable amounts of electricity to national and even transnational energy grids.

Earlier projects were more concerned with the decentralization of power needed for such goals as providing rural villages with stand-alone power generation units, primarily because it was uneconomical to provide power from the centralized grids to such remote areas.

CSTP offers the best economies of scale for large, low-cost solar power production.¹³ A recent study, based on satellite images by the German Aerospace Center, illustrates that using less than 0.3% of the vast desert area in MENA for CSTP would produce adequate electricity and desalinated water for both the EU and MENA regions.¹⁴ CSTP plants generally are ideal for pro-

ducing secure solar power.

It is estimated that every year sunlight representing the potential for generating 630,000 Tw-hr of power falls unused on the deserts of the MENA states.¹⁵ To place it in perspective, Europe uses 4,000 Tw-hr/year of energy—0.6% of the unused solar energy falling in the MENA deserts.¹⁵

CSTP technology

The basic technology that undergirds CSTP is elementary: CSTP plants use curved mirrors called "parabolic trough collectors" that concentrate sunlight to create heat, which generates steam to drive steam turbines that, in turn, generate electricity (see photo of California CSTP model).¹⁵

Heat storage tanks, such as molten salt storage areas, can be used to store heat during the day to run the steam turbines at night. The plan has a clear preference for CSTP over photovoltaics because CSTP can supply electricity for periods up to 24 hr. And CSTP is a proven technology that has provided electricity in Nevada and California since the 1980s.¹⁶

The TREC plan, which requires initial state support to reach the goal of producing a capacity of 100 Gw of exportable solar power by 2050, has gathered some high-profile endorsements. These include Jordan's Prince Al Hassan, French President Nicolas Sarkozy, and UK Prime Minister Gordon Brown. Sarkozy's support for the multinational grid is consistent with his goal to create a more robust Mediterranean bloc of nations. A MENA-EU energy grid would serve as a first step for such an interconnected bloc.¹⁷

Even though the plan for a transnational solar grid has not developed beyond the conceptual stage, there are certain pressures, such as the energy shortages and the finite quantity of petroleum, that drive the concerned par-



The Solar Electric Generating Station IV power plant in California has many parallel rows of parabolic trough collectors that track the sun. The cooling towers at right show water plumes rising into the air. White water tanks are in the background. Photo by Sandia National Laboratory

ties towards this potent energy source, with Saudi Arabia taking the first steps in that direction. European and MENA leaders envision such a super grid as an optimal solution that serves both Europe and the Middle East: It would address Europe's energy needs and MENA's massive desalination requirements.

Saudi Arabia's role

After the pilot schemes to develop solar energy in the 1980s, Saudi Arabia is taking a much more active approach to solar power development.

In March 2008, Saudi Arabia's oil minister, Ali al-Naimi, stated that Saudi Arabia's strategic plan is to sharpen its solar energy expertise, essentially modeling it on the expertise that Saudi Arabia enjoys in the oil industry. Al-Naimi advised the French Newsletter Petrostrategies: "One of the research efforts that we are going to undertake is to see how we make Saudi Arabia a center for solar energy research, and hopefully over the next 30-50 years, we will be a major megawatt exporter."¹⁸

Echoing the official view, Al-Naimi explained that solar energy was the cleanest of renewable energy and that its usage should expand to all parts of the world and all economic sectors, particularly those involving manufacturing

and power generation.¹⁹

Despite these declarations, CSTP is still not competitive with conventionally generated energy. Consistent with Saudi statements, however, experts estimate that by 2020, solar thermal-produced power will be competitive with traditional fossil fuels.²⁰

The enhanced use of solar power should, logically, contribute to price stability in the solar energy markets, as the sun's power is unlimited and quite stable in the cloudless desert. However, most experts estimate that it will take at least another decade to bring the cost down to 9-11¢/kw-hr, buttressed by well-sited plants and large economies of scale.²¹

Yet many argue that the West is just expressing wishful thinking when it contends that weaning itself off of fossil fuels will lead to energy security. If energy dynamics evolve along the present trajectory, the same geopolitical factors that pervaded the Oil Age may very well persist in the Renewable Energy Age, if one region remains the dominant producer.

Oil, gas primary

However impressive these renewable energy projects are to the development of power generation in Saudi Arabia and Masdar City in Abu Dhabi, it is anti-

ipated that oil and gas will remain the primary fuels for the world's vehicles and manufacturing facilities for the foreseeable future.

It is understandable that the GCC countries wish to increase oil and gas supplies for export and to reserve renewables for domestic usage. But the GCC preference for renewable energies is also the result of certain market inefficiencies; for example, the previously mentioned GCC gas crises and power outages that result from artificially low administrative prices in GCC markets.

Renewables also could serve as an energy source to satisfy the peak generation needs of the rapidly industrializing Gulf countries.

Yousef Omais Ben Yousef, CEO of Abu Dhabi National Oil Co., represented the pervasive governmental view when he stated that he saw neither conflict nor rivalry between renewables and oil and gas. When asked, he declared: "I don't see Masdar as a competitor or an alternative...there is room for both."²²

Illustrating the Saudi response to the economic crisis, Saudi King Abdullah—at the emergency economic summit held in Washington, DC, on Nov. 15, 2008—pledged to invest more than \$400 billion in the strategic Saudi industrial sectors, with the bulk going

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to oil field development.²³ That sums up the strategic view for the region: to be the flagship in the movement towards a future of renewables while simultaneously hedging its bets in the current Oil Age. ♦

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OPEC aims at full compliance with existing quota

The Organization of Petroleum Exporting Countries, noting signs of market strengthening, agreed in a Mar. 15 meeting in Vienna to seek full compliance with a quota cut announced in December.

The exporters' group had been expected to focus on compliance with the earlier target rather than adjust the quota again (OGJ Online, Mar. 11, 2009).

The group said "secondary sources" had reported 79% compliance in Febru-

ary with the December decision, which in conjunction with an earlier quota adjustment was to have reduced output by 4.2 million b/d to 24.85 million b/d.

It said that level of compliance with production targets "has contributed to balancing the price of the OPEC reference basket at around \$40/bbl since the beginning of the year, despite the critical economic outlook."

It cited forecasts that the global economy will contract by 0.2% this year, bringing annual average oil de-

mand down by 1 million b/d to 84.6 million b/d.

OPEC expects supply from outside its membership to grow by 400,000 b/d this year to 50.7 million b/d. That balance would lower the requirement for OPEC crude oil production by 1.8 million b/d to 29.1 million b/d in 2009.

The group noted "some initial signs reported of a reversal in crude oil stock trends and a narrowing of the contango in the front price structure." In a contango market, forward prices exceed

those of crude for immediate delivery.

OPEC's expectation of an increase in non-OPEC supply differs from the view of the International Energy Agency (OGJ Online, Mar. 13, 2009). In its March Oil Market Report IEA projected non-OPEC supply at 50.6 million b/d, unchanged

from 2008 (see story, this page).

IEA's projections, which include average annual oil demand of 84.4 million b/d, imply a need for OPEC crude oil, with no stock change, of 28.8 million b/d.

A third major source of market data,

the US Energy Information Administration, this month forecast global oil demand at 84.27 million b/d, down 1.38 million b/d from 2008, and non-OPEC production at 49.76 million b/d, up 10,000 b/d (OGJ, Mar. 16, 2009, p. 36). ♦

IEA, OPEC cut 2009 oil market demand, supply forecasts

The International Energy Agency and the Organization of Petroleum Exporting Countries have revised their forecasts for 2009 oil demand and supply in their latest monthly oil market reports. All the revisions were downward.

The Paris-based IEA has lowered its forecast for 2009 non-OPEC supply growth to zero following a new look at ongoing problems, including gas leaks and power outages, at Azerbaijan's offshore Azeri-Chirag-Guneshli complex in the Caspian Sea.

In its previous monthly oil market report, IEA had forecast that non-OPEC supply would grow 380,000 b/d this year. This month's revision leaves 2009 output flat from 2008, averaging 50.6 million b/d.

In contrast, OPEC now projects in its March oil market report that 2009 non-OPEC oil supply will increase 400,000 b/d from 2008 to average 50.7 million b/d. This new estimate is a downward revision of 200,000 b/d from the organization's previous assessment, however, mainly due to revisions to the output forecasts for Mexico, Norway, Russia, and the UK, OPEC said.

Demand outlooks

IEA slightly lowered its global oil demand forecast to average 84.4 million b/d this year, a contraction of 1.2 million b/d from 2008 due to a reassessment of demand prospects in the former Soviet Union, Asia, and North America. This includes a cut of 130,000 b/d from Russian 2009 demand amid signs that economic slowdown there is gathering pace.

Meanwhile, OPEC forecasts that

2009 worldwide oil demand will decline 1 million b/d from last year. This is a 400,000 b/d downward revision from the organization's previous forecast.

OPEC said the revision takes into account the continued deterioration in the world economy and the accompanying erosion in demand growth, noting that the decline in demand will extend across all regions except the

Middle East and China.

Oil demand in the Organization for Economic Cooperation and Development countries is expected to decline 1.3 million b/d this year, while demand outside the OECD is projected to increase only 300,000 b/d from a year ago, according to OPEC projections.

February supply

IEA estimates that global oil supply

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in February averaged 83.9 million b/d, down 1 million b/d from January and down 3.4 million b/d from a year earlier. OPEC crude supply, at 28 million b/d, was down 1.1 million b/d from January.

The agency said a concerted effort by some OPEC members to rein in produc-

tion in line with lower output targets and, to a lesser extent, operational disruptions in other countries, led to near 80% compliance last month with the cumulative 4.2 million b/d target cuts agreed since September 2008.

Full compliance with agreed sup-

ply cuts would take OPEC output 1.6 million b/d below the 2009 call on OPEC crude, implying a potential draw in OECD stocks. Such full compliance would tighten the market even without further cuts to the target at the Mar. 15 meeting, IEA said. ♦

OPEC oil exports at 5-year low, analyst says

Eric Watkins
Oil Diplomacy Editor

Seaborne oil exports of the Organization of Petroleum Exporting Countries, excluding Angola and Ecuador, will fall to a 5-year low in the four weeks to Mar. 28, according to analyst Oil Movements.

Exports from the group will average 22.76 million b/d, down 350,000 b/d from 23.11 million b/d, in the 4-week period to Feb. 28, Oil Movements said in its weekly estimate.

"On the evidence available late last month, the rate of decline in OPEC sailings had looked set to accelerate," Oil Movements said.

It noted, however, that "provisional estimates for the rest of this month instead show ongoing steady decline, at a rate of 0.3-0.4 million b/d per month."

The analyst observed that OPEC oil ministers met the same weekend as the finance ministers of G20 countries.

Both meetings are to address problems running out of control.

"OPEC opted for 'shock and awe' in December but has failed to take ownership of prices, up to this point," it said.

"Whatever further action on further production restraint OPEC opts for this week, the impact on long haul crude arriving in the region will not become fully visible until late April-early May," Oil Movements said.

Meanwhile, production cuts through the year to date have "certainly had an effect on the tanker market, but not to the scale implied by the size of the targeted cuts."

Fixtures for OPEC cargoes show volumes slipping below those of a year ago through the year to date (and for most of the time since last November). But the year-ago difference has rarely climbed above 1.5 million b/d so far, and is not very different from the gap visible in estimated sailings.

"In a downswing of the order implied by OPEC target cuts, the spot market would normally take most of the adjustment; full compliance would have imposed a much heavier burden than this," the analyst noted.

Considerable stock "overhang" at yearend was in the Atlantic Basin, and although OPEC's supply cuts have fallen short of targets, the cuts that have surfaced have fallen mainly in this quarter.

Westbound sailings from the Gulf are around 1 million b/d below year ago, and a high proportion of that difference is likely to be accounted for by Saudi initiatives on compliance.

As a result, with the help of the recent recovery in eastbound crude flows out of the area, the year-ago deficit in Atlantic Basin net inflows will reach 0.7 million b/d at end quarter.

Moving into the spring quarter, according to Oil Movements, "this will help to move stock figures back into line." ♦

Russia declines OPEC membership; offers alternative

Eric Watkins
Oil Diplomacy Editor

Russia has proposed sending a permanent envoy to the Secretariat of the Organization of Petroleum Exporting Countries in an effort to coordinate policies, again declining membership in the group.

"We can live without [OPEC] membership but we want to have closer dialogue with OPEC to exchange data, information, and ideas and that's why we raised the idea

of having a permanent representative here at the secretariat," said Russian Deputy Prime Minister Igor Sechin.

"We believe that with this initiative a sustainable and prompt exchange of views between the parties concerned could be established," said Sechin. "We believe it to be very important in a time of the [global] crisis."

The Russian proposal of a permanent envoy is an attempt at compromise with OPEC, according to Sechin. "The OPEC

secretariat insists on Russia's accession [to the organization] and we insist on signing a memorandum [between OPEC and Russia's energy ministry]."

While the Russian official did not rule out the possibility of his country joining OPEC at some point in the future, he said that membership would take place "only if all our agreements with the cartel are fulfilled."

Sechin did not spell out any of Russia's agreements with OPEC. Instead, he

WATCHING THE WORLD

Eric Watkins, Oil Diplomacy Editor

Blog at www.ogjonline.com

proposed several ideas for consideration, including the creation of new trading centers for oil, harmonized taxation of oil producing companies, and preferential long-term contracts for oil supplies.

"It is necessary to create a trading floor where the amounts sold would be strictly in line with the real supplies. That would rule out speculation," he said, conveniently adding that Russia's St. Petersburg commodity exchange could be used for the purpose.

Sechin also called on OPEC, as well as non-OPEC states friendly to the group, to coordinate their crude oil tax policies. He said such coordination should cover all facets of oil policy and "would ensure stability" of the oil market.

He also said, "The preferential application of long-term oil shipment contracts would be a strong instrument in making the market more stable and more predictable."

Such contracts, he said, "would help take due account of real outlays related to the extraction and transportation of oil while forming the price, and allow producers to plan investment in long-term projects."

Meanwhile, Sechin said Russia has proposed holding an international conference in the autumn, with OPEC and other oil producers invited.

"We proposed holding an international conference in Moscow in autumn 2009 with the participation of OPEC members, independent oil producing states, and major oil companies and investors," he said.

"The idea of the conference is to discuss long overdue issues pertaining to energy security and stable development of the oil market," Sechin said. ♦

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Algeria deserves a tax break

Algeria's energy minister Chakib Khelil recently urged gas-consuming nations to rethink their tax policies if they are to remove barriers and encourage imports (OGJ, Mar. 2, 2009).

Khelil gave a broad hint concerning his intended target, saying: "If it is recognized that the gas is cleaner energy than coal, it must be given a tax advantage."

The Algerian energy minister was perhaps referring to possible changes in Europe's taxation of energy that could emerge when the European Commission (EC) early next month tables a proposal to revise the 2003 EU energy tax directive.

While such a proposal is only being mooted at the moment and may never be tabled, Khelil is leaving nothing to chance as he sees an opportunity to change a law that could be viewed as hindering his country's natural gas exports.

Gas lumped with coal

In 2003, when revising its tax laws on energy, the EC welcomed the unanimous adoption of a directive by the EU's council of ministers widening the scope of the minimum rate system—previously limited to mineral oils—to all energy products including coal, natural gas, and electricity.

"This important directive provides for a more realistic system of minimum tax levels on all competing sources of energy," said European Commissioner for Taxation Frits Bolkestein.

"The directive will improve the functioning of the internal market and help to meet the environmental objectives of the community and the

Kyoto Protocol," Bolkestein said.

But Khelil clearly does not think that natural gas should, uh, be lumped together with coal, and he wants the Europeans to amend the energy tax laws to ensure that his country's natural gas gets a break.

He's right on that, and the Europeans should pay him greater heed, especially given the wrangles they have had—and the deep worries they still have—regarding Russia as a reliable supplier of natural gas.

Khelil a willing ally

In Khelil, the Europeans have not only an able supplier of natural gas but one who has shown himself more than willing to work with them politically to provide it.

Remember destination clauses that restricted where the buyer of the gas could resell it, something the EC believed broke EU competition law?

Well, about 2 years ago, the Algerians—led by Khelil—decided to drop destination clauses in the interests of seeing state-owned Sonatrach as "an active player in an open, transparent, and competitive EU gas market."

At the time, EU Competition Commissioner Neelie Kroes recognized the importance of the Algerian gesture, describing it as "a major breakthrough in our relations with one of Europe's most important suppliers for gas and eliminates an important obstacle for creating a single EU-wide market in gas."

Back then, Algeria clearly played ball with Europe. Now, as Khelil suggests regarding the possible upcoming changes in the taxation of energy, the ball is assuredly back in Europe's court. ♦

GENERAL INTEREST

Worldwide oil, natural gas deal value plunges

Paula Ditrack
Senior Staff Writer

The total transaction value for worldwide upstream corporate and asset deals plunged to \$104 billion in 2008 compared with an annual average of nearly \$160 billion during 2005-07, consultants said in an annual report.

John S. Herold Inc. and Harrison Lovegrove & Co. Ltd. on Mar. 13 released highlights of their joint 2009 Global Upstream Mergers and Acquisitions Review, an analysis of more than 280 major upstream transactions announced in 2008. They released an analysis of US transactions on Mar. 17.

The analysts said the upstream merger and acquisition market again appears ripe for considerable consolidation. The expectation is that corporate takeover activity will increase this year and into 2010.

"The number of assets coming to the market is expected to increase," the report said. "However, the buyer universe may be smaller than in the past, at least in the near term, as many of the companies that completed transactions over the last 4 years now lack the resources to remain active in the M&A market."

During first-half 2008, deal activity was occurring at a record pace. But the pace slowed dramatically in the second half, particularly in the US and Canada.

The steep second-half decline sent the worldwide deal count to a 4-year low from a record high level in 2007. During 2008, 203 transactions were announced by July 31.

Deals slow on lower oil prices

"Then the market tailed off precipitously to just 79 in the final 5 months of [2008] due to plunging commodity prices and the extreme weakness in equity and credit markets," the report said. "Activity in November and December was a record low 25 deals, half the historical average."

The total value for corporate transactions was \$34.2 billion in 2008 compared with \$64.2 billion in 2007 and \$120.2 billion announced in 2005. The corporate deal count was a 5-year low, with no US corporate transactions in the fourth quarter.

The value for transactions involving oil and gas assets dropped during 2008 after rising for 6 consecutive years.

Total worldwide asset transaction value fell to \$70.1 billion from the

record \$88.2 billion in 2007. But 2008 asset transaction values still marked the second highest on record. Asset transactions accounted for a record 67% of total worldwide transaction value and 80% of US transaction value.

Unconventional gas resources in Canada, the US, and the Asia-Pacific region represented nearly 40% of total 2008 global M&A activity.

Buyers competed vigorously for coal seam gas assets in Australia and shale gas interests in the US and Canada. The gas weighting of transacted reserves reached 70%, marking a 10-year high.

The largest 2008 global upstream transaction was ConocoPhillips's \$5.9 billion purchase of 50% interest in the coal seam methane projects from power retailer Origin Energy Ltd., Sydney. That transaction was announced in September.

Other Australia transactions included BG Group's \$2.9 billion acquisition of Queensland Gas Co. and Petronas's \$2 billion investment in the coal seam gas and LNG project of Santos (OGJ, July 14, 2008, p. 42).

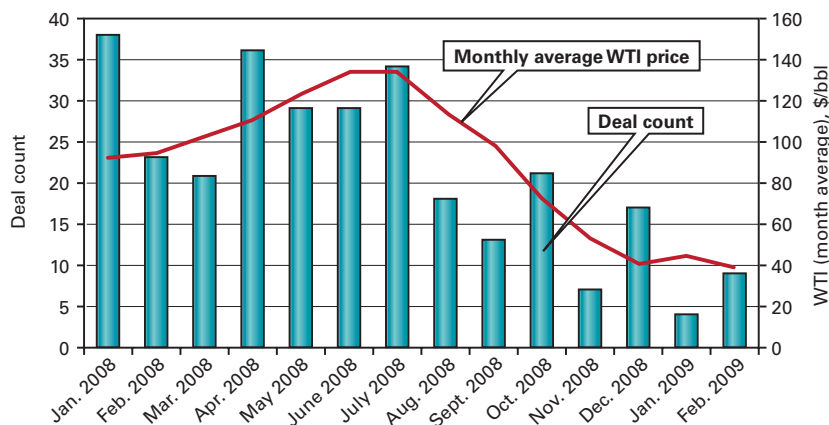
Meanwhile in the US, shale gas transactions accounted for more than 35% of 2008 deal value. Gas represented more than 70% of acquired US proved reserves for the third consecutive year.

Chesapeake Energy Corp. sold more than \$12 billion of US onshore assets during 2008, including forward-sale volumetric production payment transactions.

Chesapeake's divestments involved interests in producing properties and leases to form joint ventures with StatoilHydro (Marcellus shale), Plains Exploration & Production Co. (Haynesville shale), and BP PLC (Fayetteville and Woodford shales) (OGJ, July 14, 2008, p. 42).

XTO Energy spent more than \$8 billion on nine US transactions, including a \$4.2 billion corporate acquisition

WORLD UPSTREAM DEAL COUNT*



*Announced deals greater than \$10 million.
Sources: John S. Herold Inc. and Harrison Lovegrove & Co. Ltd.

of Hunt Petroleum Corp., a private company.

Reserves values increased

Worldwide weighted average pricing for proved reserves increased to \$11.51/boe, up from \$10.01/boe in 2007. In the US, the weighted average pricing for proved reserves soared to \$19.11/boe in the second quarter and

then retracted in the second half.

The average deal pricing for the US in 2008 was a record \$16.56/boe because of the strong first-half performance.

Internationally, national oil companies continued to be active buyers. NOCs and Sovereign Wealth Funds based in Asia, the Middle East, Europe, and Latin America accounted for

a record 15% of global open market transaction value during 2008.

NOC transactions included six of the 10 largest asset deals last year. Analysts said NOCs continued to be the most active acquirers in the first quarter, analysts said.

John S. Herold is an IHS company, and Harrison Lovegrove belongs to Standards Chartered Bank. ♦

MMS, BLM must clarify lease policies, acting IG says

Nick Snow
Washington Editor

Federal oil and gas leasing programs could do more to encourage leaseholders to move more aggressively toward production, the US Department of the Interior's acting inspector general told a congressional subcommittee on Mar. 17.

Mary L. Kendall told the House Natural Resources Committee's Energy and Minerals subcommittee that DOI's IG office recently completed an evaluation of nonproducing federal oil and gas leases for US Rep. Norman D. Dicks (D-Wash.), who chairs the House Appropriations Committee's Interior and Environment subcommittee.

"In addition to some very challenging data integrity and lease oversight issues, we found that the [US] Bureau of Land Management and the [US] Minerals Management Service need to develop much clearer policy concerning the expectations of production of oil and gas on federal lands. We recommended that [DOI] consult with Congress in this regard," she said.

Kendall said investigators from her office found that producers who hold federal leases have little obligation to actually produce oil and gas, and that DOI has no formal policy to compel them to bring the leases into production.

"While current statutes, regulations, and policies do promote exploration, production activities are not required

to commence within the primary lease term. The bureaus do not inquire about the production strategies of companies and have not attempted to enforce the performance clause included in lease agreements," she said in her written testimony.

"Both industry and bureau officials cautioned, however, that mandating production activities may not necessarily have positive outcomes and could, in fact, be counterproductive by reducing industry interest in federal leases," Kendall said.

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GENERAL INTEREST

MMS Lease Sale 208 attracts \$703 million in high bids

Apparent high bids totaling just over \$703 million were offered for 348 tracts in the central Gulf of Mexico at Lease Sale 208, reported the US Department of the Interior's Minerals Management Service Mar. 18 in New Orleans.

MMS received 476 bids totaling nearly \$994 million from 70 companies at the sale. The tracts offered covered nearly 1.9 million acres off Louisiana, Mississippi, and Alabama.

The highest bid received on a tract was \$65,611,235 submitted by Shell Gulf of Mexico Inc. for Mississippi Canyon Block 721. The block receiving the greatest number of bids was Walker Ridge Block 134 with 6 bids.

Interior Secretary Ken Salazar, who attended the lease sale and then later toured an offshore production platform in the gulf's Mississippi Canyon area, told reporters that the number of companies participating in the sale showed a "high level of interest" in the central gulf area, despite a dramatic decline in the total amount bid. Last year, MMS's Central Gulf Lease Sale 206 attracted \$3.7 billion in apparent high bids, which set a record in US leasing history

for high bids since area-wide leasing began in 1983 (OGJ, Mar. 24, 2008, p. 38). During that sale, MMS received 1,057 bids from 85 companies on 615 tracts.

During this year's sale, there was a total of 13 tracts receiving bids in the 181 South Area of the central gulf, Salazar noted, and the high bids for these tracts totaled \$6,476,545. Alabama, Mississippi, Louisiana, and Texas will all share in 37.5% of the high bids on these tracts as well as all future revenues generated from this acreage leased in the 181 South Area as mandated by the enhanced revenue sharing program in the Gulf of Mexico Energy Security Act of 2006. Additionally, 12.5% of revenues from the tracts in the 181 South Area will be deposited into the Land and Water Conservation Fund for use by states to enhance parklands and for other conservation projects.

Shortly after bids were announced, American Petroleum Institute Pres. Jack Gerard said in a statement, "The results of Lease Sale 208 underscore that, like most US industries, the domestic oil and natural gas sector faces tough

economic challenges, not only with the economy reeling but with oil prices half of what they were a year ago."

Gerard said, "The Obama administration's plans to add billions of dollars in new taxes would have a devastating impact on an industry that supports 6 million jobs and contributes billions of dollars to government revenue. These new taxes are ultimately anticonsumer, threatening millions of jobs, the nation's economic recovery and energy security."

Sale results, top bidders

The ultradeep water was a big draw at the sale. Of the tracts receiving bids, 106 blocks lie in greater than 2,000 m of water, 39 lie in 1,600-2,000 m of water, and 69 are in 800-1,600 m of water.

The top five companies submitting the highest dollar amount of high bids for Lease Sale 208 included Shell Gulf of Mexico Inc., 39 bids, \$153,631,475; BP Exploration & Production Inc., 27 bids, \$77,466,559; Marathon Oil Co., 16 bids, \$62,441,178; Noble Energy Inc., 24 bids, \$55,442,147; and BHP Billiton Petroleum (Deepwater) Inc., 28 bids,

Dispenses with rhetoric

Kendall made her observations at the House Natural Resources subcommittee's hearing examining oil and gas production on the US Outer Continental Shelf. Rep. Jim Costa (D-Calif.), the subcommittee's chairman, said he was determined to examine the lease diligence question without the rhetoric that characterized congressional debate on the matter last summer.

"Perhaps no single statistic was used more last year than the number 68 million, as in 'There are 68 million acres of nonproducing federal oil and gas leases in the United States.' While an accurate number, by itself it told us very little," Costa said in his opening statement.

"One side argued that oil companies were just sitting on these leases and they should 'use it or lose it.' The other side argued that these leases had no oil and gas beneath them, and we needed to provide new acreage to the industry so they could 'drill, baby, drill.' To me, both of these positions are nonsensical," he maintained.

Costa said witnesses at the Mar. 17 hearing also included a representative from the Government Accountability Office, which also has been examining whether federal leaseholders are aggressively trying to produce oil and gas from their tracts.

"From their reports, this much is clear: The answers here are not solely on one side or the other. Companies are not just sitting on their leases and refus-

ing to drill, but they are also not being blocked by lawsuits at every turn or... stuck with land that has no resources," he said.

Many reasons

He noted that many factors can explain why a lease does not produce oil and gas, including regulatory delays, workforce shortages, equipment shortages, and many other complexities. "Understanding these reasons in a more thoughtful manner will allow us to move forward more intelligently and ultimately help us figure out how domestic oil and gas production will fit into our short-term, medium-term, and long-term energy strategies," Costa said.

Rep. Doug Lamborn (R-Colo.), the subcommittee's ranking minority mem-

RESULTS OF CENTRAL GULF OF MEXICO LEASE SALE 208

Top 10 companies based on sum of high bids submitted

Company	Total high bids	Sum of high bids, \$
1. Shell Gulf of Mexico Inc.	39	153,631,475
2. BP Exploration & Production Inc.	27	77,466,559
3. Marathon Oil Co.	16	62,441,178
4. Noble Energy Inc.	24	55,442,147
5. BHP Billiton Petroleum (Deepwater) Inc.	28	50,393,232
6. Statoil Gulf of Mexico LLC	9	49,276,000
7. Repsol E&P USA Inc.	20	48,545,024
8. ExxonMobil Corp.	15	24,484,400
9. Chevron USA Inc.	21	22,400,166
10. Ecopetrol America Inc.	26	20,558,066

Companies submitting Top 10 single highest bids

Company	Block	Water depth, m	High bid amount, \$
1. Shell Gulf of Mexico Inc.*	Mississippi Canyon 721	800-<1,600	65,611,235
2. Marathon Oil Co.*	Walker Ridge 578	>2,000	46,471,680
3. Repsol E&P USA Inc.			
4. Noble Energy Inc.*	Green Canyon 774	800-<1,600	31,786,250
5. BP Exploration & Production Inc.*	Mississippi Canyon 418	800-<1,600	29,194,317
6. Shell Gulf of Mexico Inc.*	Mississippi Canyon 720	800-<1,600	23,511,235
7. Eni Petroleum US LLC*	Walker Ridge 133	1,600-2,000	22,000,222
8. Cobalt International Energy LP			
9. Samson Offshore Co.			
10. Marathon Oil Co.*	Walker Ridge 579	>2,000	19,375,173
11. Repsol E&P USA Inc.			
12. Shell Gulf of Mexico Inc.*	Green Canyon 114	800-<1,600	17,011,235
13. Marathon Oil Co.*	Walker Ridge 134	1,600-2,000	16,226,128
14. Statoil Gulf of Mexico LLC*	Keathley Canyon 698	>2,000	14,289,000

*Denotes the submitter.

Source: US Minerals Management Service

\$50,393,232.

Norway's StatoilHydro reported it was the highest bidder on 23 leases.

"The leases we acquired are in deepwater and predominantly in

high quality Miocene sands, in which StatoilHydro is participating in several promising discoveries, including Tahiti, Heidelberg, Caesar-Tonga, and Knotty Head," the company reported.

ber, noted that Congress extensively debated the nonproducing leases issue last year after the Natural Resources Committee's majority staff issued a report on the subject.

"Unfortunately, that debate was held on the House floor and not in this subcommittee. The result was the dissemination of a tremendous amount of misinformation about the process and status of oil and gas development on our federal lands and the OCS," Lamborn said.

"Now we all know that there are no domestic companies sitting on vast reserves of oil. There are, however, many state-run companies that are part of the [Organization of Petroleum Exporting Countries] cartel who are committed to hoarding oil to drive up prices. That

isn't an option for American companies who only make money by bringing the oil out of the ground," Lamborn said.

New policies proposed by US President Barack H. Obama are more disturbing than statements about domestic producers not aggressively developing their leases, because Obama clearly relied on information from the committee majority staff's report, he continued. "Last year, it was the 'Use it or lose it' legislation. This year, it's the president's budget, which includes a billion dollars in new taxes just on operations in the Gulf of Mexico," he said.

"These new 'nonproducing' fees will charge companies while they wait for federal permits, evaluate seismic data,

or spend billions to build the infrastructure needed to produce oil from deep beneath the sea floor. These fees will not make companies develop any faster. In fact, they constitute a purely punitive proposal designed for what appears to be cheap political gain. They will, however, harm domestic development by discouraging companies from investing in marginal leases, thus reducing investments in new development and ultimately leaving us more dependent on foreign sources of oil," Lamborn maintained.

'Litany of obstacles'

Kendall said investigators from her office found that the three primary reasons many federal leases were not in active production were: data integrity issues in the MMS and BLM systems, "a litany of obstacles cited by oil and gas companies," and limited statutory requirements on either DOI or the oil and gas industry to promote production.

"We believe that improved and more comprehensive data would assist in instituting a monitoring program for nonproducing leases and [would] paint a much more accurate picture of the production status of DOI leases. Similarly, a better understanding of the processes and problems leading to production would lead to a more accurate perception by the public of the production status of DOI leases. Further, more explicit statutory or regulatory mandates would contribute to clearer expectations on the part of both DOI and the oil and gas industry," she said in her written testimony.

Frank Rusco, GAO's natural resources and environment director, told the committee that the congressional watchdog service has found many material weaknesses in the numerous evaluations of federal oil and gas management it has conducted in recent years.

Weaknesses include DOI's doing less to encourage development of federal leases than some state and private landowners; MMS and BLM's employing different practices for deciding which properties to lease and when; their not

WATCHING GOVERNMENT

Nick Snow, Washington Editor

Blog at www.ogjonline.com

Independents begin long haul

The opportunity was too tempting to resist.

After US President Barack H. Obama hosted a small business roundtable at the White House Mar. 16, Independent Petroleum Association of America Pres. Barry Russell reminded him that independent producers are small businesses too.

"The median number of full-time employees at these oil and gas exploration and production companies is 12, and these companies have been reinvesting 150% of their cash flow back into the development of new technology aimed at finding and producing more energy from fewer wells," Russell said on Mar. 17.

"As the president moves forward on an aggressive plan to support and promote small businesses through new federal grants and significant loan guarantees, all we're asking for is a level playing field on which to continue our critical work," he continued.

Unfortunately, the Obama administration's proposed federal budget for fiscal 2010 targets US oil and gas producers with billions of dollars in new taxes and compliance costs, Russell said. "At a time of unprecedented insecurity, with millions of Americans out of work, a more prudent approach would be one that supports all of America's small businesses," he said.

Eight key provisions

In a Mar. 17 letter to Obama, IPAA's president said the budget proposed ending eight key tax provisions that aid smaller US producers. "Taken together, these tax changes would strip more than \$25 billion from US natural gas and oil production investment (money spent in the US) and would most hurt indepen-

dent oil and natural gas producers," he said.

"This budget would cripple America's independent producers and negate any such improvement that might be seen from the announcement you made yesterday," Russell told Obama.

Independent producers and their associations had already responded quickly to the administration's oil and gas tax proposals. IPAA held its 2009 Washington Call-up the week of Mar. 2-6 as more than 30 of its members came to the nation's capital to meet with federal lawmakers and their staffs. The previously scheduled event came less than a week after the White House announced its proposed fiscal 2010 budget.

Other issues too

The oil and gas tax changes in it were the primary topic, but IPAA officers and members also discussed environmental regulations, access to capital and resources, and permitting issues, IPAA said.

Several regional independent producers' associations joined the IPAA call-up, including Texas Independent Producers and Royalty Owners, Independent Petroleum Association of Mountain States, and California Independent Petroleum Association. IPAMS members will be back for their association's call-up Apr. 1-2, and CIPA members will be in Washington Apr. 20-22.

A proposed federal budget can take months to move through Congress under ordinary circumstances. This one will take longer because it's ambitious and complex.

US independent producers spoke out quickly because several provisions seriously threaten their businesses. They've taken the first steps in what will be a long haul. ♦

doing more to encourage development of leases that appear more likely to have considerable resources; and BLM's persistent problems in hiring and retaining enough well-trained employees to accommodate its rapidly increasing workload.

"The federal government receives one of the lowest shares of revenue for oil and gas resources compared with other countries, and [DOI] has not systematically re-examined how the federal government is compensated for extraction of oil and gas for over 25 years," Rusco said in his written testimony.

Kendall said her office's investigators found that incompatible data in MMS's and BLM's tracking systems put DOI at risk of losing millions of dollars in royalties. "In one case, a breakdown in communications between MMS and BLM could have resulted in a loss of nearly \$6 million in royalties over a 5-year period had the company holding the leases not sent its first production report to both bureaus, not just BLM. The existing process is heavily reliant upon companies doing the right thing," she said.

Little guidance

She said that, while several federal leasing laws and regulations contain general "due diligence" provisions requiring lessees to act affirmatively in developing tracts, DOI has done little to give leaseholders specific guidance. "For 99% of the leases, the department does not monitor to ensure that due diligence is exercised. Accordingly, none of these leases is terminated for failure to produce. Rather, [DOI] allows these leases to expire naturally," Kendall said.

Another witness confirmed that MMS has some statutory authority to enforce due diligence, which could be used to seek additional data from leaseholders. "Until a company comes to us with an exploration plan, we don't know whether it has been conducting seismic tests," said Chris Oynes, the associate MMS director in charge of the DOI agency's offshore energy and minerals management program.

MMS employs a detailed evaluation process to determine whether bids are adequate, he said in his written testimony. "It considers the potential income stream to the lessee associated with the lease and all potential royalties and rental payments to be paid to the federal government to ensure that the bonus received adequately reflects the value of the potential resources associated with the lease," he indicated. Nearly \$10 million of high bids in four 2008 OCS lease sales were rejected because this evaluation process showed that they did not meet fair market value criteria, Oynes said.

Rusco suggested that DOI might adopt leasing rates and durations that could be adjusted to reflect a property's relative hydrocarbon prospects. Oynes questioned whether this would be effective. "Some leases have more prospectivity in terms of whether hydrocarbons are there, but this can't be determined until they are actually drilled," he said.

Fiscal changes, burdens

Another witness warned that changing US offshore leasing terms could dampen producers' interest in the OCS. "Fluctuations in prices and costs are something we in the industry have come to expect and have learned to manage. What has taken us by surprise, however, is the change in fiscal terms in the United States," said James W. Farnsworth, president and chief exploration officer at Cobalt International Energy LP, a privately-held Houston independent.

"For us, the high cost and technical complexity of the Gulf of Mexico was offset by a stable tax and royalty system. Since 2005, when Cobalt was founded and we began investing over \$1 billion, federal royalty rates in the offshore have increased by 50%, and lease rental costs have increased by 47%," Farnsworth said. "This increase has occurred despite the fact that oil prices have reverted back to 2005 levels. Additional taxes and fees are now being considered to add even more burden to companies that are trying to find new oil and gas

fields here in the US," he told the subcommittee.

Last fall the US moved into a world without OCS moratoriums or withdrawals for the first time in more than 20 years, "a world we haven't known for some time," observed another witness, National Ocean Industries Association President Tom Fry. "Is there more oil and gas out there? Most likely," he said. Fry said new evaluations of areas that have been off-limits for 2 decades clearly are needed, but they should be conducted by the oil and gas industry and not the federal government.

"When you consider how much oil is coming from a comparatively small amount of land offshore, it becomes increasingly clear just how much

potential resource may exist in areas in which we haven't looked," he said. "As decision-makers, Congress doesn't have all of this information. The information we do have is often over 30 years old and reliant on outdated technology," said Fry, who also testified on behalf of the American Petroleum Institute, Independent Petroleum Association of America, International Association of Drilling Contractors, Natural Gas Supply Association, American Exploration and Production Council, and the US Oil & Gas Association.

"We know there are plenty of areas where oil and gas exploration may not be compatible with the landscape. We also know there will be parts of the ocean where resources will not be present or will not be economic. With

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GENERAL INTEREST

talk of opening up areas or closing some down, shouldn't we increase our knowledge base so we can have an informed discussion about the consequences?" Fry said in his written testimony.

Oynes said a full inventory of the OCS by the federal government would take 3-5 years, depending on the type

of seismic survey used and several other variables. He said MMS would close the public comment period soon on gathering information for an environmental impact statement of the Atlantic OCS but it does not have funding for the actual EIS. Other funding options are being considered, but Oynes said he does not expect much activity before 2010. ♦

Ethanol supporters petition EPA to raise gasoline blend level limits

Paula Dittrick
Senior Staff Writer

Ethanol supporters petitioned the US Environmental Protection Agency to raise the limit on the amount of ethanol blended into gasoline to 15% from 10%.

Wesley Clark, cochairman of a group called Growth Energy, announced the petition Mar. 6 at a news conference in Washington, DC. Clark is a former Army general and 2004 Democratic presidential candidate.

Other groups joining Growth Energy in filing an official waiver request with the EPA to allow a higher ethanol blend included the Renewable Fuels Association, the American Coalition for Ethanol, and the National Ethanol Vehicle Coalition.

EPA said it will review the request. Previously, EPA Administrator Lisa Jackson told an agriculture meeting that it would take her agency several months to make any decision on whether to allow a higher ethanol level.

Clark said that increasing the blend up to E15 would create 136,101 jobs and inject \$24.4 billion/year into the American economy. EPA's approval of the waiver request would not impact small engines because gas stations could still sell lower blends of ethanol.

"Thirty years ago, the EPA allowed the 10% blend based on much less scientific evidence than we have today,

and we now have years of driving experience showing that our cars' performance is not affected," Clark said. "Raising the cap up to E15 is supported by sound science. If the EPA acts swiftly, a higher blend of ethanol will help us jump-start the economy while further reducing our dependence on foreign oil."

Industry reacts

The American Petroleum Institute said it supports a realistic, workable Renewable Fuels Standard. API is researching whether there is an adequate technical basis for use of ethanol blends above 10%.

API partnered with the auto industry and the government to determine the ethanol level that can be used safely in vehicles and distributed in the retail gasoline station infrastructure.

"API is confident that EPA will analyze this waiver request with the appropriate level of technical scrutiny that they use for all similar applications. API believes that it would be premature to approve any waiver request until this research is completed," the organization said.

The National Petrochemical & Refiners Association was among an informal coalition of groups calling for the EPA to conduct a thorough, science-based review of the ethanol supporters' re-

quest to increase the blend level.

"To date, there has not been sufficient testing of motor vehicle and nonroad equipment engines, such as outdoor power equipment and marine engines, to determine whether any midlevel ethanol blend would meet current federal air quality protection requirements or be safe for consumers to use," the coalition said.

Consisting of health, environmental, food production, and manufacturing groups, the coalition said that consideration of a higher ethanol blend level must be undertaken in an open, public, and transparent process that takes into account any increased air pollution and any risks to consumers of driving vehicles or handling engines using these higher blends.

RFA comments

Bob Dinneen, RFA president and chief executive officer, said a higher ethanol blend is "is important to the long-term viability of America's ethanol industry and the success of the Renewable Fuels Standard."

The Alliance of Automobile Manufacturers has said it believes more testing is necessary. Some manufacturers say higher ethanol blends could damage the pollution-control devices within vehicle engines.

The EPA already is considering how to measure greenhouse gas emissions associated with biofuels.

Dinneen said he believes comprehensive testing will demonstrate that a higher ethanol blend in gasoline can be used with little if any impact on existing vehicle technologies.

"Our industry looks forward to working closely with EPA, the Department of Energy, the Department of Agriculture, and the rest of the Obama administration to ensure the full potential of a robust domestic ethanol industry is realized," Dinneen said.

While advocating a 15% blend, he suggested an immediate move to a 12% blend would be "both prudent and scientifically supportable." ♦

EXPLORATION & DEVELOPMENT

There are many reasons—economic, preaudits, strategic planning for enhanced recovery, among others—that call for the size or ultimate reserves of an oil or gas field to be estimated.

Fundamentally, there are three ways to estimate reserves, and two of these—volumetric and material balance—require sensitive geologic and engineering data at the reservoir level that are highly proprietary to the operators.

A field may consist of several reservoirs, varying from about three in Saudi Arabia to 15 in Venezuela, grouped in the same geological structure, each of which has to be evaluated individually for its reserves and then summed together for the field total.

The only method of directly estimating reserves for the entire field is decline analysis. Although this methodology only requires knowledge of the field's production history, this information is also proprietary and therefore sparsely available.

The huge share of mature fields, which the IEA estimates the figure at half of the total oil fields, calls for an agile method for estimating reserves. This article develops a model that would provide an estimate of reserves based only on the peak production rate of an oil or gas field. Some unexpected physical variations in the behavior of oil and gas fields are brought to light.

The world's fields

Oil has been produced worldwide for well over a century, and more than 40,000 oil fields have been discovered.^{1 2 3}

Of the known discovered reserves of these fields, estimated at 2.4 trillion bbl—94% are concentrated in fewer than 1,500 major fields defined as those with more than 100 million bbl of ultimate reserves.

For the US, the tally exceeds 30,000 oil fields, of which roughly 300 are majors with

80% of total US reserves. The North Sea has 265 oil fields of which 90 are majors that account for 80% of total reserves. Saudi Arabia has 96 oil fields.

Worldwide, the top 100 oil fields account for 50% of current production and 65% of reserves.

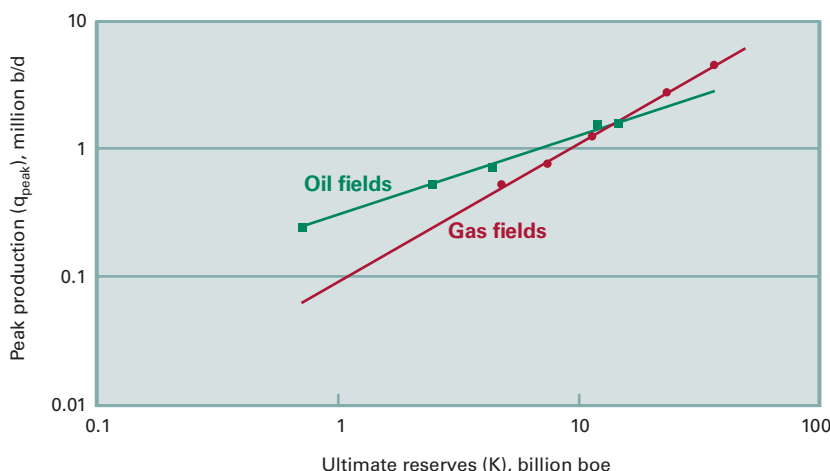
More than 90% of the world's oil fields are classified as small and hold just 3% of reserves. A small oil field is defined as one with less than 25 million bbl of reserves.

The tally of gas fields discovered is not as straightforward as for oil because gas comes from multiple sources: fields of nonassociated gas only, fields with both nonassociated gas and oil reservoirs with associated gas, uncon-

New tool determines reserves of mature oil and gas fields

Rafael Sandra
IPC Petroleum Consultants Inc.
Broken Arrow, Okla.

PRODUCTION, RESERVES POTENTIAL OF MATURE FIELDS



EXPLORATION & DEVELOPMENT

ventional (coalbed methane and shale gas) 'fields,' and gas associated with all oil fields.

Associated gas accounts for a significant 16% of total output; this percentage varies considerably from about 10% in Russia to 25% in the US to almost 100% in Saudi Arabia, Venezuela, and elsewhere.

With the exception of the US, gas production and reserves statistics do not differentiate source details. Estimates of the global number of nonassociated gas fields are in the range of 28,000. There are about 365 giant nonassociated gas fields compared with 370 giant oil fields.

Giant gas fields account for roughly 75% of the total ultimate reserves discovered of 13.8 quadrillion cu ft (qcf) or 2.3 trillion bbl of oil equivalent; giant oil fields account for a similar percentage.

A giant oil or gas field is defined here as one with reserves of more than 500 million boe—that is, roughly 3.5 tcf of gas. More than 90% of the world's gas fields are classified as small and hold 12% of total reserves. A small gas field is defined here as one with less than 0.25 tcf of reserves.

The tally of US gas fields is around 24,000, of which roughly 300 are major fields with reserves greater than 1 tcf.

In 2000-08 on average worldwide 214 oil fields and 58 gas fields have been discovered annually. The average size of these fields is 28 million bbl and 1.7 tcf, respectively.

Three producing countries—the US, Russia, and Saudi Arabia—together hold 600 billion bbl of ultimate reserves or one quarter of the total oil reserves dis-

ESTIMATES OF ULTIMATE RESERVES FOR SELECTED FIELDS

Field (country)	Production began	Peak year	Peak output, 1,000 b/d	Ultimate reserves – Billion bbl of oil – Decline ¹	Model ²	Difference, %
OIL						
Abkatun (Mexico)	1979	2004	548	2.4	2.6	8.3
Brent (UK)	1975	1984	483	2.0	2.1	5.0
•Cusiana (Colombia)	1992	1998	250	0.71	0.75	5.6
•Forties (UK)	1975	1979	523	2.5	2.4	4.0
Furrial (Venezuela)	1986	1998	454	2.0	2.0	0
Gullfaks (Norway)	1982	1994	530	2.5	2.5	0
Marlim (Brazil)	1991	2002	602	2.7	3.0	11.1
Oseberg (Norway)	1988	1994	503	2.3	2.3	0
•Prudhoe Bay (US)	1977	1988	1,500	12	13	8.3
•Romashkino (Russia)	1950	1972	1,645	16	15	6.2
•Statfjord (Norway/UK)	1979	1991	641	3.5	3.4	2.8
GAS						
			1,000 boe/d (bcfd)		Billion boe/d (tcf)	
•Groningen (Netherlands)	1963	1977	1,400 (8.6)	12 (73)	12 (73)	0
•Medvezhye (Russia)	1972	1983	1,200 (7.1)	11 (68)	10 (61)	9.0
•Orenberg (Russia)	1971	1979	770 (4.6)	7.5 (45)	6.7 (40)	10.6
•Shatlyk (Turkmenistan)	1973	1977	550 (3.3)	4.8 (29)	4.8 (29)	0
•Urengoy (Russia)	1981	1987	4,700 (28)	37 (222)	37 (222)	0
•Yamburg (Russia)	1985	1998	2,800 (17)	23 (138)	23 (138)	0

¹Values established by decline analysis; ²Estimates using Equations 2 & 3.
• = Field used in Fig. 1 correlations.

covered globally to date. They have all passed their peak production,⁴ and it is estimated that 80% of their oil production today comes from mature fields, or fields that have passed their peak.

Time to peak varies with the size of the field (Equation 4). It would normally occur as early as 2 years after production start-up in a field with 100 million bbl of reserves or as late as 28 years in a 100 billion bbl field akin to Saudi Arabia's Ghawar. Real time to peak is usually longer, however, as conservation, economics, and policy considerations alter the field's natural production profile.

The model

In earlier articles,^{5,6} the following power relationship between peak production and field size was firmly established with real data from both oil and gas fields:

$$q_{\text{peak}} = a K^b \quad (1)$$

where q is the field peak production rate and K its ultimate recoverable reserves; a and b are constants specific to oil or gas fields. The power relationship is derived from the familiar logistic production decline model.

The algorithm for oil fields is:

$$K = 11 \cdot 10^{-5} \cdot (q_{\text{peak}})^{1.6} \quad (2)$$

with a correlation coefficient (r^2) of 0.996. The units for q_{peak} and K are thousands of barrels a day (kb/d) and billion barrels of oil (Bbo), respectively.

For gas fields, the corresponding algorithm is:

$$K = 0.012 \cdot (q_{\text{peak}})^{0.951} \quad (3)$$

with a correlation coefficient (r^2) of 0.994. For the purpose of this analysis, the units for q and K are in oil equivalent, kboe/d and Bboe, respectively. The original field units in cubic feet (cf) were converted to boe using a factor of 6,000 cf/bbl.

Results

Five oil fields and six gas fields covering a spectrum of oil provinces were used to establish the correlations shown in the figure on p. 33.

The ultimate reserves of each field were determined by production decline analysis—considered the standard; the peak production rates are actual field values. The basic data are summarized in the table.

For the oil fields, the mean devia-

tion between the reserves obtained by the model algorithm (Equation 2) and the decline standard was 5.3%. For the gas fields, the mean deviation was 3.3% for the values estimated with Equation 3.

Contrary to intuitive expectation that the trend lines for oil and gas fields would be parallel, it turns out that they intersect each other at about $K = 10$ Bboe or 60 tcf. This indicates that the production potential of the vast majority (99%) of gas fields—those smaller than 60 tcf—is lower than that of oil fields of comparable size.

On the other hand, the production potential of supergiant gas fields—those larger than 60 tcf—is much higher than that of oil fields of equivalent size. The dissimilarity in the slopes of the two correlations is apparently not due to reservoir lithology. This premise was tested using a mix of carbonate and sandstone oil and gas fields.

The model was applied to a diverse set of 17 oil and gas fields from around the globe for which reliable data on size and field peak production rate are available. The table summarizes the recoverable reserves values obtained using Equations 2 and 3, which are compared with the standard values.

Deviation averages 4.6% for the oil fields and 3.3% for the gas fields. It is extraordinary that the ultimate reserves of an oil or gas field can be estimated with a reliability of 95% based on a single parameter—its peak production rate.

The model was then used to estimate the ultimate reserves of Ghawar, a number that has been elusive with approximations ranging from 75 billion to 95 billion bbl.

According to the recent IEA Outlook, Ghawar peaked at 5.588 million b/d 29 years after production start-up in 1951. These two facts can now be used to obtain a fresh estimate of its reserves. Equation 2 indicates that Ghawar's reserves are about 110 billion bbl. This value can now be used to check its time to peak using the following algorithm:⁴

$$t_{\text{peak}} = 5 \cdot K^{0.37} \quad (4)$$

The calculated value of 28 years is evidently a good match with the known field peak time of 29 years. The units of t and K are years and billion barrels of oil, respectively.

The model algorithm depends on a single factor—field peak rate. While this simplicity enhances its versatility, it also limits its applicability in fields subject to practices or conditions that compromise the attainment of the field's natural peak rate, such as, conservation, capacity caps on production and pipeline facilities, and policy considerations.

The latter affects many important fields in the Persian Gulf. Ghawar was an exception. It peaked prior to its first major shut-in in 1981-82.

Snorre field in the North Sea is a good example of the effect of production caps. When the field was first appraised, estimates of its oil reserves were 1.4 billion bbl. These reserves have a production potential of 367,000 b/d according to Equation 2.

Snorre development plans called for installing an initial production capacity of 186,000 b/d with subsequent upgrades to 245,000 b/d and 360,000 b/d. The latter expansion was never realized.

The field went on production in 1992 and evidently could never produce beyond 245,000 b/d; decline began after 2003. A glimpse of its production history would show that the field 'peaked' at 245,000 b/d which, according to the model—Equation 2—would indicate reserves of 730 million bbl or roughly half of its real value.

Finally, it should be pointed out that the model is applicable only to single fields and not to a cluster of several fields like, for instance, the Cantarell complex; grouping distorts the production profile.

In regard to gas fields, it was difficult to obtain data for major fields other than those used in the correlation; auspiciously, the resulting correlation is first rate in that four of the six fields used show no deviation between the

estimated reserves and the standard decline values (see table). In fact, for fields with reserves less than 30 tcf—this covers 99% of all gas fields—the model algorithm, Equation 3, reduces to a simple linear expression:

$$K = 10 \cdot q_{\text{peak}} \quad (5)$$

with units of tcf and bcfd, respectively. This algorithm can also be used inversely to estimate the production capacity of newly discovered reserves.

Final comments

A model was developed to provide a quick estimate of the reserves of mature oil and gas fields based on a single parameter—the peak production rate of the field.

The model provides estimates with a 95% confidence level and is applicable to individual fields which were produced without any operational limitations that ultimately repress their true peak rate.

The method is particularly useful because it obviates the need for decline analysis, which requires the complete production history of the field and may not be always available.

For the majority of gas fields, those smaller than 30 tcf, a simple rule-of-thumb applies: the size of the field is 10 times its peak production rate. Conversely, for newly discovered gas fields: the production potential of the field is one tenth of its reserves. ♦

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prospect ranking, targeting 2D seismic, 3D seismic if warranted, and drillsite definition.

The area has potential for multiple pay zones and natural gas in structural accumulations and may have potential in Lower Pennsylvanian black shales in an "elevator basin" setting, similar to the ongoing play in Guadalupe and San Miguel counties, NM (see map, OGJ, Feb. 23, 2009, p. 32).

Australia

The board of Blue Energy Ltd., Perth, approved development of coalbed methane from Jurassic Walloon coal measures on ATP 854P in Queensland.

Two Blue Energy wells, Cerulean-1 and 2, intersected gas in Permian Bannanna coals in ATP 854P.

The company plans to drill three wells in the second quarter of 2009 and at least one pilot later in the year leading to gas certification in the first quarter of 2010. The program targets an initial 300 PJ potentially present in the permit.

Nigeria-Sao Tome JDZ

Addax Petroleum Corp., Calgary, let a contract to Transocean for the drilling of four wells in the Nigeria-Sao Tome Joint Development Zone starting in the fourth quarter of 2009.

The Deepwater Pathfinder drillship is to start by drilling the Kina prospect in Block 4, subject to Joint Development Authority approval (see map, OGJ, Sept. 8, 2003, p. 38).

Addax Petroleum operates Block 4 and also has interests in JDZ blocks 1, 2, and 3, operated by Chevron, Sinopec, and Anadarko, respectively.

Addax Petroleum also operates OPL 291 off Nigeria.

California

Daybreak Oil & Gas Inc., Spokane, Wash., said its fourth well in an explo-

ration program around the flanks of giant Mount Poso oil field in the southeastern San Joaquin basin cut 26 ft of oil pay in Oligocene Vedder at 2,200 ft.

The Bear-1 well, in 13-26s-27e, Kern County, went to TD 3,261 ft and is to be completed. The Sunday-1 well, in 19-26s-28e, Kern County, is pumping 50 b/d of oil and likely will be offset.

Olanca-1, in 29-27s-28e, plugged at TD 3,990 ft, is a candidate for reentry pending 3D seismic reinterpretation, and Piute-1, in 33-27s-28e, was plugged at 3,856 ft.

Daybreak said the Sunday and Bear wells have set up several development locations. Drilling of the four wells will result in the company earning a 25% interest in 3,000 acres held by Chevron USA Inc. in the East Slopes Project acreage in Kern and Tulare counties.

Chevron earned a 50% working interest in 19,000 acres contributed by Daybreak and its partners by funding the 35 sq miles of 3D seismic in late 2007.

New Mexico

Sun River Energy Inc., Wheat Ridge, Colo., let a contract to Thomasson Partner Associates Inc., Denver, to coordinate all evaluation and exploration activity leading to drillsite selection on Sun River's 112,000 acres in Colfax County, northeast New Mexico.

The 9-month project timeline includes gathering data, assessing area potential, secondary data gathering,

Oklahoma

Red Fork Energy Ltd., Perth, is preparing to build a compression facility to produce shallow, biogenic gas from Mississippian-Devonian Woodford shale in northeastern Oklahoma.

Four wells have been drilled and cased near Tullahassee in Wagoner County to the shale at 550 ft. The Chidester 1-3 and Dorsey 2-5 wells cut about 50 ft of prospective shale and tested at rates of 100 Mcfd of gas from 10 ft of stimulated zone. Red Fork has drilled a water disposal well.

The company believes it could sustain delivery of 300 Mcfd/well if it stimulated several intervals and that its 50,000-acre lease position has room for more than 600 wells.

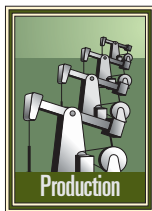
Wyoming

Double Eagle Petroleum Co., Casper, Wyo., set a \$10-20 million budget for 2009 to enhance gas production from existing Atlantic Rim wells and drill development wells at Pinedale anticline and the Waltman area of the Wind River basin, all in Wyoming.

Double Eagle drilled 24 producing wells and 6 injectors at the operated Atlantic Rim Catalina Unit. Five wells were online at yearend 2008, one was dry, and 18 are to be available for production by the end of March.

The company participated in drilling 65 wells at the nonoperated Sun Dog and Doty Mountain units at Atlantic Rim to be hooked up in the first half of 2009 and 24 wells at Pinedale to start producing this year.

DRILLING & PRODUCTION



Hydraulic fracturing in the presence of natural fractures causes a complex network of fractures to form because of shear and tensile failure.

During hydraulic fracturing, shear failure in a reservoir appears pervasive where natural fractures occur.

Hydraulic fracturing treatments induce a network of shear and tensile fractures in a reservoir and enhance the virgin permeability in a large volume around a well.

In the Barnett shale, for example, microseismic bursts, which are shear-induced, are numerous, and extensive. Systematic shear failure appears to occur

HYDRAULIC FRACTURING—1

series of two articles. This first part will discuss the complex geometries formed and the first key, while the concluding part will cover the remaining three keys.

Complex geometry

The presence of natural fractures, or planes of weakness, causes a hydraulic fracture to have a complex geometry.

Natural fractures influence shear stimulation direction

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over a large region. Other gas fields in North America display similar complex attributes.

There are four keys for understanding, modeling, and predicting shear stimulation and its benefits. Many studies have discussed each key separately; however, the studies generally have not integrated the four keys.

The role of natural fractures as related to these keys is the subject of this

Studies argued this more than 15 years ago, in the oil and gas context,¹ and the subject again recently has gained emphasis.²

A complex fracture geometry results from both tensile and shear failure. In the Barnett shale, for example, observations show microseismic shear events are numerous, and one can connect some of the simultaneous bursts with straight lines extending for hundreds of feet.

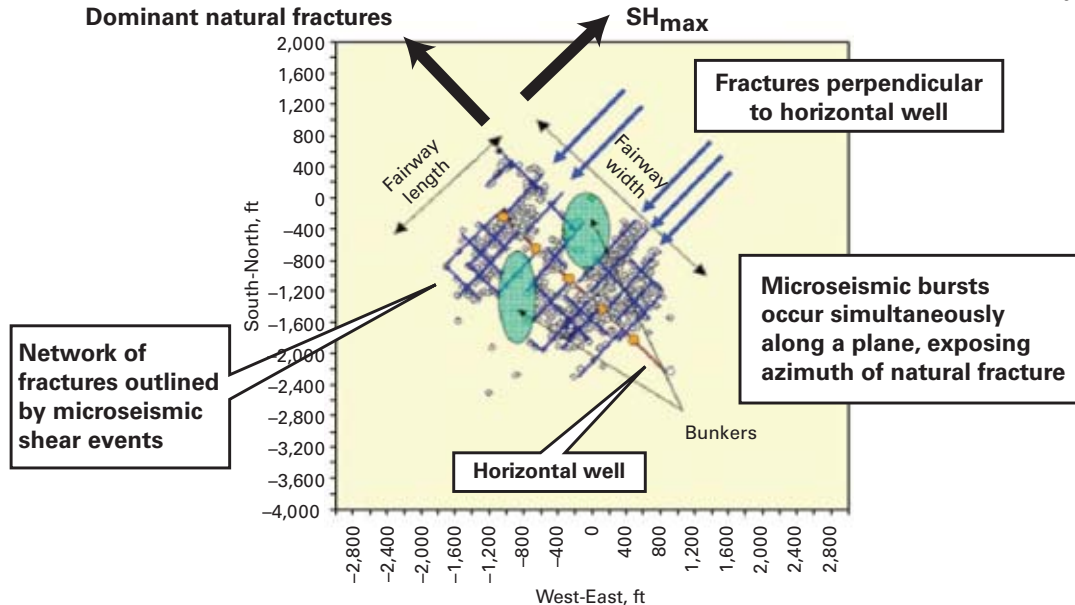
The pattern of bursts extends out to large distances (Fig. 1).³

It is hard to discount systematic

Based on a presentation to the International Coalbed Methane and Gas Shales Symposium, May 19-23, 2008.

DRILLING & PRODUCTION

COMPLEX GEOMETRY OF BARNETT SHALE HYDRAULIC FRACTURE



Note: This well is a typical single-stage uncemented horizontal.
Source: Reference 3

Fig. 1

Barnett shale, where the slick water jobs inject at rates of about 70 bbl/min into six or more segments of a long horizontal well (about 3,000-ft total length).

In contrast, a slug of viscous cross-linked gel pumped at high rate ahead of a foamed-water fracture can reduce the fracture complexity in coalbed methane wells.⁷

Studies have diagnosed a variety of network shapes by mining back

shear failure occurring over a large region.

The balance between tensile and shear failure, however, depends on many things, including natural fracture orientation with respect to the stress field (Fig. 2).^{4,5} In coals, the cleats inflate if aligned with the in situ stresses, but shear when the cleats are at about 45° to the in situ stresses.⁵ The same behavior occurs in hard rock.⁶

In coals, shear slippage at layer inter-

faces or intersection with existing cleats or natural fractures can disrupt elastic coupling and further create a complex fracture network.⁴

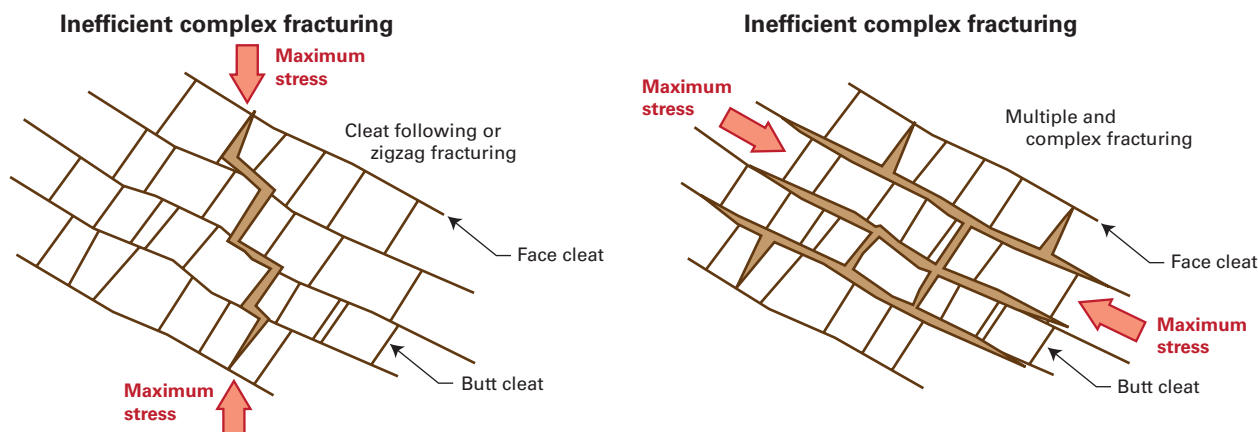
The shape of the induced fracture network also depends on injection conditions. A low-rate injection of nonviscous fluid, such as water, will tend to form a rounder fracture network. This is the situation in the

coalbeds (Fig. 3)⁸ and after injecting paint with the hydraulic fracture fluid. The majority of such shapes, however, are elongated, and Fig. 3a is typical, as discussed previously.⁹

From the old-paradigm perspective, this leads to inefficient fracturing, high pressure with shorter fracture length, and more fluid damage due to greater fluid invasion. The potential advantage, however, is a widespread zone of shear-tensile fracturing where per-

NATURAL FRACTURES IN COALS CAUSE COMPLEX FRACTURE GEOMETRY

Fig. 2



Complex fracturing where maximum stress is at an angle to face cleats
Source: Reference 4

Complex fracturing where maximum stress is parallel to face cleats

meability increases because the rock volume dilates or expands (dilatancy). This new paradigm is the focus of this article.

GeoMechanics International Inc. (GMI) has emphasized the pervasiveness of shear failure.¹⁰ The conventional concept of critical natural fractures is that conductive fractures, aligned with the maximum horizontal stress, SH_{max} , are those on the verge of failing (opening) in tension. GMI's concept, however, is that tensile fractures are less likely to control flow compared with shear fractures and faults in many reservoirs.

The GMI concept is that conductive fractures are those on the verge of failing in shear. Such critical fractures will probably not align with SH_{max} (Fig. 4). Geothermal data also supports this conclusion when microseismic bursts have aligned in a direction at a significant angle to SH_{max} .

If the pore pressure stays below the minimum horizontal stress, Sh_{min} , as is the usual geothermal situation, it seems that initial failure is shear failure on fractures at an angle to SH_{max} , and these are the permeable fractures. But in the oil and gas context, where pore pressure generally exceeds Sh_{min} , both shear and tensile failure can occur and the situation is more complex.

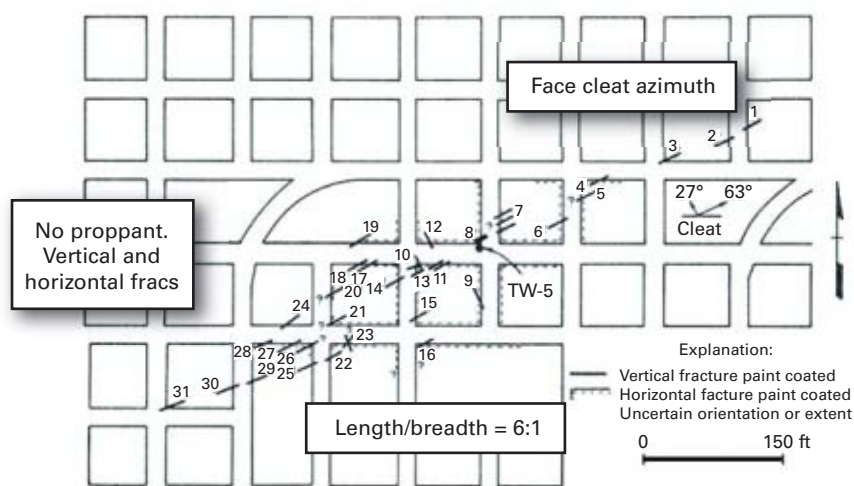
In the special case of the Barnett shale, shear failure should not occur (theoretically) in the production sweet-spot, because natural fractures align with in situ stresses. But shear failure does occur everywhere, implying that natural fractures are misaligned with local stress or differential forces can shift or rotate large matrix blocks, causing shear failure.

Also, natural fractures align roughly with Sh_{min} and not SH_{max} .¹¹ This condition may favor shear failure because the natural fractures may block and divert the growth of a tensile fracture; and thereby create a fracture network.

When the stress field has local variations and orientation, it is possible for the growing fracture to depart in dif-

MINEBACK COAL FRACTURES

Elongated multistranded fracture in coal

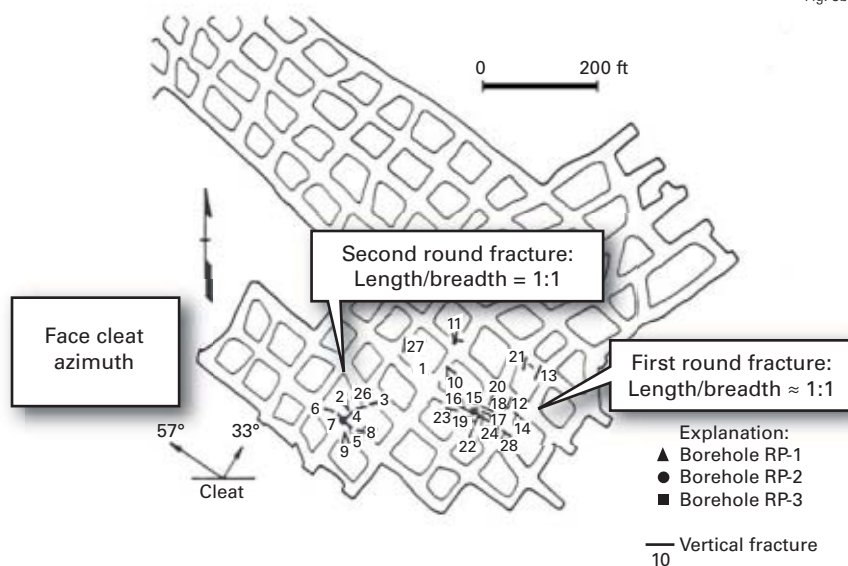


Note: Locations of vertical and horizontal fractures around borehole TW-5, Blue Creek coalbed, Oak Grove mine, Jefferson County, Ala.

Fig. 3

Fig. 3a

Less elongated fractures in coal



Note: Locations of vertical fractures around boreholes RP-1, RP-2, and RP-3, Upper Freeport coalbed, Lucerne No. 6 mine, Indiana County, Pa.
Source: Reference 8

Fig. 3b

ferent directions, which may include shear failure, and create a local network. This is one explanation for local variations observed in microseismic patterns (although the far-field stress will govern the overall direction).

Our mental model for shear stimulation in a naturally fractured formation

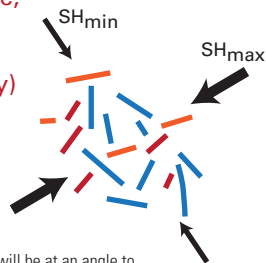
is a central induced fracture, aligned with SH_{max} , surrounded by an elliptical diffuse zone of shear-tensile failure that has enhanced virgin permeability (Fig. 5). The central fracture may be a

DRILLING & PRODUCTION

CRITICALLY STRESSED NATURAL FRACTURES

Hydraulically conductive, critically stressed (Repeated fault slip is preserving permeability)

Hydraulically nonconductive, stable faults



Note: Critically stressed natural fractures will be at an angle to SH_{max} , and these are the conductive fractures. Source: Reference 10

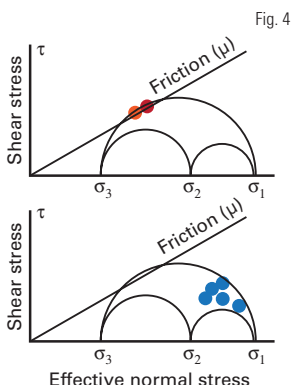
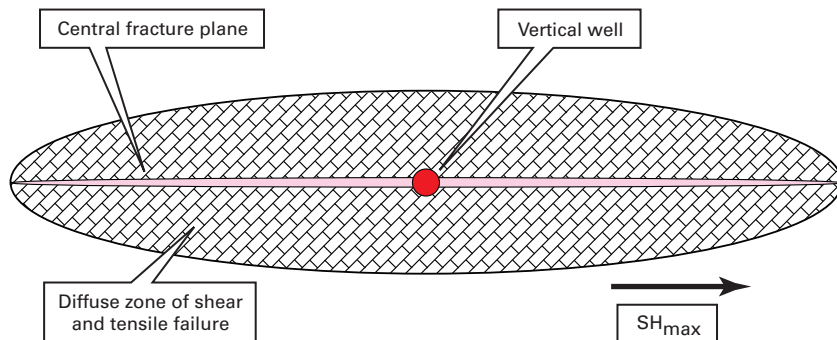


Fig. 4

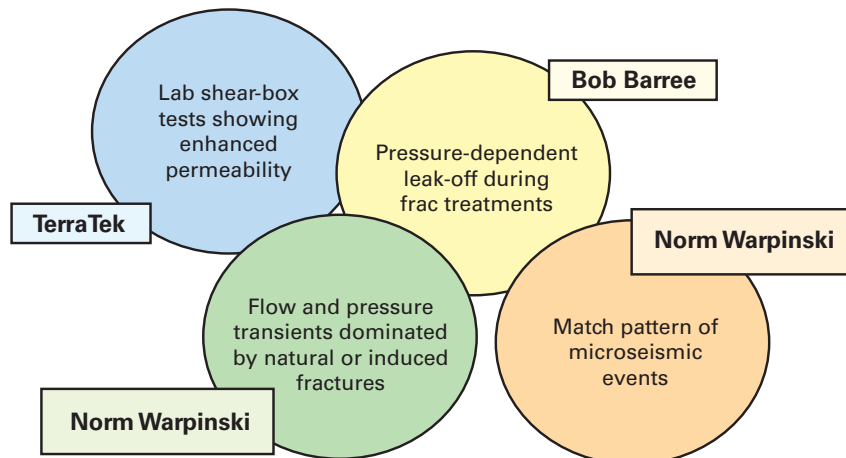
SHEAR STIMULATION MENTAL MODEL



Source: Illustration of shear stimulation in a naturally fractured formation

Fig. 5

FOUR KEYS FOR SHEAR STIMULATION MODELING, PREDICTING



Note: The names are the originators whose work is most relevant.

Fig. 6

discrete fracture or it may be reduced to being just a part of the diffuse zone.

Keys to shear stimulation

There are four keys needed to model

and predict shear stimulation (Fig. 6).¹² Many studies have investigated each key separately. Some modeling approaches have integrated some of these keys.¹³⁻¹⁵ The integration of the four keys, how-

ever, is difficult.

As previously mentioned, this article will discuss the first key while the concluding part of this two-part series will cover the remaining three keys.

The first key involves laboratory studies that investigate permeability enhancement from shearing. Fig. 7 illustrates the concept. It shows that shear stress acting along a natural fracture or weak plane can cause slippage.¹⁶ If the surface is rough, this leads to gaps and enhanced permeability. The term for this mechanism is dilatancy.

In the lab, shear-box tests (direct shear tests) can measure dilation and associated permeability increase. Fig. 8 is a good illustration for coal in which dilation mostly increases with shear stress up to shear failure.¹⁷ Note however, that for the lower curves, where normal stress is higher, the dilation can decrease before it begins its large increase.

Fig. 9 shows the amount of permeability increase for different initial coal permeabilities, K_i . The increase is very large: 60 times for $K_i = 30$ md, and 600 times for $K_i = 2$ md.

The permeability enhancement is greater if the initial permeability is lower. It is also interesting that the permeabilities at failure 1,200-1,900 md are not very sensitive to their initial permeabilities.

Terra Tek has generalized these lab results into an equation for permeability enhancement K_s/K_i , both in md, in terms of d_s the single-fracture dilation in μm , and aK_i where a is the fracture spacing in cm.¹⁷ If we assume a similar relationship applies to hard rock as well as coals, the implications for shear stimulation in the field are:

- A smaller aK_i (or equivalently a smaller fracture width) gives a larger K_s/K_i (Fig. 10)
- A larger dilation d_s is better. One should make sure that shear stress on a natural fracture increases past yielding and all the way to failure.
- Induce failure as far as possible out into the reservoir, for example with a pore pressure increase.

Fig. 10 shows that the permeability enhancement is greatest in granites, which is important in geothermal applications. Tight sands are intermediate. Coals and dolostones exhibit the smallest permeability enhancement, although as Fig. 9 shows, the permeability enhancement in coals can still be very large.

The measurement of permeability enhancement by shearing in the lab is a key for predicting shear stimulation in the field. We know how to predict a zone where shear failure occurs after injection into a well, but one needs lab measurements to predict the degree of permeability increase. Researchers still have not done this integration properly, to our knowledge.

An approximate approach assumes a pressure-dependent permeability function (for natural fractures) and uses this as a free parameter to match both shear failure zone (microseismic burst pattern) and well production.¹³

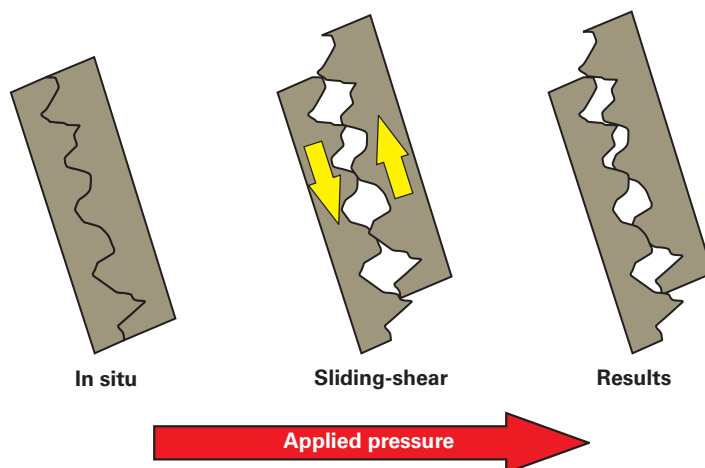
The pressure-dependent permeability during injection would include permeability enhancement due to shearing (dilatancy). It could also include presumably other mechanisms such as elastic pressure-dependent permeability (ballooning of fractures), or tensile failure. This lumped approach is the approach we have used in our modeling.

In future work, we envisage an approach in which lab measurements of shear failure and permeability enhancement are directly input into shear stimulation models. ♦

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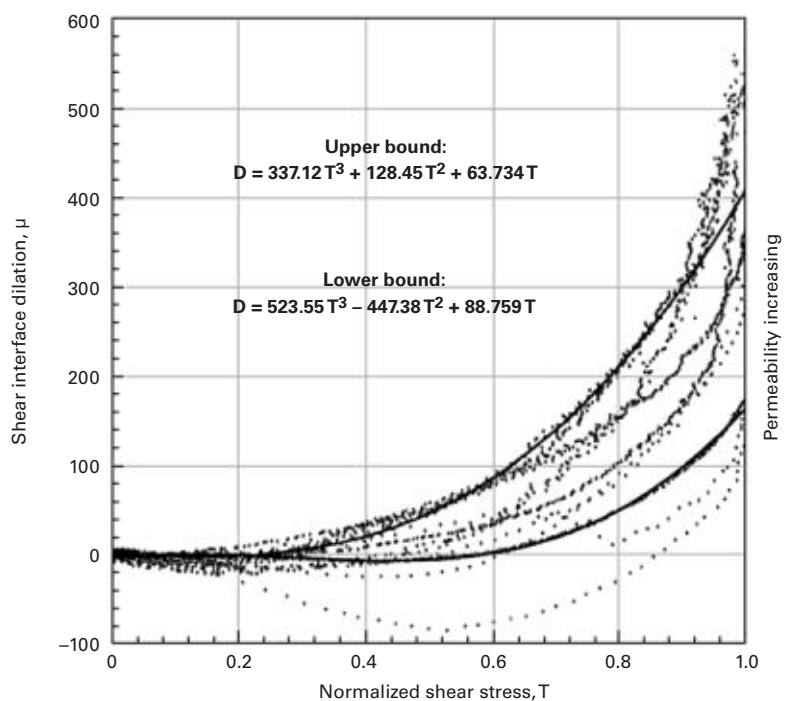
SHEAR DILATION CONCEPT



Source: Reference 16

Fig. 7

SHEAR DILATION



Note: Shear stress increases up to actual shear failure at $T = 1$. Increasing dilation or permeability accompanies the shear stress increase. This is total dilation of five cleats in the lab test.
Source: Reference 17

Fig. 8

Barnett shale," SPE ATW on Unconventional Gas Reservoirs, Keystone, Colo., Apr. 21, 2006.

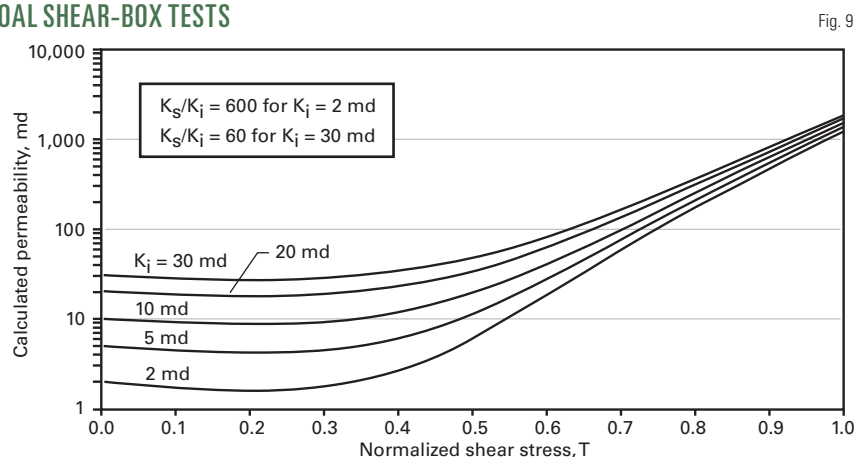
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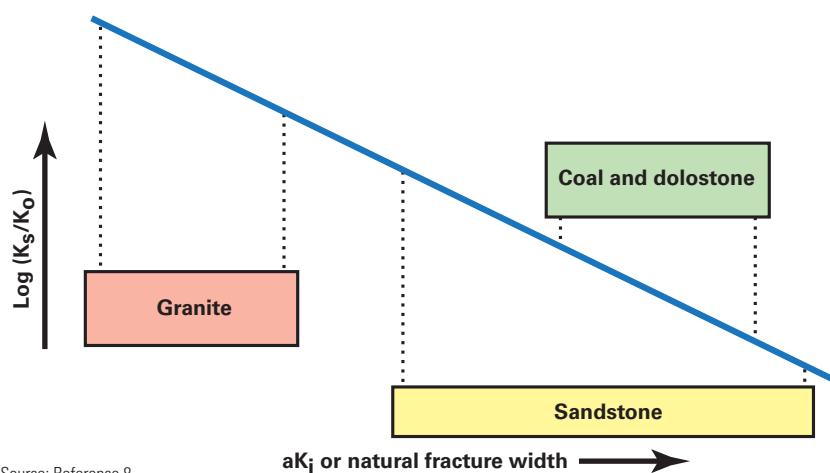
COAL SHEAR-BOX TESTS



Note: Permeability increases from shearbox tests on coal, as a function of initial permeability. For the logarithmic scale, $a = 1$ cm, $n = 5$.
Source: Reference 17

Fig. 9

PERMEABILITY ENHANCEMENT TREND



Source: Reference 8

Fig. 10

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Special Report

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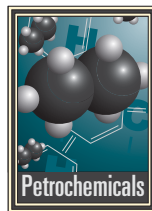


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PROCESSING

With an abundance of cheap feedstock, the Middle East is poised to become one of the world's largest exporters of petrochemicals, targeting markets in Europe and Asia.



Currently, several new mega petrochemical projects are under construc-

tion in Saudi Arabia, Iran, Qatar, the UAE, and Kuwait. After the completion of these projects, Middle East ethylene production capacity will increase to roughly 28.1 million tonnes/year (tpy) in 2012 from 16.9 million tpy in 2008. Middle East propylene production capacity will increase to 7.0 million tpy in 2012 from 3.5 million tpy in 2008.

online in 2009, may face an oversupplied market. Large capacity additions in the Middle East and Asia during 2009-12 combined with weakness in demand may affect the operating rate of petrochemical complexes in the Middle East, which is currently higher than 90%. This down-cycle will be difficult for Asian naphtha-based projects, especially the smaller ones (less than 300,000 tpy) that face relatively high operating and feedstock costs.

Although the availability of inexpensive gas prompted many companies to move forward with massive expansion plans, the region is facing new uncertainties in providing sufficient feedstock. This is a serious concern for new proposed projects, especially in Iran and Saudi Arabia.

At the same time, Middle East domestic natural gas prices are likely to increase as production costs have risen sharply. This may push governments to set higher prices for petrochemical feedstock. New feed-gas prices for petrochemical projects in Saudi Arabia could even top \$2/MMBtu, well more than the \$0.75/MMBtu seen in the past.

Even with higher feed-gas prices, Middle East petrochemical projects are still economical but certainly less attractive for new investment.

Looming Mideast olefin production may—or may not—spell oversupply

Siamak Adibi
FACTS Global Energy
Honolulu

With global economic recession depressing ethylene and polyethylene demand, the new wave of petrochemical projects, especially those coming

MIDEAST ETHYLENE CAPACITY, 2008-12

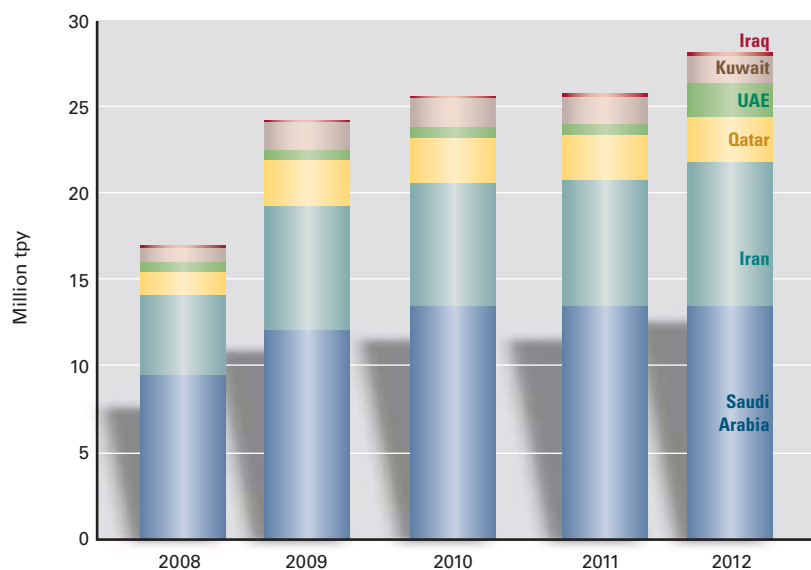


Fig. 1

Ethylene, propylene production

Ethylene and propylene are the principal petrochemical products and a major feedstock for production of other polymers. The world's largest expansion ever for the construction of new ethylene and propylene plants is taking place in the Middle East. These additions have a major influence on the global petrochemical industry in the near future.

Several new mega petrochemical projects are currently under construction at Jubail and Yanbu in Saudi Arabia, Bandar Imam and Assaluyeh in Iran, and Messaid in Qatar. Fig. 1 illustrates the growth of ethylene production capacity in the region.

For propylene, Middle East produc-

tion capacity is likely to jump to 7.0 million tpy in 2012 from 3.5 million tpy in 2008, representing an average growth rate of 18%/year during 2008-12 (Fig. 2).

In 2009 alone, FGE expects a 7.3-million-tpy ethylene capacity increase, coming mainly from Saudi Arabia, Iran, and Qatar.

Saudi Arabia

Saudi Arabia will play the main role in propylene capacity increase in the region over the next 4 years. The country will add at least 1.4 million tpy of new propylene capacity in 2009.

It is the largest ethylene producer in the region with current capacity roughly 9.5 million tpy. Ethylene is being produced in such large Saudi petrochemical complexes as Sadaf, Yanpet, Kemya, United, PetroKemya, Tasnee, and Yansab.

Overall, propylene capacity in Saudi Arabia increased to 2.2 million tpy after completion of the Tasnee and Yansab petrochemical plants. Propylene is also being produced in other petrochemical complexes, such as Al-Fassel, Jubail Chevron Phillips, and PetroKemya.

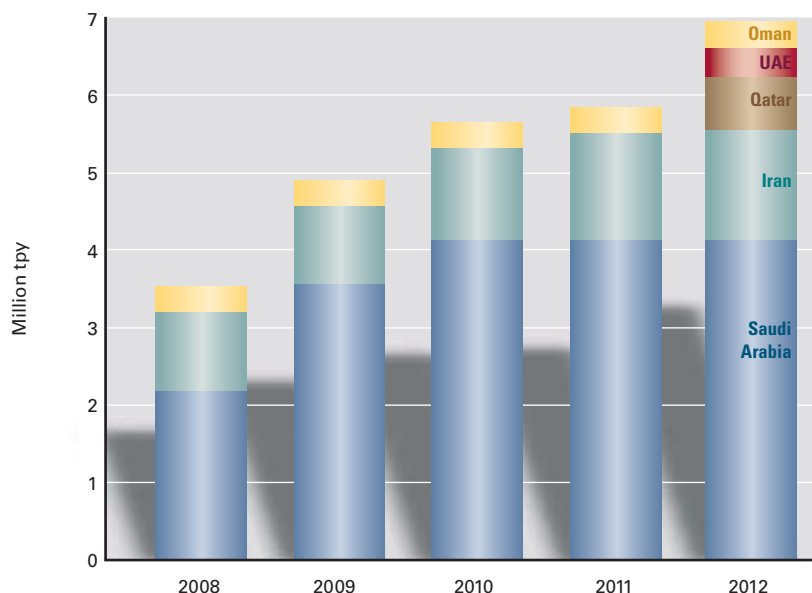
The Saudi petrochemical sector will see a massive increase in ethylene and propylene production capacity, securing the country's position as a leader in the global petrochemical industry. Jubail and Yanbu will be the focus of Saudi Arabia's petrochemical development in the future.

Currently, four key petrochemical projects are under construction in Saudi Arabia and are scheduled for completion during 2009-10. The new projects will add 4.0 million tpy of ethylene capacity. An additional 1.9 million tpy of propylene production capacity will be completed by 2010 (Table 1).

The recently built ethylene cracker owned by the Tasnee Petrochemical Co. (a joint venture of Tasnee, Basell, Sipchem, and Sahara) was completed in late September 2008 in Jubail. The

MIDEAST PROPYLENE CAPACITY, 2008-12

Fig. 2



complex is designed to produce roughly 1.0 million tpy of ethylene, 285,000 tpy of propylene, 400,000 tpy of high-density polyethylene, and 400,000 tpy of low-density polyethylene.

