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Quiet Stars

CNAEP's Base Business Racks Up Solid Gains and Redefines the Status Quo

by John Kelly

North America's base business might lack the glamour of new growth projects, but it currently accounts for more than 35 percent of Chevron's net income.

The production figures for the 105-year-old Kern River oil field in California's San Joaquin Valley are a testament to hard-knuckled perseverance as much as to advances in technology. Output was said to have peaked at 60,000 barrels of oil a day in the early 1900s and, indeed, it gradually dropped by 75 percent. By the mid-1960s, however, the field benefited from a new heavy oil technology called steamflooding and reached a new high of 120,000 barrels a day. Today it chugs along at a respectable 92,000.

In some ways, Kern River typifies the ups, downs and long history of the "base business," a term that refers to the ongoing crude oil and natural gas production that's core to the company and fundamental to its success. After recent asset sales and the acquisition of Unocal properties, Chevron's base business in North America comprises some 500 fields and another 500 royalty interest properties, many producing for decades and undergoing a natural production decline that ranges from 2 to 10 percent a year. (The royalty properties are based on interests in production or production income only; the royalty owner is not responsible for capital or operating costs.)

A Low Profile – But High Impact

The base business in North America might lack the glamour of new growth projects, but it accounts for more than 800,000 barrels a day of oil-equivalent production and more than 35 percent of the corporation's 2005 net income through September.

Critical in providing funding and expertise for the company's future growth, the base business also has a history of quiet heroics in its workhorse way of getting the job done year after year.

What attracts employees, including many with international experience, is not the spotlight but the



OSI team members Wayne Doverspike and Johnna Tyler review plans for a low-nitrogen-oxide emissions conversion at the Kern River steam generators (in background), near Bakersfield, California.

challenge of coaxing ever more crude oil out of the ground, of getting to know the quirks and caprices of individual fields. In some areas, production actually continues to increase – for example, in portions of the Cymric and Midway-Sunset fields near Bakersfield, California, and in the McElroy Field in the Permian Basin in West Texas.

“The Cumulative Value of Small Steps”

“I credit employees who see the cumulative value of small steps,” says Ken Sample, general manager of Business Development and Planning for Chevron North America Exploration and Production (CNAEP). “From a thousand candle lights, you get a whole lot of lumens.”

“Production decline in this business is normal,” says Allen Robinson, audit manager for a new initiative called Operations Standardization and Improvement, or OSI. “By focusing on our base production, we can reduce the decline and make solid financial gains.”

In the fall of 2003, the company took a fresh look at its North American base business, a new mix of Chevron and Texaco assets following the merger of the two companies. Operating expenses per barrel were about \$1 higher than competitors’. In addition, the portfolio of producing fields needed thinning.

The following spring, North America Upstream launched Compete, a major initiative to maximize production and reduce operating costs through greater efficiency. Under Compete, the company put 900 of its 1,500 fields on the auction block, with the goal of retaining more than 90 percent of production. It also cut back on service providers and restructured the organization to emphasize the base business.

What attracts employees is not the spotlight but the challenge of coaxing ever more crude oil out of the ground.

The goal of OSI – a major component of the Compete initiative – is to standardize work processes across the company to increase reliability and efficiency. “We used to reward people on an individual basis,” says OSI general manager Dick Filgate. “Now we are rewarding folks for thinking strategically on an enterprisewide basis and moving out of our historical silos.”

“This is not just another initiative,” he adds. “We’ve created the structure in the strategic business units and at headquarters and staffed it to fully integrate OSI into the organization.”

International Upstream has its own base business initiative, with a goal of boosting production and generating \$90 million to \$210 million annually by standardizing processes.

Adopting the Best of Best Practices

OSI sets mandatory standards in three areas: surface maintenance, subsurface maintenance and production operations. Essentially, the OSI team picks the best of the best practices in use – internally or externally – or creates a hybrid that can be deployed across the organization. “We were good at sharing best practices but not always at adopting them,” says Allen.

In surface maintenance, a detailed approach to planning and scheduling, with a greater emphasis on prioritizing jobs, is eliminating unnecessary tasks and reducing the number of work crews. At the San Ardo Field in the San Joaquin Valley, for example, maintenance costs have been reduced by about 30

percent, from \$1.60 per barrel to \$1.10 since May 2004. Kern River also has lowered maintenance costs by a third.



