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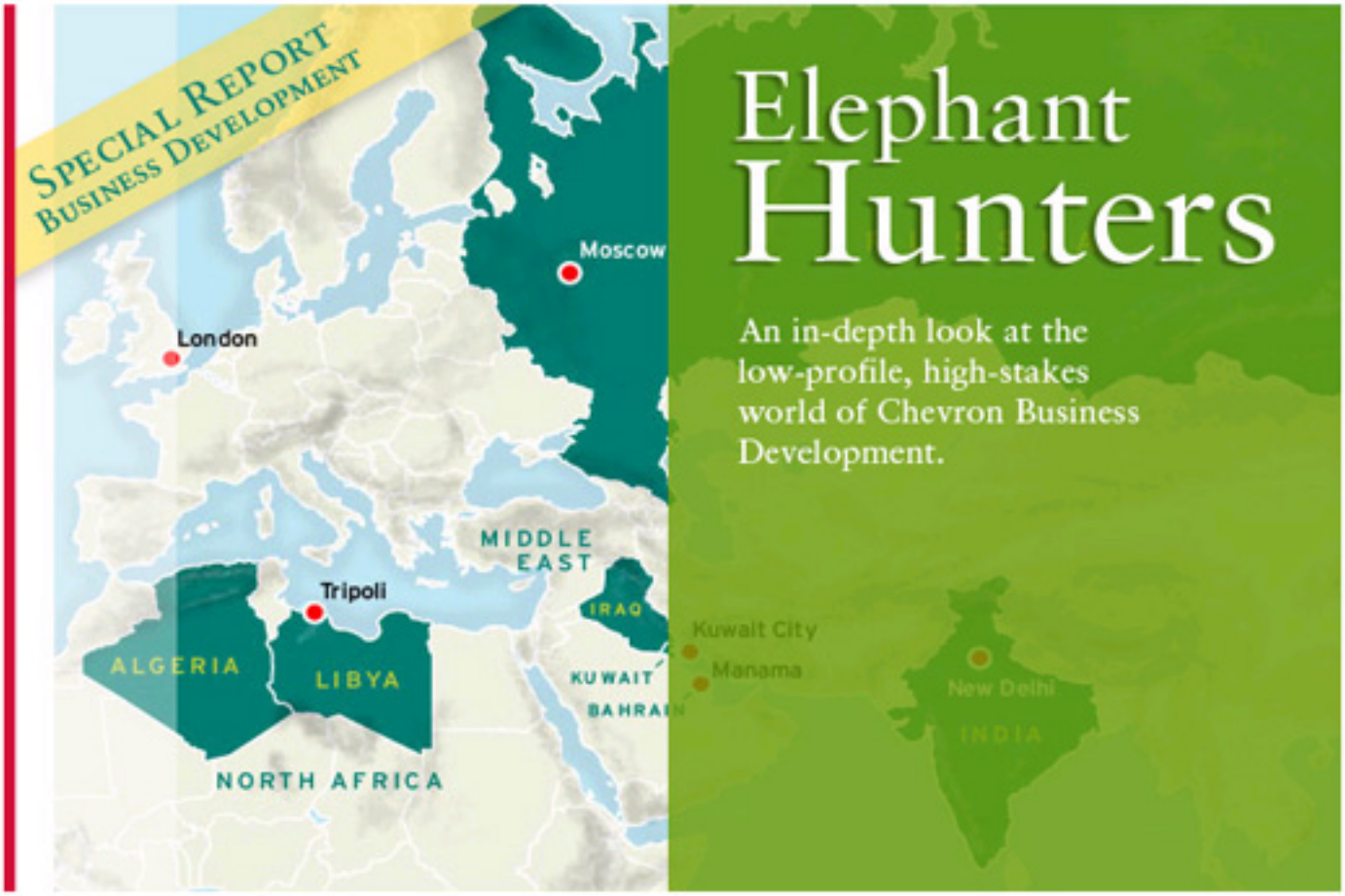

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LETTERS TO THE EDITOR

26 February 2007

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Elephant Hunters

Line Rider takes an in-depth look at the low-profile, high-stakes world of Chevron Business Development.

by Jim Hendon

The October news arrived like a gust of Arctic wind: Instead of joining with Chevron and other companies, the Russians would develop the gigantic Shtokman natural gas project and its liquefied natural gas (LNG) facilities on their own.

Dozens of Chevron scientists, engineers and leaders had spent two years and $25 million seeking a stake in the $10 billion-plus venture, proposed for a remote sector of the icy Barents Sea. Russian energy giant Gazprom had short listed five potential partners and promised to make its decision in 2006. Then came the surprise announcement on Russian television that Gazprom would go it alone – and instead of supplying an LNG-export project aimed at North America, Shtokman's gas would feed a new pipeline to Europe.

But the drama didn't end there. Just a few weeks later, Russian President Vladimir Putin said Gazprom might consider participants for Shtokman after all.

Welcome to the high-stakes world of Chevron Business Development (CBD), a three-year-old group of mega-deal hunters with visions of long-term success in a global game of thin odds and thick skins.

Their current focus: Win new Chevron projects in India, the Middle East, North Africa and Russia.

Their mission: Seek only "legacy" opportunities, especially those that could help Chevron achieve its upstream growth strategy.

Their portfolio: Track a handful of multibillion-dollar moving targets, ranging from Russian LNG and Algerian gas-to-liquids (GTL) prospects to mammoth Middle East oil fields and a brand new refinery deal in India.

'We Want Them Big'

"We have just one standard criterion," says Corporate Vice President for Business Development, Jay Pryor, who left Chevron's top Nigeria post in early 2006 to take the reins at CBD. "We want them big."

In the upstream, where CBD concentrates most of its efforts, big means 500 million to 1 billion barrels of future, cumulative Chevron crude oil production, he explains – resource opportunities known in the oil industry as "elephants." In the downstream, it means looking at markets with major growth potential or refineries with advantages such as highly flexible processing capability or good proximity to crude supplies.

A perfect legacy project also has no decline curve in sight, promising long-term growth and, if possible, the chance for decades of shared investment and expansion, according to James LeJeune, CBD's vice president for Middle East/North Africa.

Members of the London office: Marina Lyon and James LeJeune (seated) and (standing, from left) Sarah White, Ron Milligan and Chris Steele.

Shtokman met the legacy test. Gazprom is Russia's biggest company. The target resource holds more than 100 trillion cubic feet of natural gas in place – five times the annual consumption of Western Europe. The project, if built, would probably produce for half of the 21st century.

"We won't do deals just to do deals," James says. "Our job is to bring in the next generation of major Chevron assets. They must create value for our stockholders and for the partner country. To capture these opportunities, we must convince future partners that we can create more value from a given resource – and faster – than the national oil company by itself or than our competitors."