The Yansab complex was completed in late October 2008, adding more than 4 million tpy of petrochemical capacity, including 1.3 million tpy of ethylene, 400,000 tpy of propylene, 700,000 tpy of monoethylene glycol (MEG), 400,000 tpy of polypropylene, and 800,000 tpy of linear low-density polyethylene and HDPE as well as butane, benzene, and methyl tertiary butyl ether.

The first phase of the PetroRabigh complex, a JV between Saudi Aramco and Japanese company Sumitomo Chemical, is to start commercial production in second-quarter 2009. It will

produce 1.3 million tpy of ethylene and 900,000 tpy of propylene. The plant is to produce 600,000 tpy of MEG as well. The feedstock is to be roughly 95 MMscfd of ethane and about 15,000 b/d of LPG, both provided by Saudi Aramco.

The Sabic Eastern Petrochemical Co. (Sharq III) is planning to bring its new unit on stream by early 2009, including 1.3 million tpy of ethylene, 700,000 tpy of ethylene glycol, 400,000 tpy of HDPE, and 400,000 tpy of LLDPE.

Another important petrochemical project is the Saudi Kayan mega complex. The Saudi Kayan petrochemical complex will be located at the industrial city of Jubail with a production capacity of 4.0 million tpy.

The complex will add some specialized chemicals to the Saudi marketplace that will be produced in the country for the first time. These products include aminoethanols, aminomethyls, dimethylformamide, choline chloride, dimethylethanol, dimethylethanolamine, ethoxylates, phenol, cumene, and polycarbonate. This is in addition to production of

NEW ETHYLENE, PROPYLENE CAPACITY: SAUDI ARABIA

Table 1

Project	Start-up	Ethylene — Capacity, 1,000 tpy —	Propylene — Capacity, 1,000 tpy —
PetroRabigh	Early 2009	1,300	900
Sharq III	Early 2009	1,300	—
Saudi Ethylene & Polyethylene Co.	Early 2009	—	460
Saudi Kayan	2009-10	1,350	550
Total		3,950	1,910

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MIDEAST ETHYLENE CAPACITY ADDITIONS

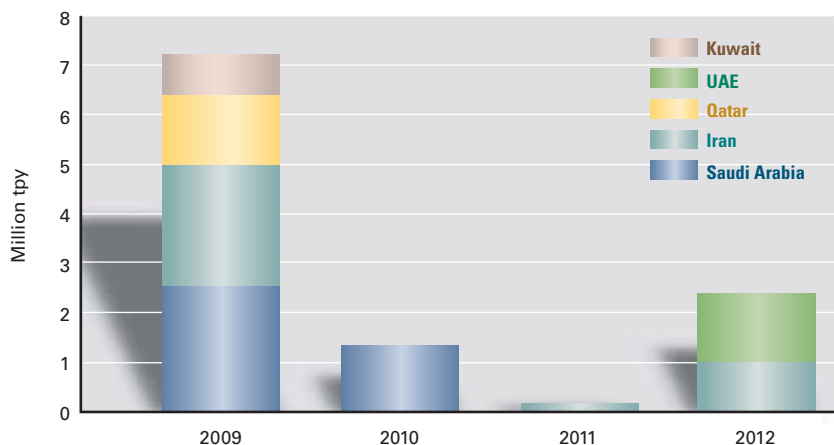


Fig. 3

and 640,000 tpy chlor alkali. Saudi Aramco plans to supply feedstock to the plant from its nearby 550,000-b/d Ras Tanura refinery and Ju'aymah gas processing plant. Target completion for the plant is 2013.

It should be noted that Saudi Aramco provides feed gas for petrochemical projects at a fixed price of \$0.75/MMbtu, and the cheap feedstock is a great advantage for the petrochemical industry in Saudi Arabia.

Iran

Iran represents the second major petrochemical player in the region. Currently, the country produces ethylene in Amir Kabir, Marun, Tabriz, Arya Sasol, Jam, Arak, and Bandar Imam. Current ethylene and propylene capacities are around 4.7 million tpy and 1.0 million tpy, respectively.

Figs. 5 and 6 illustrate Iran's ethylene and propylene production capacities by project in 2008.

The Jam petrochemical complex is the largest ethylene producer in Iran with capacity of about 1.32 million tpy. The plant also produces 305,000 tpy of propylene, 216,000 tpy of pyrolysis gasoline, 444,000 tpy of ethylene glycol, and 600,000 tpy of LDPE and HDPE, and other products.

FGE forecasts that Iran's combined ethylene and propylene production capacity will increase greatly after the completion of the new petrochemical projects (Table 2). By 2012, Iran's ethylene production capacity will increase to 8.4 million tpy, while its propylene capacity will increase to 1.4 million tpy.

It should be noted that Iran has also announced a planned project for production of ethylene and propylene (Persian Gulf Petrochemical Co.). It is to be completed in 2014-15 and will produce 1.3 million tpy of ethylene and more than 1.0 million tpy of propylene.

Currently, Iran provides feed gas for its petrochemical projects in the range

MIDEAST PROPYLENE CAPACITY ADDITIONS

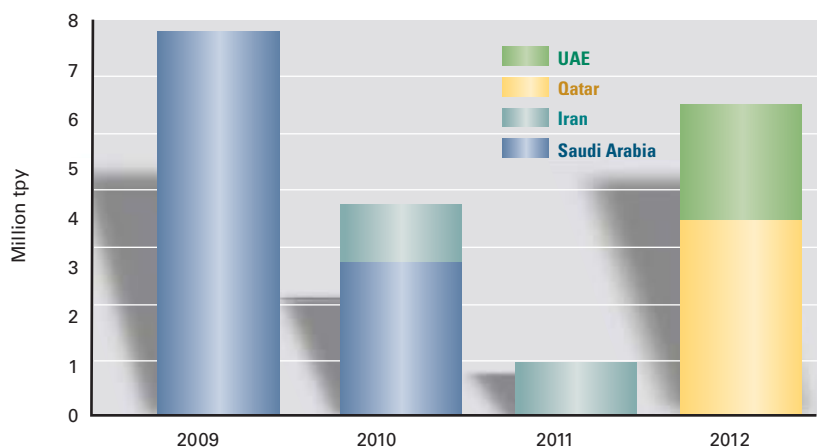


Fig. 4

ethylene, propylene, polypropylene, ethylene glycol, and butene-1.

It should be noted that by 2012, Saudi Arabia's petrochemical industry will raise ethylene production capacity to 13.5 million tpy and propylene production capacity to at least 4.1 million tpy.

Saudi Arabia also plans to invest more to produce ethylene and propylene beyond 2012. Dow Chemicals and Saudi Aramco signed a joint-venture agreement to build a petrochemical complex for

producing 1.2 million tpy of ethylene, 400,000 tpy of propylene, 400,000 tpy of benzene, 460,000 tpy of paraxylene,

NEW ETHYLENE, PROPYLENE CAPACITY: IRAN

Table 2

Project	Start-up	Ethylene — Capacity, 1,000 tpy —	Propylene
11th Olefin (Kavyan Petrochemical Co.)	2009	2,000	—
13th Olefin (Ilam Petrochemical Co.)	2011-12	153	120
Gachsaran Olefin	2012	1,000	—
Assaluyeh Olefin (Morvarid Petrochemical Co.)	2009	500	—
Fanavar Petrochemical Co.)	2010-11	—	120
Total		3,653	240



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Worldwide Construction Projects — List of planned construction products updated in May and November each year.

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Refinery	E1340	E1340C
Pipeline	E1342	E1342C
Petrochemical	E1341	E1341C
Gas Processing	E1344	E1344C

U.S. Pipeline Study — There are 14 categories of operating and financial data on the liquids pipeline worksheet and 13 on the natural gas pipeline worksheet.
E1040

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IRAN'S ETHYLENE CAPACITY, 2008

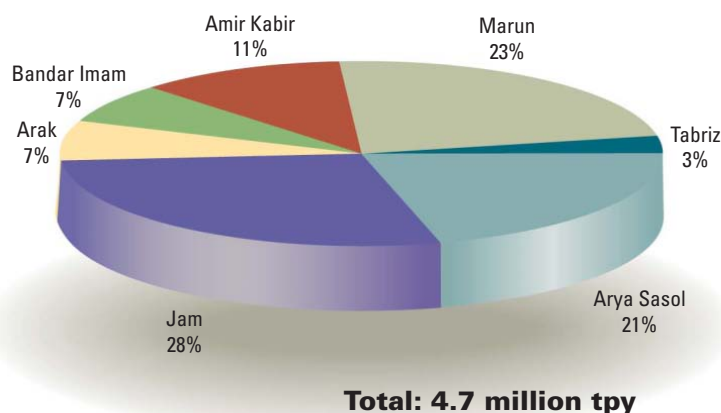


Fig. 5

of \$0.39-0.56/MMbtu (2008). The government's projects are still paying \$0.39/MMbtu, and new private projects pay \$0.56/MMbtu for their feed gas. The feed-gas price is fixed with an annual escalation approved by the Iranian government. A price increase is expected, but a massive increase in the feed-gas price is unlikely, as the government tries to encourage industrial development in the country.

Qatar, others

Ethylene is being produced by two major petrochemical companies in Qatar with a total production capacity of 1.2 million tpy.

Qatar Petrochemical Co. (Qapco) and Qatar Chemical Co. (Q-Chem) are ethylene producers in the country. Qapco's ethylene production capacity is roughly 720,000 tpy, while Q-Chem has a production capacity of 500,000 tpy. The companies plan several ethylene crackers but the most important project in the near term is a 1.3-million-tpy ethylene cracker in Ras Laffan, under construction by Technip. The project is to come on stream this year.

The country currently has no propylene production, but that is likely to change sometime in 2012-13 when a plant will come on stream with capacity of 700,000 tpy.

It should be noted that Qatar Petro-

leum has two agreements for construction of ethylene crackers, but construction has yet to start.

In 2005, Shell and Qatar Petroleum signed a letter of intent to build a 1.3-1.6 million tpy ethylene plant in Qatar. The project is still in negotiation and start-up is unlikely before 2013-14.

In 2006, ExxonMobil and Qatar Petroleum also signed a heads of agreement for construction of a 1.3-million-tpy ethylene cracker in the industrial city of Ras Laffan. The proposed petrochemical complex will include a worldscale, 1.3-million-tpy steam cracker and associated derivative units, including LDPE (420,000 tpy), LLDPE (570,000 tpy), and ethylene glycol (700,000 tpy). Start-up of the new ethylene cracker is to be in 2013-14 at the earliest.

It should also be noted that feed-gas prices for Qatari petrochemical projects are extremely low, at around \$0.50/MMbtu, giving great advantage to the petrochemical industry.

- **UAE.** Only ethylene is being produced in Abu Dhabi. The Brouge petrochemical company operates a 600,000-tpy ethylene plant in the Emirate. The second ethylene plant (Brouge 2) is under construction and will come on line in 2012. After completion of the project, total ethylene production in the country will increase to 2 million tpy.

- **Kuwait.** In September 2008, Kuwait's ethylene production capacity was roughly 800,000 tpy. Equate Petrochemical Co. operates the ethylene plant.

In November 2008, an expansion by Equate allowed Kuwaiti ethylene production capacity to increase to 1.6 million tpy. The new ethane steam cracker is to produce ethylene at its plateau capacity during 2009.

- **Oman.** Oman is producing propylene at the Sohar refinery. The refinery operates in an olefin mode to enable it to produce roughly 327,000 tpy of propylene feedstock for the polypropylene plant owned by Oman Polypropylene LLC (OPP).

- **Iraq.** Currently, Petrochemical Complex No. 1 (PC1) in Khor al-Zubair, near Basrah, is producing ethylene with capacity to produce 130,000 tpy ethylene, 110,000 tpy of ethylene dichloride, 66,000 tpy of vinyl chloride monomer, 60,000 tpy of polyvinyl chloride, and 90,000 tpy of LDPE and HDPE. The plant, however, is operating below its nameplate capacity and needs rehabilitation.

Feedstock challenges

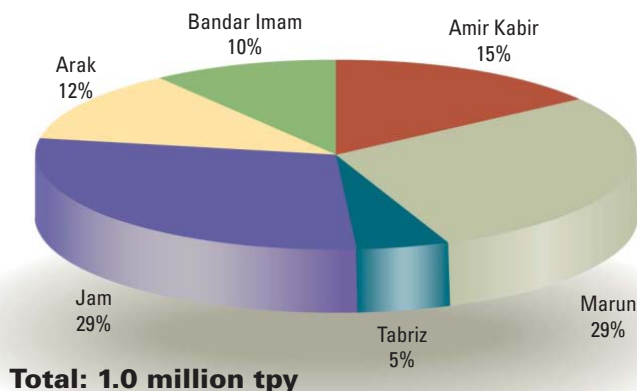
It should be noted that low gas prices in the Middle East provide an attractive environment for gas-based petrochemical projects, which is a great advantage for Middle East petrochemical producers. Naphtha-based ethylene in Asia is much more costly than ethane-based ethylene in Saudi Arabia.

Middle East ethylene producers, however, will face several challenges. The first is uncertainty in securing feedstock, which has become a serious concern for new projects, especially those in Iran and Saudi Arabia.

Except for the Karan gas project, which could provide 1.5 bscfd of dry gas for new industrial projects 2011-12, the prospects for nonassociated production in Saudi Arabia indicate a likely unmet supply for new petrochemical projects. In fact, construction of a new 2-million-tpy ethylene cracker by the NEOS/Delta Oil Co. was put on

IRAN'S PROPYLENE CAPACITY, 2008

Fig. 6



hold due to feedstock issues.

In Iran, a massive gas shortage, especially in winter 2007, interrupted gas supply for many petrochemical projects. This gas shortage will likely continue during 2008-12.

Delayed South Pars gas projects will affect gas and ethane supplies to Iranian petrochemical projects. The most critical concern appears to be for new polyethylene units in the west and northwest of the country. It should be noted that new projects in these areas will receive their feedstock by a 2,163-km ethylene pipeline (the West Ethylene Pipeline).

This project, now only 50% complete, was due to be completed in 2007. The initial plan was for construction of five petrochemical complexes along the pipeline. Now, however, the number of complexes has increased to 11 projects. The availability of feedstock from the West Ethylene Pipeline is a serious challenge.

In Oman, recently, a new gas-based olefin plant at Sohar was cancelled or postponed because of gas-supply obstacles. In the UAE and Kuwait, gas supply to petrochemical plants has become a critical problem because the countries have a massive gas shortage, especially in the summer.

Market implications

The global olefin market will be oversupplied in the near term, and this will likely depress market prices. Middle East olefin suppliers, however, will be less affected than Asian petrochemical producers because the Middle East has access to relatively low-priced feedstock. In Asia, small naphtha-based projects (less than 300,000 tpy) will be most affected.

For new projects, the era of extremely low feed-gas prices is over. Governments in the Middle East, however, are not expected to increase feedstock prices dramatically because they want to encourage industrial development. The new range of feedstock prices may be \$1.5-2.0/MMBtu and still allows projects to move forward economically. Some new projects will be less attractive when compared with the past. ♦

The author

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TRANSPORTATION

Shell completes testing of record-setting tie-in plan

Christopher E. Smith
Pipeline Editor

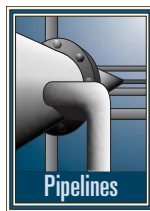
Shell's tie-in of the Perdido oil pipeline in the US Gulf of Mexico is the deepest tie-in ever preformed to an already operating system (5,000 ft). It is also the first to use a prefabricated foundation and jumper. Shell projects Perdido production of 130,000 b/d,

with first oil slated for early 2010. This article examines preparation for the foundation and jumper installation.

HOOPS connection

The only path out from Shell's Perdido development is south through harsh terrain and into a canyon running north. Tie-in lies 200 miles south of Houston. The closest platform is Hoover, 75 miles to the north but lacking large-diameter connections or expansion capacity (Fig. 1).

Tie-in of Perdido is the first deep-water postinstalled subsea connection. It was designed to reduce mainline downtime, allow for future reconfiguration (or disconnection), and use



proved components.

Design and installation incorporated lessons Shell learned repairing the Mars pipeline, damaged by an anchor drag during Hurricane Ivan in 2005. Mars repair used dual sleds with a jumper connection. Alignment of the various components, including the large jumper, proved difficult and the project's gantry system had to be re-designed. Repairs included reinstalling a 3,500-ft section of the Delta 20-in. pipeline system upstream of the MP69 P pump station and reconnecting it to the Odyssey 20-in. line (OGJ, Aug. 22, 2005, p. 75).

The Perdido connection to the Hoover Offshore Oil Pipeline System (HOOPS) attaches the Hoover pipeline to a smaller jumper which in turn is attached to a piggable Y before reconnecting to the main line (Fig. 2). The other branch of the Y will be used to connect the Perdido line. The frame used (Fig. 3) fixes the alignment of the entire system, allowing the jumper to travel out on the initial mobilization.

Vessel, modeling

Oceaneering's Olympic Intervention IV will transport the hardware and tools

PERDIDO-TO-SHORE INFRASTRUCTURE

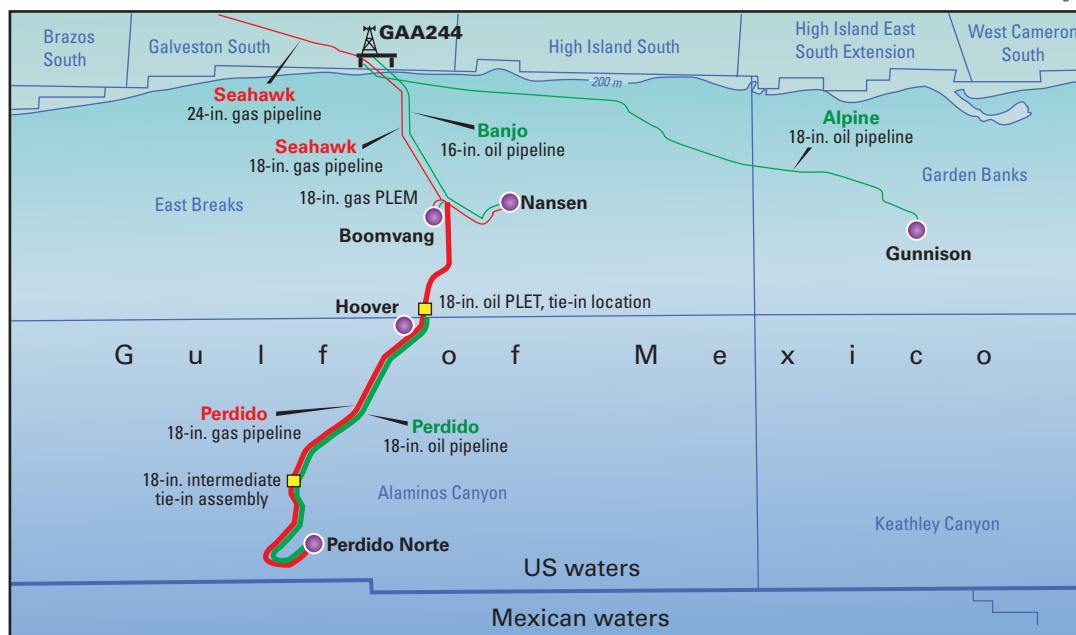


Fig. 1

required for the installation and perform surface duties during the installation. The vessel features a satellite communications system capable of transmitting streaming video for real-time work observation by shore personnel. Olympic Intervention IV also has 1,600 tons deck capacity, 10,225 sq ft of clear deck, a large working moon pool, two Oceaneering work-class remotely operated vehicles (ROV), an on-board ROV tooling suite, a 150 mt capacity crane with active heave compensation, accommodations for 150 persons, a DNV AUTHR (Class 2) dynamic positioning system, and a helicopter platform capable of landing Super Puma and Sikorsky S61 aircraft.

Solid-works three dimensional modeling of the vessel allowed for equipment layout, loadout modeling, and hazard assessment prior to loading (Fig. 4).

The Perdido connection to HOOPS will use this prefabricated 70-ft long frame, giving both ends of the existing pipeline, the jumper and the connection from Perdido a common rigid tie-in point (Fig. 3, photo by Christopher E. Smith).

PERDIDO TIE-IN FRAME, PIPING

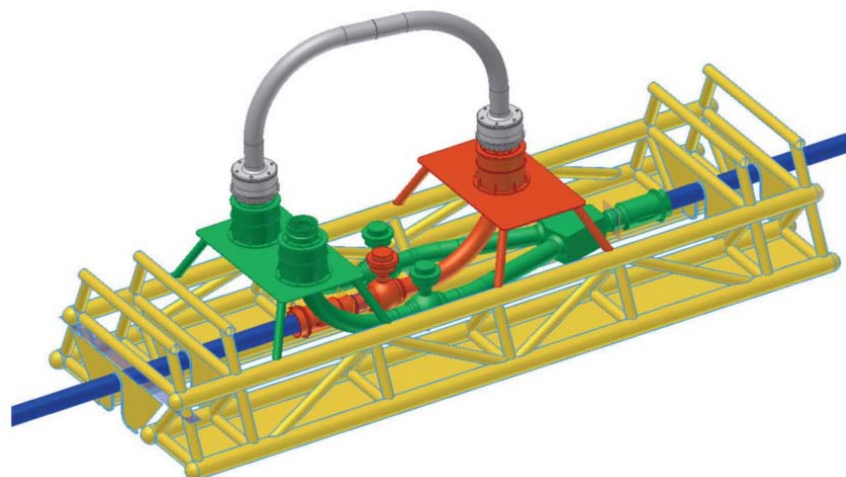


Fig. 2

Mission simulation

Oceaneering's Modular Integrated Man-Machine Interaction Control (MIMIC) allowed a wide scope of preinstallation simulation. Beyond building ROV-pilot familiarity with the tools they will be using, flying the vehicle, and observational perspective,

simulation with MIMIC—which uses real weights and strains and changeable environmental variables—helped develop installation procedures through pilot testing.

MIMIC provides realistic tension on guidelines and accurate dynamics computation as well as sea-state and



TRANSPORTATION

THREE-DIMENSIONAL WORKS MODELING

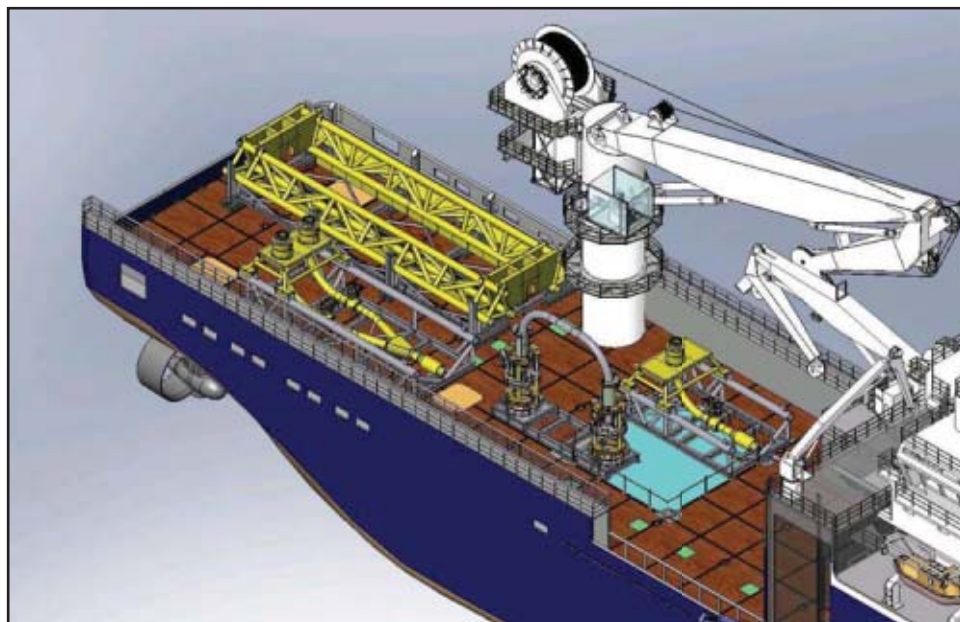


Fig. 4

lecting these data added input to the processes actually used during installation.

It can also help fine-tune tools proposed for a given project. If a task is not easily completed in a particular sequence, from a particular direction, or with a particular tool, pilot input can help shape the installation procedure used in the field. Any standard CAD format can create installation models for use in MIMIC.

environmental conditions. It then uses these data to develop simulations and distributable simulation replays.

Oceanering initially left pilots to their own means, telling them what was to be done and timing them. Col-

An inertial navigation system (INS) provides essential ROV behavior data to the MIMIC system. The INS core consists of an inertial measurement unit containing three fiber-optic gyroscopes to give heading information and three accelerometers to monitor changes



This inside view of the FPE-weld seam removal tool to be used while making the interconnection also shows the fixed frame, a single-clamp hoist, and a section of the actual pipeline pipe set aside for onshore installation run-through (Fig. 5, photo by Christopher E. Smith).

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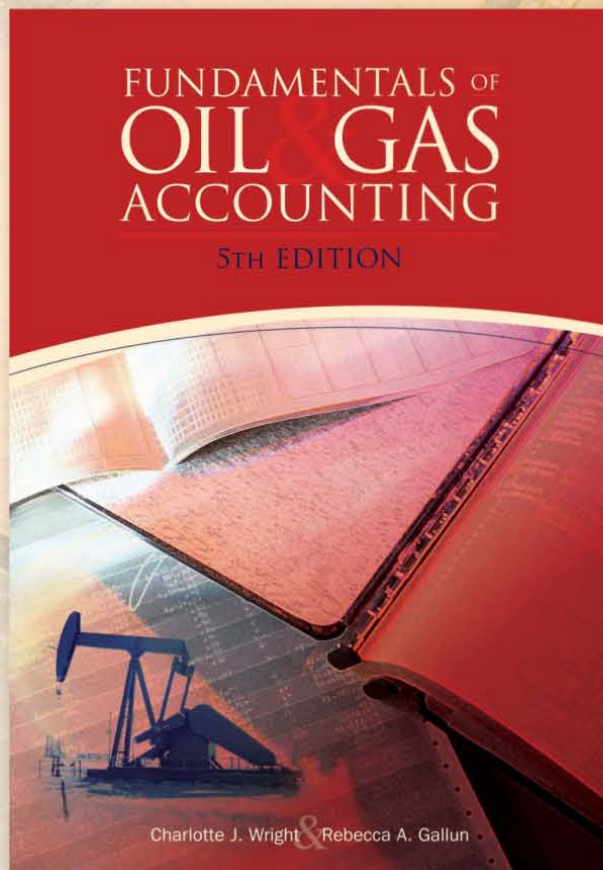
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TRANSPORTATION



An ROV would fly this saw to pipe locations needing cutting, attach it, and leave it behind to be operated by the ROV pilot. The 60-in. diameter carbide-tipped blades shown below the tool would be attached prior to deployment (Fig. 6, photo by Christopher E. Smith).

in acceleration.

MIMIC also contains a video streaming module providing broadband quality on a single 64 kilobyte/sec data line, with no limit on the number of users. The module consists of a video processing computer, which streams the video signal from the operation. The data line then streams the compressed video to an onshore server which transfers the live stream to a password-protected web site for customer access.

Development, tools

Shell developed the Perdido tie-in concept and hired Oceaneering to make it ROV friendly and doable. Shell and Oceaneering used a sample of the actual pipeline already installed for testing of all tools at Arctic Slope Regional Corp. subsidiary Omega Natchiq Inc.'s facilities in New Iberia, La. An onshore run-

through of the completion took place in New Iberia Feb. 6, 2009.

An ROV-piloted FPE-weld seam removal tool rated for 10,000-ft water depths will remove weld seams from the already laid pipe (Fig. 5). An ROV will also deliver a saw attachment with a 60-in. diameter carbide tipped blade (Fig. 6) to the pipe segments needing sawing and clamp it to the pipe, leaving it in place under the ROV pilot's control while the vehicle itself uses a hydraulic ram to engage the pipe and keep it in place.

Similar saws were used for years nonstop doing offshore salvage and recovery work after hurricanes Katrina and Rita.

An oil containment dome used while this work is under way can capture up to 1,000 bbl of potentially leaked oil and transfer it to a reservoir sitting on the bottom for recovery to

surface. A similar dome was developed during Mars repairs to contain an offshore leak in Main Pass 69 near a wildlife refuge.

The ROV cage Olympic Intervention IV lowers from the surface will also carry the ROV's tools below, allowing the vehicle to move to and from to change tools without returning to the surface. Two ROVs will be operating simultaneously on this job; one working while the other observes.

High-definition cameras will record the entire operation to a hard drive. The cameras allow pilots to pan in much closer than they could with con-

ventional filming technology without actually flying the ROV as close as they once had to.

Two full crews flying 12-hr shifts will be working at any given time during connection installation. Four four-person crews total will deploy, each consisting of a pilot, supervisor, and two technicians.

Hydraulic winches preinstalled on the bottom will pull the 70-ft long foundation down to the pipeline. The foundation will be buoyant. Rather than let the winches hold the load for the project's lifetime, however, the load will be transferred to pipe hangers, and the winches and other hydraulic components will be recovered to the surface. ♦

E q u i p m e n t / S o f t w a r e / L i t e r a t u r e

New, third generation oil, gas flow multiphase meter

The new, third generation multiphase meter MPFM 2600 is based on the firm's new Zector technology and comes with new measurement principles.

Zector technology consists of new field electronics, new electrode arrangements, and voxel-based signal processing, which will provide higher accuracy than was previously available. The new technology allows for a large number of simultaneous sectors of the flow to be investigated with a measurement rate of 12,000 measurements/sec.

The company says its technology allows for an accurate understanding of flow regimes, mixing effects, and velocity profiles and can detect rapid changes in



composition, thereby making measurements accurate and consistent. The new technology measures multiple oil and gas flow velocities as a function of its 4D location; e.g., near wall velocity will be different to center of pipe velocity. Velocities will also vary over time due to composition, turbulence, viscosity, and other effects.

The MPFM 2600 comes in a new simple and lightweight design which, at 220 lb and 25.5 in., is 80% lighter and 50% shorter than previous multiphase meters from the firm. This allows operators to install the unit on individual wells and in previously inaccessible locations. The standard version of the MPFM 2600 is without radioactive technology and covers the full operating range of 0-100% water cut and 0-100% gas void fractions (GVFs). For special applications or GVF above 95%, the company recommends addition of a compact gamma density system to the meter.

Source: **Roxar ASA**, Gamle Forusvei 17, Box 112, 4065 Stavanger, Norway.

New lighting fixture suited for wet or damp uses

This new 379 Series lighting fixture is designed for broad application in wet or damp environments or as an enclosed high bay fixture.

With its fiberglass reinforced housing and closed cell polyurethane gasket with no seams, the fixture is IP67 rated for indoor or outdoor use in locations with high-pressure hose-down requirements.

The fixture is designed for standard V hook mounting. An optional cable mount is also offered.

Source: **LDPI Inc.**, 4404 Anderson Drive, Eau Claire, WI 54703.

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S e r v i c e s / S u p p l i e r s

ABS,

Houston, has named Sean T. Connaughton vice-president for government affairs. Previously, he was US Maritime Administrator since 2006 until his resignation with the change of administrations in Washington, DC. Prior to that, he served on numerous regional boards and commissions, including the Metropolitan Washington Council of Governments and the Northern Virginia Transportation Authority. He also worked for the American Petroleum Institute. Connaughton served the US Coast Guard as both a commissioned officer and as a civil servant in the Office of Marine Safety, Security, and Environmental Protection. He has specialized in maritime and international law in private practice and for 6 years in the transportation practice of Troutman Sanders LLP. Connaughton is a graduate of the US Merchant Marine Academy and US Naval War College, has a master's degree, and has a JD from George Mason University.



Connaughton

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

Siemens AG,

Berlin and Munich, has signed a long-term strategic alliance agreement with Fluor Corp., Irving, Tex., involving Siemens' energy and industry divisions. The agreement establishes Siemens as a preferred supplier to Fluor and its global projects business. The companies will coordinate their work and planning processes to better meet increased project requirements, with a focus on risk minimization and acceleration of planning and implementation for major projects.

Fluor provides engineering, procurement, construction, operations, maintenance, and project management services worldwide.

Siemens' energy division is a leading supplier of products, services, and solutions for the generation, transmission, and distribution of power and for the extraction, conversion, and transport of oil and gas. Its industrial division is a leading supplier of production, transportation, building, and lighting technologies in the fields of industry and infrastructure.

GulfMark Offshore Inc.,

Houston, has appointed David Rosenwasser vice-president, Americas, and Lee Johnson vice-president, IT, and CIO. Rosenwasser will assume the lead role of GulfMark's Americas operating segment, which includes the US Gulf of Mexico, Trinidad and Tobago, Mexico, and Brazil. He has been with GulfMark since 2001, when he joined the company as director of business development and more recently served as area manager of Brazil. Previously, he worked in the energy investment banking group of Lehman Bros. Inc. Prior to that, he was a federal law clerk to the chief judge of the US District Court, Southern District of Texas. Rosenwasser has a JD from New York Law School and a BBA from Texas A&M University. Johnson has over 25 years of experience in applying technical solutions and leading information technology organizations. Previously, he was with Tatum LLC as a partner and practice leader for its Houston technology organization. He also has held CIO leadership positions at eCommlink, Evercom Systems, and Nortel Networks. Johnson has a BS from Pennsylvania State University and attended the executive masters program in computer science and software engineering at Southern Methodist University.

GulfMark provides marine transportation services to the energy industry through a fleet of 95 offshore support vessels serving every major offshore energy market throughout the world.

Merichem Co.,

Houston has promoted Patrick J. Hickey to executive vice-president of parent Merichem and president of its wholly owned Merichem Chemicals & Refinery Services LLC. In this role, he will serve as COO of Merichem's group of wholly owned businesses. Hickey joined Merichem in 2005

and most recently served as vice-president with responsibilities for research and engineering, commercial development, intellectual property, and information technologies. Previously, he held research, business development, and operations positions with leading international companies. Hickey has bachelor's and master's degrees in chemical engineering from Manhattan College and a PhD in chemical engineering from Clemson University.

Merichem Chemicals & Refinery Services provides licensed process technologies for the treatment of hydrocarbon streams.

Jee Ltd.,

London, has opened a new office in the Westhill area of Aberdeen that houses 25 engineers specializing in subsea engineering.

Jee is an independent firm of consultants specializing in pipeline, riser, and subsea engineering and training services for the oil and gas industry. It has offices in London, Aberdeen, and Abu Dhabi.

UOP LLC,

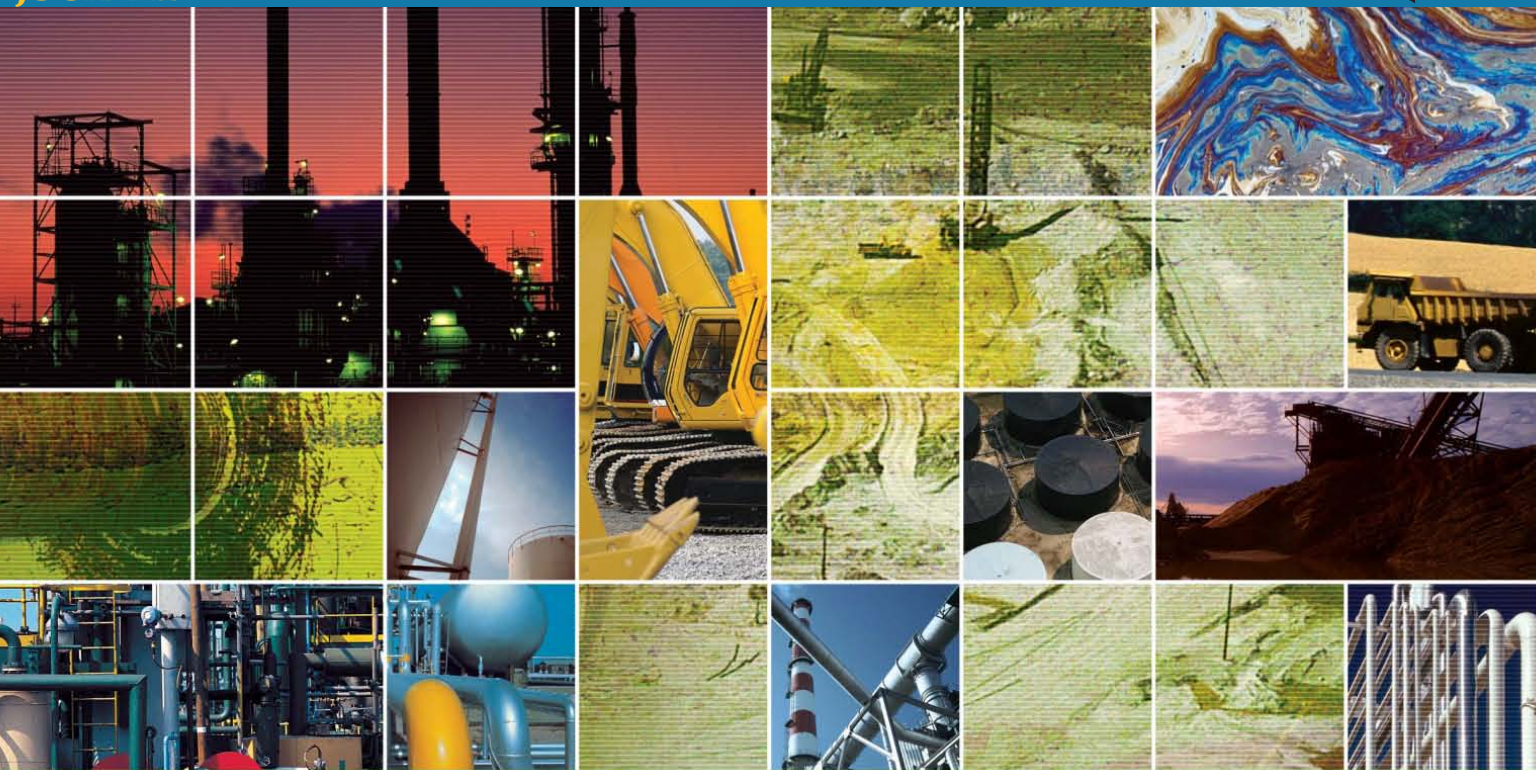
Des Plaines, Ill., has signed an agreement granting Newpoint Gas LP, College Station, Tex., exclusive rights to offer UOP's Separex membrane technology in the design of certain types of gas treating plants in Canada and the US. Separex technology upgrades natural gas streams by removing carbon dioxide and water vapor in order to meet pipeline quality specifications.

UOP is a leading international supplier and licensor of process technology, catalysts, adsorbents, process plants, and consulting services to the petroleum refining, petrochemical, and gas processing industries. It is part of Honeywell International Inc.'s specialty materials business group.

Newpoint offers engineering, equipment, and services for the treatment and purification of natural gas.



Hickey



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Statistics

IMPORTS OF CRUDE AND PRODUCTS

	— Districts 1-4 —		— District 5 —		— Total US —		
	3-6 2009	2-27 2009	3-6 2009	2-27 2009	3-6 2009	2-27 2009	*3-7 2008
	1,000 b/d						
Total motor gasoline	1,228	1,051	29	119	1,257	1,170	745
Mo. gas. blending comp.....	784	987	17	112	801	1,099	376
Distillate	302	294	0	0	302	294	133
Residual	404	436	98	0	502	436	264
Jet fuel-kerosine	24	59	23	0	47	59	258
Propane-propylene	169	471	36	74	205	545	164
Other	141	(19)	12	(89)	153	(108)	1,376
Total products.....	3,052	3,279	215	216	3,267	3,495	3,316
Total crude	7,897	7,833	1,224	1,195	9,121	9,028	10,548
Total imports	10,949	11,112	1,439	1,411	12,388	12,523	13,864

*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

	*3-13-09	*3-14-08	Change	Change
	\$/bbl			%
SPOT PRICES				
Product value	50.96	116.79	-65.82	-56.4
Brent crude	44.46	108.91	-64.45	-59.2
Crack spread	6.50	7.87	-1.37	-17.4

FUTURES MARKET PRICES

	*3-13-09	*3-14-08	Change	Change
	\$/bbl			%
One month				
Product value	53.24	119.54	-66.30	-55.5
Light sweet crude	45.68	109.42	-63.74	-58.3
Crack spread	7.56	10.12	-2.56	-25.3
Six month				
Product value	55.65	116.73	-61.08	-52.3
Light sweet crude	50.21	104.23	-54.02	-51.8
Crack spread	5.43	12.50	-7.07	-56.5

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

PURVIN & GERTZ LNG NETBACKS—MAR. 13, 2009

Receiving terminal	Liquefaction plant					
	Algeria	Malaysia	Nigeria	Austr. NW Shelf	Qatar	Trinidad
	\$/MMbtu					
Barcelona	11.05	7.78	8.96	7.69	8.30	8.89
Everett	3.55	1.84	3.26	1.96	2.27	3.78
Isle of Grain	3.16	1.47	2.68	1.39	1.89	2.70
Lake Charles	1.75	0.31	1.57	0.44	0.54	2.22
Sodegaura	4.61	6.48	4.87	6.24	5.65	4.12
Zeebrugge	6.73	4.17	6.18	4.01	5.03	6.22

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

CRUDE AND PRODUCT STOCKS

District	Crude oil	— Motor gasoline —			— Fuel oils —		Propane-propylene
		Total	Blending comp. ¹	Jet fuel, kerosine 1,000 bbl	Distillate	Residual	
PADD 1	13,118	53,309	33,879	9,798	53,494	13,513	2,380
PADD 2	83,947	55,024	23,283	8,143	35,445	1,265	12,992
PADD 3	180,463	69,438	38,915	13,080	38,953	17,914	21,596
PADD 4	15,353	6,530	2,349	545	3,235	290	1,968
PADD 5	58,458	28,216	23,723	9,998	14,277	5,150	—
Mar. 6, 2009.....	351,339	212,517	122,149	41,564	145,404	38,132	37,936
Feb. 27, 2009.....	350,590	215,510	124,296	41,692	143,296	36,636	38,287
Mar. 7, 2008².....	311,626	235,967	117,287	38,925	116,400	36,564	27,609

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

REFINERY REPORT—MAR. 6, 2009

District	REFINERY OPERATIONS		REFINERY OUTPUT				
	Gross inputs	Crude oil inputs	Total motor gasoline	Jet fuel, kerosine	Fuel oils		Propane-propylene
	1,000 b/d		1,000 b/d				
PADD 1	1,181	1,174	2,019	84	365	128	44
PADD 2	3,137	3,110	2,093	202	953	42	199
PADD 3	6,986	6,775	2,731	659	2,157	256	577
PADD 4	534	534	269	22	155	21	1,160
PADD 5	2,737	2,523	1,427	401	613	135	—
Mar. 6, 2009.....	14,575	14,116	8,539	1,368	4,243	582	980
Feb. 27, 2009.....	14,650	14,345	9,003	1,449	4,088	491	1,033
Mar. 7, 2008².....	14,818	14,622	9,030	1,479	3,891	707	1,165
	17,621 Operable capacity		82.7% utilization rate				

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

OGJ GASOLINE PRICES

	Price ex tax 3-11-09	Pump price* 3-11-09 c/gal	Pump price 3-12-08
(Approx. prices for self-service unleaded gasoline)			
Atlanta.....	147.4	193.9	327.3
Baltimore.....	150.0	191.9	317.1
Boston.....	148.0	189.9	312.7
Buffalo.....	135.0	195.9	334.8
Miami.....	140.8	192.4	340.4
Newark.....	151.8	184.4	298.7
New York.....	121.0	181.9	314.6
Norfolk.....	146.5	184.9	314.0
Philadelphia.....	148.2	198.9	320.6
Pittsburgh.....	158.2	208.9	318.8
Wash., DC.....	169.5	207.9	322.4
PAD I avg.....	146.9	193.7	320.1
Chicago.....	146.3	210.7	347.9
Cleveland.....	143.8	190.2	311.7
Des Moines.....	144.4	184.8	315.5
Detroit.....	132.9	192.3	313.8
Indianapolis.....	129.2	188.6	318.8
Kansas City.....	145.5	181.5	311.3
Louisville.....	146.0	186.9	333.1
Memphis.....	141.0	180.8	315.2
Milwaukee.....	137.1	188.4	311.8
Minn.-St. Paul.....	141.0	185.0	307.7
Oklahoma City.....	136.4	171.8	311.2
Omaha.....	141.5	186.8	317.9
St. Louis.....	141.2	177.2	301.4
Tulsa.....	138.1	173.5	304.0
Wichita.....	135.9	179.3	303.1
PAD II avg.....	140.0	185.2	315.0
Albuquerque.....	149.0	185.4	308.6
Birmingham.....	144.1	183.4	318.2
Dallas-Fort Worth.....	142.0	180.4	312.1
Houston.....	138.0	176.4	311.3
Little Rock.....	147.7	187.9	315.0
New Orleans.....	145.5	183.9	311.3
San Antonio.....	144.0	182.4	305.3
PAD III avg.....	144.3	182.8	311.7
Cheyenne.....	142.3	174.7	300.7
Denver.....	144.7	185.1	315.0
Salt Lake City.....	138.8	181.7	313.9
PAD IV avg.....	141.9	180.5	309.9
Los Angeles.....	147.3	214.4	345.6
Phoenix.....	162.4	199.8	301.4
Portland.....	180.1	223.5	340.4
San Diego.....	162.0	229.1	357.4
San Francisco.....	167.0	234.1	369.9
Seattle.....	167.1	223.0	349.5
PAD V avg.....	164.3	220.7	344.0
Week's avg.....	146.2	191.8	319.6
Feb. avg.....	144.0	189.6	303.1
Jan. avg.....	131.5	177.1	304.5
2009 to date.....	139.4	185.0	—
2008 to date.....	262.8	306.4	—

*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

	3-6-09 c/gal	3-6-09 c/gal
Spot market product prices		
Motor gasoline	Heating oil No. 2	
(Conventional-regular)	New York Harbor.....	121.60
New York Harbor.....	Gulf Coast.....	113.35
Gulf Coast.....	Gas oil	
Los Angeles.....	ARA.....	120.81
Amsterdam-Rotterdam- Antwerp (ARA).....	Singapore.....	110.24
Singapore.....	Residual fuel oil	
Motor gasoline	New York Harbor.....	87.57
(Reformulated-regular)	Gulf Coast.....	88.62
New York Harbor.....	Los Angeles.....	107.42
Gulf Coast.....	ARA.....	80.61
Los Angeles.....	Singapore.....	87.21

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

BAKER HUGHES RIG COUNT

	3-13-09	3-14-08
Alabama.....	2	5
Alaska.....	11	10
Arkansas.....	45	37
California.....	23	34
Land.....	22	33
Offshore.....	1	1
Colorado.....	61	118
Florida.....	0	0
Illinois.....	1	0
Indiana.....	2	2
Kansas.....	17	11
Kentucky.....	11	11
Louisiana.....	137	143
N. Land.....	71	46
S. Inland waters.....	6	17
S. Land.....	18	29
Offshore.....	42	51
Maryland.....	0	0
Michigan.....	0	1
Mississippi.....	14	11
Montana.....	3	10
Nebraska.....	0	0
New Mexico.....	43	74
New York.....	3	5
North Dakota.....	50	59
Ohio.....	7	13
Oklahoma.....	110	203
Pennsylvania.....	26	19
South Dakota.....	0	2
Texas.....	456	881
Offshore.....	3	8
Inland waters.....	0	3
Dist. 1.....	10	26
Dist. 2.....	18	39
Dist. 3.....	41	56
Dist. 4.....	40	88
Dist. 5.....	106	191
Dist. 6.....	84	130
Dist. 7B.....	11	32
Dist. 7C.....	25	53
Dist. 8.....	48	120
Dist. 8A.....	13	26
Dist. 9.....	19	39
Dist. 10.....	38	70
Utah.....	23	42
West Virginia.....	23	24
Wyoming.....	44	66
Others—NV-5; TN-4; VA-3; WA-2.....	14	11
Total US.....	1,126	1,792
Total Canada.....	220	510
Grand total.....	1,346	2,302
US Oil rigs.....	228	343
US Gas rigs.....	884	1,441
Total US offshore.....	47	60
Total US cum. avg. YTD.....	1,623	1,765

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	3-13-09 Percent footage*	Rig count	3-14-08 Percent footage*
0-2,500	43	2.3	76	2.6
2,501-5,000	69	56.5	105	54.2
5,001-7,500	152	19.0	197	21.8
7,501-10,000	255	3.1	441	2.9
10,001-12,500	214	2.8	423	4.4
12,501-15,000	225	—	308	0.3
15,001-17,500	124	—	97	—
17,501-20,000	74	—	81	—
20,001-over	32	—	38	—
Total	1,188	6.9	1,766	7.6
INLAND	12	—	31	—
LAND	1,128	—	1,680	—
OFFSHORE	48	—	55	—

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

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

OGJ PRODUCTION REPORT

	'3-13-09 1,000 b/d	'3-14-08 1,000 b/d
(Crude oil and lease condensate)		
Alabama.....	22	20
Alaska.....	726	726
California.....	656	650
Colorado.....	63	65
Florida.....	7	6
Illinois.....	25	26
Kansas.....	106	106
Louisiana.....	1,431	1,279
Michigan.....	16	16
Mississippi.....	61	60
Montana.....	92	85
New Mexico.....	165	163
North Dakota.....	196	144
Oklahoma.....	178	171
Texas.....	1,367	1,337
Utah.....	59	54
Wyoming.....	149	148
All others.....	70	69
Total.....	5,389	5,125

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

US CRUDE PRICES

	3-13-09 \$/bbl*
Alaska-North Slope 27°.....	35.34
South Louisiana Sweet.....	48.25
California-Kern River 13°.....	39.35
Lost Hills 30°.....	49.45
Wyoming Sweet.....	32.25
East Texas Sweet.....	42.25
West Texas Sour 34°.....	35.00
West Texas Intermediate.....	42.75
Oklahoma Sweet.....	42.75
Texas Upper Gulf Coast.....	35.75
Michigan Sour.....	34.75
Kansas Common.....	41.75
North Dakota Sweet.....	37.50

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

WORLD CRUDE PRICES

	3-6-09 \$/bbl ¹
United Kingdom-Brent 38°.....	44.16
Russia-Urals 32°.....	43.08
Saudi Light 34°.....	40.63
Dubai Fateh 32°.....	43.13
Algeria Saharan 44°.....	46.24
Nigeria-Bonny Light 37°.....	47.37
Indonesia-Minas 34°.....	45.47
Venezuela-Tia Juana Light 31°.....	43.67
Mexico-Isthmus 33°.....	43.56
OPEC basket.....	44.21
Total OPEC ²	42.95
Total non-OPEC ²	42.72
Total world ²	42.85
US imports ³	41.31

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

	3-6-09 bcf	2-27-09 bcf	3-6-08 bcf	Change, %
Producing region.....	690	708	515	34.0
Consuming region east.....	703	793	714	-1.5
Consuming region west.....	288	292	181	59.1
Total US.....	1,681	1,793	1,410	19.2
	Dec. 08	Dec. 07	Change, %	
Total US².....	2,840	2,879	-1.4	

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

Statistics

WORLD OIL BALANCE

	2008			2007		
	3rd qtr.	2nd qtr.	1st qtr.	4th qtr.	3rd qtr.	2nd qtr.
Million b/d						
DEMAND						
OECD						
US & Territories	19.13	19.96	20.15	20.90	21.06	20.95
Canada	2.34	2.25	2.37	2.39	2.40	2.29
Mexico	2.11	2.16	2.10	2.16	2.06	2.14
Japan	4.30	4.59	5.41	5.25	4.70	4.64
South Korea	2.07	2.09	2.33	2.31	2.06	2.12
France	1.92	1.92	1.98	2.02	1.94	1.86
Italy	1.65	1.61	1.62	1.75	1.65	1.69
United Kingdom	1.64	1.72	1.72	1.73	1.73	1.73
Germany	2.72	2.41	2.47	2.54	2.55	2.37
Other OECD						
Europe	7.46	7.24	7.41	7.62	7.55	7.27
Australia & New Zealand	1.12	1.14	1.13	1.15	1.12	1.10
Total OECD	46.46	47.09	48.69	49.82	48.82	48.16
NON-OECD						
China	8.05	7.99	7.74	7.61	7.54	7.75
FSU	4.31	4.30	4.34	4.36	4.25	4.00
Non-OECD Europe	0.76	0.79	0.83	0.78	0.73	0.78
Other Asia	9.14	9.26	9.22	9.25	8.93	9.19
Other non-OECD	15.99	15.80	15.59	15.20	15.36	15.07
Total non-OECD	38.25	38.14	37.72	37.20	36.81	36.79
TOTAL DEMAND	84.71	85.23	86.41	87.02	85.63	84.95
SUPPLY						
OECD						
US	8.18	8.75	8.64	8.58	8.36	8.50
Canada	3.40	3.23	3.38	3.40	3.48	3.37
Mexico	3.15	3.19	3.29	3.33	3.46	3.61
North Sea	4.07	4.33	4.46	4.57	4.28	4.49
Other OECD	1.59	1.58	1.54	1.57	1.57	1.55
Total OECD	20.39	21.08	21.31	21.45	21.15	21.52
NON-OECD						
FSU	12.42	12.60	12.59	12.65	12.55	12.59
China	3.97	4.00	3.94	3.87	3.88	3.97
Other non-OECD	11.64	11.06	10.82	11.13	11.21	11.04
Total non-OECD, non-OPEC	28.03	27.66	27.35	27.65	27.64	27.60
OPEC*	37.30	36.87	36.70	36.19	35.45	35.08
TOTAL SUPPLY	85.72	85.61	85.36	85.29	84.24	84.20
Stock change	1.01	0.38	-1.05	-1.73	-1.39	-0.75

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

US PETROLEUM IMPORTS FROM SOURCE COUNTRY

	Nov. 2008	Oct. 2008	Average YTD		Chg. vs. previous year	
			2008	2007	Volume	%
1,000 b/d						
Algeria	677	555	553	677	-124	-18.3
Angola	450	539	508	514	-6	-1.2
Kuwait	292	240	210	183	27	14.8
Nigeria	827	979	1,121	1,118	3	0.3
Saudi Arabia	1,514	1,487	1,538	1,466	72	4.9
Venezuela	1,236	1,162	1,194	1,358	-164	-12.1
Other OPEC	803	926	860	652	208	31.9
Total OPEC	5,799	5,888	5,984	5,968	16	0.3
Canada	2,532	2,587	2,446	2,462	-16	-0.6
Mexico	1,406	1,433	1,306	1,552	-246	-15.9
Norway	114	70	104	145	-41	-28.3
United Kingdom	224	386	239	281	-42	-14.9
Virgin Islands	338	267	323	342	-19	-5.6
Other non-OPEC	2,440	2,586	2,495	2,774	-279	-10.1
Total non-OPEC	7,054	7,329	6,913	7,556	-643	-8.5
TOTAL IMPORTS	12,853	13,217	12,897	13,524	-627	-4.6

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

OECD TOTAL NET OIL IMPORTS

	Nov. 2008	Oct. 2008	Sept. 2008	Nov. 2007	Chg. vs. previous year	
					Volume	%
Million b/d						
Canada	-1,445	-1,065	-1,190	-1,269	-176	13.9
US	11,123	11,548	10,174	11,421	-298	-2.6
Mexico	-1,309	-1,242	-805	-1,512	203	-13.4
France	1,730	1,911	1,733	1,945	-215	-11.1
Germany	2,454	2,509	2,563	2,176	278	12.8
Italy	1,422	1,412	1,471	1,528	-106	-6.9
Netherlands	1,127	861	939	1,212	-85	-7.0
Spain	1,509	1,437	1,530	1,514	-5	-0.3
Other importers	3,822	4,154	4,077	4,125	-303	-7.3
Norway	-2,372	-1,724	-1,567	-2,030	-342	16.8
United Kingdom	202	99	84	-86	288	-334.9
Total OECD Europe	9,894	10,659	10,830	10,384	-490	-4.7
Japan	4,527	4,465	4,533	5,101	-574	-11.3
South Korea	2,058	1,819	1,854	1,909	149	7.8
Other OECD	741	984	776	833	-92	-11.0
Total OECD	25,589	27,168	26,172	26,867	-1,278	-4.8

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

OECD* TOTAL GROSS IMPORTS FROM OPEC

	Nov. 2008	Oct. 2008	Sept. 2008	Nov. 2007	Chg. vs. previous year	
					Volume	%
Million b/d						
Canada	414	542	544	409	5	1.2
US	5,799	5,888	5,128	6,122	-323	-5.3
Mexico	41	27	28	32	9	28.1
France	930	1,046	1,102	792	138	17.4
Germany	508	477	501	360	148	41.1
Italy	1,083	1,139	1,329	1,272	-189	-14.9
Netherlands	591	545	685	642	-51	-7.9
Spain	827	817	847	562	265	47.2
Other importers	1,139	1,232	1,585	1,287	-148	-11.5
United Kingdom	322	341	275	295	27	9.2
Total OECD Europe	5,400	5,597	6,324	5,210	190	3.6
Japan	3,974	4,035	4,138	4,419	-445	-10.1
South Korea	2,344	2,350	2,365	2,158	186	8.6
Other OECD	489	586	586	692	-203	-29.3
Total OECD	18,461	19,025	19,113	19,042	-581	-3.1

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

OIL STOCKS IN OECD COUNTRIES*

	Nov. 2008	Oct. 2008	Sept. 2008	Nov. 2007	Chg. vs. previous year	
					Volume	%
Million bbl						
France	179	179	177	166	13	7.8
Germany	273	269	272	270	3	1.1
Italy	127	129	130	130	-3	-2.3
United Kingdom	95	93	95	91	4	4.4
Other OECD Europe	701	689	688	669	32	4.8
Total OECD Europe	1,375	1,359	1,362	1,326	49	3.7
Canada	203	200	198	195	8	4.1
US	1,733	1,712	1,705	1,690	43	2.5
Japan	641	648	646	622	19	3.1
South Korea	139	138	141	149	-10	-6.7
Other OECD	115	120	116	107	8	7.5
Total OECD	4,206	4,177	4,168	4,089	117	2.9

*End of period.
Source: DOE International Petroleum Monthly Report
Data available in OGJ Online Research Center.

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From the Subscribers Only area of

Land-grab defeat doesn't herald a friendly Congress

Defeat by the US House of a major lock-up of federal land provides a welcome ray of hope—but a flickering one.

In one of many assaults on US energy supply since the beginning of the year, the Senate in January passed a bill that would have excluded economic activity on more than 2 million federal acres and in other ways thwarted oil and gas exploration and production.

The Editor's Perspective

by Bob Tippee, Editor

To attract votes, the Senate last year larded up the measure with parochial spending programs worth an estimated \$10 billion, bundling 150 bills into an "omnibus" package that probably no one read in its entirety.

The unwieldy measure stalled until it took aboard a dozen more spending bills and Majority Leader Harry Reid pushed it forward in a rare Sunday session.

On Mar. 11, however, the earmark-festooned land grab fell to defeat in the House.

At first blush, the House move seems like a spasm of sound judgment. It's really just a political maneuver that didn't work.

The bill went to the House floor under a rules suspension prohibiting amendments but requiring a two-thirds majority for passage (OGJ Online, Mar. 12, 2009).

It failed 282-144. So 282 representatives—3 fewer than needed to enact the bill—gave their assent to curtailment of resource development amid recession and of activities vital to future oil and gas supply.

The oil and gas industry has little to cheer about here.

In fact, its leaders should know by now to be wary of hopeful signs, few as they are, in the current political climate.

President Barack Obama entered office on a strong note for the industry when he rejected the windfall profit tax with which many congressional Democrats wanted to slug producers. For a while, the industry might have thought he understood what's wrong with singling out oil and gas for punishing taxation.

The budget he proposed this month, which includes nearly every way to sap the industry except a windfall levy, corrects that misconception.

For the oil and gas business, the White House and Congress both remain hostile ground.

(Online Mar. 13, 2009; author's e-mail: bobt@ogjonline.com)

Market Journal

by Sam Fletcher, Senior Writer

OPEC expects lower oil demand

A few days before its Mar. 15 meeting in Vienna, the Organization of Petroleum Exporting Countries reduced its latest forecast of 2009 world crude demand by 400,000 b/d for a total loss of 1.01 million b/d to 84.6 million b/d.

"The world economy is in a dreadful situation with gross domestic product sliding into the red for the entire year of 2009," OPEC said. "Consequently, world oil demand is slipping steeply to a record low year-over-year."

In that same period, the International Energy Agency, Paris, projected global oil demand will fall 1.3 million b/d to 84.4 million b/d in 2009, down 300,000 b/d from its previous forecast. At KBC Market Services, a division of KBC Process Technology Ltd. in Surrey, UK, analysts projected the demand "collapse" at 1.6 million b/d.

As expected, OPEC members did not reduce quotas at their mid-March meeting but called instead for stricter compliance with previously approved production levels. Sources said OPEC was at 79% compliance in February with its December decision for a total reduction by 4.2 million b/d to 24.85 million b/d.

KBC analysts claimed, "The reality is that in December, when OPEC announced its most recent production cut, world oil demand in 2009 was widely believed to be falling by 'only' 400,000 b/d." As a result, OPEC's reduction target "deals with yesterday's problem and further action is needed to deal with today's even worse environment," they said. Eventually, the odds must favor another production cut.

KBC analysts said, "OPEC countries need higher prices. A \$45/bbl world does not satisfy their immediate budget needs, and it certainly does nothing to ensure that the medium term investment in new capacity that is needed—particularly in the upstream—can happen."

OPEC estimated demand for its crude at 30.9 million b/d in 2008, down 500,000 b/d from 2007. It expects demand for its crude to average 29.1 million b/d in 2009. OPEC's production declined 700,000 b/d in February, according to secondary sources. OPEC NGLs and nonconventional oils are expected to average 4.8 million b/d in 2009, an increase of 400,000 b/d from the previous year.

IEA outlook

IEA estimated global oil supply at 83.9 million b/d in February, down 1 million b/d from the previous month and 3.4 million b/d from the same period a year ago. It put OPEC production at 28 million b/d in February, down 1.1 million b/d from January. "Full compliance with agreed cuts...would take OPEC output 1.6 million b/d below the 2009 'call', implying a potential draw in OECD stocks," IEA said.

OPEC estimated non-OPEC oil supply fell 200,000 b/d in 2008, broadly unchanged from its previous report. In 2009, OPEC expects non-OPEC oil supply to increase 400,000 b/d over 2008. However, the Centre for Global Energy Studies, London, said, "OPEC usually overestimates non-OPEC oil production, and their most recent forecast for 2009 is no exception." CGES analysts estimate non-OPEC production may be down as much as 450,000 b/d in 2009.

CGES said, "Mexico, Russia, and China are all struggling to maintain their oil output and, as reported by IEA, Azerbaijan is experiencing more problems with its production at the Azeri-Chirag-Guneshli complex. OPEC's estimate that non-OPEC supplies will increase...could help persuade its members to trim output later on in the year, especially if the global contraction in oil demand proves to be more severe than current forecasts."

Analysts in the Houston office of Raymond James & Associates Inc. said, "We continue to believe that the IEA's forecast for 2009 global demand and non-OPEC supply are too high and need to be revised lower."

Olivier Jakob at Petromatrix, Zug, Switzerland said, "IEA went neutral on the revisions before the OPEC meeting," with the 300,000 b/d reduction in demand offset by a 400,000 b/d reduction in non-OPEC production to zero growth. He said, "The 'call on OPEC and stocks' is thus increased by 100,000 b/d to 28.9 million b/d for 2009, and this compares to an IEA estimate of OPEC production in February of 27.99 million b/d. The demand revisions were priced-in but not the supply revisions; hence the IEA report should be a market-positive input that will also contribute through a flat growth outlook on non-OPEC to bring further focus to the supply side of oil in a sub \$40/bbl environment.

IEA saw "a steady gain" to 2-month highs in a \$41-45/bbl range through early March due to OPEC compliance, with West Texas Intermediate topping North Sea Brent for the first time since late 2008.

(Online Mar. 16, 2009; author's e-mail: samf@ogjonline.com)

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The key to success in challenging markets

When oil and gas prices are high, technology obviously plays a key role in helping find and produce the energy necessary to fuel growing global economies. Likewise, when equipment and skilled personnel are in short supply, technology helps ensure that our industry gets the maximum productivity out of the limited asset base. Today, however, we are all faced with a different environment – one in which oil and gas prices have fallen to substantially reduced levels and the assets necessary to find and produce energy are readily available. Nevertheless, technology remains the key to success, even in challenging markets, because technical innovation provides the vehicle for achieving the cost reductions and increased efficiency essential for maintaining the economic viability of many exploration and development programs.

Throughout its history, the oil and gas industry has continually had to deal with high levels of risk and uncertainty. In challenging markets, in particular, effectively managing risks and reducing uncertainty can make the difference between a project's success and its failure. Reducing uncertainty begins with putting together an optimized drilling plan that takes into account all available information. One of the most important developments in this area, which is highlighted in this publication, has been the development of highly sophisticated dynamic models of the total drilling system using finite element analysis of the BHA elements and precise detail of the drill bit/formation interface.

Another important element of optimizing drilling efficiency and controlling costs is avoiding drilling surprises that can result in increases in non-productive time. Among the technologies contributing to improvements in this area are managed pressure drilling, advancements in measurement-while-drilling and logging-while-drilling systems, and improvement in the reliability and performance of drill bits and downhole tools. Many of the important advancements in these areas are also reviewed in this PennWell drilling technology supplement.

Smith International, Inc. has sponsored this drilling technology supplement as a means for helping operators around the globe better understand how recent technical advancements can be effectively applied to improve drilling performance, drive down drilling costs, reduce the levels of risk and uncertainty and help meet the drilling challenges of today and tomorrow.



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(IDEAS)

IDEAS drill bit modeling and simulation delivers superior performance

When Smith Bits developed and pioneered its IDEAS® (Integrated Dynamic Engineering Analysis System) several years ago, it represented a revolutionary breakthrough in fully understanding the dynamics of a drill bit at the rock/cutter interface and how the bit behaves as an integral part of the total drilling system. While IDEAS originally was developed to optimally design roller cone bits, the proprietary software has since been applied to fixed cutter bits. Today, as a result, every new roller cone and PDC bit designed and produced by SMITH is first run in a virtual environment and certified with IDEAS before being run in a customer's well.

Attesting to the soundness and accuracy of the engineering principles embodied in the IDEAS simulation algorithms, Hart's *E&P* magazine recognized SMITH as the World Record Leader for drill bit performance the past nine consecutive years (1999-2007) for PDC bits, natural diamond and diamond impregnated bits, tungsten carbide insert bits, milled tooth bits and hammer bits. SMITH attained this impressive record through the accurate evaluation of drill bit performance gained from IDEAS and using the knowledge to design, build and apply PDC and roller cone bits in a wide range of drilling applications while providing superior performance.

IDEAS design and certification process

IDEAS is used by Smith's engineers as an interactive tool to understand in detail how even very small changes in cutter position and orientation can affect a bit's dynamic stability, which in turn affects a bit's drilling performance. IDEAS provides a graphic representation of a wide variety of elements that impact the drilling process.

The software details how each tooth, insert or PDC cutter removes formation, the movement of the bit within the wellbore, the force and bending moment condition of the drill string and each element of the BHA.

SMITH uses the IDEAS process to design both PDC and roller cone drill bits that deliver superior performance in any target application.



The IDEAS design process enables Smith's drill bits to move from concept to field proven performance significantly quicker than bits developed via traditional design scenarios, enabling Smith's engineers to more quickly arrive at an optimum bit design. With IDEAS, a simulation model is used to design, test and analyze a bit's performance through the drilling of a virtual well and conducting a virtual case study.

Once the bit's performance objectives are defined, the design is optimized through IDEAS, the bit is manufactured by SMITH and run in the well for which it was designed. The bit then is "IDEAS certified" and integrated into the company's product line.

With the traditional bit development process, a bit's performance objectives are defined, the bit is designed to meet those performance objectives, and an experimental bit is manufactured and then run in the field. Engineers analyze the results of the bit run. If the bit does not meet the initial performance objectives (and for initial designs, it invariably does not), the process is repeated until it does. The often extended time lag between bit runs waiting for appropriate testing opportunities further increases the development time. In this design scenario, the customer is essentially a testing service for the bit company, incurring the time, expense and risk of developing a bit.

IDEAS' five basic elements

There are five basic elements to the IDEAS bit design and product development process. They are:

- Comprehensive drilling system analysis;
- Holistic design process;
- Application-specific performance enhancements;
- Rapid solutions with reliable results; and
- Optimized integration of advanced materials.

The IDEAS certification process includes examining bit performance in relation to the entire drill string and individual bottom hole assembly (BHA) components. The simulation software also takes into account the specific operating parameters and interaction of the individual elements of the entire drilling assembly.

With the holistic design process, Smith's bit design engineers can account for every critical variable to assure that IDEAS-designed bits are optimized for performance. With IDEAS' insight into bit performance, virtually every



IDEAS allows designers to quantitatively evaluate the bottom hole behavior of cutters and cones to use this knowledge to rapidly optimize bit performance.



cone or cutter layout and configuration is designed to result in a stable bit that rotates around its center, the key to an efficient and optimized drilling operation.

Each IDEAS certified bit includes performance enhancements specific to the application for which it is designed. The result is a bit that consistently outperforms previous designs when measured against the same parameters and objectives. For example, IDEAS-designed and certified bits result in improved rate of penetration (ROP), durability or specific bit behavior when utilized with a rotary steerable system. IDEAS certified bits are consistently dynamically stable within the operating envelope for which they are designed. The result is more stable bit designs and less stress on the BHA, which ultimately results in improved bit durability.

IDEAS certified bits move through the design stage significantly quicker and with a greater level of reliability and reduced uncertainty than ever before. IDEAS' modeling and simulation capabilities removes the trial-and-error approach previously associated with the bit design process by utilizing laboratory tests to quantify variables such as cutter forces and rock removal rates. The IDEAS process can prove the efficacy of the bit design prior to moving to the field trial stage. This ensures that drill bits that move into the field are true candidates for the application for which they were designed.

SMITH can more effectively introduce advanced cutter materials by utilizing the IDEAS process. Stronger and more durable materials work in conjunction with the IDEAS design process and simulation capabilities to deliver a bit that is more than just correcting a design for weak and high wear areas. The result is an optimally-designed bit for high performance and abrasion and impact resistant cutters.

(IDEAS)

Beginning the IDEAS analysis process

The IDEAS analysis process begins in a drilling research laboratory where comprehensive tests are conducted to accurately document cutter forces and rock removal rates for specific cutter types in specific rock types. Smith's IDEAS lab is a state-of-the-art facility that provides design engineers with the equipment and opportunity to validate their design simulations in a controlled environment.

The sophisticated equipment allows the testing of cutting structures on a virtually unconstrained range of formations and rock types. The results provide quantitative feedback to the engineer, who then confirms the bit's performance expectations or provides data that can be utilized to improve the bit's design specifications.

The lab's and engineers' capabilities provide the customer with a bit that is the optimum solution for the drilling application in the shortest time possible. The customer can have greater confidence that the bit will meet performance objectives the first time it is run in the well.

Data from IDEAS quantifies actual cutter forces and rock removal rates. The data is then used for the design analysis in lithologies that compare to the particular field application rather than the estimated rock/cutter behaviors generated by traditional design tools noted above.

Modeling the entire drilling system

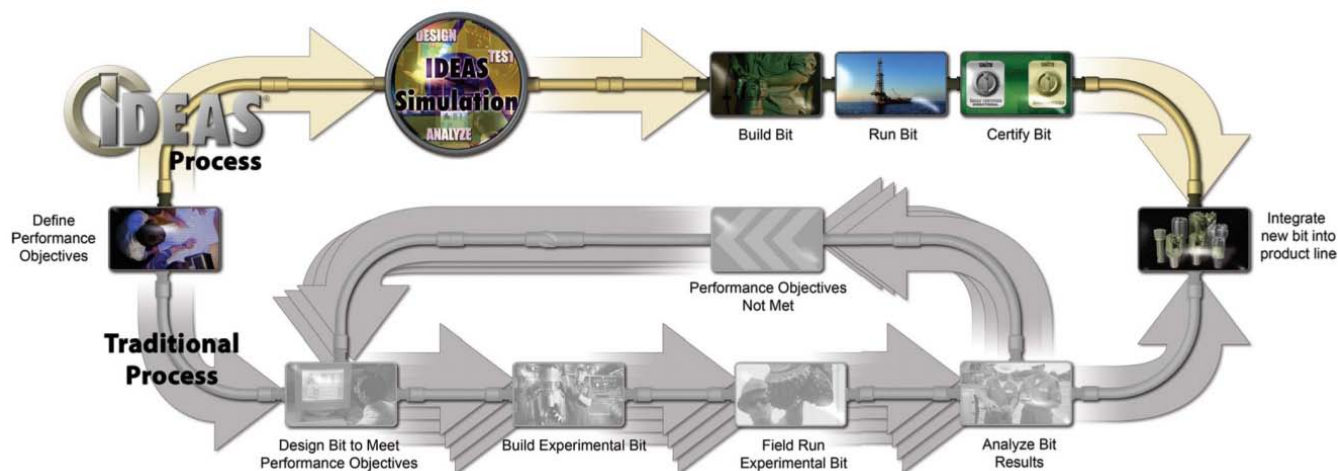
IDEAS is a dynamic model of the total drilling system. When the actual rock/cutter data is obtained, it is integrated into a full bit design model to determine the performance



characteristics of the bit in actual drilling conditions. As a result, the model analyzes specific attributes of the well geometry, the rock/cutter interface, BHA configuration, drill string behavior and directional response, weight on bit (WOB), dynamic analysis of projected bit behavior, rotary speed, and how changes in operating parameters affect bit performance. All are taken into account as integral parts of the bit design process.

The IDEAS software provides a virtual picture of the bottom hole pattern of the bit, allowing the design engineer to adjust the design to ensure that the bit will deliver stable, vibration-free behavior during drilling. Additionally, IDEAS provides data on the load applied to each cutter in a given formation. With this information, the engineer can adjust the cutting structure layout and geometry to optimize durability while maximizing ROP, two objectives that sometimes are mutually exclusive.

The IDEAS process is used to certify a bit's performance capabilities through dynamic simulation and modeling meth-



The IDEAS process significantly shortens the bit development process, and gets improved performance to the customer much faster than the conventional trial-and-error method.

odology that takes into account not only the lithology at the rock/cutter interface but the drill string, drive system, BHA and the total system's influence on the bit behavior.

IDEAS certified directional bits

When it comes to directional bits, Smith's philosophy, whether utilizing a positive displacement motor (PDM) or rotary steerable system (RSS), is that a single bit design can provide exceptional performance when used with a range of different types of directional drilling systems provided the bit has been designed to remain dynamically stable. This is where IDEAS comes into play.

Historically, the perception was that each type of RSS, push-the-bit or point-the-bit, or steerable motor BHA, required its own precise bit design with highly specialized directional features. This still is the generally accepted philosophy among many bit designers and manufacturers.

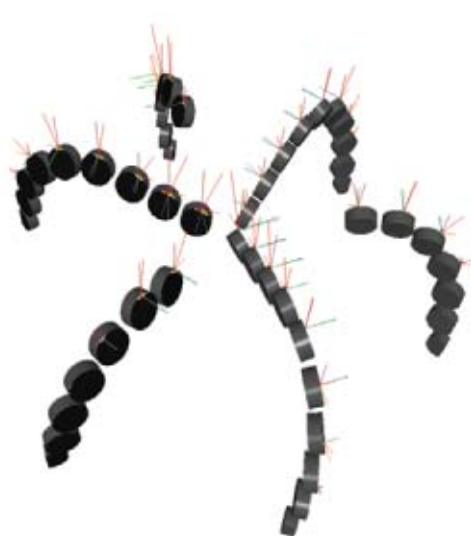
However, incorporating IDEAS to analyze conventional directional bit designs has helped to reveal that, in many instances, the range of special directional features previously incorporated into a bit served as little more than a crutch that allowed a basically unstable bit design to drill acceptably only in a specific directional application. A bit's unstable characteristics are revealed when used with a slightly different BHA or in a different application, thus re-

quiring a new or significantly modified bit to compensate for the inherent instability of a bit design under different downhole or steering conditions.

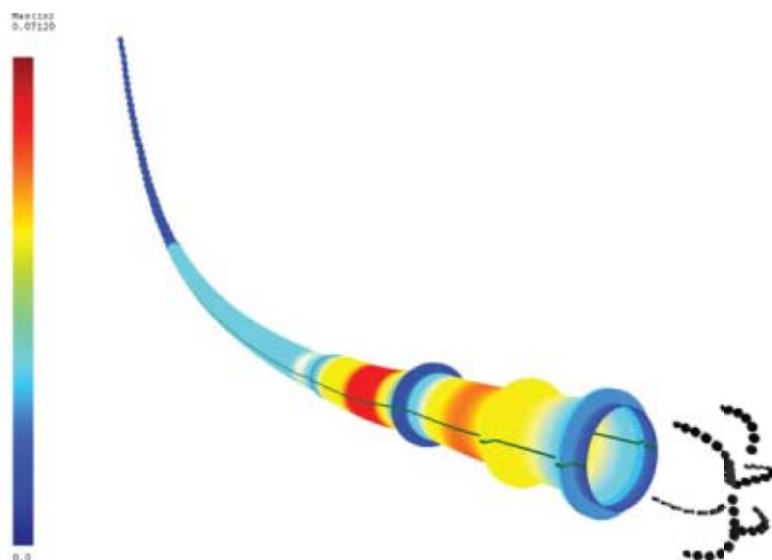
IDEAS has enabled SMITH to take a revolutionary approach to designing bits for directional applications. Rather than offering a line of directional PDC bits with specialized features for the different types of rotary steerable systems, SMITH uses IDEAS to evaluate individual directional applications and then develop a bit design that remains dynamically stable for the intended range of applications and anticipated directional systems.

With IDEAS, each of the different types of rotary steerable systems can be accurately modeled individually. As a result, it is possible to precisely model and predict how several different IDEAS bit designs will perform, in specific formations with a specific RSS, with specific operating parameters and with specific BHAs. PDC bits can now be certified as being dynamically stable and directionally responsive across a wide range of directional applications.

With IDEAS, a bit designer no longer needs to focus on stabilizing an unstable bit design. Instead, the designer can concentrate on optimizing the blade count, cutter selection and layout, and hydraulic configuration to make the bit drill faster and last longer. Generally, directionally certified IDEAS bits can have reduced blade counts, larger



IDEAS calculates the loads placed on each individual PDC cutter, and enables engineers to fine-tune their designs to improve durability without sacrificing ROP.



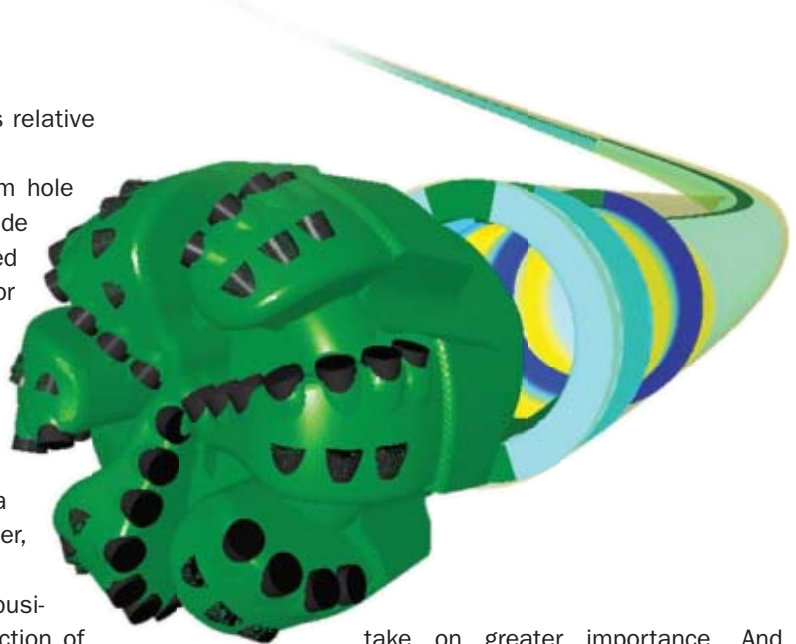
The IDEAS simulation is able to analyze not just the bit, but every component in the bottom hole assembly (BHA) and drill string.

(IDEAS)

diameter PDC cutters and lower back rake angles relative to conventional directional bits.

The larger diameter cutters establish full bottom hole coverage, generate higher loads per cutter and provide greater depth of cut to maximize ROP. IDEAS certified directional bits remain stable and provide superior performance with different types of steering systems in a wide range of applications, reducing risk of suboptimal performance should it become necessary to change the system's configuration, operating parameters or something else due to unforeseen developments during drilling. Drilling with a stable bit reduces well costs and provides a smoother, higher quality wellbore for completing the well.

In the oil and gas exploration and production business, performance gains at the drill bit and reduction of drilling risk and uncertainty are always important. However, when energy prices are under pressure and every dollar spent must provide even more value, performance gains



take on greater importance. And IDEAS delivers the consistent performance gains necessary for driving down drilling costs in today's challenging markets. □

	Schlumberger Power-Drive Xtra/X5®	Baker Hughes INTEQ AutoTrak®	PathFinder PathMaker 3D®	PathFinder Steerable PDM®
Drive Type	Push-the-Bit	Push-the-Bit	Point-the-Bit	PDM
DLS (degrees/100 feet)	3.8 - 4.25	4.08	2.7	Maintain Verticality
ROP (feet/hour)	80	113	50	56
Results	The objective was to build angle from 7° to 10° to 90°. The section was drilled twice, with the main wellbore and a sidetrack. The bit drilled a total of 9,574 feet and met the customer's objective for directional control and drilling performance.	The objective was to build hole inclination from 34° to 67° through the target formation to TD. The bit drilled with minimal vibration, stickslip and torque while meeting the customer's objective for directional control and drilling performance.	The objective was to drill the 12 1/4" section in one run and build angle from 23° to 36° while maintaining a constant DLS of 2.7°. The objective was met by drilling 1804 feet at the desired DLS with minimal vibration, stickslip and torque.	The objective was to maintain the vertical well profile while drilling through salt and shale and to reach TD with one bit run. The objective was met by drilling 2,995 feet in a single bit run while maintaining the desired vertical well profile. ROP was 25% faster than offset bit runs.

An IDEAS Certified Directional PDC bit was successfully run on multiple drive systems in the North Sea and delivered excellent performance on both push-the-bit and point-the-bit RSS as well as a PDM. (Trademarks are owned by the respective referenced companies.)

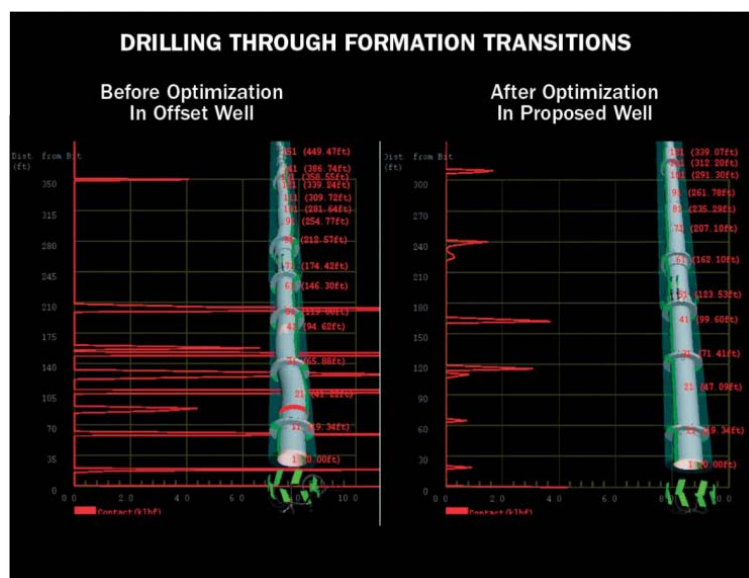
Understanding and optimizing downhole dynamic conditions with i-DRILL

SMITH commercialized i-DRILL® in mid-2004 following an eight-year, multi-million dollar R&D and engineering effort. The goal was to develop a highly accurate predictive modeling system for analyzing complex drilling operations and developing optimized drilling program solutions to reduce risk and lower drilling costs. i-DRILL provides a unique approach to a complete drilling system analysis. Instead of the common practice used in the past of assuming generalized bit-effect factors on the formation, i-DRILL incorporates the detailed effects of the bit/rock interaction and the forces on all cutters individually as they dynamically contact the rock.

The software is the industry's most powerful pre-well planning analysis resource. It is capable of optimizing the total drilling process, including bit selection, optimization of operating parameters, bottom hole assembly (BHA) design, and precise placement of each BHA element.

i-DRILL's 4D modeling predicts a drilling system's performance and behavior using detailed geometric input parameters, anticipated operating parameters, extreme computing power, finite element analysis (FEA) and laboratory-derived rock mechanics data. The 4D modeling accurately predicts the vibrations and accelerations often seen to have detrimental effects on directional control, tool reliability, drill string integrity and drilling performance. The software's ability to pinpoint sources and effects of torsional, axial and lateral oscillations enables Smith's drilling engineers and directional drillers to quantify design changes to drill string configurations and optimize parameters.

Smith's engineers can conduct a virtual case study utilizing i-DRILL's simulation capabilities in a way similar to what the company's IDEAS simulation software does for the bit design process. However, where IDEAS tests application-specific



Understanding the dynamic behavior of the BHA through formation transitions is critical to obtaining optimal performance. Note the significantly lower contract forces of the i-DRILL optimized BHA assembly.

(i - D R I L L)

bit designs, i-DRILL models, analyzes and predicts an entire drilling system's performance and behavior.

Offset well data is integrated with comprehensive drilling data in a virtual downhole world created by powerful computers. This approach allows the engineers to accurately identify the root causes of inefficient and damaging drilling behavior without drilling the well and exposing the operator to unnecessary risk. The engineers then can objectively and precisely evaluate multiple approaches for correcting the problem utilizing i-DRILL's FEA system.

How it works

Offset well data is used to calibrate i-DRILL's simulation software for each individual application. Data includes details of the physical characteristics of the entire drill string, BHA and bit. Information also includes directional surveys and caliper logs to characterize hole geometry as well as surface and downhole operating parameters including weight on bit (WOB), torque and RPM. Additionally, mud log and wireline data is included to characterize the formations being drilled.

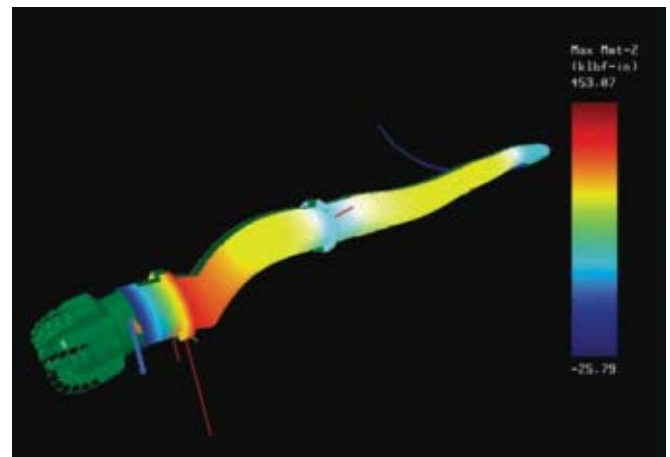
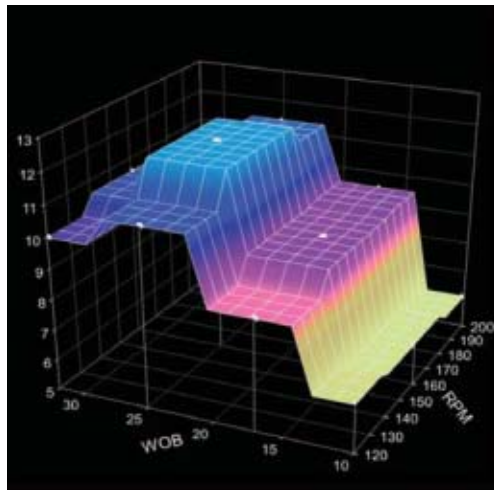
The information is used to build a virtual replica of the offset drilling assembly, formations and wellbore inside the i-DRILL workstation to model and simulate the operation of the drilling assembly as a function of time. i-DRILL allows for the analysis of specific target lithology and behavior of each component of the drilling assembly, allowing identification of suspect behavior, which is quantified and illustrated through the software's advanced graphics capabilities.

Video clips of the simulation accurately show what would be actually happening downhole. i-DRILL can virtually reproduce the static and dynamic components of any drill string, including push-the-bit and point-the-bit rotary steerable systems, vertical drilling tools and steerable motors. Behavior such as high contact forces in the rotary steerable BHA, bit whirl and excessive bending moments in a cross-over sub are only a few examples of what can be learned in the "before optimization" analysis. i-DRILL's extensive tool portfolio includes the differentiation between push-the-bit and point-the-bit rotary steerable systems, concentric and eccentric reamers, positive displacement

motors, hole openers and roller reamers, among other system elements.

When the causes of less than optimal drilling performance are identified, THE i-DRILL engineer can reconfigure the modeled drilling assembly, using the simulation analysis to correct the identified performance issues. This corrective action could include substituting a different bit, changing to roller reamers from stabilizers, moving the relative position of the individual BHA components, changing operating parameters or a combination of these or other corrective actions until significant performance improvements are confirmed.

When the i-DRILL engineer optimizes the drill string assembly and its components, a comprehensive report documenting the simulation process is presented to the customer. The report contains the results of each simulation and identifies all of the potential changes that could be made to the drilling assembly and the effects these changes would have on performance. The customer can choose the option that best meets its drilling objectives, minimizes problems and improves performance.

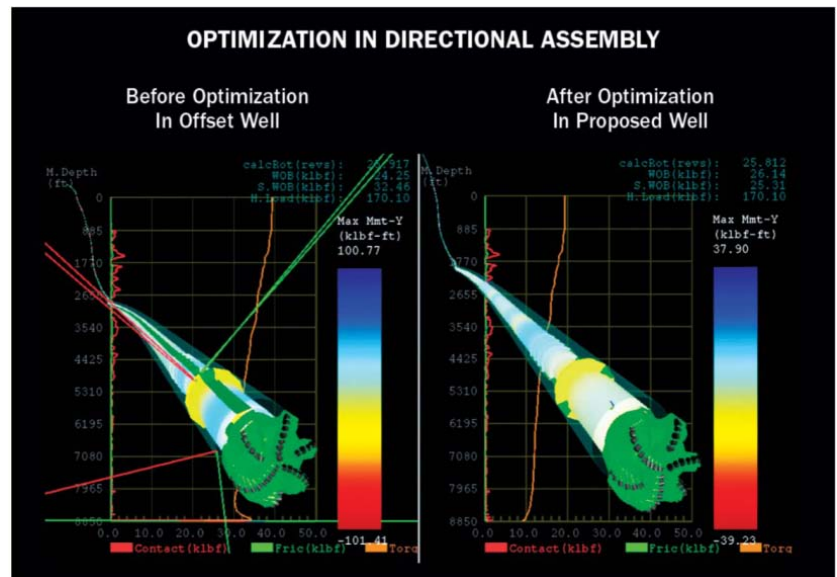


To evaluate a drill string's integrity, i-DRILL calculates bending moments throughout the entire drill string. This simulation includes a PDC bit, mud motor with 1.2° bent angle housing, and two stabilizers in a deviated well. Contact forces and bit directional and inclination forces are evaluated to predict directional tendencies, as well as drill string integrity.