In subsurface maintenance, a standardized “workover queue” prioritizes all upcoming remedial work in order to best leverage equipment and personnel. In one field, for example, annual producing-well failures dropped from 0.55 per well in 2003 to 0.35 per well currently.

In North America production, the company currently operates some 900 compression units, used mainly to move natural gas from a reservoir to a pipeline system. Because a reservoir’s natural pressure declines over time, compression is particularly important in mature fields. The Production Operations group in OSI combined the best approaches to compression optimization from the Midcontinent and Gulf of Mexico business units. As an example, at the Mount Point natural gas field in the western Gulf of Mexico, one compressor is now doing the work of two – resulting in an annual savings of \$700,000.

Audits – With an Operations Twist

The OSI Audit teams, well grounded in operations, plan to evaluate each of the nine CNAEP production areas once a year. With sophisticated score cards and benchmarking tools, the teams track the costs associated with each standard and compare like fields across the company. “In any given audit, we typically come up with 10 key findings that help the business unit address gaps in implementing the new standards,” Allen says.

“The full effect of the new standards won’t kick in until the end of 2005, but audits let us know where we stand,” says Ken. “In two or three years, thanks to a dedicated workforce, I can see us as the most efficient operator in North America.”

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Welcome to Tengiz – the Town

With housing for some 6,000 workers, plus amenities like cinemas and workout facilities, Shanyrak looks like a small city – but runs like a hotel.

by Colin Bryer

As the sun begins to set in the desert just east of the Caspian Sea, all is quiet. The only sound is from a light wind that sends tiny spirals of dust into the air. Yet there is an atmosphere of expectation.

Suddenly, as if an invisible switch has been turned on, a few buses appear on the horizon, followed by the sound of their engines. As they approach, other buses appear, some from different directions, all headed for the same location.

Within minutes, the buses – dozens upon dozens of them – have entered the huge offloading area, following a meticulously planned, safe pattern of movement. Scores of people dressed in safety boots and safety helmets pour from the vehicles. Tired and hungry after a hard day's work, they smile and chat with each other as they walk. Now there are hundreds of them, soon thousands, from many different ethnic groups. This single, continuous stream of human traffic heads toward the biggest hotel in Kazakhstan.

This daily ritual is one of many that have been engineered to provide maximum safety and comfort to the residents of Shanyrak – the huge accommodation complex commissioned by Tengizchevroil (TCO), an equity affiliate in which Chevron holds a 50 percent interest, and TCO's engineering, procurement and construction-management contractor, Parsons Fluor Daniels (PFD).

Looks Like a Town, Operates Like a Hotel

A small town that is operated as a hotel, Shanyrak is, and will remain for years to come, a marvel. Designed and built by a Kazakh consortium, the project was at the time the biggest single contract awarded by TCO to a business from the republic. It houses 6,000 of the more than 9,000 construction



Each of the five main buildings features a domed center, which houses a restaurant, gym and other leisure facilities, and 14 spoke-like accommodation blocks.

workers and ancillary personnel currently involved in TCO's groundbreaking integrated Sour Gas Injection/Second Generation Project (SGI/SGP). (One of Chevron's 'Big 5' projects, SGI/SGP is designed to inject hydrogen sulfide gas from Tengiz and Korolev fields into the reservoirs, and is estimated to boost crude oil production capacity between 44 and 68 percent – from 298,000 barrels a day (bpd) to between 430,000 and 500,000 bpd.)

The quality of Shanyrak's construction, accommodations and amenities has received praise from many quarters, and the project has been recognized as a benchmark for the biggest oil and gas projects of the future. The 247-acre complex consists of five massive buildings, each with a huge central dome from which 14 long accommodation blocks emanate in a star formation.