Hungry Competitors

Mission impossible? Not quite. But CBD's work requires continually analyzing difficult prospects, saying no to most of them, slowly building positions and relationships that may never pay off, and generally waiting for what seems like forever to succeed.

"Perseverance is a key competency in business development," says Marina Lyon, CBD's director of Commercial and Negotiations, a native of Russia who holds a doctorate from Moscow State University. "Often you make two steps forward then three steps back."

Today's fluid deal marketplace is swept by shifting political tides and crowded with big, hungry Chevron competitors. They're all chasing a limited number of opportunities, most very technically difficult, at a time when host countries are pushing tougher commercial terms than in the past, says Jay.

High crude oil prices have brought huge profits to oil-producing nations, dampening their interest in outside partners, notes Stephen Lambert, CBD's general manager for Strategy and Planning. These days, it would be unrealistic to expect to capture a true legacy project every year, he says. So the game requires CBD to sometimes pursue prospects that may not be elephants in themselves but will ultimately help Chevron capture a legacy opportunity in the future.

In fact, says Ian MacDonald, head of Chevron's Russia operations, a cold analysis of the realities of business development in Russia has led to a shift in emphasis toward ventures that may provide access to bigger projects.

"We are still going to pursue single-legacy positions as they arise," he says. "But we also plan to pursue incremental growth through building a portfolio of assets."

Case in point: Despite the Shtokman decision, Chevron has formed a new exploration and production venture in western Siberia with Gazprom Neft, the oil arm of Gazprom (see "Focus Areas" at right).

Everybody's Business

Of course, the 140-person CBD group isn't the only Chevron organization looking for new business. All of Chevron's Upstream business units work constantly on it, and so do Global Gas and Global Downstream –

bidding on leases, lining up drilling deals, promoting projects where Chevron already has a strong presence, opening markets, making selective acquisitions, finding customers and more.

Near the CBD office in New Delhi, are (from left) Sudha Chaudhary, Bob Dastmalchi, Rajni Yadav and John Digby.

At the same time, the corporate Mergers and Acquisitions (M&A) team constantly evaluates prospects – and Global Exploration directs the screening and selection of places to probe for new crude oil and natural gas, the oil industry's most basic business-development activity.

So CBD must coordinate and collaborate with everyone, says Jay, not always taking the lead, because, naturally, boundaries blur. For example, M&A and Global Downstream contributed, along with CBD, to Chevron's successful participation in a new Reliance Industries Ltd. refinery venture in India; CBD worked with Global Exploration and Chevron International Exploration and Production to win a new tract in Libya.

Hand-Picked Teams

By design, CBD handpicks teammates from throughout the company for tours of duty ranging from a few days to a few years: LNG shipping experts, commercial specialists, geologists and reservoir engineers from Chevron Energy Technology Co. (ETC); lawyers, project-management pros from Project Resources, and processing wizards from ETC and Global Refining.

"As the opportunities ebb and flow, we bring in the Chevron resources we need," says James. "Our strategy stays the same, but our tactics change with each situation."

On average, Jay estimates, CBD's 24/7 elephant hunt requires five Chevron colleagues for each CBD specialist. Especially important is nimble technical analysis of exploration prospects and oil or gas fields that Chevron might want to manage for a partner. "The first question we ask is, 'Do we like the rocks?'" says Jay.

One Deal in 100

For every deal CBD pursues in earnest, it screens about 100 ideas and seriously evaluates 10 of those, says Jay, who gets 15 to 20 letters, emails and other pitches every week. Raw prospects also flow in to other CBD offices. Most are quickly dismissed as too small, risky, wrong-fit or half-baked, but CBD's leadership team looks at the most promising (along with any that CBD conceives on its own) at its monthly meeting.

Typically, serious prospects take one to three weeks to evaluate, such as a Madagascar heavy oil project which Chevron recently rejected. The few opportunities that meet Chevron's high standards are boiled down to one-page scoping notices, which must win a nod from the Corporate Executive Committee to advance.

Currently, CBD is leading or coordinating the pursuit of seven legacy opportunities in six countries located in its major focus areas: Algeria, India, Iraq, Kuwait, Libya and Russia.

The Current Portfolio

"People are often surprised that we're working on so many," says Jean Camy, CBD's technical manager. "But you have to invest lots of time in multiple prospects to capture just one. Remember that it took almost nine years to secure Tengiz. Still, it's exciting work, because these prospects could really make a

big contribution to Chevron's bottom line."

In Kuwait, for example, the company hopes to turn a long-term technical services relationship into a larger deal to support development of the supergiant Burgan Field and also continues to compete for an elusive contract to expand the technically difficult Northern Fields. In Algeria, Sasol Chevron is taking the lead in discussing a proposed project that would harness a large complex of gas fields to supply a new GTL plant.

Libya, India, Iraq

In Libya, Chevron is talking with government officials about possibly co-managing some mature oil fields while also doing initial exploration work on Block 177, won in 2005.

In India, a new office in New Delhi and the blossoming relationship with Reliance have set the stage for boosting Chevron's presence in the Indian economy. The company could greatly increase its 5 percent share of the big, new Reliance refinery venture. It also has a shot at working with Reliance or others on upstream prospects in India.

"With its rapid economic growth and a fifth of the world's population, India is a place we have to be," says John Digby, CBD's country manager.

At the Libya office, with a view of the Mediterranean Sea, are (from left) Darrell Cordry, Dr. Rafa Labedi and Salah Qaja.

Meanwhile, Chevron has quietly established a valuable relationship with Iraq, providing training and development for some 500 Iraqis and gaining a fresh understanding of the country's large oil and gas fields. Most need investment and modernization, so if the door opens to outside partners, Chevron is now very well positioned to compete, says Donald MacDonald, who heads CBD's Iraq effort from its Manama, Bahrain, office.

"In this line of work, you have to be a person who sees the glass as half full," he says. "If you are not prudently optimistic, especially in the early days of a prospect, you'll never get anywhere."

Business Development Focus Map

Russia – Fresh Progress

To the outside observer, Chevron's prospects in Russia looked poor after energy giant Gazprom said it would develop the giant Shtokman gas project without Western partners.

But Chevron's two-year effort to win a stake in that $10 billion-plus venture has quietly borne other fruit: a new and much stronger relationship with Gazprom Neft – the oil arm of Gazprom – and a greater understanding of how to work with Russian partners within the system, says Ian MacDonald, head of the company's Russia effort in Moscow.

The two companies have formed the Northern Taiga Neftegaz Ltd. joint venture, which will be looking for – and producing – oil in western Siberia, with an initial, Chevron-funded exploratory well being drilled during the first quarter of 2007.

Chevron will have 49 percent – and Gazprom Neft, 51 percent – in the venture, which will initially have two large license blocks transferred to it, says Ian.

"The venture's design reflects an ever changing Russian investment scene where Western partners like Chevron are welcome but only as minority interest holders," he explains. "Nonetheless a 49 percent interest in one of the world's most prospective hydrocarbon producing regions is a solid basis for future growth."