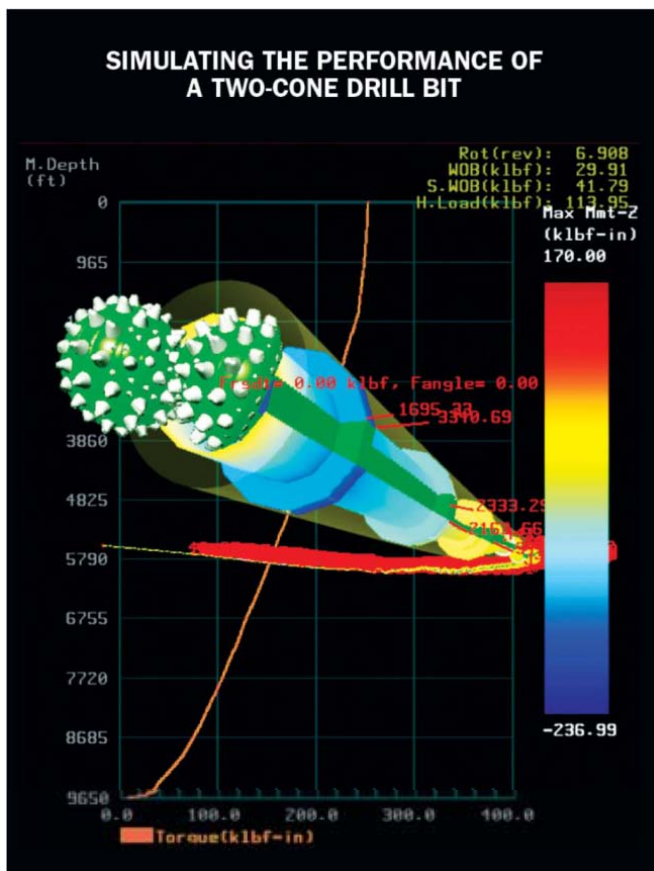
What i-DRILL can do for you

i-DRILL can process a multitude of simulations representing any combination of drill bit options, drilling assembly components, drill string designs and component placement. The simulation provides an in-depth understanding of a drilling system's integrity by evaluating bending moments in two directions. The highly accurate simulations allow the engineer and customer to quantitatively evaluate various scenarios and then choose the optimum solution, confident that the predicted performance will be duplicated in the actual drilling application.

The simulation and analysis can predict the performance of new bit designs for achieving step-change performance improvement. It can predict the dynamic behavior of directional BHAs and identify weak areas in the drill string and BHA to help prevent lost tools down-hole and subsequent expensive fishing operations.



The i-DRILL optimized drilling assembly exhibits substantial improvements in reduced contact forces, bending moments and torque compared to the offset well drilling assembly.



i-DRILL can minimize harmful lateral, torsional and axial vibrations through the selection of dynamically stable drilling assemblies. The result is improved rates of penetration (ROP), increased mean time between failure (MTBF) in MWD and LWD electronic components and other tools, and minimized connection failures and repair costs.

Additionally, the simulation and analysis results in balanced drill bit and hole opener cutting structure loading to eliminate excessive vibrations. i-DRILL develops more accurate drilling program schedules with reduced risk of unplanned delays, saving the customer time and money. Also, its ability to accurately simulate the downhole behavior of the drill bit, each component of the BHA, and the drill string, allows the aggressive testing of new technology in a virtual environment without incurring the risk or expense of trial-and-error testing on the rig.

By giving customers the opportunity to truly understand what is happening in the dynamic downhole drilling environment, i-DRILL is the key for finding the optimum solution to even the most complex drilling problems. □

i-DRILL's ability to accurately simulate the downhole behavior of the drill bit, each component of the BHA and the drill string allows the aggressive testing of new technology in a virtual environment without incurring the risk or expense of trial-and-error testing on the rig.

(Case study)

i-DRILL solves complex vibration problems, achieves record ROP in Peruvian field

When PlusPetrol experienced excessive BHA/PDC bit vibration while drilling in its high-profile Pagoreni field in Peru with a rotary steerable system, the company called upon Smith's i-DRILL engineering group to optimize the BHA design, including the PDC bit selection for its next well.

The drilling problems were causing unacceptable rates of penetration (ROP) while reducing the life of expensive downhole equipment, ultimately driving up the cost of field development. The issues were most noticeable when using an expandable reamer in a rotary steerable system BHA to drill a 10 $\frac{5}{8}$ -in. pilot hole reamed open to 12 $\frac{1}{4}$ -in. Specific performance issues experienced while holding angle in the tangent section included excessive torque-induced stick-slip as well as high axial and lateral vibration problems.

PlusPetrol drilling engineers and Schlumberger rotary steerable system engineers experimented with different operating parameters and BHA configurations in an effort to mitigate the downhole vibration issues, but they achieved limited success. Axial and lateral vibrations subsided slightly; however, stick-slip increased, causing more downhole problems than the original BHA configuration.

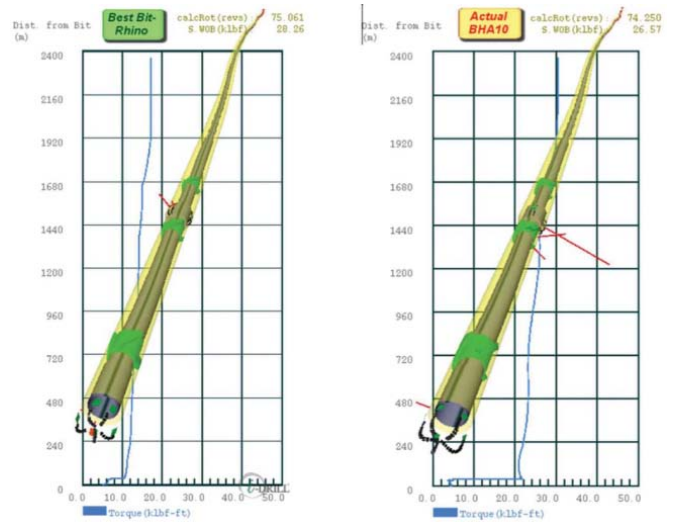
» SMITH utilized its proprietary i-DRILL simulation and analysis software to model the drill string configuration and behavior. The goal was to optimize the drilling system including rotary steerable system, reamer, PDC bit and operating parameters. Results were dramatic, enabling the Pag-1004D well to become the performance benchmark, at that time.

PlusPetrol contacted Smith's i-DRILL engineering group to optimize the BHA design and the PDC bit selection for the operator's Pag-1004D well. The i-DRILL analysis focused on data and drilling practices from three previous wells in which similar issues were encountered. SMITH utilized its proprietary i-DRILL simulation and analysis software to model the drill string configuration and behavior. The goal was to optimize the drilling system including rotary steerable system, reamer, PDC bit and operating parameters.

» Used in conjunction with suggested operating parameters, the BHA delivered all directional objectives while mitigating axial and lateral vibrations.

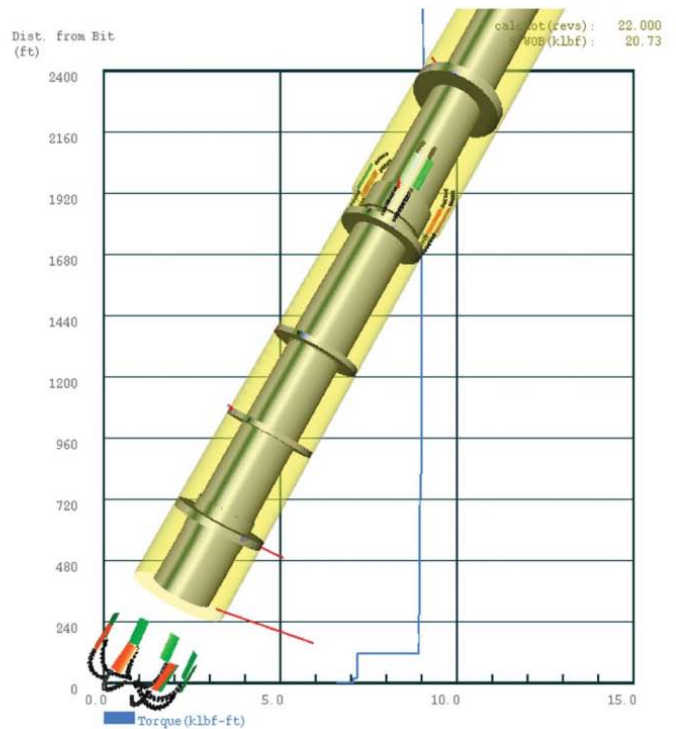
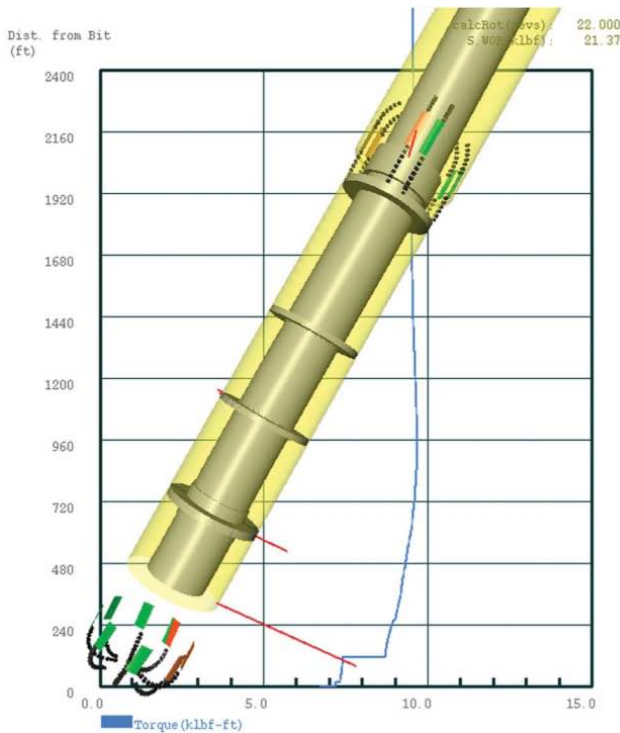
Results were dramatic, enabling the Pag-1004D well to become the performance benchmark, at that time. The recommendations of Smith's i-DRILL engineers as a result of the simulation successfully reduced vibrations to allow the 12 1/4-in. x 10 5/8-in. section to be drilled and underreamed to its 8,482 ft TD in one run with an IDEAS certified MDi616 PDC bit. Used in conjunction with suggested operating parameters, the BHA delivered all directional objectives while mitigating axial and lateral vibrations.

Average ROP rose to 37.4 ft/hr on the Pag-1004D well from only 19.4 ft/hr on the Pag-1001D well, a 93% increase. The BHA and bit delivered a high-quality, full gauge wellbore at a final inclination of 46.8° as planned. By reducing drilling issues and increasing ROP, PlusPetrol realized a 15% reduction in cost/ft compared to its AFE, for a total savings of \$1.2 million for the 12 1/4-in. x 10 5/8-in. hole section alone. □



i-DRILL enabled the drilling team to simulate the behavior of several BHA configurations and then choose the drilling assembly that best mitigated vibrations while allowing all of the directional objectives to be met.

Using i-DRILL's ability to accurately simulate the behavior of the drill bit and the reamer, these two cutting tools can be optimized to deliver superior drilling synergy.



(Advanced Services Engineering)

Drilling costs reduced with objective drill bit selection

Within SMITH is an independent applications organization that provides expert drill bit selection, in addition to drilling systems design input and operating parameters selection, to its customers. Project demands on an operator's drilling engineering organization frequently means insufficient time for a comprehensive bit selection process, often resulting in less than optimal bit performance, in turn leading to higher well costs. Smith's Advanced Services Engineering (ASE) program provides full-time, experienced and expert bit application specialists as part of the customer's drilling team.

The ASE engineer provides objective technical recommendations to the customer for the optimal bits for the application using a sophisticated suite of application analysis tools and the vast amount of historical data from our proprietary databases. Above all else, the ASE engineer is trained to remain objective and always act in the customer's best interest, even when that means a competitor's bit selection over a Smith bit. In addition to advising the customer on bit selection, the ASE engineer provides feedback to our design engineers on day-to-day drilling results and future drilling requirements as a means for ensuring that SMITH maintains superior bit performance.

Establishing a measurable goal

A bit's performance and its interrelationship with a rig's capabilities and the downhole environment significantly impact drilling costs. The ASE engineer considers the entire drilling environment as well as a rig's capabilities when selecting the optimal bit. This includes the bottom hole assembly, drilling fluids, formation to be drilled, crew capabilities and any special drilling objectives during the bit design process.

In establishing a measurable goal, ASE engineers help prepare a comprehensive well plan and obtain the drilling team's agreement to using this plan to evaluate



drilling performance. A post-well analysis is performed that measures the success of the actual results versus the well plan and provides a permanent, formal reference for future development wells.

ASE engineers are on site worldwide in a multitude of drilling operations including multiple rig developments, exploration wells, shallow and deep offshore wells and directional and extended reach applications.

Optimal tools for optimal bits

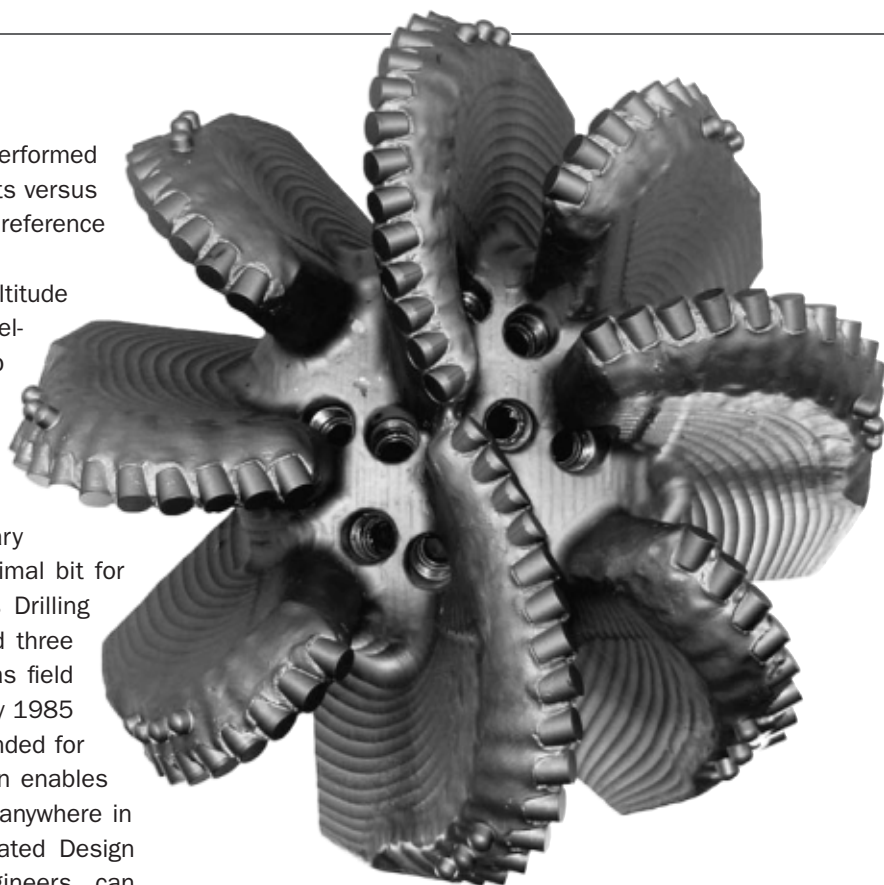
The ASE engineer brings an arsenal of proprietary design and modeling tools to identify the optimal bit for the application. The toolbox includes Smith's Drilling Records System (DRS), a collection of around three million bit runs from virtually every oil and gas field in the world. The database was initiated in May 1985 and has been continuously updated and expanded for oil, gas and geothermal wells. This information enables ASE engineers to evaluate individual bit runs anywhere in the world. When coupled with Smith's Integrated Design Engineering Analysis System (IDEAS), engineers can simulate bit performance and enhance their bit designs to optimize that performance to a specific application.

The ASE engineer also utilizes the Drill Bit Optimization System (DBOS) to aid in determining the appropriate combination of cutting structure, gauge protection, hydraulic configuration and other bit optimizing features to help achieve the lowest cost per foot drilled. SMITH has offered DBOS for 17 years and utilizes a supporting database containing records from more than 11,300 projects in more than 56 countries, encompassing more than 16,300 wells.

Additionally, ASE engineers utilize Smith's Yield Point drilling hydraulics and hole cleaning simulation and analysis software. Yield Point can identify potential hole cleaning problems in the planning stage rather than during drilling operations, further lowering well costs.

Well planning

Planning the well starts with support from DRS, DBOS and Yield Point software and the ASE engineer's experience and expertise in drill bit design and application. The well plan begins with the DBOS program and its analysis of offset wells from the DRS and an array of other relevant information. The DBOS analysis provides a thorough reconstruction of expected lithologies gleaned from well logs from the closest offset wells. The information includes a formation analysis,



unconfirmed rock strength analysis and roller cone and fixed cutter bit selections.

Operational needs and the well plan are added to the process, including casing points and hole sizes, well directional plot, expected formation tops and mud weights and types. This results in an optimized minimum cost per foot well program that often also includes multiple options and alternatives to the initial well plan.

The Yield Point software creates a graphical user interface to aid drilling engineers in specifying the mud types and properties necessary to satisfy rheological models of drill strings and well annuli.

When the well plan is complete, the appropriate rig and office personnel are briefed on the drilling program. They can monitor the well prognosis during implementation of the well plan. Any problems that may arise are identified and investigated and decisions are made to correct the issues, subject to the objective of maintaining optimal drilling efficiency safely and timely.

Upon the well's completion, a thorough performance assessment is conducted during which every facet of the drilling operation is evaluated. The drilling team, including Smith's ASE engineer, then makes recommendations for improvements, which will be incorporated into future well plans.

(Advanced Services Engineering)

Reducing drilling time reduces drilling cost

Smith's ASE process and ASE engineers enabled Brazilian national oil company Petrobras to reduce its drilling days by up to 45% in the technologically challenging Tupi field in the Santos Basin 180 miles south of Rio de Janeiro. The ASE group within SMITH helped Petrobras optimize its operations in the Tupi field, which could result in the country increasing its proven reserves by up to 50%. The new field, in approximately 8,200 ft of water, contains an estimated 5-8 billion barrels of light crude.

Delineation wells are being drilled to determine the size of the field, however, based upon analysis from reservoir characterization studies, engineers estimate that the field could be 500 miles long and 120 miles wide with a 400 ft thick pay zone.

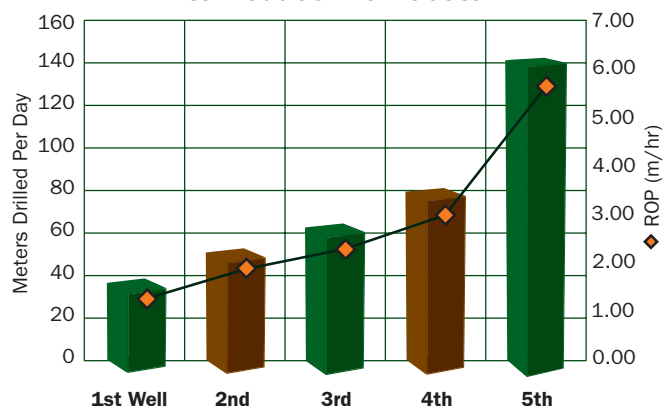
Due to the field's potential size and the magnitude of the development project, Petrobras wanted an independent applications engineering organization to provide unbiased drill bit selection and well planning services to optimize performance and reduce expensive offshore drilling costs. The ASE engineers focus on recommending the ideal bit for a specific application, including a competitor's bit if it is appropriate.



Petrobras and Smith Technologies ASE engineers mark the success of a recent Tupi field bit application with an awards ceremony. Providing customers with unbiased, technical bit applications expertise is the hallmark of the ASE organization.

Petrobras must use some of the world's most sophisticated and expensive deepwater drilling rigs where operational costs can reach \$1 million per day. Because of the Tupi field's high stakes, advanced planning becomes a powerful tool that can lead to significant cost savings.

A proactive approach can reduce the chance of non-productive, unexpected flat-time and help ensure that operations run as smoothly as possible. The ASE engineers can focus on any combination of customer requirements including well planning, logistics, data collection or post well analysis. DRS, DBOS, Yield Point and IDEAS software is at the engineers' disposal.

ASE Group Partners with Petrobras to Reduce Well Costs

Operator teamwork and Smith ASE group involvement resulted in incremental meterage and ROP improvements in Tupi field.

To meet Petrobras' well objectives, Smith's ASE engineers and Petrobras' engineers conducted an in-depth investigation of expected formation types and rock strengths that led to optimized bit recommendations to result in increased overall drilling efficiency. The ongoing interaction between the two companies' engineering teams enabled Petrobras to organize its bit inventory in an application-specific manner to assure the availability of the ideal bit for the application.

The study also identified an opportunity for SMITH to use its unique and proprietary IDEAS simulator to develop, test and manufacture new bit technology that conformed to Petrobras' specific application and requirements. The new bit was designed to increase drilling distance (durability) and rate of penetration (ROP), which in many situations are mutually exclusive, without compromising the geologist's ability to capture rock cuttings at the surface. The new bit technology is being tested on the formation below the salt interval.

As a result of the cooperative effort between ASE engineers and Petrobras' engineers, the operator and its partners are experiencing a significant savings on this extremely challenging offshore project. One of the first wells drilled in the subsalt exploration program required 110 days to reach TD. However, due to Smith's ASE involvement and other factors, Petrobras can now drill a similar well in the Tupi field area in approximately 60 days. ROP increased from just under 2 m/hr during the first well to above 3 m/hr in the third well and more than 6 m/hr in the fifth well. The higher ROP resulted in increased footage drilled from just less than 40 m drilled per day in the first well to more than 140 m per day in the fifth well. □

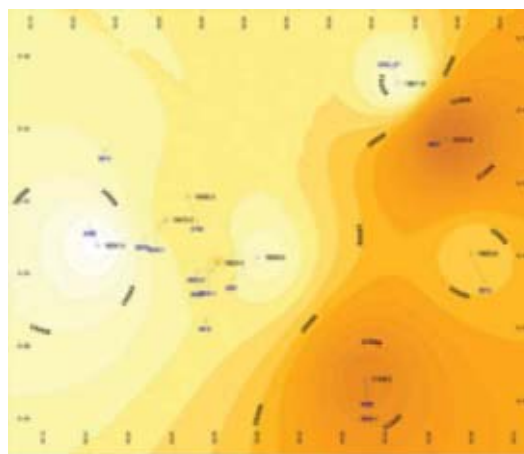
(Drill Bit Optimization System)

Bit optimization system achieves lower cost per foot drilled

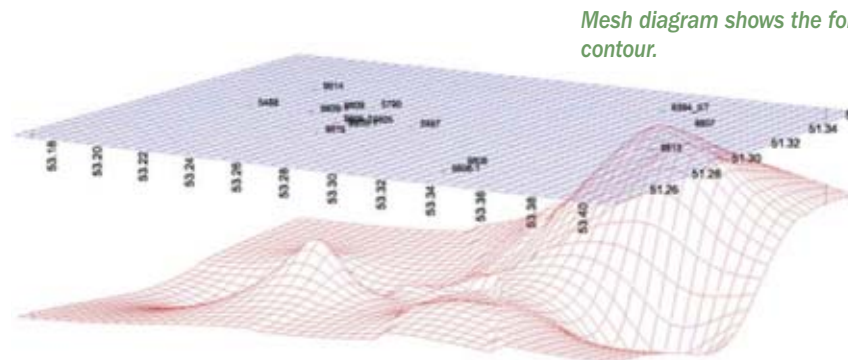
Smith's DBOS (Drill Bit Optimization System) is a software-based process that identifies the Smith fixed cutter or roller cone bit with the appropriate combination of cutting structure, gauge protection, hydraulic configuration and other features to achieve the lowest cost per foot drilled. DBOS achieves this goal by aiding the design engineer to optimize drilling performance to accurately match the specific attributes and capabilities of the bit with the physical characteristics of the interval to be drilled.

DBOS has been offered for more than 17 years. As a result, SMITH has amassed a database that includes drilling records from more than 11,300 projects in 56 countries encompassing more than 16,300 wells. DBOS utilizes this information to deliver the optimal bit for a specific interval by incorporating a thorough analysis of offset well data including well logs, formation tops, mud logs, core analysis, rock mechanics, drilling parameters, bit records and dull bit conditions.

To identify the optimal bit, DBOS combines a geologic mapping program and well log correlation and analysis software with Smith's proprietary algorithms for rock compressive strengths, bit performance analysis and bit selection. The highly flexible service allows Smith's engineers to analyze various levels of information and

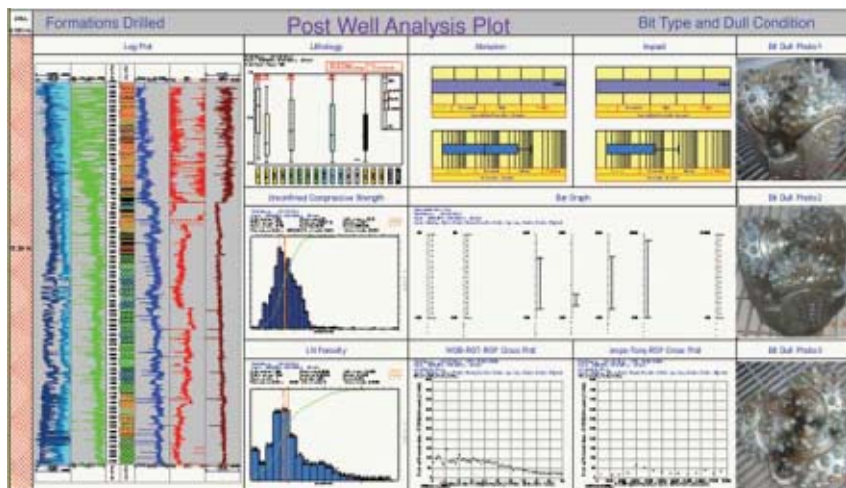


In this contour map of unconfined compressive strength, the light color represents softer formation and the darker color indicate harder formation within the same interval.



Mesh diagram shows the formation contour.

(Drill Bit Optimization System)



The Post Run Analysis plot evaluates the “as run” conditions that the bit/BHA run experienced. Cross-plotting the parameter data and the resulting ROP identifies optimal running parameters.

» DBOS determines unconfined rock compressive strength, effective porosity, abrasion characteristics and impact potential. Rock properties help identify one or more potentially optimal bit types for the application.

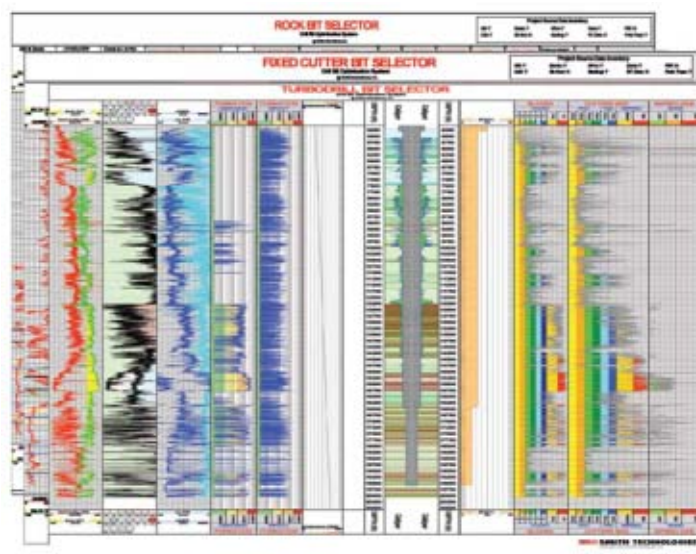
deliver a bit strategy based on input from a single offset well, a multi-well cross section or a full-field mapping and regional trend analysis.

Bit evaluation process

The DBOS evaluation process starts with an evaluation of the formation types expected to be encountered in an interval and the interval lengths, which is obtained from offset well logs. DBOS determines unconfined rock compressive strength, effective porosity, abrasion characteristics and impact potential. Rock properties help identify one or more potentially optimal bit types for the application.

DBOS then identifies various applicable bit characteristics based on its analysis. Among the characteristics evaluated by DBOS for both milled tooth and tungsten carbide insert roller cone bits are cone layout, insert type, gauge protection, and optimal jet nozzle hydraulic configurations. For PDC bit designs, cutter type and diameter, cutter density, bit profile, hydraulic configuration and gauge protection are also optimized. For high RPM turbodrilling applications, DBOS evaluates the PDC, natural diamond and Impreg bit technology options for drilling at RPM ranges from 1200 to 3000+ rpm.

For each of the various levels of the DBOS service offered, data are presented graphically to customers in log plot form called a Drill Bit Selector Plot(s) which combines numerous parameters that affect the rate of penetration (ROP). The Selectors evaluate key bit performance variables



over the given intervals and identifies which bit type would be the most successful for drilling through particular single or multiple intervals. Parameters include, among other information, bit record information, directional surveys, real-time ROP and mud log data, rock type and strength data and hydraulic and mechanical energy factors.

Post well analyses evaluate bit performance from available data including real-time ROP, weight on bit, RPM, torque, dull bit conditions and other parameters. This analysis provides design and application engineering feedback for continuous bit optimization improvement. □

IDEAS Certified Outlaw PDC bits set numerous Anadarko Basin drilling records

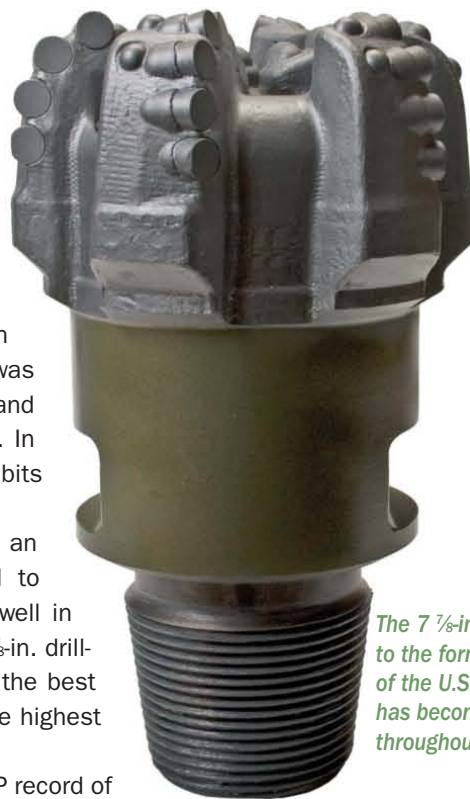
Smith's Outlaw™ PDC bit has become the performance leader in the Anadarko Basin, a result of optimizing the bit through the IDEAS simulation process. The 7 7/8-in. Mi616 six-blade bit features 26 face cutters and six gauge cutters to provide the optimum balance of durability for longer bit runs and aggressiveness for faster rates of penetration. Three standard series 60N nozzles are precisely positioned to effectively clean the hole. The bit also features an 8.88 sq. in. junk slot area. The bit is optimized for superior performance in the tough carbonate, shale and sandstone formations typically found in the Anadarko Basin.

In 2008 alone, the Outlaw PDC bit set six drilling records in numerous Texas and Oklahoma counties in the Anadarko Basin for footage drilled and rate of penetration (ROP). All were 7 7/8-in. PDC bits.

For example, Bronco Drilling Rig #6 drilled the Corwin B 5-29 well for XTO Energy in Major County, OK, with an Mi616MNSPX bit, achieving an ROP of 92 ft/hr. This was 104% faster than the best competitor bit offset run and set a Major County ROP record to a depth of 8,543 ft. In comparison, three offset wells drilled with competitor bits experienced ROPs of 41 ft/hr, 44 ft/hr and 45 ft/hr.

In another Oklahoma county record well drilled with an Outlaw PDC bit, Bronco Drilling Rig #42, contracted to Kingfisher Resources to drill the Branham Trust 1-34 well in Dewey County, set a footage record of 9,590 ft for a 7 7/8-in. drill-out PDC bit. The footage record was 27% farther than the best offset run. The bit also achieved an ROP of 51 ft/hr, the highest of five offset wells.

In Texas, an Outlaw PDC bit set a Texas Panhandle ROP record of 77 ft/hr drilling 8,902 ft to a depth of 11,970 ft. The ROP was 24% faster than the best offset well. The record-setting Zybach 207 well was drilled by Unit Drilling Rig #339 for Forest Oil in Wheeler County.



The 7 7/8-in. Mi616 has been tailored to the formations and applications of the U.S. Mid-Continent area, and has become a premier performer throughout the region.

(Outlaw)

There were more Texas record-setters with the Outlaw PDC bit. The Johnson LA 7059A well drilled by Unit Drilling Rig #337 for Forest Oil in Hemphill County achieved an ROP of 82 ft/hr, 22% faster than the best competitor bit offset run with an ROP of 67 ft/hr. This bit set a Hemphill County ROP record and drilled to a depth of 10,704 ft. The Johnson LA 1359A well was drilled by the same rig with a 7 7/8-in. Outlaw bit, achieving an ROP of 75 ft/hr.

A Smith Outlaw PDC bit set a Woodward County, Texas record ROP for a 7 7/8-in. PDC bit, drilling to a depth of 7,765 ft. This bit achieved an ROP of 85 ft/hr, 20% faster than the best offset bit run of 71 ft/hr. The MCGU 3 3-33 well was drilled for Crusader Energy by Patterson-UTI Energy Rig #412.

While not record-setting wells, 7 7/8-in. Mi616MNSPX Outlaw PDC bits were used to drill wells significantly faster or farther than the previously best offset wells. For example, an Outlaw bit drilled 8,627 ft in the Zybach 207 well in Wheeler County, Texas, 76% farther than the best offset bit run of 4,888 ft.

An Outlaw PDC bit in another Wheeler County well drilled 8,556 ft, 38% farther than the best competitor bit offset

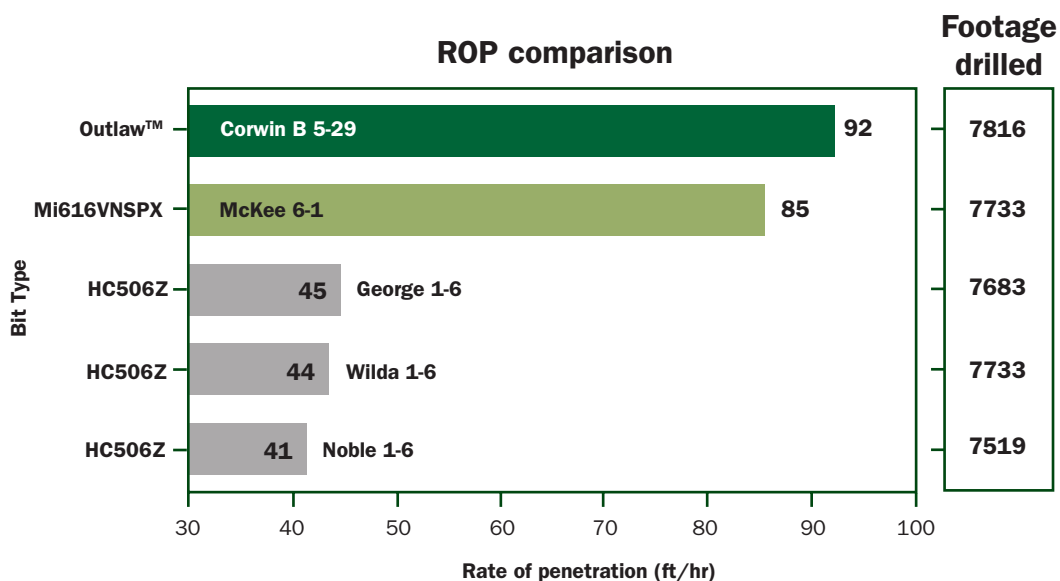
run. The well was drilled by Trinidad Drilling Rig #25, which achieved back-to-back Outlaw runs which drilled below 11,000 ft with an average ROP greater than 70 ft/hr.

Goober Drilling, using an Outlaw PDC bit in two wells for Linn Operating in Wheeler County, Texas, drilled significantly deeper and faster than offset bit runs. Linn Operating's Dobson Ranch 40 04 well was drilled 9,240 ft with an Outlaw PDC bit, 23% farther than the closest competitor's bit. The Outlaw bit drilled to a depth of 12,727 ft, deeper than all of the offset wells. The well was drilled by Goober Drilling Rig #18.

Goober Drilling Rig #15 used a 7 7/8-in. Outlaw PDC bit to drill Linn Operating's Dukes 7 04 well in Wheeler County, achieving an ROP of 69 ft/hr, 23% faster than the best offset run. This run achieved the fastest ROP and went deeper than all of the offset wells.

It's apparent from the above wells, record-setting or not, that Smith's fixed cutter bits are the workhorses of the oilfield. The IDEAS Certified design process assures their optimal performance. The above case studies verify that they outperform other PDC bits for the specific drilling application for which they were designed with IDEAS. □

» An Outlaw PDC bit in another Wheeler County well drilled 8,556 ft, 38% farther than the best competitor bit offset run. The well was drilled by Trinidad Drilling Rig #25, which achieved back-to-back Outlaw runs which drilled below 11,000 ft with an average ROP greater than 70 ft/hr.



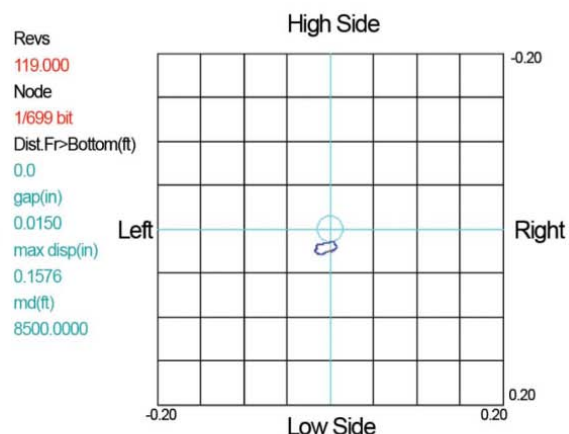
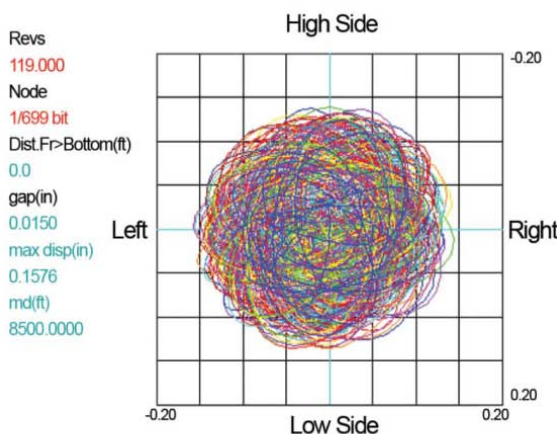
Outlaw has established many field ROP records throughout the U.S. Mid-Continent. One example is shown here.

Increased analytical precision in drill bit selection

The IDEAS Analysis Report (IAR) is the applications-focused output of the IDEAS design simulation system. The IDEAS Analysis Report provides an accurate plan for superior drilling performance, which is accomplished with a 13-step process to optimize bit selection. Because the IAR analyzes the entire BHA and drill string, detailed information on each component such as length, weight, ID, OD and material properties, are critical to the accuracy of the IDEAS analysis and recommendations.

To prepare an accurate IAR, the Smith engineer first compiles comprehensive well plan information from the customer. This information includes well location, well profile, drive system, directional program, BHA configuration, operating parameters, casing program, component specifications, drill string information, and dimensions for all components of the drill string and BHA.

THE IAR engineer inputs the complete data set into the IDEAS simulation model. Armed with this information, the proprietary design software evaluates the individual bit's performance in the specific application. Typically, several bit designs will be



The precise physical location of each individual cutter is input for all the bits being modeled in the IAR analysis

(IDEAS analysis report)

evaluated and the optimum bit will be identified. The results of the custom analysis are presented to the customer in a detailed package that includes a summary of the application details, the bit performance objectives, bit layout, graphical representation of the well profile and the specific BHA that will be used.

The IAR package also includes output from the IDEAS dynamic simulation for each bit, which includes the bit bottom hole pattern, the bit center trajectory, torque, lateral force and lateral acceleration. Additionally, the analysis includes the optimized bit RPM and ROP projections.

The profile and cutting structure geometry (including the precise location of each individual cutter) of the bits being considered for the target application are fundamental data input parameters of the analysis. The analysis generates a graphical representation of the target well, which contains a measured depth, azimuth and inclination plot. The analysis also uses a gradient colored bar to indicate the loading condition of the BHA assembly in the wellbore, including indications of the BHA under compression, neutral and under tension.

The IDEAS analysis shows the last 30 revolutions of each bit in the dynamic simulation. In the graphs on the previous page, a light blue circle represents the center of the well at the start of the simulation. Significant bit vibration represented by high eccentric rotation is graphically represented as is smooth, stable bit behavior, which is graphically represented by a small magnitude of rotations. Additionally, the IDEAS simulation provides a graphic representation of the bottom hole behavior of the bits in the target formation. A choppy, basket weave pattern would indicate unstable bit behavior while smooth, concentric patterns would indicate stable bit behavior.

Lateral acceleration and vibration are measured for each bit. Significant levels of lateral vibration can shorten bit life and can cause lower rates of penetration (ROP). Low levels of lateral vibration maximize bit life and increase ROP. The IDEAS simulation measures the lateral force acting on the bit due to its cutting action and the bit body's gauge pads

contacting the hole wall. High lateral force fluctuation is an indication of bit vibration, while lower fluctuation indicates stable bit behavior and low vibration.

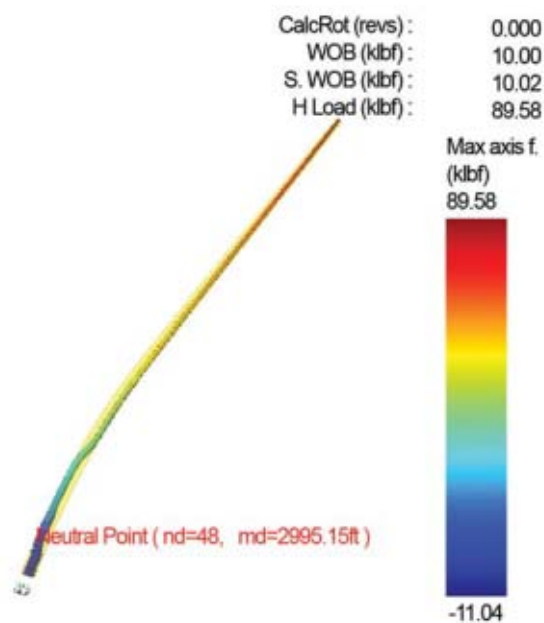
The analysis measures the rate at which the bit's axial velocity changes with time. Shock forces that the bit experiences in a bouncing (axial) motion can lead to bit failure and failure of other BHA components. The more frequent spikes experienced by a bit on the IAR graph indicate a greater incidence of bit bounce.

Axial force is measured as the calculated weight on bit (WOB). The magnitude of the fluctuations in WOB indicates the forces that are applied to the bit face as a result of bit bounce. Large fluctuations adversely affect cutter life and ROP, while a constant and consistent load maximizes bit life and ROP.

Torsional vibration is measured at the bit during the simulation and analysis. Severe fluctuations in bit torque/torsional vibration can lead to premature bit failure and damage to other BHA components. Smaller, more consistent fluctuations indicate stable bit behavior that contributes to longer bit life and increased ROP. Torque values can be compared to the torque capability of directional or other downhole tools to help determine the suitability of the bit in the target application.

Lateral displacement for azimuth and inclination are measured. The analysis also measures the relationship between ROP and RPM. Periodic fluctuation in RPM indicates torsional vibration or stick-slip behavior. High torsional vibration can cause cutter breakage, accelerated cutter wear or cause other BHA components to fail. A smooth relationship between ROP and RPM indicates stable bit behavior and optimizes the performance of the bit and the BHA.

IDEAS helps SMITH to deliver superior bit performance and solutions, from the "simplest" vertical hole to the most complex directional and rotary steerable applications. The IDEAS applications analysis process customizes the drilling plan and proposed solution to the individual customer and its particular objectives. The result is the optimal bit for the formation, reduced drilling uncertainty and risk, and lower drilling cost. □



Shamal Typhoon bits designed specifically for Middle East carbonate drilling

In the Middle East, "shamal" is a word used to refer to the strong northwest winds funneled into the Persian Gulf through the mountains of Turkey and Iraq to the northeast and the high plains of Saudi Arabia to the southwest. The first major shamal typically occurs in late May and is known as Al-Haffar, or the driller, because it is known to drill large depressions in the desert sand dunes.

Smith's recent roller cone drill bit design, Shamal® Typhoon, was developed specifically for the unique challenges of the Middle East region's larger diameter drilling applications. The original Shamal bit, Shamal TNG, established the SMITH commitment to provide application-specific bit technology for the hard carbonate formations found in the Middle East. The new design incorporates the traditional Shamal features along with a new "Typhoon" hydraulics configuration for more effective cleaning of large diameter holes. The proprietary IDEAS® modeling and simulation software integrates the Shamal Typhoon hydraulics, innovative insert geometries and advanced carbide technology to achieve optimal performance. The latest Shamal drill bit iteration is setting new standards throughout the Middle East region.

Computational fluid dynamics ensures optimized flow

The aptly-named Shamal Typhoon uses sophisticated computational fluid dynamics (CFD) analysis techniques to evaluate fluid flow and ensure that flow is optimized to clean the cones, remove cuttings more efficiently and ensure that the cutting structure is always drilling virgin formation.

The nozzle configuration provides Smith's engineers the capability to create the best configuration for the specific application. The Typhoon hydraulics configuration is currently available for bits with ODs of 16-in. and larger.

Historically, conventional three-nozzle bit designs experienced difficulty cleaning the larger cones and effectively removing cuttings from the increased bottom hole area. The Shamal Typhoon bit uses three Vector Extended (VE) and three Dome Jet (J3) nozzles to provide the optimum hydraulic solution for the specific application. With the six-nozzle configuration, SMITH successfully addressed the problem with a significant improvement in the distribution of available hydraulic energy.



(S h a m a l)



The VE nozzles precisely direct the fluid flow to the leading edge of the cones, providing the most efficient cleaning without causing cone shell erosion. The J3 nozzles direct fluid toward the intermesh area between the cones rather than directly at them. The combined effect of the six nozzles is a flow pattern that creates significant improvements in the path and velocity of the drilling fluid, optimizing cutter cleaning and the displacements of cuttings off-bottom and up the drill string, resulting in maximum rate of penetration (ROP).

Ground breaking insert geometries

Working in combination with the superior hydraulics design, Shamal Typhoon bits utilize a wide range of tungsten carbide inserts to maximize performance in a specific application. The various insert geometries allow Smith's design engineers to choose the precise combination of insert shapes for optimal ROP. The inserts include Incisor, Dogbone, Conical, Chisel and Asymmetric Conical Edge shapes that can be used in combination for the optimal results.

Insert layouts on the Shamal Typhoon's cones are precisely calculated to achieve the ideal placement balance for maximizing ROP while retaining a high level of durability. The insert options complement the cone layouts and en-



able Smith's engineers to build application-specific cutting structures for optimal performance. Using the best combination of the inserts allows the engineer to fine-tune the performance of a particular bit for a particular application. Utilizing the IDEAS modeling and simulation software provides the information to certify the bit's performance.

Developing carbides optimized for Middle East applications

SMITH has invested significant resources in R&D of carbides for Middle East carbonate drilling. The result is a range of proprietary carbides with the microstructure characteristics that offer a balance of impact durability and abrasion resistance, a balance that typically has been difficult to achieve.

Additionally, continuous advances in carbide technology have resulted in carbides used in the Shamal Typhoon drill bits to provide significant increases in fracture toughness compared to the carbides in the original Shamal TNG bits. The enhanced carbide material results in bits that drill faster and stay in the hole longer than all other conventional roller cone bits.

Record rate of penetration

In the Ghawar field in Saudi Arabia, a 16-in. Shamal Typhoon six-nozzle bit drilled 2,344 ft of hole, setting a field record ROP of 90.15 ft/hr, 54.6% better than the five-well offset average of 58.32 ft/hr. Another important record was set with the well when the bit finished the hole section at a cost/ft of \$31 compared with \$41/ft for the five-well offset average.

A hole section drilled in the field earlier with a 16-in. Shamal Typhoon held the previous record with an ROP of 76.19 ft/hr and a per foot cost of \$33.

This study included three competitor products, one standard Shamal bit and two Shamal Typhoon bits. The 16-in. Shamal Typhoon bit set the record in rotary drilling mode from the Wasia formation to mid-Thamama in one run (shoe-to-shoe). □

Downhole imaging complements directional drilling technology to reduce drilling risk and uncertainty

PathFinder®, one of the recent additions to the Smith portfolio, provides technically sophisticated services in the areas of logging-while-drilling (LWD), measurement-while-drilling (MWD), and directional drilling including its innovative rotary steerable systems (RSS) and downhole positive displacement motors (PDMs). PathFinder's name is most appropriate since it is one of only a few companies in the industry with the sophisticated technology to offer a full line of LWD/MWD and directional drilling products and services that help provide the most efficient and cost effective path to the operator's geological objectives. By providing real-time downhole data that not only indicates the possible presence of hydrocarbons but also assists in improving drilling performance to reach those hydrocarbons, PathFinder can reduce customer risk and cost while maximizing prospects. According to Spears and Associates, a leading oilfield consulting business, over the past five years, PathFinder has been the fastest growing full-service directional services/MWD/LWD company, with a compound annual growth rate of 37%.

LWD technology utilizes real-time formation information to assist real time decision-making on altering the wellbore path to an optimum position in the formation that provides enhanced production of oil or natural gas. PathFinder's MWD products and services utilize downhole tools to precisely locate and direct the drilling assembly to the target.

PathFinder offers the industry a unique and innovative rotary steerable system that can be operated in a point-the-bit or push-the-bit mode, unlike other systems that are either one or the other. PathFinder's versatile RSS enables operators to use the best mode for the application. This versatility is ideally matched with Smith's directionally certified IDEAS PDC bits, which are designed to be suitable for use on both types of RSS rather than other PDC manufacturers' bits, which are designed and built for one particular RSS.

The company also supplies downhole drilling motors that incorporate Dyna-Drill power sections for consistent power output and maximum durability. The motors are designed to operate across a full range of speeds and torque levels and



The PathMaker RSS can be configured for either push-the-bit or point-the-bit operation. This operational flexibility is combined with state-of-the-art MWD and LWD technology to deliver superior performance in the most challenging directional drilling applications.

(PathFinder)

to withstand severe environmental conditions such as high temperatures, hard rock and abrasive drilling fluids.

All of the products and tools can be combined to produce the most efficient tool string required for a particular application. The directional products and services can accurately drill deviated, horizontal and extended reach wells. In fact, directional products and services can also be used to ensure a quality *vertical* wellbore in applications where there is a natural tendency for a BHA to deviate.

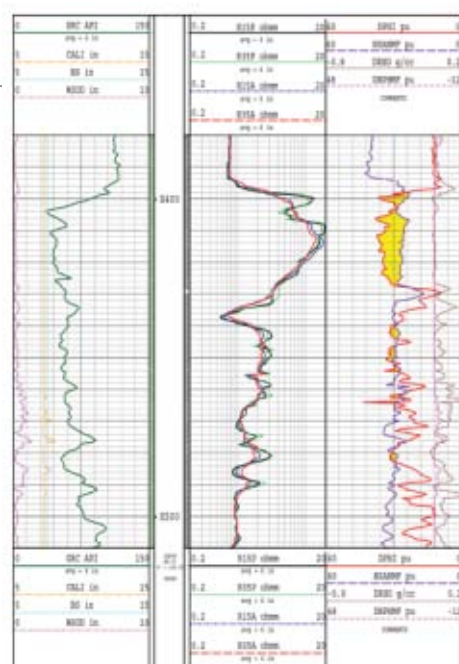
Downhole measurement and imaging tools

PathFinder offers an impressive array of downhole measurement and imaging tools to enhance and optimize the drilling process and formation evaluation. The company continually engages in research and development activities to improve its existing product line and services as well as to satisfy customers' demand for new tools and services to increase their operational efficiency. The company's R&D effort is conducted at its facilities in Houston, where most of its LWD and MWD and directional drilling technologies are developed.

At the core of the company's MWD/LWD system is the modular fixed-collar HDS-1L directional tool with positive pulse telemetry. The tool provides continuous inclination and azimuth information and acts as the telemetry module to make real-time data transmission possible. The DataLink™ provides real-time communication with PathFinder LWD sensors.

PathFinder offers real-time Density Neutron Standoff Caliper (DNSC) service. While neutron and density LWD tools have been available to the industry for several years, early designs had no direct means to account for potentially large standoff-induced errors. The DNSC was the first LWD tool designed to measure standoff directly and use that measurement to improve the accuracy of neutron and density measurements.

PathFinder's Slim Density Neutron Standoff Caliper (SDNSC) technology provides customers with more reliable wellbore caliper and formation density and porosity measurements. This service is available in small wellbore diameters. Built to operate in high pressure, high temperature (HPHT) environments, the SDNSC has a modular design for placement anywhere in the PathFinder bottom hole assembly. The SDNSC tool utilizes the industry's first low energy, high output Californium-252 neutron source. Two ultrasonic transducers provide accurate and redundant standoff and while-rotating measurements, storing the data in a high capacity memory. The battery provides over 300 hours of power for use in extended bit runs.



The LWD triple combo formation evaluation log plot shows the beginning of the hydrocarbon zone with a shale-to-sand gamma ray response change at X396, a significant increase in formation resistivity and the corresponding density/neutron cross-over.

PathFinder's suite of LWD tools and services also includes the Slim Array Wave Resistivity (SAWR™) technology that involves the use of proprietary tools and data analysis techniques to improve the reliability and quality of resistivity data for formation evaluation. The technology measures the formation resistivity by transmitting electromagnetic waves through the formation surrounding a wellbore. The SAWR tools, along with the larger Array Wave Resistivity (AWR) tools, are capable of operating in HPHT conditions up to 25,000 psi and 350°F.

The company's Survivor™ HPHT Dynamic Pressure Module technology measures the pressure and temperature of the drilling fluid in the drill pipe and annulus, providing information regarding the performance of the drilling equipment and borehole environment. The tools are compatible with the company's other Survivor suite of tools as well as with its LWD technologies such as its Directional/Gamma tool, AWR and SAWR tools and the SDNSC tool.

At-bit gamma and inclination services

PathFinder provides at-bit inclination and gamma ray measurements from the PayZone Inclination Gamma (PZIG) System to reduce directional drilling risk in critical hole section (at-bit inclination) and early detection of changes in lithology to accurately land horizontal wells where planned (at-bit gamma ray). The tool is designed to operate as two separate subs. The lower sub (LXM), located directly behind the bit, acquires then transmits data via wireless electro-

magnetic short-hop across the motor to the upper sub (UXM), which then provides communication to the MWD/LWD components. The LXM at-bit sub measures dynamic inclination and gamma ray units, providing the closest to the bit sensor offsets available in the industry.

The LXM modular sub can be used in rotary assembly applications as well as with steerable mud motors. PathFinder's 2-D rotary steerable system can be used in conjunction with the PZIG modular subs. Additionally, the PZIG subs can be utilized with PathFinder's PathMaker® rotary steerable system or an independent RSS.

The PZIG system is designed for the inclination and gamma ray sensors to be completely independent of the mud motor or RSS for several reasons. The modular subs can be configured to operate with any type of mud motor power section or rotary assembly. Also, sensor reliability and operating life are not affected by motor reliability. Operational decisions on whether at-bit measurements are needed on a specific run are not tied to the availability of an instrumented motor. Additionally, the modular subs of the PZIG system are small and easily transportable, and there is significantly lower lost-in-hole exposure.

PayZone steering services for real-time forward modeling

PathFinder's PayZone Steering (PZS) service includes high quality real-time LWD measurements and a software system for interpreting the log responses and proposing adjustments to the well plan. In addition to identifying the position of the well in the geologic section, PZS is used to predict lithology ahead of the bit. These services can be provided to the geologist at the wellsite or at an offsite location.

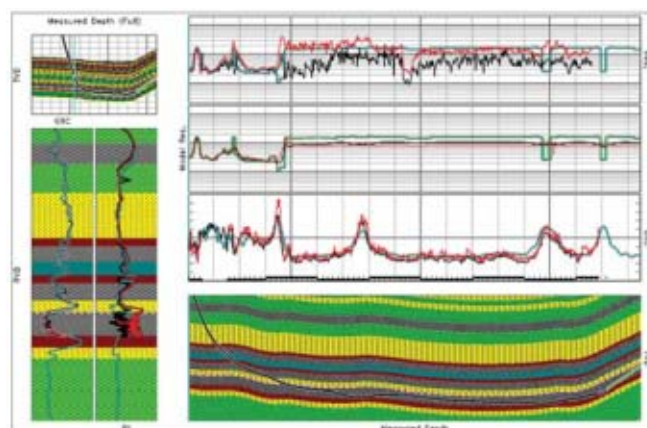
The service components include PayZone steering expertise, modeling software, formation evaluation sensors and at-bit inclination and gamma ray sensors. The key to the service is the PayZone steering software suite along with the expertise of the engineers. The PZS software provides a working model that is updated based on the real-time MWD and LWD logs by the engineer.

The software was developed for the geological steering of a deviated well path. The geological earth model, the directional well plan and the petrophysical data from real-time LWD logs are combined into a single modeling program. The software generates synthetic log responses based on formation petrophysical properties and well trajectory. The geology model is adjusted to match the real-time log and determine the stratigraphic position of the well path. Real-time data from sensors located in the drill string are continually

fed into the PayZone steering program from the PathFinder surface system to enable real-time knowledge of where the bit is currently, which direction the well is heading and the direction the well should be heading.

iFinder™ density imaging service

iFinder's primary measurement is bulk density imaging, a graphical representation of the variation of bulk density around the circumference of the wellbore. Density imaging is made possible by the collimated source and detectors of the density tool, which focuses the density measurement on the formation directly in front of the sensor. As the tool rotates, the image covers the entire circumference of the wellbore.



The PZS suite of proprietary computer program was developed to aid directional drillers in recognizing geological formation changes. PZS software uses forward modeling to predict the responses of logging-while-drilling (LWD) gamma ray, resistivity, density-neutron, density image, sonic sensors to the various geological formations along the proposed well path.

PathFinder's bulk density measurement uses a patented standoff weighting technique to select a subset of the rotating data with a minimum of standoff. The company's patented imaging algorithm employs a weighting technique to focus the density measurement on discreet sectors around the wellbore. Because the algorithm does not "bin" the data, there is no technical limit to the number of sectors that can be imaged.

Density images are mainly used for geosteering because of the ability to determine the direction from which a particular bed is entered or exited. Standoff, or caliper, images become very important in geomechanics and wellbore stability analysis while the wellbore image of the photoelectric index may provide useful additional geological information.

(PathFinder)

iFinder features real-time transmission of computed log data and quality parameters, and extreme temperature and pressure ratings of 350°F and 25,000 psi. The modular tool design allows placement anywhere in the LWD tool string. The tool has a 300 hour memory storage capacity of log data at 6-in. intervals at a drilling rate of 200 ft/hr. Its long life battery power is used for LWD and logging while tripping.

Rotary steerable systems

PathFinder's PathMaker RSS can be configured as a point-the-bit or push-the-bit system, depending on the application. The point-the-bit system uses a near-bit stabilizer to provide a fulcrum point to tilt the bit in the desired direction. The push-the-bit mode uses the steering unit to push the bit sideways, resulting in higher dogleg severity (DLS), making it more suitable for shallow, overgauged hole, washed out applications and open hole sidetracking. In situations where higher rotational speeds are required, the PathMaker RSS can be powered with a PathFinder mud motor, and it is ideal for performance drilling where maximum rate of penetration (ROP) is required.

The RSS also can be integrated with any of PathFinder's MWD/LWD tools. For lower cost vertical applications, the PathMaker can be run stand alone in automated vertical control mode.

The PathMaker system is designed with three hydraulically actuated pads housed in a steering unit. While drilling, the pads provide a constant contact force with the wellbore to maintain the steering unit stationary. The toolface and dogleg severity are controlled by proportionally offsetting the steering unit from the centerline of the wellbore, enabling the tool to drill a constant curve resulting in superior wellbore quality and reduced torque and drag.

The PathMaker system is the only RSS available that provides real-time pad-contact caliper measurement while drilling. The caliper measurements are taken from the physical pad position and gives the directional driller real-time information several feet behind the bit. The information provides real-time feedback on the wellbore condition and allows surface parameters to be optimized to ensure consistent and accurate directional response.

Downlinking of steering commands to the RSS is achieved using a non-intrusive patented drill string rotation programming method. No special surface equipment or rig-up is required. The RSS relies entirely on drill string rotation and flow commands from the surface and is designed to allow commands to be sent while on bottom and drilling ahead.

Another feature is automated closed-loop control for maintaining inclination and azimuth, allowing the tool to be locked onto the target inclination and/or azimuth, providing automated control without the need for human interaction. The target inclination and azimuth values can be changed using a downlink if the well path or drilling target positions are moved.

Lateral and axial vibration and stick/slip severity are monitored using the onboard real-time detection system. Severity levels are transmitted to the surface in real time, allowing the directional driller to change drilling parameters, if necessary, to reduce downhole vibration and stick/slip.

Mud motors

Cost-conscious oil and gas operators recognize the positive contributions that downhole motors can make to the economics of many drillable prospects. Drilling motors convert hydraulic energy to mechanical energy to rotate the bit incrementally to the drill string rotation, offering significant cost savings due to higher ROP resulting from delivering more energy to the bit. The application of downhole drilling motors has expanded from the initial conventional directional kick-off applications to other

PathFinder launches innovative iFinder Density Imaging service

PathFinder recently introduced the innovative iFinder™ Density Imaging service specifically designed to enhance and optimize borehole geosteering to help drilling engineers meet all critical directional objectives and complex well trajectory requirements. The iFinder tool generates a real-time borehole visualization image by measuring and recording azimuthal density, photoelectric index and ultrasonic stand-off. The iFinder service provides quantitative formation dip analysis and insight into wellbore stability.

Technology Platform

The iFinder tool utilizes density imaging to produce a graphical representation of the density variations around the circumference of the borehole. The sophisticated measurement is accomplished by using a collimated source and detectors to focus the density measurement on the formation directly in front of the sensor. As the tool rotates, the measurement covers the entire circumference of the borehole.

areas, including steerable drilling, medium and long radius drilling, re-entry, performance drilling, hole opening, under-reaming and casing cutting, coring and milling.

The PathFinder Drilling Motors (PDM) are positive displacement mud motors that incorporate high performance power sections for optimal durability. PDMs increase the bit's RPM without increasing the drills tring's rotational speed and enable drilling with less weight on bit. Drill pipe and casing wear is reduced because the drill string does not rotate. ROP is increased and long runs can be drilled for extended drilling operations.

The company's motors provide increased ROP, better hole deviation control, and reduced drill string failure. PDMs also reduce tear and wear of the swivel, kelly and rotary drives. Additionally, fuel costs are reduced compared to rotary drilling because less energy is required to power the downhole motor.

The critical components of the motors are serialized to closely track their status throughout their useful life. The components are retired from service after accumulating a certain number of operating hours, regardless of their appearance, in compliance with PathFinder's standards. After

PathFinder's best-in-industry bulk density measurement technology utilizes a patented stand-off weighting technique to select the appropriate sub-set of rotating data. Similarly, our patented imaging algorithm employs a weighting technique to focus the density measurement on discreet sectors around the borehole. Since the algorithm does not "bin" data, there are no technical limits to the number of azimuth measurements that can be imaged; however, the practical limit derived from the azimuthal resolution of the detectors is 32 sectors for memory images, while available communications bandwidth allows up to 16 sectors to be transmitted up-hole in real-time.

Customer Benefit

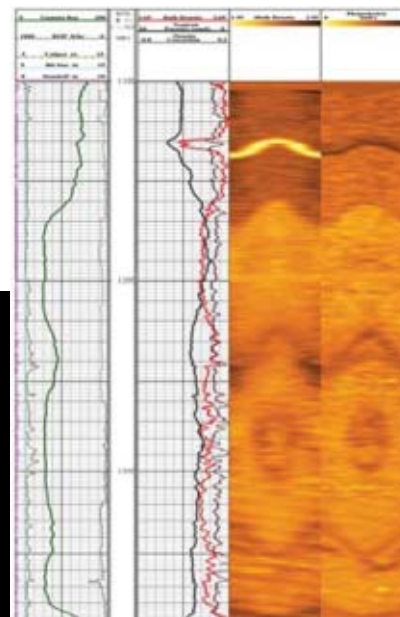
The dataset is processed and graphically presented by cutting the cylindrical borehole image open at the high side of the borehole and folding it flat so it is oriented from left to right from high side to low side and back to high side (Figure 1). These density images and the photoelectric index image are extremely useful for geosteering because they allow the driller to determine the direction and angle from which a particular formation bed is entered or exited. The highly accurate stand-off images are also important in geomechanics and wellbore stability analysis.

each field run, every motor is completely disassembled and cleaned to undergo a rigorous inspection procedure.

PathFinder's reliable and versatile downhole measurement, imaging and directional drilling products and services are designed and manufactured by expertly trained and experienced technical personnel to deliver accurate information to significantly reduce risk and uncertainty, thereby reducing costs and increasing success. □

▼ **Figure 1.** The iFinder Density Imaging capability provides the directional driller with the ability to more precisely steer the wellbore by showing the direction from which the formation is entered and exited.

▼ The 4 3/4-in. iFinder Density Imaging tool provides real-time azimuthal images of bulk density and photoelectric index measurements in hole sizes from 5 7/8-in. to 7-in.



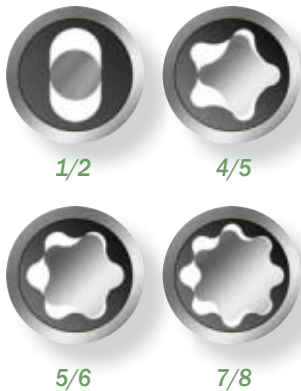
Features

- Formation density and photoelectric index image logs
- Compensated neutron porosity and density logs
- Dynamic standoff measurement and weighting processing helps minimize standoff effects on density and neutron measurements
- Real-time transmission of computed log data and quality parameters
- Extreme temperature/pressure ratings: 350 °F / 175 °C, 25,000 psi
- Flow rates up to 375 gpm
- Modular design for flexible positioning in the LWD tool string



(Dyna-Drill)

Dyna-Drill remains the technical leader in high performance power sections for every application



Customized power sections are available for a wide range of applications. Customers can specify over 60 configurations to ensure that the tool is perfectly tailored to the target application.

With the merger of W-H Energy Services into SMITH, Dyna-Drill Technologies returns to its roots. SMITH invented and launched positive displacement motor technology to the oil and gas services industry as an innovative tool for directional drilling more than 50 years ago, with the introduction of the original Dyna-Drill design in 1958. To this day, the Dyna-Drill identity remains synonymous with leadership in downhole drilling motor technology.

Since its inception, Dyna-Drill has been a leader in advancing motor design and technology, and the Company has developed an extensive product range that has helped bring high performance motor technology into many new applications. The current Dyna-Drill Technologies product line includes configurations from ultra slow-speed/high-torque to ultra high-speed/low-torque performance power sections, coated high performance bearing packs and precision machining. Applications for Smith's Dyna-Drill technology now extends to mud motors



Combining premium materials with state of the art manufacturing techniques and unsurpassed quality assurance processes, Dyna-Drill components are built to provide long-lasting optimum performance in the toughest applications.

for straight hole, directional, air drilling, medium and short radius wells and drilling high temperature environments. Today, approximately one of every three positive displacement motor in use anywhere in the world has a Dyna-Drill power section

The Company's manufacturing facilities provide the latest technology to the industry, including CNC machining centers, a custom-designed trepanning machine, high-capacity vacuum furnacing capabilities, and state of the industry product testing laboratories including an advanced elastomer and quality control measure lab.

Ongoing elastomer development efforts within Dyna-Drill study the impact of drilling fluids on power section stators to produce the most technologically advanced materials for downhole motor equipment. The Company's Matrix-3 coated bearings provide superior resistance to wear, corrosion and mechanical fatigue. The bearings combine innovative metallurgy and brazing technologies to provide exceptional bearing life in even the harshest drilling environments.

» Dyna-Drill's NBR-HR™ is one of the latest innovative rubber compounds and increases torque by 50% over conventional compounds. NBR-HR stators offer superior performance in aggressive drilling applications and is a cost effective alternative to metal reinforced stators.

The Company is headquartered in Houston, TX, U.S.A. and maintains its primary manufacturing facilities there. Dyna-Drill also operates a power section and PC pump manufacturing facility in Nisku, Alberta, Canada, and a stator reline facility in Dubai, U.A.E.

High performance elastomer technology

Dyna-Drill's NBR-HR™ is one of the latest innovative rubber compounds and increases torque by 50% over conventional compounds. NBR-HR stators offer superior performance in aggressive drilling applications and is a cost effective alternative to metal reinforced stators.

Power sections for every application

Dyna-Drill offers more than 70 different power section models for virtually every conceivable application, from extra slow, high torque models to high speed/low torque power sections. They provide superior longevity for long production hours and optimal mud motor performance even in extreme drilling applications.

The higher performance power sections are designed for longer mud motor life and can be teamed with mud motors ranging from 1 1/16-in. to 11 1/2-in. diameters. Extra slow ESX models, recommended for use with PDC bits, provide speed ranges from 30-80 rpm and high torque ranges from 3,500 to more than 22,000 ft-lbs. Roller cone bits typically operate at slow speeds but not high torque. PDC bits, running at any speed, require high torque. ESX power sections accommodate both operating demands.

For example, in one well drilled through deep Wyoming rock, an ESX power section helped increase rate of penetration (ROP) by as much as 83%, outperforming bits running at higher speeds. The slow speed, high torque motor drilled approximately 10,000 ft in the tough downhole environment before requiring a replacement trip.

The product line also includes coiled tubing-compatible power sections that can be teamed with drilling motors ranging from 1 1/16-in. to 3 3/4-in. diameter. Additionally the Company offers extended length power sections to provide the necessary torque for rotary steerable systems, which

may also require higher RPM. The extended length power sections are available in extra slow speed, slow speed and medium speed configurations.

Additionally the company offers extended length power sections to provide the necessary torque for rotary steerable systems, which may also require higher RPM. This power section includes Dyna-Drill's proprietary NBR elastomer technology. The extended length power sections are available in extra slow speed, slow speed and medium speed configurations.

Coated bearings boost performance

To boost performance and increase mud motor durability, Dyna-Drill offers the proprietary Matrix-3 coated bearings. Tungsten and other carbide phases, bonded in a nickel-chrome matrix, are metallurgically fused to the base metal to form a solid, inseparable unit. Coating thicknesses range from .020-in. to .100-in. and apply to virtually every shape. The bearings provide exceptional resistance to metal-to-metal impact, wear, corrosion and mechanical fatigue.

(Dyna - Drill)

» Dyna-Drill experience, spanning decades, results in superior CNC machining of extremely tight tolerance, ultra-high precision components ranging from very small configurations to 30 ft collars, including MWD/LWD and wireline components. Among the precision machining equipment are CNC machines for consistent machining of products, a vertical machining center, a horizontal machining center and turning center capabilities.

The Matrix-3 coating system provides very dense, medium-to-high carbide content and is metallurgically bonded at pressures exceeding 70,000 psi, increasing impact resistance. The coating's low porosity and high ductility of less than 2% increases impact, corrosion and wear resistance.

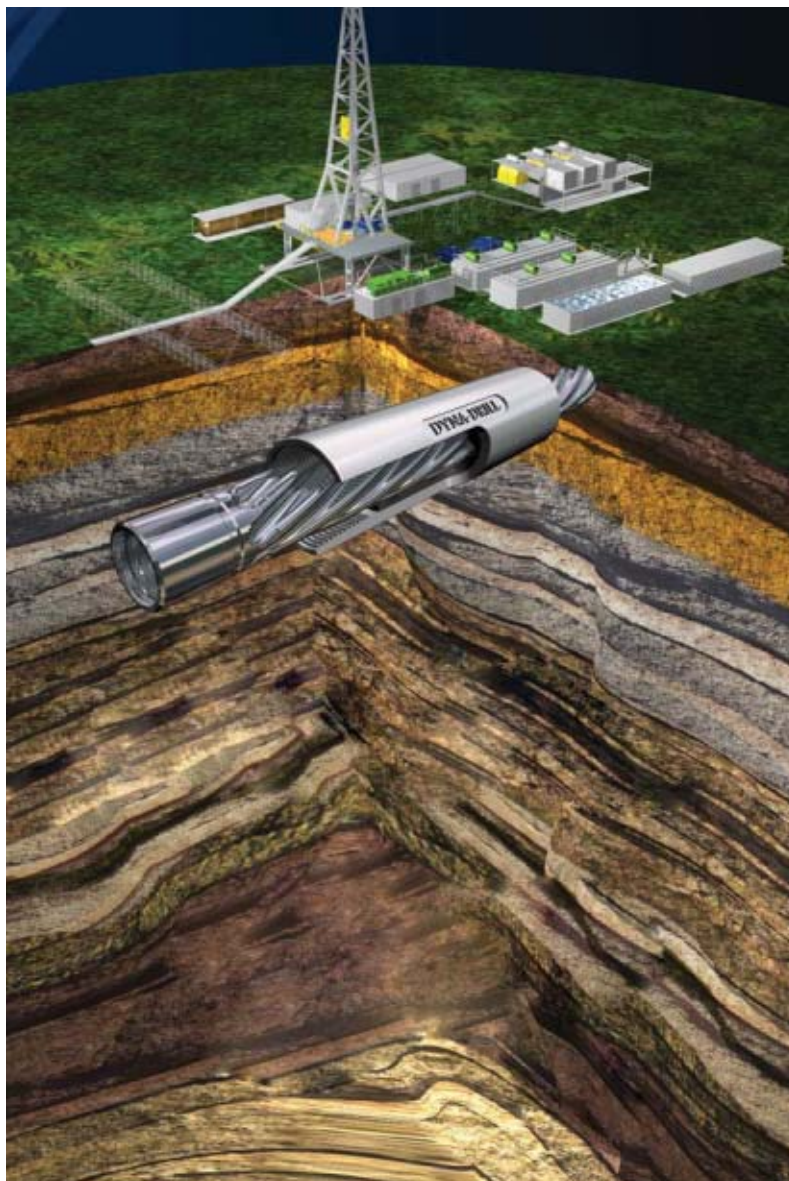
Matrix-3 coating system chemistry allows heat treating of bearings to a full range of required mechanical properties with no effect on the coatings. Additionally, the composition can be custom-formulated to provide optimal performance characteristics for each specific application and operating environment.

Precision machining for high performance power
Dyna-Drill's manufacturing facility in Houston has more than 80,000 sq. ft of design, production and testing space. The production engineers, teamed with leading edge computerized machining equipment, produce custom ordered components and assemblies that are machined to exacting measurements and tolerances.

As described in the PC pump manufacturing details, Dyna-Drill utilizes the industry's most sophisticated Weingartner milling machine to precisely contour rotors. The rotors are 17-4 stainless steel and chrome-plated for maximum wear and corrosion resistance. The stators incorporate NBR and HSN elastomers for various drilling applications and downhole conditions.

Dyna-Drill experience, spanning decades, results in superior CNC machining of extremely tight tolerance, ultra-high precision components ranging from very small configurations to 30 ft collars, including MWD/LWD and wireline components. Among the precision machining equipment are CNC machines for consistent machining of products, a vertical machining center, a horizontal machining center and turning center capabilities.

Dyna-Drill also offers relining services for previously used power sections where the worn or damaged rubber material is removed and relined at its service centers in the U.S., Canada and Dubai.



(Dyna - Drill)



Power sections are manufactured on ultra-sophisticated machining stations that have the ability to consistently hold very tight tolerances. This precision pays off in both increased performance and improved durability.



Quality control and inspection of every tool

Quality control of each power section design is secured through an in-house 1,000 HP dynamometer powered by two triplex mud pumps, the largest PDM power section testing facility in the industry. It is capable of testing power sections as large as 12-in. diameter and 25 ft long. Every power section manufactured is proven on the dynamometer prior to production release.

Dyna-Drill also conducts 100% final inspections of each tool. A coordinate measuring machine uses custom data acquisition software to measure power section rotor and stator core profiles, producing accurately measured parts dimensions within .0001-in.

Inspections include full traceability, 100% rotor profile inspection, stator electronic gauges including tube ultrasound testing, and 100% inspection of serialized parts. The Dyna-Drill inspection process means that many of its customers can forego testing of incoming equipment, saving time and money.

Dyna-Drill Technologies brings reliable power for virtually any drilling application and downhole environment, including soft or hard formations, high temperatures, vertical or directional and rotary steerables and coiled tubing. The history and future of downhole drilling motor technology is truly discovered at Dyna-Drill. □

(Rotating control devices)

Rotating control devices take off the pressure when drilling complex underbalanced wells



The HOLD 2500 features a dual element stripper rubber and real-time wellbore pressure sensor and recorder.

The oil and gas industry continually explores increasingly difficult and complex environments, in which non-traditional drilling methods are required. These non-traditional methods include air, foam and gas drilling; underbalanced drilling (UBD); and managed pressure drilling (MPD), all of which increase complexity, often requiring meticulous planning and preparation to result in a safe and successful operation.

SMITH offers HOLD® rotating control devices (RCDs), also called rotating heads, for use in various drilling applications. Smith RCDs are designed and built with a distinct focus on rig personnel safety, rig equipment and operational reliability. A sealing element within the RCD seals around the drill string components to safely divert dust, mud, air/gas, mist, foam or steam away from the rig floor.

The RCD's main components include the spool or lower bowl with inlet and outlet flanges, the bearing assembly, drive bushing assembly including the sealing element and the kelly bushing. The sealing element is the most critical component and is the barrier between the fluids in the wellbore and the rig floor personnel. A seal is created by the stretch interference fit between the kelly/drill pipe and the ID of the sealing element and this seal is 100% active once engaged. Seal reliability and sealing element life are maximized through strict material quality and manufacturing controls.

At Balance with SMITH

At Balance with SMITH, a joint business relationship, combines At Balance Automated Pressure Drilling™ Services with Smith's HOLD RCD products. At Balance drilling services include a pressure management method that increases safety, enhances performance and reduces drilling costs. This revolutionary technology uses the Integrated Pressure Manager (IPM), which combines a high speed programmable system with a real-time hydraulics model, to control down-hole pressure with unmatched speed and precision. Combined with HOLD RCDs, operators have a high-performance solution to the most complex and challenging MPD applications.

At Balance Automated Pressure Drilling Services offer a better way to boost drilling capability by instantly responding to changing pressure conditions and taking

(Rotating control devices)

rapid, accurate corrective action before potentially critical well control events occur. Integrated pressure management through a high speed control network facilitates a response at a speed that cannot be achieved with conventional and manual methods.

Accurate hydraulics result from calibrated, real-time modeling, which provide a continuous stream of data to maintain bottom hole pressure (BHP) within a tight safety window in narrow margins. Continuous pressure adjustments reduce the risk of wellbore instability, ballooning and annular loading, while driving stability and performance to new levels, even in hostile environments.

SMITH'S HOLD ROTATING CONTROL DEVICES

Rig site safety is the primary reason for using an RCD. The equipment allows drilling operations to continue while isolating the drilling personnel from potentially dangerous wellbore fluids and gases. Conventional air, mist, foam and gas drilling requires an RCD for the isolation and redirection of the wellbore discharge. Additionally, RCDs protect the environment by directing potentially harmful wellbore fluids and gases through the processing equipment on location before being returned to the atmosphere.

The Smith HOLD RCD is available in two pressure ratings, the HOLD 1500 and HOLD 2500. The HOLD 1500 is rated for 1,500 psi operating pressure and has a bearing assembly with a pass through of 13 $\frac{3}{8}$ -in. The HOLD 2500 is rated to 2,500 psi operating pressure and has a bearing assembly with a pass through of 12 $\frac{1}{4}$ -in. The HOLD 2500 is static pressure rated to 3,000 psi or 5,000 psi dependant on the spool.

The remotely operated hydraulic lock-down system on the HOLD RCD eliminates the need to send personnel below the drill floor to release primary locking systems when installing or replacing the sealing element. The driller operates all hydraulic systems from a control console on the rig floor, improving rig safety and decreasing element replacement time. The sealing element can be changed independently from the bearing assembly, saving rig time and eliminating the need for excess inventory at the rig site.

Additional safety elements include a fail-safe locking mechanism, which requires hydraulic pressure to open.

A safety interlock system prevents release of the sealing element in the presence of wellbore pressure, eliminating the need for a secondary mechanical locking system. A visual indicator pin on the head confirms when the system is locked down.

The HOLD RCDs offer built-in safety features for UBD and MPD projects. The HOLD RCDs features a split body design with the bearing assembly attached to the mounting spool with a heavy-duty lower clamp. The RCDs feature independent high pressure oil circulation and bearing lubrication system and mechanically energized stripper element to provide an uninterrupted wellbore seal. Large, heavy-duty tapered roller bearings provide low torque rotation and load support while continuous circulation of hydraulic oil lubricates and cools the bearings and seals.

The HOLD RCDs also feature a real-time wellbore pressure sensor and recorder. Additionally, a dual sealing element assembly is available to further increase safety for drilling personnel and the rig floor area.



At Balance, a SMITH joint venture partner, offers automated drilling pressure services for complex MPD applications

HOLD offshore kit for zero environmental discharge

The offshore conversion kit for the HOLD 1500 and 2500 RCDs is the only system currently available that is in compliance with 100% zero environmental discharge. In the event of a sealing element failure, fluids are safely contained within the overshot riser, preventing minor environmental incidents from impacting rig operations.

(Rotating control devices)

The offshore kit is easily adapted to land applications for zero discharge compliance.

The offshore conversion kit modifies the top section of the HOLD RCD with a custom flange. A typical installation would provide a top flange with a welded-on 24-in. OD overshot mandrel to engage the overshot packer for jackup or tension-leg platform installation. The offshore conversion kit is not restricted to just jackup and TLP applications.

Although the offshore conversion kit is not designed to be a structural member of the marine riser, it does provide a fluid connection to enable flow through the RCD to the diverter and bell nipple used in many typical marine riser installations. In a marine riser installation, with the stripper rubber element installed, all return flow is diverted through the side outlet on the wellhead adapter spool.

Smith's line of rotating control devices

SMITH offers a full line of RCDs for virtually every balanced, underbalanced and MPD drilling situation, installation and application. For example, the DHS 1400 RCD is the Smith intermediate pressure rated drilling head, rated at 600 psi rotating pressure and 1,000 psi static test pressure. Its compact design and large 14-in. thru-bore make it the ideal choice when substructure height is limited.



The DHS 1400 is an intermediate pressure RCD designed for use where substructure space is limited.

The Model 7068 RCD is the low pressure workhorse, with 250 psi rotating pressure and 750 psi static test pressure. The compact design makes the Model 7068 the perfect choice for use on small drilling rigs where substructure height is limited. This RCD is available in a version as short as 24 3/8-in. high, which is aptly dubbed the "Shorty" model.

The Model 8068 RCD is designed for use on large diameter wells and features a split body design with the bearing assembly attached to the mounting spool with clamping dogs. The mounting spool is available for 13 5/8-in. to 20-in. BOP bolt-on spools and 30-in. and 36-in. weld-on mounting flanges for conductor pipe.

The Model 8068-G Geothermal RCD has been designed with several unique features that enable it to operate safely in high temperature environments. It uses the Model 8068 RCD bearing and drive bushing section for reliability and performance. The bearing section is fastened to the spool and sealed for safe operation. The spool is equipped with a large diameter sealing element with an ID large enough to safely seal on large diameter drill string components such as drill collars. Special water injection ports enable the sealing elements and exposed seal faces to be cooled and lubricated by circulating water through the head when tripping.

The Model 7368 RCD is designed for use where space is limited, such as on workover rigs. This model employs the same design features as the larger Model 7068 low-pressure RCD.

Smith rotating control devices, particularly when combined with At Balance pressure management services, take the pressure off both you and your drilling system for all your critical underbalanced and managed pressure drilling projects. □



The Model 7068 is a low pressure RCD especially suited for small rigs where substructure height is an issue.

(Impact system)

AP impact system solves costly sticky situations

The complex drilling systems and assemblies that could include MWD/LWD tools, rotary steerable systems and other expensive tools and electronics mean that lost-in-hole situations could cost the operator hundreds of thousands of dollars. Smith's AP Impact System can significantly reduce the risk of this potential loss of expensive equipment and the cost of having to plug back and drill around a lost in hole drill string with its numerous jarring tools.

The jar is designed to move up and down the wellbore, releasing stuck drill stem components by the tool's impact. The driller controls the frequency and force of the jar on the stuck downhole equipment. Smith's AP Impact system includes the Hydra-Jar AP tool, Accelerator AP, Jar-Pact Analysis Program and a data acquisition program.

The Sup-R-Jar product is an addition to Smith's impact system as the result of the acquisition of W-H Energy Services, Inc. This tool is built with quality and simplicity in mind, including only eight major components. The tool is simple to build, easy to dress and extremely durable.

A jar's application includes drilling conditions where the risk of differential sticking, hole sloughing or other potential stuck-in-hole situations exist. They are also used in fishing operations requiring significant down-hitting impact or alternating up and down jarring force. Jars also may be required when downhole tools, directional and MWD/LWD equipment are used in the bottom hole assembly (BHA). Extended and long-reach directional and horizontal applications may require multiple jars for maximum effectiveness. Jars also are used in casing swaging operations requiring impact for successful completion.

The Hydra-Jar AP Impact System is the industry's premiere performer for reducing the risk of losing expensive drill string equipment downhole.

(i m p a c t s y s t e m)

Hydra-Jar AP

Smith's Hydra-Jar AP frees stuck drill stem components during drilling or workover operations by jarring both up and down with an impact force controlled by the driller, who controls the direction, intensity and frequency of the impacts. The system works without applied torque so directional tools maintain their orientation throughout the jarring operations.

Hydra-Jar's high temperature seals make the tool ideal for hostile drilling conditions. The tool will perform in every drilling condition, onshore or offshore, in vertical, deviated, ultra-deep and ultra-hot wells.

The tool is balanced to hydrostatic pressure through ports open to the wellbore, ensuring consistent hitting performance regardless of changes in downhole pressures. The tool also is temperature-compensated through the use of a unique detent system that provides consistent loading and firing of the jar over a broad range of wellbore temperatures.

Hydra-Jar's unique metering process compensates for the decrease in detent cylinder oil viscosity as the jar is fired repeatedly, ensuring consistent impact. The tool's full bore design minimizes pressure losses and provides wireline compatibility. Additionally, the jar may be run in compression or tension, providing optimized placement in the drill string. A safety clamp enables the jar to be made up, racked and handled like a drill pipe joint and can be made up and racked like a standard length of drill pipe, reducing trip time.

Smith's data acquisition program ensures that all Hydra-Jar tools are tested to specification prior to being sent to the wellsite. The system uses two pressure transducers to perform a push test and pull test for short and full detent. A laser rangefinder device measures the stroke length.

Accelerator AP

In most applications, the Hydra-Jar AP tool should be run in conjunction with the Accelerator AP tool, which increases the jar's impact and protects the drill string and surface equipment from jar shock loads. The Accelerator AP operates automatically with the jar to increase reliability and ease of use. The tool combines the advantages of up or down or up and down motion with hydraulic fluid for maximum jarring impact, resulting in as much as twice the impact provided by competitors' tools. Accelerator AP optimizes jar performance in extended reach directional and horizontal wells where stored energy in the drill pipe is lost due to hole drag.

When used in conjunction with Hydra-Jar AP, the Accelerator AP replaces or supplements pipe stretch so the fish is hit



The Hydra-Jar AP can be run in compression or tension to allow maximum flexibility in drill string placement, and will deliver consistent maximum "hitting" power in the most difficult applications.

The Accelerator AP is run with the Hydra-Jar AP and protects the drill string from jar shock loads.

The Hydra-TT Jar is a slimhole tool with the design and performance attributes of the Hydra-Jar AP. This tool can deliver superior results in the extreme conditions of HPHT applications

The TT Accelerator is designed for coiled tubing and other slim-hole applications. With the ability to increase the energy of the Hydra-TT Jar, this tool also protects the drill string from impact damage.

hard regardless of the depth of shallow or crooked holes. Additionally, Accelerator AP provides the same hit with less overpull at the jar. The hammer mass receives 100% transfer of the overpull.

Fluid compression inside the tool compensates for limited drill pipe stretch in shallow wells to provide stored energy to create maximum impact. The tool's full bore design minimizes pressure losses and provides wireline tool compatibility.

Jar-Pact

Smith's proprietary Jar-Pact software allows its engineers to model the placement and performance of the AP Impact System to ensure that Hydra-Jar AP and Accelerator AP provide superior performance in a specific application. Jar-Pact uses information from the operator's well plan including wellbore and BHA parameters and then recommends the optimum jar tool placement in the BHA.

The proprietary Jar Pact software allows SMITH to model the placement of the Impact System to ensure that performance is optimized.

Optimal placement in the BHA is critical in order to avoid locating the tools in or near the drill string's neutral point or transition zones. Jar-Pact also ensures that the ratio of the hole size of the Hydra-Jar AP and Accelerator AP is within recommended guidelines.

Slimhole impact tool

The Hydra-TT Double Acting Hydraulic Jar is a slimhole impact tool with the same design principles as the Hydra-Jar. The tool's small diameter, ranging from 1 ¹³/₁₆-in. to 2 ⁷/₈-in.

OD, is ideal for use in coiled tubing operations, snubbing, small diameter rotary drilling and fishing applications. The tool is capable of torque transmission and can be used with a downhole motor. The standard tool features premium seals for use in high temperature and high pressure wells. The tool's large bore accommodates drop balls and flow release equipment below the tool.

The TT Double Acting Accelerator is a slimhole impact enhancement tool designed to multiply jar impact by providing or enhancing the stored energy source. Its small diameter makes this tool, along with the Hydra-TT Jar, ideal for coiled tubing operations, snubbing and small diameter rotary drilling and fishing applications. The tool is recommended any time a jar is included in the work string during milling, drilling, workover, remedial or completion operations in vertical, deviated, ultra-deep and ultra-hot wellbores.

The TT Double Acting Accelerator Tool's nitrogen filled compression chamber stores the tool's energy while reducing tool length. The tool's 6-in. maximum stroke length increases acceleration energy and improves the tool's effectiveness. The tool also functions as a shock absorber to prevent impact damage to the BHA components such as coiled tubing connectors and back pressure valves.

Hydra-Stroke Bumper Subs for deepwater

The Hydra-Stroke Bumper Sub is a key drillstem component for deepwater drilling operations where drill string oscillation can be a problem. The tool provides 6 ft of reliable telescopic movement without placing limitations on drill string torque capacity. The bumper sub is fully balanced to the annulus and the mud pumps, making it completely reliable at any depth and in any drilling environment.

The tool isolates drill string assemblies from the effects of wave motion on floating drilling rigs. It also provides drill string travel in plug and abandon operations when low level jarring or bumping is necessary. The sub provides the travel necessary to deploy knives in casing cutting operations. The closed drive system prevents ingress of wellbore fluid into the drive section to improve reliability. The tool's fully balanced feature eliminates pump-open effect caused by internal pressure.

Smith's wide array of jarring tools can get anyone out of a sticky situation. □

(Percussion hammers and bits)

The impact of Impax percussion hammers and bits on hard rock formations

The Impax line of air percussion hammers and bits provides the industry with the most effective and reliable combination of percussion tools when drilling through hard rock formations. The Impax bits and hammers feature several patented technologies to improve durability, performance, and reliability in hard rock applications, thereby lowering cost per foot compared with the industry's conventional hammers and bits.