“Shanyrak is a self-contained, fully functioning small town in the middle of the desert,”

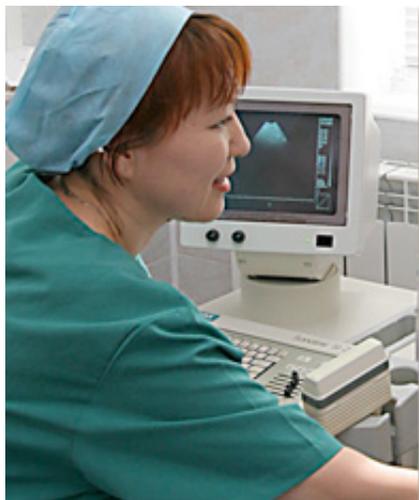
— Vladimir Bashmakov, Construction Manager

Each dome holds a restaurant, leisure area, gymnasium, shop, laundry and meeting room, while the blocks house the secure living areas. The complex also includes a safety training and administration center, boiler house, water supply and storage tanks, and water- and wastewater-treating buildings, plus two bakeries, tennis courts, soccer and basketball fields, and a medical center – all connected by 5.6 miles (9 km) of tarmac roadways and 4.3 miles (7 km) of sidewalks.

When it opened in January 2004 after two years of construction, Shanyrak was already the envy of other project housing sites – a status enhanced last spring with the opening of a state-of-the-art swimming pool and movie theater.

“We are very proud of what we have achieved,” says Vladimir Bashmakov, construction manager of Munaigazkurlys, which with Intergasstroj and Consolidated Development Corporation forms the Kazakh consortium that designed and built the complex. “Shanyrak is truly a self-contained, fully functioning small town in the middle of the desert.”

A Staff of Hundreds



Shanyrak's main objectives are to help its residents work, rest and play as safely as possible. Providing world-class service to this world-class facility is no mean feat, though. Hundreds of people keep the village running smoothly – making sure that the rooms are neither too hot nor too cold, that the menu is diverse enough, that the buses run on time.

“My first impression of Shanyrak was that it represented a bigger challenge compared with the existing construction camps at Tengiz,” says Steve Green, PFD site services manager, SGI/SGP. “Whereas TCO's original village has one restaurant, one laundry and one gymnasium, Shanyrak has five of everything – and it is paramount to maintain a high level of quality control.”

Steve has more than 40 administration staff on site coordinating activities such as rotational travel, room allocations, visa facilitation, finance and transport. A team of 130 drivers currently move workers to and from the Tengiz field sites.

Working alongside the site services team is ERSS – a joint venture between part of the world’s largest food-service and hospitality company, the Compass Group, and Raytheon Technical Services. Steve Main manages the group’s 1,520 staff, 98 percent of whom are Kazakh nationals.

“We cater for 19,500 meals per day,” says Steve, who joined ERSS three years ago. “Each week we supply thousands of toilet rolls and 44,000 pounds of chicken and handle 140,800 pounds of laundry.”

Getting the Thumbs Up from Residents

Given the ethnic and religious diversity of its people – at least seven languages can be heard as you walk around the complex – what do construction workers really think about Shanyrak? A survey conducted earlier this year revealed that up to 85 percent said the village met or exceeded their expectations. This is very favorable compared with other construction camps throughout the world.

Shanyrak represents a triumph of good partner relationships, attention to detail and good project management, says Joe Chadwick, a general superintendent for PFD. “We all found new and inventive ways of putting it together,” he says. “Coordination between the various teams was very positive during the construction phase and remains the same today.”

Eating Well at Shanyrak Village

Weekly consumption of typical items, as of mid-April 2005:

Eggs:	216,000
Chicken (in kg):	20,000
Tea (100-bag packs):	6,000
Coffee (100g jars):	1,000
Lamb (kg):	4,500
Beef (kg):	29,500
Pork (kg):	5,700
Flour, white (kg):	12,000
Rice (kg):	6,000
Cheese (kg):	1,600
Fruit juice (in liters):	30,000
Mineral water (liters):	45,000
Milk (liters):	30,000
Apples (kg):	5,500
Oranges (kg):	3,000
Potatoes (kg):	15,000

The Year in Chevron

From hydrogen to hurricanes to a new name, 2005 has been quite a year.

by Line Rider Staff

Are we the only ones overwhelmed by the events of the last year? In what amounted to one heck of a roller coaster, Chevron got a new name, a new acquisition and some new technologies. We suffered together through tragic tsunamis and hurricanes, and we worked together to build a new future. Here, *Line Rider* looks back in brief at the year that was.

JAN

The company makes an initial contribution of more than \$1 million to disaster relief efforts after the devastating **tsunami** in Southeast Asia. By February, the corporate contribution had reached \$12 million.