India - Full Spectrum of Opportunity

While working on upstream in most of its focus countries, the Chevron Business Development (CBD) group is taking quite a different approach in India.

Here, a brand-new, nine-person CBD office in New Delhi is seeking fresh prospects in everything from exploration to marketing. The effort is anchored by Chevron's small but diverse India presence: a major new investment in the refining sector plus existing businesses in lubricants, jet fuel, additives and other products.

“Our fully integrated approach makes us different, and as India opens up more to foreign investment, our current position puts us ahead of our peer companies,” says John Digby, CBD’s country manager, who notes that Chevron also licenses technology to Indian refineries, uses software from two Indian companies and hires Indian mariners and crews for Chevron tankers.

Last year, Chevron acquired a 5 percent stake in Reliance Petroleum Ltd., a company formed by India’s largest private company, Reliance Industries Ltd., to own and operate a new export refinery being constructed in Jamnagar, India, with an option to increase that to 29 percent. Chevron plans to play a significant part in both crude supply to the refinery and finished-product delivery – a solid fit with Downstream’s global strategies and skills, says Tom Simons, general manager of Downstream Ventures for the India office.

Upstream, the office recently brought in Bob Dastmalchi to coordinate Chevron’s oil and gas prospecting. Chevron and Texaco both explored parts of India’s offshore without success in the 1980s. Today, Chevron is touting its heavy oil expertise, deepwater skills and other capabilities, looking for future upstream business in India.

“Our objective is to create legacy positions across the value chain,” says John, a former president of Chevron Global Aviation.

Meanwhile, Chevron's India Leadership Team, headed by John, is working on presenting a coordinated Chevron image for business development, public relations and government interface in India. Some first steps: a 2007 advertising campaign and re-branding the India lubricants business from Caltex to Chevron.

“Integrated visibility is one of the keys to demonstrating we’re a serious, committed partner for India,” he says.

Iraq - Building Trust and Knowledge

Because of Iraq’s troubled recent history, the country’s oil industry hasn’t been able to function effectively, produce at capacity or keep up with technological trends, so there’s wide agreement that it needs modernization and investment.

When can that begin? Time and politics will tell. But Chevron has been laying the groundwork for potential Iraq partnerships, most recently hosting 50 Iraqi oil and gas professionals at a site in Bahrain for a workshop on upstream health, safety and environmental practices. It was the latest effort in a multifaceted Iraq initiative led by Chevron Business Development (CBD).

“We started looking seriously at Iraq in 2003, and by early 2004, we had set up the country’s first Iraq Technical Assistance Program, or ITAP,” says Donald MacDonald, CBD’s country manager, based in the Manama, Bahrain, office. “So far, Chevron has trained, sponsored, hosted and assisted more than 500 Iraqis, and we’ve provided technical support and evaluations for selected oil and gas fields. Many other companies have since set up similar programs.”

Chevron has long been a noted purchaser of Iraqi crude oil. But it hasn’t been safe or appropriate in recent years for Chevron people to visit Iraq for business development, says Donald. The ITAP has allowed the company to build promising, new relationships with the energy ministry and two national oil companies, as well as greatly increase our understanding of the country’s oil and gas fields and prospects. The effort should position Chevron to act swiftly and confidently on best-fit opportunities when the window opens, he says.

“With stability in the country, the outlook for future work would be huge: co-managing developed areas,

bringing on undeveloped discoveries and exploring for more. The country has the full gamut of upstream opportunities," says Donald

The Iraq initiative is managed from CBD's growing Bahrain office, which recently added Gary Ehret as the new Iraq exploration manager and Walid Masri as the new Iraq projects manager. More staff will be added in 2007, says Donald. Chevron is mainly interested in the large, conventional oil developments, but also sees potential elsewhere in the value chain – and the Iraqis are particularly interested in integrated projects. Most Iraq oil fields also contain large amounts of natural gas, so oil development would most likely have a gas component, such as an export pipeline to the national grid or local power plant.

"The Iraqis we have met and work with are great people, looking forward to a future when their oil and gas industry can realize its full potential and be a major component in the revitalization of Iraq. We look forward to being part of that future," says Donald.

North Africa Prospects - From Exploration to GTL

Chevron's business development efforts in North Africa are poised for new momentum in 2007. The Chevron Business Development (CBD) group's Libya office in Tripoli continues to build relationships with that country's national oil company, and the Sasol Chevron joint venture is discussing a proposed Algerian gas-to-liquids (GTL) project.

Chevron's recent Libya effort began in 2004, when the U.S. government lifted sanctions prohibiting investment. In 2005, the company won rights to explore remote Block 177, where seismic work is in progress. Chevron International Exploration and Production manages that effort as well as the pursuit of additional, similar opportunities.

Meanwhile, CBD is seeking future partnerships with Libya that would encompass a combination of exploration, undeveloped discovered reserve opportunities and revitalization programs of existing producing fields. Unlike new exploration, policies for venturing on projects with existing reserves have not yet been developed by the Libyan government, says Darrell Cordry, CBD's country manager. Along with regular exchanges with Libyan oil officials, Chevron has presented workshops in key technical areas, including horizontal drilling, water flooding and carbon dioxide–enhanced oil recovery.

"At this stage, we're demonstrating what we could bring," he says.

Other big companies are doing the same, and time will tell whether Libya will seek the kinds of deals Chevron has in mind. But Darrell says there is high interest in the company's experience, technology and know how – and appreciation for the open, straightforward outreach of Chevron's people.

Chevron isn't promising it can come in and transform all mature operations into growth machines, he says. Instead, Chevron identifies specific areas where it is confident it can add significant value, then makes its case for those, and Darrell says it is clear from the Libyans that they appreciate this frank approach. Moreover, 15 of the 18 team members at Chevron's Tripoli office are Libyans.

In Algeria, Sasol Chevron is taking the lead in discussing a proposed GTL project that would harness a large complex of gas fields to supply a proposed, new GTL plant. At the country's invitation, Sasol Chevron submitted a first technical proposal in 2005. Algeria will reportedly take project bids in 2007. Because of the project's scale, integrated structure and GTL component, contenders are few.

A Dialogue with Corporate Vice President for Business Development Jay Pryor

1. How does the work of the Chevron Business Development group fit in with the corporation's overall strategy?

Business development is a primary Chevron growth strategy, so we need to integrate and coordinate with the operating companies, service companies and business units to create growth over the long term. We need to take an enterprise view and use all our expertise and outside relationships to capture new opportunities. Our work is really about collaborating to advance legacy-scale prospects to the point where Chevron businesses happily take over and build them. Business Development can't work alone. We have to ask, how can we work together and better support each other to bring more opportunity into the company?

2. Most of your group's work is focused on upstream, yet in India, Chevron launched a new initiative with a downstream stake in a big refinery project. What's the strategy there?