Hammer is designed for oilfield conditions

Smith's hammers are designed specifically for the oilfield drilling conditions. The Impax hammers feature optimum energy delivery and energy transfer to the bit and rock. In addition, Impax hammers are capable of sustained operation with larger volumes of water (mist) injection, a key requirement for the oilfield in presence of water-influx from the hole. Impax hammers also offer improved durability from a hardened steel sleeve that replaces the plastic "blow tube" used in conventional hammers and are capable of operating at high downhole ambient temperatures without loss of performance.

The blow tube, or the foot valve, is a plastic tube pressed into the bit. When the piston travels past the blow tube, the lower chamber of the hammer is allowed to exhaust. However, blow tubes have historically been the Achilles heel for conventional hammers. A blow tube failure can result in complete stoppage of the percussive action or at the very least, a significant reduction in performance. Often, this means a trip out of the hole to replace the blow tube. Impax hammers use a hardened steel guide sleeve to replace the blow tube and thereby improve overall operational reliability. This feature eliminates any common blow tube failures due to high temperatures, shock and vibration, and fluid erosion.

In addition, the Impax hammers are designed with a larger lower chamber, which improves mist-handling capabilities and performance in high annular back pressure conditions encountered in deep hole drilling using high air volumes. The result is at least a 10-20% increase in water handling capability from mist-injection over conventional hammers and the saving of a trip out of the hole as the "watering out" limit is approached in a well. Under the right conditions, Impax hammers are capable of drilling at depths exceeding 13,000'.



SMITH offers a full line of percussion bits that provide superior performance in a wide range of challenging applications.

(Percussion hammers and bits)

Impax bits increase ROP, reduce cost per foot

Smith's premium line of Impax percussion bits provide customers with a combination of high reliability, durability and drilling performance in some of the hardest and most abrasive formations encountered in oil and gas drilling. The Impax hammer bits feature 100% diamond enhanced inserts (DEI), which results in an increase in the drilled footage as well as higher overall ROP. The ability to complete long intervals with a single bit run results in substantially less down time and cost savings. Cutting structures and DEI insert technology undergoes constant improvement to meet application specific drilling conditions. For a given bit size and cutting structure, multiple spline options are available for adaptability.

The "PD" gauge feature virtually eliminates the need for reaming thereby improving the life of the next bit and providing a quality wellbore for subsequent casing operations. The exhaust ports are designed for optimum hole cleaning, cuttings removal, and improved ROP. The bit profiles a concave center, which offers good directional control, even in some of the most crooked hole drilling conditions.

For drilling applications that do not require cutting structures with 100% diamond enhanced inserts, Smith's Diamond in Gauge Row (DIGR) line of hammer bits is a cost-effective option. DIGR bits offer a full range of cutting structure options, while strategically using diamond enhanced inserts in the gauge or outer rows only. This ensures that the bit maintains full gauge. These bits provide excellent ROP and durability in less demanding applications.

Industry's most reliable bit retention system

All Smith bits and hammers utilize the same patented bit retention system for increased reliability. The patented bit retention system is the industry's most reliable and proven retention system. The robust retainer system prevents the loss of the bit head in the hole and saves the costs incurred from expensive side-tracking or fishing compared to other less reliable systems. The simple, yet elegant, retention system allows virtually any bit to be retained, regardless of its size and spline configuration when run with the Impax hammers.

Conventional hammer bits use a set of split bit retaining rings for retention. However in the event of a "shank", the retaining rings are unable to prevent the bit head from being left in the hole. All Smith bits and hammers feature the bit retainer system, which serves as a secondary catch mechanism to secure the bit and allow it to be retrieved

from the hole. The threaded retention system relies on the fact that the right-hand rotation of the drill string virtually eliminates any chance of the bit retainer coming loose. Features, such as the retainers, add immense value to the overall success of percussion hammers and bits technology in the oilfield drilling applications.

SMITH is committed to being a leader in all the bit technologies used for oil and gas drilling, and is, in fact, the only major bit provider for fixed cutter, roller cone as well as percussion drill bits! □



The Impax hammer's unique retainer design offers customers the assurance that should the bit experience a failure, the bit will be captured and tripped out of the hole without the need for a fishing job.



The Impax's feed tube is of hardened steel which is much more durable than the plastic material found in conventional percussion hammers and improves energy transfer between the piston and the bit.

(Rhino XS)

Rhino XS reamer improves wellbore enlargement and efficiency

Smith Borehole Enlargement (SBE) is an operating group within SMITH that combines the wellbore enlargement products, technical capabilities, people expertise and industry experience of both Smith Drilling & Evaluation and Smith Technologies. The result is a blend of best in class products and services. SBE unites the Smith Drilling & Evaluation leading wellbore enlargement technologies of the Rhino® XS reamer and Reamaster®, with the Smith Technologies innovative and proprietary drilling products and design simulation systems, which include the IDEAS® (Integrated Dynamic Engineering Analysis System) design and modeling software and Quad-D bi-center bits.

The IDEAS capability to provide application-specific cutter design for drill bits is also applied to the Rhino XS reamer, designing the optimal cutting structure for borehole enlargement. IDEAS is used to design drilling and backreaming cutting structures, providing the customer with a significant increase in reamer and drilling performance.

The Rhino XS reamer performance is optimized with the remaining bottom hole assembly (BHA) components, including the drill bit, by utilizing Smith's proprietary i-DRILL® modeling and analysis process. i-DRILL optimizes the entire drill string, including reamers, by determining the precise placement of each BHA element.

Rhino XS reamer for simultaneous drilling and hole enlargement

The hydraulically expandable Rhino XS reamer is a concentric reaming tool designed to enlarge the wellbore for improved equivalent circulating density (ECD) control, running casing and cementing clearance.

The tool can enlarge an existing or pilot wellbore by up to 25%. The tool body houses three equally spaced cutter blocks with PDC inserts for both drilling and backreaming. The tool is ideal for use with rotary steerable systems (RSS), directional drilling assemblies and adjustable stabilizer assemblies as well as conventional enlargement of an existing pilot hole. The Rhino XS reamer has been successful in a wide range of situations including extended reach drilling, backreaming in loosely consolidated formations and in highly abrasive formations.

The Rhino XS utilizes application specific cutter blocks designed with IDEAS, Smith's sophisticated modeling and simulation process for optimizing cutting structure performance.



Durability increases with the one-piece cutter block/extension mechanism. The single piece tool body design also increases torque and load-carrying capacity, and the balanced mass design eliminates vibration while drilling. The reamer PDC cutters provide wear resistance and the ability to drill a wide range of formations.

The cutter blocks are hydraulically actuated using system differential pressure. The tongue-and-groove actuation system (Z-Drive) traverses the cutter blocks to a pre-selected diameter and hydraulically secures them in place. Pressure indication at the surface notifies the operator that the cutting blocks are fully deployed. The cutter blocks reliably collapse when the pumps are turned off to help ensure a problem-free trip out of the hole. During casing shoetrack drillout, an integrated cutter block lock-out system internally restricts fluid and ensures that the cutter blocks do not deploy.

Field-changeable nozzles ensure optimum cleaning at every opening diameter. The large-bore nozzles accommodate high volume fluid requirements with optimized fluid distribution between bit and cutter blocks. This high volume capability also accommodates fluid requirements for RSS and directional assemblies..

Rhino stabilization system reduces vibration

The Rhino Stabilization System is an integrated configuration of the Rhino XS Reamer and Rhino Stabilizer. The integral stabilizer pads on the Rhino Stabilizer assist in centralizing the BHA and helps prevent side cutting by the Rhino Reamer cutting structure. This reduces vibration, improves dynamic stability and optimizes drilling performance as well as MWD/LWD and RSS performance.

The stabilizer activation method is a double ball drop, the same activation method as the Rhino XS reamer. The stabilizer configuration is typically run under gauge and 30 ft above the Rhino XS reamer.

The Rhino Stabilization System reduces vibration by utilizing abrasion resistant stabilizer blocks, which feature diamond enhanced gauge inserts and tungsten carbide hardfacing. The stabilizer is deployed with the same proven Z-Drive system used on the Rhino Reamer XS.

Modified internal component kits now allow the Rhino Reamer to be closed (de-activated) in situations where this is desirable such as pulling out of hole while maintaining full flow circulation.

The most recent addition to the Rhino family is a shortened version of the tool that can be placed below a downhole mo-



The Rhino XS System delivers a superior solution in the most challenging HEWD applications.



The Rhino AB is a revolutionary tool that provides the ability to perform HEWD operations in directional and downhole motor applications.

tor. The Rhino AB (At Bit) Reamer is actuated by threshold differential pressure to deploy cutter blocks simultaneously and similarly drill a high quality concentric borehole.

The Rhino XS reamer, the Rhino AB and Rhino Stabilization System offer the accurate combination for a high quality wellbore, improved drilling performance, reliable operation and consistently lower costs. □

(M e g a D i a m o n d)

Producing PDC products for the world's toughest drilling applications

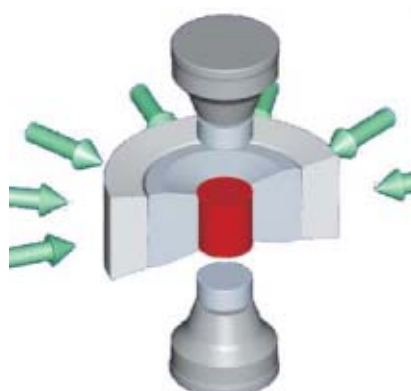
Smith's Ultra-hard Materials division designs and manufactures high performance PDC cutters, maintaining state-of-the-art, ISO 9001 quality certified manufacturing facilities in Provo, Utah (MegaDiamond), and Scurelle, Italy (SupraDiamant). The ultra hard materials are used in Smith's fixed cutter PDC bits, roller cone bits and reaming tools as well as for cutting tools and in the construction and mining industries.

Since its inception 43 years ago, MegaDiamond has become an industry leader by combining its experience and expertise to produce a wide array of advanced ultra-hard materials and products, including polycrystalline diamond (PCD) and polycrystalline carbon boron nitride (PCBN) products. The company manufactures the products using a complex high pressure, high temperature (HP/HT) process, of which MegaDiamond is the world's only company to have mastered the three major HP/HT manufacturing technologies.

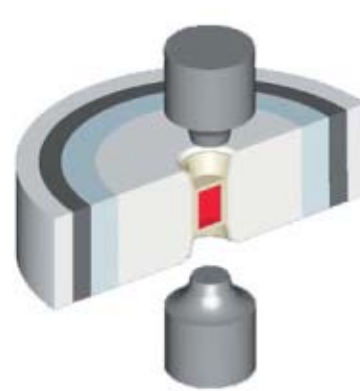
SMITH continues to develop new materials and technologies for ultra-hard products with increasing performance and reliability. Advanced materials labs provide the tools necessary for controlling raw materials, analyzing compositions and evaluating material properties. Sophisticated computer modeling and finite element analysis (FEA) systems assist the highly qualified technical staff in designing products for optimal performance.



Cubic Press



Piston-Cylinder Press



Belt Press

Developing and improving ultra-hard technologies

MegaDiamond was founded in 1966 by Dr. H. Tracy Hall, the renowned scientist who was the first person to successfully synthesize diamond in 1954 while working for General Electric Research Labs.

In 1955, Dr. Hall left G.E. and joined Brigham Young University (BYU) as a chemistry professor and director of research, during which time he continued to improve and develop synthetic diamond technology and associated manufacturing equipment. In 1957, he invented the tetrahedral press and later a belt press design that would be scaled up to become the first commercial production equipment.

In 1966, Dr. Hall was joined by two other BYU professors, Dr. Bill Pope and Dr. Duane Horton, who formed MegaDiamond to manufacture synthetic diamonds and HP/HT equipment. PCD was developed by fusing diamond powder particles together under high pressure, high temperature synthesis conditions, forming a sintered diamond mass that is simultaneously bonded to a tungsten carbide substrate. This results in the advantage of extreme hardness (close to natural diamond) and the toughness characteristics of tungsten carbide.

Ten years later, in 1976, the first modern PDC fixed cutter bit developed specifically for an oilfield application was successfully run in the Rangely field in Colorado, opening the door for diamond bit expansion into traditional roller cone bit applications and increasing demand for MegaDiamond's products.

SMITH acquired MegaDiamond in 1985 and still uses many of Dr. Hall's pioneering technologies and procedures developed over his storied career. In 1994, SMITH acquired SupraDiamant, a French company, and the Scurelle plant in Italy in 1996.

PDC development and manufacture

SMITH has become an industry leader by studying material characteristics and applying new and upgraded processing techniques to provide the highest quality and best performing polycrystalline ultra-hard products available. The company produces an extensive line of engineered PDC products including diamond enhanced inserts for roller cone and percussion bits and PDC shear elements for fixed cutter bits and reamers. Grades are designed for specific material and wear demands encountered in specific customer applications.

MegaDiamond is the world's only company to master the three major HP/HT manufacturing processes, the cubic



MegaDiamond has mastered the techniques for using a variety of advanced, state-of-the-art presses to create polycrystalline diamond used in an array of cutting configurations.



press, belt press and piston-cylinder press. Each system is capable of generating ultra-high pressures (800,000 psi/55 kbar) and temperatures (2,700°F/1,500°C) required to sinter PCD and PCBN products. Each press design employs its own particular advantages relating to sintering characteristics and properties imparted to the product. MegaDiamond's mastery of each of these technologies provides the company with a unique advantage of optimizing

(M e g a D i a m o n d)

sintering conditions for each product to obtain the highest quality and performance for a given application.

MegaDiamond's domed insert products are available with 813 diamond grade for applications needing more abrasion resistant products and 820 diamond grade for more impact resistant products. Smith's proprietary insert designs incorporate transition layers between the diamond layer and tungsten carbide substrate to improve impact strength and thermal integrity.

The company's shear cutter products are available in diameters ranging from 11 mm to 19 mm and in lengths from 8 mm to 16 mm. The cutters are produced with a diamond grade that is effective in critical applications requiring high impact and high abrasion resistance. The cutters incorporate a unique non-planar interface design for enhanced performance.

Continued ultra-hard product development

With its team of scientists, researchers and engineers, SMITH continues to develop new materials and technologies to provide ultra-hard products with ever-increasing performance and reliability. Advanced computer systems and FEA combine to yield improved product designs.

Performance testing is an integral part of Smith's product development process. MegaDiamond possesses well-equipped test labs where its engineers evaluate materials performance



Polycrystalline diamond cutters for drill bit are produced in a wide range of sizes and geometries.

in a variety of functional tests that simulate real-world application conditions. Test data is fed back into the design process to improve existing products and to culminate in new and innovative ultra-hard products.

Smith's aggressive and proactive business strategy for expansion at both of its ultra-hard manufacturing facilities includes major investments at the MegaDiamond facility in Utah and additional press capacity at the Scurelle plant to enable manufacturing of shear cutters for oilfield diamond bits for Eastern Hemisphere markets.

High performance PDC cutters and diamond enhanced tungsten carbide inserts are essential for supplying bits that can drill both faster and farther and drive down the cost of drilling. The ability to engineer and supply proprietary cutter designs, provided by MegaDiamond and SupraDiamant, is certainly a key factor in helping to keep Smith Bits the undisputed leader in worldwide drilling records for PDC, roller cone, and percussion bits. □



Smith's MegaDiamond headquarters in Provo, Utah.

SMITH operates a polycrystalline diamond manufacturing plant in Scurelle, Italy.



Trackmaster wellbore departure systems provide one-trip reliability

When drilling and development plans call for a complex multilateral production scheme, or if it becomes necessary to sidetrack around obstacles downhole, Smith's Trackmaster Plus wellbore departure systems provide application-specific one-trip sidetrack reliability and cost optimization. Trackmaster services are tailored to specific wellbore departure objectives, constraints and physical characteristics.

Wellbore geometry, casing program, formation properties, and rathole, completion and production requirements are only a few of the sidetrack parameters to be considered. The system's one-trip window success is based on matching specific technologies to wellbore conditions and completion requirements. Thorough job preparation by Smith's personnel ensures the wellbore departure system matches project objectives. Trackmaster Plus operators undergo comprehensive technical and on-the-job training before taking charge of your wellbore departure.

The resulting one-trip reliability lowers sidetrack costs and results in faster asset exploitation. A comprehensive end-of-job report and analysis are standard parts of the system package and are critical elements of the Trackmaster Plus System philosophy and vital to one-trip window success. Understanding what has worked successfully drives the continuous improvement process and identifies best practices for future projects. The permanent record will provide the basis for future planning.

Trackmaster Plus offers, among other products and services, a whipstock system for hard formations, a thru-tubing system, cementing system, open hole and tie-in systems, and flow-by system. The Trackmaster Plus GeoTrack® system provides the capability to orient the system, set the whipstock, mill the window

The Trackmaster wellbore departure system delivers superior performance in the most challenging applications.

(Trackmaster)

and drill the lateral section in a single trip. GeoTrack integrates window milling equipment, directional tools, project engineering and directional planning to mill the window and directionally drill the rathole.

Trackmaster Plus operational features

All Trackmaster Plus whipstock systems utilize a patented multiple ramp design to deliver a high quality window by enhancing and maximizing the critical milling processes and milling efficiency. Mill life is prolonged and a lower dogleg severity (DLS) across the window is achieved. The fast cutout ramp at the top of the whipstock cradles the full gauge lead mill while running in the hole and produces the necessary kick-off angle to promptly initiate cut out. The result is a full-gauge window within a few inches of the cutout.

The full gauge section extends the window and maximizes its quality while reducing DLS. The mid-ramp accelerates the lead mill past its center point, reducing the risk of coring the mill and facilitating completion of the window and rathole in one run.

A one-way hinge incorporated into the Trackmaster Plus system provides a flex point when running through doglegs. This ensures the whipstock seats properly against the casing when set in deviated hole sections.

The mill/whipstock hook-up system is designed to provide higher torque values while delivering reliable shear performance. The unique retention system allows up to 3° of flex between the milling assembly and the whipstock for trouble-free passage through doglegs in the wellbore.

The standard mill configuration of the Trackmaster Plus wellbore departure system is a tri-mill consisting of the lead, follow and dress mill sections. In some applications, the dress mill is eliminated, resulting in a bi-mill design. The lead mill is geometrically matched to the angles on the Trackmaster Plus whipstock to maximize cutting structure engagement with the casing while minimizing the loads on the whipstock face. This results in directing the milling efficiency into the casing and not the whipstock. The lead mill is available with a variety of cutting structures for efficient and cost effective performance.

The follow mill elongates the window and utilizes the Millmaster® carbide inserts with chip breaker feature for efficient casing removal. The dress mill conditions the window and ensures that subsequent assemblies can be deployed and retrieved through the window without problem.

Trackmaster Plus' anchors are either hydraulically or mechanically actuated and are extremely effective for se-

curing the Trackmaster Plus whipstocks during sidetracking operations. Cased hole anchors are designed for dependable retrieval, except the Permanent Packer and Thru-Tubing Anchor, which are non-retrievable.

Trackmaster Plus wellbore departure systems for every application

Trackmaster Plus wellbore departure systems are tailored to the specific application. The standard whipstock system is recommended for exiting standard steel casing in a low-to-medium compressive strength formation where a 3-15 ft rathole is required. The DLS is optimized across the exit to reduce stress through the window. A carbide Tri-Mill is used to cut the window in soft formations to provide a typical rathole while a FasTrack Tri-Mill is used for medium formations and extended ratholes.

Among the numerous departure system options, Trackmaster Plus also offers the GeoTrack, MX Multilateral Junction System and Radialok 3™ Level 3 Multilateral System and the OnPoint Whipstock Orientation System.

The operators for the Trackmaster Plus GeoTrack whipstock system undergo comprehensive technical and on-the-job training before taking charge of your wellbore departure. GeoTrack is designed to orient and anchor the whipstock, mill the window and drill a directional extended rathole in one trip. The system includes the necessary components, engineering services and directional planning required to exit the casing and directionally drill the required hole section. The system's one-trip window success is based on matching specific technologies to wellbore properties and completion requirements.

The GeoTrack whipstock system is lowered into the wellbore with the milling/drilling assembly. Once orientation has been completed, the multi-cycle bypass valve is closed to allow sufficient flow through the mud motor to set the retrievable hydraulic anchor. The motor is restrained from rotation during this process by a lock-up system. When the anchor has been set, the milling assembly is disconnected from the whipstock by upward pull, severing the shear bolt. Increased fluid flow releases the motor lock-up, allowing the motor to function freely. Conventional directional drilling practices are used when the window has been milled.

The GeoTrack whipstock features optimized mid-ramp geometry and delivers a quality full gauge window with low DLS across the exit. The GeoTrack mill utilizes PDC inserts, which withstand vibration and impact loading and are optimized for steerability. The mill's aggressive cutting structures deliver high rates of penetration (ROP).

The Trackmaster Plus open hole system is recommended for going around a fish or other obstruction encountered during the drilling operation. Depending on the nature of the fish, equipment for this departure can be configured for use with traditional tie-in type devices or inflatable packers and anchors. This system is ideal for drilling TAML Level 1 open hole sidetracks. If using tie-in devices, the system could require multiple trips, one to engage the anchor and one or more to sidetrack and continue drilling.

Trackmaster Plus's tie-in systems are deployed on a specially designed shear sub, which can transmit sufficient torque or fluid volumes to effectively anchor and orient the system. If using an inflatable packer or anchor, a one-trip system can be deployed. Orientation of the whipstock face can be achieved by using the hydraulic swivel, which enables orientation of the whipstock after the anchor is set and is actuated in increments as small as 11.25°.

The Trackmaster Plus thru-tubing system is recommended for exiting standard steel casing below the production tubing or other restriction where a 3-15 ft rathole is required. This is a non-retrievable system and is ideal for conventional and extended ratholes. The system features consistent, fast and reliable milling performance. PDC cutters can be added for increased wear resistance. The unique geometry compensates for the relative size differences between the whipstock diameters and casing diameter. The hydraulically actuated kick-over hinge positions and stabilizes the whipstock. Use of an expandable, non-retrievable anchor spans multiple casing sizes and weights.

OnPoint whipstock orientation system

Smith's OnPoint whipstock orientation system reduces rig time during sidetracking operations by providing wireline-quality orientation 6-8 times faster than with standard wireline systems by using mud pulse telemetry to update tool face orientation every 60 seconds. The system is fully integrated with the Trackmaster Plus wellbore departure system, reducing rig time by eliminating a trip into the hole. No additional trips are required to orient.

The rig floor display receives standpipe pressure from the transducer, which decodes pressure pulses into measurement data and provides the information on an easy-to-read screen. Displayed data includes inclination, azimuth, tool face, tool condition, total field strength and temperature. The tool is pressure rated to 15,000 psi and temperature rated to 302°F (150°C). The system is wireline retrievable.

Multilateral junction systems

Smith's MX multilateral junction system provides a cost effective alternative for the efficient exploitation of new and mature reservoirs. It offers a solid platform for the construction of TAML Level 3, 4 and 5 multilateral junctions in new



With a cost effective, reliable orienting tool and multiple configurations for multi-lateral junction systems, Trackmaster's wide variety of wellbore departure options gives customers total flexibility in optimizing their wellbore departure plan.

(Trackmaster)

and re-entry wellbores. Trackmaster Plus technology enables the customization of the window profile and the ability to place the junction in high compressive strength rock. The MX multilateral junction system is ideal for cased hole junctions in reservoirs with formation properties requiring mechanical isolation across the junction and for multilateral junctions where selective re-entry is required.

MX multilateral system components include a permanent depth and orientation marker, which is set in place by the whipstock anchor. The main bore tubular is pre-machined with a matching window profile and provides a deployment ramp for the lateral tubular. The upper profile orients the lateral tubular and lands on the PLI for orientation to the window. The lateral bore tubular telescopes inside the main bore tubular and into the lateral section. The pre-machined window aligns with the main bore tubular, and both tubular sections create a mechanical junction. A guide shoe facilitates rotation of the main bore tubular.

Large ID multilateral system

The Radialok 3 Level 3 multilateral system combines large ID access with high hanging capacity to optimize new and mature reservoirs. The system maximizes main and lateral bore access with a permanent junction, enhancing completion and production operations. The system meets all TAML Level 3 requirements and utilizes Smith's components for optimal system reliability and performance.

The system's large ID maximizes reservoir performance as the main bore remains accessible for further drilling and completion operations. Full circumference anchoring improves lateral position integrity. The lateral bore anchors with full radial contact, maximizing completion options for hanging and torque capacity. The deflected tubular locates the window and enters the upper leg, providing maximum ID for liner hangers or packers in the lateral bore and allowing maximum ID access for the main bore.

The hydraulic running tool conveys the liner system into the lateral bore, transferring weight and torque to facilitate system setting. When the swivel and lock-up sub are locked, the liner and lateral bore tubular can be run as a single unit. When unlocked, it allows the orientation and location of the lateral bore tubular without rotating the liner. The window finder allows the optimum placement of the lateral bore tubular. The hydraulically actuated arm seeks the bottom of the window. A spline sub allows orientation of the window finders and lateral liner hydraulic running tool.

An optional expandable casing packer permits selective isolation of the lateral open hole. A hydraulic setting sequence for the expandable packer operates independently of Radialok 3's setting and releasing sequence.

Sidetrack operations are far too critical to settle for a "one-size-fits-all" solution. Smith's comprehensive range of Trackmaster Plus wellbore departure systems have your needs covered, from "simple" sidetracks to complex multilaterals. □



The right combination of tools, technology and experience to retrieve tubulars, casing and tools

When it becomes necessary to repair or remove damaged casing, or to retrieve tools or pipe lost downhole, SMITH has every tool and accessory for every conceivable situation plus the experience to get the job done right the first time. Fishing and casing remediation tools include casing back-off tools, packer milling and retrieving tools, internal and external casing and tubing patches, mechanical casing cutters, casing scrapers and a complete line of mills for every purpose.

For example, the casing back-off tool, used to replace worn or damaged sections of casing by unscrewing uncemented casing at a selected coupling location, can be used effectively in both vertical and horizontal wells. The tool features nine sub-assemblies, including two hydraulic anchors and a torque generator. The hydraulic anchors allow the back-off tool to be used in horizontal wells. The tool is cycled, and, using hydraulic pressure only, the torque generator and anchors work in tandem to breakout and unscrew the casing threaded connectors with approximately one-half turn per cycle. When connection torque is sufficiently lowered, the back-off tool is pulled out of the hole and a casing spear is run to complete the unscrewing and recovery of the casing stump. A threaded connection remains downhole for the new casing string to be stabbed into and made up.

Casing patches

External casing and tubing patches are designed to quickly and economically repair damaged casing and tubing strings without reducing their ID. The patch restores integrity to damaged tubulars in regular or slim hole sections. The slim hole version of the tool is ideal for small, restricted wellbores or for use below a restriction. The casing or tubing string must be removed to a point below the damaged section in preparation for installation of the external casing patch. The top of the casing or tubing stub is dressed with a milling tool and the patch is run over the casing or tubing to a depth sufficient to engage the slip.

The external casing patch is available with lead or packer-type sealing mechanisms. Extensions for underwater wellhead applications are available for packer-type patches. Additionally, corrosion-resistant alloys and low-yield alloys are available for sour service wells.



Casing back off tools are available in a variety of configurations for both vertical and horizontal wells.

(Fishing and pipe recovery)

» SMITH offers several fishing tools and taps to retrieve drill pipe, casing, tubing and downhole equipment that cannot be engaged with external catch tools. The EFL rotating and releasing spear ensures successful fishing operations by engaging the bore of the fish in situations where external catch tools are not feasible, such as when fishing drill pipe, casing or tubing.

Smith's mechanical casing cutter can quickly convert to alternate inside cutting diameters, increasing flexibility while reducing rig time. The tool can cut casing and drill pipe in multiple locations and is adjustable to cut multiple casing sizes, often without tool conversion, and usually only needing to change slips and friction blocks. The tool disengages and resets to the run-in position automatically when the casing is cut by an automatic nut that permits resetting and disengaging the tool without returning it to the surface. The casing cutter is available for casing sizes ranging from 4 1/2-in. to 13 3/8-in.

Internal cutting and recovery tools

SMITH offers several fishing tools and taps to retrieve drill pipe, casing, tubing and downhole equipment that cannot be engaged with external catch tools. The EFL rotating and releasing spear ensures successful fishing operations by engaging the bore of the fish in situations where external catch tools are not feasible, such as when fishing drill pipe, casing or tubing. The spear features a full bore to facilitate the use of wireline equipment during fishing operations. The EFL rotating and releasing spear is available in ODs ranging from 1 29/32-in. to 11 3/4-in. The tool disassembles into five components for on-site servicing, and reduces maintenance costs by sacrificing wear slips. It resets to the catch position downhole with one full left-hand rotation.

The Itco-type releasing spear is designed to ensure positive engagement with the fish and can internally engage and retrieve drill pipe, casing, tubing or any other obstruction with up to a 20-in. inside diameter. The tool is built to withstand severe jarring and pulling strains. Heavy-duty versions of the spear can be used with pulling tools for maximum performance. The grapple and wicker design ensures nearly 360° of engagement to minimize damage or distortion of the fish. The Itco-type spear can be released with right-hand rotation if necessary.

Several taps are available for use with the spears, including a pin tap, which provides an economical means

The Mechanical Casing Cutter is designed to quickly convert to alternate inside cutting diameters.



to retrieve a tubular fish that is restrained from rotating. The pin tap is designed to mate with a box up tool joint and includes an open bore to allow wireline tools through the tap. The one-piece taper tap is constructed with a fine thread form that allows the tap to work as a threading tool. The box tap/die collars are available with a choice of special guides and are well-suited for threading onto ragged-surface fish.

Overshot fishing tools

SMITH offers several releasing overshot fishing tools that are designed to engage, pack off and retrieve tubular fish, and they are especially suited to retrieve parted drill pipe and drill collars. The Series 150-Type Releasing Overshot features a large bore for use in conjunction with wireline tools, and is available in a range of strength categories for jarring and back-off operations. The Series 150-Type Releasing Overshot is available in four different configurations, ranging from full strength to slim hole and extra slim hole to cover a range of external catch fishing requirements.

The Series 70-Type Releasing Overshot is specifically designed to use when the top of the fish is too short to be engaged with a Series 150-Type Overshot. With the grapple positioned at the bottom of the tool, the overshot is able to successfully engage fish with short necks. The tool's unique tapered helix internal construction provides 360° degree wall contact while distributing loads evenly on the tool and the fish. Cylinder basket grapples are used when the fish OD is more than one-half inch smaller than the tool's maximum catch size.

» SMITH offers several releasing overshot fishing tools that are designed to engage, pack off and retrieve tubular fish, and they are especially suited to retrieve parted drill pipe and drill collars. The Series 150-Type Releasing Overshot features a large bore for use in conjunction with wireline tools, and is available in a range of strength categories for jarring and back-off operations.



Smith's overshot product offering contains large bore, slimhole and extra slim hole tools that offer reliable, cost effective options for retrieving fish in the toughest applications.

The Rotating and Releasing (R&R) Overshot sets the industry standard for reliability and flexibility when externally engaging fish under high torsional and tensile loads. A unique segmented slip design developed to outlast conventional grapples is combined with lugs located between each slip to provide a high-torque lock, delivering unmatched gripping strength and reliability, job after job.

Smith's standard R&R Overshot assembly consists of a top coupling, body, standard guide, spring, slip carrier, one set of slips and a blanking ring, all constructed of high-strength steel. The R&R Overshot is designed as a left-hand high-torque overshot for use below the Smith Services AJ Reversing Tool.

When Smith people go fishing with customers, it's not their day off. And they always arrive with the best combination of tools, technology and experience to get the job done right. □

(M a c h i n i n g s e r v i c e s)

Maintaining drilling system reliability requires a commitment to quality drill string services

An oilfield drilling system is a complex collection of many individual elements including the drilling rig, surface drilling equipment, the drill bit, the bottom hole assembly (incorporating a combination of often very sophisticated tools with electronics and complex mechanical components) and the drill string. The performance of even the most advanced drilling rig and a complex steerable BHA with a full suite of MWD and LWD tools can be compromised by a lack of attention to maintaining drill string integrity. Drilling tubulars represent a substantial part of the total capital equipment needed to drill a well, and proper maintenance and repair is essential to avoid the high unplanned costs associated with drill string failure.

Tubular repair services

High quality tubular repair services actually begin before the component ever sees the machine shop floor. At SMITH, the first step is for a qualified representative to meet with the customer to discuss the scope of work, review inspection reports and dimensional data, and confirm that the connection to be machined best suits the OD and ID of the tubular.

Smith's machinists are experts in the machining and repair of rotary shouldered connections and this ensures that each job is performed to the API and Smith standards. Once each tubular is in the lathe, the machinist sizes, monitors and measures all five of the critical elements of the rotary shouldered connection: thread form, lead, taper, size and bevel diameter.

Connection recuts are the most common type of tubular repair. The process is similar for drill collars, drilling tools, rotary kellys and other tubular products in a procedure that requires 4-6-in. of material to be removed depending on the connection type and its features. Enough material must be removed to ensure that the damaged area near the base of the box or the pin is not part of the recut connection. Most rotary shoulder connections can be recut and repaired at any Smith machining facility. All repairs to drill collars and downhole drilling tools are completed and inspected using calibrated lead and taper gauges and ring and plug gauges.

Tool joint build-up is an industry-accepted procedure to extend the service life of drill pipe and Hevi-Wate drill pipe. Tool joints that meet minimum recommended length and diameter criteria can be professionally restored to their original ID at

Mobile hardbanding brings state-of-the-art capability to customer locations and eliminates expensive freight charges moving tubulars to and from a machine shop facility.



selected Smith machining facilities. A properly rebuilt tool will yield a connection with the same OD, seal face and bevel diameter as a new tool joint.

To ensure trouble-free life for a rebuilt tool joint, SMITH adheres to several processes and parameters. Among them is that the depth of the heat affected zone must be prevented from entering the threaded area. A proprietary blend of wire and flux provides build-up material with an optimum combination of yield strength, wear resistance and ductility. Preheat and postheat cycles are carefully monitored to ensure that mechanical properties of the tool joint are maintained and adequate postweld stress relief is accomplished. The tool joint is machined to its finished diameter, hardband is reapplied and the connection is re-machined to specific dimensions.

Hardbanding for wear protection

SMITH is known worldwide for its quality hardbanding for the protection of drill collars, drill pipe, heavy wall drill pipe and other tools while downhole. An automatic, metal-arc, inert gas shielded, consumable electrode process is used with closely controlled preheat and postheat.

Conventional hardband material consists of granular tungsten carbide that is fed automatically into the molten puddle to obtain uniform distribution of the tungsten carbide particles. A selection of casing friendly, non-tungsten carbide hardband from industry-approved suppliers also is available through SMITH.

Standard and spiral drill collars

The drill collar not only is the most common component in the bottom hole assembly (BHA), it also is the most critical to the BHA's overall performance. Hole size integrity results from proper drill collar sizing, enabling the desired casing size to be run to bottom. The drill collar accomplishes this by limiting lateral movement of the drill bit in the absence of larger diameter drilling tools. Also, drill collar stiffness is important to drill and maintain a straight wellbore. The first 90 ft of BHA above the bit has the greatest impact on hole straightness and is where drill collar stiffness should be optimized.

Smith's drill collars outperform the competition due to the care the company takes in material specification, heat-treat, machining and inspection. SMITH can provide roller, milled or machined surface finishes to drill collars. The drill collar's connections are manufactured to specifications contained in API Spec 7. Connections are "kemplated" (phosphosphate coated) to protect them from the elements after machining and to help prevent galling upon initial make-up. All drill collars are rigorously inspected during their manufacture, including

ultrasonic testing of drill collar bars after heat treating.

SMITH offers several important optional and beneficial features for its drill collars. For example, slip and elevator recesses are designed to cut drill collar handling time by eliminating lift subs and safety clamps. Extreme care is taken to machine smooth radii, free of tool marks. Cold rolling the radii at the upper shoulder of each recess is done to extend the drill collar's fatigue life.

An API stress-relief groove on the pin and an API back bore box are available as a requested option and are recommended for drill collars and all downhole tools where fatigue can occur as a result of bending. These features remove the unengaged threads in the highly-stressed areas of the drill collar connection, providing a connection that is less likely to crack due to fatigue because bending in the connection occurs in areas with smooth surfaces free of stress concentrations.

Spiral drill collars reduce the area of contact between the drill collar and the wellbore wall. This feature should be applied in drilling conditions where differential sticking occurs.

SMITH has the machining expertise and experience to manufacture new tools or repair old tools. Either way, the tools are the highest quality in the industry thanks to Smith's rigorous manufacturing and inspection processes.

Tubular Rentals

One of the companies that SMITH gained through the W-H Energy acquisition was Thomas Energy Services and its Thomas Tools and Thomas Tubing Specialists operations. Thomas Tools is a rental operation providing drill pipe, high-torque drill pipe, drill collars, heavy weight drill pipe, high pressure blow out preventers, handling tools, cross-over subs and specialized downhole tools. Thomas Tubing Specialists rents premium tubing workstrings, high pressure BOPs, flow iron packages, high pressure manifolds, tanks and all tubing handling tools.

Thomas Tools was the first company to initiate the development of high-torque drill pipe in the U.S. in 1986, increasing the torsional strength of high-torque connections with what is called the "Thomas Tools Feature." This feature incorporates a proprietary special box counterbore dimension in the development and manufacture of the first high-torque double shouldered refacing tool.

SMITH is recognized worldwide for being able to offer everything in a drilling system, from the rotary table to the drill bit. This comprehensive understanding of all aspects of drilling technology and extensive global experience make SMITH the ideal partner for maintaining the integrity of your drill string to ensure total drilling system reliability. □



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publisher's letter

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Since 1910, PennWell has been a leader for coverage of and service to the worldwide petroleum and power industries. With foundation magazines and web sites such as *Oil & Gas Journal*, *Offshore Magazine*, *Renewable Energy World*, *Power Engineering*, and *Utility Automation Engineering T&D*, PennWell created PennEnergy.com to serve as a one-stop resource for energy news, research, and insight. In addition to today's energy news and information, the site contains ten years of archived content from PennWell's award-winning energy publications.

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Regards,
Stacey Schmidt
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Career Focus In Economic Uncertainty



Maintaining your financial and career security is priority number one, but it is also important to keep in mind your long term goal—turning this tumultuous time into a career upgrade.

By the end of January, the unemployment rate rose to 7.6% bringing job losses to a 34 year high. The energy sector has fared better than areas including manufacturing and construction. Moreover, the peaked interest and support in renewable energy has led to a great deal of discourse around the so-called “green collar” jobs. This could possibly result in fewer lay offs in the energy industry, yet more transitions. The overall reality is the precarious environment in which we currently live is serving as a catalyst to think about our career development.

Regardless of your job’s current state of vulnerability, it is the perfect time to think about your next career move. The evolution of your career will either be in your current company or outside of it. The decision may not be yours to make, but you can at least insert yourself into the outcome.

Build a road map of your career future by asking yourself some important questions. What is the current state of my career? How susceptible is it to a lay off? What are my options?

The level of lay off susceptibility will help to determine whether or not your path will stay within your current organization or outside your current organization. For those of you who find yourself highly susceptible to a lay off, you should get your resume up to date, reach out to your network and start researching. Find out which companies are hiring, which energy jobs are active and how your skills and experience could translate into a new opportunity.

Not everyone will be looking for career options outside of their company. Internally, the short term goal is to make your job less vulnerable by gravitating towards the work, taking on challenging projects, appraising your skills and expertise and working on building areas of weakness. Take the initiative, work hard and you could potentially increase the sustainability of your job.

Maintaining your financial and career security is priority number one, but it is also important to keep in mind your long term goal—turning this tumultuous time into a career upgrade. Future tides will turn once again providing opportunity for promotion. Finish out your road map with a target promotion in mind and strive towards it every day. Doing so could pay rich dividends.

These challenging times should be looked upon as a catalyst for career growth, not just by those laid off, but by everyone. There may be hardships incurred earlier, but effort spent now is the key to a more stable career over time.

Sincerely,
Stanna Brazeel,
Manager, Staffing and Salary Administration, Human Resources
PennWell



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Energy Workforce Opportunities in the New Economic Climate

It's a mixed message out there. On the one hand the media is claiming the energy sector is the place to be; on the other hand, energy companies are not immune to the current economic woes. With commodity prices down, industrial demand destruction a reality and the inevitable increase in slow or no paying customers, energy companies are definitely experiencing the effects of our current economy.

Just as consumers have become wallet vigilant, so too are energy companies. And given that energy companies cannot control demand destruction, commodity costs, or payment consistency, that leaves projects and labor costs as the target rich environment for cost control. We are already seeing hiring freezes, projects being killed and a number of related signals that indicate many energy companies are following the rest of the economy into a standstill.

Opportunity Knocks

Who hasn't heard or read about the workforce crisis facing the energy industry? A couple of telling figures; such as 50 percent or more of utility employees are eligible for retirement within 10 years, or, that Gen-Xers fall 4 to 6 million people short of filling the vacated positions across all industries within the next 3 years, are sobering indeed.

Meanwhile, the energy industry is experiencing a popularity boost like nothing seen before. A recent college senior survey indicated energy as one of the top 5 fields of interest. Until two years ago, energy didn't even make the top 20 list.

It's an employers market today. There may not be a better time to capitalize on this opportunity and when the economy starts to recover, this window of opportunity will close.

Answering the Door

It would be easy to suggest a simple strategy, such as, go out and hire people from outside the industry in droves, but the odds of that working and the cost of the inevitable large number of "mistakes" is pretty high.

There are essentially two key issues with hiring from outside the energy industry: 1) lack of training, and, 2) retention risk.

Training can be an expensive investment in people, especially given post-training retention risks.

This doesn't have to be the case.

According to a Skipping Stone survey which was administered to non-energy industry job seekers who were interested in getting into the energy industry, 35 percent of respondents were willing to pay for some amount of industry training out of their own pocket. The number increased to over 50 percent if they knew a job was waiting for them upon successful completion of training. The number jumped to 85 percent if the company hiring them was willing to reimburse their training costs over a period of time.

Given the survey results, the current unemployment situation and willingness of non-energy professionals to be retrained, this screams for a low cost strategy that results in a new trained and retained talent pool. For example, offering jobs upon successful training completion with a three-year payback program tied to retention starts to look attractive. If you couple that with a third party student loan program backed by your company and a personal guarantee from the applicant, it gets even better.

If you don't want to wait for people to get outside training to get them started, a simple and cost effective retention risk mitigation strategy is a contract to permanent program.

Contract to permanent has a myriad of benefits beyond the obvious "try before you buy". Advantages such as flexibility, no benefits costs, no HR issues, and little or no insurance impact come with a "contract-to-permanent" approach.

Contract-to-permanent is a viable solution whether your strategy is progressive on workforce development or if you are simply in cost control mode. Using contractors for staff augmentation and project work enables the ability to shed costs quickly and easily as financial conditions warrant.

Implementation

Most human resource departments aren't equipped to implement these strategies single handedly. Outsourcing in

a partnership mode with internal HR is the quickest way to capture what may be a short term opportunity. This eliminates the ramp rate of hiring internal recruiters, contract coordinators, training coordinators and other gaps to timely implementation.

To streamline the effort and minimize the number of outsource partners needed, one way to effectively hit the market hard and fast is the use of a firm that can provide a combination of recruiting services, contractors, including payroll and benefits, training coordination and assist in developing strategies and tracking performance and budget.

Financial Impact

Consider the investment in the aforementioned workforce strategies in terms of a two to three year window. The cost to implement it in 2009 will be much lower than in future years as eventually the labor market will strengthen and in the current environment the competition for talent is at a low point.

Assuming there is a need to either address a retiring work force, renewable mandates or potentially a government backed

windfall of activities, any way you look at it, there is a need to invest in a workforce strategy. Doing so should not impact earnings to a significant degree and could position the company for a significant return on that investment in future years. If positioned right, analysts might even reward such a strategy.

The competition for talent may never be this low again. —EW

About the Authors:



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Forum: Continued advancement for women in energy is promising

In the Spring 2008 issue of *Energy Workforce*, we invited three female executives in the energy industry to participate in a forum on women seeking to enter or advance their careers in the energy industry.

In light of this article's notable reception, we are continuing our forum one year later in the Second Annual Women in Energy Forum.

Forum Participants:

Betty Shanahan is the executive director and CEO for the Society of Women Engineers, the first engineer to hold this position. Prior to joining SWE, Betty spent 24 years in development, engineering management, and marketing for the electronics and software industries. She has earned B.S. in electrical engineering, Master of Software Engineering, and M.B.A. degrees.

Wanyonyi J. Kendrick is the Chief Information Office at Jacksonville Energy Authority. Ms. Kendrick joined JEA in February 2000 as Director of Corporate Applications. She is responsible for a \$500 million information technology portfolio. Ms. Kendrick has spent the last 17 years of her career focusing on integrating technology solutions with regulatory, legislative, and business process requirements, resulting in solutions with measurable results.

Kristine J. Nichols directs engineering for Nicor Gas, one of the nation's largest natural gas distribution companies, serving over 2 million customers in the northern third of Illinois (outside of Chicago). Her responsibilities include all aspects of pipeline integrity and regulatory compliance for the utility. Prior to joining Nicor in 2003, she held management positions at Kohler Company

in Brownwood, Texas and Wisconsin Gas Company/WEC in Milwaukee, Wisconsin (now WeEnergies). She is the Inaugural Chair of Energetic Women, a nationwide organization designed to increase the pool of promotable women in energy operations and engineering.

Gianna Manes is senior vice president of retail customer services for Duke Energy. With 20 years of industry experience, Manes leads the retail customer services function, which includes call center operations, revenue services, marketing, energy efficiency and large business customers providing service to Duke Energy's approximately 4 million customers in the Midwest and Carolinas. Previously, Manes served as senior vice president of regulated portfolio optimization and fuels for Duke Energy's U.S. Franchised Electric and Gas organization.

Existing roadblocks and challenges

Q: Do you see any challenges or roadblocks that still exist for women in the energy industry whose career management paths include intentions to reach senior levels? If so, what are the challenges you see?

Kendrick: Utilities are facing a workforce crisis with the imminent retirement of baby boomers and the changing demographics of the future smaller workforce talent pools. I have heard statistics expressing as many as 50 percent of some utility's workforce can retire in the next 5 years. This creates many opportunities, especially for women, in the utility business. Not only as positions become available but additional new skill sets will be needed which do not require the physical strength many utility positions required in the past. The bigger roadblock, in my opinion, are the numbers of girls being attracted to take science, math and technology classes starting in middle school. These courses will be critical to the success of the future utility workforce. Therefore, attracting girls to these classes will be crucial; inspiring them to stay in science classes is essential; and providing the right mentors and positive experiences in the utility business is fundamental to continued recruitment.

Shanahan: I believe the challenges and roadblocks for the advancement of technical women in the energy industry

are the result of decades of engineering colleges graduating predominately white men. The few women work in a male-dominated environment. Although I believe very few in the industry seek to exclude women from the field or advancing, that is not the same as creating an inclusive environment. The value of diversity to an organization is the better decisions and results from bringing together a diverse set of perspectives, approaches and styles of thought to business problems. But for women to succeed, we often train women to adapt to the predominant (male) culture. Although this makes women more effective in the work environment, the women no longer participate "authentically." The business loses the value of diversity and the women have to hide their authentic self. Creating an inclusive environment would increase women's ability to fully contribute at all points in a career path and give the employer stronger business results.

Nichols: At the 2008 Energetic Women's inaugural conference, guest speaker Alice Eagly, author of *Through the Labyrinth*, shared her research-based concept that the glass ceiling no longer exists – there is no barrier to the top. There are lots of challenges (a labyrinth to navigate) for women in their quest for the corner office, but there are plenty for men as well. Those challenges may be different then for men, but the bottom line

is always about how much value you can bring to the table for the organization. If women focus on how they can help their organization to be successful, rather than focusing on being in a male-dominated environment, it becomes easier to meet the challenges and overcome the perceived barriers.



“...the bottom line is always about how much value you can bring to the table for the organization. If women focus on how they can help their organization to be successful, rather than focusing on being in a male-dominated environment, it becomes easier to meet the challenges and overcome the perceived barriers.”
—Kristine J. Nichols, Vice President, Engineering, Nicor Gas

Manes: The challenges for women are no different in the energy industry than in other fields. The ability to progress in a career starts with a strong foundation of knowledge (education), curiosity and the willingness and ability to get the job done. In addition to the foundation, there are other actions women (and all workers) can take to enhance their advancement potential: 1) seek mentors and role models who have your best interest in mind to provide guidance and honest feedback, even if it is difficult to hear; 2) be honest about and know your personal strengths and weaknesses; 3) leverage your skills and experience and be intentional in career choices and identifying experiences you want to gain (rather than focusing on a specific “job”); 4) don’t expect others to read your mind – make your interests known; 5) be willing to take risks.

Prospects for advancement

Q: *How would you characterize prospects for career advancement for women in general in the energy industry?*

Shanahan: I have the opportunity to speak to executives in many segments of the energy industry, from huge energy producers like ExxonMobil to utilities like Exelon. The uniform message I hear from executives is their desire to advance women in their organizations and benefit from having women in the most senior positions. The challenge becomes getting the executive commitment reflected in the day-by-day actions throughout the organization that advance or hinder women’s career paths. My advice for women in the energy industry is to understand your employer’s overall commitment to diversity. If your employer is committed to diversity but the day-by-day environment you experience is not supportive, then work with your employer to find opportunities elsewhere in your organization. If your employer is not committed

to diversity, then I suggest you look at the many energy organizations that offer advancement.

Nichols: Although traditionally dominated by men, today there are opportunities galore for women in the energy

industry! Today’s senior leaders understand the value of diversity at every level of an organization, and often actively seek opportunities to grow talent where they may not feel they are diverse enough. My recommendation for women is to focus on how they can add the most value to

their organization, and ignore that there may be more men than women at the table. Being the only woman can be an opportunity rather than a barrier to showcase their talents.

Manes: There are tremendous opportunities for women in the energy industry. Energy companies are competing with other industries for smart, creative and adept employees. These companies recognize their future viability is dependent on the ability to attract and retain this type of talent. As a result, any bias, however subtle, that may have existed in the past limiting the success of females or other minorities no longer has a place. As these companies also face significant retirements in the coming years, I am optimistic about the opportunities that will be presented for women as the next generation of industry leaders. Lastly, the energy industry is undergoing dramatic change as it expands from traditional technologies that have sustained us in the past to include emerging technologies and renewable energy. The need for innovators and entrepreneurial thinking to support this change is increasing, which makes it an exciting time for everyone – one full of growth potential.

Kendrick: Career advancement in utilities has been perceived as difficult (if not impossible) for women in the past; however, both a combination of the landscape of the industry and a changing talent pool provides great hopes for the future. The prospective talent pool for utilities will definitely be more heterogeneous than in the past and that includes women. As a result of workforce planning pressures, the utility industry’s workforce needs and expectations are also changing to meet this new talent pool. The utility jobs of the past will not be the utility jobs of the future, with key national initiatives such as green energy jobs, smart grids, and social responsibility, utilities are reengineering their positions to embrace and

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accommodate the new talent pool. I believe the future for women's advancement in utilities is promising.

"The utility jobs of the past will not be the utility jobs of the future, with key national initiatives such as green energy jobs, smart grids, and social responsibility, utilities are re-engineering their positions to embrace and accommodate the new talent pool. I believe the future for women's advancement in utilities is promising."
—Wanyonyi Kendrick,
Jacksonville Energy Authority



Organizational support

Q: What measures and/or initiatives have you seen implemented within your own company that support women in their career management paths, even into the senior levels of your organization?

Manes: Duke Energy has taken steps in a number of areas to actively support women in their career development. One of the biggest successes in recent years is the growth and value created by our employee resource groups. One such group, the Business Women's Network (BWN), promotes networking and workshops targeted to the specific needs and interests of women in the company. This group is supported by an executive steering team comprised of women executives who are actively and visibly engaged with BWN members in various activities and serve as accessible role models and mentors. The company also promotes a voluntary mentoring program for all employees where they are matched with an executive leader. Additionally, I have seen an increase in the flexibility employees are provided in terms of work hours and location, which gives them increased ability to manage both a career and family. We are redefining the definition of "workplace." Increasingly, work is being performed where the employee is physically located rather than the traditional job where employees go to the work location. While not directed specifically at women, this greatly increases women's ability to better integrate their career and lives over the course of time, increasing their choices and enhancing their overall career opportunities.

Nichols: Nicor Gas has an excellent and well-earned reputation for promoting the people that add the most value – and that certainly includes women. The most impressive aspect of Nicor Gas' leadership development is the support senior leaders within the organization provide to emerg-

ing leaders. Nicor has a comprehensive succession plan which focuses on growing internal talent. In succession planning, employees have the opportunity to take on different positions and responsibilities which allows them to develop a broad vision of the organization. The fact that Nicor has so many women in leadership roles across the company with a variety of experiences on their resume demonstrates their long-term commitment to empowering women to assume meaningful leadership roles.

Kendrick: Over the past decade JEA has developed both implicit and explicit strategies that support and promote career advancement for women even into senior management positions of JEA. Change starts at the top and both our present and immediate past CEO actively supported these strategies. In fact, JEA's Board of Directors closely reflects our community in diversity and for fiscal year 2008 our Board Chair was an African American woman. Today we have three relevant initiatives: cultural competence initiative, executive leadership development program and internships. At JEA cultural competence is recognizing, understanding, and valuing people's differences and using this knowledge to interact effectively. JEA's vision is to be recognized as a leader in achieving excellence by valuing the unique contributions and needs of our employees and the communities we serve. We are establishing a multiyear initiative focusing on our cultural competency goals with the intended outcome of supporting the expected changes in our workforce to reflect the heterogeneous community we support. JEA's Executive Leadership Development (ELD) identifies and supports (through training and mentoring) our future utility leaders. The ELD group endeavors to be diverse. The group meets regularly and not only has an opportunity to network with both the JEA board and executive management but also some of the best and brightest CEOs in North East Florida. JEA's Employee Development Program is similar to the ELD but specifically focused on the unique needs of individuals striving to become supervisors and entry level managers, however it continues to ensure strong mentorship as well as the creation

"As a tactic to support women, I encourage managers at all levels to create forums for women to network with each other, learn, and feel a sense of community. Organizations like the Society of Women Engineers can serve as such a forum."
—Betty Shanahan, executive director and CEO for the Society of Women Engineers



of sustainable networks to support career advancements. JEA's internship program promotes hiring the best and the brightest college students for internships for up to four years to prepare these students for a career in utilities. Again the initiative attempts to represent the community in its demographics.

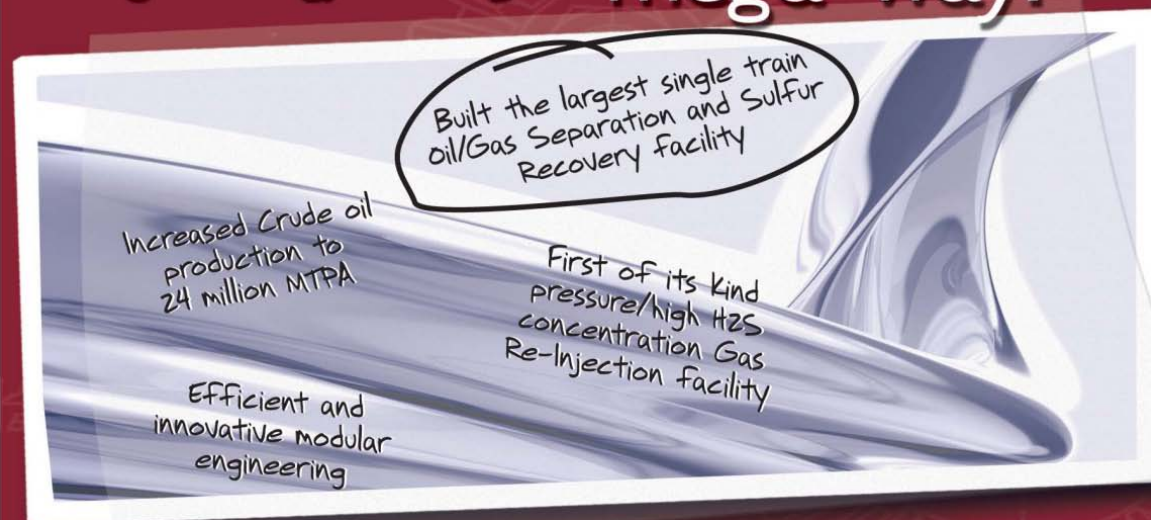
Industry improvement

Q: How might the energy industry in general improve prospects for women to advance their careers?

Shanahan: The first requirement is commitment from top management. CEOs, facility managers, and others in top management must demonstrate, not just say, their commitment to diversity throughout the organization. From that commitment should spring efforts to have all employees shift their understanding of diversity from tolerance to others to creating an inclusive corporate culture where all employees can contribute. As a tactic to support women, I encourage managers at all levels to create forums for women to network with each other, learn, and feel a sense of community. Organizations like the Society of Women Engineers can serve as such a forum.

Kendrick: I am a strong proponent of a best practice approach to improving the advancement of women in business. There are many industries and many companies in the utility business that have embraced successful strategies that have encouraged better promotion of women into senior management positions. These practices start with defining the business case: clearly understanding the benefits of hiring women and other groups in the customer base serviced. Continue by creating a strategy and an organization structure that can sustain the objectives: including recruitment, retention, development, training, communication and most importantly measurement strategies. Lastly monitoring and celebrating the results. At a more fundamental level many of the criteria that make a great company also make a great company for women's advancement. There are certain programs that can be considered that truly will attract and retain women: strong mentoring programs, access to senior management, career paths and succession planning. But the basics are also important: great benefits, flexible hours, job sharing and various forms of childcare may also help a company to differentiate itself to women.

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Nichols: The opportunities are out there; the industry already provides them! The real question is what women can do to capitalize on those opportunities? First, I would advise women to join Energetic Women and other leadership development and networking groups as a means of broadening their horizons and creating a supportive network outside of the organization to grow their leadership potential. Second, seek out ways to maximize your potential. Objectively evaluate your past experiences, the value you currently add to your organization, and what experiences or skill sets you need to work on in order to be the best candidate for another opportunity. Finally, be brave! Time and time again, women executives most often credit having the courage to try something totally new as the primary reason behind their success. They did not always go seeking their next assignment. Many were just thrust in a new direction. They had to dig deep, have faith in their own abilities to grow and adapt, and have the courage to face their challenges head on. Those experiences are the ones that really make a difference.

Concerns about the economy and employment

Q: With the recent economic and employment slump, have you noticed any changes in recruitment and sourcing activities aimed at women in the energy industry?

Kendrick: Yes, the transition to a 21st century heterogeneous workforce has definitely slowed down as a result of the economic downturn. Any initiative that is not essential to the next 12 to 18 months has been put on hold, canceled or eliminated, oftentimes diversity initiatives fall into this category. However, the problem still remains with a shrinking talent pool of the future, the pain has just been postponed and I am confident that most of these initiatives will begin again in the coming years in the same form or a more appropriate modified format.

Nichols: It is a tighter market for everyone, not just women. Now is a good time to focus on leadership development opportunities. Consider formal education, taking on new assignments in an area you have not worked before, or testing your skill sets as a volunteer outside of the corporate world. Showing your dedication to continually grow and add value will only strengthen you, regardless of the economy.

Manes: I believe all challenges present opportunities. While current economic conditions seem daunting, I believe opportunities are hidden in the news about job losses and are providing us the chance to rethink how we manage our business. It is an opportunity to be creative with regard to costs, earnings and

resources – especially employees. This is the time to focus on the best talent, the best ideas and the best solutions. In order to succeed, we need a multi-dimensional, inclusive workforce. We are being more deliberate in our sourcing and recruiting in all areas with these needs in mind, which will continue to improve opportunities for all, including women.

“While current economic conditions seem daunting, I believe opportunities are hidden in the news about job losses and are providing us the chance to rethink how we manage our business... In order to succeed, we need a multi-dimensional, inclusive workforce.”



—Gianna Manes, Duke Power

Shanahan: I wouldn't note changes for women that are any different than the changes for men. Some sectors of the industry are facing hiring slowdowns or freezes that impact both men and women.

Final thoughts

Q: What else do energy companies need to know about women in the industry?

Nichols: Many women learn and grow in ways different than their male counterparts. The opportunity to network with other women in the industry is a great asset to their growth and development. It has become obvious to me now, through my involvement with Energetic Women, that it is really essential to have a safe venue for women to explore their leadership potential with other women and to find solutions to the challenges they experience in their careers. I strongly encourage energy companies to look into Energetic Women as a resource to attract, develop, and retain women to diversify their talent pool and strengthen the organization long term.

Shanahan: The energy industry must fully utilize all the talents of a diverse workforce if it is create a long-term strategy to deliver sustainable energy to the world while maintaining and increasing quality of life globally.

Kendrick: Women and other diverse workforce groups should not be portrayed as replacing any one demographic... but rather complementing the workforce and providing opportunities for better decision-making similar to Abraham Lincoln's strong cabinet team of rivals. *—EW*

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The screenshot displays the PennEnergy.com website layout. At the top, there are navigation links for 'Petroleum', 'Power Generation Transmission & Distribution', 'Energy Products & Services', 'Finance', 'Research & Data', 'Jobs', 'Products', and 'Equipment | Books'. A search bar is located in the top right corner.

The main content area is divided into several sections:

- Petroleum:** Includes sub-sections for 'Exploration & Production' (with sub-links for Regions and Companies), 'Offshore', 'Pipelines', and 'Refining'. A news headline reads: 'Maurel & Prom discovers oil in Gabon (Oil & Gas Journal, August 4, 3:08 PM)'. Other headlines include 'Opus, ROU team up for research project (Offshore, August 4, 2008 9:08 AM)' and 'CSL awarded Grove, Seven Seas contract (Offshore, August 4, 2008 9:08 AM)'. A 'More News' link is provided.
- Power Generation Transmission & Distribution:** Includes sub-sections for 'Fossil Fuels', 'Nuclear', 'Renewables', 'Smart Grid', 'Reliability', 'Metering', 'Customer Service', and 'Policy'. A news headline reads: 'Maurel & Prom discovers oil in Gabon (Oil & Gas Journal, August 4, 3:08 PM)'. Other headlines include 'Opus, ROU team up for research project (Offshore, August 4, 2008 9:08 AM)' and 'CSL awarded Grove, Seven Seas contract (Offshore, August 4, 2008 9:08 AM)'. A 'More News' link is provided.
- Energy Products & Services:** Includes sub-sections for 'Instrumentation', 'HSS&E', 'Engineering & Construction', 'Workforce Management', 'Software Solutions', 'Logistics', and 'Regulatory / Legal'. A news headline reads: 'Maurel & Prom discovers oil in Gabon (Oil & Gas Journal, August 4, 3:08 PM)'. Other headlines include 'Opus, ROU team up for research project (Offshore, August 4, 2008 9:08 AM)' and 'CSL awarded Grove, Seven Seas contract (Offshore, August 4, 2008 9:08 AM)'. A 'More News' link is provided.
- Market Indices:** A table showing various indices and their values:

Index	Value	Change
OGJ200	8501.44	+121.92
NYSE	8501.44	+121.92
NSDQ	8501.44	+121.92
S&P500	8501.44	+121.92
Crude Oil	8501.44	+121.92
Natural Gas	8501.44	+121.92
- PennEnergy Research:** A section for research reports, including 'New Reports' such as 'The Future of Oil & Gas Supply: A Quantitative Analysis', 'The EU Electricity and Gas Markets - Market Research Report', 'ABB Power Predictor Report and Interactive Database Package - Market Research Report & Database', and 'Hydro Power - Large & Small Hydropower - Market Research Report'. A 'More New Reports' link is provided.

At the bottom of the page, there are several promotional banners for '2007 International Petroleum Encyclopedia - Third Edition', 'Electric Power Generation and Transmission Systems Map of the U.S. and Canada 5th Edition', 'CHINA POWER OIL & GAS' (September 2-4, 2008, Guangzhou, People's Republic of China), and 'POWER-GEN Online'. A footer contains the PennWell logo, navigation links, and copyright information: 'Copyright © 2008, PennWell Corporation'.

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Customized and Personalized Improving Frontline Training Practices

Training and training delivery systems are changing, evolving to take advantage of the power of the Internet, mobile communications, and handheld technologies—the technologies that are changing society itself. Technological advancement has made it possible and practical to shift from classroom training to individualized learning. In turn, corporations are expecting trainers to become performance consultants, with the goal of developing custom learning content to help individual employees achieve their desired outcome.

As a result, companies are spending more per employee on training and the average number of hours of formal learning per employee is increasing. The use of technology to deliver learning content has increased and companies are also spending more on external services like content design, development and delivery or technology infrastructure.

More and more subject matter experts are assuming the training role. More live instruction is being delivered remotely or online and more and more self-paced or computer-based training is being offered to busy employees, making it even more convenient to brush up on skills or learn a new procedure. Training that is portable, self-directed, and available on-demand is becoming popular, through pod casts, PDAs, or even mobile phones. Simulation technology is also being widely implemented, allowing learners to realistically “try the job” before actually on the job.

Companies are expecting more from their training organizations—to maximize results while minimizing resources; to prove that the investment in training is paying off in employee performance; to develop content more quickly; and to deliver learning in such a manner that it is more accessible, even seamless with work duties. More so than ever before, an organization’s training function is being run like any other business function with increased attention on operational efficiency, accountability, and connection to organizational strategy.

These challenges are reflected in the top concerns identified by training and development professionals in recent industry research:

- Managing training costs and funding
- Getting the most out of e-learning, learning development systems
- Linking learning to performance
- Increasing training comprehension
- Aligning learning with business needs and individual employee competency needs.

It’s no longer acceptable to hope an employee learns something at a training session. The best performing companies are thoughtfully developing and engaging their most important resource: the people they employ.

Engaged employees are the key to excellent customer service. Engaged employees are employees that feel as though they are truly valued at work; that their efforts directly contribute towards the mission and success of the company. Engaged employees are more productive and less likely to look outside of the company for employment.

However, employee engagement is beginning to deteriorate due to the failing economies of the U.S. and elsewhere around the world. A recent national study by Modern Survey revealed that that 21% of U.S. workers actively disengaged. Poor employee engagement can lead to absenteeism, a lack of teamwork, poor morale, and low productivity, among other concerns.

It is becoming more and more difficult to find and engage the right employees. Tight labor markets are making companies think twice about compensation packages, benefits, and incentives. Turnover and competition are pushing companies to focus on ways to keep qualified employees happy and motivated. Customer service management’s top priority is attracting and engaging top-performing customer service employees.

Learning plays a key role in helping employees to get and stay engaged. Many organizations have begun to rely heavily on the learning function for engagement support. While new-

hire training can initiate an employee's engagement with the company, refresher training and other personal development opportunities can help keep employees engaged. However, training and development alone does not guarantee employee engagement.

Additionally a good relationship between employees and immediate supervisors is recognized as a top driver of employee engagement. Yet this is a problem area for many customer service organizations—frontline supervisors and managers lack the skills to effectively engage employees. A study performed by the Ascent Group found, many customer service organizations do not offer basic supervisory training to frontline supervisors, much less tactics to improve employee engagement.

With all this in mind, the Ascent Group conducted research in mid- and late-2008 to better understand training and development programs for front-line customer service employees. This research was conducted in concert with additional research into the recruitment and hiring of front-line employees and performance measurement.

The main objective of the study was to identify “best practices” for front-line customer service training. In particular, focus was given to understanding how best-in-class customer service organizations train and prepare their front-line, customer-facing employees.

Secondary objectives included understanding:

- What initial training programs are used? Duration?
- What on-going training programs are used? Duration? Frequency? Pass/Fail?
- What job rotation processes are in place? Are they effective in increasing productivity and customer satisfaction?
- What technologies are improving the training process?

Participants were also asked to share management tactics and strategies, as well as identify any improvement in performance. The study also asked companies to include considerations, successes, and plans moving forward. Study participants ranged from 2 to 6,000 frontline employees and from 1 to 1,900 new hires per year.

Lessons Learned

Hire for Attitude, Train for Technical Skills. The best foundation for service excellence is your people. It is easier to teach proficiency than it is to change attitudes. Best-in-Class companies look for motivated and enthusiastic people who demonstrate a propensity to serve—hire for attitude and train for skill. Consider potential, not necessarily experience. Best-in-Class companies have turned hiring into an art form, not only the process but also the identification of the right type of employee. In a service business, the employees are the company and hiring is critical. Work with your recruiters to find the right candidates.

*Communicate Job Expectations Throughout New Hire Training—*Do as much as possible to relay expectations to students during the new hire-training program. The more a new employee understands about the job, the work environment, performance expectations, and culture, the quicker they will be able to achieve standard. Use job shadowing, peer mentoring, or simulation to relay culture and expectations. Revise training content so the appropriate expectations are conveyed. Survey new students to better understand how to continually refine the process and minimize new-hire surprise.

*Emphasize the Importance of Customer Service in the Training Process—*Make sure that students know up front about your organizational commitment to customer service. Stress the importance of customer service and customer satisfaction throughout the new-hire training program. Do as much as possible to integrate the “Customer Experience” into Training Program—so students understand customer expectations and appreciate the customer perspective. Use simulation, role-playing, and mentoring to convey the correct “customer experience”. On average, our participants spend about 20 percent of new-hire training hours on soft-skills, usually integrated into the new-hire training program.

*Engage New Hires with “Hands-On” Training, Customized to Individual Learning Styles—*Research shows a growth in more interactive, hands-on training opportunities for new hires—role playing, simulation, peer mentoring. Hands-on experiences help internalize learning, incorporate more “learning by doing” opportunities into your new-hire program. Hands-on learning can also be used to drive assessment so that trainers can measure both factual knowledge and comprehension. Additionally, training comprehension is increased through individualized training—training tailored

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to each student's individual learning style. Smaller class sizes, modular training, and self-paced activities help students learn at their own pace.

Mentoring & Monitoring Ease the Transition to the Floor—

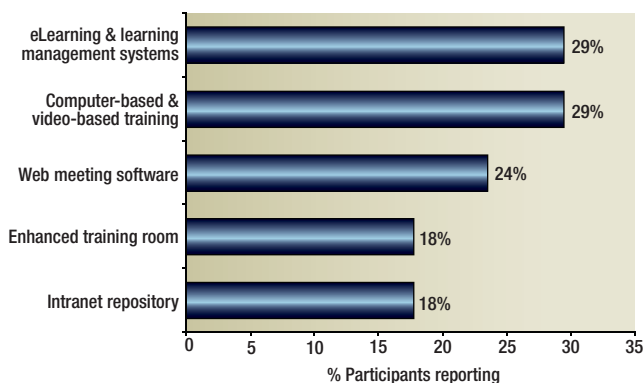
Participants use a combination of one-on-one mentoring and frequent call monitoring to help new hires transition to the floor. Many companies also employ “nesting”—pod on the floor dedicated to new hires—to facilitate more extensive coaching and one-on-one assistance until the team is up-to-standard. Another approach that has been successful is the creation of an OJT manager to shepherd new-hire and ongoing OJT efforts.

Maximize Intranet and Internet Resources and other

Technologies to Enhance Training and Job Aids—Newer technologies offer the opportunity to customize learning and make it more accessible. Investigate opportunities to deliver online or computer-based training. Self-paced training is inherently customized to individual learning speeds and styles. Training that is portable, self-directed, and available on-demand, through pod casts, PDAs, or mobile phones, will be more convenient and more appealing for many employees. Simulation technologies allow learners to “try the job” before actually being on the job, creating a more realistic training environment. Research also shows a growth in the use of web-based meeting applications, such as WebEx, GoTo Meeting, and LiveMeeting, to facilitate distance learning and to reduce training costs.

Integrate Training with Quality Assurance and Operational Excellence to Facilitate Continual Improvement and Pre-emptive Targeted Training. To ensure successful continuous improvement, encourage training groups to work closely with quality assurance and operational excellence groups.

Fig. 1. Top new training technologies



This will encourage the link between learning and performance—making sure the training group is equipping employees to successfully perform as well as making sure any operational changes are reflected in training. At the same time, underperforming employees can receive targeted training.

Provide Supervisors with Training on How to Coach

and Engage Employees. Organizations reporting more highly engaged workers actively promoting a culture of engagement by ensuring that organizational leaders, including immediate supervisors, are skilled in the area of engagement improvement. After all, having a good relationship between employees and immediate supervisors is a top driver of employee engagement. Yet, many frontline supervisors are lacking in basic supervisory skills, much less tactics for engaging employees. A study by the Ascent Group found that only 57 percent of participants have a formal supervisory (coach) training program for front-line customer service employees.

Evolve Your Training Resources. As technology becomes more specialized and learning becomes more personalized, trainers will assume more of a performance consultant role. Make sure your trainers have the appropriate training and resources to make the transition. Many companies have a difficult time balancing the needs of the business to meet service level goals and the need to train and develop frontline employees. Make the time to adequately train your frontline customer service resources.

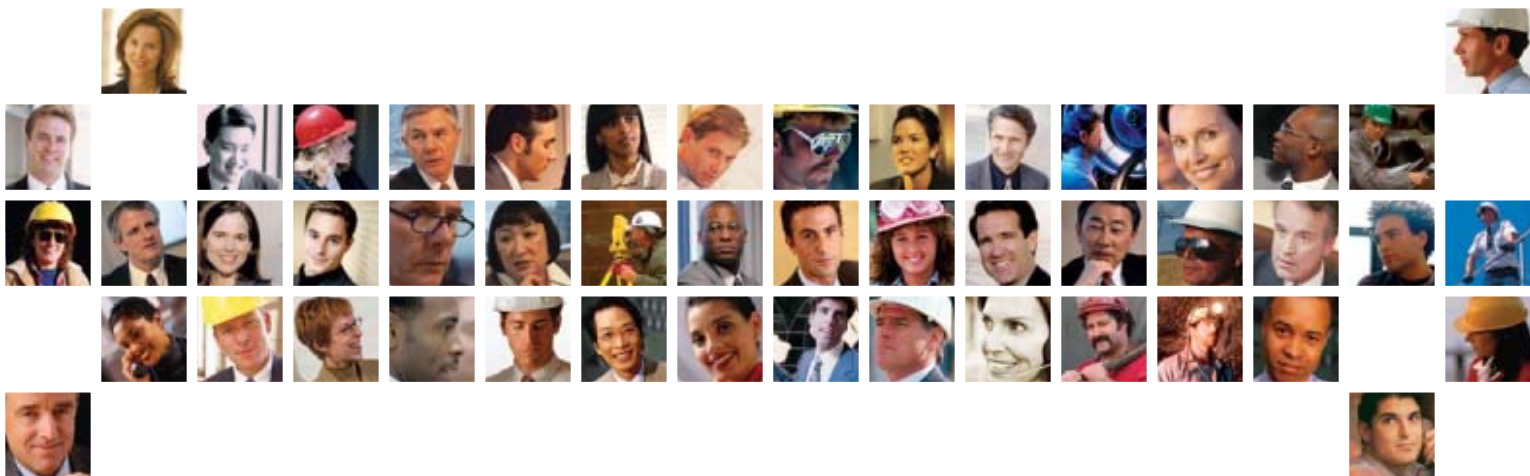
Make Time for Training. Many companies have a difficult time balancing the day-to-day needs of the business and the need to train and develop frontline employees. Make the time to adequately train and prepare your frontline customer service resources. Make sure they are equipped and trained to handle all situations. Refresh training periodically to keep employees in top performance and up-to-date on customer service and technical skills. —EW

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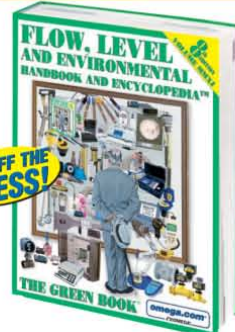
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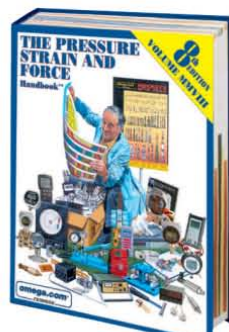
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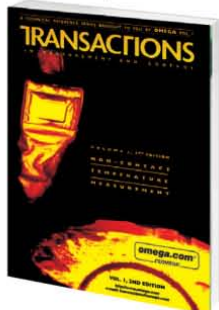
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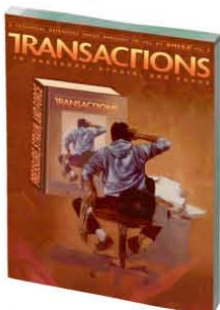
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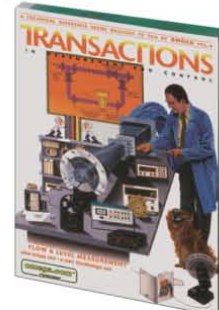
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2009 Petroleum Buyers Guide

Your fourth annual Petroleum Buyers' Guide continues to offer a comprehensive source of oil-industry-applicable equipment, products, systems, services, technologies, and solutions.

In both printed and online format, this 2009 Edition provides overviews, references, cross references, indices, and specifics on more than 1000 global manufacturers and service providers. Guide responses come from more than 30 countries on 5,000 plus upstream, midstream, and downstream specialties.

This Guide is from PennWell's PennEnergy.Com, Oil & Gas Journal, Offshore Magazine, Oil & Gas Financial Journal, and Oil, Gas & Petrochem Equipment brands.

In April, this entire Guide will be available online at five PennWell websites:

pennenergy.com ogpe.com ogj.com offshore-mag.com ogfj.com

Look for the "Products" tab at each site. It will lead you to company, product, and service information.

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- 6 PRODUCTS** section with 27 major oil and gas application or product categories and 700+ subcategories on equipment, products, and systems
- 31 SERVICES** section with 37 major upstream, midstream, and downstream-applicable offerings for all operations phases of the industry include construction, financial, health, safety, environmental
- 34 COMPANIES** section with full-contact details, key personnel, email, website data. Summaries as provided by manufacturers and service providers present product, service, and capabilities
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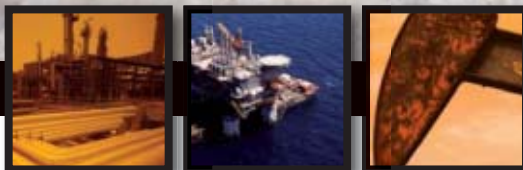
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PennWell Petroleum Buyer's Guide supplement reaches global professionals engaged in the operation, management, and maintenance of upstream, midstream, and downstream oil industry operations and facilities, as well as those involved in its design, engineering, and construction.

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2009 Petroleum Buyers Guide



4th Annual 2009 Petroleum Buyers' Guide

Now more than ever — the place to find quality upstream, midstream and downstream products, services, companies

Who could have forecast, predicted so far down from the \$100/barrel oil we touted this time last year to open Petroleum Buyers' Guide?

So now more than ever, petroleum professionals need to invest in "just the right" equipment, products, systems, services, technologies and solutions — to make certain their capital investments are sound and of highest quality.

This 2009 Petroleum Buyers' Guide from PennWell's PennEnergy Group is offered to aid that search. It brings together 1,000+ companies from 25+ countries: manufacturers and service providers.

The 5,000+ listings offer you one-stop, accurate, reliable information to research specify, recommend, approve, and purchase upstream, midstream, and downstream products and services. Our product/service/company format presents complete data, cross references, and indices to 28 major oil industry application or product categories and more than 700 individual products and services.

This 2009, 4th edition is a single, complete source of oil industry specialties to help you explore for, drill, produce, process, transport, and market petroleum products globally. It also provides complete contact and background information on more than 1,000 manufacturers and service providers.

In April Petroleum Buyers' Guide will be available online at five PennWell websites under their "Products" tabs in the top navigation:

- PennEnergy.com**
- Oil & Gas Journal: ogj.com**
- Offshore Magazine: offshore-mag.com**
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Each of these unique, dynamic sites give you total access to vital petroleum information — and are complemented with this Guide. More than 120,000 global petroleum professionals will have the opportunity to use this 2009 Guide.

Thank you for using our Guide. We trust you will find it helpful in these ongoing, challenging circumstances to find, produce, process, and market petroleum.



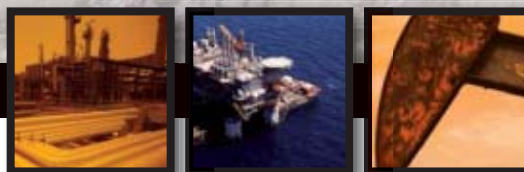
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products

2009 Petroleum Buyers Guide



Section lists equipment, products, and systems offered for the design, construction, and operation of upstream, midstream, and downstream petroleum field and plant facilities. It includes more than 400 product categories from 1,100+ manufacturers.

Products are grouped by category. Companies are listed alphabetically within each. If you are uncertain of a category in which a product may be listed, refer to the alphabetic products index at the back of this Guide.

For quick reference, web addresses or telephone numbers are provided for those companies supplying products in a given category. Additional, more complete company information — including address, telephone, fax, key contact personnel, as well as email and web addresses — appear in the Companies section.

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Emerson Process Management
ESS
Nextteq LLC
Nickpoint Environmental Services Inc
Sorbent Products Co Inc
Thermo Scientific Niton Analyzers

CONTAINMENT

C I Agent Solutions
Eldred Environmental & Export
Enviro-Pak/Tech Oil Products
Industrial Textiles & Plastics Ltd
ITW Devcon Coatings
Mahaffey Fabric Structures
Sorbent Products Co Inc

DRYERS

American Alloy Steel
ClearDrain
Parker dominick hunter
Quincy Compressor
Van Air Inc

EMISSIONS ANALYZERS

AMETEK Process Instruments
AMKO Systems Inc
Applied Analytics Inc
COSA Instrument
E Instruments Group
Emerson Process Management
Enerac Inc
Flir Systems Inc
■ **Omega Engineering Inc**
(See ad p 2, 3)
PANalytical BV
Sick Maihak Inc

ENVIRONMENTAL FILTERS

Aquatech International Corp
BORSIG Membrane Technology
Flottweg Separation Technology Inc
W L Gore & Associates Inc
RCI Technologies Inc

LEAK DETECTION

Air Liquide America Specialty Gases LLC
ANGEL Services
Arizona Instrument LLC
Aviation Technology Services Llc
Cantest Solutions Inc
Compur Monitors GmbH & Co KG
Dunlop Oil & Marine Ltd
FAFNIR GmbH
FasTest Inc
Gassonic
GE Analytical Instruments
GOW-MAC Instrument Co
Industrial Scientific Corp
JH Technology Inc
Kernco Instruments Co Inc
■ **Mil-Ram Technology Inc**
(See ad p 15)
Modutank Inc
■ **Omega Engineering Inc**
(See ad p 2, 3)
optek-Danulat Inc
Phaze Technologies AS
Quincy Compressor
ROSEN Group
Spectronics Corp

NOISE CONTROL

Cirrus Research Plc
Miratech Corp
■ **Omega Engineering Inc**
(See ad p 2, 3)
Thermafiber Inc
Universal Silencer

ODOR CONTROL

Aeration Industries International Inc
Air Chiller Inc
Carbonair Environmental Systems Inc
Environetics Inc
■ **Merichem Chemicals & Refinery Services LLC**
(See ad p 12, 13)
Pureaire Monitoring Systems Inc
Sarva Bio Remed LLC
Schutte & Koerting
Tri-mer Corp

OIL SPILL EQUIPMENT

Atlas Incinerators A/S
CHEMetrics Inc
Environetics Inc
Hazmatpac Inc
Kayden Instruments
Modutank Inc
Oil Stop
P&R Technologies
Wilks Enterprise Inc

SCRUBBERS

American Alloy Steel
Fabricated Plastics Ltd
GEA Jet Pumps GmbH
■ **Merichem Chemicals & Refinery Services LLC**
(See ad p 12, 13)
Quincy Compressor
Schutte & Koerting
Severn Trent Services
Tri-mer Corp

SKIMMERS

■ **Mesa Rubber Co**
(See ad p 21)
Oil Skimmers Inc
Oil Stop

Sandvik Process Systems

VAPOR RECOVERY

BORSIG Membrane Technology
Enardo
FAFNIR GmbH
FLSmith Inc
HBD/Thermoid Inc
■ **Mesa Rubber Co**
(See ad p 21)

Nash A Gardner Denver Product
OPW Engineered Systems
Perenne Equipamentos e Sistemas de Agua Ltda

VOC REMOVAL

BORSIG Membrane Technology
Carbonair Environmental Systems Inc
The CMM Group LLC
Tri-mer Corp

WATER TREATING



Aeration Industries International Inc

Amiad Filtration Systems
Aquatech International Corp
BPC - Bio Petro Clean
Carbonair Environmental Systems Inc
CHEMetrics Inc
ECT Offshore Service AB
Enviro-tech Systems LLC
GE Water & Process Technologies
■ **Omega Engineering Inc**
(See ad p 2, 3)

Perenne Equipamentos e Sistemas de Agua Ltda
■ **ProSep Technologies Inc**
(See ad Front Cover)

PVAC R C Ltda
Severn Trent Services
Siemens AG Energy Sector
Siemens Water Technologies
Walchem Corp

EXPLORATION/DEVELOPMENT

GEOCHEMICAL

SETA SA

GEOGRAPHIC INFORMATION SYSTEMS

ANGEL Services
Drillinginfo Inc
eyevis
Nickpoint Environmental Services Inc
Western Land Services Inc

GEOLOGICAL

Fugro-Jason
Geovariances
Harwood Capital Inc
Ifremer
Paradigm Geophysical Corp
TGS Geological Products and Services

GEOPHYSICAL

Fugro-Geoteam AS
Fugro-Jason
JW Fishers Manufacturing Inc
Paradigm Geophysical Corp

Saint-Gobain Crystals
Southernstar Consultants
TGS Geological Products and Services

NAVIGATION

Beier Radio
Sea-Image Corporation Ltd
Sonardyne International Ltd

RESERVOIR EVALUATION

DMT GmbH & Co KG
Geoservices SA
Oil Plus Ltd
Paradigm Geophysical Corp

SEISMIC

Fecon Inc
Fugro-Geoteam AS
Geovariances
Paradigm Geophysical Corp
TGS Geological Products and Services

FILTRATION

AIR FILTERS

ASCO Valve Canada
Baldwin Filters
ClearDrain
■ **Donaldson Company Inc**
(See ad p 11)
W L Gore & Associates Inc
MAC Equipment
Menardi
Quincy Compressor
Tiancheng aviation purification equipments co ltd
United Filtration Systems Inc
Xenometrix Inc

CARTRIDGES

Baldwin Filters
Behringer Corp
■ **Donaldson Company Inc**
(See ad p 11)
Hilliard Corp
Liquid Process Systems Inc
MAC Equipment
Menardi
One Eye Industries Inc (OEI)
Pall Corp
Total Separation Solutions LLC

COALESCERS

Behringer Corp
Hilliard Corp
Hudson Industries
Pall Corp
Quincy Compressor
Tiancheng aviation purification equipments co ltd
United Filtration Systems Inc
Universal Silencer

ELEMENTS

Amiad Filtration Systems
Baldwin Filters
Behringer Corp
Cummins Filtration
■ **Donaldson Company Inc**
(See ad p 11)
Hilliard Corp
Liquid Process Systems Inc
Menardi
One Eye Industries Inc (OEI)
Parker Hannifin Corp
Quincy Compressor
United Filtration Systems Inc
Universal Silencer

FILTERS, GENERAL

Cummins Filtration
Lakos Separators and Filtration Systems
Lautrette Filtration Pipeline Equipment
Mst Inc
Tiancheng aviation purification equipments co ltd
Total Separation Solutions LLC

HOUSINGS

Cummins Filtration
■ **Donaldson Company Inc**
(See ad p 11)
Easi-Set Industries/Precast Buildings
Hilliard Corp
Liquid Process Systems Inc
Nowata Filtration
One Eye Industries Inc (OEI)
Pall Corp
Parker Hannifin Corp
United Filtration Systems Inc
Universal Silencer

MEDIA

W L Gore & Associates Inc
Hilliard Corp
Lakos Separators and Filtration Systems
Liquid Process Systems Inc
MAC Equipment
McNichols Co Steel Service Centers

Menardi
Nowata Filtration

STRAINERS

Amiad Filtration Systems
Bollfilter UK Ltd
Hayward Gordon Ltd
Hellan Strainer Co
McNichols Co Steel Service Centers
Nowata Filtration
One Eye Industries Inc (OEI)
Parker Hannifin Corp
Tiancheng aviation purification equipments co ltd

FLOW

CUSTODY TRANSFER

AMKO Systems Inc
Cameron
■ **Control Microsystems**
(See ad p 9)
Gas Turbine Efficiency LLC
Krohne Inc
OMNI Flow Computers Inc
Sensus
Sick Maihak Inc
Siemens Energy & Automation

COMPUTERS

CCS-inc Comprehensive Computer Solutions
■ **Control Microsystems**
(See ad p 9)

Brace Yourself for the Game Changer:

Donaldson D-Salt™ Filter



- Pulse cleanable
- H10 / MERV 16
- H11 & H12 also available
- Superior salt & dust removal
- Hydrophobic ePTFE membrane
- Helps reduce fouling & hot corrosion on turbine blades

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filterinfo@mail.donaldson.com

ARE ALL

H₂S**REMOVAL**

It takes expertise and experience to pick out the right H₂S removal strategy for your application.

With a full line of hydrogen sulfide oxidation products, Gas Technology Products Division provides media, equipment, engineering, installation, and service to create a flexible process that operates easily, safely, and economically. We offer complete turnkey systems and can take total system responsibility.

Use of By-Product Sulfur in Agriculture

Much of the sulfur pulled from many exhaust gas streams can be used in agriculture. Sulfur products derived from the LO-CAT[®] iron redox sulfur removal process produces sulfur-based agricultural products with superior results.

For virtually any application, flow rate, system capacity, or hydrogen sulfide level, Gas Technology Products Division has a proven liquid or solid media desulfurization technology to sweeten your gas stream and ventilation air.



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visit www.gtp-merichem.com

PROCESSES REALLY ALIKE?