Chevron returns to **Libya** after a 28-year absence with an onshore license in the country's first exploration license round.

FEB



Chevron unveils the first **Chevron Hydrogen** energy station in Chino, California.

MAR



Cabinda Gulf Oil Company Ltd. announces first production of condensate (a light, valuable oil) from the **Sanha Field**, offshore Angola.

APR

The company announces that it has reached an agreement to acquire **Unocal**. The deal will add key operations in the Asia-Pacific and Caspian regions, and the U.S. Gulf of Mexico.

MAY

Techron enters the world market, as the company announces plans to sell gasoline made with the additive at Texaco-branded stations in Latin America.



The company formerly known as ChevronTexaco changes its name to **Chevron Corporation**.

JUN

JUL



Chevron launches a new global **advertising** campaign focused on important issues facing the energy industry, with the tagline: "Will You Join Us?"

AUG



The **Chevron Way** is revamped, tying together Vision and Strategy, bringing ingenuity into the picture and adding a "sense of urgency" for high performance.

SEP



Hurricanes Katrina and Rita slam the U.S. Gulf Coast – displacing thousands of employees; taking upstream platforms and the Pascagoula, Mississippi, refinery offline; and boosting global oil prices.

OCT



Chevron reaches a deal to sell liquefied natural gas (**LNG**) from the jumbo Gorgon Project, offshore Australia, into Japan, the world's largest LNG market.

NOV

Chevron CEO Dave O'Reilly, along with four other top oil industry executives, gives **testimony** to the U.S. Senate on oil prices.



HOW IT WORKS

Steamflooding – the 80 Percent Solution

When it comes to coaxing heavy oil from the ground, few processes work better than steamflooding.

by Nancy Boas

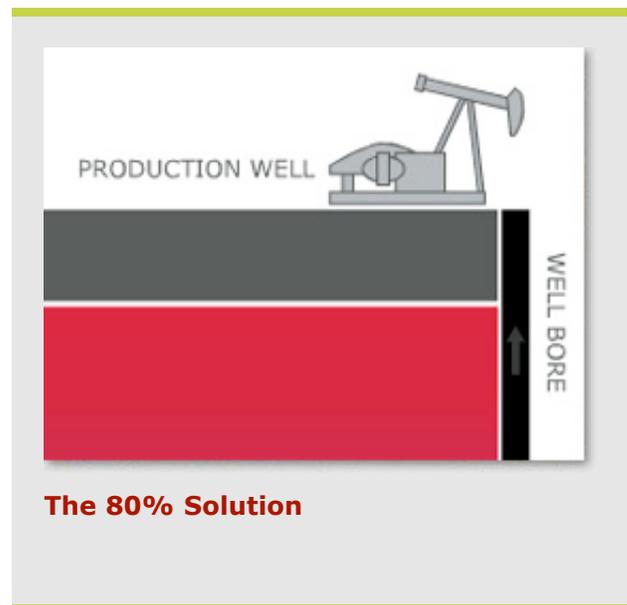
In 1965, production at California’s Kern River Field was limping along at less than 10,000 barrels of oil a day. More than six decades of production had drained only 15 percent of the heavy-oil reservoir.

Steamflooding technology, introduced that year, transformed Kern River into one of Chevron’s most robust, reliable producers. Today, Chevron produces more than 90,000 net oil-equivalent barrels a day and has drained nearly 65 percent of the mature Kern River Field. The goal: 80 percent drainage.

The principles of steamflooding are as simple as they are effective. In heavy-oil reservoirs, thick crude sticks to sand grains like honey to cornbread. Well operators continuously inject steam into that confection of oil-soaked sandstone; since the vapor is less dense than Kern River’s viscous crude, the steam floats to the top of the reservoir and spreads laterally. Steam comes in contact with oil along a horizontal interface and heats the oil, turning it to the consistency of corn syrup; the oil then drains off to surrounding producing wells.

“Picture an ice block melting in a sink,” explains Jeff Hatlen, heat management adviser in the San Joaquin Valley business unit. The steam is not pushing or displacing the oil, says Jeff. Rather, it is simply melting the top layer of oil -- which, relieved of its extreme viscosity, now “dribbles readily along the liquid-steam interface to producing wells.”