We're going to work on expanding that downstream relationship and seek new upstream prospects at the same time. Reliance Industries is an aggressive and dynamic company, and they're building a complex refinery that can use multiple crudes and turn out a slate of high-value products, a good match with Chevron's downstream strategies and talents. Plus, Reliance is very active in India's upstream.

3. So India is the only place where Business Development has an integrated strategy?

No, but it's our best country example of marketing ourselves as a world-class integrated company well prepared to work in upstream, midstream, downstream or any combination. These days, more countries are interested in value chain partners, and most of the natural gas opportunities are value chain projects. If Chevron doesn't step up, others will – and integration is an area where we can really add value as an experienced partner. With our mergers and acquisitions of recent years, we offer greater size, strength and global reach. Plus, both Global Gas and Downstream are working closely with Upstream, driving value chain strategies in the business and in seeking new opportunities as well.

4. When you make a pitch for Chevron to compete for a big, new project, what's the most important thing?

What we're really selling out there is our reputation. That means everything we've done in our history, including being first to find oil in Saudi Arabia and achieving impressive growth in Kazakhstan. It includes how we've behaved in the past. For example, people still respect us for our environmental stewardship in Papua New Guinea during the 1990s. It also includes how we perform today as a partner.

Our success is grounded in the performance of all Chevron people over the years, and we present that as an analogy for the future. We're painting a picture that says, "We've done this many times and you can trust us."

5. So the human element really matters?

In fact, our people are a big component of what we offer. We like working in all kinds of cultures, and we have a lot of experience. We're seen as very professional, with great teamwork values and good technical skill in exploration and other key areas. Plus, we go out of our way to help train and develop our partners' employees. Some of our competitors are seen as mainly interested in extracting value. Chevron's story is more about sharing growth and creating value. We're more open to options and different ways to do things. We listen.

6. Along with reputation, you place a big premium on relationships. Why?

The first time I met the president of Libya, one of Chevron's focus areas, I was introduced by the president of Nigeria, whom I knew from my last position. In another example, our Global Refining president, Jeet Bindra – a native of India active in the international Indian business community – was instrumental in getting Chevron connected with Reliance Industries, which helped set the stage for our new India downstream opportunity. That's how relationships can matter in business development.

7. What else makes a company successful in business development?

Appreciating the perspective of whom you're dealing with. Many of the leaders in petroleum-producing countries feel a strong sense of stewardship for their national energy wealth; they're looking out for future generations. They like the way Chevron plans to involve their citizens in new developments and operations. They also appreciate Chevron's disciplined work processes, like our focus on operational excellence. Some people say Chevron is overly process-driven, but in business development work with national oil companies, it's often a positive differentiator.

8. In a business where you can never be sure you'll win the projects you're pursuing, how do you measure performance?

What you want is an active portfolio of options to partner in your key areas. For us right now, we have seven serious opportunities in the areas we've identified as best for us – India, the Middle East, North Africa and Russia.

9. What if they don't work out?

You can't do this work believing the only measure of success is capturing deals. Quality of effort really matters. Sometimes we do our best work deciding to pass when a value proposition just isn't there or when a partnership doesn't feel like it can work.

10. What else is important in an effective business development group?

You also have to know when a deal isn't going anywhere, and to then move resources and staff time to other opportunities. And regardless of all that, you have to do excellent, efficient technical analysis on the prospects, because the deal-making environment often forces you make quick decisions with incomplete information.

11. Is it true there are fewer big opportunities?

Yes, but most companies can't realistically compete for what Chevron's going after. When you're talking about the deep water, the Arctic, the geologically difficult fields, and the big, value chain projects like gas-to-liquids, heavy oil and liquefied natural gas, you need to have size, operating experience and technology to compete. Often, these things are so big that you need to bring in partners to spread the risk, so you have to be able to manage that too.

12. Have high oil prices made more prospects commercially viable?

They've given Chevron the cash flow and balance-sheet strength to go after really big opportunities. On the other hand, all our competitors have money too, so it isn't an advantage. Also, while higher prices have made more deals look commercial, you have to be careful because prices can change tomorrow.

You can’t afford to create a portfolio that makes you a high-cost producer.

13. Does Chevron’s technology give it a competitive edge?

It’s part of the whole. We’re viewed as being very technically competent over all. Depending on the situation, we may emphasize our technical capability and experience, such as subsurface interpretation, deepwater exploration, subsea facilities and complex refining.

14. Can you cite examples?

Recently, Gazprom and Chevron looked at heavy oil prospects in Russia together because of our expertise in that area. And our experience with subsea facilities helped us conceive a very competitive development concept for the Shtokman natural gas prospect in the Russian Arctic. Our heritage of innovation in refining technology helped make us an attractive partner for Reliance in India. Also, our gas-to-liquids (GTL) initiatives, investments and partnership with technology leader Sasol, position us to compete for GTL opportunities in several countries. Only a handful of companies are competitive in GTL technology and experience and are big enough to undertake a serious project.

The $1 Billion Challenge

A new reliability culture is taking hold in our refineries.

by Stacey Simon

When Alex Kent came to work at Chevron two years ago, one of the first things he noticed was the company's focus on safety.

Alex Kent (above) at Pascagoula was hired for his skills and experience in the nuclear industry.

Top picture: Mark Forsyth, pictured with Dami Okojie, is a leader in Richmond Refinery's reliability drive.

"As a new employee, you see a strong safety culture. It's not only expected we'll talk about safety, but if we see someone working unsafely, we'll feel OK to approach them," says the former nuclear engineer who was hired by Global Refining to help improve reliability at the company's refineries.

"Was it as acceptable here to talk about reliability failures as it was about safety? Not routinely," Alex recalls. "The 'no shame, no blame' culture didn't exist when it came to reliability. If a unit at a refinery shut down, it wouldn't be communicated consistently across the system. It would be left to the employees of the unit to restore it as quickly and quietly as possible."

That sort of thinking was symptomatic of a production-oriented culture with less regard for reliability – a culture, Alex explains, in which the priority was to get production back online without always correcting the underlying cause of the shutdown, thereby leaving the unit vulnerable to future failures.

As such, no one was prepared when a review of unscheduled downtime at Chevron's four largest refineries showed that, on average, one major unit at these refineries had an unscheduled shutdown every 10 to 12 days.

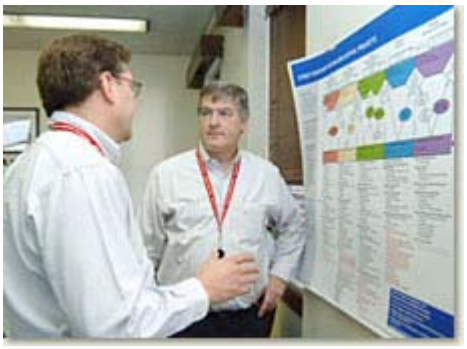
'The "no shame, no blame" culture didn't exist when it came to reliability.'