**Gas
Technology
Products
Division**

Gas detection

Emerson Process Management
Hoffer Flow Controls Inc
Mobrey Measurement
■ **Omega Engineering Inc**
(See ad p 2, 3)

OMNI Flow Computers Inc
Remote Automation Solutions

CONDITIONERS

Cheng Fluid Systems
COX Instruments
FCI Fluid Components International LLC
Fluid Components International (FCI)
Lee-Dickens Ltd
■ **Omega Engineering Inc**
(See ad p 2, 3)

DETECTORS

AMETEK
Kidd Pipeline & Specialties Inc
■ **Omega Engineering Inc**
(See ad p 2, 3)

Sierra Instruments Inc

FLOW RATE INDICATORS

AW-Lake Co
FCI Fluid Components International LLC
Muis Controls Ltd
Newport Electronics Inc
■ **Omega Engineering Inc**
(See ad p 2, 3)
Racine Flow Meter Group
Siemens Energy & Automation
Sierra Instruments Inc
Sure Flow Products LLC

INHIBITORS

Select Industries

METERS(0045)GAS

Air Liquide America Specialty Gases LLC
COX Instruments
Endress+Hauser
FCI Fluid Components International LLC
Fluid Components International (FCI)
Fox Thermal Instruments Inc
Gas Turbine Efficiency LLC
Hoffer Flow Controls Inc
Krohne Inc
McCrometer Inc
Muis Controls Ltd
■ **Omega Engineering Inc**
(See ad p 2, 3)
OMNI Flow Computers Inc
Racine Flow Meter Group
Sensus
Siemens Energy & Automation
Sierra Instruments Inc
Sure Flow Products LLC
Thermal Instrument Co
Veris Inc

METERS(0045)LIQUID

Automation Products Inc
AW-Lake Co
COX Instruments
Endress+Hauser
FCI Fluid Components International LLC
Fluid Components International (FCI)
GF Piping Systems
Hoffer Flow Controls Inc
Krohne Inc
Max Machinery Inc

McCrometer Inc
Muis Controls Ltd
Newport Electronics Inc
■ **Omega Engineering Inc**
(See ad p 2, 3)

OMNI Flow Computers Inc
Racine Flow Meter Group
Siemens Energy & Automation
Sierra Instruments Inc
Sure Flow Products LLC
Thermal Instrument Co
Veris Inc

MONITORS

AMKO Systems Inc
AW-Lake Co
DH Instruments
eyevis
Hoffer Flow Controls Inc
Newport Electronics Inc
■ **Omega Engineering Inc**
(See ad p 2, 3)
Pressure Systems Inc
Sick Maihak Inc
Sure Flow Products LLC
TURCK GmbH & Co Kg

MULTIPHASE FLOWMETERING

Industrial Tomography Systems
Presens AS

ORIFICE FITTINGS

ADACONN

SWITCHES

FCI Fluid Components International LLC
Fluid Components International (FCI)
Fox Thermal Instruments Inc
Gems Sensors & Controls
Kayden Instruments
Muis Controls Ltd
■ **Omega Engineering Inc**
(See ad p 2, 3)
Racine Flow Meter Group
Sierra Instruments Inc
SOR Inc
Thermal Instrument Co

TOTALIZERS

Acromag Inc
AW-Lake Co
Cameron's Measurement Systems Division
Fox Thermal Instruments Inc
Muis Controls Ltd
Newport Electronics Inc
■ **Omega Engineering Inc**
(See ad p 2, 3)

TRANSMITTERS

AW-Lake Co
Newport Electronics Inc
Veris Inc

ULTRASONIC

Cameron
Krohne Inc
OMNI Flow Computers Inc
Sensus
Siemens Energy & Automation
Sierra Instruments Inc

GAS DETECTION**CO₂ DETECTION**

Carthago International Solutions Inc
Enerac Inc

ENMET Corp
Industrial Scientific Corp
■ **Mil-Ram Technology Inc**
(See ad p 15)

RKI Instruments Inc
testo AG

CARBON MONOXIDE DETECTION

Draeger Safety Inc
ENMET Corp
GfG Instrumentation Inc
Global Detection Systems Corp
Industrial Scientific Corp
Kernco Instruments Co Inc
■ **Mil-Ram Technology Inc**
(See ad p 15)

MSA
Mst Inc
■ **Omega Engineering Inc**
(See ad p 2, 3)

RKI Instruments Inc

COMBUSTIBLE GASES DETECTION

Air Liquide America Specialty Gases LLC
AMETEK Process Instruments
Bourgeois & Associates Inc
Bw Technologies
Carthago International Solutions Inc
Compur Monitors GmbH & Co KG
Control Instruments Corp
Det-Tronics Ltd
Draeger Safety Inc
ENMET Corp
Fire Combat
Gassonic
General Monitors
GfG Instrumentation Inc
Global Detection Systems Corp
Groveley Detection
Industrial Scientific Corp
Kernco Instruments Co Inc
Lab Safety Supply
■ **Mil-Ram Technology Inc**
(See ad p 15)

MSA
Net Safety Monitoring Inc
RIDGID
RKI Instruments Inc
Senscient
Sierra Monitor Corp

FIXED GAS DETECTION

Bw Technologies
Carthago International Solutions Inc
Compur Monitors GmbH & Co KG
Control Instruments Corp
Det-Tronics Ltd
Draeger Safety Inc
EMGS Americas
Gassonic
General Monitors
GfG Instrumentation Inc
Global Detection Systems Corp
Industrial Scientific Corp
■ **Mil-Ram Technology Inc**
(See ad p 15)
MSA

RAE Systems
RKI Instruments Inc
Senscient
Sierra Monitor Corp

FLAME DETECTION

Det-Tronics Ltd
General Monitors
Industrial Scientific Corp
Micropack Detection (Americas) Inc
■ **Mil-Ram Technology Inc**
(See ad p 15)



Net Safety Monitoring Inc

Sierra Monitor Corp

GAS DETECTION ACCESSORIES

Industrial Scientific Corp
■ **Mil-Ram Technology Inc**
(See ad p 15)

HYDROGEN SULFIDE

Applied Analytics Inc
Arizona Instrument LLC
Bw Technologies
Carthago International Solutions Inc
Control Instruments Corp
Det-Tronics Ltd
ENMET Corp
General Monitors
Global Detection Systems Corp
Groveley Detection
Industrial Scientific Corp
Kernco Instruments Co Inc
■ **Mil-Ram Technology Inc**
(See ad p 15)

Net Safety Monitoring Inc
Nextteq LLC
Pureaire Monitoring Systems Inc
Senscient

MULTIPLE GAS DETECTION

Bw Technologies
Control Instruments Corp
GfG Instrumentation Inc
GrayWolf Sensing Solutions
Industrial Scientific Corp
Lab Safety Supply
MSA

Pyroban Corp
RAE Systems
RKI Instruments Inc
Senscient
UE Systems Inc

NATURAL GAS DETECTION

ANGEL Services
Can-Con Industries Inc
Carthago International Solutions Inc
Flir Systems Inc
Fugro-Geoteam AS
Groveley Detection
Industrial Scientific Corp
■ **Mil-Ram Technology Inc**
(See ad p 15)

OXYGEN DETECTION

AMETEK Process Instruments
ENMET Corp
General Monitors
Global Detection Systems Corp
Industrial Scientific Corp
■ **Mil-Ram Technology Inc**
(See ad p 15)



Net Safety Monitoring Inc

Pureaire Monitoring Systems Inc

MSA

■ **Omega Engineering Inc**
(See ad p 2, 3)

Pureaire Monitoring Systems Inc
Servomex Inc
Sierra Monitor Corp
Systech Instruments Ltd

PIPELINE

ANGEL Services
Groveley Detection
Industrial Scientific Corp
■ **Mil-Ram Technology Inc**
(See ad p 15)
Nextteq LLC

SINGLE GAS DETECTION

Bw Technologies
GfG Instrumentation Inc
Groveley Detection
Industrial Scientific Corp
■ **Mil-Ram Technology Inc**
(See ad p 15)

Nextteq LLC
RAE Systems
Wilks Enterprise Inc

TOXIC

Fire Combat
Industrial Scientific Corp
■ **Mil-Ram Technology Inc**
(See ad p 15)



Net Safety Monitoring Inc

OI Analytical
Senscient
Sierra Monitor Corp
Wilks Enterprise Inc

GAS PROCESSING

ADSORBERS

Alloy Engineering Co
G&G International NV
Maloney Industries
■ **Merichem Chemicals & Refinery Services LLC**
(See ad p 12, 13)

Sphinx Adsorbents Inc
Van Air Inc

AGITATORS

Mixing & Mass Transfer Technologies

BATCH CONTROL

■ **Omega Engineering Inc**
(See ad p 2, 3)

CATALYSTS

Arabian Construction Engineering Co (ACEC)
Christy Catalytics LLC
■ **Merichem Chemicals & Refinery Services LLC**
(See ad p 12, 13)

COALESCERS

Bollfilter UK Ltd
Lautrette Filtration Pipeline Equipment
Nowata Filtration

COLUMNS

G&G International NV
Titanium Fabrication Corp

DEHYDRATORS

Christy Catalytics LLC
Maloney Industries
■ **ProSep Technologies Inc**
(See ad Front Cover)

Sphinx Adsorbents Inc
Twister B V
Universal Industries
Van Air Inc

DESALTERS

■ **ProSep Technologies Inc**
(See ad Front Cover)

FRACTIONATORS

G&G International NV

GAS FLARES

Callidus Technologies LLC

GAS SWEETENING MEMBRANES

■ **ProSep Technologies Inc**
(See ad Front Cover)

MIST ELIMINATORS

Fabricated Plastics Ltd
■ **ProSep Technologies Inc**
(See ad Front Cover)

Van Air Inc

MIXERS

Cameron's Measurement Systems Division
Mixing & Mass Transfer Technologies
■ **ProSep Technologies Inc**
(See ad Front Cover)

PACKING

Christy Catalytics LLC
Fabricated Plastics Ltd

PRESSURE VESSELS

Alloy Engineering Co
Baldwin Filters
BORSIG Process Heat Exchangers GmbH
H BUTTING GmbH & Co KG
Corlac Industries
Degerfors Formings AB DEFORM
Dyнетek Industries Ltd
Fairchild Industrial Products Co
Gesellschaft für OELTECHNIK mbH
G&G International NV
■ **Omega Engineering Inc**
(See ad p 2, 3)

■ **ProSep Technologies Inc**
(See ad Front Cover)

Smith Tank & Equipment Co
Titanium Fabrication Corp
Universal Industries
Van Air Inc

PROCESS VESSELS

BORSIG Process Heat Exchangers GmbH
H BUTTING GmbH & Co KG
Fabricated Plastics Ltd
Hudson Industries
Smith Tank & Equipment Co
Titanium Fabrication Corp

STORAGE

Degerfors Formings AB DEFORM
Dyнетek Industries Ltd
Easi-Set Industries/Precast Buildings
G&G International NV
Precision Quincy Corp

SAMPLERS

Cameron's Measurement Systems Division

TRAYS

Alloy Engineering Co

GENERATORS

DRIVES

Allen Gears
Arrow Engine Co
Howden Buffalo Inc
SSS Clutch Company Inc
Wabash Power Equipment Co

GENERATOR ACCESSORIES

Baldor Electric Co
Ronk Electrical Industries Inc
Schweitzer Engineering Lab

GENERATOR SETS (ELECTRIC)

Calnetix Power Solutions
Wärtsilä Finland Oy
WEG Electric Corp

GENERATORS, GENERAL

Calnetix
Direct Drive Systems
FactoryNetwork Inc
Hertz Equipment Rental Corp
Magnum Products LLC
WEG Electric Corp

NITROGEN GENERATORS

Parker dominick hunter

HEATING/COOLING

AIR CONDITIONING

Air Chiller Inc
Marc Climatic Controls Inc
SCANCAB A/S

BOILERS

CHEMetrics Inc
FactoryNetwork Inc

BURNERS

Aecometric Corp
Atlas Incinerators A/S
Callidus Technologies LLC

CHILLERS

Parker dominick hunter

COOLERS

Air Chiller Inc
BORSIG Process Heat Exchangers GmbH
JULABO Labortechnik GmbH

DRYERS

Nord-Bulk Pte Ltd
Quincy Compressor

HEAT EXCHANGERS

Allied Fluid Conditioners Inc
Alloy Engineering Co
American Alloy Steel
BORSIG Process Heat Exchangers GmbH
CTI Industries Inc
Durex Industries

MIL-RAM
Patented Technology
no false alarms
Gas Detection Systems
ISO 9001:2000 Certified

Acrylonitrile (ACN)	C ₃ H ₃ N
Ammonia	NH ₃
Arsenic Pentafluoride	AsF ₅
Arsine	AsH ₃
Boron Trichloride	BCl ₃
Boron Trifluoride	BF ₃
Bromine	Br ₂
Carbon Dioxide	CO ₂
Carbon Monoxide	CO
Chlorine	Cl ₂
Chlorine Dioxide	ClO ₂
Chlorobenzene	C ₆ H ₅ Cl
Combustible Gas	L.E.L.
Diborane	B ₂ H ₆
Dichloroethane	C ₂ H ₄ Cl ₂
Dichlorosilane	SiH ₂ Cl ₂
Diffluoromethane	CH ₂ F ₂
Fluorine	F ₂
Freon Gases, R-123, 134a, 11, 12, others	ALL
Germane	GeH ₄
Hydrazine	N ₂ H ₄
Hydrogen	H ₂
Hydrogen Bromide	HBr
Hydrogen Chloride	HCl
Hydrogen Cyanide	HCN
Hydrogen Fluoride	HF
Hydrogen Iodide	HI
Hydrogen Peroxide	H ₂ O ₂
Hydrogen Sulfide	H ₂ S
Iodine	I ₂
Methane	L.E.L.
Methyl Bromide	CH ₃ Br
Methyl Chloride	CH ₃ Cl
Methyl Iodide	CH ₃ I
Methylene Chloride	CH ₂ Cl ₂
Nitric Acid Vapors	HNO ₃
Nitric Oxide	NO
Nitrogen Dioxide	NO ₂
Nitrogen Trifluoride	NF ₃
Oxygen	O ₂
Ozone	O ₃
Phosgene	COCl ₂
Phosphine	PH ₃
Phosphorous Oxychloride	POCl ₃
Propane	L.E.L.
Silane	SiH ₄
Sulfur Dioxide	SO ₂
Sulfuric Acid Vapors	H ₂ SO ₄
Tetrachloroethylene	C ₂ Cl ₄
Trichloroethylene	C ₂ HCl ₃

And More (Call Factory)

no false alarms
Gas & Fire Detection Systems **NEW**

TA-2048MB
Digital Modbus RTU Rack Mount Controller
(also Wall - Mount) 48-channel system with 3 separate 16 channel Modbus Networks

TA-2100
RS 485/4-20mA 3 or 4-Wire
Self Calibration *smarter* Transmitter

GO GREEN WITH MIL-RAM
* *no false alarms*
* No zero drift
* No LEL, methane, hydrocarbons, CO, CO₂ gas interference
* Chemically specific
* No sensor warm-up time = no wasted energy
* No additional electrolyte required for 3-5 year life of each sensor charge - sensor is rechargeable
* Do not go to sleep - no energy wasted in start-up
* Do not saturate when exposed to occasional high gas concentrations
* Not sensitive to changes in temperature, humidity or pressure
* Response time is less than 30 seconds to 90% of full reading - less energy because less time required to see results
* Recovery to 90% in less than 30 seconds
* Do not react with air
* 2 minute gas calibration - quick results = less energy
* Zero and span are not interactive
* Electrochemical, Photoionization, Infrared, Catalytic
* Hundreds of different gases and vapors

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TOLL FREE: 888-4MILRAM • TEL: 510-656-2001 • FAX: 510-656-2004

Instruments

GEA Westfalia Separator Systems
Gesellschaft für OELTECHNIK mbH
Heatrex Inc
John Crane
Lakos Separators and Filtration
Systems
Linde AG
Lummus Technology
Sentry Equipment Corp
TLV Corp
Tranter PHE Inc

HEAT RECOVERY

American Alloy Steel
BORSIG Process Heat Exchangers
GmbH
Calnetix Power Solutions
The CMM Group LLC
Express Integrated Technologies
LLC
Tranter PHE Inc

HEAT TRACING

BARTEC GmbH

HEAT TRANSFER

Allied Fluid Conditioners Inc
Alloy Engineering Co
Lakos Separators and Filtration
Systems
Tranter PHE Inc

HEATERS, GENERAL

Indeeco

INSULATION

LOGSTOR
Potters Industries Inc
Smith Tank & Equipment Co
Thermafiber Inc

REFRIGERATION

FasTest Inc
Johnson Controls Inc
JULABO Labortechnik GmbH

THERMAL FLUID SYSTEMS

Durex Industries
JULABO Labortechnik GmbH
Solutia

INSTRUMENTS**ACCELEROMETERS**

CEC Vibration Products Inc
ECT Offshore Service AB
Hardy Instruments
IMI Sensors
Metrix Instrument Co
■ **Omega Engineering Inc**
(See ad p 2, 3)
OYO Geospace Corp
PCB Piezotronics Inc
Sea-Image Corporation Ltd

ANALYZERS

ABB Inc
AEMC Instruments
AMETEK
AMETEK Process Instruments
AMKO Systems Inc
Analytik Jena AG
Applied Analytics Inc
Arizona Instrument LLC
Brimrose Corp of America
COSA Instrument
Draeger Safety Inc
Echometer Co
E Instruments Group
Emerson Process Management
Enerac Inc

FOSS NIRSystems Inc
GOW-MAC Instrument Co
Grabner Instruments Messtechnik
GmbH
Industrial Scientific Corp
OI Analytical
■ **Omega Engineering Inc**
(See ad p 2, 3)
Petrolab Company
Phaze Technologies AS
Servomex Inc
Shimadzu Scientific Instruments
Sick Maihak Inc
Signalcrafters Tech Inc
SPECTRO Analytical Instruments Inc
Stanhope-Seta
Systech Instruments Ltd
testo AG
Thermo Scientific Niton Analyzers
Xenometrix Inc

AUTOMATION

e3a3 Ltd
E-T-A Circuit Breakers
Lexycom Technologies Inc
Newport Electronics Inc
Phoenix Contact
Schischek GmbH Explosionproof
Vacon Oyj

CABLE, TRAYS

Houston Wire & Cable Co
LEONI Kerpen GmbH
Quabbin Wire & Cable Co Inc

CALIBRATORS

AMETEK
DH Instruments
E Instruments Group
■ **Omega Engineering Inc**
(See ad p 2, 3)
Palmer Wahl Instrumentation Group
ProComSol Ltd
Tel-Tru Manufacturing Co

CHROMATOGRAPHS

ABB Inc
AMETEK
Analytical Instruments Corp
COSA Instrument
GOW-MAC Instrument Co
Hamilton Sundstrand
OI Analytical
Shimadzu Scientific Instruments

COMMUNICATIONS

Adalet Wireless
Data Comm For Business Inc
■ **EIM Controls Inc**
(See ad p 7)
FHF Funke Huster Fernsig GmbH
Fieldserver Technologies
Lexycom Technologies Inc
Moore Industries International Inc
MTS Systems Corp
Newport Electronics Inc
ProComSol Ltd
Signalcrafters Tech Inc
Storacall Teleacoustics Ltd

COMPUTERS

CCS-inc Comprehensive Computer
Solutions
Computer Dynamics
■ **Omega Engineering Inc**
(See ad p 2, 3)
Quick Oilfield Solutions
Schweitzer Engineering Lab
Staco Systems

CONTROLS

Acromag Inc
AD Products
Altronic Inc
Amot Controls
ControlAir Inc
Deutsch
Divelbiss Corp
Dwyer Instruments Inc
Emerson Process Management
E-T-A Circuit Breakers
Fieldserver Technologies
G3 Technologies
GE Fanuc Intelligent Platforms
Governor Control Systems Inc
Magnetrol International Inc
New Avionics Corp
Newport Electronics Inc
Norriseal
NOV M/D Totco
■ **Omega Engineering Inc**
(See ad p 2, 3)
Phoenix Contact
Quincy Compressor
Rigserv International LLC
Rotronic Instrument Corp
Solon Manufacturing Co
SymCom Inc
WAGO Corp

DATA ACQUISITION

Acromag Inc
ACR Systems Inc
AMKO Systems Inc
■ **Control Microsystems**
(See ad p 9)
CYBERNETIX SA
Data Comm For Business Inc
Dickson Co
DMT GmbH & Co KG
e3a3 Ltd
Echometer Co
Emerson Process Management
FARO Technologies Inc
Fieldserver Technologies
FOSS NIRSystems Inc
G3 Technologies
GE Energy
Geoservices SA
GM International Safety Inc
GrayWolf Sensing Solutions
Ifremer
Impact Guidance Systems Inc
Industrial Tomography Systems
Lascar Electronics
Lee Specialties Ltd
Lexycom Technologies Inc
■ **Mil-Ram Technology Inc**
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(See ad p 17)

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(See ad p 2, 3)

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(See ad p 2, 3)
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■ **BellowsTech LLC**
(See ad p 22)

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KG
CoorsTek Inc
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Flex-a-Seal Inc
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(See ad p 21)
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■ **Mesa Rubber Co**
(See ad p 21)
Oreco A/S
Peaceland Fabricating
Smith Tank & Equipment Co
Southernstar Consultants
Universal Industries
Wilco Industries Ltd

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BOLTED TANKS

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Environetics Inc

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Farwest Corrosion Control Co
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Norton Corrosion Ltd
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(See ad p 2, 3)

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■ **BellowsTech LLC**
(See ad p 22)
Cooper Crouse-Hinds
Hydratight Ltd
■ **Omega Engineering Inc**
(See ad p 2, 3)

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Snap-tite Inc

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DRAINS

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(See ad p 22)
Servometer

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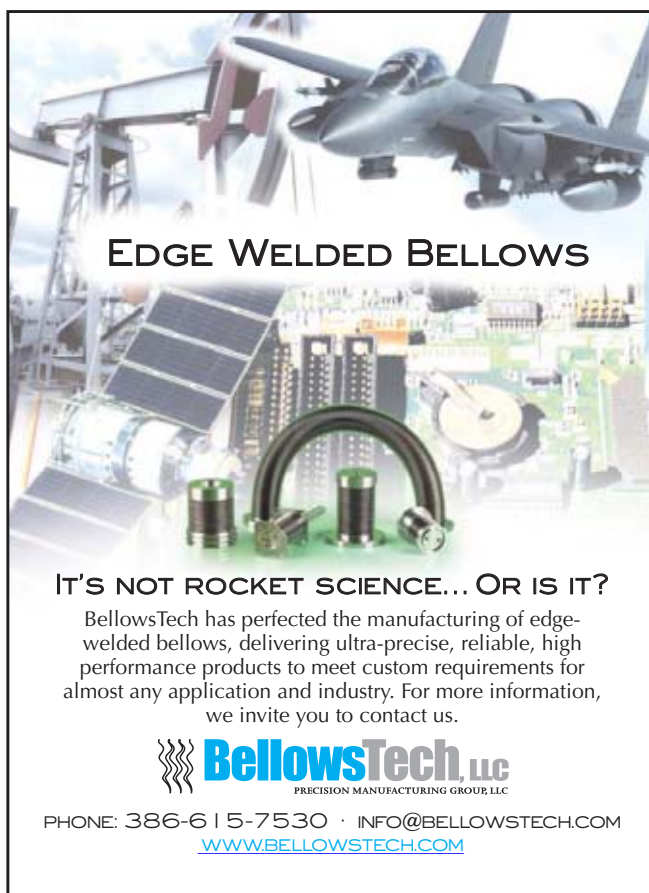
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■ **Cashco Inc**
(See ad p 29)
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(See ad p 2, 3)

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(See ad Front Cover)

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(See ad p 2, 3)

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ROPLAST

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PIGS

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■ **Mesa Rubber Co**

(See ad p 21)

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(See ad p 2, 3)

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(See ad p 2, 3)

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(See ad p 22)

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Ltd

Magnum Products LLC

■ **Omega Engineering Inc**

(See ad p 2, 3)

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Graco Inc

Hertz Equipment Rental Corp

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KNF Neuberger Inc

Milton Roy

■ **Omega Engineering Inc**

(See ad p 2, 3)

Wanner Engineering Inc

DOSING

EMEC Americas Inc

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DOWNHOLE■ **Omega Engineering Inc**

(See ad p 2, 3)

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seepex Inc

TYDUS Maintenance Supply Inc

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Gardner Denver

Gardner Denver Machinery Inc

Godwin Pumps

DUPLEX

Milton Roy

Viking Pump Inc

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Hammelmann Corp
Hydraulics International Inc
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Milton Roy
■ **Omega Engineering Inc**
(See ad p 2, 3)

Sulzer Pumps Ltd
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Fluid Metering Inc
Graco Inc
Hayward Gordon Ltd
Hydra-Cell Industrial Pumps
KNF Neuberger Inc
Linc Milton Roy
Milton Roy
■ **Omega Engineering Inc**
(See ad p 2, 3)

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Walchem Corp
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Leistritz Corp

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(See ad p 2, 3)
Thompson Pump & Manufacturing

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Ballast Technologies Inc
ITT Goulds Pumps

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Control Co
Hayward Gordon Ltd
Hydra-Cell Industrial Pumps
Wanner Engineering Inc

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Granco Manufacturing Inc
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Hydra-Cell Industrial Pumps
John Crane
Leistritz Corp
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(See ad p 2, 3)
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SPX Process Equipment
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Granco Manufacturing Inc
Graphite Metallizing Corp
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Iwaki America Inc
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Viking Pump Inc

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(See ad p 2, 3)
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Sprague Division
Fluid Metering Inc
Gardner Denver
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Williams Milton Roy

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Goulds Pumps
Graphite Metallizing Corp
ITT Goulds Pumps
Sulzer Pumps Ltd

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Colfax Corp
Granco Manufacturing Inc
Leistritz Corp
■ **Omega Engineering Inc**
(See ad p 2, 3)
Thompson Pump & Manufacturing
Viking Pump Inc

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ALLWEILER AG
Colfax Corp
Leistritz Corp
■ **Omega Engineering Inc**
(See ad p 2, 3)

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Presens AS
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Thompson Pump & Manufacturing

TRIPLEX

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CATALYSTS

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(See ad p 12, 13)

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(See ad p 21)

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E Instruments Group
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GOW-MAC Instrument Co
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MASS TRANSFER

Mixing & Mass Transfer Technologies

MIXING

Aeration Industries International Inc
Mixing & Mass Transfer Technologies

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■ **Mil-Ram Technology Inc**
(See ad p 2, 3)

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JH Technology Inc
Michell Instruments Ltd
■ **Mil-Ram Technology Inc**
(See ad p 15)
Newport Electronics Inc
■ **Omega Engineering Inc**
(See ad p 2, 3)
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(See ad p 15)
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Bourgeois & Associates Inc
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Bourgeois & Associates Inc
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(See ad p 15)

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(See ad p 21)

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(See ad p 25)

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INTERCOMMS

Rescom Sales Inc
Special Electronics & Designs Inc

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Chalmit Lighting
Cooper Crouse-Hinds
EverGlow NA Inc
FoxFury Personal Lighting Solutions
LDPI Inc
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Pelican Products Inc
Rig-A-Lite
R STAHL
Victor Lighting
Wolf Safety Lamp Co Ltd

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Cooper B-Line
EverGlow NA Inc
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G-raff Systems
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SAFEGUARD TECHNOLOGY INC
Scotgrip UK Ltd

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Capital Safety
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Hannay Reels Inc
Miller Fall Protection/Sperian
Mobilam
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DUPONT DE NEMOURS
International SA
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Viking Life Saving Equipment
Workrite Uniform Co

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BARTEC GmbH
Continental Disc Corp
FHF Funke Huster Fernsig GmbH
GM International Safety Inc
Industrial Scientific Corp
■ **Mil-Ram Technology Inc**
(See ad p 15)

Mobilam
Newson Gale Inc

SAFETY, INTRINSIC

FHF Funke Huster Fernsig GmbH
FoxFury Personal Lighting Solutions
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■ **Mil-Ram Technology Inc**
(See ad p 15)

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R STAHL
Staco Systems
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Work Area Protection Corp

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MSE
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Fire & Safety Equipment
Glasforms
K-Sun Corp
Lab Safety Supply
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Tech Products Inc
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Howard Leight

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Keller Products Inc
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Universal Industries

H₂S REMOVAL

GE Water & Process Technologies
Hiller GmbH
Maloney Industries
■ **Merichem Chemicals & Refinery Services LLC**
(See ad p 12, 13)

HEATER TREATERS

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Maloney Industries
■ **ProSep Technologies Inc**
(See ad Front Cover)

Universal Industries

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GEA Westfalia Separator Systems
Global Wire Cloth
Hiller GmbH
Keller Products Inc
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(See ad Front Cover)

Total Separation Solutions LLC

MEMBRANE SEPARATION

Perenne Equipamentos e Sistemas de Agua Ltda
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(See ad Front Cover)

Total Separation Solutions LLC

MULTIPHASE

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Hiller GmbH
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Corlac Industries
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GEA Westfalia Separator Systems
Genoil Inc
Hiller GmbH
Hudson Industries
Keller Products Inc
■ **Mesa Rubber Co**
(See ad p 21)
OMAX Corp
Pall Corp
Parker Hannifin Corp
■ **ProSep Technologies Inc**
(See ad Front Cover)
Quincy Compressor
RCI Technologies Inc
Siemens AG Energy Sector
Siemens Water Technologies
Stettler Oil & Gas
Superior Technical Ceramics Corp

SEPARATORS

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Dresser-Rand Co
Flottweg Separation Technology Inc
GEA Westfalia Separator Systems
Hiller GmbH
Keller Products Inc
Lakos Separators and Filtration Systems
Martin Engineering
RCI Technologies Inc
Stettler Oil & Gas
Superior Technical Ceramics Corp
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ChemSW Inc
Drillinginfo Inc
e3a3 Ltd
Eurocon InfoSystem AB
■ **MacDonald, Dettwiler & Assoc Ltd(MDA)**
(See ad p 27)

ODS-Petrodata

■ **Omega Engineering Inc**
(See ad p 2, 3)

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ROSEN Group

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Veritech Software LLC

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ODS-Petrodata
Paradigm Geophysical Corp
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Aclaro Softworks Inc
Aker Arctic Technology In
BOLO by WellPoint Systems Inc
Drillinginfo Inc
ENSYS Energy
■ **MacDonald, Dettwiler & Assoc Ltd(MDA)**
(See ad p 27)

Molli Computer Services Inc
Palantir Solutions
Palisade
RiskAdvisory
Veritech Software LLC

ENGINEERING

Aclaro Softworks Inc
ARLA Maschinentechnik GmbH
Belsim Production LLC
CanWeb Internet Services Ltd
Cooper Bussmann
Engineering Software
Eurocon InfoSystem AB
Exele Information Systems Inc
FARO Technologies Inc
GSE Systems Inc
John M Campbell and Co
OMAX Corp
■ **Omega Engineering Inc**
(See ad p 2, 3)
Paradigm Geophysical Corp

TCR Engineering Services
Technical Toolboxes Inc
Texas Engineering Systems
Veritech Software LLC

EXPLORATION

Aclaro Softworks Inc
Drillinginfo Inc
Geovariances
Hampson-Russell Software & Services
OpenSpirit
Paradigm Geophysical Corp

FORMATION EVALUATION

Fugro-Jason
Geovariances
Hampson-Russell Software & Services
Palisade
Paradigm Geophysical Corp

GIS

Geospatial Corp
NDT Systems & Services AG
OpenSpirit

OPERATIONS

Abacus Solutions Inc
Actenum Corp
Belsim Production LLC
CanWeb Internet Services Ltd
Exele Information Systems Inc
Global Training Solutions Inc
GSE Systems Inc

■ **MacDonald, Dettwiler & Assoc Ltd(MDA)**

(See ad p 27)

RiskAdvisory
SPT Group Norway AS
ThermoProbe Inc
Ventyx

PETROCHEMICAL

CanWeb Internet Services Ltd
Engineering Software
MPRI

PIPELINE

EMK3
ROSEN Group
SPT Group Norway AS
Technical Toolboxes Inc

PROCESSING

Belsim Production LLC
CanWeb Internet Services Ltd
Engineering Software
Geovariances

■ **Omega Engineering Inc**

(See ad p 2, 3)

Technical Toolboxes Inc
Veritech Software LLC

PRODUCTION

Actenum Corp
Belsim Production LLC
BOLO by WellPoint Systems Inc
Echometer Co
ENSYS Energy
ESS

GE Fanuc Intelligent Platforms
Lee Specialties Ltd
Quick Oilfield Solutions
SPT Group Norway AS
Technical Toolboxes Inc
Weatherford Production Optimization

REFINING

Belsim Production LLC
CanWeb Internet Services Ltd
ENSYS Energy
Global Training Solutions Inc

RESERVOIR ENGINEERING

Aclaro Softworks Inc
Palisade
Paradigm Geophysical Corp
SPT Group Norway AS

SEISMIC

Hampson-Russell Software & Services
OpenSpirit
Paradigm Geophysical Corp

SUBSEA ROBOTICS**AUBONOMOUS UNDERWATER VEHICLES (AUV)**

Atlas Maridan Aps
Lexycom Technologies Inc
Trelleborg CRP Inc

HOSE, CABLE

Parker / Page International Hose
Polyflex
Yale Cordage

INSPECTION ROBOTS

Atlas Maridan Aps

REMOTE CONTROLLER VEHICLES (RCV)

JW Fishers Manufacturing Inc
miniBOOSTER Hydraulics A/S
Saipem America Inc
Trelleborg CRP Inc

SUBSEA CAMERAS

Ashtead Technology

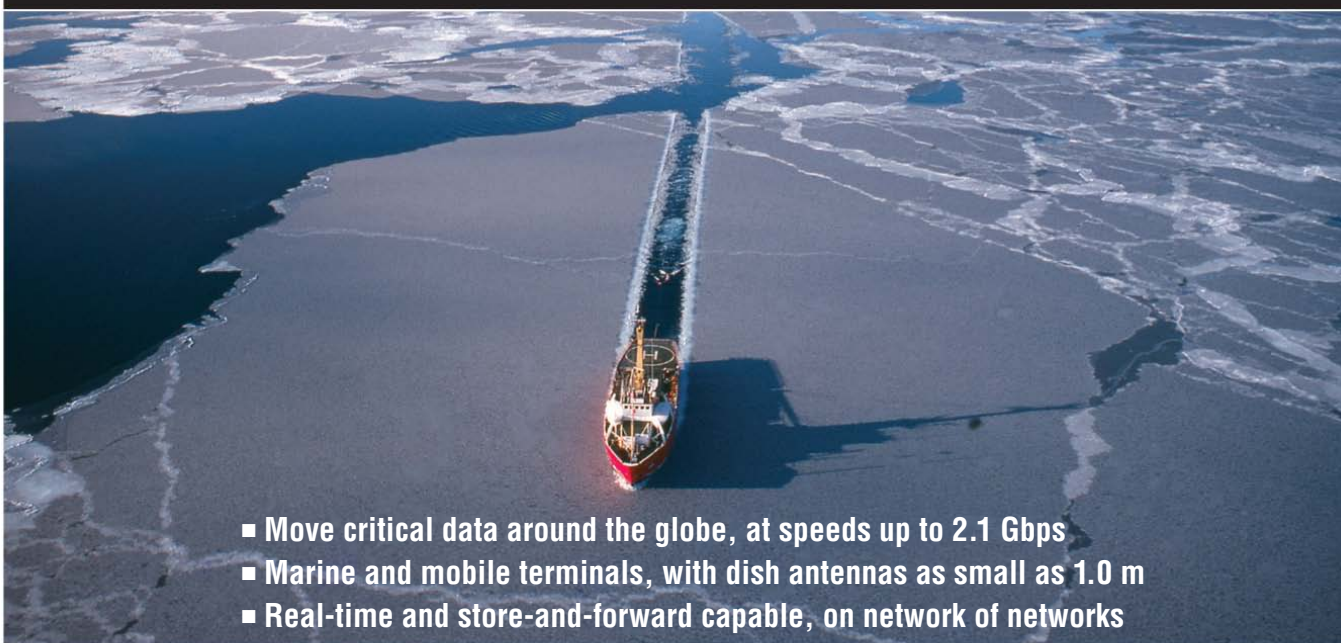
TOOLS: HAND, POWER**BEVELERS**

CS Unitec Inc
E H Wachs Co

BOLTING TOOLS

BOLTIGHT Ltd
Hydratight
Hydratight Ltd
Hytorc
INTEGRA Services Technologies Inc
Jetyd Corp
miniBOOSTER Hydraulics A/S
Norbar Torque Tools Ltd
Norbar USA Inc
SPX Hydraulic Technologies
Titan Technologies International Inc

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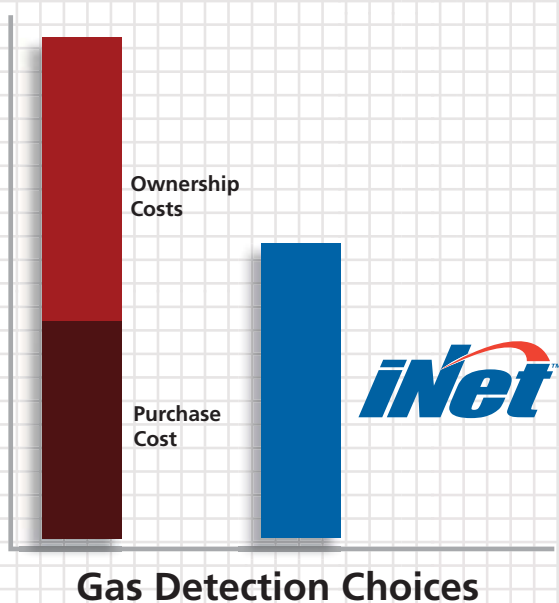


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TorcUP Industrial Bolting Tools
Torkworx

BOLTS

Metal Coatings Corp
Superbolt Inc
Zero Products Inc

CUTTERS

Enco
HGG Profiling Equipment BV
miniBOOSTER Hydraulics A/S
Reed Manufacturing Co
E H Wachs Co

DRILLS

CS Unitec Inc
E H Wachs Co

FASTENERS

BOLTIGHT Ltd
Caplugs
Jetyd Corp
Metal Coatings Corp
Superbolt Inc
Zero Products Inc

FLANGE ALIGNMENT

TorcUP Industrial Bolting Tools

FLANGE SPREADERS

Hydratight
INTEGRA Services Technologies Inc
Simson Power Tools AB
SPX Hydraulic Technologies
Titan Technologies International Inc

GENERAL HAND TOOLS

Armstrong Industrial Tools
b3o enviroTek
Hytorc
Lowell Corp
Norbar Torque Tools Ltd
Reed Manufacturing Co
RIDGID
Snap-on Industrial
TorcUP Industrial Bolting Tools
Wright Tool Co

GENERAL POWER TOOLS

CS Unitec Inc
Hytorc
Norbar Torque Tools Ltd
Snap-on Industrial
TorcUP Industrial Bolting Tools

HOISTS

Columbus McKinnon
JD Neuhaus GmbH & Co Kg
J D Neuhaus Lp

HYDRAULIC TOOLS, JACKS

BOLTIGHT Ltd
CS Unitec Inc
Global Supplier ApS
Hydratight
Lowell Corp
miniBOOSTER Hydraulics A/S
Simson Power Tools AB
SPX Hydraulic Technologies

LIFTING

Columbus McKinnon

JD Neuhaus GmbH & Co Kg
Simson Power Tools AB
SPX Hydraulic Technologies
Them Inc
Yale Cordage

NUT RUNNERS

Torkworx

SAWS

CS Unitec Inc

STUD RUNNERS

Power House Tool Inc

TENSIONERS

BOLTIGHT Ltd
Hydratight
Hydratight Ltd
INTEGRA Services Technologies Inc
Simson Power Tools AB
Superbolt Inc
Titan Technologies International Inc
Torkworx

TORQUE TOOLS

Armstrong Industrial Tools
BOLTIGHT Ltd
Hydratight
Hydratight Ltd
Hytorc
INTEGRA Services Technologies Inc
Jetyd Corp
Norbar Torque Tools Ltd
Snap-on Industrial
SPX Hydraulic Technologies

Titan Technologies International Inc
TorcUP Industrial Bolting Tools
Torkworx
Wright Tool Co

WINCHES

JD Neuhaus GmbH & Co Kg
J D Neuhaus Lp
Them Inc

WRENCHES

Armstrong Industrial Tools
Hytorc
INTEGRA Services Technologies Inc
Lowell Corp
Reed Manufacturing Co
RIDGID
Snap-on Industrial
TorcUP Industrial Bolting Tools
Torkworx
Wright Tool Co

VALVES**ACCESSORIES**

■ BellowsTech LLC
(See ad p 22)

ControlAir Inc
Emerson Process Management
Inserta Products Inc
Ronk Electrical Industries Inc

BALL

Asahi/America Inc
Autoclave Engineers
Behringer Corp



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At Cashco, Inc., we do not follow "office hours." We have trained employees available 24/7 to offer technical assistance and customer support. This includes next day service on critical parts; express stock capabilities, and parts delivery to regional stocking locations worldwide.

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Dan Ray, Regional Manager
28 Years Industry Experience





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Innovative Solutions

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Valves

BORSIG Boiler Systems GmbH
BORSIG Service GmbH
Brush Wellman Inc
Burcelik Valve
CoorsTek Inc
Dualco
Econosto UK Ltd
Emerson Process Management
Flowserve Corp
Fluid Power Inc
GF Piping Systems
Global Flow Technologies
Hammond Valve
Industrial Specialties Manufacturing
Innovative Pressure Technologies
Inserta Products Inc
KF Industries
Louisiana Valve Source Inc
Nibco Inc
■ **Omega Engineering Inc**
(See ad p 2, 3)
PBM Inc
Swagelok Co
T3 Energy Services
Tyco Flow Control
Velan Valve Corp
Worldwide Oilfield Machine Inc

BLOCK-AND-BLEED

Innovative Pressure Technologies

BUTTERFLY

Asahi/America Inc
Burcelik Valve
Econosto UK Ltd
Flowserve Corp
GF Piping Systems
Global Flow Technologies
Hammond Valve
KF Industries
Linde AG
Nibco Inc
Norriseal
■ **Omega Engineering Inc**
(See ad p 2, 3)

Tyco Flow Control
Velan Valve Corp

CHANGE-OVER

Nord-Bulk Pte Ltd

CHECK

Econosto UK Ltd
Eldred Environmental & Export
Flowserve Corp
Fluid Power Inc
GF Piping Systems
Global Flow Technologies
Hammond Valve
Hydraulics International Inc
Industrial Specialties Manufacturing
Innovative Pressure Technologies
Inserta Products Inc
KF Industries
The Lee Co
Lexair Inc
M&J Valve
Norriseal
PBM Inc
Schutte & Koerting
Snap-tite Inc

Stream-Flo USA
TLV Corp
Velan Valve Corp

CHOKES

GW Lisk Co
Superior Technical Ceramics Corp

COMPRESSOR

ClearDrain
Lexair Inc

CONTROL

Amot Controls
ARCA Regler GmbH
Emerson Process Management
KOSO America
Lexair Inc
Louisiana Valve Source Inc
M&J Valve
Motion Industries
Norriseal
■ **Omega Engineering Inc**
(See ad p 2, 3)
Parker Fluid Control Division
SPX Flow Control
T3 Energy Services
T 3 Energy Services
TLV Corp

CRYOGENIC

Gems Sensors & Controls
KOSO America
■ **Omega Engineering Inc**
(See ad p 2, 3)

DIAPHRAGM

■ **BellowsTech LLC**
(See ad p 22)
■ **Omega Engineering Inc**
(See ad p 2, 3)

DIVERTER

Everlasting Valve Co
MAC Equipment
PBM Inc

ELECTRIC

■ **EIM Controls Inc**
(See ad p 7)
GF Piping Systems
Precision Engine Controls Corp

EMERGENCY SHUTOFF

Amot Controls
■ **EIM Controls Inc**
(See ad p 7)
Gascat Industrial e Comercio Ltda
KF Industries
Morrison Bros Co
Parker Fluid Control Division

FLOW CONTROL

ARCA Regler GmbH
GW Lisk Co
The Lee Co
■ **Omega Engineering Inc**
(See ad p 2, 3)
Parker Fluid Control Division
Precision Engine Controls Corp
Richter Chemie-Technik GmbH
Schischek GmbH Explosionproof
Sensus

GAS PROCESS

Lexair Inc

GATE

Asahi/America Inc
DeltaValve
Econosto UK Ltd
Global Flow Technologies
Hammond Valve
Louisiana Valve Source Inc
M&J Valve
Nibco Inc
OFM An SPX Brand
SPX Flow Control
Traeger Brothers & Associates Inc
Velan Valve Corp
Worldwide Oilfield Machine Inc

GLOBE

ARCA Regler GmbH
Econosto UK Ltd
Emerson Process Management
Global Flow Technologies
Hammond Valve
TLV Corp
Velan Valve Corp

INSTRUMENT

■ **Omega Engineering Inc**
(See ad p 2, 3)
PBM Inc

KNIFE GATE

Tyco Flow Control

LOCK-OUT/TAG-OUT

Tech Products Inc

MANIFOLD

GW Lisk Co
Innovative Pressure Technologies
TLV Corp
Worldwide Oilfield Machine Inc

NATURAL GAS

ASCO Valve Canada
Burcelik Valve
Can-Con Industries Inc
Gascat Industrial e Comercio Ltda
GW Lisk Co

NEEDLE

Autoclave Engineers
Industrial Specialties Manufacturing
Innovative Pressure Technologies
KF Industries
SPIR Star Ltd

PETROCHEMICAL

Everlasting Valve Co
Richter Chemie-Technik GmbH
SWEDPARTS HAMBURG

PINCH

Lexair Inc

PIPELINE

Advance Products & Systems Inc
Burcelik Valve
Dualco
Sub-one Technology
T 3 Energy Services

PISTON

ASCO Valve Canada
Stream-Flo USA

PLUG

Caplugs
Dualco
Flowserve Corp

PRODUCTION

Burcelik Valve
Everlasting Valve Co
Louisiana Valve Source Inc

REFINING

DeltaValve
Everlasting Valve Co

RELIEF

Air Liquide America Specialty Gases LLC
■ **Cashco Inc**
(See ad p 29)

Enardo
Gascat Industrial e Comercio Ltda
Hydraulics International Inc
The Lee Co
Louisiana Valve Source Inc
Sensus
Varna Products TRC

SAFETY

■ **Cashco Inc**
(See ad p 29)

DeltaValve
Richter Chemie-Technik GmbH

SAMPLING

Everlasting Valve Co
PBM Inc
Sentry Equipment Corp

SOLENOID

ASCO Valve Canada
Gems Sensors & Controls
GW Lisk Co
The Lee Co
Parker Fluid Control Division

SUBSEA

Autoclave Engineers
The Lee Co
Snap-tite Inc

SWING-CHECK

M&J Valve
Morrison Bros Co
SPX Flow Control
Stream-Flo USA

TANK BLANKETING

■ **Cashco Inc**
(See ad p 29)

TEMPERATURE CONTROL

Newport Electronics Inc
Schischek GmbH Explosionproof

TESTERS, VALVES

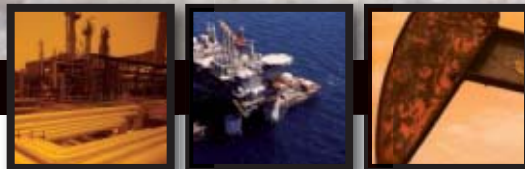
■ **Omega Engineering Inc**
(See ad p 2, 3)

VALVE CHAINWHEELS

Trumbull Industries

services

2009 Petroleum Buyers Guide



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

Aviation Technology Services Llc
UTC Overseas

ASSET MANAGEMENT, TRACKING

@hand Corp
Robert J Beck and Associates
BOLO by WellPoint Systems Inc
Cantest Solutions Inc
ChemSW Inc
Eagle Rock Energy Partners
Harwood Capital Inc
SkyWave Mobile Communications
Western Land Services Inc

BRAZING, HEATING TREATING

TCR Engineering Services

COMMISSIONING/ DECOMMISSIONING

ANT Applied New Technologies AG
■ **ProSep Technologies Inc**
(See ad Front Cover)

CONSTRUCTION

Aker Arctic Technology In
Butler Manufacturing Co
CB&I
CB&I Lummus
CCI Inspection Services Inc
■ **CH2M HILL**
(See ad Back Cover)
Containerhouse International Inc
Eagle Rock Energy Partners
Eiffel
Envirocore
Linde AG
MADCON Corp
MENCK GmbH
ODS-Petrodata
Omega Natchiq Inc

ROSEN Group
Saipem America Inc
Smart Drilling GmbH
SPT Offshore
Stallion Oilfield Service
United Pipeline Systems
Voith Industrial Services Engineering GmbH

CONSULTING

Crowley Marine Services Inc
CUDD Well Control
Enerscope Systems Inc
Epsis
Exploration Logistics Group plc
Fugro-Jason
Honeywell International Inc
John M Campbell and Co
Knighthawk Engineering
LAGO Energy
Lightning Eliminators & Consultants Inc

■ **MacDonald, Dettwiler & Assoc Ltd(MDA)**
(See ad p 27)

Mhd Offshore Group
Oil Plus Ltd
Palantir Solutions
Paradigm Geophysical Corp
Pathway to China
Phoenix International Inc
Quincy Compressor
ROSEN Group
Rwd Technologies Inc
System Improvements Inc
Terra Remote Sensing Inc
UTC Overseas
Western Land Services Inc
WFN Strategies

DRILLING/PRODUCTION

Baker Energy
Baker Hughes Inc

ECT Offshore Service AB
Enventure Global Technology
Envirocore
Frontier Drilling
Geoservices SA
Harwood Capital Inc
IFP
Mhd Offshore Group
Namtvedt SealMaker Services A/S
ODS-Petrodata
Petans Ltd
Q&B Services Ltda
Stallion Oilfield Service
Total Separation Solutions LLC

EDUCATION

ChemSW Inc
Energy Institute
Global Training Solutions Inc
John M Campbell and Co
System Improvements Inc

ENGINEERING

3X Engineering
Aker Arctic Technology In
Al Masaood
ARLA Maschinentechnik GmbH
Bal Seal Engineering Inc
BARTEC GmbH
■ **BellowsTech LLC**
(See ad p 22)
Boots & Coots International Well Control Inc
CB&I
CB&I Lummus
Cetek Ltd
■ **CH2M HILL**
(See ad Back Cover)
Cooper Bussmann
Crowley Marine Services Inc
CUDD Well Control
CYBERNETIX SA
Deepwater Corrosion Services Inc

Deutsch
Divelbiss Corp
ECT Offshore Service AB
Edg Inc
Electrochem
Enerscope Systems Inc
Engineering Software
Eurocon InfoSystem AB
Express Integrated Technologies LLC
FalCan Industries Ltd
GeoCompany Tecnologia
Engenharia & Meio Ambiente Ltda
Governor Control Systems Inc
GSE Systems Inc
IMPac Offshore Engineering GmbH
Knighthawk Engineering
Lightning Eliminators & Consultants Inc
Linde AG
Lummus Technology
MarTech Systems Inc
MATCOR Inc
Mohawk Innovative Technology Inc
Namtvedt SealMaker Services A/S
Oil Plus Ltd
■ **ProSep Technologies Inc**
(See ad Front Cover)
ROSEN Group
Saipem America Inc
Sandvik Process Systems
Siirtec Nigi SpA
Smart Drilling GmbH
S&N Pump Co
Solutia
SPT Offshore
TCR Engineering Services
T-Rex Subsea
TSEC - Tito Silveira Engenharia e Consultoria Ltda
TURBOCAM International
UOP

Environmental/pollution control

Voith Industrial Services Engineering GmbH
Western Land Services Inc
WFN Strategies
Wood Group

ENVIRONMENTAL/POLLUTION CONTROL

Atlas Incinerators A/S
CCS Midstream Services
Clean Harbors Environmental
The CMM Group LLC
DMT GmbH & Co KG
ESS
Hazmatpac Inc
MarTech Systems Inc
■ **Merichem Chemicals & Refinery Services LLC**
(See ad p 12, 13)
Nickpoint Environmental Services Inc
PVAC R C Ltda
Rotronic Instrument Corp
Sandvik Process Systems
Western Land Services Inc

FINANCIAL

Allegiance Capital
Robert J Beck and Associates
Harwood Capital Inc
LAGO Energy
PreConstruction Catalysts Inc
Quantum Energy Partners
SMH Capital
Tristone Capital
VERSABAR Inc

FLOW ASSURANCE

Oil Plus Ltd

FLOW MODELING

Gas Turbine Efficiency LLC

GAS PROCESSING

Baker Energy
■ **CH2M HILL**
(See ad Back Cover)
IFP
Lummus Technology
UOP

GEOLOGICAL

Divestco Inc
DMT GmbH & Co KG
Englehart Energy Inc
GeoCompany Tecnologia Engenharia & Meio Ambiente Ltda
Harwood Capital Inc
IFP
Paradigm Geophysical Corp
Terra Remote Sensing Inc
WFN Strategies

GEOPHYSICAL

Baker Hughes Inc
Divestco Inc
DMT GmbH & Co KG
Fugro-Geoteam AS

Hampson-Russell Software & Services
Ifremer
Paradigm Geophysical Corp
Scan Geophysical ASA
Terra Remote Sensing Inc

GEOTECHNICAL

GeoCompany Tecnologia Engenharia & Meio Ambiente Ltda
IFP
SPT Offshore

HEATING/COOLING

Sandvik Process Systems
Solutia
Tranter PHE Inc

INSPECTION

Allied Transmissions Ltd
Martin Engineering
Mistras Group Inc
MTU Maintenance
Berlin-Brandenburg GmbH
Nord Marine Services Ltd
Phoenix International Inc
Quest TruTec LP
ROSEN Group
Sulzer Enpro Inc
System Improvements Inc

LEGAL

Plexus
TSEC - Tito Silveira Engenharia e Consultoria Ltda

MAINTENANCE

3X Engineering
Allied Transmissions Ltd
b3o enviroTek
Baker Energy
BARTEC GmbH
BORSIG Boiler Systems GmbH
BORSIG Service GmbH
Butler Manufacturing Co
Cetek Ltd
Conbor Borrachas Tecnico Industriais Ltda
Containerhouse International Inc
CTI Industries Inc
Emco Wheaton GmbH
Express Integrated Technologies LLC
FAG Bearings
Fixturlaser AB
Geoservices SA
Global Supplier ApS
Goulds Pumps
Howden Buffalo Inc
MADCON Corp
MAN Turbo AG
MTU Maintenance
Berlin-Brandenburg GmbH
Oreco A/S
Phoenix International Inc
POLARIS Laboratories
Q&B Servicos Ltda
ROSEN Group

SimplexGrinnell
TSEC - Tito Silveira Engenharia e Consultoria Ltda
Tube Tech International Ltd
Varna Products TRC
Voith Industrial Services Engineering GmbH

MANUFACTURING

AC Dandy Products Ltd
Allied Transmissions Ltd

**All Metals & Forge**

Amiad Filtration Systems
■ **BellowsTech LLC**

(See ad p 22)

BORSIG Boiler Systems GmbH
BORSIG Service GmbH
Can-Con Industries Inc
Containerhouse International Inc
Corlac Industries
De-In Industries
Emco Wheaton GmbH
Enviro-Pak/Tech Oil Products
FalCan Industries Ltd
Foremost Industries LP
GD Engineering
Global Supplier ApS
Hole Opener Corp
Huntingdon Fusion Techniques
Kalapi Engineering Associates Pvt Ltd
Leading Edge Manufacturing
Mhd Offshore Group
Pathway to China
Peaceland Fabricating
Q&B Servicos Ltda
R STAHL
Scotgrip UK Ltd
Servometer
Stettler Oil & Gas
TURBOCAM International
Wilco Industries Ltd

NDT TESTING

Eagle Rock Energy Partners
Norbar USA Inc
Phoenix International Inc
Quest TruTec LP
TURBOCAM International

OFFSHORE

Aker Arctic Technology In
ANT Applied New Technologies AG
Ballast Technologies Inc
Crowley Marine Services Inc
Eiffel
Marking Services Inc
Nordvedt SealMaker Services A/S
Nordseetaucher GmbH
Omega Natchiq Inc
Petans Ltd
Phoenix International Inc
Q&B Servicos Ltda

ROSEN Group
R STAHL
Saipem America Inc
United Pipeline Systems
Wood Group

PETROCHEMICAL

BORSIG Boiler Systems GmbH
BORSIG Service GmbH
Cetek Ltd
■ **CH2M HILL**
(See ad Back Cover)
Emco Wheaton GmbH
Engineering Software
GD Engineering
Hertz Equipment Rental Corp
Hudson Industries
Knighthawk Engineering
Magnetrol International Inc
Marking Services Inc
R&G Laboratories Inc
TSEC - Tito Silveira Engenharia e Consultoria Ltda
UOP

PIPELINE CLEANING

ROSEN Group
Weatherford Pipeline and Specialty Services

PIPELINE/STORAGE

BORSIG Boiler Systems GmbH
BORSIG Service GmbH
Cantest Solutions Inc
■ **CH2M HILL**
(See ad Back Cover)
Corus Tubes
Degerfors Formings AB DEFORM
Dynetek Industries Ltd
GeoCompany Tecnologia Engenharia & Meio Ambiente Ltda
NDT Systems & Services AG
Q&B Servicos Ltda
ROSEN Group
United Pipeline Systems

PROCUREMENT

CB&I Lummus
Eiffel
IMPac Offshore Engineering GmbH
Pathway to China
PreConstruction Catalysts Inc
Voith Industrial Services Engineering GmbH
WFN Strategies

REFINING

BPC - Bio Petro Clean
CB&I
Cetek Ltd
DeltaValve
Genoil Inc
IFP
MarTech Systems Inc
Umicore Precious Metals Refining
UOP

RENTAL

AC Dandy Products Ltd

Boots & Coots International Well Control Inc
 Canadian Linen & Uniform Service
 Carbonair Environmental Systems Inc
 Enviro-Pak/Tech Oil Products
 Hole Opener Corp
 Impact Guidance Systems Inc
 Industrial Scientific Corp
 Mahaffey Fabric Structures
 MENCK GmbH
 SPT Offshore
 Titan Technologies International Inc
 VERSABAR Inc

RESEARCH

Drillinginfo Inc
 Energy Institute

SAFETY/HEALTH

Baker Energy
 Canadian Linen & Uniform Service
 Energy Institute
 Exploration Logistics Group plc
 Express Signs (North East) Ltd
 Hazmatpac Inc
 John M Campbell and Co
 Modutank Inc

MSE
 PVAC R C Ltda
 Raxton Ltd
 System Improvements Inc
 TSEC - Tito Silveira Engenharia e Consultoria Ltda
 Voith Industrial Services Engineering GmbH
Wlnss.com

SEISMIC

Divestco Inc
 Fugro-Geoteam AS
 GeoCompany Tecnologia Engenharia & Meio Ambiente Ltda
 OYO Geospace Corp
 Paradigm Geophysical Corp

TANK CLEANING

BPC - Bio Petro Clean
 CCS Midstream Services
 Knighthawk Engineering
 Weatherford Pipeline and Specialty Services

TELECOMMUNICATIONS/SATELLITE

Beier Radio
 Broadpoint

Data Comm For Business Inc
 ■ **MacDonald, Dettwiler & Assoc Ltd(MDA)**
 (See ad p 27)
 Mackay Communications
 Sea-Image Corporation Ltd
 SkyWave Mobile Communications
 Stallion Oilfield Service
 WFN Strategies

TRAINING

Baker Energy
 Boots & Coots International Well Control Inc
 BullEx Digital Safety
 Capital Safety
 Cooper Bussmann
 Energy Institute
 Exploration Logistics Group plc
 Global Training Solutions Inc
 GSE Systems Inc
 Hampson-Russell Software & Services
 John M Campbell and Co
 Miller Fall Protection/Sperian
 Miratech Corp
 MPRI
 NACE International

Paradigm Geophysical Corp
 Paradigm Strategy Group Inc
 Rwd Technologies Inc
 Southernstar Consultants
 System Improvements Inc

TRANSPORTATION

Biglift Shipping BV
 Crowley Marine Services Inc
 Livingston International Inc
 UTC Overseas

WELL

Boots & Coots International Well Control Inc
 The GasGun Inc
 Namtvedt SealMaker Services A/S
 Wood Group

WELL INTERVENTION

Boots & Coots International Well Control Inc
 Impact Guidance Systems Inc
 Namtvedt SealMaker Services A/S
 Saipem America Inc

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- Weekly career-oriented newsletter
- Salary Wizards (*Are you getting paid enough?*)

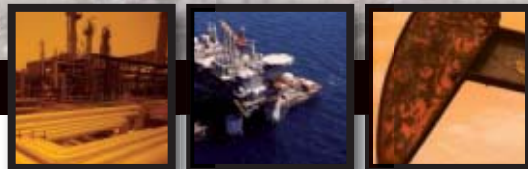
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companies

2009 Petroleum Buyers Guide



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.

3M Oil & Gas

3M United Kingdom Plc, 3M Centre, Cain Rd, Bracknell, Berkshire, RG12 8HT UK, 44-1344-858000, dricketts@mmm.com
Contact: Dawn Ricketts

3X Engineering

9 Avenue Albert II, Monaco, Monaco, 377-920-579-81, 3x@3xeng.com, www.3xengineering.com
Specializes in pipe repair. Provides solutions for pipes in different domains, such as corrosion and leaks.

@hand Corp

4030 W Baker Ln, Suite 550, Austin, TX 78759, 888-686-9993, information@hand.com, www.hand.com

Contact: Dir Energy Solutions, Leo Mandoza
Provides software solutions for mission-critical mobile work processes, including asset management, field service, and materials management. The company connects the mobile workforce to enterprise information systems by delivering solutions with patented mobile software technology, configure-to-order applications, and strategic solution services.

Abacus Solutions Inc

24704 Voorhees Dr, Los Altos Hills, CA 94022, 650-941-1728, info@abacussolutionsinc.com, www.abacussolutionsinc.com

Contact: CEO, Salim J. Jabbour
Offers the modern software SATURN, a web-based enterprise integration and risk management system. Offers capabilities, including deal capture, transaction management, data mining, data analysis, price simulation, generation optimization, contracts valuation, risk analytics, budgeting and financial analysis, extensive reporting and seamless integration with other tools.

ABB Inc

(div of Analytical Products)
843 N Jefferson St, Lewisburg, WV 24901, 304-647-4358, FAX: 304-647-4236, analyzeit@us.abb.com, www.abb.com/analytical

Contact: Mktg/Comms Mgr, Sandra Farren
Provides solutions that combine analyzers, advanced process control, process, and application knowledge to create value for customers. These include laboratory and on-line delite analyzers (gas chromatography, IR/UV photometry, and mass spectrometry).

ACCOAT

Accoat A/S

Munkegaardsvej 16, DK-3490 Kvistgaard, Denmark, 45-4912-6800, FAX: 4549126899, info@accoat.dk, www.accoat.com

Contact: Prod Spec Oil and Gas, Niels Melgarrd Christensen
Offers long term corrosion protection and flow enhancement, the leading European applicator for fluoropolymer coatings. Capabilities development and customization of coating processes; handling and managing large and heavy items; flexible and versatile production facilities; and supplying to customers worldwide.

AC Dandy Products Ltd

4012 49th St, Wetaskiwin, Alberta, Canada T9A 2K1, 780-261-5300, toll-free: 800-642-2952, FAX: 780-352-2249, www.acdandy.com

Contact: Sls Mgr, Ray Hurcomb
Manufactures a line of electrical distribution products, including 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.

Aclaro Softworks Inc

11000 Richmond Ave, Suite 180, 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, 4–20 mA, and Profibus protocols.

ACR Systems Inc

12960 84th Ave, Bldg 210, Surrey, British Columbia, Canada V3W 1K7, 604-591-1128, FAX: 604-591-2252, sales@acrsystems.com, www.acrsystems.com

Contact: Territory Sls Mgr, Juliette Sicotte
Manufactures compact, portable Data Loggers. These electronic devices measure and record parameters such as temperature, relative humidity, current, voltage, pressure, process signals, pulse frequency, and more. Recorded data can be downloaded to a PC or laptop and analyzed with the company's easy-to-use and versatile software.

Actenum Corp

675 Water St, 10th Floor, Vancouver, British Columbia, Canada V6B 1N2, 604-681-1262, FAX: 604-687-1256, info@actenum.com, www.actenum.com

Contact: VP Bus Dev, Owen Plowman
Provides software that takes the guesswork out of planning and scheduling by giving you immediate feedback on decisions you make as you assign resources to activities. Interactively reschedule during daily operations to maximize the utility of assets and get the right equipment in the right place at the right time.

ADACONN

538 Township Line Rd, Blue Bell, PA 19422, 215-643-1900, FAX: 215-643-4017, mrries@adaconn.com, www.adaconn.com

Offers products that include a proprietary line of adapters and connectors. These products are used in industrial and mobile integrated hydraulic systems to save space, time, and money, eliminating piping leaks and adding 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.

Adalet Wireless

(sub of Berkshire Hathaway)
Scott Fetzer Div

4801 W 150th St, Cleveland, OH 44135, 216-267-6864, FAX: 216-267-3219, info@adaletwireless.com, www.adaletwireless.com

Contact: Mktg/Sls Mgr, Matthew R. Piecuch
Manufactures industrial wireless systems. Markets a line of industrial wireless systems which include rugged NEMA 4X, explosion-proof Class 1, Division 1, multipoint wireless systems, battery, AC and DC powered wireless systems, and DIN rail-mounted systems.

AD Products

4799 W 150th St, Cleveland, OH 44135, 800-325-4935, FAX: 216-267-5392, jshoemaker@adproductsco.com, www.adproductsco.com

Contact: Bus Dev Mgr, Joe Shoemaker
Offers thousands of products, including electrical enclosures, thermal management products, pressure gauges, instrumentation devices, and more.

Advanced Polymer Coatings

951 Jaycox Rd, PO Box 269, Avon, OH 44011, 440-937-6218, toll-free: 800-334-7193, FAX: 440-937-5046, denise.keeahan@adv-polymer.com, www.adv-polymer.com

Contact: Tech Sls/Support, Sharon O. Short
Manufactures corrosion, erosion, and chemical resistant coatings for primary and secondary containment linings for heavy industry, utilities, petrochemical, rail, bulk transportation, and marine cargo vessels.

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: Pres, Tom Forlander
Manufactures pipeline accessories for the water, wastewater, oil and gas industries both domestically and internationally. Products manufactured include casing spacers, pipe seals (Innerlynx), isolating gasket kits, nite caps, u-bolt pipe supports, safety spray shields, kleebrand flange protectors.

Aecomtric Corp

374 Ohio Rd, Richmond Hill, Ontario, Canada L4C 2Z9, 905-883-9555, FAX: 905-883-9578, sales@aecomtric.com, www.aecomtric.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: Dir Sls/Mktg, John Olobri
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 more.



Aeration Industries International Inc
4100 Peavey Rd, Chaska, MN 55318,
952-448-6789, toll-free: 800-328-8287, FAX:
952-448-7293, aiii@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.

Air Chiller Inc

920 N Palestine, Athens, TX 75751, 800-925-0269, FAX: 903-675-0018, info@airchiller.net, www.airchiller.net

Contact: Dir Oper, Bill Hochmuth
Manufactures explosion-proof portable misting/cooling systems specifically designed for the oil and gas industry. The company's units bring comfort to the surrounding environment, which makes workers more efficient and reduces errors and health-related heat incidents.

Air Compressor Energy Systems Inc

10151 S Perdue, PO Box 80048, Baton Rouge, LA 70898, 225-272-2722, toll-free: 800-962-9837, FAX: 225-272-1424, info@acesgs.com, www.acesgs.com

Contact: Pres, Ron Naquin
Manufactures special compressor packages. The company handles sales, service, and parts for compressors, dryers, FRLs, aftercoolers, and air receivers. More than 30 years of experience in design, engineering, and fabrication.

Air Liquide America Specialty Gases LLC

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Contact: Dir Mktg/Comms, Robert G. Jefferys
Manufactures specialty gases and gas handling equipment for hydrocarbon, natural gas, medical, environmental, semiconductor applications, and more.

Airport Windsock Corp

3051 100th St, Barnesville, MN 56514, 218-493-4300, FAX: 218-493-4305, aviation@rrt.net, www.airportwindsocks.com

Aker Arctic Technology In

Merenkulkijan Katu 6, FI-00980 Helsinki, Finland, 358-10-670-2540, FAX: 358-10-670-2527, goran.wilkman@akerarctic.fi, www.akerarctic.fi

Contact: Mktg Mgr, Göran Wilkman
Specializes in ice technology for shipyards, ship owners, and offshore. Offers engineering services as well as ice model tests in a unique new facility in Helsinki, Finland.

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Contact: VP Sls, Olav Kvaale
Provides drilling solutions and drilling equipment for the high-efficiency drilling market.

Aker Subsea AS

(div of Aker Solutions)
PO Box 94, N-1325 Lysaker, Norway, 47-22-94-58-91, FAX: 47-67-82-64-00, endre.johansen@akersolutions.com, www.akersolutions.com

Provides offerings that cover all phases of life in the field, from concept screening and design through manufacturing and commissioning to operational support and maintenance. The company provides complete subsea production systems, as well as intervention, marine operations, installation, and geological services.

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 nationwide for shaft, pulley, bore, turbine, roll parallel, and machine alignment for flat, straight, square, and spindle pointing direction. Also offers alignment training classes as well as laser repair and calibration.

Allegiance Capital

Allegiance Capital

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214-217-7727, FAX: 214-217-7751,
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www.allcapcorp.com

Contact: Chmn/Founder, David Mahmood
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Contact: Mktg Mgr, Samantha Griffith
Designs, manufactures, and services epicyclic
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Contact: Nat'l Sls Mgr, Bill DeRoche
Manufactures NEMA Type 4X fiberglass
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sales@allied-transmission.com,
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Contact: Pres, James Jackson

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ALLWEILER AG

(sub of Colfax Corp)

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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,
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Al Masaoood

Projects and Engineering Services Div

PO Box 322, Abu Dhabi, United Arab Emirates,
971-2-677-1688, FAX: 971-2-677-0840,
mbmpesd@emirates.net, www.masaoood.com

Altronic Inc

712 Trumbull Ave, Girard, OH 44420,
330-545-9768, FAX: 330-545-9005,
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Contact: VP After-Market Sls/Svc, David Bell
Manufactures ignition systems, instrumentation,
controls, and fuel delivery systems for natural
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for sensing temperature, pressure, and speed;
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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 and distributes Amercoat Protective
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Contact: Exec VP, Pat Moore

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Manufactures and distributes lines of products for
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Contact: Sales

Manufactures pressure sensors, transducers, and
transmitters for hazardous locations and IS
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AMETEK

Technical & Industrial Products Div

627 Lake St, Kent, OH 44240, 330-673-3452,
FAX: 330-677-3306, www.ametektip.com

Contact: Mktg Mgr, Shannon Booth
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,
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727-539-6882, www.ametekcalibration.com

Contact: Prod Mgr, Scott Crone

Offers the M&G product line, which includes
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AMETEK

US Gauge Div

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Contact: Mktg Mgr, Trish Gabler

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302-456-4444, www.ametekpi.com

Contact: Mktg Mgr, Kim Montani

Offers the monitoring of various contaminants in bulk gas supplies for the semiconductor industry. Product line includes a series of gas purity monitors and ancillary equipment such as gas blenders and stream switchers. Contaminants that can be detected include H₂, CO, CO₂, CH₄, and nonmethane hydrocarbons.**AMETEK***Drexelbrook Div*412-828-9040, FAX: 412-826-0399,
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Contact: Mktg Coord, Danielle Hauptert

Offers eight different technologies, including radar, ultrasonic, RF admittance, TDR, magnetostrictive, hydrostatic, and vibration technology.

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Contact: Mktg Mgr, Kim Montani

Manufactures process analyzers and instrumentation servicing worldwide markets. We focus experience on designing new, analyzers that help customers achieve higher levels of productivity and quality. We do this by seeking out ways to overcome the limitations of current methods of process monitoring, control, and quality assurance.

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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.

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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. Turnkey 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,
info@amot.com, www.amot.com

Contact: Nat'l Sls Dir, Bill Ellerbrock

Provides the oil and gas, rail, marine, power generation, and 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 Instruments Corp9845 Drysdale, Houston, TX 77041,
49-3641-77-70, FAX: 713-460-1987,
aicgc@sbcglobal.net, www.aicgc.com

Contact: VP, Gilbert Coody

Manufactures precision analyzers: distributed control chromatography systems; process, pipeline/BTU, laboratory; complete package responsibility.

Analytik Jena AGKonrad-Zuse-Str 1, 07745 Jena, Germany,
49-3641-77-70, FAX: 49-3641-77-9279,
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Contact: Int'l Sls Mgmt, Andrea Glomb

Develops high quality analytical instruments for atomic spectrometry (AAS, AFS), molecular spectroscopy (UV VIS, VIS), elemental analysis (C, N, S, Cl), and sum parameter analysis (TOC/TN, TOX). Products are designed for industrial and scientific applications in the field of environment, life science, chemical industry, petrochemical, and renewable energy sources.

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Contact: Dir, Daniel Brake

Offers comprehensive aerial leak surveys that enhance safety and efficiency of pipeline operations. Flies above pipeline's right-of-way (ROW), the company finds natural gas leaks that other methods miss.

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Contact: Nat'l Sls Mktg Mgr, Thomas Collentine

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Contact: Sls Mgr, Jochen Kleimann

Manufacturers specialized equipment for cutting and dismantling tasks within the offshore oil and gas industries. Supplies Water Abrasive Suspension (WAS) jet cutting equipment and cutting devices, such as cutting tables and manipulation systems.

Appleton Electric*(sub of Emerson)**EGS Electrical Group Div*
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847-268-6016, sales@appletonelec.com,
www.appletonelec.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.

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Contact: Sls/Mktg, Julie Williams

Provides applied analytics manufacturers on-line process analyzers and sampling systems for the chemical, petrochemical, power generation, and pharmaceutical industries.

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Contact: Mktg Dir, Brian Stroehlein

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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.

Arabian Construction Engineering Co (ACEC)18 Jabr Bin Mohd, PO Box 1277, Doha, 1277
Qatar, 974-44-148-62, FAX: 974-44-301-12,
acecmain@acecgroup.com

Contact: Man Dir, G. W. Shousha'a

Provides construction management, civil engineering, trading, projects, sales, services, agencies, and representation of international companies in various fields, such as the oil and gas industry, petrochemical, human resources solutions, power generation, shipping, telecommunication, travel industry, medical supplies, and more.

ARCA Regler GmbH

ARCA Regler GmbH

Kempener Strasse 18, 47918 Toenisvorst, Germany, 49-2156-7709-0, FAX: 49-2156-770955, sale@arca-valve.com, www.arca-valve.com

Contact: Sr Eng, Harald Seidler
Manufactures control valves and steam reformers. The product range consists of globe, butterfly, hygienic and sterile valves in sizes of DN 1/2-32 in. and pressure classes PN 10-630, ANSI 150-ANSI 2500 sp. cl. with pneumatic, electric and hydraulic actuators, I/P- and smart positioners, HART, PROFIBUS, and field communications available.

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/or 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 little 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@arkema-inc.com, www.arkema-inc.com

Provides industrial chemicals, including acrylics, PMMA, thiochemicals, fluorochemicals, hydrogen peroxide, and performance products, such as technical polymers, specialty chemicals organic provider, additives, formaldehyde resins, and agrochemicals.

ARLA Maschinenteknik 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 Industrial Tools

(div of Danaher)
Danaher Tool Group Div
14600 York Rd, Bldg A, Sparks, MD 21152, 410-773-7987, toll-free: 800-763-1233, FAX: 877-356-2952, dan.mislak@danahertool.com, www.armstrongtools.com

Contact: Gen Mgr, Daniel Mislak
Manufactures industrial quality hand tools.

Arrow Engine Co

(div of Trimas)
2301 E Independence, Tulsa, OK 74110, 800-331-3662, FAX: 918-699-3202, 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, VCR-2 Compressor, gas products, including scrubbers, separators, coalescers and gas engine automation equipment. Supplies replacement parts for Ajax, Fairbanks Morris, Gemini, Ford, Hercules, Caterpillar, 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: Tech Eng, Ken Blystone
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 5M8, 519-758-2700, FAX: 519-758-5540, ascmail@asco.ca, www.ascovalve.ca

Contact: VP Sls/Mktg, Jon Haigh
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

250 E Main St, Stratford, CT 06614-5145, 203-378-8281, toll-free: 800-328-8258, FAX: 203-385-0408, info@ashcroft.com, www.ashcroft.com

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

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: Dir Sls, 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, subsea cameras, side-scan and sub-bottom profiling systems.

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: 803-817-7336, information@us.atlascopco.com, www.atlascopco.us

Contact: VP Comms/Branding, Paul Humphreys
Supplies air compressors, selling one of every three compressors and serving more than a quarter of a million customers on six continents.

Atlas Copco Hurricane LLC

1015 Hurricane Rd, Franklin, IN 46131, 317-736-3800, toll-free: 800-754-7408, FAX: 317-736-3801, sales@hurricane-compressors.com, www.atlascopco.com/hurricane

Contact: VP/Sls Mktg, Richard Baker
Offers high-pressure booster incorporate technologies, application flexibility, and size and weight advantages. Supplying airpower to rugged industries in extreme environments requires reliable equipment. Rises to the challenges by offering world-class products that are dependable, adaptable, and serviceable.

Atlas Incinerators A/S

Masnedovervej 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 offshore industry, on power plants, and more.

Atlas Maridan Aps

Atlas Elektronik GmbH
Agern Allee 3, 2970 Hoersholm, Denmark, 45-4576-4050, FAX: 45-4576-4051, info@atlasmaridan.com, www.atlasmaridan.com

Contact: Mktg/Sls Mgr, Jesper Peter Menne Baunsgaard
Develops and integrates autonomous underwater vehicles. Specialized in development AUVs, systems for control of underwater vehicles (AUV, ROV, ROTV, and Towed Array) as well as integration of payload sensors.

Autoclave Engineers

8325 Hessinger Dr, Erie, PA 16509, 814-860-5700, FAX: 814-833-0145, snaptitle@snap-tite.com, www.snap-tite.com

Contact: Customer Service
Manufactures high and ultrahigh pressure valves, fittings, and tubing for pressures to 100,000 psi. Products include needle, ball, check, and relief valves; NPT and ferrule fittings to 15,000 psi; coned and threaded fittings and adapters from 10,000 to 100,000 psi; and stainless or specialty tubing for all pressures.

Automatic Power Inc

213 Hutcheson St, Houston, TX 77003, 713-228-5208, FAX: 713-228-3717, sales@automaticpower.com, www.automaticpower.com

Contact: Sls Mgr, Bob Nichols
Manufactures marine and aviation obstruction light fog signals and racons. Supplier for solar power systems. ATEX and NEC approvals.

Automation Products Group Inc

1025 W 1700 North, Logan, UT 84321, 435-753-7300, toll-free: 888-525-7300, FAX: 435-753-7490, sales@apgsensors.com, www.apgsensors.com

Contact: Cust Svc Mgr, Shawn Rigby
Manufactures level sensors, pressure transmitters, and digital pressure gauges for process control applications.

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.

Autronic Reglersysteme GmbH

Grützmühlenweg 44, 22339 Hamburg, Germany,
49-40-538-904-32, FAX: 49-40-538-21-40,
mail@autronic-regler.de, www.autronic-regler.de

Contact: Carsten Teichler
Manufactures electrohydraulic actuators and regulators for safety and control valves, suitable for hazardous areas. Offers worldwide service and representatives in several countries. ATEX certified.

Aviation Technology Services LLC

7355 S Peoria St, Suite 112, Box A-1,
Englewood, CO 80112, 303-858-1359,
rwestra@atshelo.com, www.atshelo.com

Specializes in airborne high pressure gas pipeline leak detection utilizing the Boreal laser and video right-of-ways. Helicopter services supporting the energy industry crew transport, and external load operations.

AW-Lake Co

8809 Industrial Dr, Franksville, WI 53126,
262-884-9800, toll-free: 800-850-6110, FAX:
262-884-9810, aw@awcompany.com,
www.aw-lake.com

Contact: Dir Sls/Mktg, Curt Foreman
Manufactures positive displacement, turbine, mass coriolis flowmeters, plural component metered mixing systems, flow computers, controllers, and flow monitors and flow ranges from 1 gpd to 5000 bpm.

b3o enviroTek*Locate Underground Div*

695 Nashville Park, #310, Gallatin, TN 37066,
615-989-1576, FAX: 615-206-7592,
budr@locateunderground.com,
www.locateunderground.com

Contact: Dir Opers, Julie Cosens
Provides leak detection systems for hydro test failure, pipe locating services, pipe locating, PVC pipe locating, and an assortment of tools and systems for the utility and energy industries.

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.

Baker Hughes Inc

2929 Allen Pkwy, Suite 2100, Houston, TX 77019,
713-439-8118, www.bakerhughes.com

Provides the worldwide oil and natural gas industry products and services for drilling, formation evaluation, completion, and production. Creates value for the producers by providing advanced technology to find, develop, produce, and manage oil and gas reservoirs, operating in more than 90 countries serving international and national oil companies.

Baldor Electric Co

PO Box 2400, Fort Smith, AR 72902,
479-646-4711, FAX: 479-648-5792,
www.baldor.com

Contact: Exec VP Sls, Randy Colip
Markets, designs, and manufactures industrial electric motors, power transmission products, drives, and generators.

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.

Ballast Technologies Inc

4620 S Coach Dr, Tucson, AZ 85714-3442,
520-790-2229, toll-free: 866-547-8349, FAX:
520-790-2239, markensio@alum.mit.edu,
www.ballasttech.com

Contact: Pres, Mark A. Ensio
Supplies and installs fixed ballasts. The company's system, named Perma Ballast, is acknowledged to be fast and cost-effective method of ballast installation. The rapid and environmentally safe process and materials require minimal vessel modification, which yields savings for vessel owners and shipyards.

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*(div of Balmoral Comtec Ltd)*

Balmoral Park, Loirston, Aberdeen, AB12 3GY
UK, 44-1224-859-000, FAX: 44-1224-859-059,
group@balmoral.co.uk, www.offshore.com

Contact: Int'l Bus Dev Dir, Jim Hamilton
Provides rigid, dynamic, and BHOR 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

Contact: Mktg/Comms, Mark Halloran
Provides custom-engineered sealing, connecting, conducting and shielding solutions for energy, oil and gas applications. Products, formulated from PEEK, PTFE, UHMWPE and other high-performance materials, employ canted-coil spring technology for enhanced equipment performance and reliability.

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: Dir Mktg/Comms, Bob Durkee
Manufactures electronic machine guarding systems, photoelectric and ultrasonic sensors, fiberoptic assemblies, vision sensors, precision measurement systems, and wireless networks. Serves a variety of industries, such as petroleum, automotive, packaging, pharmaceutical, semiconductor, carwash, metalforming, food processing, printing, and material handling.

Bardex Corp

6338 Lindmar Dr, Goleta, CA 93117,
805-964-7747, FAX: 805-683-1763,
bardex@bardex.com, www.bardex.com

Provides hydraulic load handling equipment for a number of diverse applications, including rig skidding, FPSO mooring, TLP tendon tensioning, shiplifts, portable pier systems, construction/erection, and SCR (steel catenary riser) pull-in.

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, Myron Vogt
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 corporate mission statement. Provides components and systems tested to international standards, and has acquired an international position among safety technology suppliers.

Battery Operated Barrier

Battery Operated Barrier

7054 CR 521, Bayfield, CO 81122,
970-946-4180, evers@frontier.net,
www.batteryoperatedbarrier.com

Contact: Owner, Dennis Evers

Provides portable 12 ft. barrier gates for well sites and anywhere you need to limit access. The company's security barriers can be set up instantly. For locations prone to terrorism, the company offers tire shredders that work with the gates to flatten all tires of a threatening vehicle instantly, reducing the threat.

BEAR Power Supplies

1916 Route 96, Phelps, NY 14532,
315-548-5000, toll-free: 800-551-2327, FAX:
315-548-5100, sales@bearpwr.com,
www.bearpwr.com

Contact: Global Sls Mgr, Peter Growney
Designs and makes rugged power supplies for commercial, industrial, and medical systems. Standard and custom products include AC/DC, DC/DC, and DC/AC converters from mW to kW with compact size and high reliability. All products feature long life and reliable operation from -40°C to at least 70°C.

Robert J Beck and Associates

5377 S Irvington Ave, Tulsa, OK 74135,
918-630-2891, rbeck1@cox.net

Provides energy-economic analysis and planning for the energy industry. Provides short and long term outlook analysis for energy industry planning, operational, investment analysis.

Behringer Corp

17 Ridge Rd, Branchville, NJ 07826,
973-948-0226, FAX: 973-948-2562,
cserv@behringersystems.com,
www.behringersystems.com

Contact: Prod Mgr, Scott Christina
Manufactures and markets hydraulic accessories, including filter elements, valves, and clamps. Represents Mahle Industrial Filters and Roetelmann high pressure ball valves.

Beier Radio

2605 Concord Rd, Belle Chasse, LA 70037-3104,
504-341-0123, sales@beierradio.com,
www.beierradio.com

Contact: Sls Mgr, Buddy Morgan
Provides electronic engineering, systems integration, submittals to regulatory bodies, project management, and installation of electronic systems of marine vessels, which include dynamic positioning systems, machinery automation-control and monitoring equipment, satellite systems, communications, and navigation systems.

BEI Industrial Encoders

7230 Hollister Ave, Goleta, CA 93117,
805-968-0782, toll-free: 800-350-2727, FAX:
805-968-3154, encoders@beieid.com,
www.beieid.com

Manufactures rugged ATEX compliant rotary optical encoders for oil and gas services. Well sealed and rated for hazardous environments per international standards. Explosion-proof and safe models, combined with BEI isolation barriers, ensure complete ATEX compliant solutions. 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, control, and flexible automation applications.

■ 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
Produces edge welded bellows, specializing in the custom design and manufacturing of precision edge welded bellows and assemblies, in an array of alloys and dimensional configurations serving the high vacuum, semiconductor, oil services, and process control industries. Materials include titanium, 316LSS, AM350SS, aluminum and inconel/hastelloy.
(See ad p 22)

Belsim Production LLC

(sub of BELSIM S A)
Rue Berotte 29 A, 4470 St Georges, Belgium,
32-4-259-88-88, FAX: 32-4-259-88-89,
info@belsim.com, www.belsim.com

Contact: Dir Sls/Mktg, Ulrika Wising
Specializes in solutions for energy management, production allocation/accounting, performance management, condition based maintenance, and optimization in petroleum production, refining, and chemical industries, and in the energy sector. The core business is the field of advanced data validation and reconciliation.

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.

Bernard Welding Equipment

449 West Corning Rd, PO Box 667, Beecher, IL
60401, 708-946-2281, toll-free: 800-946-2281,
FAX: 708-946-6726, info@bernardwelds.com,
www.bernardwelds.com

Offers premier MIG guns and consumables for the most demanding of industrial welding applications. From our semi-automatic, air-cooled Q-Guns and CenterFire consumables to our self-shielded flux-cored Dura-Flux gun, each product offers the durability, precision and quality that our customers have come to expect from Bernard.

BETAFENCE NV

Industrial Mesh Div
Deerlijkstraat 58A, Zvevegem, Belgium,
32-56-73-4530, armapipe@betafence.com,
www.betafence.com

Contact: Global Key Acct Mgr, Frederik De Knijf
Manufactures Armapipe, a spot-welded mesh of galvanized low-carbon steel wire used to reinforce the concrete coating of offshore pipelines.

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.

Biglift Shipping BV

Radarweg 36, PO Box 2599, 1000 CN
Amsterdam, The Netherlands, 31-20-4488-300,
FAX: 31-20-4488-333,
management@bigliftshipping.com,
www.bigliftshipping.com

Specializes in heavy lift and project cargo transportation worldwide.

Bollfilter UK Ltd

(sub of Boll & Kirch)
UK Technical Sales & Support Div
Union 9 Station Way, Station Rd, Tolleshunt
D'arcy, Essex, CM9 8TY UK, 44-1621-862-180,
FAX: 44-1621-869-257, 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.



BOLO by WellPoint Systems Inc
12596 W Bayaud Ave, Suite 400, Lakewood,
CO 80228, 303-987-2238, toll-free:
866-987-2238, FAX: 303-986-5558,
mktg@wellpointsystems.com,
www.bolosystems.com

Contact: Sr VP WW Sls/Svc, Carrie Manion
Provides the oil and gas industry with a customer-centric accounting and land and production software. The interface design and configurable systems increase user productivity and efficiency through streamlined functionality and real-time data analysis. Offers users an integrated, highly scalable software suite to efficiently process data and provide immediate access to pertinent information.

BOLTIGHT Ltd

Unit 2, Junction 10 Business Park, Walsall, West
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, 49-2043-4006-01, FAX:
49-2043-4006-6299, 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, D-13507 Berlin, Germany,
49-30-4301-01, FAX: 49-30-4301-2447,
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)
Egellsstr 21, D-13507 Berlin, Germany,
49-30-4301-01, FAX: 49-30-4301-2771,
info@is.borsig.de, www.borsig.de

Contact: Man Ind'l Svcs, Aedah
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, and centrifugal compressors for process gas blowers and blower systems. Service for compressors and blowers.

Bortech Corp

66 Victoria St, Keene, NH 03431, 603-358-4030,
FAX: 603-358-4007, sales@bortech.com,
www.bortech.com

Contact: Pres, Leo White
Repairs worn bores, pins, shafts, faces, and conical seats; with IDs, ranging from 0.5 to 12 ft. by applying a GMAW weld overlay. Provides ID cladding of round (symmetrical) parts, such as nozzles and tubes, using stainless steel or nickel alloys. Local demonstrations and training are available.

Bourgeois & Associates Inc

Station 1, PO Box 10157, Houma, LA 70363,
985-851-0881, FAX: 985-851-0888,
bourgeois@lahotfire.com, www.lahotfire.com

Contact: Pres, Roger Bourgeois
Sells, services, and installs fire detection/suppression systems.

BPC - Bio Petro Clean

5090 Richmond Ave, #148, Houston, TX 77056,
646-367-3729, info@biopetroclean.com,
www.biopetroclean.com

Delivers ecological solution (ACT) for wastewater treatments. The company directly addresses the challenges facing various industries, including oil refineries, oil storage farms, drilling sites, marine ports, contaminated reservoirs, and storage tanks.

Brimrose Corp of America

19 Loveton Cir, Hunt Valley Loveton Ctr, Sparks,
MD 21152, 410-472-7070, FAX: 410-472-7960,
smiddleton@brimrose.com, www.brimrose.com

Contact: Apps Eng, Shana Middleton
Manufactures portable NIR spectrometers used for in-line processing or laboratory analysis. Applications include: raw material ID; measuring, monitoring, and controlling the manufacturing process; measuring moisture, density, and viscosity; detecting and quantifying aromatics, additives; separating high, medium, and low quality characteristics; and measuring the cetane index in addition to several other applications.

Broadpoint

11335 Clay Rd, Suite 190, Houston, TX 77041,
281-501-4700, toll-free: 800-458-8301, FAX:
281-501-4750, inquiries@broadpointinc.com,
www.broadpointinc.com

Offers a GSM digital wireless network that covers more than 100,000 square miles of the Gulf of Mexico and provides voice, voicemail, texting, faxing, Internet, e-mail, and data. The company provides Ku and C-band satellite packages domestically, internationally, onshore, and offshore that include voice, fax, and data video.

Bronto Skylift

Teerivuorenkatu 28, FI-33300 Tampere, Finland,
358-20-7927-111, FAX: 358-20-7927-300,
sales@bronto.fi, www.bronto.fi

Manufactures truck mounted hydraulic platforms.

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 Sls, 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.

Brown Corrosion Service Inc

PO Box 940638, Houston, TX 77094,
832-327-0965, FAX: 832-327-0968,
sales@browncorrosion.com,
www.browncorrosion.com

Contact: VP, Jane N. Brown
Provides cathodic protection supply and service, corrosion control, corrosion monitoring equipment and systems, and sand and hydrogen monitoring systems. The company specializes in material degradation and corrosion/erosion control.

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, 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.

BS&B Safety

7455 East 46th St, Tulsa, OK 74145,
918-622-5950, FAX: 918-665-3904,
sales@bsbsystems.com, www.bsbsystems.com
Manufactures high-quality pressure relief devices, explosion protection systems, and wireless monitoring solutions that are marketed throughout the world. The company is ISO 9001 certified with manufacturing facilities.

Bulldog Specialties Ltd

1312 W 2nd, PO Box 7037, Odessa, TX 79763,
432-333-4652, toll-free: 800-444-9504, FAX:
432-337-9106,
scottmac@bulldogspecialties.com,
www.bulldogspecialties.com

Contact: Pres, Gene L. Kirby
Manufactures oil field equipment and distributes wholesale.

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: Sls 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.

Bulwark Protective Apparel

(div of VF Imagewear)
545 Marriott Dr, Nashville, TN 37214,
615-565-5000, toll-free: 800-223-3372, FAX:
615-565-5284, www.bulwark.com

Provides secondary flame-resistant apparel to the North American industrial market, primarily serving the electric utility and petrochemical segments through the designing, manufacturing, and marketing of a range of apparel products. Also offers technical service.