Once the steam-heated oil begins draining to well bores, operators can turn down the steam spigot while maintaining the same level of production. It’s like boiling an egg, says Jeff. “As soon as you’ve got a rolling boil, you can turn the heat down to a gentler boil. The water temperature stays the same,



and it takes just as long to cook the egg.”

Turning down the heat on a boiling egg saves enough money to buy ... well, not much. But turning down the heat on a 9,000-well steamflood like Kern River saves millions of dollars each year.

Steam is the most expensive injectant the industry puts in the ground. A barrel of water injected in a waterflood project -- in which water physically sweeps oil into adjacent production wells -- might cost 2 to 25 cents a barrel. By contrast, steam costs between \$2.00 and \$4.00 a barrel. “What pays for steamflooding,” says Jeff, “is high oil recovery.”

Chevron exported its steamflooding techniques to subsidiary PT. Chevron Pacific Indonesia’s Duri Field, now the largest steamflood in the world. Last year, Duri production averaged 212,000 barrels of crude per day.

While Chevron continues to refine this 40-year-old technology -- particularly in managing heat costs, by fine-tuning the precise amount of steam needed -- steamflooding is making its debut in some interesting places. In 2006, Chevron plans to begin a small-scale steamflood pilot in the Partitioned Neutral Zone between Saudi Arabia and Kuwait, the first of its type in the Middle East.

CAUTIONARY STATEMENT RELEVANT TO FORWARD-LOOKING INFORMATION FOR THE PURPOSE OF "SAFE HARBOR" PROVISIONS OF THE PRIVATE SECURITIES LITIGATION REFORM ACT OF 1995

Some of the items discussed in this article are forward-looking statements about Chevron’s strategy. Words such as "expected," "planned" and similar expressions are intended to identify such forward-looking statements. The statements are based upon management’s current expectations, estimates, and projections; are not guarantees of future performance; and are subject to certain risks, uncertainties and other factors, some of which are beyond the company’s control and are difficult to predict. Among the factors that could cause actual results to differ materially are changes in the demand for and supply of crude oil and natural gas; actions of competitors; the potential disruption or interruption of project activities due to war, accidents, political events, civil unrest or severe weather; inability or failure of the company’s joint-venture partners to fund their share of project expenditures; and general economic and political conditions. You should not place undue reliance on these forward-looking statements, which speak only as of the date of this article. Unless legally required, Chevron undertakes no obligation to update publicly any forward-looking statements, whether as a result of new information, future events or otherwise.



LETTER FROM...

On Board the *Gemini Voyager*: At sea, chief mate Angelo Merolla does a little bit of everything.



Angelo Merolla

Chief mate

Gemini Voyager

Chevron Shipping Co.

As a child in a small town in Italy, Angelo Merolla dreamed of a life at sea.

Today, at 32, Merolla travels the globe as an officer for Chevron Shipping. As it turns out, running a ship is like managing a small company – you have to know it all, from business practices to human resources to first aid.

Dear Colleagues,

When I was a child, my dream was to go to sea. I grew up in a small town in the middle of Italy, nowhere near the ocean, but I went to nautical college, then joined the Italian Navy, and finally went to work for an Italian shipping company. Today I am chief mate for Chevron Shipping. I have traveled all over the world – Brazil, Singapore, Hawaii, Europe – and I've had the opportunity to live in Japan and Angola. This was my goal. It's always exciting.

As I write, I am now the chief mate of the *Gemini Voyager*, a type of oil tanker called a very large crude carrier, or VLCC. It can carry more than 2 million barrels of oil and weighs in excess of 300,000 tons fully laded. We loaded part of our cargo in Poland and part in Denmark, and are now on our way to China. After passing through the English Channel, we head south to Cape Town, South Africa, then turn north. We will go through the Malacca Strait, past Singapore and finally into the South China Sea to offload our cargo. It's a journey of about a month and a half, but I will be with this ship for four months – so after we finish this discharge we will go on to another voyage.

The chief mate – we sometimes call it "chief officer" – is the second in command on a vessel, in charge of



Angelo Merolla, currently the chief mate of the *Gemini Voyager*.

all the activity relating to the deck and cargo. At the end of the day, my main responsibility is the safety of the people here, of the ship and of the environment. Everything else comes after.