In fact, as Chairman Dave O'Reilly pointed out in his keynote address at the 2006 Operational Excellence Forum, the "size of the prize" – what the company could have realized operating at maximum reliability – was worth $1 billion in 2005.

“Now, when it comes to reliability, we’re making it not just acceptable but expected and positive to talk about an incident,” says Alex, who is based at the Pascagoula Refinery in Mississippi.

“Although I’m a relatively new employee myself, I’ve learned that it took years for Chevron’s safety culture to become ingrained across the company,” says Alex. Nonetheless, Global Refining’s objective – to instill a similar core value around reliability and intolerance for repeated system failures – has begun to take hold throughout our refineries.

Citing the direct relationship between safety and reliability, Sandy Cornelius, vice president of Global Refining Operations, explains, “Both are concerned with unplanned events and their consequences. Stable, reliable, predictable facilities lead to less exposure and less potential for injuries. Improving reliability will reduce injuries.”



Mike Coyle (right) and Brian Garber track reliability processes.

And progress is evident just 18 months after the company redoubled its efforts to improve refinery reliability.

“We stepped up the pace of our efforts and hired reliability professionals, implemented short-term improvement measures using refinery process experts and put together long-term improvement plans,” recalls Mike Coyle, operations manager at the Richmond, California, refinery. Mike leads the Reliability Operating Committee – comprising the operations and maintenance managers of our four largest refineries – which was established more than two years ago by Global Refining to tackle the reliability issue.

“We’ve learned a lot over the past couple of years,” he adds. “It’s not going to happen overnight. Are we better? Yes. Do we have a way to go? Definitely.”

‘A lot of factors affect reliability at a refinery – most important are people’

Mark Forsyth, a senior reliability professional within Global Refining, explains: “Our biggest risk in the past was that our refining organization operated in silos. We didn’t see systemic problems that we were all facing across Global Refining, which hampered our ability to recognize and address generic issues. This is changing through more effective communication and sharing lessons learned within the organization.”

Nuclear Reaction

Like Alex, Mark hails from the nuclear power industry and is another of the five former nuclear professionals hired by Global Refining over the past two years.

Known for high standards of excellence in operating reliability, the nuclear power industry bears enough similarities to refining that it was an obvious place to look for best practices around reliability.

In the United States, the newest nuclear power plants and refineries were built in the 1970s; however, they were operated at design capacity. To increase utilization as demand for electric power grew, the

nuclear power industry found it had to improve reliability, efficiency and turnaround time. Refineries find themselves in a similar position today.

The nuclear professionals have brought a new vision to the reliability effort in more ways than one. Unlike workers in other industries, they are keenly aware of something called “normalization of deviation.”

Bobby Manning, who works in the coker unit at the Pascagoula Refinery, uses a handheld computer to monitor temperatures, pressures and vibrations. Chevron introduced this device in 2004 to improve reliability.

Most people become desensitized to their environments after living and working in them day after day, but nuclear experts are trained to do just the opposite: to remain conscious of sights and sounds they may confront daily and notice any deviations in them.

With that unique vision, they are drawing on their years of experience to add traction to the corporatewide Operational Excellence Reliability Improvement process. This helps focus on what’s critical, defining performance requirements for key systems and components, analyzing gaps, determining the root causes of those gaps, and taking actions to close them.

A Ticking Clock

One process tool, implemented with success throughout Chevron’s refineries, was conceived by the Pascagoula reliability team: the reliability clock. For years, our facilities have publicized the number of days they’ve gone without experiencing a safety incident, but this is the first time they’ve begun to publicly track days of continuous operation without an unscheduled shutdown.

“It’s a mechanism to put us on a level playing field for reporting reliability incidents,” Alex explains. “Any time a key unit shuts down for more than 24 hours, it’s a clock reset. The whole idea of the clock is to start people talking about and building energy around the ‘zero is attainable’ concept when it comes to reliability incidents.”

Alex adds that all clock reset events are subjected to an incident investigation, the type of investigation common to safety incidents in Chevron, but unprecedented in all but significant cases of unreliability.

Building a Center of Excellence

These tools and others are helping bolster the reliability processes now being piloted in the eight refineries Chevron operates – El Segundo, Hawaii, Richmond, Pascagoula and Salt Lake in the United States; Burnaby, Canada; Cape Town, South Africa; and Pembroke United.Kingdom. Ultimately, the processes will become standards, maintained within a Reliability Center of Excellence that the Global Refining’s new general manager for reliability, Bruce Chinn, was hired to develop. The center, a repository of best practices – proven locally for deployment globally – will serve as a primary resource for all Global Refining.

“We’ve just got no excuse but to succeed,” says Sandy Cornelius (left), vice president of Global Refining Operations, pictured with Bruce Chinn, who is building a Reliability Center of Excellence.

“I’m here to help our businesses align with standardized reliability practices – to find them and implement them.” This, he adds, involves culture change as much as procedural change.

That objective is not without its challenges. “A lot of factors affect reliability at a refinery – most important are people,” says Jay Peterson, Global Refining’s reliability leader.

“For a plant to operate as designed, all functions performed by the refinery personnel must be executed with excellence. People charged with selecting and managing feedstocks; engineers who analyze those feedstocks and establish operating conditions to meet product specifications; equipment specialists and mechanics who monitor, maintain and repair the gear; and operations people who support the daily plant operation – each is a critical link in the reliability chain,” Jay emphasizes.

Sandy Cornelius adds that multiple perspectives are changing Global Refining’s culture as well as procedures.

“There’s a great diversity of thought in the folks we have tackling reliability. In addition to representation from the nuclear industry and some external consultants, we have our own homegrown people from operations, engineering and maintenance. We’ve just got no excuse but to succeed at this.”

The Winners

Readers select stunning pictures in Line Rider's photo contest.

by Paul Chandler

The beauty and the tranquility of nature, and an engineering marvel in harmony with it, are exquisitely captured in the winning photos in the *Line Rider* 'Where I Live' photographic contest.

The photos, picked by readers from a shortlist of 40, provided a window onto the diverse places where these talented amateur photographers have lived.

Standards in the competition were high. But as well as technical quality, the photos conveyed the true affection and fascination these employees hold for the places they call home.

The winners are:

- Linda Curran for "Winter Perfection"
- Thomas Even for "Swamp Light"
- Elvin Marcelo for "Majestic Mayon"
- Audrey Newell for "A View of the Flåm Valley – Norway"
- Raymond Ullarich for "Golden Gate Bridge at Sunrise"

More than 650 employees entered the competition, representing scores of countries, submitting 2,137 photographs of their homes, towns, pets, neighbors and favorite places to visit.

Some 5,370 people took part in the voting.

Viewpoints

The snow scene that looks like it comes straight from a children's picture book is the view Linda Curran has "the pleasure of enjoying every day" from her home.