Burcelik Valve

Ata Center, Ahi Evren Cad #1 K3, Maslak,
Istanbul, 80870 Turkey, 90-212-286-66-40, FAX:
90-212-286-66-44, vana@burcelikvana.com,
www.burcelikvana.com

Burgmann Industries GmbH & Co KG

Burgmann Industries GmbH & Co KG

Aeussere Sauerlacher Strabe 6-10, D-82515 Wolfratshausen, Germany, 49-8171-23-0, FAX: 49-8171-23-1214, info@eagleburgmann.com, www.eagleburgmann.com

Contact: Press Officer, Ellen Klier
Offers a product range that includes: mechanical seals, stuffing box packings, static seals, magnetic couplings, automotive seals; fabric, rubber and metal expansion joints; seal supply systems, and rotary kiln sealing systems.

Butler Manufacturing Co

1540 Genessee St, Kansas City, MO 64102, 816-968-3000, mbruns@butlermfg.com, www.butlermfg.com

Provides superior-performance buildings for the petroleum industry. The company maximizes productivity with clear-span structural framing, weathertight standing-seam metal roof systems, and an energy-efficient building envelope. Can compress building schedules to get you up and running faster.

Butterworth Inc

16737 W Hardy Rd, Houston, TX 77060, 281-821-7300, FAX: 281-821-5550, info@butterworth.com, www.butterworth.com

Contact: Sls Mgr, Mark Murphy
Manufactures, sells, and leases tank cleaning equipment and accessories (hose).

H BUTTING GmbH & Co KG

Gifhorner Strasse 59, 29379 Knesbeck, Germany, 49-5834-50-0, FAX: 49-5834-50-320, info@butting.de, www.butting.de

Contact: Sls 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

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: Mgr Cust Svc, Gigi Grubbs
Provides gas monitoring instrumentation. Showcasing a full line of portable, fixed, and stand-alone equipment. The company utilizes advanced microcontrollers and sensing technology to design and produce small, user-friendly and cost-effective instruments for the gas detection industry.

Caldon Ultrasonics

Cameron Measurement Systems Div
1000 McClaren Woods Dr, Coraopolis, PA 15108, 724-273-9300, FAX: 724-273-9301, chris.laird@c-a-m.com, www.c-a-m.com

Contact: Ultrasonics Prod Leader, Christopher B. Laird
Supplies precision ultrasonic flowmeters for petroleum measurement, leak detection, allocation measurement, and custody transfer measurement.

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 proven technology on a global basis. Offers SlimWELL, 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.

Callidus Technologies LLC

7130 S Lewis Ave, Suite 335, Tulsa, OK 74136, 918-496-7599, FAX: 918-496-7589,

kclarke@callidus.com, www.callidus.com
Designs, manufactures, supplies, and services environmental combustion equipment; such as process heater burners, flare systems, vapor control systems and thermal oxidizers/incinerators, to the petroleum, petro-chemical, and pharmaceutical industries.

Calnetix

12880 Moore St, Cerritos, CA 90703, 562-293-1660, wholt@calnetix.com, www.calnetix.com

Contact: Mktg Mgr, Wendy Holt
Develops and manufactures high efficiency permanent magnet motors, generators, and magnetic bearing systems. Speeds from 5000 to 400,000 rpm and powers of 1 kW to 2 MW. experience with integration of these systems into turbomachinery and offers cost-effective solutions from prototyping to production.

Calnetix Power Solutions

(sub of Calnetix Inc)
2901 SE Monroe St, Stuart, FL 34997, 772-219-9449, info@calnetixps.com, www.calnetixps.com

Contact: Mktg Mgr, Wendy Holt
Manufactures microturbine power generation and waste heat recovery electric generation equipment. Both microturbines and waste heat generators (WHG) are available in 100 kW units. Both products can be packaged in configuration that will allow them to run parallel to achieve outputs of 1000 kW and above.

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 Prod Mgr Caldon Ultrasonic, Christopher Laird
Manufactures ultrasonic products at the Caldon Ultrasonics Technology Center in Pennsylvania. Caldon brand LEFM ultrasonic products measure mass and 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 Sls, Gary Delander
Designs, manufactures, and distributes measurement and control instrumentation for the global oil and gas and process control industries. Our flagship product brands are BARTON, NUFLO, CLIF MOCK, JISKOOT, and CALDON.

SALES OFFICES:

Cameron's Measurement Systems Division-Caldon Ultrasonics
Coraopolis, PA 724-273-9300, FAX: 724-273-9301

Cameron's Measurement Systems Division-Jiskoot
Tunbridge Wells, UK 44-1892-518000, FAX: 44-1892-518100, information@jiskoot.com

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, high-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 nappy and linen rentals.

Can-Con Industries Inc

(A Wolseley Co)
9333 45th Ave, Edmonton, Alberta, Canada T6E 5Z7, 780-436-1930, FAX: 780-435-4849, info.can-con@wolseleyinc.ca, www.can-con.com

Contact: Reg Mgr, Scott A. Toshack
Manufactures and distributes pipe fittings and accessories for the natural gas, oil, and water industries.

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, thermoelectric 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.

CanWeb Internet Services Ltd

iWare Div
1086 Modeland Rd, Bldg 1010, Sarnia N75 6LZ, Ontario, Canada, 519-332-6900, toll-free: 877-422-6932, FAX: 519-332-6464, info@canweb.com, www.iware.canweb.com

Contact: Pres, David Grant
Provides iWare knowledge management solutions to enable companies to manage the most important resource. Offers operator support, compliance management, maintenance management, engineering, and coordination operations.

Capital Safety

3833 SALA Way, Red Wing, MN 55066,
651-388-8282, FAX: 651-388-5065,
jhalbach@capitalsafety.com,
www.capitalsafety.com

Contact: VP Sls, Kevin Coplan
Provides innovative products such as full body harnesses, shock absorbing lanyards, self retracting lifelines, rope grabs, confined space equipment, ladder safety systems, anchorage connectors, horizontal lifeline, custom-engineered systems and professional training and consulting for maximum worker protection.

Caplugs

2150 Elmwood Ave, Buffalo, NY 14207,
716-876-9855, FAX: 716-874-1680,
melody.napierala@caplugs.com,
www.caplugs.com

Carbonair Environmental Systems Inc

7500 Boone Ave N, Suite 101, Brooklyn Park, MN 55428, 763-315-4771, toll-free: 800-526-4999, FAX: 763-315-4614,
bbergsgaard@carbonair.com,
www.carbonair.com

Contact: Sls Mgr, Bob Bergsgaard
Supplies groundwater treatment solutions for customers in the environmental, petroleum, and construction industries for rent. Also sells low profile airstrippers, oil/water separators, and GAC adsorbers for permanent applications. Built a reputation by combining water treatment process knowledge and the ability for putting together custom systems with customer service and a commitment to safety and the environment.

Carrack LTD

Badentoy Crescent, Portlethen, Aberdeen, 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 oil field equipment.

Carthago International Solutions Inc

28-24 Steinway St, Suite 240, Astoria, NY 11103,
212-217-2222, FAX: 212-217-1598,
carthagois@aol.com, www.carthagois.com

Contact: Pres, Mourad Baraket
Develops and manufactures nuclear gas detectors based on proprietary opto-acoustic sensor technology. Products include combustible gas detectors, as well as gas CO₂, H₂S, HCl, and NH₃. High end sensors for improved safety.

■ **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 29)

Caterpillar Global Pipeline

(Div of Caterpillar inc)
13105 Northwest Freeway, Suite 1100, Houston, TX 77040, 713-329-2288,
macholan_daniel_r@cat.com,
www.cat.com/pipeline

Contact: Pipeline Mgr, Daniel Macholan
Equipment manufacturer for onshore oil and natural gas pipeline construction.

CAT PUMPS-High Pressure Pumps & Systems

1681 94th Ln NE, Minneapolis, MN 55449,
763-780-5440, FAX: 763-780-2958,
techsales@catpumps.com, www.catpumps.com
Manufactures high pressure, reciprocating, triplex pumps to 320 gpm, 7000 psi for methanol/glycol injection, secondary recovery, gas turbine mist cooling and seawater desalination, plus custom built pumps to API 674 specs, 316SSL block-style flushing/cooling models, and custom designed power units offering energy efficiency, long life, and low maintenance.

CB&I

2103 Research Forest Dr, The Woodlands, TX 77380, 832-513-1000, FAX: 832-513-1005, info@cbi.com, www.cbi.com

Contact: Dir Global Mktg, Bruce Steimle
Combines proven process technology with global capabilities in engineering, procurement, and construction to deliver comprehensive solutions to customers in the energy and natural resource industries. Drawing upon the global expertise and local knowledge of approximately 18,000 employees in more than 80 locations. Safely and reliably executes projects worldwide.

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: Comms Mgr, 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 Inspection Services Inc

2210 N Frazier, Suite 200, Conroe, TX 77303,
281-367-6740, toll-free: 800-521-8879, FAX:
936-441-4974, njixon@cci-inspection.com,
www.cciinspection.com

Distributes Elcometer, Extech, 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).

CCS-inc Comprehensive Computer Solutions

105 Industrial Dr, Christiansburg, VA 24073,
540-382-4234, toll-free: 800-277-3077, FAX:
540-382-4701, jyoung@ccs-inc.com,
www.ccs-inc.com

Contact: Sls Coord, Willa Caldwell
Designs, manufactures, and integrates industrial computer systems and NEMA-rated computer and printer enclosures. The engineering staff is skilled at working with customers as an extension of their own design teams to develop turnkey solutions for industrial and mission-critical applications.

CCS Midstream Services

(div of CCS Corp)
2400 530 8th Ave SW, Calgary, Alberta, Canada T2P 3S8, 403-233-7565, FAX: 403-261-5612,
www.ccsmidstream.com

Provides treatment, recovery, and disposal of petroleum byproducts. Finds solutions that maximize efficiencies at every level. Customer service facilities in Saskatchewan, Alberta, and British Columbia.

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.

CEM Systems Ltd

Unit 4, Ravenhill Business Park, Belfast, BT6 8AW UK, 44-28-9045-6767,
cem.info@tycoint.com, www.cemsys.com

Contact: Sls/Mktg Mgr, Philip Verner
Provides advanced access control and security management systems. Originating from a computer background and with more than 20 years of experience in the IT and security industry, and has developed a strong understanding of the IT issues and strategies that companies have in place. Provides access control, ID badging, and more.

CeRam-Kote Coatings

1800 Industrial Dr, PO Box 2119, Big Spring, TX 79721, 432-263-8497, FAX: 432-263-5269,
freecom@ceram-kote.com,
www.ceram-kote.com

Contact: Pres, Kevin Freeman
Manufactures and applies high performance CERAM-KOTE ceramic coatings. Application division coats the internals and externals of tubulars, tanks, and oilfield equipment, and has experienced, insured field service crews. The product division sells coatings to many industries, primarily for protection against corrosion, erosion, and abrasion.

Cetek Ltd

(div of Fosbel)
20600 Sheldon Rd, Brook Park, OH 44142,
216-362-3900, FAX: 216-362-3901,
cetek@fosbel.com, www.ceteklimited.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, procurement, construction, and operations for public and private clients.

(See ad Back Cover)

Chalmit Lighting

Chalmit Lighting*Hubbell Ltd Div*

PO Box 5575, Glasgow, G52 4AP UK,
44-141-88-25555, FAX: 44-141-88-33704,
info@chalmit.com, www.chalmit.com
Manufactures and supplies hazardous area
luminaries to more than 40 countries around the
world. The global range of IEC and NEC products
are suitable for hazardous area lighting and
apparatus installations on any continent and
complying with all international codes and
standards.

CHEMetrics Inc

4295 Catlett Rd, Calverton, VA 20138,
540-788-9026, toll-free: 800-356-3072, FAX:
540-788-4856, orders@chemetrics.com,
www.chemetrics.com

Manufactures simple-to-use, accurate portable
water quality testkits and instruments. Some of the
test analytes include ammonia, phenols, dissolved
oxygens, sulfides, and iron. Also produces a TPH
kit for testing hydrocarbons in soil. Each testkit
contains patented, self-filling ampoules.

ChemSW Inc

4771 Mangels Blvd, Fairfield, CA 94534,
707-864-0845, FAX: 707-864-2815,
info@chemsw.com, www.chemsw.com

Provides laboratory asset management systems as
well as chemical inventory software and services.
The company offers a range of products to
streamline laboratory processes and reduce
chemical purchasing and disposal costs. The
company supports more than 15,000 customers in
more than 40 countries worldwide.

Cheng Fluid Systems

480 San Antonio Rd, Suite 120, Mountain View,
CA 94040, 650-559-9292, 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.

Christy Catalytics LLC

4641 McRee Ave, St Louis, MO 63110,
314-773-7500, FAX: 314-773-8371,
info@christyco.com, www.christycatalytics.com

Contact: VP Sls/Mktg, Jim Chwirut
Manufactures ceramic and refractory alumina
internals for fixed bed reactors and adsorbers,
including PROX-SVERS support balls and ceramic
heat-exchange media. Other refractory shapes,
such as hexagonal alumina tiles, are used as
catalyst hold-down in synthesis gas applications.
Also custom fabricates refractory shapes to order.

C I Agent Solutions

11760 Commonwealth Dr, Louisville, KY 40299,
502-267-0101, toll-free: 866-242-4368, FAX:
502-267-0181, bj@ciagent.com,
www.ciagent.com

Contact: Nat'l Sls Mgr, Terry Masters
Provides products utilizing technology to prevent
and mitigate hydrocarbon releases into the
environment. The company has developed a blend
of polymers which can instantly solidify liquid
hydrocarbons on land or in water. Products include
booms, bags, and emergency response kits.

Cirrus Research Plc

Acoustic House, Bridlington Rd, Hunmanby,
North Yorkshire, YO14 0PH UK,
44-1723-891655, FAX: 44-1723-891742,
gill.cussions@cirrusresearch.co.uk

Contact: Export Sls Mgr, Jonathan Phillips
Manufactures a range of noise measurement
instruments and is ISO 9001:2000 certified. The
company produces intrinsically safe noise
dosimeters with ATEX, EEX, IECEX, and MSHA
certification along with sound level meters for
environmental and health and safety noise control.

ClampOn

Damsgaardsveien 131, 5162 Laksevaag, Norway,
47-5594-8850, FAX: 47-5594-8855,
mail@clampon.com, www.clampon.com

Contact: Mktg Coord, Tonje Dahl
Supplies ultrasonic non-intrusive sensors for
sand/particle monitoring, pig detection, leak
monitoring and corrosion-erosion monitoring to the
global oil and gas industry. All products are based
on the same, well proven technology platform.

SALES OFFICES:**ClampOn Inc**

Houston, TX 281-492-9805, FAX:
281-492-9810, info@clamponinc.com,
www.clampon.com

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.

Clean Harbors Environmental

42 Longwater Dr, Norwell, MA 02061-9149,
781-792-5000, FAX: 800-282-0058,
customerservice@cleanharbors.com,
www.cleanharbors.com

ClearDrain

(div of Melville Industries Inc)
219 Saint Michael Dr, Suite 2, Riverside, NJ
08075, 856-461-0091, toll-free: 800-990-6163,
FAX: 856-461-0092, sales@cleardrainusa.com,
www.cleardrainusa.com

Contact: Man Dir, Frank A. Chille Jr.
Manufactures the ClearDrain system, a complete
replacement for air dryers, 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.

The CMM Group LLC

2071-C Lawrence Dr, PO Box 5903, De Pere, WI
54115-5903, 920-336-9800, toll-free:
866-336-9800, FAX: 920-336-9797,
info@thecmmgroup.com,
www.thecmmgroup.com

Contact: Pres, Charles M. Martinson
Manufactures regenerative thermal, catalytic, and
thermal recuperative oxidizers, which destroy to
99.9% of volatile organic compounds (VOCs) and
hazardous air pollutants (HAPs) found in process
air streams, exceeding all local, state, and federal
clean air standards. Offers oxidizers in airflow
capacities from 3000 to 100,000+ scfm.

Colfax Corp

1710 Airport Rd, Monroe, NC 28110,
704-289-6511, toll-free: 877-853-7867, FAX:
704-289-9273,
customercare-americas@colfaxcorp.com,
www.colfaxcorp.com

Contact: Dir Oil/Gas Mktg, Mike Moore
Global leader in critical fluid-handling solutions,
including the manufacturer of positive displacement
industrial pumps and valves used in global oil and
gas, power generation, marine, naval, and a variety
of other industrial applications. Additional
information about Colfax's products, businesses,
and practices.

Columbus McKinnon

140 John James Audubon Pkwy, Amherst, NY
14228, 716-689-5400, FAX: 716-689-5645,
www.cmworks.com

Contact: Dir- Mktg Rsch/Comms, Rob Beightol
Manufactures a broad line of material handling
products for use in a wide range of markets around
the world. Products include hoists, lifting chain,
overhead crane systems and below-the-hook
attachments. Many of the brands are recognized
around the world.

Compressco Canada Inc

(sub of Tetra Technologies)
5050 76th Ave SE, Calgary, Alberta, Canada T2C
2X2, 403-279-5866, FAX: 403-279-5880,
www.compressco.com

Contact: VP Canada, Kevin Book
Provides manufacturing, sales, rentals, and service
of the company's patented 48 hp reciprocating
gasjack compressor. Suction pressures from 0-50
psig, discharge to 500 psig, and flow rates to 700
mcsd.

Compur Monitors GmbH & Co KG

Sales Div
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 Intelligent Platforms)
GE Fanuc Embedded Systems Div
7640 Pelham Rd, Greenville, SC 29615,
864-627-8800, FAX: 864-675-0106,
cdsales@gefanuc.com, www.cdynamics.com

Contact: Sls Oil/Gas, Ryan Nelson
Manufactures enclosed and open frame flat-panel
display systems, both computers and monitors, for
OEMs and end-users in an array of industries,
including hazardous outdoor and indoor
environments. Custom and semicustom design
capabilities to fulfill demanding applications.

Conbor Borrachas Tecnico Industriais Ltda

Av Itaoca, 1185/1197 and Warehouse, Rio De Janeiro, Brazil, 55-21-2270-0821, FAX: 55-21-2270-0821, diretoria@conbor.com.br, www.conbor.com.br

Contact: Sls/Mktg Dir, Homero Bicalho de Rezende

Provides manufacturing, technical assistance, and maintenance of accessories and parts of clutches, pneumatic brakes, rubber molded parts, and couplings, on- and offshore under a quality management system certified by RINA/IQNet as being in compliance with standard ISO 9001:2000.

Concoa

Controls Corp of America Div, 1501 Harpers Rd, Virginia Beach, VA 23454, 757-422-8330, FAX: 757-422-3125

Contact: Bus Dev Mgr, Richard Green
Develops new and improved products for the pressure control industry. Invests in R&D to develop a continuous stream of pressurizing controls. The company's goal is to understand values in order to streamline development and successfully launch gas control solutions.

Conservatek Industries Inc

PO Box 1678, Conroe, TX 77305, 936-539-1747, toll-free: 800-880-3663, FAX: 936-539-5355, nbailey@conservatek.com, www.conservatek.com

Designs, fabricates, and installs aluminum domes and aluminum roof structures for use on tanks of various shapes and sizes. Typical applications include petroleum storage, water storage, wastewater treatment basins, and bulk storage enclosures in the industrial and municipal markets.

CON-SPACE Communications

Search Systems Inc Div
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, Renee Magnusson
Offers Conspace Communications and Videogear that are designed for high noise and explosive environments. The Hardline systems offer two-way, simultaneous voice communications for confined spaces. The range of radio accessories are built tough and work in high noise situations or with any respiratory protective equipment suits.

Containerhouse International Inc

300 Battleground Rd, Houston, TX 77571, 281-478-0505, FAX: 281-478-0736, sales@containerhouse.com, www.containerhouse.com

Contact: Pres/Gen Mgr, George Vernau Jr.
Offers portable, customized buildings and containers, including control rooms, workshops, storage buildings, living quarters, and more.

ContainerWest Sales Ltd

11660 Mitchell Rd, Richmond, British Columbia, Canada V6V 1T7, 604-322-0533, toll-free: 800-561-9530, FAX: 604-322-0540, www.containerwest.com

Specializing in shipping container sales, rentals, and custom manufacturing for more than 30 years. The company offers a variety of secure mobile storage, portable building, and enclosure solutions that can be customized to suit customer needs. Rush orders welcome. Services offered throughout western Canada.

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.

ControlAir Inc

8 Columbia Dr, Amherst, NH 03031, 603-886-9400, toll-free: 800-216-3636, FAX: 603-889-1844, sales@controlair.com, www.controlair.com

Contact: Tech Sls, John Walsh
Manufactures general and precision air pressure regulators, I/P transducers, E/P transducers, P/I transducers, MITE relays, bubbler-level systems, and frictionless diaphragm air cylinders. The ISO 9001 registered quality system assures controlled specifications and processes, resulting in high performance and dependable pneumatic controls.

Control Co

4455 Rex Rd, Friendswood, TX 77546, 281-482-1714, sales@control3.com, www.control3.com

Contact: VP Sls/Mktg, Cindy Gisler
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
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.

■ Control Microsystems

48 Steacie Dr, Kanata, Ontario, Canada K2K 2A9, 613-591-1943, toll-free: 888-267-2232, FAX: 613-591-1022, sales@controlmicrosystems.com, www.controlmicrosystems.com

Contact: VP Mktg, Stephen Goodman
Offers solutions for oil and gas production optimization. Products are totally integrated, remotely configurable from well to network, and offers Modbus, Enron Modbus, DF1 and DNP3 protocols. Innovative flow and pressure measurement products augment the SCADAPack, family of programmable controllers, notably the RealFLO 4202 Gas Flow Computer. (See ad p 9)

Cooper B-Line

Grip Strut Safety Grating Div
3764 Longspur Rd, Pinckneyville, IL 62274, 618-357-5353, toll-free: 800-851-9341, FAX: 618-357-3605, www.gripstrut.com

Contact: Dir Mktg, Steven Groner
Offers safety grating, platforms, and treads; cable tray, metal framing, and hardware.

Cooper Bussmann

(div of Cooper Industries)
114 Old State Rd, PO Box 14460, Ellisville, MO 63021, 636-527-3877, FAX: 800-544-2570, busscustsat@cooperindustries.com, www.cooperbussmann.com

Contact: VP Sls, Kevin Duggan
Develops, manufactures, and markets circuit protection products, and provides engineering, training, and testing services globally for the electrical, electronics, and transportation industries. Reduces downtime, promotes workplace safety, and offers code compliance solutions.

Cooper Crouse-Hinds

(div of Cooper Industries)
PO Box 499, Syracuse, NY 13221, 315-477-5531, toll-free: 866-653-0640, FAX: 315-477-5179, crouse.customerctr@cooperindustries.com, www.crouse-hinds.com

Contact: Prod Line Mgr, Nick Daddabo
Manufactures and markets high quality products that provide safety and protect electrical systems in residential, commercial, institutional, and industrial environments. The company offers a line of products, including conduit and cable fittings; control stations and apparatus; plugs and receptacles; industrial lighting; cast and sheet metal enclosures; signals and alarms; and hazardous area and corrosion-resistant products.

COORSTEK
Amazing Solutions!

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.

Corlac Industries

PO Box 10050, Lloydminster, Alberta, Canada T9V 3A2, 780-875-8459, FAX: 780-875-9530, www.corlac.com

Contact: Sales
Specializes in the fabrication, sandblasting, painting and coating of tanks and SKUD's (inclined free water knockouts). Because we are ASME certified to build pressure vessels and utilize API codes in tank manufacturing, our qualified team ensures high quality standards of products and services.

Corr Instruments

303 Clarence Tinker Dr, Suite 116, San Antonio, TX 78226, 210-924-3101, lyang@corrinstruments.com, www.corrinstruments.com

Contact: Sr Apps Eng, Lietai Yang PhD
Offers coupled multielectrode array sensor (CMAS) systems for easily and quantitatively monitoring localized and general corrosion in gases, liquids, and biodeposits in the field. CMAS has unlimited life (>10 years), measure pitting, and crevice corrosion from 0.02 to 2000 mpy (0.5 to 50,000 µm/yr), and is virtually unaffected by H₂S.

Corus Tubes

Corus Tubes*(div of Corus Group Ltd)*

Weldon Rd, PO Box 101, Corby,
Northamptonshire, NN17 5UA UK,
44-1536-402121, FAX: 44-1536-404004,
corustubes.energy@corusgroup.com,
www.corustubes.com

Contact: Bus Dev Mgr, Richard Freeman
Supplies products and services specially packaged to meet the specific needs whether in the OCTG, onshore or offshore pipeline, process plant sectors of the industry. Specializes in deepwater products such as thickwall double submerged arc welded pipe and pipe-in-pipe systems.

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.

COWI A/S*Oil & Gas Div*

Parallevej 2, DK-2800 Lyngby, Denmark,
45-4597-2211, FAX: 45-4597-2212,
cowi@cowi.dk, www.cowi.com

Contact: Dir Oil/Gas, Johnny Mikkelsen
Offers services for all aspects of the oil and gas field; from production, through transmission and treatment, to distribution to consumers. Disciplines include oil and gas engineering, risk and safety management, financial disciplines, environment management, professional advice, and complete field development plans. Total engineering design of onshore/offshore installations.

COX Instruments

15555 N 79th Pl, Scottsdale, AZ 85260,
480-922-7446, FAX: 480-948-3610,
rmadison@cox-instruments.com,
www.cox-instruments.com

Contact: VP Sls/Mktg, Ron Madison
Supplies precision turbine flowmeters, sonic nozzles, variable area flowmeters, and ancillary products for today's demanding liquid and gas flow measurement applications. The company's flowmeters have been recognized for their uncompromised accuracy and reliability. Diverse customers can be found in a range of processing industries.

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 heavy lift deck barges, rig/ocean towing, arctic all-terrain transportation vehicles, salvage vessels, and equipment.

CST Industries

5400 Kansas Ave, Kansas City, KS 66106,
913-621-3700, tthill@tanks.com, www.tanks.com
Specializes in pre-engineered and prefabricated steel, aluminum, and stainless-steel storage tanks. Industries served include power and energy, water supply and treatment, wastewater treatment, and dry bulk storage. Applications include all types of water, municipal and industrial wastewater, petroleum products, dry bulk plastics, minerals, and chemicals.

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 retubing or replacement. Customers include Aramco, BP, ChevronTexaco, ConocoPhillips, ExxonMobil, PDVSA, Shell, and others.

CUDD Well Control

16770 Imperial Valley Dr, #100, Houston, TX
77060, 713-849-2769, toll-free: 800-990-2833,
FAX: 713-849-3861, tooltrack@cudd.com,
www.cuddwellcontrol.com

Contact: Bus Dev Mgr, Trampas Poldrack
Provides blowout firefighters, well control specialists and engineering services.

Cummins Filtration*Cummins Inc Div*

2931 Elm Hill Pike, Nashville, TN 37214,
615-367-0040, toll-free: 800-777-7064,
ken.r.swalls@cummins.com,
www.cumminsfiltration.com

Contact: Dir N.A. Oil/Gas, Ken R. Swalls
Designs and manufactures air, fuel, hydraulic and lube filtration, chemicals and exhaust systems technology products for all engine-powered equipment. Going beyond compliance, proactively seeks improvements to products and processes and offers environmentally friendlier product choices.

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.

Custom Instrumentation Services Corp-CiSCO

7325 S Revere Pkwy, Centennial, CO 80112,
303-790-1000, FAX: 303-790-7292,
www.ciscocems.com

Contact: Dir Mktg, Vic Johnson
Offers custom built quality CEMS and DAHS solutions to meet air permit requirements. Full service manufacturer. Offers start-up, certification, training, and field services. Supplies more than 850 CEM systems with a certification rate of 99+% on the first attempt. Class 1 Division 2 Requirements, as well as build RIES and specialized analytical systems.

CYBERNETIX SA*Oil and Gas Business Unit Div*

Technopole de Chateau Gombert, Rue Albert
Einstein BP 94, F-13382 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.

Danfoss Drives*(div of Danfoss Inc)*

4401 Bell School Rd, Loves Park, IL 61111,
815-639-8600, toll-free: 800-432-6367, FAX:
815-639-8000, sales@danfossdrives.com,
www.danfossdrives.com

Contact: Mktg Mgr, Jeff Duncan
Offers AC variable speed drives ranging from 1/2 to 600 hp. Many models UL, CUL, CSA, and VDE rated. Manufactured in an ISO 9001 facility.

Data Comm For Business Inc

2949 CR 1000E, Dewey, IL 61840,
217-897-6600, toll-free: 800-432-2638, FAX:
217-897-1331, cschutz@dcbnet.com,
www.dcbnet.com

Contact: VP 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.

DCL Mooring & Rigging

4500 N Galvez St., New Orleans, LA 70117,
504-944-3366, FAX: 504-947-8557,
sales@dcl-usa.com

DEEPWATER

Deepwater Corrosion Services Inc
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 I-Rod brand pipe supports.

SALES OFFICES:

Deepwater EU Ltd
Canterbury, CT34JJ UK 44-1227-290305,
FAX: 44-1227-290306,
sales@deepwater.eu.com,
www.deepwater.eu.com

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-693 21 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.

De-In Industries

PO Box 559, Debolt, Alberta, Canada T0H 1B0,
780-957-2521, FAX: 780-957-3779,
www.de-in.com

Contact: Sales
Provides fabrication of storage tanks, cement silos, pre-mix tanks and asphalt tanks. We are proud of our ability to meet the needs of all our customers throughout Canada and the United States focuses on storage tanks for fertilizer, grain processing waste, oil well production and rental tanks.

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: S Reg Off/Sls Mgr, Mike Wartko
Provides solutions to challenging high temperature, wear, corrosion, and abrasion problems. The company is a development partner that will cast and machine components to your specifications upstream and downstream, including components for MWD/LWD tools, safety flappers, nozzles, thermowells, and more.

SALES OFFICES:

Deloro Stellite Southern Regional Office
Katy, TX 281-579-9447,
mwartko@stellite.com, www.stellite.com

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 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.

Den-con Tool Co

5354 South I-35, Oklahoma City, OK 73129,
405-670-5942, FAX: 405-672-5884,
info@dencon.com, www.dencon.com

Contact: Pres, Larry Denny
Manufactures pipe handling tools and RFID tagging and tracking systems.

Det-Tronics Ltd

(sub of Detector Electronics Corp)
Mathisen Way, Colnbrook, Slough, SL3 0HB UK,
44-1753-683059, FAX: 44-1753-684540,
detronics@detronics.com, www.detronics.com

Deutsch

(div of Industrial Connectors)
Offshore Div

8 Blvd Pierre Lefauchaux, 72027 Le Mans,
France, 33-243-61-45-45, FAX: 33-243-61-73-80,
msmith@deutsch.net, www.deutsch.net

Contact: Mktg/Comm Dir, Matthew Smith
Offers wet and dry mateable electrical power, signal and optical connectors for topside, subsea, downhole and custom designs. Topside splash-zone/dry/eeed connectors for FPSOs, turrets, 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.

DH Instruments

(A Fluke Co)
4765 E Beautiful Ln, Phoenix, AZ 85044-5318,
602-431-9100, FAX: 602-431-9559,
dhi@dhinstruments.com,
www.dhinstruments.com

Contact: Pres, Martin Girard
Provides high accuracy pressure and flow calibration standards and services, including PG7000 reference level pressure standards, PDC4 pressure controller/calibrators, RPM4 reference pressure monitors, molbloc/molbox mass flow calibration systems, and compass calibration software. Also provides calibration service, repair, and training.

Dickson Co

930 S Westwood Ave, Addison, IL 60101,
630-543-3747, dicksoncsr@dicksondata.com,
www.dicksondata.com
Manufactures Data Loggers, chart recorders, and wireless systems for monitoring temperature, humidity, pressure, event, and universal inputs.

Direct Drive Systems

12880 Moore St, Cerritos, CA 90703,
562-293-1660, wholt@directdrivesystems.net,
www.directdrivesystems.net

Contact: Mktg Mgr, Wendy Holt
Manufactures a line of permanent magnet high speed high power motors and alternators and all necessary power electronics. The company's drive systems operate at 8000 to 30,000 rpm and couple directly to loads without gearboxes, increasing efficiency while reducing size, weight, and capital and ownership costs.

Ditch Witch

PO Box 66, Perry, OK 73077-0066,
580-336-4402, toll-free: 800-654-6481, FAX:
580-572-3523, info@ditchwitch.com,
www.ditchwitch.com

Provides equipment to industry, including compact utility, trenchers, HPD, and electronics.

Divelbiss Corp

9778 Mt Gilead Rd, Fredericktown, OH 43019,
740-694-9015, toll-free: 800-245-2327, FAX:
740-694-9035, mike@divelbiss.com,
www.divelbiss.com

Contact: Sls/Mktg, Michael Colgin
Designs and manufactures both standard and custom electronic controls for automation. Standard controllers are centered on patented PLC on a Chip technology. Available in off-the-shelf controllers, modules, or at chip level; all PLC on a Chip based products program with EZ ladder software.

Divestco Inc

707 7th Ave SW, #700, Calgary, Alberta, Canada
T2P 3H6, 403-237-9170, toll-free: 888-294-0081,
FAX: 403-229-4853, info@divestco.com,
www.divestco.com

Provides a comprehensive and integrated portfolio of software, services, data, and consulting to the oil and gas industry. Through commitment to aligning and bundling products and services, the company is creating integrated solutions and unique benefits for the marketplace.

DMT GmbH & Co KG

DMT GmbH & Co KG*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.

■ **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, Henrik Blichfeld
Provides air filtration systems and replace-
ment filters, hydraulic filters, and retrofit ser-
vices on air inlet systems for turbines and
compressors. Sales and service worldwide.
(See ad p 11)

Double Life Corp

200 N Rockwell Ave, Oklahoma City, OK 73127,
405-789-7867, FAX: 405-792-2202,
www.doublelifecorp.com

Contact: Sls Mgr, Nicole Griffin
Manufactures solids control and centrifugal pumps.
Washpipes and parking along with drilling mud
equipment.

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.

Dresser Natural Gas Solutions*(div of Dresser Inc)*

Infrastructure Solutions Div
2822 S 1030 West, Salt Lake City, UT 84119,
801-487-2225, FAX: 801-487-2587,
john.schnitzer@dresser.com, www.dresser.com
Manufactures Mooney and REDQ pilot operated
regulators 1 inch through 12 inch CL150, 300, 600.

Dresser-Rand Co

10205 Westheimer Rd, West 8 Tower, Suite
1000, Houston, TX 77042, 713-354-6100, FAX:
713-354-6110, 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.

Dresser-Rand Co Ltd*(formerly Peter Brotherhood Ltd)*

85 Papyrus Rd, Peterborough, Cambridgeshire,
PE4 5HG UK, 44-1733-292-200, FAX:
44-1733-292-300,
sales@peterbrotherhood.co.uk,
www.dresser-rand.com

Contact: Gen Mgr Compressor Sls, Tony Murphy
Designs, manufactures, installs, and commissions
API 618 gas compressors and steam turbines (to
40 MW). The company has experience in providing
equipment for refineries, petrochemical plants,
FPSO vessels, marine applications, oil and gas
industry, power generation, and waste-to-energy
applications worldwide.

Drillinginfo Inc*Energy Services Group Div*

PO Box 5545, Austin, TX 78763, 512-519-5501,
sales@drillinginfo.com, www.drillinginfo.com

Dsr Corp/Dsr Wire Corp

Woosin Bldg 7f, 646-15 Yeoksam-dong,
Gangnam-gu, Seoul, 135-911 South Korea,
82-2-3420-3700, FAX: 82-2-3420-3600,
ckno@dsrcorp.com, www.dsrcorp.com
Manufacturers and specializes in fiber rope, super
sling, wire rope, wire, and stainless wire in Korea.

Dualco

8404 Braniff Ave, Houston, TX 77061-5224,
713-644-7764, FAX: 713-644-7761,
ronmeade@dualco-inc.com,
www.dualco-inc.com

Contact: Sls/Mktg Mgr, Ron Meade
Manufactures a complete line of valve lubrication
equipment, fittings and adapters. Products include
screw-prime, hydraulic and pneumatic grease
guns, and large self-contained skid mounted
lubrication systems. A line of valve lubricants,
sealants and cleaners are offered. Also offers
complete valve maintenance training.

Dunlop Oil & Marine Ltd

Moody Ln, Pyewipe, Grimsby, Northeast
Lincolnshire, DN31 2SY UK, 44-1472-359281,
FAX: 44-1472-362948, dunlop.sales@dunlop.com,
www.dunlop-oil-marine.co.uk

Contact: Sls/Mktg Mgr, Chris Slater
Designs, manufactures, and supplies hoses for the
oil, gas, petrochemical, and dredging industries, for
both onshore and offshore based operations
(OCIMF).

Duoline Technologies*(sub of Robroy Industries)*

9019 N County Rd, West Odessa, TX 79764,
903-843-5591, FAX: 432-552-9701,
sroot@robroy.com, www.duoline.com

Provides an organization of synergistic member
companies dedicated to product and service
leadership within specialty markets.

DUPONT DE NEMOURS International SA

C/o The McOnie Agency, Guildford, Surrey, GU3
3JW UK, 44-148-323-7230,
stephanie@monieagency.com,
www.dpp-europe.com

Creates sustainable solutions essential to a better,
safer, healthier life for people everywhere.
Operating in more than 70 countries, the company
offers a range of products and services for markets,
such as agriculture, nutrition, electronics,
communications, safety and protection, home and
construction, transport, and apparel.

DuPont Performance Elastomers

300 Bellevue Pkwy, Wilmington, DE 19809,
800-853-5515, FAX: 302-792-4450,
ctc.dpe@dupontelastomers.com,
www.dupontelastomers.com

Offers a variety of thermoset rubber products,
including Viton, Neoprene, Kalrez, and Vamac used
in the automotive, chemical processing, and
general rubber industries. Supplies worldwide.

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: Reg Sls Mgr, 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.

Dynetek Industries Ltd

4410 46th Ave SE, Calgary, Alberta, Canada T2B
3N7, 888-396-3835, FAX: 403-720-0263,
contactus@dynetek.com, www.dynetek.com

Contact: Dir Sls, Donald Fraser
Designs and manufactures advanced lightweight
fuel storage systems for compressed natural gas
(CNG), compressed hydrogen, and industrial gases.
Used in various applications around the world, the
core system technology is the lightweight, Dynecell
cylinder made from a seamless, thin wall aluminum
liner covered with a full carbon fiber overwrap.

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 control systems
for reliable operation to 15,000 psi. Water-glycol
pumps lower system costs. The single fluid design
eliminates a separate lubrication circuit and the cost
of ongoing maintenance. Mineral oil pumps
requiring only 1 hp input power are used for
land-based panel systems and portable torque tool
power units.

Dynisco

38 Forge Pkwy, Franklin, MA 02038,
508-541-9400, FAX: 508-541-6206,
solutions@viatran.com, www.viatran.com

Contact: Oil/Gas Segment Leader, 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, 44-1502-446-148, 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. The company supplies standard and advanced engineered systems in addition to a line of cost-effective services to users of rotating equipment, including enhanced reliability services, MRO inventory management, repair, and training.

Eagle Rock Energy Partners

16701 Greenspoint Park Dr, Houston, TX 77060, 281-408-1211,

jschimelpfening@montierraminerals.com, www.eaglerockenergy.com

Eagle Technology Inc

11019 N Towne Square Rd, Suite 8, Mequon, WI 53092-5015, 262-241-3845, toll-free: 800-388-3268, FAX: 262-241-5248,

sales@eaglecmms.com, 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/Precast Buildings

5119 Catlett Rd, PO Box 400, Midland, VA 22728, 540-439-3266, toll-free: 800-547-4045, FAX: 540-439-1232, adventures@easiset.com, www.precastbuildings.com

Contact: Tech Dir, Rick Groves

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 10x12 ft. to 40x200 ft.

Easy-Laser/Damalini AB

Abacksgatan 6b, 431 67 Molndal, Sweden, 46-31-708-6300, FAX: 46-31-708-6350, easy-laser@damalini.se, www.easy-laser.com

Contact: Man Dir, Anders Edenhmar

Provides measurement and alignment systems for shaft alignment, sheave/pulley alignment, and 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.

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: Comm Dir, Pascal Muller
Manufactures FRP/GRP cable trays, racks, ladders, ducts, and light structures. More than 45 years of experience worldwide.

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 instruments, dynamometers, and motor power measuring equipment for optimizing gas and oilwell production.

Eclipse Scientific

60 Baffin Pl, Unit 4, Waterloo, Ontario, Canada N2V 1Z7, 519-886-6717, toll-free: 800-490-1072, FAX: 519-886-1102, info@eclipsescientific.com, www.eclipsescientific.com

Provides quality services, training, and products.

Equipped with advanced inspection tools, the company specializes in phased array, TOFD, and automated ultrasonic inspections. Training programs include classroom or in-field training. Product list is continually updated.

Econosto UK Ltd

Whiteacres, Cambridge Rd, Whetstone Leicester, LE8 6ZG UK, 44-116-272-7300, FAX:

44-116-272-7345, sales@econosto.uk.com, www.econosto.uk.com

Provides valves for all industries from stock.

ECT Inc

401 E Fourth St, Bldg 20, Bridgeport, PA 19405, 610-239-5120, FAX: 610-239-7863, btassone@ectinc.com, www.ectinc.net

Contact: Dir, Bruce Tassone

Manufactures turbomachinery cleaners and other specialty chemistries. Also offers customized pump skids and chemical injection equipment.

ECT Offshore Service AB

Ovädersgatan 14, SE-418 34 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 requirements from any government, and has extensive experience of decontaminating Legionella bacteria within the marine/offshore sector. In cooperation with ECT Water Academy AB, the company educates offshore personnel in drinking water handling.

Edg Inc

10777 Westheimer, #700, Houston, TX 77042, 713-977-2347, toll-free: 888-334-9298, FAX: 713-977-2387, www.edg.net

Contact: VP Sls/Mktg, Rick Brooks

Provides engineering and design solutions, including project management, procurement, inspection, high definition (laser) surveying, construction management, and operations support. Serves the upstream, midstream, and downstream segments of the oil and gas industry, industrial plants, marine and land-based, terminals and ports, and handling facilities for liquid and dry bulk.

Eiffel

Offshore Energy 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 projects. With more than 40 years of experience, the company is able to construct technical modules, living quarters, production platforms, jackets, and jack-up platforms with quality and HSE requirements.

EIM Controls Inc

13840 Pike Rd, Missouri City, TX 77489, 281-499-1561, toll-free: 800-679-1561, FAX: 281-499-8445, sales.usa@eim-co.com, www.eim-co.com

Offers common sense valve control worldwide, including Series 2000 electric actuators. Quarter and multiturn designs come in a range of frame sizes, horsepower ratings, and output speeds to meet a variety of torque, voltage, operating time, and valve shaft diameter requirements. (See ad p 7)

E Instruments Group

172 Middletown Blvd, Suite B201, Langhorne, PA 19047, 215-750-1212, FAX: 215-750-1399, info@einstrumentsgroup.com, www.einstrumentsgroup.com

Contact: Prod Mgr, Jason Esteves
Manufactures instrumentation solutions for the petroleum, oil, fuel, gas, power, process, industrial, institutional, chemical, pharmaceutical, food, automotive, and HVAC markets.

Elcometer Inc

1893 Rochester Industrial Dr, Rochester Hills, MI 48309, 800-521-0635, FAX: 248-650-0501, sales@elcometerusa.com, www.elcometer.com

Contact: Sls Mgr, Joel Bialek
Manufactures and distributes instruments for the quality control of surface coatings. Offers a line of coating, concrete, and physical test inspection instruments for both field and laboratory use.

Elcometer Ltd

Edge Ln, Manchester, M43 6BU UK, 44-161-371-6000, FAX: 44-161-371-6010, sales@elcometer.com, www.elcometer.com

Contact: New Media Tech Author, Vicky Meldrum

Manufactures high quality inspection equipment, with specialized divisions dedicated to coatings inspection, concrete inspection, and industrial metal detection. Also manufactures gauges for coating thickness, viscosity, holiday detection and abrasion, as well as other nondestructive test equipment. Provides choice and peace of mind, meeting your inspection needs.

Eldred Environmental & Export

Fol-Da-Tank Co Div

1275 W 11th St, PO Box 110, Milan, IL 61264, 309-787-3500, toll-free: 800-637-8265, FAX: 309-787-3635, info@fol-da-tank.com, www.eldredenvironmental.com

Contact: Sls Mgr, Chad Christensen
Manufactures portable secondary containment berms, folding frame liquid containment tanks, onion style self supporting tanks, and pillow tanks for emergency temporary spill containment.

Electrochem

Electrochem*(sub of Greatbatch Ltd)*

1000 Wehrle Dr, Clarence, NY 14031,
716-759-5800, toll-free: 866-224-8164, FAX:
716-759-2562, sales@electrochemsolutions.com,
www.electrochemsolutions.com

Contact: Sls Mgr, David Sieck

Provides technology solutions to the oil and gas industry with reliable, durable lithium batteries used in downhole drilling. The company now offers wireless sensor solutions; a complete system empowering operations in a range of oil field applications, including exploration, drilling, production, refining, and transportation.

Electrochemical Devices Inc

PO Box 355, Belmont, MA 02478-0003,
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 electrodes with long demonstrated design lives for all applications. Also offers linear distributed and probe-type impressed current anodes along with other cathodic protection products.

Elliott Co*(sub of Ebara Corp)*

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 compressors and steam turbines used in oil and gas, petrochemical and LNG markets and other industrial and power applications.

Emco Wheaton GmbH

Emcostrasse 24, D-35274 Kirchain, 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; marine loading arms, loading arms for road and rail tankers, swivel joints, API couplers, emergency separation systems, floating suction, and safe access equipment.

SALES OFFICES:**EMCO Wheaton USA Inc**

Houston, TX 281-856-1300, FAX:

281-856-1325, sales-us@emcowheaton.com,

www.emcowheaton.com

Gardner Denver France SA

Paris-Montrouge, France 33-1-46-12-41-41,

FAX: 33-1-46-12-41-59,

sales-fr@emcowheaton.com,

www.emcowheaton.com

EMEC Americas Inc

1365 Piper Rd, Ashby, MA 01431, 978-386-0000,
toll-free: 800-998-3632, FAX: 978-386-0002,
info@emecamericas.com,
www.emecamericas.com

Contact: Pres, Joe Novelli

Provides quality for the oil and gas industry. Achieves product performance through the application of proprietary manufacturing techniques and advanced product engineering to meet rigorous industry applications. Technology solutions include solenoid, centrifugal, and motor driven metering pumps.

Emerson Process Management*Rosemount Div*

8200 Market Blvd, Chanhassen, MN 55317,
952-906-8888, toll-free: 800-999-9307, FAX:
952-949-7001, www.rosemount.com

Offers a line of pressure, temperature, flow, and level instrumentation.

Emerson Process Management*Fisher Div*

301 S 1st Ave, Marshalltown, IA 50158,
641-754-3011, FAX: 641-754-2830,
www.fisher.com

Delivers time tested solutions designed to help customers reduce plant maintenance cost, reduce capital requirements, reduce cost of regulatory compliance, and increase process availability. This is enabled by products—such as Fisher control valves, regulators, instrumentation, and performance services—which are made for the process control industry.

Emerson Process Management*Rosemount Tank Gauging Div*

Gamlestadsv 18B, PO Box 13045, 402 51
Goteborg, Sweden, 46-31-337-0000, FAX:
46-31-253-022, sales.rtg@emerson.com,
www.rosemount-tg.com

Contact: Sls Mgr, Johan Sandberg

Offers 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 detection. Comes with the option of being installed in a wireless configuration.

Emerson Process Management*Rosemount Analytical Div*

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/remote

Contact: Prod Mgr, John Culp

Supplies flow computers, RTUs, presets, instruments, and engineering services under the Bristol, Control Wave, FloBoss, ROC, and Danload brands.

EMGS Americas

16000 Barkers Point Ln, Suite 145, Houston, TX
77079-4023, 281-920-5601, sg@emgs.com

Offers EM imaging that can reveal the presence of commercial hydrocarbon reserves and can identify reservoirs before seismic surveys are conducted.

EMK3

15770 N Dallas Pkwy, Suite 200, Dallas, TX
75248, 972-267-3653, tcoulter@emk3.com,
www.emk3.com

Contact: VP Sls/Bus Dev, Terry Coulter
Provides information technology solutions designed for oil and gas producers, marketers, first-purchasers, and operators of gathering and transportation systems. The company's software helps realize key business objectives across both upstream and midstream business processes, thereby enabling significant, sustainable improvements in revenue, productivity, and internal controls.

Emmert International*(div of Emmert Industrial Corp)*

11811 SE Highway 212, Clackamas, OR 97015,
503-655-7191, FAX: 503-655-3933,
remmert@emmertintl.com, www.emmertintl.com

Contact: VP Spec Proj, Terry M. Emmert
Specializes in overweight, oversized hauling, heavy lifting of large power components, entire plant installation, and relocation. Offers expertise and equipment to move anything, anywhere worldwide.

Empire Magnetics

5708-B LaBath Ave, PO Box 1908, Rohnert Park,
CA 94928, 707-584-2801, FAX: 707-584-3418,
empiremagnetics@empiremagnetics.com,
www.empiremagnetics.com

Contact: Pres, Rick Halstead

Offers specialty motors, gearboxes, and feedback devices for vacuum, radiation, wet, cryogenic, dusty, and hazardous environments.

EMS USA

2000 Bering Dr, Suite 600, Houston, TX
77057-3835, 713-595-7613, FAX: 713-595-7645,
teade@msglobal.net, www.emsglobal.net

Contact: Dir Mktg/Comms, Trevor Eade

Offers fully-integrated pipeline operations, management, and maintenance services to pipeline owners, operators, local distribution companies, and independent power, oil, and gas producers throughout North America. Eliminates the need for multiple contractors by delivering an integrated solution—one invoice, one point of contact, and one comprehensive insurance coverage.

Enardo

4470 S 70th East Ave, Tulsa, OK 74145,
918-622-6161, toll-free: 800-336-2736, FAX:
918-622-0004, sales@enardo.com,
www.enardo.com

Contact: VP Sls/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 U.S. Coast Guard, Factory Mutual, ATEX, and ISO 9001.

Enco

PO Box 357, Farmingdale, NY 11735,
800-873-3626, FAX: 800-965-5857,
sales@use-enco.com, www.use-enco.com

Supplies machinery, machine tools, and shop supplies. The company features a low price guarantee and a 99% in-stock inventory of all items ordered.

Endress+Hauser

2350 Endress Place, Greenwood, IN 46143,
317-535-7138, FAX: 317-535-8498,
inquiry@us.endress.com, www.us.endress.com

Contact: Mktg Asst, Ladonna Gilbert

Supplies process automation solutions. The company develops sensors and systems for production and logistics. These products acquire, transmit and use process information.

Enerac Inc

67 Bond St, Westbury, NY 11590, 516-997-2100,
toll-free: 800-695-3637, FAX: 516-997-2129,
bdascalj@enerac.com, www.enerac.com

Contact: Nat'l Sls Dir, Bill Dascal Jr.

Manufactures portable emissions analyzers for boilers, exhausts turbines, furnaces, and heaters for NOx, SO₂, CO, O₂, HC, and temperature reading.

Energy Institute

61 New Cavendish St, London, W1G 7AR UK, 44-20-7467-7100, FAX: 44-20-7255-1472, www.energyinst.org
Offers a chartered professional membership body for those working in energy. Provides an independent focalpoint to engage business and industry, government, academics, and the public. Promotes the safe, environmentally responsible, and efficient supply and use of energy in all its forms and applications.

Enerscope Systems Inc

15859 116th Ave, Edmonton, Alberta, Canada T5M 3W1, 780-439-9600, toll-free: 866-501-0818, FAX: 780-439-7787, sales@enerscopesystems.com, www.enerscopesystem.com
Supplies equipment for the oil and gas industry. Offers filtration systems worldwide. Provides products, including LAKOS and Amiad, for the oil and gas industry.

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, Gordán Ferić
Provides engineering high performance computing e-solutions; continuing education and professional development hours; and e-courses for energy conversion systems.

Englehart Energy Inc

400 N Sam Houston Pkwy E, Suite 301, Houston, TX 77060-3537, tom@englehartenergy.com, www.englehartenergy.com
Offers oil and natural gas finding geologists, geophysicists, and petroleum engineers with an average of 30 years experience in exploration and production and a 78% production completion success rate. Provides complete prospect presentations with appropriate technical data, volumetric calculations, and full cost economic models.

ENMET Corp

680 Fairfield Ct, PO Box 979, Ann Arbor, MI 48106, 734-761-1270, FAX: 734-761-3220, info@enmet.com, www.enmet.com
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, and 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 technology solutions for the energy industry. With 10 years of service experience, the company has a global presence with operations in North America, the Middle East, Asia/Pacific, South America, Europe, and the Far East.

Envirocore

IROC Energy Services Partnership Div
1910 715 5th Ave SW, Calgary, Alberta, Canada T2P 2X6, 403-263-1110, FAX: 403-263-1182, envirocore@iroccorp.com, www.iroccorp.com
Contact: Sr VP, Dean Webster
Specializes in UASe construction, including general oilfield construction, UASe and well site preparation, and road construction.

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.

Enviro-Pak/Tech Oil Products

4308 W Admiral Doyle Dr, New Iberia, LA 70560, 337-367-6165, FAX: 337-367-9956, lonnie@enviro-pak.net, www.enviro-pak.net
Contact: Sls Mgr, Lonnie Harrington
Manufactures, sells, and rents cargo baskets and compaction equipment, including general waste compactors, recycling compactors, drum crushers, filter crushers, balers, and galley grinders.

Enviro-tech Systems LLC

17327 Norwell Dr, PO Box 5374, Covington, LA 70435, 985-809-6480, FAX: 985-809-6422, frank@envirotechsystems.com, www.envirotechsystems.com
Contact: Pres, Frank A. Richerand
Designs and manufactures oil/water separation equipment, including the Enviro-Sep and Enviro-Cell. Also provides technical services and repairs on all oil/water separation equipment, including Wemco, Tridair, Monosep, and other manufacturers.

Epsis

1200 Smith St, Suite 1600, Two Allen Center, Houston, TX 77002, 713-353-4615, FAX: 713-353-4601, la@epsis.no, www.epsis.no
Contact: VP NA Sls/Mktg, Lee Alvarez
Supplies technology for integrated operations in the exploration and production industry.

ESS

1620 W Fountainhead Pkwy, Suite 100, 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, and safety (EH&S), and crisis management sustainability software that supports governance, risk, and compliance. The company has provided global and local software solutions for thousands of businesses and government agencies worldwide. Headquartered in Tempe, AZ, with offices in Denver, Houston, Washington D.C., Beijing, Calgary, and London.

E-T-A Circuit Breakers

1551 Bishop Ct, Mt Prospect, IL 60056, 847-827-7600, FAX: 847-827-7655, usinfo@e-t-a.com, www.e-t-a.com/electronic
Manufactures circuit breakers for equipment and is a resource for circuit protection technologies: thermal, thermal-magnetic, magnetic, electronic, and high performance. All modules are precision manufactured and fit the ever-increasing number of applications created by advancing technology.

Euramco Safety

2746 Via Orange Way, Spring Valley, CA 91978, 619-670-9590, FAX: 619-670-7345, tsingleton@euramcosafety.com, www.euramcosafety.com
Contact: Nat'l Sls Mgr, Dale Mohn
Manufactures a line of electric-, gasoline-, air-, and water-driven turbo blowers under the RAMFAN brand name. The RAMFAN Hazardous Location line of turbo ventilators and ducting is designed specifically for safe hazardous environment ventilation and include ATEX and UL certification.

Eurocon InfoSystem AB

PO Box 279, 891 26 Örnköldsvik, Sweden, 46-660-29-56-00, FAX: 46-660-83-805, info.sitebase@eurocon.se, www.sitebase.se
Contact: Mktg/Sls Mgr, Per Åström
Specializes in software that manages information and creates a structured and cost-effective environment to control all aspects of a project, plant, and site. The main product is SiteBase, an integrated site system for process industries. The key functions in SiteBase are project engineering and document handling.

Euro Petroleum Consultants Ltd (EPC)

44 Oxford Dr, Berrymonsey St, London, SE1 2FB UK, 44-20-735-78394, FAX: 44-20-735-78395, conferences@europetro.com, www.europetro.com
Contact: Conference Dir, Suzanne Costello
Organizes technology and business conferences and also provides independent consulting advice and assistance through all stages of project analysis and implementation.

EverGlow NA Inc

1122 Industrial Dr, PO Box 830, Matthews, NC 28106-0830, 704-841-2580, toll-free: 866-744-4706, FAX: 704-841-2582, info@everglow.us, www.everglow.us
Manufactures code compliant photoluminescent exit signs, exit path markings, stair and handrail markers, obstacle and hazard markers, safety equipment signs, films, tapes, and coatings.

Everlasting Valve Co

108 Somogyi Ct, South Plainfield, NJ 07080, 908-769-0700, FAX: 908-769-8697, info@everlastingvalvesusa.com, www.everlastingvalvesusa.com
Contact: Gen 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.

Exele Information Systems Inc

Exele Information Systems Inc

445 W Commercial St, East Rochester, NY,
585-385-9740, sales@exele.com,
www.exele.com

Contact: Dane Overfield

Provides consulting software engineering company that specializes in manufacturing applications such as real-time process control. A privately-held company founded in 1978, provides consulting, environmental reporting, and software products for process automation (OPC, SCADA, PI), and systems.

Exploration Logistics Group plc

Bldg 8, 3rd Floor, 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

Specializes in the provision of medical and safety solutions for companies operating in remote and hazardous environments. With 1000 experienced staff worldwide, the company offers health and safety services, medical support, medical supplies and equipment, driver training, mountaineering support, mine and unexploded ordnance clearance, and explosive detection dog teams.



Express Integrated Technologies LLC
1640 S 101st East Ave, Tulsa, OK 74128-4630,
918-622-1420, FAX: 918-622-1457,
sales@expresstechnology.com,
www.expresstechnology.com

Contact: Mktg Coord, Phyllis Kraus
Provides, designs, and builds fired heaters; waste heat systems to process fluids for energy recovery, steam generation, and heat media systems. Provides engineering support and services for thermal performance evaluations, heater modification studies, combustion evaluations, burner upgrades and emissions improvements, replacement parts, start-up assistance, and inspection services.

Express Signs (North East) Ltd

Unit 1 Portrack Grange Close, Stockton-on-Tees, Cleveland, TS18 2PU UK, 44-1642-670748,
expresssigns@ntlworld.com

Provides industrial and commercial engraving, laser engraving, S/S cable markers, labels, signs, identifications products, and health and safety signs.

Expro Americas LLC

738 Highway 6 S, Suite 500, Houston, TX 77079,
713-463-9776, FAX: 281-587-8833,
jeff.whittaker@dnhvi.com, www.exprogroup.com

Provides services and products that measure, improve, control, and process flow from high-value oil and gas wells. Services include well testing, production systems, wireline intervention, measurements, chokes, connectors, and measurements, providing customers with the well flow services they need.

eyevis

In Laisen 76, D-72766 Reutlingen, Germany,
49-712-143-303-0, FAX: 49-712-143-303-22,
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, including DLP rear projection cubes, LCD monitors, graphics controllers, and display and well management software.

FabEnCo Inc

2002 Karbach St, Houston, TX 77092,
713-686-6620, toll-free: 800-962-6111, FAX:
713-688-6031, www.safetygate.com

Designs develops, manufactures and markets quality fabricated metal products including the FabEnCo Self-Closing Safety Gate.
(See ad p 25)

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 and 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.

FactoryNetwork Inc

9423 Montgomery Rd, Cincinnati, OH 45242,
513-273-4760, FAX: 866-612-7089,
kathy.sostaric@factorynetwork.com,
www.factorynetwork.com

Provides an online marketplace for new and used industrial equipment and services.

FAFNIR GmbH

Bahrenfelder Strasse 19, PO Box 50 13 49,
22765 Hamburg, Germany, 49-40-398-2070,
FAX: 49-40-390-6339, info@fafnir.de,
www.fafnir.com

Contact: Dir Sls, Lars Weidemeyer

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 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,
diana.dibartolomeo@ntlschaeffler.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.

Fairchild Industrial Products Co

3920 West Point Blvd, Winston-Salem, NC 27103, 336-659-3438, FAX: 336-659-9323,
bcarpenter@fairchildproducts.com

Contact: VP Sls/Mktg, Brian Carpenter

Manufactures precision pressure control devices, including pressure regulators, volume boosters, pneumatic relays, I/P pressure transducers, and P/I pressure transmitters.

FalCan Industries Ltd

260 Hartley Ave, PO Box 1178, Fort Macleod, Alberta, Canada T0L 0Z0, 403-553-2114,
toll-free: 866-853-2114, FAX: 403-553-2527,
falcan@telusplanet.net, www.falcan.com

Contact: Pres, James Vandervalk
Manufactures a complete line of equipment trailers and truck/service decks. Specializes in custom fabrication design and engineering. Provides onsite engineers and craftsmen who can work with the customer to design specialized units. Also manufactures heavy duty bumper grill guards and a truck mounted crane.

Falcon Electric Inc

5106 Azusa Canyon Rd, Irwindale, CA 91760,
626-962-7770, toll-free: 800-842-6940, FAX:
626-962-7720, sales@falconups.com,
www.falconups.com

Manufactures award-winning, rugged power backup and protection systems (UPS) and specializes in oil/petroleum applications. Offers UPS products with galvanic isolation to protect petroleum equipment in harsh environments. Our products are used by Chevron, Allis Chalmers, and other major oil industry companies with more than one million units worldwide.

FARO Technologies Inc

125 Technology Park, Lake Mary, FL 32746,
407-333-9911, FAX: 407-333-4181,
darin.sahler@faro.com, www.faro.com

Contact: Mktg, Dan Alred

Develops portable devices for 3-D measurement, inspection, imaging, and documentation. Focus is on simplifying customers' work with tools that make them more productive. Instruments allow for more complex measurement which could not be achieved with traditional techniques.

Farwest Corrosion Control Co

1480 W Artesia Blvd, Gardena, CA 90248,
310-532-9524, FAX: 310-532-3934,
sales@farwestcorrosion.com,
www.farwestcorrosion.com

Contact: VP, Troy Rankin

Provides cathodic protection and corrosion related materials, equipment, and services. Operates on a worldwide basis with six warehouse locations.

FasTest Inc

1646 Terrace Dr, Roseville, MN 55113,
651-645-6266, toll-free: 800-444-2373, FAX:
651-645-7390, fastsales@fastestinc.com,
www.fastestinc.com

Contact: VP Mktg, Grant Bistram

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.

FCI Fluid Components International LLC

1755 La Costa Meadows Dr, San Marcos, CA 92078-5187, 760-744-6950, toll-free:
800-854-1993, FAX: 760-736-6250,
fcimarcom@fluidcomponents.com,
www.fluidcomponents.com

Contact: Mktg/Comms, Mary Pund

Manufactures mass flowmeters, gas flowmeters, liquid flowmeters, liquid flow switches, gas flow switches, and liquid level switches for industrial processes and on-board aircraft applications.

Fecon Inc

3460 Grant Dr, Lebanon, OH 45036,
513-696-4430, FAX: 513-696-4431,
sales@fecon.com, www.fecon.com
Contact: VP Sls, Mike Slattery

Fedd Wireless LLC

5315-B FM 1960 West, Suite 364, Houston, TX
77069, 832-375-0807, FAX: 832-375-0898,
jbrooks@feddwireless.com,
www.feddwireless.com

Contact: Mktg Mgr, Jim Brooks
Manufactures an industrial data acquisition system that monitors hydrocarbons, pressure, temperature, flow, volume, and vibration in tanks, pipelines, pumps, fans, and rotating equipment throughout a facility. Information is then wirelessly transmitted to any receipt point(s) located worldwide.

FHF Funke Huster Fernsig GmbH

Gewerbealle 15-19, PO Box 140166, 45478
Muelheim/Ruhr, Germany, 49-208-8268-0, FAX:
49-208-8628-268, info@fhf.de, www.fhf.de

Contact: Dir Sls/Mktg, Hans Gunkel
Manufactures weather and explosion proof signalling devices and telephone sets, loudspeakers, IP phones, and monitoring systems.

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
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

810 Cromwell Park Dr, Suite R, Glen Burnie, MD
21061, 410-760-9696, toll-free: 888-342-6987,
FAX: 410-760-8686, dsouffie@fiboxusa.com,
www.fiboxusa.com

Contact: Mgr, Diane Souffie
Manufactures corrosion resistant plastic enclosures for the electronic and electrical industries. The company's NEMA 4X enclosures protect products from hostile environments. Offers more than 700 off-the-shelf sizes, from 2x2x2 in. to 24x16x10 in.

Fieldserver Technologies

1991 Tarob Ct, Milpitas, CA 95035,
408-262-2299, toll-free: 888-509-1970, FAX:
408-262-9042, sales@fieldserver.com,
www.fieldserver.com

Provides gateways and protocol translators that enable interoperability between different devices and systems, even when they utilize different communication protocols. Has a large protocol library.

FIMA Maschinenbau GmbH

Oberfischacher Str 58, 74423 Obersontheim,
Germany, 49-7973-693-614, FAX: 49-7973-693,
info@fima.de, www.fima.de
Develops individual solutions in fluid mechanics and process technology. Realizes customer-specific systems.

Fire Combat

(div of *Sensor Electronics Corp*)
5500 Lincoln Dr, Minneapolis, MN 55436-0407,
952-938-9486, FAX: 952-938-9617,
sales@sensorelectronics.com, www.firecombat.com

Contact: Mktg Mgr, Sarah Robb
Manufactures single, dual, and triple agent component, trailer and skid systems using dry chemical, foam, and clean agent fire suppression systems.

Fire & Safety Equipment

2420 Harrison Ave, PO Box 5646, Rockford, IL
61125, 815-394-0100, toll-free: 800-541-2528,
FAX: 815-394-0320, www.firensafety.com

Contact: Cust Svc Mgr, Diana Bliss
Distributes safety equipment. Free 184-page catalog of personal protective equipment, gloves, clothing, footwear, respirator, eye and face protection, and more. Fire extinguisher sales and service and Ansul fire suppression systems.

Fireye Inc

(div of *UTC*)
Fire & Security 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: Inside Sls Rep, Juliann Goodwill
Manufactures coating thickness, ferrite content, and material analysis measurement instruments. Various measurement principles are incorporated into hand held and bench top modules. Thickness measurement includes anodization, paint, and precious metals with single, double, or alloy coatings. Other product offerings include porosity testers, conductivity meters, x-ray fluorescence, certified standards, and foils.

Fisher Tank Co

3131 W 4th St, Chester, PA 19013,
610-494-7200, FAX: 610-485-0157,
sales@fishertank.com, www.fishertank.com

Contact: Sls Mgr, Fred Ruinen
Provides fabrication, erection, repair, and modification of aboveground welded steel storage tanks.

SALES OFFICES:

Southeast Sales Office
Lexington, SC 803-359-4173,
sales@fishertank.com

**Fixturlaser AB**

Östergårdsgatan 9, PO Box 7, SE-431 21
Molndal, Sweden, 46-31-706-2800, FAX:
46-31-706-2850, info@fixturlaser.se,
www.fixturlaser.com

Contact: Man/Mktg Dir, Hans Svensson
Develops, manufactures, and markets laser-based measurement instruments for alignment and positioning of rotating machinery in any kind of manufacturing industry. Our systems are user friendly tools that minimize the number of operations involved in the alignment process, thus speeding up the process.

Flex-a-Seal Inc

One Jackson St, Essex Junction, VT 05453,
802-878-8307, toll-free: 800-426-3594, FAX:
802-878-2479, sales@flexaseal.com,
www.flexaseal.com

Contact: Bus Dev, Rodney Strong
Manufactures mechanical seals for the fluid sealing industry. Products range from simple single-spring seals to complex engineered cartridge designs. The company is renowned for its welded bellows capabilities and its patented split seal cartridge design. Offers quick and dependable deliveries and engineering support.

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/Comms, Ed Metro
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 Separation Technology Inc

(div of *Flottweg AG Germany*)
10700 Toebben Dr, Independence, KY 41051,
859-448-2300, FAX: 859-448-2333,
esweeney@flottweg.net, www.flottweg.com

Contact: Ind Mgr, Ed Sweeney
Manufactures liquid and solid separation equipment, including decanter centrifuges, tricanter centrifuges, disc centrifuges, and related systems.

Flowline Specialists Ltd

Mill of Crichtie, Fyvie, Turriff, AB53 8QL UK,
44-1651-89-1890,
alistair@flowlinespecialists.com,
www.flowlinespecialists.com

Contact: Man Dir, Alistair Nieuwenhuijse
Supplies under rollers, including shelf loading rollers for flexible pipe and umbilical reels, powered reels, and HP hoses for ship to rig hose transfer, turntables and subsea pallets, tensioners, reels, flexible pipe, umbilicals and buoyancy modules. We also carry out plastic welding and pressure testing of flexible pipes.

Flowserve Corp

Pump Div
C/o TriCom B2B, 1200 Industrial Park Dr,
Vandalia, OH 45377, 937-890-5311, toll-free:
800-728-7867, FAX: 937-890-5314,
fpdinfo@flowserve.com, www.flowserve.com

Provides fluid motion and control products and services. Operating in more than 55 countries, the company produces engineered and industrial pumps, seals, and valves, as well as a range of related flow management services.

Flowserve Corp

1978 Foreman Dr, Cookeville, TN 38502,
931-432-4021, toll-free: 800-251-6761, FAX:
931-432-5518, bhood@flowserve.com,
www.flowserve.com

Contact: Dir Mktg Process, Roy Johnson
Provides the systems, products, and experience to help your processes run smarter, safer, and more efficiently. The industry's most complete range of valves, actuators, positioners, controls and switches - complemented by their comprehensive R&D, engineering, and global support services - provide every customer with a one-stop solution to their flow control needs.

FLSmith Inc

FLSmith Inc

Pneumatic Transport Department Div
2040 Ave C, Bethlehem, PA 18017,
610-264-6800, toll-free: 800-523-9482, FAX:
610-264-6735, info-us@flsmith.com,
www.flis-pt.com

Contact: Sls Mgr, Fred Wuertele
Offers an industry leader in pneumatic conveying for bulk materials handling. The company offers technology and experience in all aspects of material handling systems, and has more than 30 offices, subsidiaries, and joint ventures located around the world.

Fluid Components International (FCI)

1755 La Costa Meadows Dr, San Marcos, 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 Design Solutions Inc

PO Box 3466, Spruce Grove, Alberta, Canada
T7X 3A7, 780-960-8848, FAX: 780-960-8877,
www.fluid-design.ca

Contact: Pres, Shawn Neilsen
Manufactures oilfield equipment.

Fluid Dynamics International

White Pl, River Rd, Taplow, Bucks, SL6 0BG UK,
44-1628-634-073, FAX: 44-1628-670-981,
info@scaleprevention.com,
www.scaleprevention.com

Supplies catalytic water treatment systems to prevent scaling caused by hard water, salts, seawater, and some waxes.

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, and accuracy better than 1%.

Fluid Power Inc

534 Township Line Rd, Blue Bell, PA 19422,
215-643-0350, FAX: 215-643-4017,
mries@fluidpowerinc.com

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.

Force Compression Systems

PO Box 652, Stettler, Alberta, Canada T0C 2L0,
888-782-0615, www.forcecompression.ca

Contact: Sales
Manufactures a line of casing gas and booster compressors to 400 HP. We believe in providing a standard proven product to meet the needs of multiple customers. All of our packages have pre-engineered options to fit most applications. Committed to meeting your compression need simply.

Foremost Industries LP

1225 64th Ave NE, Calgary, Alberta, Canada T2E
8P9, 403-295-5800, toll-free: 800-661-9190, 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, and 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 Prods 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

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

Contact: Pres, Philip Irving
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.

FoxFury Personal Lighting Solutions

2091 Elevado Hills Dr, Vista, CA 92078,
760-945-4231, FAX: 760-758-6283,
fox@foxfury.com, www.foxfury.com

Contact: Dir Mktg, Antonio Cugini
Manufactures UL 913 class 1, Division 1 personal lighting solutions which offer hands-free use, enhanced distance and peripheral visibility, and immediate situation assessment.

Fox Thermal Instruments Inc

399 Reservation Rd, Marina, CA 93933,
831-384-4300, FAX: 831-384-4312,
sales@foxthermalinstruments.com,
www.foxthermalinstruments.com

Contact: VP Sls/Mktg, Rich Cada
Manufactures Model 10A thermal mass flowmeter; the Model FT2 gas mass flowmeter; and the Model SW100 thermal flow and level switch. Experienced in thermal flow design, proactive to customer needs, and is dedicated to the development of new products.

FRIATEC Aktiengesellschaft

Rheinhütte Pumpen Div
Rheingaustraße 96-98, 65203 Wiesbaden,
Germany, 49-611-604-0, FAX: 49-611-604-328,
info@rheinhuette.de, www.rheinhuette.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.

Frontier Drilling

Statsminister Michels, PO Box 6076, NO-5892
Paradis, Norway, 47-5592-2820, FAX:
47-5592-2930, goj@frontier-drill.com
Provides drilling and early production services.

Frontier Power Products Ltd

7983 Progress Way, Delta, British Columbia,
Canada V4G 1A3, 604-946-5531, FAX:
604-946-8524, lyork@frontierpower.com,
www.frontierpower.com

Contact: Pres, Larrie York
Supplies diesel and gas engines to 4000 hp. Manufactures diesel powered generator sets, custom pumping units, power units, and NG engines. Authorized distributor for John Deere, Kubota, and Mitsubishi engines. Funk power transmission products and Kohler generators.

Fugro-Geoteam AS

(sub of Fugro NV)
Development & Production Div
Hoffsveien 1C, PO Box 490 Skoyen, N-0213
Oslo, Norway, 47-22-13-4600, FAX:
47-22-13-4646, geoteam@fugro.no,
www.fugro.no

Contact: VP Sls/Mktg, Jan Helgebostad
Operates a high technology fleet of seismic vessels. With more than 30 years of experience, the company is capable of meeting today's variety of technical and environmental challenges when acquiring and processing 2-D, 3-D, and 4-D seismic data.

Fugro-Jason

6100 Hillcroft, Suite 200, Houston, TX 77081,
605-491-4144, ejohnson@fugro-jason.com,
www.fugro-jason.com

Contact: Mktg Dept, Erik Johnson
Helps customers increase the profitability of their reservoirs through quantitative integration of geoscience and engineering information into highly accurate and predictive reservoir models. Customers can take advantage of this advanced technology either by purchasing software and training or by utilizing our experienced consulting service staff to perform the processing and analysis on their behalf.



Future Fibre Technologies US Inc
800 W El Camino Real, Suite 180, Mountain
View, CA 94040, 770-973-2531, FAX:
435-417-6671, ereynolds@fft-usa.com,
www.fft-usa.com

Contact: Bus Dev, Erick Reynolds
Manufactures Secure Fence and Secure Pipe outdoor fiberoptic intrusion detection and monitoring systems that provide early warning and location of intrusions on perimeters and buried pipelines. Requires no electronics and no power in the field. Patented technology is in use at military, commercial, and pipeline facilities worldwide.

G3 Technologies

2536 W 239th St, Louisburg, KS 66053,
913-947-7205, info@g3ti.com, www.g3ti.com

Contact: Pres, Jim Grimes

Designs and manufactures specialized wireless I/O devices for remote site monitoring and control in the oil and gas industry, for well fields, pipelines, and more. Both stand-alone master/slave pairs for cable replacement and Modbus Slave units are offered. The wireless I/O is robust, highly integrated, and optimized for solar power.

Galvotec Alloys Inc

181 Grefer Ln, Harvey, LA 70058, 504-362-7776,
FAX: 504-362-7440, anodes@galvotec.com,
www.galvotec.com

Contact: Reg Mgr, Linda B. Perque

Gamajet Cleaning Systems Inc

604 Jeffers Cir, Exton, PA 19341, 610-408-9940,
toll-free: 877-426-2538, bob@gamajet.com,
www.gamajet.com

Contact: Pres, Bob Delaney

Manufactures rotary impingement cleaners for both above- and underground storage tanks.

Gardner Denver

1800 Gardner Expwy, Quincy, IL 62305,
217-222-5400, FAX: 217-228-8243,
maggie@gardnerdenver.com,
www.gardnerdenver.com

Contact: Mktg Spec, Susan Wray

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.

Gardner Denver Machinery Inc

4747 S 83rd East Ave, Tulsa, OK 74145,
918-664-1151, FAX: 918-664-6225,
tollcustserv@gardnerdenver.com,
www.gardnerdenver.com

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 distribution. Provides application and package design engineering, and fabricates packages incorporating high quality compressors manufactured by Howden, Burton Corblin, and others. Maintains a large inventory of genuine, factory approved spare parts and provides field services.

Gascat Industrial e Comercio Ltda

Rodovia SP-73, No 1141, Indaiatuba, 13347-390
Brazil, 55-19-3936-9300, FAX: 55-19-3935-6009,
sales@gascat.com.br, www.gascat.com.br

Contact: Mgr, Celso Nieto

Produces pressure regulators, shut-off valves, relief valves, heaters, gas filters (cartridges, quick closure, basket, and combined), pressure regulation and measurement stations, and city-gates; all embedding high technology and quality.

The GasGun Inc

165 SW Tualatin Loop, West Linn, OR 97068,
503-557-1370, info@thegasgun.com,
www.thegasgun.com

Contact: Pres/CEO, Adam Schmidt

Provides a wireline conveyed propellant stimulation device based on proprietary ballistic technology from the U.S. military. It incorporates a design by using progressively burning propellants that have been proven by independent research to be many times more effective in creating fractures and increasing formation permeability.

Gasoline Chemicals-Federal Process Corp

4620 Richmond Rd, Cleveland, OH 44128,
216-464-6440, FAX: 216-464-2080,
drew@pinnmedia.com, www.gasoila.com

Offers a line of products for the petroleum, plumbing, LP gas, HVAC, automotive, and general industrial markets. From industrial thread sealants and cutting oils to gas gauging pastes and industrial cleaning chemicals, provides a choice for tough, reliable chemical products that get the job done.

Gassonic

Energivej 42A, DK-2750 Ballerup, Denmark,
45-44-700-910, FAX: 45-44-700-911,
mail@gassonic.com, www.gassonic.com

Contact: Man Dir, Martin T. Olesen

Provides ultrasonic gas leak detectors for the processing industry worldwide. Ultrasonic gas leak detection ensures instant detection without being affected by changing wind directions and fast dilution of the gas. The company is part of General Monitors, total solution providers for flame and gas detection systems.

Gas Turbine Efficiency Inc

300 Sunport Ln, Orlando, FL 32809,
407-304-5200, FAX: 407-304-5201,
info@gtefficiency.com, www.gtefficiency.com

Contact: Pres, Michael S. Thomas

Designs, manufactures, and supplies proprietary cleantech energy saving and performance enhancing systems to the power generation, oil and gas and aviation industries. The company's portfolio of patented cleantech solutions save fuel, reduce emissions, increase availability, and extend turbine and parts life.

Gas Turbine Efficiency LLC

300 Sunport Ln, Orlando, FL 32809,
407-304-5200, FAX: 407-304-5201,
info@gtefficiency.com, www.gtefficiency.com

Contact: Pres, Michael S. Thomas

Designs, manufactures, and supplies cleantech energy saving and performance enhancing solutions to the power generation, oil and gas and aviation industries. The company's extensive portfolio of patented cleantech solutions save fuel, reduce emissions, increase availability, and extend turbine and parts life.

Gates Corp

Fluid Power Div
1551 Wewatta St, PO Box 5887, Denver, CO
80217, 303-744-1911, toll-free: 800-366-3128,
FAX: 303-744-4499,
gatesmail@salesupport.com,
www.gates.com/oilfield

Contact: Mktg Dir, Sheila Schnoor

Provides belts, hoses, and hydraulics.

Gateway Safety Inc

11111 Memphis Ave, Cleveland, OH 44144,
216-889-2000, FAX: 216-749-0526,
info@gatewaysafety.com,
www.gatewaysafety.com

Contact: VP, Matthew J. Love

Designs and manufactures industrial safety products. Over the course of 60 years, the company has earned a reputation as a provider of durable, yet cost-effective, personal protection equipment. Product lines are available in eye, face, head, hearing, and respiratory protection.

The Gauge House

117 Row 1, PO Box 80426, Lafayette, LA 70508,
337-261-0510, FAX: 337-261-0512,
robert@gaugehouse.net, www.gaugehouse.com

Contact: Sls, Scott Rowe

GD Engineering

(div of SPX Flow Control)

19191 Hempstead Hwy, Houston, TX 77065,
281-807-2815, FAX: 281-807-2805,
gd@processequipment.spx.com,
www.spxfc.com

Contact: Nat'l Sls Mgr, Steven King

Manufactures high pressure pipeline products.

GEA Jet Pumps GmbH

Einsteinstrasse 9-15, 76275 Ettlingen, Germany,
49-7243-705-0, FAX: 49-7243-705-351,
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 an 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, geai@ge.com,
www.geinstruments.com

Contact: Sls, Sandy Barber

Manufactures instruments for measuring total organic carbon (TOC) in water, and also offers highly sensitive total boron and nitric oxide analyzers, as well as oil-on-water monitoring systems. The company's brands include Sievers and Leakwise.

GEA Westfalia Separator Systems

Werner-Habig-Str 1, 59302 Oelde, Germany,
49-2522-77-0, FAX: 49-2522-77-1778,
ws.systems@geagroup.com,
www.westfalia-separator.com

Contact: Head Oilfield, Thomas Perschke

Delivers compact system solutions with high speed centrifugal separators. Main applications: drain water, drilling mud, produced water, crude oil, bilgewater, slop oils, and oil sands. Helps to improve return on capital employed and to meet stringent environmental regulations.

GE Energy

GE Energy*Optimization and Control Div*

1631 Bently Pkwy S, Minden, NV 89423, 775-215-2226, FAX: 775-215-2864, bnsales@ge.com, www.ge-energy.com/oc
Serves the condition monitoring needs of many industries through portfolio of Bently Nevada permanent and portable vibration monitoring instrumentation. System 1 software links online and offline condition monitoring technologies and provides services covering product repair and installation, machinery diagnostics, and consulting services for reliability improvement.

GE Fanuc Intelligent Platforms

Route 29 N & Route 606, PO Box 8106, Charlottesville, VA 22911, 434-978-5200, toll-free: 800-433-2682, FAX: 434-978-5205, www.gefanuc.com

Contact: Global Ind Mgr Oil/Gas, Mayank Mehta

Provides a high performance technology company and global provider of hardware, software, services, expertise, and experience in automation and embedded computing, with products employed in virtually every industry, including manufacturing automation, defence, automotive, telecommunications, healthcare, and aerospace. Part of GE Enterprise Solutions.

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 of experience, the company is committed to protecting life and property.

Genoil Inc

2020 633 6th Ave SW, Calgary, Alberta, Canada T2P 2Y5, 403-750-3450, FAX: 403-290-0592, sales@genoil.net, www.genoil.net

Contact: Pres, Thomas Bugg
Develops hydrocarbon and oil and water separation technologies. The Hydroconversion Upgrader (GHU) upgrades and increases yields of heavy crudes and refinery feedstocks into light, clean transportation fuels. The Crystal bilge water treatment system meets U.S. Coast Guard standards according to 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. The company's 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 oilfield 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.

Geospatial Corp

229 Howes Run Rd, Sarver, PA 16055, 724-353-3400, FAX: 724-353-3049, info@geospatialcorporation.com, www.geospatialcorporation.com

Contact: Exec VP, Linda Ward
Provides solutions to the underground infrastructure industry. Proven mapping systems technology accurately maps x-y-z centerline coordinates and creates 3-D maps/GIS databases. Technology provides clients in the oil and gas, electric, municipal services (water and sewer), telecommunications, GIS, and HDD markets fast, cost-effective solutions.

Geovariances

49 bis Ave Franklin Roosevelt, 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: Sls 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.

Gesellschaft für OELTECHNIK mbH

Lessingstrasse 32, 68753 Waghäusel, Baden, Württemberg, Germany, 49-7254-981-232, FAX: 49-7254-981-239, sales@oeltechnik.com, www.oeltechnik.com

Contact: Int'l Sls, Bernhard Hackmann
Specializes in the design and fabrication of shell and tube heat exchangers, enhanced surface inter- and aftercoolers for turbo compressors, surface condenser systems, fin fan heat exchangers, and oil systems. The company designs and fabricates pressure vessels according to international and national codes and design regulations.

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 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
Develops and manufactures a line of portable gas detectors, fixed systems, and respiratory airline monitors to provide protection from combustible gases and vapors, oxygen hazards, and toxic gases. Reliable protection that can be customized to meet your specific gas detection needs.

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 pipes 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: Ch Comm Off, 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.

Glasforms

3943 Valley E Industrial Dr, Birmingham, AL 35217, 800-778-6002, FAX: 408-294-2064, marker-sales@glasforms.com, www.glasforms.com

Manufactures pipeline markers and warning decals.

Global Detection Systems Corp

3904 Searle Dr, Houston, TX 77009,
713-984-1437, FAX: 713-984-0955,
kprice@globaldetectionsystems.com,
www.globaldetectionsystems.com

Contact: Pres, Ken Price

Manufactures a line of combustible and toxic gas detectors and control systems. The systems are designed for harsh industrial and offshore applications and carry CSA certifications. The electronic displays offer user-friendly access and state-of-the-art diagnostics.

Global Energy Services Ltd

#10, 5920 11th St SE, Calgary, Alberta, Canada
T2H 2M4, 403-243-0820, FAX: 403-243-3425,
www.global-energy.com

Global Flow Technologies

10600 Corporate Dr, Stafford, TX 77477,
281-565-1010, toll-free: 800-231-3530, FAX:
281-565-3171, sales@globalflowtech.com,
www.globalflowtech.com

Contact: VP Int'l Sls, Maury Mills

Manufactures DSI gate, globe and check valves, PBV floating and trunnion mounted ball valves, ABZ butterfly valves, and Quadrant ball and butterfly valves and actuators for the petroleum, gas, power, and chemical industries worldwide.

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 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.

Global Training Solutions Inc

3136 Winston Churchill Blvd, PO Box 26067,
Mississauga, Ontario, Canada L5L 5W7,
416-806-5777, info@globaltrainingsolutions.ca,
www.globaltrainingsolutions.ca

Contact: VP Sls, Annalisa Larocca

Supplier of training programs and instructor-led courses aimed at the development, training, and safety of employees. Training programs are available on interactive CD-ROM, web-based e-learning, and DVD and VHS formats. Training topics include maintenance, operations, industrial skills, safety and environment, health, human resources, and sales.

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 Sls, 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.

GM International Safety Inc

(div of GM International Srl)

17453 Village Green Dr, Houston, TX 77040,
713-896-0777, toll-free: 800-960-3088, FAX:
713-896-0782, info@gmisafety.com,
www.gmisafety.com

Contact: Sls Mgr, Giorgio Landrini

Manufactures intrinsically safe instrumentation, such as isolators, barriers, digital/temperature multiplexers, display, and power supplies. Also offers a full line of SIL3 rated products. Offers high quality products at competitive pricing with stock delivery.

Godwin Pumps

One Floodgate Rd, Bridgeport, NJ 08014,
856-467-3636, FAX: 856-467-4841,
sales@godwinpumps.com,
www.godwinpumps.com

Contact: Nat'l Sls 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 U.S. rental offices, global network of distributors, rental fleet, more than 5000 pumps, complete parts inventory, and manufacturing facilities on two continents.

W L Gore & Associates Inc

Fibers Div

PO Box 1488, Elkton, MD 21922, 410-392-3200,
brodrigu@wlgore.com, www.gore.com

Gorman-Rupp Co

PO Box 1217, Mansfield, OH 44901-1217,
419-755-1011, FAX: 419-755-1251,
grsales@gormanrupp.com, www.grpumps.com

Contact: Sls Mgr Ind'l Pumps, John Zgela
Manufactures high performance, high quality pumps and pumping systems that allow for lasting service in the construction, municipal, water, wastewater, sewage, industrial, petroleum, fire, agricultural, and OEM markets. Pump line includes self-priming centrifugal, standard centrifugal, submersible, trash, priming assisted, rotary gear, and air-driven diaphragm.

Gough Econ

9400 N Lakebrook Rd, PO Box 668583,
Charlotte, NC 28266-8583, 704-399-4501,
toll-free: 800-264-6844, FAX: 704-392-8706,
sales@goughecon.com, www.goughecon.com

Manufactures heavy-duty bucket elevator and conveyor systems, belt conveyors, vibratory feeders, and screens.

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.

Governor Control Systems Inc

3101 SW 3rd Ave, Fort Lauderdale, FL 33315,
877-659-6328, FAX: 954-761-8768,
info@govconsys.com, www.govconsys.com

Contact: Oper Mgr, Kenny Dennis

Specializes in control, starting, and monitoring solutions. Control system engineering/modernizations, 24/7 worldwide service/repair, tech support, and product training. Schaller Visatron Oil Mist Detection systems, Dynalco instrumentation, TDI air starters, and DCL emissions controls.

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: Sales

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.

Grabner Instruments Messtechnik GmbH

Dr Otto-Neurath-Gasse 1, A-1220 Vienna,
Austria, 43-1-282-16-27-13, FAX:

43-1-280-73-34,

info.grabner-instruments@ametec.at,

www.grabner-instruments.com

Contact: Prod Mktg Mgr, Hannes Pichler
Manufactures fully automated, portable, rugged, and easy-to-operate fuel and oil analyzers for accurate quality control in the laboratory, as well as for fast on-site tests in mobile laboratories. Product line includes vapor pressure, flashpoint and distillation testers, fuel and viscosity analyzers, and other instruments.

Grace Engineered Products Inc

5001 Tremont Ave, Davenport, IA 52807,
563-386-9596, toll-free: 800-280-9517, FAX:
563-386-9639, sales@grace-eng.com,
www.graceport.com

Provides products that assist people with electrical safety while increasing employee productivity. Known as the "Thru-door Electrical Safety People."

Graco Inc

PO Box 1441, Minneapolis, MN 55440,
877-844-7226, FAX: 612-623-6940,
gracocustomerservice@graco.com,
www.graco.com

Manufactures pumps, meters, valves, hose reels, and other fluid handling equipment used in lubrication applications, as well as sprayers for corrosion control applications.

G-raff Systems

5384 Evergreen Pkwy, PO Box 406, Sheffield
Village, OH 44054, 440-238-4360, FAX:
440-934-4052, dingram@g-raffsystems.com,
www.g-raffsystems.com

Contact: Sls Mgr, Doug Ingram

Manufactures a line of tank truck fall protection equipment and access equipment.

Granco Manufacturing Inc

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.

Graves & Co

1415 Louisiana, Suite 2100, Houston, TX 77002, 713-650-0811, FAX: 713-650-0840, cmiller@graves-co.com, www.graves-co.com

Contact: Owner/Pres, John Graves

Provides transaction advisory, service, and support to the upstream oil and gas industry. The firm has a predominant buy-side focus, and assists clients in the acquisition of producing properties, negotiating and documenting exploration joint ventures and drilling deals, and in conducting due diligence for lenders.

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 of instruments for IAQ pressure and general HVAC applications. On board sensor tips include government and industry guidelines. Snapshot of continuous Data Logging. Stores data with text, graphic, and audio notes. Inquire for purchase, lease, and rental.