But that “everything else” includes a little bit of everything. I need to know traditional navigation – how to tell the ship’s position by the stars and the sun – and electronic navigation, by satellites and computers. I have to be able to provide first aid and first-responder medical treatment; I have to be aware of business and legal issues, and be able to coordinate with local authorities. I’m responsible for loading and unloading, for mechanical and maintenance work, and for the training of the crew – making sure everyone is following company policy. That is why it is an exciting job.

My assignments are usually four months long. After that I go back to my town in Italy for about three months. I have been working for Chevron for eight years, so now, whenever I come onto a new ship, there are people I already know. Sometimes I know almost everyone on board. Usually we have about 26 to 28 people on a vessel. It’s normal to have a mix of nationalities among the officers, although our crew is usually all Indian or from the Philippines. But on board, our shared language is English.

“The ship is not only a workplace; once we finish work, it is our home. So we try to create a very familial environment.”

I like to build a very easygoing environment for my crew. The ship is not only a workplace; once we finish work, it is our home. So we try to create a very familial environment. At the end of the day, we share a meal together, and we have some social life – we can watch a movie, or spend time talking. Once a month we have a special dinner, with games and special activities, or maybe to recognize some special cause. Some officers can bring their wives on board, but I am not married.



Chevron Shipping is not a normal shipping company; it’s the shipping branch of a big oil company. Everybody on our vessels is very proud, because we are a leader in the industry for the way we operate. Safety is the most important thing: We spend a lot of energy making sure everyone is doing the extra training, and we have on board extra safety equipment provided by the company.

I’ve had many different assignments since I joined Chevron. I’ve worked on VLCCs and on floating storage and off-loading (FSO) vessels, which are usually moored offshore, fixed to the sea bottom. And I spent a year in Japan working as a consultant on the construction of one of the largest FPSOs (floating production, storage and offloading vessels) in the world, for the Sanha project,

offshore Angola. It’s like a floating refinery.

To do this job, you need to love it. When we’re on a ship, we work straight through, without days off. At sea, there is no day and night, no weekend, no Christmas Day; you are always in operation, 24 hours a day, every day of the year. This is not a job, but a life. Some people fall into this career – they don’t know how – and I see them struggling. But it’s easy to do if you have a passion for it.

Sincerely,

Angelo Merolla

Facts About Chevron Shipping

- Chevron precursor Pacific Coast Oil Company commissioned its first tanker ship – an oil-fired steamer dubbed the George Loomis – in 1895.
 - Today, Chevron Shipping Co. (CSC) manages 28 Chevron-owned and operated vessels around the world.
 - Shipping's vessels transport 365 million barrels of oil per year, and import more than 600,000 barrels per day of crude oil into the United States.
 - CSC staff includes roughly 1,275 mariners and 225 shoreside support staff.
 - CSC operations include: Marine Transportation, which operates the company's fleet of oil tankers and gas carriers; Marine Services, which oversees construction projects and terminal and floating platform management; LNG Shipping, which provides shipping solutions to Chevron's gas-related projects; and Commercial, which is responsible for Chevron's chartered vessels.
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VOICES



How – and why – did you come to work for Chevron?

by Rachel F. Elson

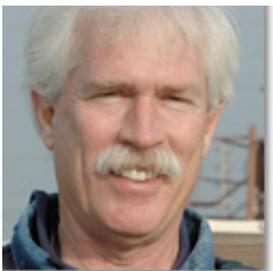
Andy Hood

**Operational Excellence champion,
Upstream Europe,
Aberdeen, Scotland**



“I joined the company in January 2002. I'd been a

consultant on the Britannia project, which is a joint venture between Chevron and ConocoPhillips, and I'd worked with a number of Chevron employees. I liked the culture in which they worked: It was relaxed but efficient, both open and accountable. And I liked the opportunities Chevron presented. When I was asked to join Chevron, it was one of the easiest decisions that I have made. And I've not regretted it. ”



George Harper

**Fire department trainer,
Richmond Refinery,
Richmond, California**

“I moved to California specifically to work for

Chevron. I had been a firefighter since 1974. After I started working for an oil field services company up in Alberta - we did firefighting and wild well control, plus emergency services and paramedic support - I noticed that all the best-run jobs I went on were Chevron wells. Chevron just appeared to be ahead of its competitors.