Since she moved to Sandpoint, Idaho, United States, in 2004, the beauty of her new surroundings inspired her to take more photographs, she says.

"I have snapshots of this same view in a variety of seasons. In some I've even managed to capture moose and deer as they amble across the open field between my home and the beautiful red barn below."

Linda, a computer scientist in Global Lubricants, telecommutes from this spectacular location.

She took the winning "Winter Perfection" photo with a 35 mm Canon EOS Rebel using an 80-200 mm lens. "I just happened to wander by the window one

morning when the light was just right. I let the autofocus do the work and merely snapped away."

Majestic

It was a modest "point and shoot" camera that captured the winning shot of "Majestic Mayon" in the Philippines. But in the hands of talented amateur photographer Elvin Marcelo, the device produced by far the best of many excellent shots we received of this active volcano.

Elvin is a facilities engineer with Chevron Geothermal and Power in the Philippines helping to operate the steam gathering system that provides electricity to the country.

"I've been based in Tiwi for almost five years now but the view of the world famous Mayon Volcano never ceases to amaze me," he says. "It is a work of art. Mount Mayon can show different faces at different times of the day, with either a clear view or with a stream of low-lying clouds, as I captured in my entry."

Gateways

"A symbol of beauty and openness," is how Raymond Ullarich describes the Golden Gate Bridge, whose famous span stands guard over the Pacific Ocean entrance to the San Francisco Bay.

Raymond, who works at the Richmond Refinery (not far away in the Bay Area) confesses to being "addicted and quite obsessed" with photography, a relatively recent hobby. "The lens I used for this particular shot was a Canon L series 24-105 mm. The time was right, at sunrise with the fog rolling in. I had the camera on a tripod and was quite happy with the results.

"I was quite surprised when I heard that I won the competition, being new to the world of photography. This encourages me to go make more photos of even better quality and learn even more of this wonderful hobby."

Journey

Audrey Newell, who is a structural engineer now living in Houston, took the photo "A View of the Flåm Valley – Norway" while she was living in that country on a resident expatriate assignment.

"In my opinion, Norway is home to some of the most beautiful natural scenery in the world," she says. "I lived in Oslo, but had many opportunities to see other parts of the country.

"The photograph was taken from the window of a train along the Flåm Railway, which is a 20-km (12.4 mile) journey from the mountain station of Myrdal down to Flåm."

Audrey is modest about her skills, saying she typically leaves the photography to her husband. "It is almost impossible to take a bad picture when photographing the natural scenery in Norway," she says. For her winning shot, she was using a Canon PowerShot A80.

Illuminating

The swamp that forms the subject of Thomas Even's beautiful photograph has a special significance. Thomas frequently visits Cypress Island Preserve on the south end of Lake Martin near Lafayette, Louisiana – land that was donated by Texaco to serve as a nature preserve.

"I like to visit at sunrise and sunset to photograph the cypress tree landscapes, alligators and nesting birds in the spring," says Thomas.

"I really enjoy being outdoors at the edges of the day, where life seems to slow down and I can turn off the rest of the world and focus on photographing what moves me."

Thomas, a facilities engineer in the Gulf of Mexico business unit, currently uses a Canon 5D Digital SLR with interchangeable lenses. For his winning shot, he mounted the camera on a tripod and waited for the light to be reflected off of the water in this unique way.

The Winning Photos

Thomas Even’s “Swamp Light”

Raymond Ullarich's "Golden Gate Bridge at Sunrise"

Linda Curran's "Winter Perfection"

Audrey Newell's "A View of the Flåm Valley – Norway"

Elvin Marcelo’s “Majestic Mayon”

HOW IT WORKS Energy Efficiency Series

Putting Waste to Work

Kitchen grease helps fuel a wastewater treatment plant.

by Stacey Simon

This is the first article in an occasional series about the innovative energy efficiency projects our subsidiary, Chevron Energy Solutions, deploys on behalf of its clients.

The process is perfectly natural. Wastewater – the stuff of drainpipes and toilets – is typically treated at wastewater treatment plants using gravity and microorganisms. Microorganisms (bacteria) in the wastewater use the waste material as a food source and, in the course of "feeding," convert the waste to byproducts that can include useful energy sources such as methane gas. Unless that gas is captured, it escapes into the atmosphere as a greenhouse gas and its potential as fuel is unrealized.

Chevron Energy Solutions (CES) has helped the city of Millbrae, California, realize – and expand on – the potential of that fuel by capturing it to power the city's water pollution control plant.

In January, CES completed the installation of a first-of-its-kind facility that will enable the wastewater treatment plant to use kitchen grease – the 3,000 gallons (11,400 liters) it will begin receiving daily from restaurants – to naturally produce additional biogas. The biogas will generate renewable power and heat to treat the city's wastewater.

The Power of Grease

Adding grease as a food source boosts the amount of methane produced by at least 30 percent. This justified the installation of a new 250-kilowatt microturbine cogeneration system that increased the plant's electricity production by 175 kilowatts.

In many respects, the process is the biological and mechanical equivalent of a human digestive tract, using tanks, filters and pipes to perform the functions of a stomach, bladder and intestines. Here's how it works:

- Wastewater piped into the plant is separated into solid waste, or sludge, and liquid waste. It is the sludge combined with grease that creates the fuel for the new microturbine, which generates most of the electricity needed to run the wastewater treatment plant.
- Sludge is directed to one of two digesters for treatment. The contents of these closed tanks – food, microorganisms and inert material – are kept heated to 98 degrees Fahrenheit (36.7° C).
- Restaurant grease is delivered to the facility and pumped into a new 12,000-gallon (36.7-liter) tank, where it mixes with digesting sludge and is fed continuously into the digester tanks.
- There, the bacteria ingest the waste material as a food source, breaking it down and reducing its volume. In the process, the waste is converted into methane and carbon dioxide.
- Methane is delivered to the turbine via a fuel conditioning and compressing system. The turbine, in

turn, powers 80 percent of the wastewater treatment plant. And, as a cogeneration facility, the microturbine recycles its excess heat, which is used to keep the digester at 98 degrees.

- Solids that are not digested are dewatered and subsequently hauled away to be used in composting or buried in landfill.

Chevron Energy Solutions

Chevron Energy Solutions (CES), a Chevron subsidiary based in San Francisco, California, partners with institutions and businesses to improve facilities; increase efficiency; reduce energy consumption and cost; promote renewable energy; and ensure reliable, high-quality energy for critical operations. The company employs proven technologies to meet customers' specific needs, including infrastructure technologies, energy controls, solar photovoltaics, fuel cells, biomass and other systems.