Greenstone Inc of Delaware*(sub of Greenstone Holdings Inc)*

11 Penn Plaza, 5th Flr, New York, NY 10001-2003, 877-387-3330, FAX: 646-304-2439, inquiry@egreenstone.com, www.egreenstone.com

Contact: CEO, Sal Miwa

Manufactures and imports anticorrosion coating Permeate for steel and concrete, GreenShield sealer for wood and paper, MagneLine polymer cement mortar, and Crystal-Guard asbestos sealer.

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

1332 Londontown Blvd, Suite 200, Sykesville, MD 21784, 410-970-7800, FAX: 410-970-7997, info@gses.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 OTSs that offer extensive process modeling experience and complete training solutions.

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.

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. Analysis solutions for CDU to final blending.

Hammelmann Corp

600 Progress Rd, Dayton, OH 45449, 937-859-8777, toll-free: 800-783-4935, FAX: 937-859-9188, mail@hammelmann.com

Contact: Denny Mesarvey

Manufactures thousands of pumps and waterjetting units for service in a range of industries worldwide. Pumps feature a high pressure, friction free piston seal assembly. This patented high pressure design eliminates high pressure packing. Supplies high pressure equipment to the following industries: automotive, concrete plants, cleaning contractors, airports, chemical, foundries, construction, and shipbuilding.

Hammond Valve

16550 W Stratton Dr, New Berlin, WI 53151-7301, 262-432-2702, FAX: 262-432-2703, info@hammondvalve.com, www.hammondvalve.com

Offers high quality ball, plumbing, butterfly, gate, globe, and check valves from 1/4 to 48in. Valves are available in bronze, cast iron, ductile iron, cast steel, carbon steel, and stainless steel with a variety of operators, actuation, and accessories.

Hampson-Russell Software & Services*GGG Veritas Div*

5 Kew Rd, Parkshot House, Richmond, Surrey, TW9 2PR UK, 44-20-8334-8091, 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. The London office serves clients in Europe, Africa, and India, two regional offices serve Middle East and CIS. The software is designed for reservoir characterization, including AVO and fluid inversion, pre/post-stack seismic inversion, seismic attribute analysis, geostatistics, 4-D, and multicomponent seismic.

Hannay Reels Inc

553 State Route 143, Westerlo, NY 12193, 877-467-3357, FAX: 800-733-5464, reels@hannay.com, www.hannay.com

Contact: Sls Mgr, A. David Guilzon

Manufactures quality industrial hose and cable reels. Offers variety, built-to-order, and delivered on time.

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, avoid costly downtime, and reduce operation and maintenance costs. Vibration instruments include machine monitors, vibration transmitters, vibration switches, signal conditioners, accelerometers, and sensors.

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.

Hawe Hydraulics

9009-k Perimeter Woods Dr, Charlotte, NC 28216, 704-509-1599, FAX: 704-509-6302, sales@hawehydraulics.com, www.hawehydraulics.com

Manufactures steel designed products with zero leak valve technology. Products include directional spool valves with or without proportional control, load holding valves, axial piston displacement pumps and MSHA approved explosion proof coils. The company is positioned to respond quickly to service needs.

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 and 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.

HBD/Thermoid Inc*(sub of HBD Industries Inc)*

1301 W Sandusky Ave, Bellefontaine, OH
43311-1082, 937-593-5010, toll-free:
800-543-8070, FAX: 800-423-4354,
infor@hbdthermoid.com, www.hbdthermoid.com

Contact: Gen Sls Mgr, Ed Bookwalter
Offers the Thermoid brand. Thermoid has set the standard for reliable industrial rubber products, including conveyor belting, ducting, hose (aviation, automotive, industrial, marine, and petroleum), power transmission belts, and rubber bands and rolls. From standard to custom-designed, the company can create a rubber product to meet your specific needs.

HDA/SMC

230 S Siesta Ln, Tempe, AZ 85281,
480-967-8989, FAX: 480-894-2578,
sales@hda-smc.com, www.hda-smc.com

Contact: Sls, Tom Elsby
Designs and develops turnkey contract manufacturing of surface and down-hole electronics. Offers 200°C memory products, custom hybrids, and MCMs.

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.

Hellan Strainer Co

3249 E 80th St, Cleveland, OH 44104,
216-206-4200

Contact: Sls Mgr, Clark Wormer
Offers self-cleaning strainers and filtration products which meet PED 97/23/EC. Products offered in a variety of materials, including 25 Cr stainless steel for the offshore industry. Designs remove solids without interrupting process stream. Provides a solution for protection of firewater systems, heat exchanger streams, and other critical processes. ISO 9001 certified by DNV.

Herculock

PO Box 197, Prospect, OH 43342,
740-494-2620, toll-free: 800-345-2590, FAX:
740-494-2274, sales@herculock.com,
www.herculock.com

Offers the complete line of HERCULOOCK 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.

Hernon Manufacturing Inc

121 Tech Dr, Sanford, FL 32771, 407-322-4000,
toll-free: 800-527-0004, FAX: 407-321-9700,
sales@hernon.com, <http://hernon.com>

Produces a selection of high performance adhesives and sealants. Also designs and assembles a line of precision dispensing equipment to supply turnkey, single-source responsibility systems. ISO 9001:2000 registered.

Hertz Equipment Rental Corp

225 Brae Blvd, Park Ridge, NJ 07656,
201-307-2000, toll-free: 888-777-2700,
www.hertzequip.com

Hexion*Oilfield Technology Group Div*

15115 Park Row Dr, Suite 160, Houston, TX
77084, 281-646-2800, FAX: 281-646-2898,
info@oiltg.com, www.hexion.com/oilfield

Contact: Sls/Mktg Mgr, Bill Kemp
Offers a range of resin coating proppants, from waterfracs to extreme HPHT fracturing conditions. Also offers PropTrac (fracture diagnostics).

HGG Profiling Equipment BV

Zuidrak 2, PO Box 66, 1775 ZH Middenmeer,
Noord Holland, The Netherlands, 31-227-504030,
FAX: 31-227-501903, info@hgg.nl, www.hgg.nl

Contact: Sls Mgr, Igor Gieltjes
Specializes in the field of steel profile cutting. The company gives full and thorough advice in the complete logistical process in your company. From automatic feed-in and feed-out equipment to professional software programming, the company assures your operators can spend the best part of the time actually cutting.

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, Arnim 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, and 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.

Hitachi America Ltd*Industrial Systems Div*

9700 Richmond Ave, Suite 165, Houston, TX
77042, 713-782-0529, FAX: 713-782-0981,
eiji.hashio@hal.hitachi.com, www.hitachi.us

Contact: VP Oil/Gas, Eiji Hashio
Supplies more than 1000 sets of centrifugal compressors to various clients worldwide. The company also manufactures motors, gas turbine generators, variable frequency drives, and pumps to the oil and gas industry.

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.

Hole Opener Corp

PO Box 82006, 103 Southpark Rd, Lafayette, LA
70508, 337-837-3314, FAX: 337-837-3058,
pjalleman@holeopener.com,
www.holeopener.com

Offers specialized drilling equipment for underreaming, hole opening, and well abandonment - both domestically and internationally. Provides logistical and operational services, including pre-well planning, proper tool selection, and adaptation of equipment to specific downhole parameters and conditions.

Honeywell Analytics

405 Barclay Blvd, Lincolnshire, IL 60069,
847-955-8260, toll-free: 800-321-6320, FAX:
847-955-8210, detectgas@honeywell.com,
www.honeywellanalytics.com

Provides product and service solutions that improve efficiency and profitability, support regulatory compliance, and maintain safe, comfortable environments in homes, buildings, and industry. Based in Lincolnshire, Illinois and Zurich, Switzerland, with distributors and agents located across the globe. Brings together expertise in the design, manufacture, and technology of gas detection.

Honeywell International Inc*Honeywell Process/Field Solutions Div*

14503 Bammel N Houston Rd, #300, Houston,
TX 77014, 281-444-2282, FAX: 281-444-0246,
www.honeywell.com/ps

Contact: Mktg Mgr Corrosion, Dawn C. Eden
Provides state-of-the-art corrosion monitoring systems; custom probes; corrosion engineering, consulting expertise; predictive software for process optimization, materials selection, and risk assessment. SmartCET transmitters interface real-time corrosion measurement with process information, providing insights on the true economic impact of corrosion and methods to achieve improved process control and efficiency.

Honeywell Safety Products

1136 2nd St, Rock Island, IL 61201,
309-786-7741

Manufactures rubber, neoprene, and PUC, protective footwear, including slip resistance, chemical resistant, toe and metatarsal protecting, puncture-resistant midsoles, and cold protection.

Houston Wire & Cable Co

10201 N Loop East, Houston, TX 77029,
713-609-2100, FAX: 713-609-2101,
lhowland@houwire.com, www.houwire.com

Contact: Mktg Mgr, Lance Howland
Specializing in the power generation industry since 1975, the company brings experience and a proven track record to construction jobs, both stateside and abroad. Provides a broad wire and cable product offering, and a focus on supplying various energy markets.

Howard Leight*(div of Sperian Hearing Protection LLC)*

7828 Waterville Rd, San Diego, CA 92154,
800-430-5490, FAX: 401-232-3112,
hearingconservation@howardleight.com,
www.howardleight.com

Manufactures hearing protectors in the industrial market and the recognized innovator in protection and people-oriented fit. Offers the widest variety of single-use, multiple-use and earplugs and bands, as well as earmuffs that raise the bar for innovative design, performance, and comfort.

Howden Buffalo Inc

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.

Howden Compressors LLC*(div of Howden Buffalo)*

1850 N Gravers Rd, Plymouth Meeting, PA
19462, 610-313-9800, FAX: 610-313-9215,
sales@howdencompressors.com,
www.howden.com

Contact: Gen Mgr, Thomas Hoopes
Manufactures a range of oil-injected and oil-free screw compressors, as well oil-free reciprocating, diaphragm and turbo blowers for the petrochemical industry. They are available in packaged configurations to meet most API specifications.

Hoyt Electrical Instruments

23 Meter St, PO Box 8798, Penacook, NH 03303,
603-753-6321, toll-free: 800-258-3652, FAX:
603-753-9592, sales@hoytmeter.com,
www.hoytmeter.com

Contact: Sls Mgr, Joe Legerstee
Offers analog and digital panel meters, switchboard meters, earth leakage relays, timers, relays for voltage, current, frequency, generator controls, insulation testers, transducers, and current transformers.

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 land transport management consultancy.

Hudson Industries

439 Neisler St, Shelby, NC 28152, 704-480-0014,
toll-free: 866-382-2990, FAX: 704-482-9881,
shohman@hudsonind.com, www.hudsonind.com

Designs and manufactures standard and engineered oil/water separation units for more than twenty years. From steel, to offshore, to environmental, the company's products meet a range of application needs. The company efficiently serves worldwide interests throughout the industry, offering years of engineering experience.

Huntingdon Fusion Techniques

Stukeley Meadow, Burry Port, Carmarthenshire,
SA16 0BU UK, 44-1554-836-836, FAX:
44-1554-836-837, hft@huntingdonfusion.com,
www.huntingdonfusion.com

Contact: Mktg, Mike Dunn

Hydra-Cell Industrial Pumps*(div of Wanner Engineering Inc)*

1204 Chestnut Ave, Minneapolis, MN 55403,
612-332-5681, toll-free: 800-369-4172, FAX:
612-332-6937, sales@wannereng.com,
www.wannereng.com

Contact: CEO/Sls/Mktg, Joe Grewe
Manufactures high pressure diaphragm pumps, nonmetallic ANSI centrifugal pumps, and pressure control unloader valves.

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 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

1102 Hall Ct, Deer Park, TX 77536,
713-860-4242, FAX: 713-860-4201,
houston@hydratight.com, www.hydratight.com

Contact: Bus Leader Gulf Reg, 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.

Hydratight Ltd

Bentley Rd S, Darlaston, West Midlands, WS10
8LQ UK, 44-121-5050-600, FAX:
44-121-5050-800, andy.lewis@hydratight.com,
www.hydratight.com

Provides joint integrity solutions to the oil and gas industry, offering a range of quality bolt tightening and metal pipe connecting products and services globally. Customers are supported by experienced engineering teams.

Hydraulics International Inc

9201 Independence Ave, Chatsworth, CA 91311,
818-407-3400, toll-free: 888-780-7867, FAX:
818-407-3428, lturner@hiipumps.com,
www.hiipumps.com

Contact: Dir Sls/Mktg, Les Turner
Manufactures a range of air-driven liquid pump, air and electric driven gas boosters, air-driven air pressure amplifiers, high-pressure valves and components, turbine flow meters, and standard or custom-packaged systems.

Hytorc*(div of Unex Corp)*

333 Route 17 N, Mahwah, NJ 07430,
201-512-9500, toll-free: 800-367-4986, FAX:
201-512-9615, www.hytorc.com

Contact: Dir Sls, Eric Junkers
Provides hydraulic and pneumatic torque tools and industrial fastener technology. Assures safety, quality, and scheduling.

IFP

1-4 ave de Bois-Preau, 92852 Rueil Malmaison,
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 solutions for a smooth transition to the energies and materials of tomorrow in a more efficient, more economical, clean, and sustainable way.

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 R&D activities, consultancy, research in partnership for the safe exploration and production of ocean resources. The institute covers a range of marine sciences and technologies, including underwater vehicles, deep sea monitoring, and surveys on geological hazards. Also offers studies in laboratories.

Ikey Industrial Peripherals

2621 Ridgepoint Dr, Suite 235, Austin, TX 78754,
512-837-0283, toll-free: 800-866-6506, FAX:
512-927-8530, info@ikey.com, www.ikey.com

Contact: Mktg Mgr, Danielle Nepustil
Designs and manufactures industrial peripherals, including rugged keyboards, pointing devices, and flat-panel displays. All products built to NEMA 4X specification are capable of withstanding dirt, dust, extreme temperatures, water, and ice. The intrinsically safe and nonincendive peripherals are also ideal for hazardous oil and gas environments.

Imagewear.ca*(div of Marks Work Wearhouse)*

6325 11th St SE, #14, Calgary, Alberta, Canada
T2H 2L6, 403-692-7039, toll-free: 800-663-6275,
FAX: 403-692-7580, www.imagewear.ca

Contact: Reg Sls Mgr, Curtis Bellows
Supplies diesel-resistant and antislip safety footwear, fire retardant garments, and promotional garments, and hard goods. Canadian-based and service worldwide.

IMI Sensors*(div of PCB Peizotronics Inc)*

3425 Walden Ave, Depew, NY 14043,
716-684-0003, toll-free: 800-959-4464, 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.

IMPac Offshore Engineering GmbH

Hohe Bleichen 5, D-20354 Hamburg, Germany,
49-40-355-440-0, FAX: 49-40-34-05-00,
info@impac.de, www.impac.de

Contact: Mktg Mgr, Juergen Kaiser
Provides engineering, procurement, and construction management services to the oil and gas industry, for both offshore and onshore projects.

Impact Guidance Systems Inc

519 E Oak Hill Dr, Spring, TX 77386,
281-466-1631, FAX: 281-466-1635,
jschulz@igsy.com, www.igsy.com

Contact: Pres, Stuart McLaughlin
Provides a research and development company that recognizes the need to develop high quality intelligent downhole tools for the drilling/completion and data acquisition aspects of the industry. These downhole tools for both Slickline and CT allow operators to improve their knowledge of downhole environments at significant cost savings.

Indeeco

425 Hanley Industrial, St Louis, MO 63144, 314-644-4300, FAX: 314-644-5332, sales@indeeco.com, www.indeeco.com
Designs and manufactures commercial and industrial electric heating and control systems. A staff of skilled workers build state-of-the-art heaters. Its engineers and technicians, ASME-certified welders, quality assurance personnel, skilled electronic and electrical assemblers, and panelboard fabricators work together to provide customers with turnkey heating solutions.

Industrial Engines Ltd

14355 120th Ave, Edmonton, Alberta, Canada T5L 2R8, 780-484-6213, toll-free: 888-887-0008, FAX: 780-732-0400, sales@industrialengines.ca, www.industrialengines.ca

Contact: Gen Mgr, Al Dobler
Offers natural gas engine: 10 to 252 bhp. Manufacturers represented: Ford, Lister-Petter, and Tedom.

Industrial Scientific Corp

1001 Oakdale Rd, Oakdale, PA 15071, 412-788-4353, toll-free: 800-338-3287, FAX: 412-788-8353, info@indsci.com, www.indsci.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 in monitoring hazardous gases in the most demanding work environments.

Industrial Specialties Manufacturing

4091 S Elliot St, Englewood, CO 80110, 303-781-8486, toll-free: 800-781-8487, FAX: 303-761-7939, sales@industrialspec.com, www.industrialspec.com

Contact: Pres, Jim Davis
Supplies miniature pneumatic, vacuum, and fluid circuitry components to OEMs and distributors worldwide. The company's online catalog is easily searchable by product specification, category, and key word.

Industrial Textiles & Plastics Ltd

Stillington Rd, Easingwold, York, YO61 3FA UK, 44-1347-825210, 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

Contact: Bus Dev Mgr, Emeline Bodard
Instrumentation, software, and sensors from ITS are used to characterize a wide range of multiphase processes, including mixing, separation, flow and reactions.

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 the ability to integrate video into SCADA applications. Offers cameras designed for safe use in certified areas.

Innovative Pressure Technologies

4922 Pittsburgh Ave, Erie, PA 16509-6207, 814-833-5200, FAX: 814-836-1824, sales@inpressure.com, www.inpressure.com

Contact: Sls/Mktg, Wade Brandon
Specializes in precision machined valves, fittings, and fluid control devices, all of which are customized to meet specific design requirements.

Inserta Products Inc

538 Township Line Rd, Blue Bell, PA 19422, 215-643-0192, FAX: 215-643-4017, mries@inserta.com, www.inserta.com

Offers a proprietary line of valves and modular fittings that are used in industrial and mobile integrated hydraulic systems. They are designed to save space, time, money, eliminate piping leaks, and add value and integrity to the overall system.

INTEGRA Services Technologies Inc

3238 E Pasadena Frwy, Pasadena, TX 77503, 713-920-2400, FAX: 713-920-2313, info@integratechnologies.com, www.integratechnologies.com

Contact: Mktg, Debbie Jackson
Specializes in bolted joint integrity offering a variety of products and services in Hydraulic Bolting, on site machining and engineering. Our products are available for rent, sale or for use with specialized technicians and are used in a variety of industries both topside and subsea.

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: Prod Mktg, Diane Longoria
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, chemicals, and pharmaceuticals.

International Protective Coatings

Felling, Stoneygate 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 tough environments. From Interfine and Chartek, to Interline and Interthem, the global products and experience help deliver enhanced solutions for oil and gas assets worldwide.

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.

IRO

Engelandlaan 330, PO Box 7261, 2701 AG Zoetermeer, The Netherlands, 31-79-341-1981, FAX: 31-79-341-9764, info@iro.nl, www.iro.nl

Contact: Man Dir, H. P. De Boer
Provides an association of Dutch suppliers in the oil and gas industry.

ITT Goulds Pumps

(div of ITT Corp)
240 Fall St, Seneca Falls, NY 13148, 315-568-7122, toll-free: 800-734-7867, FAX: 315-568-7145, gpsales@itt.com, www.ittog.com

Contact: Global Mktg Mgr O/G, Chad Tuttle
Provides pumps, valves, and submersible agitators; fresh water makers and process water systems for offshore.

ITW Devcon Coatings

1685 Galt Industrial Blvd, St Louis, MO 63132, 314-733-1110, FAX: 314-733-1164, dvickers@futura coatings.com, www.futura coatings.com

Contact: Nat'l Sls Mgr, Dannie L. Vickers
Manufactures and sells a complete line of advanced technology coatings, including epoxies, urethanes, polyureas, polyurethanes, and vinyl esters.

Iwaki America Inc

5 Boynton Rd, Holliston, MA 01746, 508-429-1440, FAX: 508-429-1386, info@iwaki america.com, www.iwaki america.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 the company's pump designs.

J4 Communications

4930 Chippewa Rd, Unit D, Medina, OH 44256, 330-764-9444, FAX: 330-725-7265, rose@neo.rr.com

JD Neuhaus GmbH & Co Kg

Werbeleiter, 58449 Witten-Heven, Germany, 49-2302-208-219, FAX: 49-2302-208-286, info@jdn.de, www.jdn.de
Manufactures air driven hoists, winches, and cranes with a worldwide reputation. The main applications are in hazardous areas.

Jetyd Corp

**Jetyd Corp**

120 Wesley St, South Hackensack, NJ 07606,
201-343-4570, FAX: 201-820-2545,
info@jetyd.com, www.jetyd.com

Contact: Nat'l Sls Mgr, James Fix
Manufactures industrial fasteners, hydraulic
and pneumatic torque tools. Our fasteners
provide perfect precision, safety, and
increased productivity. Products include
clamp, loadisc, and JGUN.

JH Technology Inc

4233 Clark Rd, Unit 9, Sarasota, FL 34233,
941-927-0300, toll-free: 800-808-0300, FAX:
941-925-8774, jhtek@jhtechnology.com,
www.jhtechnology.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 bellow
seals, Lemco seal support systems, and
Metastream couplings.

John Deere Power Systems

3801 W Ridgeway Ave, Waterloo, IA 50701,
800-533-6446, FAX: 319-292-5075,
jdpower@johndeere.com,
www.johndeere.com/jdpower
Manufactures and markets 30–448 kW (40–600 hp)
industrial diesel engines and 56–455 kW (75–610
hp) marine diesel engines, as well as drive train
components for use in a variety of off-highway
applications.

John M Campbell and Co

1215 Crossroads Blvd, Norman, OK 73072,
405-321-1383, FAX: 405-321-4533,
info@jmcampbell.com, www.jmcampbell.com

Contact: Mktg Coord, Amy Carlisle
Offers training to oil and gas industry engineers.
Provides PetroSkills facility training, with courses in:
electrical and instrumentation, gas processing,
mechanical, offshore, operations management,
procurement/supply chain management,
production facilities, refining, transportation, water
treatment and corrosion, reliability engineering,
health and safety, and environment.

John M Ellsworth Co Inc

8700 N Bradley Rd, Milwaukee, WI 53224,
800-563-8858, FAX: 800-563-8848,
info@jmesales.com

**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.fahay@jci.com,
www.york.com/products/ref/processsystems

Contact: YPS Sls/Mktg Mgr, Robert F. Fahay
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.york.com/products/ref/processsystems

JULABO Labortechnik GmbH

Eisenbahnstrasse 45, 77960 Seelback,
Baden-Wuerttemberg, Germany, 49-7823-51-0,
FAX: 49-7823-24-91, 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, nontoxic, and noncorrosive.

Kalapi Engineering Associates Pvt Ltd*Kalapi Group Div*

E-12 MIDC Kupad Block, Sangli-Miraj Industrial
Area, Sangli Maharashtra, 416436 India,
91-233-264-4006, FAX: 91-233-264-4570,
kalapiengg@gmail.com

Contact: Man Dir, Yogesh Lohokare
Produces castings and steel parts to exact
specifications with material certificates. Has
experience in machining components for the oil and
gas industry. High corrosion resistant castings in
stainless steel, duplex stainless steel, Monel,
Inconel, Niresist, Hastelloy, and more;
development with tooling on CAD/CAM and finish
machined to specifications.

Kalsi Engineering Inc

745 Park Two Dr, Sugar Land, TX 77498,
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 hydrodynamic
rotary shaft seals that are used in downhole drilling
applications for retaining lubricants and excluding
abrasives.

Kayden Instruments

3368 114th Ave SE, Calgary, Alberta, Canada
T2Z 3V6, 403-253-1423, FAX: 403-253-1460,
sales@kayden.com, www.kayden.com

Contact: VP Gen Mgr, Ron Charuk
Manufactures flow, level, interface, and temperature
instruments. Designs feature no moving parts,
digital electronics, constant display of function,
automatic internal diagnostics, remote
communications, and many sensor configurations.

Kee Safety Inc

100 Stradtman St, Buffalo, NY 14206,
716-896-4949, toll-free: 800-851-5181, FAX:
716-896-5696, sales@keesafety.com,
www.keesafety.com

Contact: Nat'l Sls Mgr, Andrew Kirk
Provides components and creates aluminum and
steel safety railing systems for commercial and
industrial purposes. USCG-ABS handrails and
OSHA compliant quadrails. Also offers an
alternative method of securing secondary steelwork
and building services equipment to primary
steelwork. No project is too big, or safety railing too
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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
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company's strengths: high volumes at low prices,
high flexibility pressure ranges: 5 mbar to 2000 bar.
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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

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.

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Business Unit Industrial Products Div
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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
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KF Industries

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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.

Kidd Pipeline & Specialties Inc

14826 Yarberry, Houston, TX 77039,
281-442-0270, FAX: 281-590-4705,
ddavis@kiddpipeline.com, www.kiddpipeline.com
Contact: Pres, Doris Davis
Manufactures Sphere and Pig Passage Indicators
for mainline and meter prover services, flow
indicators, scraper cups, and discs. Offers specialty
polyurethane molded products.

Kinetrol Ltd

Trading Estate, Farnham, GU9 9NU UK,
44-1252-733-838, FAX: 44-1252-713-042,
sales@kinetrol.com, www.kinetrol.com
Contact: Sls/Mktg Mgr, Geoff Burton
Manufactures quality 1/4 turn pneumatic rotary
actuators, as well as a range of positioners and
on/off control modules. Has a quality program, and
now has ATEX approvals to Category 1.

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 an industry standard. Continues to
introduce 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, sales.us@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
gauge, and piezoresistive.

KME Germany AG

S/MA 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,
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90/10 for seawater piping systems are offered.

KNF Neuberger Inc

2 Black Forest Rd, Trenton, NJ 08691,
609-890-8600, knfusa@knf.com,
www.knfprocess.com
Contact: Process Eng, Rich Aerts

Knighthawk Engineering

17625 El Camino Real, Suite 412, Houston, TX
77058, 281-282-9200, toll-free: 800-737-0591,
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1801 Parkway View Dr, Pittsburgh, PA 15205,
412-788-2830, FAX: 412-788-4890,
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Contact: Dir Oper, Pete Barna
Manufactures flow, pressure, level, and
temperature instruments to measure and monitor
liquids and gases. Provides a line of German design
sensors, switches, and transmitters in the industry.
Combines the quality and reliability of German
design with the cost effectiveness and quick
delivery of a U.S. manufacturing facility.

Kohlswa Gjuterei AB

Brusksgatan, PO Box 101, 730 30 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, ramlates, tow pins,
propeller blades, hub bodies, and more. Approved
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sbickerstaff@korkap.com, www.korkap.com
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specialty markets.

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Contact: Mktg Mgr, Mark Gallagher
Produces REXA customized electrohydraulic actuators
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978-535-6060, FAX: 978-535-1720,
info@krohne.com,
www.krohne.com/northamerica
Contact: Mktg Dir, Joe Incontri
Offers technological leader in the development,
manufactures and distributes accurate, reliable and
cost-effective, measuring instruments for the
process industries. Focuses on forming partnership
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Västerås, Sweden, 46-21-14-92-00, FAX:
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www.krusman.com
Supplies emergency showers and eye/face
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800-522-9108, llaw@ksun.com, www.ksun.com
Contact: Linda Law
Provides labeling, marking, signage, and industrial
identification solutions and has numerous electronic
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225-673-6100, toll-free: 800-735-5835, FAX:
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Contact: Dir Mktg/Cust Svc, Kevin
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Distributes tools and equipment to keep workers
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Lakos Separators and Filtration Systems

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539-255-1601, FAX: 539-255-8093,
billvp@lakos.com, www.lakos.com

Contact: Mktg Dir, Bill Vander Plaats

Manufactures centrifugal action sand separators and filters for the oil and gas industry. With no moving parts and zero liquid loss, the separators offer a maintenance-free alternative.

Lancaster Flow Automation

6718 Northwinds Dr, Houston, TX 77041,
713-983-9444, toll-free: 866-603-9444, FAX:
713-983-6392, info@lancasterflow.com,
www.lancasterflow.com

Manufactures high performance, low torque production and drilling chokes.

Lascar Electronics

4258 W 12th St, Erie, PA 16505, 814-835-0621,
FAX: 814-838-8141,
us-sales@lascarelectronics.com,
www.lascarelectronics.com

Contact: Mktg Mgr, Sian Currie

Designs and manufactures a series of USB Data Loggers and a range of digital panel meters, including LCD and LED displays, voltmeters, loop powered meters, thermometers, counters, and graphic displays.

Lautrette Filtration Pipeline Equipment

Le Chemin, 61, 800 Montsecrét, France,
33-2-33-96-06-97, FAX: 33-2-33-66-22-61,
jean-claude.lautrette@wanadoo.fr,
www.lautrettefiltration.com

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.

Layher Inc

Layher USA Div

4847 Timber Creek Dr, Houston, TX 77017,
866-300-0904, FAX: 713-947-1441,
info@layher.us, www.layherusa.com

Contact: Exec VP, Frank Frietsch

Distributes products to the U.S. and Canada. Original Ring Scaffold with more than 60 years of experience and R&D. Develops with customers in providing the best scaffolding with the utmost in service and dependability. Offers financing programs.

LDPI Inc

4404 Anderson Dr, Eau Claire, WI 54703,
715-839-9585, toll-free: 800-854-0021, FAX:
715-839-8145, sales@ldpi-inc.com,
www.ldpi-inc.com

Contact: Nat'l Sls Mgr, Wayne Nash

Manufactures specialized fluorescent, incandescent, and HID lighting fixtures for hazardous, harsh, dusty, and wet/damp environments.

Leading Edge Manufacturing

303 Chemin Metairie, Youngsville, LA 70592,
337-856-4550, FAX: 337-856-8597,
keithb@leadingedgemfg.com

Leading Edge Turbine Technologies

20120 E Hardy Rd, Houston, TX 77073,
281-821-2255, FAX: 281-821-7755,
sales@leturbine.com, www.leturbine.com

Provides an independent industrial steam and gas turbine repair company that provides repair services for the global power generation, pipeline, petrochemical, and paper mill industries.

The Lee Co

2 Pettipaug Rd, PO Box 424, Westbrook, CT
06498, 860-399-6281, toll-free: 800-533-7584,
FAX: 860-399-2270, inquiry@theleeco.com,
www.theleeco.com

Designs and manufactures miniature, precision fluid control products, including Lee plugs, solenoid valves, single- and multi-orifice flow restrictors, nozzles, safety screens, check valves, relief valves, flow controls, shuttle valves, and other microhydraulic components for use in down hole tools, subsea systems, and other industries worldwide.

Lee-Dickens Ltd

Rushton Rd, Desborough, Kettering, Northants,
NN14 2QW UK, 44-1536-760156, FAX:
44-1536-762552, sales@lee-dickens.co.uk,
www.lee-dickens.co.uk

Contact: Internal Sls, Rebecca Gee

Manufactures electronic process control instrumentation and sensors. Specializes in signal conditioning equipment, trip amplifiers, power measurement related instrumentation, relative humidity and temperature probes and transmitters (intrinsically safe), capacitance level probes, and digital process indicators. Also manufactures, installs, and commissions telemetry, SCADA, and remote control for monitoring systems.

Lee Specialties Ltd

7739 Edgar Industrial Way, Red Deer, Alberta,
Canada T4P 3R2, 403-346-4487, FAX:
403-347-3312, inquiries@leespecialties.com,
www.leespecialties.com

Contact: Pres, Jim Lee

Specializes in the design, manufacture, and sale/rental of wireline equipment. Offers a line of Made-in-Canada innovations and solutions to better serve individual business needs, including data acquisition systems and software, pressure control equipment, grease injector systems, production logging tools, and wireline trucks.

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.

Lenox Instrument Co

265 Andrews Rd, Trevose, PA 19053,
215-322-9990, toll-free: 800-356-1104,
sales@lenoxinst.com, www.lenoxinst.com

Contact: VP, Bill Lang

Manufactures and supplies remote vision instruments (RVI). Offers a full line of borescopes, videoscopes, and light sources. Also manufactures FireSight, a line of high temperature boiler and furnace camera systems.

Lexair Inc

2025 Mercer Rd, Lexington, KY 40511,
859-255-5001, FAX: 859-255-6656,
jjennings@lexairinc.com, www.lexairinc.com

Contact: VP Sls/Mktg, 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,
lisal@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.

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Offshore Crane Sales Department Div

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: Head Offshore Cranes Dept,
Alexander Klimmer

Develops a range of crane technology, including explosion-proof diesel and electric drive units for use in temperatures to -50°C or special lifting heights to 1000 m under the sea, as well as well rope and ram lifting cranes. Cranes with slew bearings or mast type cranes are also available.

Lightning Eliminators & Consultants Inc

6687 Arapahoe Rd, Boulder, CO 80303,
303-447-2828, toll-free: 800-521-6101, FAX:
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rbeatie@lightningmaster.com,
www.lightningmaster.com

Contact: VP Engr, Richard Beatie

Designs, manufactures and installs lightning protection, surge and grounding systems to protect oil, offshore, gas, chemical and processing facilities around the world.

Flowserve Limitorque

5114 Woodall Rd, Lynchburg, VA 24502,
434-522-4107, FAX: 434-845-9736,
ecarey@flowserve.com, www.flowserve.com

Produces the electronic nonintrusive MX and QX, electric powered SMB and L120, and pneumatic powered L270 actuators for power, oil and gas, water/wastewater treatment, mining, and other industries. More than 75 years of experience. Installations worldwide, from the Arctic cold to the desert heat.

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info@lincpumps.com, www.lincpumps.com

Contact: Prod Mgr, Coogan Cameron

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bhughes@ucc.ca, www.ucci.com

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, manufacturers of hydrogen and synthesis gases, natural gas treatment, and pharmaceutical industries.

LIN SCAN Advanced Pipeline & Tank Services

Hamiya Free Zone, PO Box 62159, Sharjah, United Arab Emirates, 971-6-526-2042, FAX: 971-6-526-2043, info@linscaninspection.com, www.linscaninspection.com

Contact: Bus Dev Mgr, Alexey Emelianov
Provides pipeline integrity solutions for oil and gas industry worldwide. Services include utility and intelligent pigging and x-y-z mapping of pipelines. In-line equipment of LIN SCAN is capable of running in pipelines with nonstandard conditions. Project management of LIN SCAN is supported all over the globe by an agent network.

Linvic Engineering

Hickman Ave, Wolverhampton, WV1 2DW UK, 44-1902-456-333, FAX: 44-1902-455-856, steve.swinden@linvic.co.uk, www.linvic.co.uk

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, and heat transfer fluid filtration systems. Side stream, continuous filtration without disrupting hot oil system operation.

Livingston International Inc

3636 23rd St NE, Suite 300, Meridian Corporate Park, Calgary, Alberta, Canada T2E 8Z5, 403-263-7856, FAX: 403-266-2956, www.livingstonintl.com

L&J Technologies

5911 Butterfield Rd, Hillside, IL 60162, 708-236-6000, marketing@ljtechnologies.com, www.ljtechnologies.com

Manufactures tank level gauging and filtering equipment, control systems technology, and related products. The company's custom engineering services, reliable technology, and state-of-the-art manufacturing facility help to maintain production relationships with suppliers, representatives, and customers.

LOGSTOR*Logstor Oil & Gas Div*

Danmarksvej 11, 9670 Logstor, Denmark, 45-9966-1000, FAX: 45-9966-1180, logstor@logstor.com, www.logstor.com

Contact: Global Sls Mgr, Klaus Andersen
Manufactures thermally pre-insulated pipelines for the oil and gas industry designed to meet client specified requirements both onshore and offshore. Production facilities; nine plants in Europe, two plants in Asia, one plant in MEA, and a mobile production unit for worldwide on-site production. Annual turnover 300 MEUR.

Loipart AB*(div of Loipart Oy)*

Metallgatan 2-4, PO Box 694, SE-441 18 Alingsas, Sweden, 46-322-668-360, FAX: 46-322-637-747, loipart@loipart.se, www.loipart.com

Contact: Mktg Mgr, Kristian Vidfar
Supplies marine galley and laundry systems. The company distributes Electrolux in addition to many other renowned brands.

Lone Star Fasteners LP

24131 Hardy Rd, Spring, TX 77373, 281-353-1191, toll-free: 800-645-2764, FAX: 281-353-7055, sales@lonestarfastereners.com, www.lonestarfastereners.com

Contact: VP Sls/Mktg, Steve Cabral
Manufactures standard and specialty fasteners out of stainless steel, B7, L7, and specialty alloys. Manufacturing capacity includes zinc and phosphate plating, Xylan, Sermaguard, and other coatings to meet client specifications in all major global energy markets. All testing is done in a full service lab.

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.

Lowell Corp

PO Box 158, Worcester, MA 01613, 508-835-2900, toll-free: 800-456-9355, FAX: 508-835-2944, srieder@lowellcorp.com, www.lowellcorp.com

Contact: Sls/Mktg Mgr, Scott Rieder
Manufactures bolt-thru ratchet wrenches that are designed for working in the pipeline industry. The company's ratchets are available with handle lengths from 8 to 60 in. Sockets are available to fit hexagon or square nuts from 5/8 to 9 1/8 in.

LPI Inc

4404 Anderson Dr, Eau Claire, WI 54703, 715-839-8280, toll-free: 800-657-6956, FAX: 715-839-8647, marketing@lpi-inc.com, www.lpi-inc.com

Contact: Sls Mgr, Dave Zuberbuehler
Manufactures standard and custom personnel lifting and material handling systems in a variety of power options for the industrial marketplace, including hazardous locations.

Lubrication Engineers Inc

300 Bailey Ave, Fort Worth, TX 76107, 800-537-7683, FAX: 800-228-1142, www.le-inc.com

Contact: VP Sls, Vincent M. Tofani
Manufactures high performance mineral and synthetic lubricants designed to meet demanding performance standards. The company's professional lubrication consultants offer LE Enhanced Lubricants and reliability solutions.

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, Nils 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.

Lufkin Industries Inc*Power Transmission Div*

407 Kiln St, PO Box 849, Lufkin, TX 75902, 936-637-5224, FAX: 936-633-3916, gearsales@lufkin.com, www.lufkin.com

Contact: Mktg Assoc, Kelly Ferrara
Specializes in the design and manufacture of custom-engineered gears for power generation, oil and gas, refining, and pipeline applications. Built per API specifications, experience includes units rated greater than 100 MW; units operating greater than 50,000 rpm; and units with pitchline velocities greater than 35,000 fpm.

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: Comms Mgr, Maria Principe
Combines proven process technology from its Lummus Technology business with global capabilities in engineering, procurement, and construction to deliver comprehensive solutions to customers in the energy and natural resource industries.

MacDonald, Dettwiler & Assoc Ltd (MDA)

13800 Commerce Pkwy, Richmond, British Columbia, Canada V6V 2J3, 604-278-3411, FAX: 604-278-1837,

info@mdacorporation.com, www.mdacorporation.com

Provides advanced information solutions that are essential for decision making. Our solutions capture and process large amounts of data, produce essential information, and improve the decision making and operational performance of business and government organizations. In addition we conduct a broad range of customer funded Advanced Technology development aimed at further extending human capability.
(See ad p 27)

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.

Mackay Communications

Mackay Communications

3691 Trust Dr, Raleigh, NC 27616,
919-850-3000, FAX: 919-954-1707,
info@mackaycomm.com,
www.mackaycomm.com

Contact: Dir Satellite Svcs, Patrick Fisher
Provides quality communications, navigation, and below-decks equipment to offshore, marine, and land-mobile industries, bringing the most advanced applications in the market. Offering satellite systems with 64-492 kbps data transmission, real-time video and voice communications; Inmarsat, VSAT, and Iridium platforms with worldwide installation and airtime.

MADCON Corp

63374 Old Military Rd, Pearl River, LA 70452,
985-863-7773, FAX: 985-863-7763,
btrader@madconcorp.com,
www.madconcorp.com

Contact: Pres, Bruce Trader
Provides a complete array of underwater services. Offers patented repair methods for structural repairs to collapsed wells, severely deteriorated conductors, risers, and underwater members utilizing advanced composite materials. Operates offshore dive and construction support vessels.

Magnatech Ltd Partnership

6 Kripes Rd, PO Box 260, East Granby, CT
06026-0260, 860-653-2573, FAX: 860-653-0486,
info@magnatech-lp.com,
www.magnatech-lp.com

Contact: Pres, John G. Emmerson
Manufactures specialized equipment for orbital pipe welding using GTAW and FCAW welding processes. The company's 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, and the Pulsar Pulse Burst radar level transmitter.

Magnum Products LLC

215 Power Dr, Berlin, WI 54923-24,
920-361-4442, FAX: 920-361-2214,
dhartwig@m-p-llc.com, www.m-p-llc.com

Contact: Mktg Coord, Debbie Hartwig
Supplies mobile light towers. In addition, the company has a complete line of mobile generators, water trailers, and dewatering trash pumps. Commitment to manufacturing, customer-driven service, and products.

Mahaffey Fabric Structures

4161 Delp St, Memphis, TN 38118,
901-363-6511, FAX: 901-362-8700,
sales@fabricstructures.com,
www.industrial-structure.com

Contact: Sls Mgr, Kevin Ponder
Provides blast-tested, industrial structures for temporary warehouses, dining facilities, refinery and plant site covers, environmental enclosures, and more. Structures can be outfitted with flooring, lighting, doors, HVAC, and fire safety equipment.

Maloney Industries

8825 Shepard Rd SE, Calgary, Alberta, Canada
T2C 4N9, 403-279-5000, FAX: 403-279-2068,
www.maloneyindustries.ca

Served more than 350 onshore and offshore oil and gas industry clients in more than 40 countries around the world since 1964. The services provided by Maloney include engineering, design, fabrication, installation, supervision, commissioning startup and operator training services for the complete range of oil and gas production equipment and custom vessels.

MAN Turbo AG

Steinbrinkstrasse 1, 46145 Oberhausen, North Rhine, Westphalia, Germany, 49-208-692-01,
FAX: 49-208-692-2019, info@de.manturbo.com,
www.manturbo.com

Contact: VP Sls/Contracts, Reinhard Chudzicki
Manufactures turbomachinery, offering comprehensive product lines of compressors and turbines using 250 years of accumulated experience from former OEM companies to create made-to-measure solutions for customers and operators, from single machines to turnkey packages.

Marc Climatic Controls Inc

PO Box 218309, Houston, TX 77218,
713-464-8587, toll-free: 800-397-0131, FAX:
713-468-8810, sales@marcclimatic.com,
www.marcclimatic.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.

Mariner Energy Inc

On Briar Lake Plaza, Suite 2000, 2000 W Sam
Houston Pkwy, Houston, TX 77042,
713-954-5500, FAX: 713-954-5555,
ir@mariner-energy.com,
www.mariner-energy.com

Offers a growth oriented oil and gas company with diversified operation in the Permian Basin and the Gulf of Mexico.

Marioff Corp Oy

PO Box 86, Virmatie 3, FI-01301 Vantaa, Finland,
358-9-8708-51, 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.

Marking Services Inc

5518 Decker Dr, Baytown, TX 77520,
281-424-6710, toll-free: 800-813-8642, FAX:
281-424-9721, don@markserv.com,
www.markserv.com

Contact: Sls Mgr Offshore/Petrochem, Don Aucoin
Manufactures, designs, and installs pipe identification and valve tagging systems worldwide. Clients recognize the benefits of quality labeling and the long-term cost savings associated with faster, more efficient plant commissioning and start-ups, improved operator training, and enhanced plant safety for employees.

MarTech Systems Inc

35 Viburnum Ct, Lawrenceville, NJ 08648,
609-896-4457, FAX: 760-280-9823,
huchler@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 and replacement, bid water treatment chemicals, and trains engineers and operators.

Martin Engineering

One Martin Pl, Neponset, IL 61345,
309-594-2384, toll-free: 800-544-2947, FAX:
309-594-2432, info@martin-eng.com,
www.martin-eng.com

Contact: OEM Sls Mgr, Mike Kargl
Offers an extensive product line of shale shaker vibrators and is a distributor in the oil and gas industry. Offers shale shaker vibrators for new machines as well as a comprehensive list of models for replacement vibrators, including aftermarket vibrators for Derrick shale shakers.

Martin Metallurgical Supply Inc

2150 Northmont Pkwy, Suite H, Duluth, GA
30096, 770-418-0506, FAX: 770-418-0855,
sales@martinmetalsupply.com,
www.martinmetalsupply.com

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 resistance to chemicals, including water, oils, fuels, acids, and bases.

MATCOR Inc

301 Airport Blvd, Doylestown, PA 18902,
215-348-2974, FAX: 215-348-2699,
matcorsales@matcor.com, www.matcor.com

Contact: VP Sls/Mktg, Ted Huck
Provides corrosion engineering services and cathodic protection solutions worldwide. Manufactures, installs, commissions, and tests corrosion protection materials for the oil and gas industry. Offices in Texas (Houston) and Pennsylvania.

Mattracks Inc

202 Cleveland Ave E, PO Box 214, Karlstad, MN
56732, 218-436-7000, FAX: 218-436-7500,
sales@mattracks.com, www.mattracks.com

Manufactures conversion systems that are technologically advanced, independent, rubber track systems, and can allow you to access off-road worksites and other environmentally sensitive areas with minimal impact.

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 viscosities from 0.2 to 1 million cP, pressure and temperature ratings to 7500 psi and 550°F. Linearized outputs within 0.2 and 0.3% of reading 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 irrigation,
water, wastewater, oil and gas, power, HVAC,
universities, and other processing markets.

Products include Mc Propeller & Water Specialties
Propeller flowmeters, Ultra Mag, Marsh Multi-Mag
and Single-Mag magnetic flowmeters, V2 System,
and V-Cone and Wafer-Cone differential pressure
flowmeters.

MCG Surge Protection

12 Burt Dr, Deer Park, NY 11729, 631-586-5125,
toll-free: 800-851-1508, FAX: 631-586-5120,
info1@mcgsurge.com, www.mcgsurge.com

Contact: Sls Mgr, Sue Baron

Manufactures lightning, transient, and surge
protection devices for AC power, data line, signal
line, DC, and low voltage crowbar applications.

Units install at the service panels, equipment
input/output, or directly inside. Twenty-year
warranty, custom applications available. ISO
9001:2000 certified. UL.

McNichols Co Steel Service Centers

Headquarters Div

2502 N Rocky Point, #950, PO Box 30300,
Tampa, FL 33630-3300, 813-282-3828, toll-free:
800-237-3820, FAX: 813-243-1888,
sales@mcnichols.com, www.mcnichols.com

Contact: Sls Mgr, Ben Carlson

Specializes in products with holes in them,
perforated and expanded metal; wire mesh; bar,
plank, and safety grating; for same day stock
shipment.

MCT Brattberg AB

371 92 Karlskrona, Sweden, 46-455-375200,
FAX: 46-455-375290, info@mctbrattberg.se,
www.mctbrattberg.se

Contact: Mktg Mgr, Bo Birgerud

Offers cable and pipe penetration systems.

Mega_F Motion Systems Ltd

PO Box 540, Yokneam, 20692 Israel,
972-4-9891-050, FAX: 972-4-9891-080,
mega-f@mega-f.co.il, www.mega-f.com

Develops and markets software intensive
programmable DSP based motion control
products: DSP motion control modules and
multiaxis motion 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. Supplies special woven fabrics made
from polyester, fiberglass, homopolymer acrylic,
polypropylene, aramid, PPS Teflon, and many other
fibers; most available with a Mikrotex PTFE
membrane.

MENCK GmbH

(sub of an ACTEON Co)

Am Springmoor 5a, 24568 Kaltenkirchen,
Germany, 49-4191-911-0, FAX:
49-4191-911-100, info@menck.com,
www.menck.com

Contact: Man Dir, Christoph Daum
Provides specialized hydraulic pile driving solutions
in the offshore oil and gas exploration, wind farm,
bridge, and harbor markets. With more than 35
years of experience the company offers the MUP
deepwater system, noise reduction systems, and
more.

Merichem Chemicals & Refinery Services LLC

Gas Technology Products Div

846 E Algonquin Rd, Suite A100, Schaumburg,
IL 60173, 847-285-3850, FAX: 847-285-3888,
wrouleau@merichem.com,
www.gtp-merichem.com

Contact: Dir Sls/Mktg, William Rouleau
Offers both liquid and solid media
desulfurization products and technologies to
sweeten gas streams and ventilation air con-
taining virtually any levels of hydrogen sulfide
or mercaptans for systems of widely ranging
capacities. Provides media equipment, engi-
neering, installation and service to create a
flexible process that operates easily, safely
and economically.

(See ad p 12, 13)

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 21)

Metal Coatings Corp

PO Box 630407, Houston, TX 77263,
713-977-0123, toll-free: 877-977-0123, FAX:
713-977-0824, sales@metcoat.com,
www.metcoat.com

Contact: Sls Mgr, Tim Mullen
Provides industrial coatings for the oil, gas, and
petrochemical industries. Coatings applied include
fluoropolymer, xylan, Teflon, PTFE, moly
phosphate, halar, epoxy, phenolic, polyurethane,
inorganic zinc, PPS, FEP, dykor, PFA, fastener
coatings, and fluorokote.

Metrix Instrument Co

(div of Roper Industries)

8824 Fallbrook Dr, Houston, TX 77064,
281-940-1802, toll-free: 800-638-7494, FAX:
713-559-9421, info@metrix1.com,
www.metrix1.com

Contact: Apps Spec, Minh Tu
Serves customers worldwide with a line of
instrumentation to measure and monitor vibration
and provide early warning of machinery failure.
Products include proximity probes, cables,
transducers, switches, transmitters, sensors,
accelerometers, monitors, and portable meters.
Also features direct replacements for GE/Bently
Nevada 3000, 3300, and 7200 Series components.

Mhd Offshore Group

10695 W Shadow Wood Dr, Houston, TX
77043-2723, 713-595-8880, FAX: 713-595-8881,
cmiller@mhdosg.com, www.mhdosg.com

Contact: VP Sls/Mktg, J. C. Miller

Manufactures drilling and production riser tensions
for TLPs, semis, and drillships operating in water
depths to 10,000 ft. and loads of 2500 kips.

Michell Instruments Ltd

48 Lancaster Way Business Park, Ely,
Cambridgeshire, CB6 3NW UK, 44-1353-658031,
FAX: 44-1353-658199, info@michell.com,
www.michell.com

Contact: Sales Team, Landucci

Manufactures dew point instruments, cooled mirror
hygrometers and hydrocarbon dew point meters.

MICO Inc

1911 Lee Blvd, PO Box 8118, North Mankato,
MN 56003, 507-625-6426, FAX: 507-625-3212,
micomail@mico.com, www.mico.com

Contact: Applications Department

Designs and manufactures 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, and hydraulic brake
valves.

Micropack Detection (Americas) Inc

1227 Lakecrest Ct, Fort Collins, CO 80526,
970-377-2230, FAX: 970-377-2273,
adrianlloyd@micropackamericas.com,
www.micropackamericas.com

Contact: Sls Mgr, Adrian Lloyd

Manufactures advanced CCTV visual flame
detection for high hazard applications such as
offshore oil and gas production platforms, natural
gas compressor stations, and gas processing
facilities, refineries, and chemical processing plants.

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
materials. Products include motor brakes, clutches,
clutches/brakes for conveyors, winches, constant
tension winches, draw works, cranes, hoists, and
material handling equipment. Friction material,
brake lining, friction blocks, brake bands, industrial
brake bonding, and clutch disks for industrial
applications.

Midwestern Manufacturing Co

Midwestern Manufacturing Co

2119 S Union Ave, Tulsa, OK 74107-2703,
918-858-4242, FAX: 918-858-4269,
tgolden@midwescoind.com,
www.sidebooms.com
Contact: Tom Golden

Miller Fall Protection/Sperian

1345 15th St, PO Box 271, Franklin, PA 16323,
814-432-2118, toll-free: 800-873-5242, FAX:
800-892-4078, ebickrest@bacou-dalloz.com,
www.millerfallprotection.com
Manufactures fall protection products, confined
space equipment, professional training and
engineered solutions.

Miller-Stephenson Chemical Co

George Washington Hwy, PO Box 950, Danbury,
CT 06810, 203-743-4447, toll-free:
800-992-2424, FAX: 203-791-8702,
support@miller-stephenson.com,
www.miller-stephenson.com
Offers a full line of PTFE release agents/dry
lubricants, precision cleaning solvents, solvent
cleaners, epoxy resins and curing agents, Krytox
fluorinated oils, and grease. Specializes in small
and custom packaging. Available in aerosols and
bulk liquid.

■ 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,
patented sensors, which feature no false
alarms. Products are designed to monitor and
detect hazardous gases, toxic, combustible,
oxygen deficiency, VOC and flame detection
for personal safety, environmental protection
and process controls.

(See ad p 15)

**Milton Roy**

201 Ivyland Rd, Ivyland, PA 18974,
215-441-0800, FAX: 215-441-8620,
info@miltonroy.com, www.miltonroy.com

Contact: Prod Mgr, Jim Carling

Manufactures engineered metering pumps,
accessories, and fluid handling systems. The
product family is specifically designed for the
energy market to address the aggressive
environments, extreme pressures, variable
flow ranges, and unique applications required
in the oil and gas industry.

miniBOOSTER Hydraulics A/S

Ellegaardsvej 25G, DK-6400 Soenderborg,
Denmark, 45-74-42-92-92, FAX: 45-74-42-42-04,
info@miniBOOSTER.com, www.miniBOOSTER.com

Contact: VP Sls/Mktg, Thyge Bollmann
Offers a range of hydraulic pressure boosters,
which are used worldwide in a variety of
applications. The compact size of the
miniBOOSTER allows for installation at a point
where high pressure is needed. That means less
expensive low pressure components can be used
in most of the hydraulic systems.

Miratech Corp

420 S 76th East Ave, Tulsa, OK 74108,
918-622-7077, toll-free: 800-914-3141, FAX:
918-663-5737, ajanet@miratechcorp.com,
www.miratechcorp.com

Contact: Sls Admin, Autumn Janet

Provides emission solutions for industrial engines.
Ongoing compliance for customers is provided
through NSCR and SCR catalysts, silencers, diesel
particulate filters (DPF), field service, training, and
air/fuel ratio controllers.

Mistras Group Inc

195 Clarksville Rd, Princeton Junction, NJ
08550, 609-716-4000, FAX: 609-716-0706,
sales@pacndt.com, www.mistrasgroup.com

Provides complete NDT inspection and testing
services for partners in academic, government, and
industries, including oil and gas, petrochemical,
nuclear, fossil fuel, aerospace, and civil
infrastructure applications.

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 fluids.
The company was founded by experts and leaders
in the mixing and mass transfer fields.

M&J Valve

19191 Hempstead Hwy, Houston, TX 77065,
800-231-3690, toll-free: 800-231-3690, FAX:
281-894-1332, m&jvalve@spx.com,
www.mandjvalve.com

Contact: VP Sls, John Starck

Provides valve products to the hydrocarbon
pipeline, 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, and piston and swing
valves. M&J Valves can provide a variety of flow
control solutions for liquid, geothermal, and gas
markets.

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.
Applications range from organizing wires, hoses,
and tubing in industrial, electrical, electronics,
aviation, automotive, marine, medical, instrumental,
and automation products, to protecting high
pressure hoses and electrical power tool cords
against abrasion.

Mobilarm

PO Box 1533, Applecross, Australia 6953,
61-89315-3511, peterg@mobilarm.com,
www.mobilarm.com

Contact: Bus Dev Mgr, Peter Gedye

Produces crew safety monitoring systems (for use
on vessels and in marine-based facilities) that
generate automatic and immediate alarms in
personnel emergencies, such as man overboard, as
well as marine survivor locating devices to provide
in-water tracking of MOB casualties and improve
rescue time.

Mobrey Measurement

(div of Emerson Process Management)
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 Rattlidge
Manufactures measurement and control
instrumentation. Offering single-source supply for a
range of level, flow, pressure, density, viscosity, and
other measurement solutions.

Modutank Inc

41-04 35th Ave, Long Island City, NY 11101,
718-392-1112, toll-free: 800-245-6964, FAX:
718-786-1008, info@modutank.com,
www.modutank.com

Contact: Pres, Reed Margulis
Manufactures a versatile, low cost line of
above-ground, bolt-together modular steel tanks in
unlimited capacity ranges for virtually every liquid
containment need. Standard and customized tanks
assemble easily and rapidly for indoor and outdoor
locations with little or no site preparation.

Mohawk Innovative Technology Inc

1037 Watervliet-Shaker Rd, Albany, NY
12205-2033, 518-862-4290, FAX: 518-862-4291,
jwalton@miti.cc, www.miti.cc

Contact: VP Program Dev, James F. Walton II
Provides advanced product development, R&D and
high-speed rotating machinery. Products include
compliant foil bearings and seals, lubricant-free
high-speed motors and high temperature, low
friction coatings. Rotor-bearing system integration
and customization design and manufacturing
services are also provided.

Molli Computer Services Inc

PO Box 6129, Colorado Springs, CO 80934,
719-520-1790, FAX: 719-387-1690,
info@mcsi.com, www.mcsi.com

Contact: Pres, Frank Molli

Provides a 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.

Moore Industries International Inc

16650 Schoenborn St, North Hills, CA
91343-6196, 818-894-7111, toll-free:
800-999-2900, FAX: 818-891-2816,
info@miinet.com, www.miinet.com

Contact: Dir Corp Mktg, Steve Todd

Provides interface field processes with
computer-based systems, readout equipment and
other instrumentation. Distributes I/O, temperature
sensors and transmitters, signal conditioners,
fieldbus products, service and experience help you
do it efficiently, safely, and cost-effectively.

Moorlink AB

Bror Nilssons gata 5, 417 55 Gothenburg,
Sweden, 46-31-301-20-60, FAX:
46-31-708-79-00, info@moorlink.com,
www.moorlink.com

Contact: Man Dir, Bjorn Paluquist

Offers mooring components designing worldwide.

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 marketing industry. Product line consists of service station equipment, tank truck fittings, aboveground storage tank fittings, venting equipment, industrial valves, line strainers, monitoring well manholes and plugs, vapor recovery, overflow prevention valves, liquid level gauges, and other valves and fittings.

Motion Industries

(div of Genuine 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. Offers more than three million quality replacement parts to industry, including bearings, mechanical power transmission, electrical and industrial automation, hydraulic and industrial hose, hydraulic and pneumatic components, process pumps and equipment, industrial supply products, material handling, and seals and accessories.

MPRI

(div of L3 Services Group)

Oakhill Rd, Gulls Cry, Isle of Wight, PO34 5AP
UK, 44-1983-567608, FAX: 44-8700-515312,
pchemx@interalpha.co.uk, www.mpri.com

Contact: Dir MPRI Simulations Group UK, Ray Gillett

Provides 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.

MSA

PO Box 427, Pittsburgh, PA 15230,
800-672-2222, FAX: 412-967-0398,
info@msanet.com, www.msanet.com

Contact: Customer Service Center
Manufactures and sells products to protect the safety and health of people worldwide in a diverse range of industries and businesses. Products include confined space equipment, monitors, and portable and permanent gas detection instruments. Products help provide protection from fire, volatile organic compounds, combustibles, oxygen deficiency, toxic gases, vapors, and particulates.

MSE

10 County Line Rd, Suite 20, Branchburg, NJ
08876, 908-575-9880, www.msecorp.net
Acts as a security systems integrator providing sales, implementation, and service of access control, CCTV, mesh network, intercommunications, turnstiles, and other security systems.

Mst Inc

PO Box 87, Hicksville, OH 43526, 800-542-6646,
FAX: 419-542-6475, modsafe@bright.net

MTS Systems Corp

(div of MTS Senors Div)

3001 Sheldon Dr, Cary, NC 27513,
919-677-0100, FAX: 919-677-0200,
info@mts.com, www.mtsensors.com

Contact: Sr Mktg/Comms Mgr, Janet Rapp
Offers magnetostrictive linear position sensing technology and is committed to research and development, product quality, and customer service. Manufactures rugged and reliable Temposonics position sensors, as well as the repeatable and accurate liquid level transmitters and gauges. ISO 9001 certified.

**MTU Maintenance Berlin-Brandenburg GmbH**

(div of MTU Aero Engines)

Dr Ernst Zimmermann Str 2, 14974
Ludwigsfelde, Brandenburg, Germany,
49-3378-824-213, FAX: 49-3378-824-389,
uwe.kaltwasser@mtu.de, www.mtu.de

Contact: Uwe Kaltwasser
Provides OEM independent maintenance, repair, and overhaul for industrial gas turbines GE LM2500, LM2500+, LM 5000, and LM6000. In addition to in-shop repair and overhaul, services include engineering, monitoring, periodic inspections, alignment, testing, boroscopy, training, and global field services available 24 hours/365 days a year.

Muis Controls Ltd

29 Riel Dr, St Albert, Alberta, Canada T8N 5C6,
780-459-7080, toll-free: 800-661-8823, FAX:
780-459-7085, bill.muis@muiscontrols.com,
www.muiscontrols.com

Contact: Pres, Bill Muis
Supplies industrial flowmeters, flow indicators, rota meters, flow switches, flow totalizers, variable area flowmeters, sight flow indicators, turbine flowmeters, positive displacement flowmeters, paddle wheel flowmeters, flow rate indicators, flow transmitters, and flow computers.

NACE International

1440 S Creek Dr, Houston, TX 77084,
281-228-6200, FAX: 281-228-6300,
firstservice@nace.org, www.nace.org

Contact: Mktg Mgr, Stephanie Garner
Offers a corrosion engineering and science society. With more than 20,000 members worldwide, the organization is dedicated to promoting public safety, protecting the environment, and reducing the economic impact of corrosion through training and certification, industry standards, and conferences.

Namtvedt SealMaker Services A/S

Namtvedt Offshore A/S Ltd Div

169 Eiganesveien, PO Box 414, Madla, 4009
Hafsrjord, Stavanger, Norway, 47-464-74-641,
ken@namtvedt.no, www.namtvedt.no

Contact: Partner, Ken Phillips
Offers engineered leak repair solutions from diagnostic to remediation. Specialty sealants designed 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.

Nash A Gardner Denver Product

9 Trefoil Dr, Trumbull, CT 06611, 203-459-3900,
toll-free: 800-553-6274, FAX: 203-459-3988,
nash@gardnerdenver.com, www.gdnash.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 Wire & Cable Corp

136 San Fernando Rd, Los Angeles, CA 90031,
323-225-5611, FAX: 323-225-4630,
valfonsi@nationalwire.com,
www.nationalwire.com

Contact: Nat'l Sls Mgr, Vic Alfonsi
Designs and manufactures tough, dependable geophysical cables. The company's engineers have the technical knowledge to deliver cable that meets or exceeds specifications no matter how harsh the environment.

NCA Norse Cutting and Abandonment

5535 Brystone, Northwoods Business Park W,
Houston, TX 77041, 832-327-3640, FAX:
832-327-3645, www.nca-group.com
Provides cutting services for well abandonment and decommissioning. By having access to a toolbox full of advanced cutting techniques, including abrasive waterjet cutting, guillotine saws, hydraulic shears, diamond wire cutting, and more. The company makes it their objective to recommend the optimal method for specific applications.

**NDT Systems & Services AG**

Am Hasenbiel 6, 76297 Stutensee, Germany,
49-7244-7415-0, FAX: 49-7244-7415-97,
info@ndt-global.com, www.ndt-global.com

Contact: Dir Sls, Ulrich Schneider
Provides a range of advanced pipeline inspection services, including metal loss and crack inspection, using state-of-the-art in-line inspection tools based on the ultrasound and MFL technology. Additional services include pipeline preparation, geometry inspection as well as integrity assessment based on in-line inspection data.

SALES OFFICES:

NDT Systems & Services (America) Inc
Houston, TX 713-799-5400, FAX:
713-799-5406, usa@ndt-global.com,
www.ndt-global.com

Neptune Oceanographics Ltd

Sapharey House, Sturt Rd, Charlbury, Oxon, OX7
3SX UK, 44-160-881-9177,
info@neptune.gb.com, www.neptune.gb.com

Provides subsea pipeline leak detection services.

Net Safety Monitoring Inc

**Net Safety Monitoring Inc**

2721 Hopewell Pl NE, Calgary, Alberta,
Canada T1Y 7J7, 403-219-0688, toll-free:
866-347-3427, FAX: 403-219-0694,
nsm-sales@net-safety.com,
www.net-safety.com

Contact: VP Sls/Mktg, Mike Nugent
Designs, develops, and manufactures fixed
toxic and combustible gas detectors, flame
detectors, safety systems, and ancillary safety
and security products—all certified to the
strictest global standards. Offices in the USA,
Canada, UAE, and Singapore deliver
unparalleled service/support.

J D Neuhaus Lp

9 Loveton Cir, Sparks, MD 21152, 410-472-0500,
toll-free: 800-331-2889, FAX: 410-472-2202,
sales@jdneuhaus.com, www.jdneuhaus.com

Contact: Reg Sls Mgr, John Schmidt
Manufactures air hoists, winches, monorails,
cranes, bop handling systems, low headroom
designs Icon 275 lbs to motions capacity family
business, operating worldwide.

New Avionics Corp

2631 E Oakland Park Blvd, Ft Lauderdale, FL
33306, 954-568-1991, FAX: 954-568-2577,
info@newavionics.com, www.newavionics.com

Contact: VP, Richard Hackmeister
Provides optical ice sensors for use on oil rigs and
related equipment. No moving parts. Ice*Meister
Model 9734 industrial ice detecting sensor systems
provides ice protection to -40 deg C. Senses rime
ice, frost and condensation by optical opacity,
senses clear ice and raindrops by optical refraction.
Normally-open relay contacts communicate with
host system.

Newpark Mats & Integrated Services

2900 Highway 93, Carencro, LA 70520,
337-896-8976, toll-free: 877-628-7623, FAX:
337-896-1971, mralabais@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, toll-free: 800-639-7678, 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; and 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, and test equipment and
accessories.

Nextteq LLC

8406 Benjamin Rd, Suite J, Tampa, FL 33634,
813-249-5888, toll-free: 877-312-2333, FAX:
877-312-2444, info@nextteq.com,
www.nextteq.com

Offers six product lines: gas detection, respiratory
protection, law enforcement investigation,
Homeland Security/first response/Hazmat testing,
surface and skin chemical detection, and water and
soil analysis. The company is a trusted global
leader in the industrial hygiene and safety industry,
with strong commitments to advancing safety and
R&D.

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

Contact: WSAC Sls, Mark Vogel
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
(WSAC) and "No-Frost" liquid desiccant
dehumidification systems.

Nibco Inc

1516 Middlebury St, Elkhart, IN 46516,
574-295-3000, toll-free: 800-234-0227, FAX:
574-295-3307, boyers@nibco.com,
www.nibco.com

Contact: Sr Prod Mgr Valves/Actuation, Phil Liles
Provides flow control products to customers in
residential and commercial construction, fire
protection, industrial, and irrigation markets. The
company specializes in the manufacture of plastic
and metal fittings, valves, actuators, plastic pipe,
thermoplastics, pipe hangers, supports, channels,
and strut and seismic bracing.

Nickpoint Environmental Services Inc

310, 1011, 1st St SW, Calgary, Alberta, Canada
T2R 1J2, 403-260-6702, FAX: 403-260-6701,
info@nickpoint.ca, www.nickpoint.ca

Contact: Pres, Bill Scott
Specializes in preconstruction environmental
planning and approvals, including environmental
field reports, area operating agreements,
watercourse/water body crossings, environmental
assessments, environmental inspections and
audits, historical resources, and environmental
routing and sighting. Also provides aboriginal
consultation and traditional knowledge studies, and
one-call solutions, and ticket management.

Norbar Torque Tools Ltd

Beaumont Rd, Banbury, OX16 1XJ UK,
44-1295-753600, FAX: 44-1295-753609,
sales@norbar.com, www.norbar.com

Contact: Gen Sls Mgr, Jonathan Firberg
Provides torque tools and torque measuring
equipment to 100,000 nm, including equipment
designed specifically for subsea and harsh
environment use. Services accredited to local
standards available from Norbar laboratories in the
U.K., USA, Australia, and Singapore.

Norbar USA Inc

PO Box 740617, Orange City, FL 32774,
386-774-1184, gyoung@norbar.com,
www.norbar.com

Contact: Gregory Young
Manufactures USM line of ultrasonic bolt elongation
and load measurement instruments for critical
bolted joints. Measure and reverify bolt preload
over time.

Nord-Bulk Pte Ltd

159 Telok Ayer St, Singapore 068614, Singapore,
65-6227-5465, FAX: 65-6225-1328,
info@nordbulk.com, www.nordbulk.com

Offers a consultant company with a range of
theoretical and practical skills which are applicable
to several areas, such as pilot study, new buildings,
investigation on existing systems for improvements,
and on-site supervision, all of which is done under
customer premises.

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.

Nord Marine Services Ltd

42 Dundee Ave, Mount Pearl, Newfoundland and
Labrador, Canada A1N 4R7, 709-747-7733, FAX:
709-747-7799, mash@nordmarine.nf.net,
www.nordmarine.nf.net

Sells and services marine, environmental response,
and military equipment and supplies. The company
is ISO 9000 registered and is managed to comply
with strict quality control standards set out by
Transport Canada (TC), International Marine
Organisation (IMO), Safety of Life at Sea (SOLAS),
Det Norske Veritas (DNV), and more.

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 semisat 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, and PED certification.

Norton Corrosion Ltd8820 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 problem solving. Protects POL pipelines, tank farms, underground and aboveground tanks, fuel piers, sheetpile walls, bulkheads, and ballast water treatment plants. Provides the physically survivable Morganode II; marine anodes; and Bayanode probe anodes. Offers cost-effective and practical designs, while providing material supply and construction feedback.

NOV M/D Totco*(div of National Oilwell Varco)*Sales Headquarters Div
12950 W Little York, PO Box 800457, Houston,
TX 77280-0457, 713-937-5700, FAX:
719-973-5730, mdtotco@nov.com,
www.nov.com/mdtotco

Contact: Sr Mktg Mgr, Ron Stone
Provides drift instruments, gauges, sensors, data acquisition, communication services, and business integration. With quality service the company focuses on delivering business results.

Nowata Filtration*(Member of the amafiltergroup)*Nowata and ProGuard Filtration Div
428 N Elm, PO Box 678, Nowata, OK 74048,
918-273-2204, toll-free: 800-259-2204, FAX:
918-273-2101, nowata@amafiltergroup.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.

ODS-Petrodata3200 Wilcrest, Suite 170, Houston, TX 77042,
832-463-3000, FAX: 832-463-3100,
nworkman@energycurrent.com,
www.ods-petrodata.com

Contact: Mktg/Adv Mgr, Nicole Workman
Provides market intelligence for the upstream offshore energy industry. Products include market data for offshore rigs, platforms, floating production systems, supply vessels and field development/construction. Delivery of information includes web-based data systems, strategic reports, forecasts, newswires, data publications and directories.

Offshore DenmarkNorremarksvej 27, 9270 Klarup, Denmark,
45-9831-7711, FAX: 45-9831-7755,
info@offshore-denmark.dk,
www.offshore-denmark.dk

Contact: Man Dir, Mogens Tofte Koch
Provides a network of Danish companies that manufactures products from all aspects in the marine/offshore industry.

OFI Testing Equipment1006 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.

OFM An SPX Brand3521 FM 646, PO Box 817, Santa Fe, TX 77510,
281-337-1003, FAX: 409-925-7972,
ofm@spx.com, www.ofmvalveservices.com

Contact: Sls Mgr, Don Arrington

OI Analytical151 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 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

Contact: Tech Dir, Keith Robinson
Provides independent 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 Inc12800 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 customer service and support.

Oil Stop*(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.

Olympus48 Woerd Ave, Waltham, MA 02453,
781-419-3900, toll-free: 800-225-8330, FAX:
781-419-3980, info@olympusndt.com,
www.olympus-ims.com

Contact: Mktg Mgr, Meindert Anderson
Manufactures testing instruments that are used in industrial and research applications, including aerospace, power generation, petrochemical, civil infrastructure, automotive, and consumer products. The company's instruments contribute to the quality of products and add to the safety of infrastructure and facilities.

OMAX Corp21409 72nd Ave S, Kent, WA 98032,
253-872-2300, FAX: 253-872-6190,
sandra.mclain@omax.com, www.omax.com

Contact: VP Mktg, Sandra McClain
Manufactures affordable, precision, computer-controlled abrasive JetMachining systems, making them easy to use in a variety of industries. Systems cut any material, including metals, ceramics, glass, and composites without heat affected zones. These are great for production runs, short runs, and prototyping.

■ **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)

Omega Natchiq Inc4418 Pesson Rd, New Iberia, LA 70560,
337-365-6028, FAX: 337-359-8935,
scott.mckay@asrcenergy.com,
www.omeganatchiq.com

Contact: Gen Mgr Bus Dev, Scott McKay
Provides for the global energy industry. Operations included 75 acres of 6000 ton capacity, multiservice port facilities. Onshore, offshore, subsea fabrication, ASME pressure vessels with R and U stamps, automation and control systems, electrical and instrumentation services, panel manufacturing, fire and safety detection, and suppression systems.



Omel Bombas E Compressores Ltda
Rua Silvio Manfredi, 201, Guarulhos, 07241000
Brazil, 55-11-2413-5400, FAX:
55-11-2412-5056, omel@omel.com.br,
www.omel.com.br

Contact: Export Dir, 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

OMNI Flow Computers Inc

12620 W Airport Blvd, Suite 100, Sugar Land, TX 77498-6141, sales@omniflow.com, www.omniflow.com

Contact: Inside Sls Mgr, Don Spain
Provides flow computers worldwide. The installed base connects to more than 30,000 liquid and gas flowmeters in more than 70 countries. Servicing exploration and production, pipeline networks, refinery and petrochemical markets, OMNI goes further in taking flow measurement to a higher level.

One Eye Industries Inc (OEI)

6320 11th St SE, #12, Calgary, Alberta, Canada T2H 2L7, 403-242-4221, toll-free: 877-888-8727, FAX: 403-242-4249, info@oneeyeindustries.com, www.oneeyeindustries.com

Contact: Pres, Roger Simonson
Manufactures environmentally friendly reusable filters and magnetic filtration systems, with applications in the oil and gas industry. Also specializes in pipeline filtration and erosion reduction. Offers filtration solutions that are a patented new technology with flexible designs. Welcomes new challenges.

OpenSpirit

4800 Sugar Grove Blvd, Suite 500, Stafford, TX 77477, 281-295-1400, FAX: 281-295-1401, sales@openspirit.com, www.openspirit.com
Integrates upstream applications and data stores, improving the efficiency and productivity of geoscientists, geotechnical specialists, and database managers and enabling senior managers to make better decisions while reducing costs.

**optek-Danulat Inc**

N118 W18748 Bunsen Dr, Germantown, WI 53022, 888-864-4288, petro@optek.com, www.optek.com

Contact: App 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 solid concentrations. Can accommodate hazardous area classifications, extreme temperatures, and pressures. 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: 540-265-0724, marketinginfo@occfiber.com, www.occfiber.com

Contact: Inside Sls Mgr, Tom Nackley
Manufactures fiberoptic cables for both indoor and outdoor data communications applications.

Optimex

269 Rue De Montepy, 69210 Fleurieux Sur L'Arbresle, Rhone Alpes, France, 33-4-72-52-95-74, FAX: 33-4-72-52-95-75, contact@optimex-pumps.com, www.optimex-pumps.com
Manufactures canned motor pumps.

OPW Engineered Systems

(sub of OPW Fluid Transfer Group)
Dover Div

2726 Henkle Dr, Lebanon, OH 45036, 513-932-9114, toll-free: 800-547-9393, FAX: 513-932-9845, sales@opw-es.com, www.opw-es.com

Contact: Dir Sls/Mktg, Greg Carrino
Provides solutions for the safe handling, transfer, and monitoring of hazardous bulk products worldwide.

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 aboveground 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.

Osprey Biotechnics

1833A 57th St, Sarasota, FL 34243, 941-351-2700, toll-free: 800-553-7785, FAX: 941-351-0026, info@ospreybiotechnics.com

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
Supplies high performance perforating, pipe recovery, and casing patch systems, and thru-tubing rental tools and services. Has more than 37 worldwide locations, including 16 in the USA, nine in Canada, and 12 internationally (Europe, Middle East, Asia, Pacific, and South America).

OYO Geospace Corp

7007 Pinemont Dr, Houston, TX 77040, 713-986-4444, FAX: 713-986-4445, spresley@oyogeospace.com, www.oyogeospace.com

Designs, manufactures, and deploys a spectrum of seismic instrumentation solutions and accessories for the oil and gas industry worldwide. Headquarters are located in Houston, Texas, with international sales in Canada, China, Russia, and the United Kingdom.

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

Contact: Bus Dev, Amy Williams-Alden
Provides economic and planning solutions to the oil and gas industry. Expertise in fiscal regimes, risk analysis, and portfolio management.

Palisade

Palisade Europe

31 The Green, West Drayton, UB77PN UK, 44-1895-425-050, FAX: 44-1895-425-051, cferri@palisade.com, www.palisade.com

Contact: Sls Dir, Chris Marlow
Develops risk and decision analysis software. Products including @RISK and the Decision Tools Suite integrate seamlessly with Microsoft Excel to provide cutting edge techniques such as Monte Carlo simulation, optimization and Neural networking tools in a familiar and intuitive environment.

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

Supplies disposable cartridge filters, backwashable filter systems, liquid/liquid and liquid/gas, coalescers, portable water systems, and boiler feed water systems to the oil and gas industries, and is developing new crude oil desalting solutions.

Palmer Wahl Instrumentation Group

234 Old Weaverville Rd, Asheville, NC 28804, 828-658-3131, toll-free: 800-421-2853, 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 recorders; RTD and TC meters; Data Loggers; megohmmeters; and ohmmeters. ISO 9001:2000 certified.

PANalytical BV

Lelyweg 1, PO Box 13, 7600 AA Almelo, The Netherlands, 31-546-534-444, FAX: 31-546-534-598, info@panalytical.com, www.panalytical.com

Offers a complete petrochemical package. An established range of x-ray fluorescence (XRF) spectrometers, a global support network, standard sets, and instant online performance testing program—take analysis from calibration to certification.

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

Develops and provides solutions that help customers optimize physical infrastructure growth through simplification, agility, and operational efficiency. The company's unified physical infrastructure based solutions give enterprises the capabilities to connect, manage, and automate communications, computing, power, control, and security systems for a smarter, unified business foundation.



Paradigm Geophysical Corp

Two Memorial City Plaza, Houston, TX 77024,
713-393-4800, toll-free: 800-888-3273, FAX:
713-393-4801, info@pdgm.com,
www.pdgm.com

Contact: CEO, John W. Gibson Jr.

Provides enterprise software solutions for digital subsurface asset management serving the global oil and natural gas exploration and production industry. Software solutions and integrated services for prospect generation and evaluation support every stage in the oil and gas E&P process, from data processing and imaging, and visualization interpretation.

Paradigm Strategy Group Inc

1117 E Putnam Ave, #347, Riverside, CT 06878,
203-637-1092, FAX: 203-637-5927,
info@paradigmtraining.com,
www.paradigmtraining.com

Contact: Man Dir, Ed Downing

Provides practical nontheoretical business-oriented training in energy risk management and asset optimization. Programs are structured to the specific needs of today's complex energy industries and are designed to excite participants by providing skill sets necessary for confidently managing multiple energy risks and developing new products.

Parker dominick hunter

5900-B Northwoods Pkwy, Charlotte, NC 28269,
704-921-9303, toll-free: 800-345-8462, FAX:
704-921-1960,
industrialusa@domnickhunter.com,
www.domnickhunter.com

Contact: Mktg Svcs, Jane Sexton

Manufactures compressed air and gas filtration and purification equipment, nitrogen gas generators and process water chillers.

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

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:
216-896-4410, 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 / Page International Hose

4700 Lone Star Blvd, Fort Worth, TX 76106,
817-984-0135, FAX: 817-624-9095,
jekruit@parker.com, www.pageintl.com
Provides braided fluoropolymer hose products.

Parker Scanrope AS

(sub of Parker Hannifin Corp) Energy Products Div

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 a deep water berth. Long list of references from renowned customers worldwide.

Parker Titan

(div of Parker Hannifan)

Industrial Hose Products Div

11121 Garfield Ave, PO Box 1007, South Gate,
CA 90280, 562-862-1922, FAX: 562-869-0592,
david.emmons@parker.com

Pathway to China

300 Wilcrest Dr, Suite 300, Houston, TX 77042,
713-954-4878, FAX: 281-966-1878,
ptc@pathwaytochina.com,
www.pathwaytochina.com

Contact: Dir, Austin Zhao

Specializes in China business services, including both consulting and implementation. Provides the opportunity for American companies to do business with China directly, efficiently, and cost-effectively. Featured services include sourcing and outsourcing programs designed to enable you to get quality products at low costs from Chinese manufactures without brokers or hassels.

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. 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, toll-free: 800-828-8840, 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.

Pdc Machines Inc

1875 Stout Dr, Warminster, PA 18974,
215-443-9442, FAX: 215-443-8530,
info@pdcmachines.com, www.pdcmachines.com

Contact: Mktg/Sls, Osama Al-Qasem
Manufactures diaphragm compressor where there is a need for ultra high purity leak tight gas compression. Handling discharge pressures from above atmospheric to 15,000 psig and beyond. Provides gas producers, electrolyzer manufacturers, renewable energy and fuel cell organizations, universities and government affiliations.

Peaceland Fabricating

PO Box 331, Hythe, Alberta, Canada T0H 2C0,
780-356-2200, FAX: 780-356-2822,
www.peaceland.ca
Contact: Sales

Manufactures current focus on shop fabricated tanks and rental tanks of all sizes up to 1000 BBL. We also manufacture shale bins, mud tanks, and flare tanks. We are currently working together with Stettler Oil and Gas separating equipment. Our facility is able to offer a complete manufacturing service from design through fabrication to application of coatings and linings.

Pelco Inc

3500 Pelco Way, Clovis, CA 93612,
559-292-1981, FAX: 559-348-1120,
pr@pelco.com, www.pelco.com
Designs, develops, and manufactures video security systems and equipment. The company has a history of offering quality products and technologies, and 100% guaranteed customer satisfaction.

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
Provides a global leader in the design and development of advanced lighting systems and virtually indestructible cases for protecting valuable equipment.

Pepperl+Fuchs

Process Automation Div

1600 Enterprise Pkwy, Twinsburg, OH 44087,
330-425-3555, toll-free: 800-253-5266, FAX:
330-425-4607, pa-info@us.pepperl-fuchs.com,
www.pepperl-fuchs.com

Offers intrinsic safety interfaces and hazardous location equipment. The company's portfolio contains a range of explosion protection systems and interface equipment. Also offers industrial grade monitors, BEBCO purge and pressurization systems, FieldConnex fieldbus installation systems, online corrosion monitoring transmitters, and level sensing technologies.

Perenne Equipamentos e Sistemas de Agua Ltda

Rua da Consolacao 247, Sao Paulo, SP-CEP
01301-903 Brazil, 55-11-3546-1800, FAX:
55-11-3546-1842, 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, erecting, installing, training, operating, 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-Cote Coated Conduit

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903-843-4388, FAX: 903-843-2516,
sbickerstaff@permacote.com,
www.permacote.com

Robroy Industries is an organization of synergistic member companies dedicated to product and service leadership within speciality markets.

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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 the energy of the pumping unit on location to compress low pressure gas into the sales line and increases production by reducing formation back pressure.

Petans Ltd

The Training Centre, Bullock Hill, Horsham St Faith, Norwich, NR10 3HT UK, 44-1603-891255, FAX: 44-1603-890827, bookings@petans.co.uk, www.petans.co.uk

Contact: Gen Mgr, Michael Wilder
Provides training to U.K. and international offshore standards in survival, firefighting, HUET, helicopter HLO, DGAS, maritime, first aid, and emergency response. Certificates are recognized by every major employer in the global oil and gas business. First class facilities in Norwich, U.K. with easy international links across the globe.

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7A Harriman Campus Rd, Albany, NY 12206, 518-689-0222, FAX: 518-689-0225, petrolab.sales@amatek.com, www.petrolab.com

Contact: Mktg/Comms Mgr, Angel Schell
Distributes for Grabner, Proteotest, Lovibond, Tamsom, Lawler, and Spectro Analytical Instrumentation, offering a complete selection of products for the petroleum industry. The on-line and laboratory products include vapor pressure, viscosity, flashpoint, moisture content, color, penetration, low sulfur, oxidation stability, and more.

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Contact: Tech Mgr, Peder Hansson

Phoenix Contact

PO Box 4100, Harrisburg, PA 17111, 717-944-1300, FAX: 717-944-1625, info@phoenixcon.com, www.phoenixcontact.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, Bayou Vista, 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-related 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

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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

Pipeline Seal & Insulator Inc

6525 Goforth St, Houston, TX 77021, 713-747-6948, FAX: 713-747-6029, info@psipsi.com

Plasti-Bond Coated Conduit

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Offers a cooperative initiative of Ballard Saphr Andrews & Ingersoll, LLP, Day, Jackson Walker LLP, and Thackray Burgess acting as co-counsel. The firms work together to bring clients the unparalleled ability to manage large sophisticated energy transactions internationally.

**POLARIS Laboratories**

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Contact: VP Sls, Brett Minges
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 are immediately through the company's free Internet service, HORIZON. ISO 17025:2005 A2LA accredited.

Polyflex

(sub of Parker Hannifin Corp)
Energy Products Div
12840 Sugar Ridge Blvd, Stafford, TX 77477, 281-925-4500, FAX: 281-530-5353, epdsales@parker.com, www.parker.com/epd

Contact: Sls Mgr, Paul Walker
Designs and manufactures state-of-the-art subsea umbilicals, power cables, and mooring lines; 2.2 million lbs, 1000 MT finished capacity. Complete engineering and technical support.

Potters Industries Inc

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Contact: Mktg Spec, Robert Flanagan
Manufactures solid and hollow light weight glass microspheres for drilling fluids and muds, pipe insulation, drilling cements buoyancy modules and proppants, property enhancements include reduce torque, reduced cost, thermal insulation, light weight, and high strength.

**Power House Tool Inc**

626 Nicholson St, Joliet, IL 60435, 815-727-6301, info@powerhousetool.com, www.powerhousetool.com

Contact: Inside Sls Mgr, Stephanie Porterfield

Offers the Black Jack Stud Runner, which has successfully removed studs worldwide, and the Speed Heater Controller, which heats studs fast. Other products include tightwire alignment kits, taper gauges, extensometers, and other turnaround tools.

Power Partners Inc

43 Broad St, Hudson, MA 01749, 978-567-9600, FAX: 508-967-9601, sales@powerpartners-inc.com, www.powerpartners-inc.com

Contact: Sls Mgr, Steve Swenson
Designs and manufactures AC/DC power supplies and DC/DC converters from 1 to 650W. Engineering and sales support from experienced power supply industry professionals to help select from thousands of standard products and provide a modified or custom design.

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 3000+W AC/DC power supplies for a variety of markets, including medical, industrial, instrumentation, data communications, and telecommunications. Informational website includes detailed product specifications and online procurement.

Precision Engine Controls Corp

11661 Sorrento Valley Rd, San Diego, CA 92121, 858-792-3217, toll-free: 800-200-4404, FAX: 858-792-3200, 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 Quincy Corp

1625 W Lake Shore Dr, Woodstock, IL 60098, 815-338-2675, FAX: 815-338-2960, marketing@precisionquincy.com, www.precisionquincy.com

Contact: Mktg Coord, Mike Koontz
Manufactures prefabricated shelters. Established in 1943, the company supplies OEMs and direct customers nationwide with shelters and components at competitive prices.

PreConstruction Catalysts Inc

18156 Darnell Dr, Olney, MD 20832, 301-570-9100, FAX: 240-363-0062, d2sales@ud2.us, <http://ud2.us>

Contact: Pres/CEO, Michael J. Weiner
Connects end buyers with end sellers without intermediary interference. The company's role is to put those who can sign a contract with those who can sign a check.

Presens AS

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47-22-06-40-70, FAX: 47-22-06-40-71,
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Contact: Bus Dev Mgr, Voula Terzoudi
Supplies high accuracy pressure sensors based on proprietary patented technology. The combination of the company's technology, together with design capabilities and technology expertise for advanced pressure sensing solution, has resulted in a range of pT sensors for oil and gas applications with a number of advantages over other current solutions on the market.

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 aboveground 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.

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.

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ProSep Technologies Inc

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5353 W Sam Houston Pkwy N, Suite 150,
Houston, TX 77041, 281-504-2040, toll-free:
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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, and produced water treatment systems.
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P&R Technologies

PO Box 554, Portland, OR 97207, 503-292-8682,
FAX: 503-292-8697, george@prtech-pdx.com,
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Contact: Pres, George Osgood
Offers thermal imaging cameras for leak detection and perimeter security. Offers bird diverters, hazing devices, markers, flags, and LED obstruction lights.

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.

PTC Electronics Inc

45 Whitney Rd, Suite B-9, Mahwah, NJ 07430,
201-847-0500, toll-free: 800-989-9518, FAX:
201-847-1394, sales@ptcelectronics.com,
www.ptcelectronics.com

Contact: VP Sls, John C. Kicks
Provides measurement solutions in areas of pressure, weight, and force since 1978. Distributes pressure transducers and transmitters manufactured in the USA by American Sensor Technologies. Load cells, force transducers, and electronics by SCAIME. Also distributes London Intuitive digital indicators. Complete tank level systems—display and record level(s).

Pureaire Monitoring Systems Inc

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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.

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Brazil, 55-19-32563-490, FAX: 55-19-3256-4661,
pn1@pvac.com.br, www.pvac.com.br

Contact: Dir, Pedro Nobrega
Provides vacuum sewage collection systems such as vacuum centrals, vacuum generators, and vacuum tanks. Sewage treatment plants. Biological and physical chemical type, IMO certified. Vacuum toilets and offshore or onshore maintenance and spares parts services for EVAC vacuum toilets systems and sewage treatment plants.

Pyroban Corp

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590 Bloomfield Ave, #372, Bloomfield, NJ 07003,
973-748-0760, FAX: 973-842-0508,

salesusa@pyroban.com, www.pyroban.us
Offers explosion protection services and consulting for powered industrial, offshore, and oil field equipment.

Q&B Servicos Ltda

Estrada Asfaltada do PT da Petrobras, 949
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Brazil, 55-22-2105-4100, FAX: 55-22-2105-4101,
miguel.queiroz@qbservicos.com,
www.qbservicos.com

Contact: Dir, Miguel Queiroz
Provides maintenance, welding, blasting, painting on large structures, operation, maintenance, and repair on platforms, rigs, offshore cranes, electrical submersible pumps, inflatable packers, and pressure downhole gauges. Pipeline inspection gauges and corrosion monitoring.

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 vibration, crushing, and impact. The cable jacket provides resistance to cut throughs, 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.

Quantum Energy Partners

777 Walker St, Suite 2530, Houston, TX 77002,
713-328-0022, dlb@quantumep.com,
www.quantumep.com

Contact: Man Dir, David L. Bole
Provides private equity to the global energy industry. With more than \$5 billion in assets under management, the company targets investment opportunities between \$50 and \$500 million with proven management teams in the oil and gas upstream and midstream sectors.

Quest TruTec LP

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1004 Central Ave S, Kent, WA 98032,
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sales@questtrutech.com, www.questtrutech.com
Contact: Contracts/Mktg Mgr, Margo Reyna
Provides advanced measurements, performance modeling, and process solutions to the global refining, chemical and gas processing, and power generation industries. The company's highly quantitative and proprietary data-centric technologies provide true condition-based monitoring capabilities that can be digitally linked to the operator.