That company sent me down to the Bay Area to work at one of the local refineries. I fell in love with Northern California, and I knew Chevron had a refinery here, so I brought my family down here and tried to get a job at Richmond. I got hired in 1987, working in operations; I joined the fire brigade after a fire in 1989. It took me two more years to get a job in the fire department.”

Dangchin Watchawong

*Offshore petroleum engineer,
Chevron Thailand,
Benchamas and Tantawan fields, Thailand*



“I came here three years ago, after I saw an ad in a

newspaper. In Thailand, Chevron is known for having high-caliber people, people of talent. I had worked for eight years for Shell, and I wanted to see if Chevron would value my knowledge more.

Chevron has different fields, different projects and a different approach. The assignments are better, and I'm working in a real international environment. It's more enjoyable working with such a high-caliber team. It's more challenging - I have to study hard - but it's also good fun.”



Pat Butcher

*Qatar country manager,
Sasol Chevron,
Doha, Qatar*

“I didn't come to Chevron straight after university;

I'd worked as a geologist in Libya and Australia, and had traveled for a year in Africa. That was unusual at the time; Chevron mostly hired people right out of university. But this was in 1988, during one of those upturns in the industry; oil companies were looking to expand and were looking for people who had outside experience.

After working with an independent company in Australia, I was looking to work with one of the major players. I had two offers, and it really came down to a people issue: Chevron was more diverse, more international. I really liked that international feel. And I've had a lot of international opportunities here.”



Our How It Works article on the Hamaca upgrader drew a technical question over the use of naphtha as a diluting agent. We went directly to our source – Victor Rutherford, Chevron’s business manager for Hamaca – for an answer, below. We also got a variety of comments on our story about the aftermath of Hurricane Katrina.

To the Editor:

I was a bit surprised that the extra heavy crude oil (EHCO) has to be diluted first with naphtha to reduce its viscosity. Don't you think that it is possible to transport the crude without diluting it – by designing a reactor that will first pre-heat the crude to its pour point at the field to fluidize it and then pump it along the flow line directly to the Centro Operativo Bare for onward gas removal? I would also want to know the usefulness of naphtha in our everyday life.

– [Chukwuemeka Okoli](#),
Chevron International Exploration and Production,
Lagos, Nigeria

Victor Rutherford, Chevron’s business manager for Hamaca replies:

Heating the EHCO is certainly a technically feasible alternative way to reduce its viscosity and allow it to be pumped through pipelines. However, for Hamaca's particular circumstances, economics dictated that dilution with a light hydrocarbon (naphtha in this case) was a more cost-effective solution. Heating would have required a higher initial investment (both the cost of the reactors and heaters and the cost of insulating the pipelines to avoid heat loss) as well as higher operating expenses. However, there well may be other locations where, depending on the properties of the crude and the distances to be covered, heating might be a viable option.

As for naphtha – the fraction of crude oil with a boiling range between about 200 and 315 degrees F (roughly 93 to 157 degrees C) – it already plays an important part in everyday life, as a key component used in the manufacture of gasoline.

To the Editor,

After reading these three stories (“Hurricane Heroes”) published in *Line Rider*, I have never been prouder to be a Chevron employee. All of the people who endured endless obstacles, braved wind, water and communication problems, and yet helped the sick and stranded are my heroes. It's so wonderful to know that I work for a company that really cares for its employees.

– [Elizabeth Richardson](#),

**Houston, Texas,
Chevron Products Company**

To the Editor,

I find it irresponsible to make the person in your first hurricane story out to be a hero. Perhaps the story should have been about the dangers of failing to evacuate when one lives within a block of the beach. I can only assume that this area was included in an evacuation order for such a massive approaching storm. One would hope that glorifying this dangerous behavior will not influence anyone's future decisions regarding evacuations.

— **Michael Wright**,
Houston, Texas,
Chevron Services Company

Line Rider replies:

The city of Pascagoula, Mississippi, did issue evacuation orders prior to Hurricane Katrina, but the orders weren't enforced. In Darin's case, he had just returned home the day before Katrina struck, having been working at Chevron's El Segundo refinery in California. The company does encourage employees to follow such evacuation orders -- but that said, we're all very fortunate that Darin rescued so many people that day.