Other recent high-profile projects CES has completed include:

- The largest solar power and energy-efficiency project ever undertaken for the U.S. Postal Service – a 910-kilowatt solar power system – that will help meet the Oakland, California, postal facility's power needs during peak demand periods and, with additional energy-saving improvements, reduce its power purchases by more than one-third.
- California's first megawatt-class hydrogen fuel cell cogeneration plant, installed at a Northern California correctional facility, which is saving taxpayers more than $260,000 a year by reducing electricity purchases by more than 50 percent during peak-demand, summer months.

OUR COMMUNITIES

The Spice of Life – Post-Tsunami Recovery in Thailand

Two years after a tsunami devastated southern Thailand, four small communities are reborn.

By Peggy Waldman

On December 26, 2004, a 9.1 magnitude earthquake – the world's fourth-largest since 1900 – hit 780 miles (1,250 km) southwest of Bangkok, off the northeast coast of Indonesia. The quake triggered a tsunami that caused more casualties than any ocean wave in recorded history, killing more than 157,000 people in South Asia and East Africa and displacing approximately 1.1 million, according to the U.S. Geological Survey Earthquake Center.

At least 110,000 people were killed by the earthquake and tsunami in Indonesia. Tsunamis killed some 31,000 people in Sri Lanka, 10,700 in India and 5,300 in Thailand. In addition, many other countries suffered numerous fatalities.

In Thailand, six provinces along the southern Andaman coast experienced massive destruction of property, creating losses valued at $420 million. Thai people consider the disaster the country's biggest natural catastrophe.

"What I observed was far worse than the TV news footage," says Tara Tiradnakorn, president of Chevron Thailand Exploration and Production, Ltd. "I saw a land empty of all but debris and the remains of what used to be vibrant towns."

Although the tsunami had no direct impact on Chevron's Thailand operations - either on or offshore, many communities the company serves were devastated. "We have been in Thailand since 1962. Chevron is the country's largest crude oil and natural gas producer, and our gas generates one third of Thailand's electricity," says Tara. "We were shocked and saddened by the loss and wanted to do all we could."

In the Wake of Disaster

For disaster relief in Thailand alone, Chevron immediately donated $300,000 to the Thai Red Cross. Employees personally gave an additional $180,000 in cash and services.

To promote the country's long-term recovery, the company later made donations valued at $1 million to fund redevelopment projects run by three nongovernmental organizations (NGOs): the Population and Community Development Association (PDA), Thailand Environment Institute, and Green World Foundation. (Across Southeast Asia, Chevron committed more than $15 million in support of tsunami recovery and reconstruction efforts.)

In Thailand, Chevron is backing a PDA program to help support four villages in the hard-hit Phang Nga and Krabi provinces. One of Thailand's largest NGOs, PDA is providing education, training and microloans to improve living standards - especially for women and youth - in the villages of Ban Koh Kiem Tai, Ban Laem Po, Ban Klang and Ban Nong Talay.

Chevron also is supporting Thailand Environment Institute demonstration projects to rehabilitate mangroves - salt-tolerant trees and shrubs that buffer coastlines - and Green World Foundation efforts to restore southern Thailand seashores and help tsunami-traumatized children. "To create sustainable development, we're backing projects that emphasize local involvement," says Tara.

PROJECT PHOTO GALLERY

Fishing as a Way of Life

Throughout southern Thailand, fishing is woven tightly into the fabric of daily life. In 2005, the Bank of Thailand estimated local output at approximately 370,000 metric tons, or 60 percent of Thailand's overall fishing production.

Though many small villages remained standing after the 2004 tsunami, most had their local fishing industries seriously damaged or destroyed. Support has poured in over the past two years, but the focus has been on tourist destinations.

Chevron is sponsoring redevelopment of four smaller communities in Phang Nga and Krabi provinces outside the public spotlight.

An Economic Development Model

PDA's adopted villages already have begun to thrive. "Villagers have new houses, clean drinking water and new fishing boats," says Tara. "At school, children have better lunches, books and clothes. Everywhere we see new ventures funded by microloans."

A recent University of Southern California project assessment concluded that PDA has a "proven rural economic development model" and an "ability to gain trust and confidence of rural villages." The study

lauded methods that give the community control of development.

“Immediately after the tsunami, Chevron was one of the first organizations to offer disaster relief, including helicopter evacuations and medical aid,” says Tara. “Now we’re supporting longer-term, sustainable projects that are making southern Thailand stronger than before. We appreciate all the country has done to help Chevron grow, and we’re honored to return the favor.”

Thailand Highlights

Area: 198,500 square miles (514,000 sq km)

Climate: Tropical monsoon with high humidity.

Population: 64.6 million (July 2006 estimate)

Capital: Bangkok

Chevron Interests:

- Chevron has had upstream operations in Thailand since 1962.
- The company is the country’s largest crude oil and natural gas producer, and Chevron gas generates one-third of Thailand’s electricity.
- Chevron holds interests in a 700-megawatt electric power plant in Ratchaburi and a 150,000-barrel-per-day refinery at Map Ta Phut.
- Through the Caltex brand, Chevron has been a leading Thai provider of petroleum products for nearly 60 years, supplying the country with liquefied petroleum gas, motor gasoline, jet and diesel fuel, and transport and industrial lubricants.

VOICES

What character from popular culture in your country or region do you most identify with and why?

Leonard Nwosu

Plant Operatives Supervisor,
Global Lubricants Supply Chain,
Chevron Oil Nigeria
Lagos, Nigeria

"I love football. In my youth, I played the game well, and one of the first Nigerian players who traveled to England in 1949 for a now-famous tour, Titus Okere, was from my family. In Nigeria, during World Cup or Nations cup games, everyone forgets politics and tribal clashes. Then people see themselves as one body."

Antonia Friedman

Planning and Research Manager, Global Marketing,
Chevron Global Downstream
San Ramon, California, United States

"As a newlywed and kitchen novice, I received Julia Child's book *Mastering the Art of French Cooking*. I grew to admire Julia immensely as I learned to prepare fresh, high-quality ingredients using simple techniques. Julia championed honesty in cooking - nothing fake or artificial in her recipes - and her books and TV programs showed how to manage mishaps with flair. Because of Julia, I never traded butter for trans fats, and I learned to rely more on my eyes and nose than the kitchen timer. I'm an advocate of Julia's attitudes about food fads (many are bad) and 'enjoying the moment' at the table (always good)."

Jeff Roedell

Technical Team Leader,
MidContinent Business Unit,
Chevron North America Exploration and Production Co.
Rangely, Colorado, United States

"I really identify with Jamie on *MythBusters*. [Each week on the Discovery Channel, Adam Savage and Jamie Hyneman take on three myths, using science to

show what's real and what's fiction.] Jamie and Adam don't take anything for granted. Engineers are like that anyway, but there's also a connection with the oil industry. Many people seem quick to accept that big oil is inherently bad, and we're continually trying to bust that myth. I favor Jamie's quiet, thoughtful approach. He doesn't get hurt as often as Adam!"