Quick Oilfield Solutions

Quick Oilfield Solutions

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Contact: Sls Mgr, Richard Evans
Builds Field Data Capture software which can be deployed in field offices, laptops, and intrinsically safe hand helds. It tracks production and maintenance data related to wells, compressors, tanks, and other field equipment.

Quincy Compressor

En Pro Industries Div

701 N Dobson Ave, Bay Minette, AL 36507, 217-222-7700, FAX: 251-937-7182, info@quincycompressor.com, www.quincycompressor.com

Contact: Mktg Svc Mgr, Jacqueline Gay
Designs and manufactures reciprocating and rotary screw air compressors ranging from one-third to 350 horsepower; vacuum pumps and a full line of air treatment components. Nearly 40% of rotary sales are considered custom orders with one-of-a-kind configurations ranging from electrical specialties to freeze-protection options.

Racine Flow Meter Group

8635 Washington Ave, Racine, WI 53406-3738, 262-639-6770, FAX: 262-639-2267, leads@inquiry-tracking.com, www.racinefed.com/flow

Contact: Dir Sls, Michael Scoon
Serves construction, industrial, municipal and commercial markets worldwide and offers high quality and cost-effective solutions for must-flow measurement applications. The company is comprised of six flowmeter divisions representing a variety of measurement technologies.

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.

RainMaker Energy LLC

10077 Grogans Mill Rd, Parkwood One, Suite 275, The Woodlands, TX 77380, 832-482-3612, FAX: 832-482-3617, rmun@rmenergy.net, www.rainmakerenergy.net

Contact: Co-Owner/Pres, Richard W. Munn
Focuses on acquisition of onshore U.S. production, including operated and nonoperated oil and gas properties with significantly underdeveloped assets

Raxton Ltd

Kingsway, South Westgate, Aldridge, West Midlands, WS9 8FS UK, 44-1922-450-400, FAX: 44-1922-450-401, ray.kill@raxton.co.uk, www.raxton.co.uk

Contact: Sls Dir, Ray Kill
Provides flameproof electrical thread conversion adaptors, reducers, stopping plugs, cable glands, drain plugs, insulated adaptors, stopper boxes, and accessories. Thread forms include NPT, Isometric, PG BSP, and ET in a variety of materials. Products are certified to CSA, ATEX, CENELEC, and GOST. A quality assured EN 9001:2000 company.

Raycap Inc

2310 N Molter Rd, Suite 102, Liberty Lake, WA 99019, 509-892-3660, FAX: 509-892-3690, rluse@raycap.com, www.raycapinc.com

Contact: VP Sls/Mktg, Jeff Gibbons
Manufactures advanced transient voltage surge suppression modules and systems for a range of applications. The company exports its Rayvoss systems and Strikesorb modules to more than 40 countries around the world and has operations in the USA, Canada, Panama, Switzerland, Romania, Bulgaria, and Serbia-Montenegro.

Ray Oil Tool Co Inc

PO Drawer 1078, Broussard, LA 70518-1078, 337-837-4768, toll-free: 800-937-4768, FAX: 337-837-4771, rayoiltool@attmail.com, www.rayoiltool.com

Contact: Pres, Ray Mikolajczyk
Develops and manufactures new innovative casing cementing accessories and their placement.

Raytek Corp

(sub of Fluke)
Automation Div

1201 Shaffer Rd, PO Box 1820, Santa Cruz, CA 95061-1820, 831-458-3900, FAX: 831-458-1239, solutions@raytek.com, www.raytek.com

Contact: Mktg/Comms Coord, Si'like Koltermann
Manufactures noncontact IR temperature sensors for process monitoring, quality control, and maintenance. Products include automation thermometers and on-line sensors, including miniature sensors, sensors with microprocessors, two-way communication, and IR line scanners.

RCI Technologies Inc

462 Borrego Ct, 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
Manufactures, distributes, and services the fuel industry. Offers a line of filter-less universal fuel purifiers, portable tank cleaning units, and NEMA4 UL 508A automatic fuel recirculating systems. Products remove 100% of all free water and 99% of contaminants.

Reed Manufacturing Co

1425 W 8th St, PO Box 1321, Erie, PA 16512-1321, 814-452-3691, toll-free: 800-666-3691, reedsales@reedmfgco.com, www.reedmfgco.com

Contact: Pres Sls/Fin, Scott K. Wright
Provides variety in pipe and tubing cutters, cutter wheels, vises, and offers the largest tool selection for plastic pipe applications. Groovers, threaders, power drives, dies and oil figure prominently in the line, along with water services tools and machines, wrenches, and general figure prominently in the line, along with water services tools.

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: Dir Prod Mktg, Robert Findley
Offers products that have measured, monitored, and controlled industrial processes. The goal is to develop 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

Kontrölvägen 15, PO Box 80, SE-791 22 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 electrohydraulic actuators for quarter turn and multiturn valve applications for the oil, gas, and petrochemical industries.

Reotemp Instruments

10656 Roselle St, San Diego, CA 92121, 858-784-0710, toll-free: 800-648-7737, FAX: 858-784-0720, sales@reotemp.com, www.reotemp.com

Manufactures temperature and pressure instrumentation. Products include bimetal thermometers, thermowells, pressure and temperature switches, pressure gauges, diaphragm seals, pressure transmitters, remote reading thermometers, RTDs and thermocouples, and digital thermometers. Also offers a variety of niche temperature products for the compost, waste management, and recycling markets.

Rescom Sales Inc

214 Bruce Ave, Kincardine, Ontario, Canada N2Z 2P3, 519-396-8555, toll-free: 800-665-2740, FAX: 519-396-4045, sales@rescom.ca, www.rescom.ca

Contact: Nat'l Sls Mgr, Tom Walters
Offers safe radio interfaces for hazardous environments, safe hard line communications for confined space/rescue, and vehicle communications for high noise environments; headsets and hearing protection, along with specialty services in air/communications, molding, prototyping, testing, electrical design and development, mechanical design and development, drafting services, system integration, and quality certification programs.

Rexnord Industries LLC

5555 S Moorland Rd, New Berlin, WI 53151, 262-796-4065, www.rexnord.com
Manufactures and markets power transmission and water management products.

R&G Laboratories Inc

217 Hobbs St, Suite 105, Tampa, FL 33619, 813-643-3513, FAX: 813-793-4429, cheryl@randglabs.com, www.randglabs.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.

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; and shut-off, control, and safety valves for corrosive, hazardous, contaminated, pure, and high purity fluids in chemical, pharmaceutical, petrochemical, industrial, semiconductor, and environmental applications. Materials include PFA, PTFE, PE-UHMW, hastelloy, tantalum, SiC, ASME/ANSI, and ISO/DIN.

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)*

8500 Hansen Rd, PO Box 12942, Houston, TX
77217, 713-943-0340, FAX: 713-943-8354,
info@rigalite.com, www.rigalite.com

Contact: Dir Petroleum Sls, Jeff Jannsen
Contact: Inside Sls Mgr, Anita Burnside
Provides quality lighting for the oil and gas industry.

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.

Rigserv International LLC*(sub of Rigserv Ltd)*

11381 Meadowglen, Suite F, Houston, TX 77082,
281-870-0833, FAX: 281-870-0480,
information@rigserv.com, www.rigserv.com

Contact: Man Dir, Y. T. Chan
Offers drilling control system, drilling automation,
drilling instrumentations system, integrated
AutoDriller and Crown/Floor Saver, and complete
driller's control cabin. Provides system design,
engineering, new or upgrade for offshore/land rigs
and drilling instruments.

SALES OFFICES:**Rigserv Ltd**

**Aberdeen, UK 44-1224-724-212, FAX:
44-1224-724282, information@rigserv.com,
www.rigserv.com**

RiskAdvisory*(div of SAS)*

401 9th Ave SW, Suite 970, Calgary, Alberta,
Canada T2P 3C5, 403-263-7475,
kathy.walsh@sas.com, www.riskadvisory.com

Contact: Mktg Strat Energy Risk, Kathy Walsh
Provides risk solutions to companies operating in
today's volatile energy market. Since 1995, the
company has provided software, consulting, and
educational services to 220+ clients globally.
Solutions for energy risk management represent a
complete front, middle, and back office risk
management platform.

**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: Nat'l Sls Mgr, Dave McEndarffer
**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 Highwaywy 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&MES 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.

The Rochester Corp/Tyco Electronics Corp*Tyco Electronics Corp Div*

751 Old Brandy Rd, Culpeper, VA 22701,
540-825-2111, FAX: 540-825-2238,
djharris@tycoelectronics.com

Contact: Gen Mgr, David Harris
Manufactures electromechanical optical cables
used in the oil industry, gas industry, and
government systems. Produces wire products.

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.
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, and vertical drilling
applications, including the DragonSlayer High
Performance (HP) rubber stators, which can handle
applications to 425°F. Also provides gear pumps
and progressive cavity pumps for general fluid
transfer applications.

ROPLAST

Kruppstrasse 1, 49835 Wietmarschen, Germany,
49-5908-937-37-0, FAX: 49-5908-937-37-19,
sales@roplast.de, www.roplast.de

Develops and manufactures products and systems
using high performance RoPlasthan elastomers.
Product line includes EasyClean and UltimateClean
pipeline cleaning tools (ATEX), cups and discs,
transmitters, Data Loggers, electronic pig
detectors, sensors, rollers, elastomer bearings,
vibration dampers, clamps, valve insulation plates,
diabolo rollers, buffers, wheel chocks, fasteners,
and more.

**ROSEN Group**

**Obere Spichermatt 14, 6370 Stans,
Switzerland, 41-41-618-0300, FAX:
41-41-618-0319, info@roseninspection.net,
www.roseninspection.net**

Contact: Mgr Corp 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,
(in-line cleaning, in-line inspection, EMAT
crack detection and coating disbondment,
multidiameter pipeline inspection, leak
detection, robotic inspection, data services,
and asset integrity management support).**

SALES OFFICES:**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**

Rotating Machinery Services Inc/RMS Power Solutions

2760 Baglyos Cir, Bethlehem, PA 18020,
484-821-0702, FAX: 484-821-0710,
rms@rotatingmachinery.com,
www.rotatingmachinery.com

Contact: VP Sls, Kurt Diekroeger
Provides a range of turbomachinery engineering,
rerate, overhaul, and field services to users of
compressors, steam turbines, expanders, and gas
turbines. Services the refining, chemical, gas
transmission, power generation, and steel
industries. Experienced engineers, technicians, and
manufacturing personnel.

Rotork Process Controls Inc*(Sub of Rotork Controls Inc)*

Rotork Process Controls Div
5607 W Douglas Ave, Milwaukee, WI 53218,
414-461-9200, FAX: 414-461-1024,
rpcinfo@rotork.com, www.rotork.com

Contact: VP Sls/Mktg, Howard Williams
Manufactures electric, pneumatic, and hydraulic
valve actuators and associated control systems,
valve gearboxes, and valve accessories - support
by the Rotork worldwide service network.

Rotronic Instrument Corp

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.

R STAHL

Am Bahnhof 30, 74638 Waldenburg, Germany,
49-7942-943-0, FAX: 49-7942-943-4333,
info@stahl.de, www.stahl.de

Manufactures safety technology for hazardous areas. Based in Waldenburg, Gremy, the company is a supplier of explosion protected automation, control and distribution, installation, operating and monitoring, lighting, signaling, alarm components, and systems. Key products include customer-specific systems solutions for hazardous areas.

RSVP Actuators and Controls

Highway 290 E, #600, Hempstead, TX 77445,
281-463-8089, FAX: 281-463-8046,
sales@rsvpactuators.com, www.rsvpactuators.com

Contact: Pres, Fred Stockton
Manufactures actuators for quarter turn valves, scotch-yoke type.

Rush Gears Inc

550 Virginia Dr, Dept 413.001, Ft Washington, PA 19034, 215-542-9000, www.rushgears.com
Manufactures many types of gears, including made-to-order gears. Also offers other toothed products.

Rwd Technologies Inc

55 Waugh Dr, Suite 200, Houston, TX 77007,
713-284-1800, FAX: 713-284-1801,
info@rwd.com, www.solutionsthatperform.com

Offers business process design and implementation, change strategy and management, training design and implementation, and lean system training, design, and implementation.

Sabeus Inc

26610 Agoura Rd, Suite 100, Calabass, TX 77060, 818-737-7700, FAX: 818-737-7704,
sales@sabeus.com, www.sabeus.com

Contact: Sls Eng, Jay Hong
Provides precise, reliable, cost-effective fiberoptic sensing solutions for rugged environments. Our Field Sense systems permanently measure subsurface pressure, temperature, and strain in order to optimize oilfield production and improve equipment maintenance schedules. Maintains operations in Calabasas, California, Houston, Texas, Freeport, Pennsylvania and Calgary (Alberta), Canada.

SAFEGUARD TECHNOLOGY INC

7207 Chagrin Rd, PO Box 274, Chagrin Falls, OH 44022, 440-247-1695, toll-free: 800-989-1695,
FAX: 440-247-1156,
jgkerlek@safeguard-technology.com,
www.safeguard-technology.com

Contact: VP, Jerome Kerlek
Manufactures SAFEGUARD Retrofit Step, Ladder Rung, and Walkway Hi and HiGlo-traction covers. The antislip covers are installed over grating, concrete, steel, aluminum, and wood without downtime. Available in stainless galvanized steel and Pultruded FRP composite in various colors (photoluminescent) and grades. Exceeds OSHA and ADA guidelines for COF values.

Saft

12 rue Sadi Carnot, F-93170 Bagnolet, France,
33-1-4993-1918, www.saftbatteries.com

Contact: Bus Dev Mgr, Antoine Brenier
Designs and manufactures high technology batteries for industry. Batteries are used in high performance applications, such as industrial, infrastructure, processes, transportation, space, and defense. Manufacturer of primary lithium batteries for a range of end markets.

Saint-Gobain Crystals

Scintillation Products Div
17900 Great Lakes Pkwy, Hiram, OH 44234,
440-834-5600, FAX: 440-834-7860,
scintillation@saint-gobain.com,
www.detectors.saint-gobain.com

Contact: Prod Mgr, Daniel Meldrum
Supplies ruggedized sodium iodide gamma ray detectors to the well logging industry in addition to other high performance scintillators and gas-filled radiation detectors. Notable brands include Bicron, TGM, and our new BrillLaneCe, and PreLude 420 scintillators.

Saipem America Inc

15950 Park Row, Houston, TX 77084,
281-552-5600, FAX: 281-552-5904,
marco.sclocchi@saipemamerica.com,
www.saipemamerica.com

Contact: Comm Mgr, Marco Sclocchi
Provides subsea construction services to the offshore oil and gas industry; specializing in engineering, construction, and maintenance services.

Saltys Manufacturing

3174 State Highway 7 W, Center, TX 75935,
936-598-3905, mmoloney@sofs.cc, www.saltys.biz
Offers wastewater storage and disposal tank solutions. Our frac-tanks are built entirely on site. Customized tanks have been developed for the use in a variety of industrial applications. We also can custom manufacture virtually any product made of steel.

Salzgitter Mannesmann Stainless Tubes GmbH

(div of Salzgitter Group)
Tubes Div

Wiesenstr 36, 45473 Muelheim/Ruhr, Germany,
49-208-458-01, FAX: 49-208-458-2640,
dmv@smst-tubes.com, www.smst-tubes.com

Contact: Key Acct Mgr Oil/Gas, Joelle Greenwood
Offers seamless stainless-steel pipes and tubes; nickel-based alloy tubes and pipes; heat resistant, corrosion resistant, and high temperature resistant tubing and piping, from AD 6-250 mm, WT 0.5-50 mm, in lengths to 25 m. Products are used within power generation, oil and gas applications, petrochemical and chemical industries, and more.

Sandvik Process Systems

(div of Sandvik Materials Technology Deutschland GmbH)

Saliierstrasse 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/sarge/

Contact: Dir Mktg Svc/Admin, Bob Green
Offers SAR-GEL water indicating paste, which 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

11 N Willow St, Trenton, NJ 08608,
877-717-2782, FAX: 419-710-5831,
sales@sarvabioremed.com,
www.sarvabioremed.com

Contact: Pres/CEO, Satya Ganti
Manufactures VaporRemed for the elimination of heating oil fumes.

SCANCAB A/S

Kirkegaardsvej 29, Kliplev, 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, pipe handling, and winch operation. Provides access platforms for cabins and control rooms for engineers and drillers.

Scan Geophysical ASA

Rådhusgaten 23, NO-0158 Oslo, Norway,
472-411-1000, FAX: 472-411-1010,
karlsson@scangeo.com, www.scangeo.com

Contact: VP Sls/Mktg, Kjell Karlsson
Offers marine seismic data acquisition company, specializing in marine streamer seismic and ocean bottom cable seismic. Currently operating three steamer vessels within both high-end 2-D and 3-D acquisition modes.

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 company's 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, FAX: 773-338-2562,
sstrand@sandc.com, www.sandc.com

Provides equipment and services for electric power systems. Since its beginning in 1911, the product line has expanded significantly in electric power switching and protection. Also offers a range of engineering, laboratory, and testing services for electric utilities and commercial, industrial, and institutional power users.

Schischek GmbH Explosionproof

Mühlsteig 45, 90579 Gewerbegebiet V Langenzenn, Germany, 49-910-1908-10, FAX: 49-910-19080-177, info@schischek.de, www.schischek.com

Manufactures explosion proof actuators, sensors, transducers and switching modules. Explosion expertise as well as international exports are key criteria.

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

2350 NE Hopkins Ct, Pullman, WA 99163, 509-332-1890, FAX: 509-332-7990, marketing@selindustrial.com, www.selindustrial.com

Provides protection and monitoring for power systems, generators, and motors, including automation, control, and communications products, and services. Leads in reliable systems and products and customer support. Products are proven in a temperature range, withstand harsh environments, and are covered by a ten-year warranty.

Scotgrip UK Ltd

Silverbank Industrial Estate, N Deeside Rd, Banchory, 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 antislip safety products for stairways, walkways, decks, ladders, ramps, and gangways. Products are designed to eliminate accidents, even in harsh working environments.

SEA CON Brantner & Associates Inc

1240 Vernon Way, El Cajon, CA 92020, 619-562-7070, FAX: 619-562-9706, seacon@seacon-usa.com, www.seacon-usa.com

Contact: Gulf Coast Sls Mgr, Glenn Pollock
Manufactures underwater electrical connectors; submersible switches, wet and dry mateable connectors, fiberoptic and connector cable assemblies. Offers over 35,000 product designs. Locations in California, Rhode Island, Texas, Mexico, and the UK. Provides solutions with existing or custom designed products.

Sea-Image Corporation Ltd

Unit 20, 4560 W Saanich Rd, Victoria, British Columbia, Canada V8Z 3G4, 250-519-0244, FAX: 250-519-0246, sskey@sea-image.com, www.sea-image.com

Contact: VP, Simon Skey

Sealed Enclosures Pty Ltd

Factory 4, 43-47 Riverside Ave, Werribee, Victoria, Australia 3030, 61-03-8742-3525, FAX: 61-03-9923-6497, www.sealed-enclosures.com

Provides pressure resistant enclosures for use underwater and in flood zones.

Seatools Bv

Jan Van Der Heydenstr, PO Box 7433, 3280 AE Numansdorp, The Netherlands, 31-186-68-00-00, FAX: 31-186-68-00-01, pedro@seatools.nl, www.seatools.nl

Offers a specialist in underwater equipment and dredging instrumentation.

seepex.com
all things flow

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

6000 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, carbon steel, low alloy, stainless steel, nickel alloy, and hard-surfacing welding electrodes. The company backs its exceptional welding wire products with outstanding service and the best value-added in the industry. Select-Arc sets the standard in tubular welding electrodes.

Select Industries

PO Box 2450, Wichita Falls, TX 76307, 940-855-0461, toll-free: 800-234-5801, FAX: 940-855-2734, ehuberselectind@yahoo.com, www.selectindustries.com

Contact: VP, Eddie Huber
Manufactures all types of solid chemical stick products designed for water removal, as well as down hole chemical treatment applications. Manufacturer of extruded water soluble tubes for delivery of liquid chemicals in production systems.

Senscient

2951 Marina Bay Dr, Suite 130-307, League City, TX 77573, 877-374-6842, info@senscient.com, www.senscient.com

Contact: CMO/VP, Jean Berthold
Offers SenseLine ELDS open path gas detectors, which feature orders of magnitude; better sensitivity for detecting flammable gases and low ppm level toxic gases. Detects both methane and hydrogen sulfide; faster response than any other H₂S detection technology; eliminates sensor replacement or recalibration; eliminates false alarms; and remote functionality testing.

Sensortechncs Inc

896 Main St, Walpole, MA 02081, 508-660-8823, FAX: 508-660-8836, info@sensortechncs.com, www.sensortechncs.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, and oxygen and flow sensors. All products can easily be modified according to customer requirements.

SensorTran Inc

4401 Freidrich Ln, Bldg 307, Austin, TX 78744, 512-583-3520, toll-free: 866-333-2861, FAX: 512-583-3565, www.sensortran.com

Contact: VP Bus Dev, Jack Angel
Supplies fiberoptic-based distributed monitoring solutions. Products include Gemini, next generation distributed temperature sensing (DTS) systems, and Lynx, the worlds first hybrid DTS/FBG system. Complete solutions are offered for applications in downhole O&G, pipeline leak detection/flow assurance, and process vessel hotspot detection.

Sensus

805 Liberty Blvd, DuBois, PA 15801, 814-375-8389, FAX: 814-375-8395, richard.deangelo@sensus.com, www.sensus.com

Contact: Prod Mgr/Eng, Richard C. DeAngelo
Offers natural gas regulator and metering solutions for the worldwide gas utility industry. Highlighted by FlexNet, a reliable RF AMI facilities in eight countries throughout the world.

Sentry Equipment Corp

966 Blue Ribbon Cir N, PO Box 127, Oconomowoc, WI 53066-0127, 262-567-7256, FAX: 262-567-4523, sales@sentry-equip.com, www.sentry-equip.com

Provides equipment for the sampling of liquids, gasses, slurries, and powders. Markets covered include the utility, chemical, petrochemical, pharmaceutical, food, and cement industries. Products include sample coolers, needle and cylinder panels, liquid and bulk solids samplers, steam and water sample conditioning components and systems, as well as specialty heat exchangers.

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: Tech Support Assoc, Steven Oliphant
Manufactures custom metal bellows and assemblies, bellows-type flexible shaft couplings, gold plated bellows contact springs, and lightweight and structurally rigid electroforms. Bellows are flexible, leak tight, and can be used as springs and flexible seals. Zero backlash, low windup, and bellows-type flexible shaft couplings can accommodate axial, angular, and offset deflections.

Servomex Inc

525 Julie Rivers Dr, Suite 185, Sugar Land, TX 77478, 281-295-5819, FAX: 281-295-5899, tignbor@servomex.com, www.servomex.com

Provides reliable, accurate, and stable gas measurement solutions to industries worldwide. Also provides paramagnetic sensing technology.

SETA SA

(div of Aquaquimica Ltda)

Aqua Div
PO Box 1439, Guerrico, 5458 1439 Argentina, 54-11-460-41116, 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), contamination resistant to calcium, and works in salt water.

Severn Trent Services

Severn Trent Services

3000 Advance Ln, Colmar, PA 18915,
866-646-9201, info@severntrentservices.com,
www.severntrentservices.com

Contact: Mktg Mgr, Nadia Abboud
Provides electrochlorination disinfection treatment solutions, using on-site generated sodium hypochlorite produced from seawater worldwide. They serve marine wastewater treatment applications and sea water disinfection needs for the following applications: power generation, desalination facilities, coastal industries, offshore oil and gas facilities, general marine, and cruise vessel industry.

Shark Stainless

(div of Shark Inc)
19717 62nd Ave S, Suite E102, Kent, WA 98032,
866-960-9779, FAX: 866-960-9779,
info@sharkstainless.com,
www.sharkstainless.com

Designs and manufactures stainless-steel storage furniture. Tool boxes, tables, lockers, and carts. Provides OEM solutions as well. Products are over built to stand up to intense use.

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 U.S. letter size and A4 sheets and can be printed using a PC and standard office laser printer.

Shell Global Solutions International BV

PO Box 4327, Houston, TX 77421,
281-544-8844, gillian.connor@shell.com,
www.shell.com/globalsolutions

Contact: Mktg Svcs Coord, John Karas
Provides technology focussed organizations. It provides business and operational consultancy, technical services, licensed technologies and research and development expertise to the energy and processing industries worldwide.

The Sherwin-Williams Co

101 Prospect Ave NW, Cleveland, OH 44115,
216-515-4739, FAX: 216-566-1832,
klarmstrong@sherwin.com

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 (GCMS, LCMS), UV-VIS, FTIR, ICP, and AA spectrophotometers, x-ray spectrometers, environmental/TOC analyzers, and physical measurement equipment, such as tensile/universal and hardness testers. Industries served include homeland security, petroleum, chemicals, polymers, automotive, 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 flow instrumentation; in-situ and extractive analyzers for single and multiple gases, and measurement instrumentation for dust, opacity, volume flow (ultrasonic), and level.

SICK STEGMANN Inc

(div of Max Stegmann GmbH)
7496 Webster St, Dayton, OH 45414,
937-454-1956, toll-free: 800-811-9110, FAX:
937-454-1955, sales@stegmann.com,
www.stegmann.com

Manufactures incremental modular, hollow shaft, shafted, and heavy duty encoders; single and multitur absolute encoders; linear absolute measuring systems; servo motor feedback systems; permanent magnet synchronous and stepper motors; compact gearboxes; rotary/linear actuators; and geared motors. Custom and modified designs available.

Siemens AG Energy Sector

Oil & Gas Div
Postfach 10 15 07, 47015 Duisburg, Germany,
49-9131-18-7032, FAX: 49-9131-18-7039,
support.energy@siemens.com,
www.siemens.com/oil-gas

Contact: Press Officer, Oliver Loenker
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, water management, and lifecycle services.

Siemens Energy & Automation

155 Plant Ave, Hauppauge, NY 11788,
631-231-3600, FAX: 631-231-3334,
gina.zervakos@siemens.com,
www.sea.siemens.com/flow

Contact: Sr Promo Admin, Gina Zervakos
Supplies clamp-on ultrasonic flowmeters for both gas and liquid with a large installed bases of clamp-on ultrasonic flowmeters.

Siemens Water Technologies

181 Thorn Hill Rd, Warrendale, PA 15086,
800-525-0658, FAX: 724-772-1360,
information.water@siemens.com,
www.siemens.com/water

Delivers cost-effective, reliable water and wastewater treatment systems and services to municipal, 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

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.

Signalcrafters Tech Inc

57 Eagle Rock Ave, East Hanover, NJ 07936,
800-523-5815, FAX: 973-781-9044,
scctgeneral@signalcrafters.com,
www.signalcrafters.com

Contact: Sls Mgr, Dave Jenkins
Manufactures communications equipment and test and measurement instruments. Communications equipment—remote control and status; telemetry; automated communications path monitoring for wire and microwave systems. Test and measurement, portable battery operated frequency selective voltmeter, 50 Hz to 5 MHz, built-in oscillator. Also supports many former Lucas Lexed communications products.

Siirtec Nigi SpA

Via Algardi 2, 20148 Milano, Italy, 39-2392-23-1,
FAX: 39-2392-23-010, sinimail@sinini.it, www.sinini.it

Contact: Comms Dir, Maurizio Perego
Operates worldwide in the oil and gas production facilities, gas and liquid treatments, sulphur removal and recovery projects, flue gas treatments, gas manufacture, process equipment, and skid-mounted and modulated packages. Is ISO 9001, ISO 14001, and OHSAS 18001 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 and 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: Mkt 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.

SKF Magnetic Bearings

(div of SKF Canada Ltd)

928 72nd 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. In addition, the company now offers S2M Magnetic Bearing products.

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/Mktg, 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+ and SkyWave IsaM2M network services.

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 to 17.5 in. drilling diameter for vertical and directional drilling projects.

Smarter Security Systems Ltd

1515 S Capital of Texas Hwy, #210, Austin, TX 78746-6578, 512-328-7277, toll-free: 800-943-0043, FAX: 512-328-7280, sales@smartersecurity.com, www.smartersecurity.com

Contact: VP Sls, Mark Ellsworth
Provides intelligent security solutions. Entry and outdoor product lines include: Fastlane optical turnstiles for lobby security; Door Detective tailgate and direction controls for open doors; cost-effective and accurate SmarterFence fiber intrusion detection systems; covert outdoor DVRs; and SmartSentry, a complete mobile surveillance solution.

SMH Capital

600 Travis, Suite 5800, Houston, TX 77002, 713-220-5138, FAX: 713-250-4294, ric.saalwachter@smhcapital.com

Contact: Man Dir/Head Energy Banking, Ric Saalwachter
Provides a full-service investment bank providing middle market companies with private placements and public offerings of equity and debt securities, as well as financial advisory services in connection with mergers and acquisitions, restructuring, and recapitalizations. The firm provides a full spectrum of investment banking services, including raising capital and research coverage.

Smith Tank & Equipment Co

PO Box 2014, Tyler, TX 75710, 903-597-5541, toll-free: 800-826-5663, FAX: 903-595-6804, tankone@gower.net, www.smithtank.com

Contact: Outside Sls Mgr, R. Dent Shillinglaw
Manufactures steel, stainless and aluminum tanks. Includes vertical and horizontal UL142 tanks, API650 and 12F vertical tanks, mixing and blending tanks. All tanks available with factory-applied linings, insulation and jacket, with many heat sources available. Also manufactures truck-mounted water trucks fuel bobtails, vacuum trucks service trucks and oilfield trucks.

Snap-on Industrial

(div of IDSC Holdings LLC)

2801 80th St, Kenosha, WI 53141, 262-656-5200, toll-free: 877-740-1900, FAX: 877-740-1880, dale.l.alberts@snapon.com, www.snapon.com/industrial

Contact: Contract/Proj Mgr, Jeffrey Mitchell
Offers a range of international markets, reaching every corner of the globe. We offer a tremendous range of tools, from hand tools to complete work stations to mobile tool cribs, all designed, built and tested to meet the highest demands for quality and long-life performance. Tools that fit the task, the process, the organization only from snap-on industrial.

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

Contact: Customer Service
Manufactures hydraulic quick disconnect hose couplings in push-to-connect, flat face, no-drip, thread-to-connect styles, hydraulic directional control valves; check, relief, high pressure, and flow control valves. ISO 9001 certified.

S&N Pump Co

7545 Breen Dr, Houston, TX 77086, 281-445-2243, FAX: 281-445-4061, matchchamberlain@snumpump.com, www.snumpump.com

Contact: U.S. Sls Dir, Matt Chamberlain
Provides the offshore seawater market with customized submersible pump system solution: offering design, engineering, fabrication, packaging, and worldwide customer support with stocking programs and service technicians available around the clock, seven days a week.

Solarc

9701 Richmond Ave, Suite 250, Houston, TX 77042, 713-360-5100, toll-free: 888-594-7320, FAX: 713-339-4337, ejohnson@solarc.com, www.solarc.com

Contact: VP Mktg, Eric Johnson
Provides multicommodity supply, trading, and risk management software and services. The company's solutions are used by companies to enhance their profitability and operational effectiveness. Software and services cover a range of vertical industries, including energy, transportation, finance, agriculture, consumer goods, and more.

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, hdavis@solonmfg.com, www.solonmfg.com

Contact: 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 and maintaining pressure and levels of processes with adjustable pressure ranges.

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.

Sonatest Ltd

Dickens Rd, Old Wolverton, Milton Keynes, Buckinghamshire, MK12 5QQ UK, 44-1908-525-927, FAX: 44-1908-321-323, corinna@sonatest.com, www.sonatest.com

Contact: Comms Mgr, Corinna Cuciureanu
Designs and manufactures a range of high performance ultrasonic equipment and NDT accessories.

Sorbent Products Co Inc

645 Howard Ave, Somerset, NJ 08873, 732-302-0080, toll-free: 800-333-7672, FAX: 732-302-0969, www.bradvid.com/spc
Offers sorbents that keep work areas clean and safe from virtually any spill, drip, or leak. Helps keep you in compliance and the workers safe and injury-free.

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.

Southernstar Consultants

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 U.S. and international aboveground storage tank terminals for crude oil and refined products, spherical pressure vessels, and LNG import and export terminals.

Special Electronics & Designs Inc

214 Bruce Ave, Kincardine, Ontario, Canada N2Z 2P3, 519-396-8555, FAX: 519-396-4045, sales@rescom.ca, www.sed.bz

Contact: Media/Design Spec, Wendy Goodfellow
Offers custom communications equipment, headsets, radio accessories, and vehicle intercoms for confined space, Hazmat, USAR, utilities, fire and rescue, nuclear, tactical, marine, EMS, mining, industrial, high noise, and challenging environments, as well as design, development, molding, and assembly services.

SPECTRO Analytical Instruments Inc

(sub of SPECTRO Analytical Instruments GmbH & Co KG)

AMETEK Materials Analysis Div

1515 N US Highway 281, Marble Falls, TX 78654, 830-798-8786, toll-free: 800-580-6608, FAX: 830-798-8467, spectro-tx.info@ametech.com, www.spectro.com

Contact: Gen Mgr, Robert P. Bartek
Manufactures analytical instrumentation for the petroleum industry. Products include high end systems for laboratory use, benchtop systems for at-line applications, and in-line systems for real time process control. Applications include S in crude, bunker fuel, residuals, ultralow S in diesel, lube oils, and more.

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.

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.

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, Jerry Carter
Provides high pressure hoses for waterblast cleaning, jet cutting, surface preparation, and flex lancing. Made of chemical-resistant thermoplastic and reinforced steel wire. Operating pressures range from 10,000 to 50,000 psi, and ID sizes from 1/8 to 1 in.

Sponge-Jet Inc

235 Heritage Ave, Suite 2, Portsmouth, NH 03801, 603-610-7950, FAX: 603-431-6043, tvaloria@spongejet.com, www.spongejet.com
Contact: VP, Ted Valoria

Offers Blast Where You Want—extend platform life, reduce shutdowns, blast new sensitive and rotating equipment, and reduce damage to adjacent coatings; lower material handling costs, handling freight to and from the platform, as well as disposal costs. Manufactures dry, low dust, low rebound, reusable Sponge Media abrasives and high production, and more.

SPT Group Norway AS

(sub of SPT Group)

Gasvikveien 2-4, PO Box 113, 2027 Kjeller, Norway, 47-64844550, FAX: 47-64844500, contact@sptgroup.com, www.sptgroup.com

Contact: Exec VP Mktg/Sls, John Olaf Romma
Provides a combination of software and consulting services within the areas reservoir, drilling, production, and integrated solutions to the international petroleum industry. Products such as Olga, Drillbench, Epdm, and Mepo are bridging the gap between the reservoir simulations and process plant simulations. Provides a global presence with offices worldwide.

SPT Offshore

(sub of Volker Wessels)

Korenmolenvlaan 2, PO Box 525, 3440 AM Woerden, The Netherlands, 31-348-435260, FAX: 31-348-435261, info@suctionpile.com, www.sptoffshore.com

Contact: Man Dir, Mark Riemers
Specializes in suction pile foundations and anchors for platforms and moorings. Developed four self installing platform (SIP) concepts and the suction embedded anchor (SEA) for deepwater moorings.

SPX Flow Control

19191 Hempstead Hwy, Houston, TX 77065, 800-231-3690, FAX: 281-894-1332, spxfc@spx.com, www.spxflowcontrol.com/

Manufacturers engineered fluid solutions, closures, filters, and industrial valves serving oil and gas markets worldwide. Our products are found in the most stringent and aggressive environments were equipment is expected to perform flawlessly day after day. Brands serving the oil and gas market include Copes-Vulcan, DeZURIK, GD Engineering, M&J Valve, OFM, and Plenty Filters.

SPX Hydraulic Technologies

5885 11th St, Rockford, IL 61109, 815-874-5556, toll-free: 800-541-1418, info@powerteam.com, www.spxhydraulictech.com

Contact: Sls Dir, Ray Champi
Manufactures high performance, fluid power and railway integrity products and systems. Product brands include Power Team, Stone, Hytec, Globe, and rail systems.

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, spxpe@spx.com, www.spxprocessequipment.com

Manufactures fluid solutions, metering and blending systems, pumps, mixers, valves, and fittings serving the gas and oil industries, as well as after-market support services. Brands serving the oil and gas market include Bran+Luebbe, GD Engineering, Johnson Pump, Lightnin, and Plenty Mixers.

SSS Clutch Company Inc

610 W Basin Rd, New Castle, DE 19720, 302-322-8080, FAX: 302-322-8548, engineering@sssclutch.com, www.sssclutch.com
Contact: Pres, Morgan L. Hendrey

Provides gear type overrunning clutches for dual driven fans, pumps, compressors, and generators, as well as combined cycle and CHP plant. Also, clutches for automatic turning gears and gas turbine storing.

Staco Systems

1139 Baker St, Costa Mesa, CA 92626, 714-549-3041, FAX: 714-549-0930, sales@stacosystems.com, www.stacosystems.com

Manufactures pushbutton display switches for military and commercial applications. The company's product mix includes rugged, full travel, and intrinsically safe for the military, first responder, and oil and gas industries.

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.

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, drawworks, 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, Gill Davison
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, particulates, penetration, contaminants, and other quality parameters.

Status Instruments Inc

456 Park Ave, Scotch Plains, NJ 07076, 800-700-3272, FAX: 800-700-5468, sales@statinst.com, www.statinst.com

Contact: Sls Mgr, Ed Grafstrom
Supplies field and DIN rail mount temperature and RH transmitters, plus signal conditioners and line, battery, and loop powered digital indicators and isolators.

Stettler Oil & Gas

PO Box 652, Stettler, Alberta, Canada T0C 2L0,
403-742-6686, FAX: 403-742-8225, www.sog.ca

Contact: 403-266-4556, Sales
Offers low overhead, competitive purchasing, and flexibility enabling us to offer a quality product at an economical price. The contractors we employ have a combined total of over 100 years experience in the oil and gas industry. All packaging and construction is done under an ABSA registered QC program.

Stewart & Stevenson

1000 Louisiana, Suite 5900, Houston, TX 77002,
713-751-2700, FAX: 713-751-2701,
webmaster@ssss.com,

www.stewartandstevenson.com

Contact: VP, Dennis Weisgerber
Provides equipment and service to the oil and gas industries, as well as others. Diversified product line includes well stimulation equipment, workover, well servicing and drilling rigs, coiled tubing equipment, power generation and electrical systems, as well as engines, transmissions, and materials handling equipment.

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, including pup joints, blast joints, flow couplings, crossover connectors, and couplings. The company also provides machining and threading services, and is licensed to thread Hydril, VAM, Tenaris, and API connections. Provide high quality products at competitive prices.

Storacall Teleacoustics Ltd

Cheltenham Trade Park Arle Rd, Cheltenham,
Glos, GL51 8LZ UK, 44-124-257-0995, FAX:
44-124-222-6131, sales@teleacoustics.co.uk,

www.teleacoustics.co.uk

Contact: Dir, Richard Penney
Provides acoustic telephone hoods, cabinets, kiosks, and special environment phones.

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: Area Mgr, 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 compressor blades. All new OEM replacement parts faster and at less cost than OEM. Independent manufacturer ISO 9001 and AS 9000.

Stream-Flo USA

12777 Jones Rd, Suite 332, Houston, TX 77070,
832-912-1022, FAX: 832-912-1151,
info@streamflo.com, www.streamflo.com

Contact: US Mktg Mgr, John Brown
Offers API 6D swing check valves from 2-48 in. and API 6D piston check valves from 2-12 in. The company also offers nonslam nozzle checks from 2-48 in.

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/Comms Mgr, Megan Paige
Develops a method for depositing anticorrosive, super hard, smooth, pure films on the internal surfaces of a spectrum of products, including pipes, pumps, valves, vessels, cylinders, and more. This technology applies to any industry in which a protective anticorrosive coating can produce substantial cost savings.

Sulzer Enpro Inc

1516 Engineers Rd, Belle Chasse, LA 70037,
504-392-1800, FAX: 504-392-2235,
chuck.henry@sulzer.com, www.sulzerts.com

Supplies sales and service for Woodward governors, TDI Air & Gas starters, Lincoln Lubrication, and Altronic Instruments. Offers on-site inspection, overhaul, and troubleshooting services for rotating and reciprocating machinery.

Sulzer Pumps Ltd

Zuercherstrasse 12, 8401 Winterthur,
Switzerland, 41-52-262-3904, FAX:
41-52-262-0040, hpi.pumps@sulzer.com,

www.sulzerpumps.com

Contact: Global Mktg Mgr, Claudia Proeger
Provides market-focused pumping solutions and services with a network of manufacturing and packaging facilities and sales offices and representatives in more than 150 countries. With more than 60 service centers worldwide, the company is able to consistently meet the changing demands of the petroleum market.

SunGard

1331 Lamar St, 4 Houston Center, Suite 950,
Houston, TX 77010, 713-210-8000, FAX:
713-210-8001,
sharon.fortmeyer-selan@energy.sungard.com,

www.sungard.com

Contact: Sr VP Mktg, Sharon Fortmeyer-Selan
Offers help to energy companies; industrial and financial services to efficiently compete in global energy markets by streamlining and integrating the trading, risk management, and operations of physical commodities and their associated financial instruments. These solutions provide front to back office support for management of transactions, accounting, risks, logistics, and enterprise data.

Superbolt Inc

1000 Gregg St, 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 multijackbolt tensioners designed to eliminate unsafe and time consuming bolting methods. Only hand tools are required for installation and removal of any size tensioner.

Superior Manufacturing & Hydraulics

(div of McCoy Corporation Co)
4225 Highway 90 E, Broussard, LA 70518,
337-837-8847, FAX: 337-769-1268,
sales@superior-manf.com,

www.superior-manf.com

Specializes in the design, manufacture, sale, and repair of hydraulic power equipment, including tongs, backups, bucking units, and power units. Also manufactures Grit Face dies and inserts, which can be custom designed to fit any corrosion resistant alloy (CRA) handling tool.

Superior Technical Ceramics Corp

600 Industrial Park Rd, St Albans, VT 05478,
802-527-7726, FAX: 802-527-1181,
bgleason@superiortechceramics.com,

www.ceramics.net

Contact: Sls Mgr, Jeffery Brundage
Manufactures custom-designed oxide-based technical ceramics for applications requiring extreme wear and corrosion resistance, high temperature capability, and insulators for electrical resistance. Uses multiple forming and machining methods to produce components to exacting standards. Also stocks standard ceramic parts.

Sure Flow Products LLC

28265 Beck Rd, Unit C-11, Wixom, MI 48393,
248-380-3569, FAX: 248-380-3568,
sales@sureflowproducts.com,

www.flowmetersource.com

Contact: Nat'l Sls 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 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: Mktg/Comms Mgr, Brent Baker
Develops and provides fluid system solutions, including products, assemblies and services for the chemical and petrochemical, oil and gas, sanitary, power generation and semiconductor industries. Manufacturing, research and distribution facilities support a global network of more than 200 authorized sales and service centers in 57 countries.

SWEDPARTS HAMBURG

Oil Gas & Petrochem Div
Buchheisterstrasse 6, 20457 Hamburg, Germany,
49-40-319-6028, FAX: 49-40-319-1395,
mail@swedparts.com, www.swedparts.com

Contact: Bus Dev Mgr, Samir Hashem
Specializes in the provision of system technologies and integrated engineering supplies for offshore and onshore, upstream, midstream, and downstream operations, pertaining to the oil, gas, and petrochemical industrial sectors and other related 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: Cust Svc, Warren Leopold
Provides products to monitor the power supply and protect electric motors before damage occurs 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

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)

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. 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.

Systech Instruments Ltd

17 Thame Park Business Centre, Wenman Rd,
Thame, OX9 3XA UK, 44-1844-216838, FAX:
44-1844-217220, sales@systech.co.uk,
www.systechinstruments.com

Contact: Sls Dir, Gerald Burr
Provides efficient and innovative solutions to many oxygen analysis and gas detection problems. The company has developed into a leading expert in oxygen and moisture detection.

System Improvements Inc

238 S Peters Rd, Suite 301, Knoxville, TN 87923,
423-539-2139, FAX: 865-539-4335,
info@taproot.com, www.taproot.com
Specializes in TapRoot root cause analysis training. The TapRoot system solves problems both reactively and proactively.

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).

T 3 Energy Services

7135 Ardmore St, Houston, TX 77054,
713-996-4110, FAX: 713-440-3210,
sales@t3energy.com, www.t3energy.com

Contact: VP Sls, James McMullan
Provides a broad range of oil field products and services primarily to customers in the drilling, completion of oil and gas wells, and the transportation and production of oil and gas.

TCR Engineering Services

Plot No EL-182 MIDC-TTC Electronic Zone,
Behind Nelco, Mhape, Mumbai, 400 710 India,
91-22-6516-8200, FAX: 91-22-2761-2044,
sales@tcrceng.com, www.tcrceng.com

Contact: Dir Global Sls, Rohit Bafna
Provides mechanical testing, chemical analysis, positive material identification (PMI, including onsite carbon detection). Non destructive testing (UT, DP, MP, PT, automated UT using ToFD, helium leak detection, ferrite measurement, portable hardness), metallography, welder, qualification (as per ASTM, ASME and API), RoHS compliance testing, in-situ metallography.

T D Williamson Inc

5727 S Lewis St, Suite 300, PO Box 3409, Tulsa,
OK 74101, 918-447-5383, FAX: 918-447-5050,
www.tdwilliamson.com

Designs, manufactures, and services engineered systems for monitoring, pigging, tapping, plugging, and inspecting essential piping systems. Markets its products and services through a global network of strategically located international service and/or manufacturing facilities in the United States, Belgium, England, India, and Singapore.

Technical Industries Inc

PO Box 5252, Lafayette, LA 70505,
337-984-2000,
georgesfeir@technicalindustries.com

Technical Toolboxes Inc

3801 Kirby Dr, Suite 520, PO Box 980550,
Houston, TX 77098, 713-630-0505, FAX:
713-630-0560, info@ttoolboxes.com,
www.ttoolboxes.com

Contact: Pres, Joe Summa
Develops integrated software suites ("toolboxes") for engineering and technical professionals in the energy industry. The software provides technical professionals with the tools they need to address and solve the drilling, production, process, and pipeline problems they face every day.

Tech Products Inc

105 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 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 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 Hastings Instruments

(div of Teledyne Technologies Inc)
PO Box 1436, Hampton, VA 23661-0436,
757-723-6531, FAX: 757-723-3925,
hastings_instruments@teledyne.com,
www.teledyne-hi.com

Contact: Dir Sls, Doug Baker
Designs and manufactures vacuum and mass flow instrumentation. Products include the IGE-3000 Ion Gauge, Model 2002 OBE, the Model 2002, the HPM 4/6, and the 760 Plus digital vacuum controllers. Flow products include all-metal seal massflow controllers, Metaline, and the 300 and 400 series, in both analog and digital formats.

Teledyne RD Instruments Inc

(div of Teledyne Technologies)
14020 Stowe Dr, Poway, CA 92064,
508-539-6960, FAX: 858-842-2822,
mnewcombe@teledyne.com,
www.rdinstruments.com

Contact: Mktg/Comms Mgr, Margo Newcombe
Manufactures acoustic doppler current profilers (ADCPs) and doppler velocity logs (DVLs). Offers ease-of-use, reduced cost, and patented broadband technology; providing fast, accurate, high resolution water current profiling in every environment.

Tel-Tru Manufacturing Co

408 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.

Terra Remote Sensing Inc

1962 Mills Rd, Sidney, British Columbia, Canada
V8L 5Y3, 250-656-0961, toll-free: 800-812-4212,
FAX: 250-656-4604,
harry.olynyk@terraremotecom.com,
www.terraremotecom.com

Contact: VP Marine, Harry Olynyk
Offers world-class technology for digital airborne mapping, geographical information systems, hydrographic charting, and marine geophysical surveying. The company provides digital mapping solutions for the linear engineering market through powerful, proprietary hardware and software packages.

testo AG

Testo-Strasse 1, PO Box 1140, 79853 Lenzkirch,
Germany, 49-7653-681-700, FAX:
49-7653-681-701, info@testo.de, www.testo.com
Develops, manufactures, calibrates, and distributes portable electronic measuring instruments and probes for temperature, humidity, velocity, pressure/refrigeration, flue gas/emission, indoor air quality, light/sound, water analysis, rpm/endoscopy, and stationary measurement technology. Delivers worldwide via 25 subsidiaries and 50 sales representatives.

Texas Engineering Systems

3630 N Josey Ln, Suite 100, Carrollton, TX
75007, 972-395-2138, FAX: 972-395-2139,
gutay@texasengineering.com,
www.texasengineering.com

Contact: Inside, Billy Baker
Provides 3-D OAD, rapid prototyping and analysis solutions to help engineers and designers create better products. With 11 certified application engineers and training facilities in Houston, Dallas, Austin, Oklahoma City, Tulsa and Baton Rouge, we have the knowledge, ability, and expertise to assist you.

TGS Geological Products and Services

(div of TGS-NOPEC Geophysical Co)
2500 Citywest Blvd, Suite 2000, Houston, TX
77042-3035, 281-319-4944, toll-free:
888-564-5463, FAX: 281-319-4945,
sales@tgsnopec.com, www.tgsnopec.com

Contact: Sls, Shawn Hanson
Provides well data, with more than five million logs from more than 20 countries available online.

Thermafiber Inc

(div of TF Holding Corp)
3711 Mill St, Wabash, IN 46992, 260-563-2111,
toll-free: 888-834-2371, FAX: 260-563-8979,
info@thermafiber.com, www.thermafiber.com

Contact: Cust Rltns Mgr, Kim Driscoll
Manufactures mineral wool fiber in loose, blanket, board, block, and pipe section forms for temperatures to 1900°F. Also distributes ceramic fiber in loose and blanket forms, as well as various acoustical insulation products.

Thermal Instrument Co

217 Sterner Mill Rd, Treviso, 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

1410 Gillingham Lane, Sugar Land, TX 77478,
713-272-2158, toll-free: 800-437-7979, FAX:
713-272-4573, www.thermo.com

Manufactures analytical instruments electrical measuring and testing equipment, electronic and communication measuring and testing instruments, geophysical and geotechnical instruments, soil measuring equipment, rock and strata measuring equipment, seismological instruments, land surveying instruments, hydrological instruments, and meteorological instruments.

(See ad p 19)

ThermoProbe Inc

613 E Court St, Jackson, MS 39201,
601-939-1831, 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, hand-held precision digital thermometers for laboratory, and ThermoTab gauging software for Palm OS.

Thermo Scientific

(div of Process Instruments)

Material Characterization Business Unit Div
25 Nimble Hill Rd, Newington, NH 03801,
800-258-0830, FAX: 603-436-8411,
info.mc.us@thermofisher.com,
www.thermo.com/mc

Contact: Sls Mgr/Mats Characterization, John Quigley

Supports a range of industries with comprehensive material characterization solutions; designed to analyze and measure viscosity, elasticity, processability, and temperature-related mechanical changes of plastics, food, cosmetics, pharmaceuticals, and coatings, plus a variety of liquids and solids.

Thermo Scientific Niton Analyzers

900 Middlesex Tpke, Bldg 8, Billerica, MA 01821,
978-670-7460, toll-free: 800-875-1578, FAX:
978-670-7430, niton@thermofisher.com,
www.thermo.com/niton

Contact: Mktg Mgr, Tom Anderson
Provides various analyzers, including the Niton XL3 800 Series XRF, that are purpose built for demanding customer applications. Analyzers provide fast, accurate performance for verification of alloy composition within seconds. Increased productivity, along with power documentation and reporting tools, make the XL3 Series analyzers an essential tool for today's PMI inspector.

Thern Inc

5712 Industrial Park Rd, PO Box 347, Winona,
MN 55987, 507-454-2996, toll-free:
800-843-7648, FAX: 507-454-5282,
info@thern.com, www.thern.com

Contact: Sls/Mktg Mgr, Scott Thelen
Provides products to lift it, lower it, move it, and pull it. Manufactures heavy-duty air winches to 10 ton capacity and power winches to 100,000 lbs and hand winches as small as 500 lbs, also portable and fixed cranes.

Thompson Pump & Manufacturing

(div of Corporate Headquarters)

4620 City Center Dr, PO Box 291370, Port
Orange, FL 32129, 386-767-7310, toll-free:
800-767-7310, FAX: 386-761-0362,
sales@thompsonpump.com,
www.thompsonpump.com

Offers a full service manufacturer and provider of high quality engine-powered portable pumps, pumping equipment, and engineering expertise for the toughest dewatering, bypass, and emergency pumping applications. The company sells and rents wet and dry prime trash pumps, sound attenuated models, diaphragm pumps, hydraulic submersible pumps, high pressure pumps, and wellpoint pumps.

3PS Inc

1300 Arrow Point Dr, Cedar Park, TX 78613,
512-610-5200, FAX: 512-610-5201,
sales@3psinc.com, www.3psinc.com

Manufactures load cells, 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 Mipeq distributor.

Th Wortelboer BV

PO Box 5, NL-6580 AA Malden, The Netherlands,
31-24-358-65-14, FAX: 31-24-358-70-79,
info@wortelboer.ws, www.wortelboer.ws

Contact: Export Mktg Mgr, Rob van der Haijden

Manufactures heavy duty stationary pipe end preparation machines for the pipe building industry, for beveling thick-walled pipes and highly resistant materials e.g. duplex and Hastelloy. Wortelboer relies on 60 years of experience. The machines are located on all major industrial areas in the oil and gas industry around the world.

Tiancheng aviation purification equipments co ltd

No 1 Chuangye Rd, New & High Technology
Development Zone, Xinxiang, Henan, 453003
People's Republic of China, 86-0373-352-0629,
FAX: 86-373-352-0026, tianchengfilter@aol.com,
www.tchkh.com

Manufactures various filter elements for the petrochemical, chemical, oil and gas, water treatment, steel, beverage, and more.

The Tintometer Ltd

The Colour Laboratory Div
Lovibond House, Solar Way, Solstice Park,
Amesbury, Wiltshire, SP4 7SZ UK,
44-1980-664-800, FAX: 44-1980-625-412,
sales@tintometer.com, www.tintometer.com

Contact: Gen Mgr, Marke Reid
Manufactures Lovibond instruments and reference materials for color analysis of fuels, oils, waxes, and petrochemicals according to color scales specified in ASTM methods, such as Saybolt, ASTM color, Platinum-Cobalt/APHA, Lovibond RYBN, IP Units, and Gardner Color. The company offers a specialized color analysis service, available on a test-by-test basis.

Titanium Fabrication Corp

110 Lehigh Dr, Fairfield, NJ 07006,
973-808-4966, FAX: 973-227-2141,
bwilley@tifab.com, www.tifab.com

Contact: Pres/CEO, Brent Willey
Designs and fabricates mechanical equipment made of high performance metals, primarily titanium. Serving the oil and gas, chemical, paper, mining, and military industries.

Titan Technologies International Inc

9001 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.

TLV Corp

13901 S Lakes Dr, Charlotte, NC 28273,
704-597-9070, FAX: 704-583-1610,
ces@tlvengineering.com, www.tlv.com

Contact: Mktg/Adv, Melissa Morrow
Offers a variety of products, including steam traps, valves, condensate recovery systems, and developments in measurement and control equipment.

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 metalizing equipment worldwide, including arc spray, flame spray, plasma spray, and HVOF systems. Offers the Bridemaster and Handi-Arc systems, a variety of metallization 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: Factory Sls Mgr, Mark S. West
Provides custom engineered hydraulic piston accumulators to 20,000 psi MAWP, to 250 gallons; gas bottles, bladder accumulators, and accessories, including safety shutoff valves for accumulators.

Topps Safety Apparel Inc

2516 E State Rd 14, PO Box 750, Rochester, IN
46975, 800-348-2990, FAX: 574-223-8622,
info@toppsafetyapparel.com,
www.toppsafetyapparel.com

Contact: Sls/Cust Svc, Kathy Dehne
Manufactures flame resistant apparel, including coveralls, shirts, pants, and jackets of Nomex, Indura, and Firewear.

**Torcup Industrial Bolting Tools**

1025 Conroy Pl, Easton, PA 18040,
610-250-5800, toll-free: 888-887-2871, FAX:
610-250-2700, info@torcup.com,
www.torcup.com

Contact: Sales Manager
Designs and manufactures an advanced line of hydraulic bolting tools. Produces and sells hydraulic and pneumatic torque wrenches, hydraulic pumps, nut splitters range of readers, and impact sockets.

Torkworx

**Torkworx**

22707 Encinitas Cove Ct, Tomball, TX 77375,
713-502-4550, toll-free: 888-502-9679, FAX:
713-481-6220, info@torkworx.com,
www.manningsusa.com

Contact: Reg Mgr, Pete Fuller
Delivers bolt working solutions, as well as
turnkey bolting services performed by
competent, specially trained bolting
technicians. Products and services insure the
fasteners are worked in a safe and controlled
manner, in any bolted connection.

Toromont Energy Systems

10121 Barlow Trail NE, Calgary, Alberta, Canada
T3J 3C6, 403-291-3438, FAX: 403-291-0158

Contact: Sls Mgr, Damian Saunders
Offers a source for natural gas compression,
process, CO₂, and refrigeration systems. Delivers
complete compression and process system
solutions worldwide.

Total Separation Solutions LLC

6650 W Sam Houston Pkwy N, Suite 450,
Houston, TX 77041, 832-467-3400,

bob.sloan@totalsep.com, www.totalsep.com
Provides adaptive drilling solutions by integrating
engineering, experience, and execution with
proprietary Contender fluids and patented
technology to deliver the benefits of reduced costs,
enhanced production, shortened time to
production, and minimal impact on the
environment. Services include water treatment,
filtration, evaporation, and recycling.

Tower Solutions

9814 N 83rd Pl, Scottsdale, AZ 85258,
480-315-8830, FAX: 480-315-8833,

akarson@towersolutionsinc.com,
www.towersolutionsinc.com
Contact: Pres, Allen Karson
Creates self-erecting, totally automatic
multifunctional mobile towers providing quality
solutions to user issues of needed height. Dedicated
to providing quality solutions to issues of needed
height and easy-to-do business with every activity.

TRADION OIL & GAS W/A PLC

Marketing Div

203 PTI Rd, Effurun, Warri, Delta State, 330003
Nigeria, 234-009-046-250909,
tradion.petroleum@yahoo.co.uk,
www.tradionplcng.org

Contact: Man Dir, 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 partnerships.

Traeger Brothers & Associates Inc

PVF Div

12405 SW 130th St, Miami, FL 33186,
305-371-5551, FAX: 305-371-8808,
dtilden@traeger.com, www.traeger.com

Contact: CEO/Pres, Howard Traeger
Addresses industrial concerns worldwide, stocking
Kitz valves, Smith valves, stud bolts, gaskets,
Weldbend fittings, and other items in several
Caribbean warehouses. Offers emergency service,
and features a sales staff with 50 years of
combined industrial supply experience. The
company specializes in creative solutions to
complex material supply problems.

Tranter PHE Inc

1900 Old Burk Hwy, PO Box 2289, Wichita Falls,
TX 76307, 940-723-7125, FAX: 940-723-1131,

jstonecipher@tranter.com, www.tranter.com
Contact: Jody Stonecipher
Provides a global heat transfer company with
representatives worldwide. The company has been
at the forefront of plate heat exchanger technology
for more than 70 years, offering proprietary
products and components for industrial and
commercial applications around the world.

TRC Consultants LC

(div of PHDWin)

5806 Mesa, Suite 215, Austin, TX 78731,
888-248-8062, sales@phdwin.com,

www.phdwin.com
Contact: Sls/Mktg, Amy Robertson
Provides economic and decline curve analysis
program written by petroleum engineers for
Microsoft Windows operating systems. The solution
for engineers, geologists, consultants, and
executives who need a complete decline analysis
and economics system. This power program
integrates interactive decline curve and more.

Trelleborg CRP Inc

(div of Trelleborg Engineered Systems)

1902 Rankin Rd, Houston, TX 77073,
281-774-2600, FAX: 281-774-2626,
offshore@trelleborg.com,

www.trelleborg.com/offshore
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.

T-Rex Subsea

(div of Texas ReExcavation LLC)

3025 Maxroy, Houston, TX 77008, 713-783-3363,
toll-free: 800-865-3131, FAX: 713-586-0520,

info@trexsubsea.com, www.trexsubsea.com
Provides turnkey product solutions, design and
development services, and custom fabricated
products for the offshore petroleum industry.
Provides services from conceptual design through
equipment delivery starting or stopping at any point
in between. Maintains comprehensive HSE/QA/QC
programs ensuring safety and specification
compliance.

Tri-mer Corp

PO Box 730, Owosso, MI 48867, 989-723-7838,
salesdpt@tri-mer.com

Contact: Sls Eng, Todd Ainsworth
Offers air pollution control systems consisting of
engineering, design, sales, and manufacturing.

Tristone Capital

335 8th Ave SW, #2020, Calgary, Alberta,
Canada T2P 1C9, 403-294-9541, FAX:

403-294-9543, www.tristonecapital.com
Contact: Chmn/Pres/CEO, George Gosbee
Provides fully integrated, comprehensive
investment banking, acquisitions and divestitures,
and global equity capital markets services.
Founded in 2000, the company has more than 170
employees with offices in five locations worldwide.

Trumbull Industries

1040 N Meridian Rd, PO Box 1556, Youngstown,
OH 44501, 330-270-7800, toll-free:

800-677-1799, FAX: 330-270-3090,
www.trumbull-mfg.com
Contact: VP, Sam H. Miller
Offers chainwheels in ductile iron and stainless
steel. Type 316 stainless chainwheels are ideal in
corrosive environments such as saltwater and
outdoor installations. Available with safety cable
restraints. Universal design allows chainwheels to
either be clamped to valve handwheel or mounted
directly to valve shaft. Established in 1922.

TSEC - Tito Silveira Engenharia e Consultoria Ltda

Rua Couto de Magalhaes 744-Benfica, Rio de
Janeiro, 20930-090 Brazil, 55-21-3860-6739,
FAX: 55-21-2580-6936, 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.

TT Technologies Inc

2020 E New York St, Aurora, IL 60502-9515,
630-851-8200, toll-free: 800-533-2078, FAX:
630-851-8299, www.ttechnologies.com

Contact: Cust Svc Mgr, Mike Patton
Provides trenchless underground equipment
manufacturer of Grundomat piercing tool,
Grundoram pipe rammers, Grundocrack pipe
bursting equipment, Grundoburst pipe splitting and
lateral bursting equipment, Grundodrill 4X
directional boring, and HDD assist.

Tube Tech International Ltd

14 Rawreth Industrial Estate, Rawreth Ln,
Rayleigh, Essex, SS6 9RL UK, 44-1268-786999,
FAX: 44-1268-786998, info@tubetech.com,
www.tubetech.com

Contact: Man Dir, Mike Watson
Specializes in cleaning services for heat
exchangers, WHRUs, Texas towers, catalytic
reactors, and other items of up and downstream
infrastructure. Provides a convention challenging
approach and ability to solve cleaning problems
that have defeated other companies. World leaders
in the effective use of high pressure and ultrahigh
pressure water jetting.

Tuff-N-Nuff Pipeline Rockshield*(div of Greenstreak Inc)*3400 Tree Court Industrial Blvd, St Louis, MO 63122, 636-861-0443, FAX: 800-325-3603, ireseils@tuff-n-nuff.com, www.tuff-n-nuff.com

Contact: Mkt Leader, Robin E. Seils

Provides a blanket of protection for underground pipelines and fiberoptic services. The company's design compliments CP systems without trapping water against the pipe. Patented layered filaments of flexible PVC plastic absorb shock during backfilling and provide long-term abrasion resistance.

Tufport Industries Ltd3551 River Rd W, Delta, British Columbia, Canada V4K 3N2, 604-946-0033, toll-free: 800-887-6288, FAX: 604-946-0522, sales@tufport.com, www.tufport.com

Contact: Pres, Jeff Engelland

Manufactures only Transport Canada approved roll-over Mobile Treatment Center and Emergency Transport Vehicle; off-road ambulances. A cost effect solution to providing safety on the work site and patient transport. Easily mounted on any full size pick-up truck and may be transferred to other vehicles.

Tulsa Power913 N Wheeling, Tulsa, OK 74110, 281-687-3693, FAX: 281-403-4927, vshirhatti@tulsapowerog.com, www.tulsapower.com

Contact: Dir Bus Dev, Vinod Shirhatti

Designs and builds a range of coiling and material handling solutions for the pipe, conduit, hose, and tubing Markets. Solutions are available for winding material onto reels/spools or onto coils (stretch wrapped or banded). Both on and offline coilers have been built for material ranging from 1/4 in. (6.35 mm) tubing through 10 in. (254 mm) pipe.

Tulsa Power LLC3647 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, bulk loading stations, coiled pipe drives, measuring accessories, and level wind mechanisms; IWOCS.

TURBOCAM International288 Route 125, PO Box 830, Barrington, NH 03825-0830, 603-905-0315, toll-free: 800-791-0133, FAX: 603-905-0211, sales@turbocam.com, www.turbocam.com

Contact: Sls Mgr, William Cole

Has provided more than 100 single- and multipindle five-axis milling machines at 11 locations on four continents producing more than one million bladed parts per year. The company specializes in prototype and production manufacture of impellers and other bladed components to 1100 mm for industrial, automotive, and aerospace applications.

TURCK GmbH & Co KgWitzlebenstrasse 7, D-45472 Mulheim, Germany, 49-208-4952-0, FAX: 49-208-4952-264, more@turck.com, www.turck.com

Contact: Prod Mgmt Process Automation, Ray Kromhout

Provides effective product solutions for almost any kind of application. TURCK has been a master of innovation, dedicated to fulfill the diverse needs of industrial automation. Offers versatile product range, compromising sensors, interfaces and fieldbus technology products.

Twister B VEinsteinlaan 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 and gas industry based around unique proprietary supersonic technology. This technology enables high efficiency gas conditioning using compact, unmanned units with no moving parts, chemical usage, or emissions.

TXCO Resources Inc777 E. Sonterra Blvd, Suite 350, San Antonio, TX 78258, 210-496-5300, FAX: 210-496-3232, txco@txco.com, www.txco.com

Offers an oil and gas enterprise with interests in the Maverick Basin, the onshore Gulf Coast and Marfa Basin of Texas and western Oklahoma. The company has had a long term growth in proved oil and gas reserves, leasehold acreage, production, and cash flow through established exploration and development programs.

Tyco Flow Control*Tyco International Div*10707 Clay Rd, Houston, TX 77041, 713-986-4665, www.tycoflowcontrol.com

Manufactures and markets valves, actuators, and controls, providing products, services, and solutions for challenging applications. Delivers high quality products in the oil and gas, power, chemical, pharmaceutical, mining, marine, nuclear, and food and beverage markets.

TYDUS Maintenance Supply IncPO Box 6439, Innisfail, Alberta, Canada T4G 1T2, 403-651-4627, toll-free: 800-667-7930, FAX: 403-206-7005, info@tydus.com, www.tydus.com

Contact: Pres, Bill Kirk

Manufactures the WAMCO polished rod spacer system. Respace the downhole pump or tap bottom in minutes from the ground—no clamps moved—no climbing. Spacers are manufactured from aluminum alloy. Engineer tested for safety.

UE Systems Inc14 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. Hand-held, analog, and digital models, with on-board sound recording and Data Logging; spectral analysis and data management software. Some models rated intrinsically safe.

Ultra Check Inc1575 Main St, Unit 6, Atlantic Beach, FL 32233, 904-270-2709, ultracheck@aol.com, www.ultracheck.com**Umicore Precious Metals Refining**A Greinerstraat 14, B-2660 Hoboken, Belgium, 32-3-821-7480, FAX: 32-3-821-7807, preciousmetals@umicore.com, www.preciousmetals.umicore.comContact: Comms Mgr, Marjolein Scheers
Recycles precious metal bearing material.**Union Wire Rope***(div of WireCo WorldGroup)*12200 NW Ambassador Dr, Kansas City, MO 64163-1244, 816-270-4826, FAX: 816-270-4707, info@wirecoworldgroup.com, www.unionrope.com

Contact: Dir Oilfield Prod, Wayne Anderson
Manufactures wire rope worldwide. The company is the only major wire rope manufacturer in the world to be API certified, QPL qualified, and ISO-9001:2000 registered.

United Filtration Systems Inc6558 Diplomat Dr, Sterling Heights, MI 48314, 586-802-5561, toll-free: 800-311-5561, FAX: 586-802-5562, sales@unitedfiltration.com, www.unitedfiltration.com

Contact: Prod Mgr, Dirk Loveland

Supplies UFS, headline, and onstream filters for sample process, instrumentation, liquid, vacuum, CNG, and other applications. The filters come in a variety of materials, pressure ratings, and micron efficiencies to cover a spectrum of requirements. The new Guardian membrane filters, Fast Loop, SS mini drain, and SP76 are compliant housings.

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.

Universal Industries5014-65 St, Lloydminster, Alberta, Canada T9V 2K2, 780-875-6161, FAX: 780-875-6169, www.uic.ca

Contact: Sales

Offers a full line of oil and gas processing equipment, including shop tanks, field tanks, flash treaters, process vessels and steam generators and are supported by an experienced engineering, drafting and design team. Dedicated to manufacturing each and everyone of our products under the same strict quality control processes of ASME certified pressure vessels and API tanks.

Universal Silencer



UNIVERSAL SILENCER
Acoustic and Emission Technologies

Universal Silencer

(sub of Global Headquarters)

1925 Highway 51/138, PO Box 411, Stoughton, WI 53589, 608-873-4272, toll-free: 888-300-4270, FAX: 608-873-4298, info@universalsilencer.com, www.universalsilencer.com

Designs and manufactures acoustic and emission technologies. With operations throughout the world, standard and customized systems are provided wherever our customers projects are located; reducing complexity and costs. Engine and vent silencers and generator exhaust after treatment compliance products.

UOP

(div of Honeywell International)

25 E Alonquin Rd, Des Plaines, IL 60017-5017, 847-391-2000, FAX: 847-391-2253, info@uop.com, www.uop.com

Delivers cutting-edge technology to the petroleum refining, gas processing, petrochemical production, and major manufacturing industries. Offerings include licensed processes, catalysts, molecular sieve adsorbents, and key mechanical equipment supported by an array of engineering and technical services.

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 SIs, 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 Tsubaki

Industrial Products Div

301 E Marquardt Dr, Wheeling, IL 60090, 847-459-9500, FAX: 847-459-9520, www.ustsubaki.com

Contact: Prod Mgr, George Basel
Manufactures power transmission products, including roller chains, engineering class chains, sprockets, shock relays, and other miscellaneous PT components.

UTC Overseas

1235 North Loop W, Suite 1200, Houston, TX 77008, 713-869-9939, FAX: 713-869-9995, project@utcoverseas.com, www.utcoverseas.com

Contact: VP, Marco Poisler
Provides resources and expertise to move anything in the world, regardless of size, weight or complexity. Your critical timelines and budget parameters are our in-house transportation and logistics professionals guidelines. You consistently get the professionalism and reliability you demand for your large project transportation and logistics requirements.

Vacon Oyj

Runsorintie 7, 65380 Vaasa, Finland, 358-201-212-1, FAX: 358-201-212-205, vacon@vacon.com, www.vacon.com

Contact: Product Mgr/Dir Liquid Cooled, Jussi-Pekka Sampola

Creates, develops, and provides AC drives worldwide. Offers AC drives in the power range of 0.25 kW to 5 MW. They can be used to control the speed of electric motors used by industry and municipal engineering, and in power generation using renewable energy. Solutions represent clean technology. Since 1993.

Vallourec & Mannesmann Tubes

Theodarstr 90, 40472 Duesseldorf, Germany, 49-211-960-0, FAX: 49-211-960-2267, info.service@vmtubes.de, www.vmtubes.com

Contact: HoD Proj Line Pipe, Werner Nöller
Manufactures seamless hot rolled steel tubes. A large range of seamless steel tube sizes and has an annual output to three million tons.

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.

Varel International

1434 Patton Pl, Suite 106, Carrollton, TX 75007, 972-242-1160, toll-free: 888-273-5334, FAX: 972-242-8770, info@varelintl.com, www.varelintl.com

Contact: VP SIs NW Hemisphere, William Burton
Manufactures and sells PDC and roller cone drill bits to the global oil and gas industry. The company specializes in supplying application-specific products to customers, with a commitment to quality, performance, and value. Products are available in sizes ranging from 2-7/8 in. to 36 in.

Varna Products TRC

4350 Business Dr, Cameron Park, CA 95682, 530-676-7770, toll-free: 888-676-7770, FAX: 530-676-7796, tmcachran@varnaproducts.com, www.varnaproducts.com

Contact: Inside SIs, Tiffany McAchran
Manufactures industrial pre-lube pumps.

Velan Valve Corp

94 Avenue C, Williston, VT 05495, 514-748-7743, FAX: 514-748-8635, sales@velan.com, www.velan.com

Contact: VP US SIs S/W, Charles Pogue
Manufactures industrial valves, offering complete valve solutions for the oil and gas industry, including onshore and offshore production, pipelines, refining, and petrochemicals and LNG.

Ventyx

3301 Windy Ridge Pkwy, Suite 200, Atlanta, GA 30339, 770-952-8444, toll-free: 800-868-0497, FAX: 770-989-4231, sales@ventyx.com, www.ventyx.com

Contact: Jan Cook
Provides best-of-breed business solutions, delivering asset management, mobile workforce management, customer care, energy trading and risk management, energy operations, and energy analytics solutions to more than 900 energy, utility and communications customers, as well as to asset-intensive customers in selected commercial markets.

Veolia ES Industrial Services Inc

2525 S Shore Blvd, Suite 410, League City, TX 77573, 713-307-2160, 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, ROV services, and abatement and remediation services.

Veris Inc

6315 Monarch Park Pl, Niwot, CO 80503, 303-652-8550, toll-free: 877-837-4700, FAX: 303-652-8552, contact@veris-inc.com, www.veris-inc.com

Contact: VP Oper, John Good
Provides accurate measurement in gases, liquids, and steam. The new Accelabar combines two differential pressure technologies to produce operating ranges never before attainable in a single flowmeter; capable of generating high DP for measuring flow at high turndowns with no straight run requirements.

Veritech Software LLC

526 Kingwood Dr, Suite 259, Kingwood, TX 77339, 866-904-8220, FAX: 866-904-8220, support@veritechsoftware.com, www.veritechsoftware.com
Produces desktop reference software for use by technical professionals in the energy and chemical industry.

VERSABAR Inc

11349 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.

VersaTube Building Systems

(Sub of Mid-South Metal Products Inc)
50 Eastley St, Collierville, TN 38017, 901-854-6855, toll-free: 800-900-7222, FAX: 901-854-6878, sales@versatube.com, www.versatube.com

Contact: Bus Dev Mgr, Tom Neeley
Manufactures pre-engineered steel frame systems for residential, agricultural, commercial, and light industrial building and shelter applications. Offers engineering and design services for sun shields, well pump covers, metering facility shelters, compressor sheds, and custom structures for the oil, gas, and liquid pipeline industry. Patented "Slip-Fit" frame connections simplify assembly and reduce construction time.

Vibralign Inc

530g Southlake Blvd, Richmond, VA 23236,
804-379-2250, FAX: 804-379-0189,
info@vibralign.com, www.vibralign.com
Contact: Amy Newcomb

Helps maintenance teams develop and maintain precision alignment standards. Today fields a team of sales and customer service personnel providing professional alignment tools, training, and expedient repair and calibration services. Operates as the U.S. distributor of the Fixturlaser Laser Alignment systems.

Victor Lighting

(div of Hubbell Ltd)

PO Box 551, Glasgow, G52 9AH UK,
44-141-882-5555, FAX: 4-141-883-3704,
info@victor-lighting.com,
www.victor-lighting.com

Manufactures and distributes hazardous area and industrial area luminaires. Hazardous area range is certified to comply with the latest ATEX directive. In addition, a number of products are certified as part of the IEC Ex scheme and under Russian (GOST), Thai (TIS), and Chinese (GB) standards.

Videx Inc

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.

Viper Supply LLC

PO Box 1722, Metairie, LA 70001-172,
504-212-8473, FAX: 504-217-8073,
sales@vipersupply.com, www.vipersupply.com
Manufactures OCTG, casing, tubing, line pipe, A106, and API 5CT.

voestalpine Tubulars GmbH & Co KG

Alpinestrasse 17, A-8652 Kindberg, Austria,
43-50304-23-0, FAX: 43-50304-63-531,
sales@vatubulars.com, www.vatubulars.com
Furnishes its customers with seamless tubular products. Produces seamless steel pipes with an outside diameter to 177.8 mm (7 in.), manufactured in API or special grades, with API or premium connections. Heavy upset pipe available upon request.

Voith Industrial Services Engineering GmbH

(sub of Voith AG)

Voith Industrial Services Div
Kreuzholzstr 7, 67069 Ludwigshafen, Germany,
49-621-66008-80, FAX: 49-621-66008-51,
engineering-info@voith.com,
www.engineering.voithindustrialservices.de

Contact: Man Dir, Michael O. Haid
Offers consulting, engineering, construction, and maintenance services for the oil, gas, refining, chemical, pharmaceutical, and power industries. Fields of competence include project management, process design, plant safety, basic and detail engineering, construction supervision, and maintenance planning. Also offers industrial IT applications, including regulating and component modules for SCADA systems, migration software solutions, and more.

Voith Turbo BHS Getriebe GmbH

Hans-Boeckler-Strasse 7, 87527 Sonthofen, Germany, 49-8321-802-0, FAX:
49-8321-802-685, sales.bhs@voith.com,
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, and rotor turning units. Has been manufacturing turbo gears for more than 75 years.

SALES OFFICES:**Voith Turbo Inc**

Cincinnati, OH 513-797-8101, FAX:
513-797-8103, michael.butler@voith.com,
www.bhs-gears.com

Voith Turbo Ltd Middle East

Sharjah, United Arab Emirates
971-6-557-0994, FAX: 971-6-557-0996,
karl-heinz.keck@voith.com,
www.middle-east.voithturbo.com

Vooner FloGard Corp

4729 Stockholm Ct, Charlotte, NC 28273,
704-552-9314, toll-free: 800-345-7879, FAX:
704-554-8230, info@vooner.com,
www.vooner.com

Contact: Sls/Mktg Mgr, Vince Visconti
Manufactures liquid ring vacuum pumps and compressors that are used in petroleum and chemical refining processes. Applications include; evaporation, fermentation, distillation, dehydration, solvent recovery, and vacuum separation. Bronze or stainless-steel vacuum pumps and compressors are ideally suited to handle applications where explosive or corrosive gases are present.

Vulcascot Ltd

Gatwick Gate, Lowfield Heath, Crawley, West Sussex, RH11 OTG UK, 44-1293-560-130, FAX:
44-1293-537-743, info@vulcascot.co.uk,
www.vulcascot.com

Distributes sheet plastics, industrial laminates, and all types of engineering plastics. Also manufactures and distributes a range of floor-laid flexible cable protectors.

Wabash Power Equipment Co

444 Carpenter Ave, Wheeling, IL 60090,
847-541-5600, FAX: 847-541-1279,
info@wabashpower.com,
www.wabashpower.com

Contact: Pres, Richard Caitung
Offers three modern facilities to provide customers with a range of power equipment and services, including: package boilers; rental boilers and electric generators; diesel, gas, and steam turbine generator units; pulverizing mills and accessories; auxiliary equipment, and spare parts.

E H Wachs Co

600 Knightsbridge Pkwy, Lincolnshire, IL 60069,
847-537-8800, FAX: 847-520-1168,
sales@wachscsco.com, www.wachscsco.com

Contact: Mktg Dir, John Geis
Manufactures field portable pipe cutting, drilling, flange facing, and weld prep machine tools, in addition to hand-held, truck, and trailer mounted valve exercisers and vacuum evacuators. Serving the energy industry since 1883 and sold internationally, the company offers equipment and complete support.

WAGO Corp

N120 W19129 Freistadt Rd, PO Box 1015,
Germantown, WI 53022, 262-255-6222, toll-free:
800-346-7245, FAX: 262-255-3232,
info.us@wago.com, www.wago.us

Contact: Mktg Mgr, Dean Norton
Provides Spring Pressure Connection Technology that eliminates loose wires resulting caused by vibration and temperature cycling. Innovations such as the Cage Clamp provide corrosion-resistant and maintenance-free connections. The company's product lineup includes: terminal blocks (DIN rail, chassis, and PUB), relays, power supplies, Wago I/O-system, and more.

Wahlcometroflex Inc

29 Lexington St, Lewiston, ME 04240,
207-784-2338, FAX: 207-784-1338,
evan.spoerl@wahlcometroflex.com,
www.wahlcometroflex.com

Designs and manufactures dampers and expansion joints (metallic and fabric). With more than 50 years of experience, the company has the track record of product performance and reliability.

Walchem Corp

5 Boynton Rd, Holliston, MA 01746,
508-429-1110, FAX: 508-429-7433,
info@walchem.com, www.walchem.com

Contact: Cust Svc Mgr, Tom Malcolm
Manufactures controllers, metering pumps, sensors, and accessories. Offers more than 50 years of experience with a commitment to quality and ingenuity.

Wanner Engineering Inc

Hydra-Cell Div

1204 Chestnut Ave, Minneapolis, MN 55403,
612-332-5681, FAX: 612-332-6937,
tstack@wanereng.com, www.wannereng.com
Provides positive displacement hydraulically balanced diaphragm metering pumps, peristaltic hose pumps, nonmetallic ANSI mag-drive, and mechanically sealed centrifugal pumps.

Wärtsilä Finland Oy

Wärtsilä Finland Oy*(sub of Wärtsilä Corp)***Power Plants Div**

Tarhaajantie 2, PO Box 252, FI-65100 Vasa, Finland, 358-10-709-0000, FAX: 358-6-356-9133, www.wartsila.com

Contact: Gen Mgr, Ralf Stoor

Supplies power plants, pump units, and compressor drivers based on diesel and gas reciprocation engines manufactured by Wärtsilä. Engines can use various fuel types: HFO, LFO, crude oil, biofuels, and natural and associated gasses. Has engineering and project management capabilities to deliver on equipment or EPC basis.

SALES OFFICES:**Wärtsilä North America Inc**

Houston, TX 77032 281-233-6213, FAX: 281-233-6233, bill.elston@wartsila.com, www.wartsila.com

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 and hydraulic pressure testing of HP pipework.

Weatherford Production Optimization*(div of Weatherford International)***Production Optimization Div**

22001 North Park Dr, Kingwood, TX 77339, 281-348-1000, FAX: 281-348-1280, info@ep-weatherford.com, www.ep-weatherford.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.

WEG Electric Corp

1327 Northbrook Pkwy, Suite 490, Suwanee, GA 30024, 678-249-2000, toll-free: 800-275-4934, wegsales@weg.net, www.weg.net/us

Contact: Mktg Mgr, Gerardo Elias

Provides solutions to industrial electrical technologies, offering a diverse and integrated product line that includes motors, drives, controls, transformers, and generators. An industrial electric motor manufacturer in the Americas electric motors in the world producing more than 10 million units annually.

Wellstream International Ltd

Wellstream House, Wincomblee 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 VP/Pres NA, 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 & Servicos Ltda

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

Western Land Services Inc*Corporate Headquarters Div*

1100 Conrad Industrial Dr, Ludington, MI 49431, 231-843-8878, toll-free: 800-968-4840, FAX: 231-843-3183, wls@westernls.com, www.westernls.com

Contact: Dept Mgr, Jim Welch

Serves the oil and gas industry. Offers leasing, abstract preparation, title, curative, landowner negotiation and liaison, project design and management, land surveying, water management, cultural and natural resources, GIS, and other mapping, permitting, and regulatory compliance.

SALES OFFICES:**Western Land Services Inc-Regional Office**

Richfield, UT 435-896-5501, FAX: 435-896-5515, www.westernls.com

Western Land Services Inc-Regional Office

Sheridan, WY 307-673-1817, FAX: 307-673-1823, www.westernls.com

Western Land Services Inc Regional Office

Blairsville, PA 724-459-8171, FAX: 724-459-8173, www.westernls.com

Western Land Services Inc Regional Office

Clinton, AK 501-745-8834, FAX: 501-745-8841, www.westernls.com

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 Strategies

21495 Ridgetop 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 clients. Supports RFP efforts for telecommunications services and the physical deployment and develops the standards for system design, construction, and maintenance.

Wilco Industries Ltd

PO Box 309, Neilburg, Saskatchewan, Canada S0M 2C0, 306-823-4949, FAX: 306-823-4950, www.wilcoindustries.ca

Contact: Sales

Manufactures storage tanks for the oilfield industry, located on 10 acres of land in Neilburg, Saskatchewan, 80 km southeast of Lloydminster, the company has over 14,000 sq. ft. of shop space and is capable of building tanks up to 32 in tall. The company builds all sizes of tanks.

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 for on-site measurements, including the hand-held InfraSpec VFA spectrometer for various biofuel analyses; 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

Specializes in durable and hard-to-produce labels, decals, signs, and markers. Creates products and prototypes for pipeline companies, utilities, and major manufacturers worldwide. A line of outdoor durable 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@williamspumps.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.

Winters Instruments

121 Railside Rd, Toronto, Ontario, Canada M3A 1B2, 416-444-2345, FAX: 416-444-8979,
www.winters.com

Contact: Mktg Mgr, Desmond Knor
Manufactures pressure and temperature instrumentation. Product line includes pressure gauges, thermometers, pressure switches, transmitters, and accessories.

WireCo WorldGroup*Union Wire Rope Div*

12200 NW Ambassador Dr, Kansas City, MO 64163-1244, 816-270-4700, FAX: 816-270-4707,
info@wirecoworldgroup.com,
www.unionrope.com

Contact: Dir Oilfield/Logging Slis, Jeff Steimer
Manufactures Union Wire Rope drill lines which are known for delivering performance and service life. The company is API certified, QPL qualified, and ISO 9001:2000 registered.

WIRTH GmbH

Köln Str 71-73, 41812 Erkelenz, Germany, 49-2431-83-0, FAX: 49-2431-83-267,
info@wirth-europe.com, www.wirth-europe.com

Contact: Gen Mgr/Slis, Frank Lengersdorf
Manufactures high technology oilfield drilling equipment for on and offshore applications. With more than 100 years of experience in the production of equipment for the oil and gas industry.

WlInss.com

7715 Southmeadow Dr, Houston, TX 77071, 832-372-6900, FAX: 713-723-1326,
info@wlInss.com, www.wlInss.com/phg

Contact: Pres, Hiett Ives
Provides Nikken Magsteps insoles are worn by people worldwide and are on the market today. Provides a feeling of increased energy, making feet feel less tired. They come in three trim-to-fit sizes.

Wolf Safety Lamp Co Ltd

Saxon Rd, Works, Sheffield, S8 0YA UK, 44-114-255-1051, FAX: 44-114-255-7988,
info@wolf-safety.co.uk, www.wolf-safety.co.uk

Contact: Mktg Dir, Miles Jackson
Manufactures and supplies safety lamps, flashlights, torches, searchlights, and worklights certified safe for use in potentially explosive atmospheres.

**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

Offers engineering and production facilities, well support, and gas turbine services, providing a range of engineering, production support, maintenance management, and industrial gas turbine overhaul and repair services to the oil/gas and power generation industries worldwide.

Work Area Protection Corp

2500 Production Dr, PO Box 4087, St Charles, IL 60174, 630-377-9100, toll-free: 800-327-4417,
FAX: 630-377-9270,

workarea@workareaprotection.com,
www.workareaprotection.com

Contact: Pres, Richard Bielski
Manufactures safety supplies, equipment, traffic control devices, and products related to work zone safety.

Workrite Uniform Co

1701 N Lombard St, Suite 200, Oxnard, CA 93030, 805-483-0175, toll-free: 800-521-1888,
FAX: 805-483-0678, info@workrite.com,
www.workrite.com

Contact: Mktg Coord, Ben Staley
Manufactures flame-resistant apparel in an assortment of styles, colors, sizes, and fabrics. The company's garments ensure protection for petrochemical, utility, and all industries needing compliance with NFPA 70E requirements.

Worldwide Oilfield Machine Inc

11809 Canemont St, Houston, TX 77035, 713-729-9200, FAX: 713-729-7321,
curgc@womusa.com, www.womusa.com

Contact: Mktg Mgr, Curg Click
Improves existing valve designs to increase reliability and reduce maintenance since 1980. Introduced a sealing concept for gate valves used in the petroleum industry. After testing and at the company and third party testing, the company's Magnum gate valve proved its worth. In three decades, the company has expanded its product offering.

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 Slis, Greg Helbling
Offers more than 4000 tools for the industrial, contractor, and MRO markets. All Wright-manufactured products are U.S.-made and carry lifetime guarantees against defects in workmanship.

Xenemetrix Inc

(formerly Jordan Valley AR Inc)

8601 Cross Park Dr, Suite 200, Austin, TX 78754-4522, 512-973-9229, FAX: 512-973-9282,
info@xenemetrix.com, www.xenemetrix.com

Provides customers with quality and cost effective elemental analysis through our energy dispersive x-ray fluorescence (EPX RF) systems. Delivers non-destructive multi-element determinations from ppb to high weight percentages of elements ranging from fluorine (F) to uranium (U).

Yale Cordage

77 Industrial Park Rd, Saco, ME 04072-1804, 207-282-3396, FAX: 207-282-4620,
webrequest@yalecordage.com,
www.yalecordage.com

Contact: VP Slis/Mktg, Richard Hildebrand
Provides high quality cordage and rigging services to both public and private customers in the United States, Canada, and abroad. Mission is carried out efficiently, safely, and in a socially and environmentally responsible manner to customers and end users of products and services.

Zencus International Ltd

501 The Chambers, Chelsea Harbour, London, SW10 0XF UK, 44-20-7351-1173, FAX: 44-20-7352-8277, info@zencus.com,
www.zencus.com

Contact: Sect'y, Anne Jackson
Offers a wireless field data acquisition and desk-top visualization system. Delivers real-time wellhead and field data to the user's desktop utilizing wireless technology and web-enabled data visualization tools. Real-time data "from wellhead to desk-top" is now a reality at an affordable price.

Zero Products Inc

PO Box 24146, Houston, TX 77229, 713-675-0123, FAX: 713-675-6066,
zerofast@zerofast.com, www.zerofast.com

Contact: Mgr, Tom Mullen
Manufactures nuts, bolts, and fasteners.

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

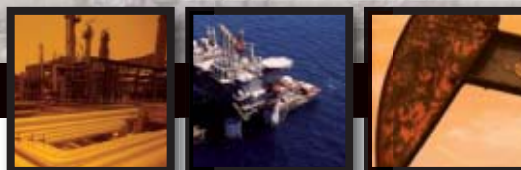
Contact: Office Mgr, Lisa Montgomery
Offers gas turbine compressor cleaning fluids, with corrosion inhibition, approved for use by all major engine manufacturers. Available from global distribution network. Used in onshore and offshore applications, worldwide. Water based and biodegradable. Ensures maximum available power output, improved fuel efficiency, and reduced wear and tear on machine components.

Zotefoams Inc

55 Precision Dr, Walton, KY 41094, 859-371-4046, FAX: 859-371-4734,
jnk@zotefoams-usa.com, www.zotefoams.com
Manufactures lightweight oil resistant materials (foam) for seals and gaskets.

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Refrigeration	16	Subsea	30	Wire rope	10
Regulators	18	Subsea	6	Wireless	20
Relief	30	Sucker rods, guides	9	Workover umbilicals	10
Remote controller vehicles (RCV)	27	Sulfur analysis	25	Wrenches	29



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