Marjorie Dean

San Ramon Onsite Support Manager,
Chevron Information Technology Co.
San Ramon, California, United States

"I identify with my namesake Marjorie Dean, a 1920s' fictional heroine of three related mini-series of books. The first reason: we share the same name. Secondly, she's described as having 'superior honor, ethics, intelligence and charm.' While I don't think I'd be described quite that way, I would like to think I have some of those characteristics! Other similarities are that we both focus on keeping a positive attitude and working on worthwhile projects to contribute to society in a way that hopefully encourages others to join in."

Eric Wee Sen Tan

Sales and Marketing Manager, Pacific Rim, Products Supply and Trading,
Chevron Singapore Pte. Ltd.
Singapore

"Philip Yeo is my choice for the face of dynamic leadership in Asia. He's helped make Singapore one of the world's most prosperous countries. I admire his visionary outlook, passion for excellence and tremendous energy to drive our country's economic transformation. Mr. Yeo was instrumental in reclaiming tiny offshore islands to form one integrated Chemicals Island, kick starting a biomedical sciences hub and creating opportunities for Singapore's brightest youth. Currently chairman of Singapore's Agency for Science, Technology and Research, Mr. Yeo recently won The Order of Nila Utama (First Class) 2006 National Day Award - probably the highest honor we have."

SR Fernandez

Executive Logistics, Supply Chain,
Chevron Lubricants India Ltd.
Chennai, India

"I relate strongly to the Dravidian culture of Tamil Nadu (south India), which is as ancient and complex as any the world has known. Tamil Nadu is a living museum where cultures that developed over 2,000 years ago still flourish. I am fascinated by the kings who ruled this area from 900 to 1500 A.D. The magnificent temples of Thanjavur and Gangaikondacholapuram express the grandeur of architecture under Raja Raja Chola. The Siva temple at Thanjavur, the largest and tallest of all Indian temples, is a masterpiece!"

LETTERS TO THE EDITOR

Your letters react to biofuels and other articles in our November issue, as well as the personal and corporate retrospectives we carried in our special year-end issue in December.

Thank You for Sharing Your "Voices"

Dear Samina, Frank, Theodora, Shack, Aqeel and Romina - my colleagues from far and wide [these correspondents answered the December 2006 "Voices" question, "What will you remember most about 2006?"].

This article has made me, again, so aware of the diversity of people who work for our great organization and the passion and commitment of our people. It also showed how our company is thought of as being part of your "worlds," both in your countries and your personal lives.

I have been associated with this organization for almost 35 years and have seen many changes, locally at our affiliate here but also across the globe. I am continually amazed at how we have not lost focus and have maintained the commitment throughout all these changes, which in many cases were associated with fairly major upheavals in peoples' lives.

The passion for your jobs is so evident in the few thoughts you shared with us in this article. Using that as a basis, we can justifiably look forward to continued success and a very prosperous 2007.

Jackie A.L. van der Heyden, Cape Town, South Africa

Investment: Let's Spread the Word

Excellent article on "The Year in Chevron" [December 2006]. You should send this to every member of the U.S. Congress along with a note on our announced capital budget for 2007. It certainly shows what we are doing with all the so-called windfall profits.

Michael Colacito, Concord, California, United States

Biofuels - Dependent on Gasoline?

I really enjoyed reading the biofuels article ["Energy to Grow," November 2006], and it broadened my knowledge concerning 85 percent ethanol and its mixture with 15 percent gasoline. Does it mean that the ethanol cannot burn alone without being blended? And won't that blending make it dependent on gasoline - therefore costly? I know the scientists have done a lot of work, but the consumer of this energy has to take price into consideration.

Rafiu Oyedele, Lagos, Nigeria

Editor's comment: *We asked one of our company experts, Chevron Fellow Lew Gibbs, for a response:*

E85, the mixture of 85 percent denatured fuel ethanol and 15 percent gasoline, can only be used in specially designed vehicles. This fuel cannot be used in conventional vehicles because it requires a different fuel-air ratio than straight gasoline. Pure - or denatured - ethanol can burn fine in a spark-ignition engine under warmed up conditions, but when an engine and the ambient conditions are cold, it is difficult to start the engine on ethanol alone. This is why the 15 percent gasoline is added to provide the needed front-end volatility for starting. For very cold areas, the concentration of gasoline is increased to 25 percent. In Brazil, motorists use vehicles that will run on ethanol, but these have a second fuel tank that contains gasoline. The engine starts on gasoline and then switches over to the ethanol.

More "How It Works," Please

I liked learning how ethanol is made using corn and watching the interactive graphics explain how that process changes with cellulosic feedstock. I encourage more articles like this showing how technologies work. Thank you.

Joao Gomes, Cabinda, Angola

Hard to Share

Line Rider consistently provides fascinating reading. I am very impressed by it, and it helps me feel proud of Chevron. The downside is that I am frequently disappointed that I have not found a way to share the material with my family, except in the printed version in which information is limited. I especially feel this way when it comes to articles related to the environment. My daughter is an environmental scientist.

Martin Richards, Cape Town, South Africa

Editor's comment: *Thank you for your compliments. Since* Line Rider *is an employee magazine, its distribution is currently limited to Chevron's intranet. But being Web-based, it allows us to add capabilities like animation, video clips, photo galleries and interactivity, such as the "Test Your Knowledge" application. In addition, we continually seek ways to leverage content that may be of broader interest to our external audiences, for example, by directly targeting the media or repurposing material in external publications such as our Corporate Responsibility Report, the Annual Report, Next* (Chevron's technology report) and Chevron's external Web site, http://www.chevron.com/.*

It is possible, of course, to access the company intranet from home using NetGIL, as perhaps evidenced by the following letter, if remote access is approved by your local management.

Kids' Stuff

The "Tails of the Deep" [November 2006] photos and videos are great. I look forward to showing my kids.

Matt Ryan, Houston, Texas, United States

Deeply Grateful

Great article and visuals regarding deep-sea marine life!

Sheldon Nelson, San Ramon, California, United States

Best Wishes

I am impressed with the quality of the articles. I am new to the Chevron organization as a contract reservoir engineer. Truly, this is a world-class company, practicing cultural diversity in the true sense. I hope to contribute to your magazine. Wishing you safe and happy holidays.

Rashmi Shah, Houston, Texas, United States

Keep on Truckin’

I gave my ’98 Chevy 1500 to a used car salesman to sell for me. He ran a couple of test drives and soon had to put some gas in it. He put some inferior gas in and immediately the fuel injectors caused major hesitations. He called me and I told him that this particular year of truck has injector issues, and I took it back from him to clean it up. I put in five gallons of Chevron Supreme with Techron® additive [see “Techron Goes Global,” September 2006] and some additional fuel injector cleaner bought at Chevron - and 13 miles later, the truck was running perfectly. There is no gas like Chevron with Techron!

Daniel Chaney, El Segundo, California, United States