

In this  
Issue...

September 2010



**Safe, Deep  
Drilling**



**Navigating the  
Options**



**Computer  
Memories**



**Test Your Knowledge Quiz**



**Voices: Your Earliest Computer Memories**



## Deepwater Drilling - Our Way

We examine how Chevron drills safely in the most testing offshore environments.

Reaching thousands of feet down to the ocean floor, then tunneling miles into the Earth's crust, deepwater wells provide a growing share of global energy supplies. In depths of more than 2,000 feet (610 m), the oil industry's worldwide production capacity has tripled to 5 million barrels of oil-equivalent per day since 2000, and could double by 2015.

 [Read more ▶](#)

*Left: Riser pipeline sections for U.K. deepwater drilling.*

In this  
Issue...

September 2010



**Safe, Deep  
Drilling**



**Navigating the  
Options**



**Computer  
Memories**



**Test Your Knowledge Quiz**



**Voices: Your Earliest Computer Memories**

## Deepwater Drilling – Our Way

[Print](#) | [Email](#)

[Comments \(9\)](#)

The Macondo well blowout in the Gulf of Mexico showed that deepwater accidents can devastate lives, environments and economies. As we seek new oil and gas in deep locations off the shores of Brazil, Russia, Africa, Indonesia, the United States, Europe and other areas, how can we be sure all future wells will be safe?

Chevron's answer is: through a drilling community passionate about operational excellence, empowered and experienced with stop-work authority. We combine top technology, rigorous equipment selection, our own training and specialists, constant interaction with rig operators, and extra layers of protection in drilling practices, well design and construction.

"We address all risks before we start, and we're prepared to handle any others that come up during drilling," says David Payne,

vice president of Drilling and Completions.

Deepwater wells are methodically planned and built with a healthy respect for oil and gas reservoirs crushed beneath billions of tons of rock and ocean at up to 15,000 pounds per square inch, more than 400 times the pressure in a car tire.

"My first boss taught me to always respect the high-pressure reservoirs we typically find in drilling offshore," recalled Chevron's Rick Graff, who has spent the past 13 years as a Gulf of Mexico deepwater drilling engineer. "So we take great care as we drill to keep them safely contained with casing, cement, drilling mud and constant monitoring." Like Payne, he credits Chevron's performance — some 375 safe deepwater wells since 1987 — to our integration of people, standards and technology.



**A blowout preventer on the Discoverer Deep Seas drillship.**

In this  
Issue...  
September 2010



**Safe, Deep  
Drilling**



**Navigating the  
Options**



**Computer  
Memories**



**Test Your Knowledge Quiz**



**Voices: Your Earliest Computer Memories**

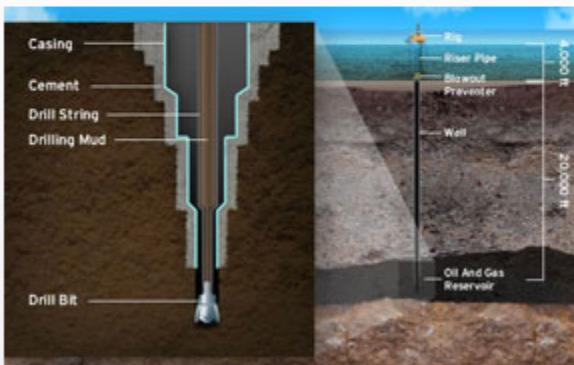
## Deepwater Drilling – Our Way

We do much of our deepwater work just like other top companies. But Graff rates us a cut above for "inspecting more closely, designing above requirements, paying a little more for better components."

Payne tallies the differentiators: We operate our own well-control school and maintain an in-house team of blowout preventer (BOP) experts, both rare in the industry. We post Chevron drilling superintendents (instead of contractors) on every major well. We constantly prod suppliers on equipment quality. (Payne: "We put our nose in their business.") We maintain a team for well intervention and another to warn drillers about hazardous "rock mechanics" as wells probe the prehistoric depths. Suppliers praise our culture of shared problem solving.

All deepwater drilling work passes through a huge BOP, one of a number of safeguards

built into the well. The hole is lined in phases with steel "casing" cemented to the rock walls. Drilling mud — like a thick milk shake — is pumped down the drill pipe rotating inside the casing, lubricating the drill bit and circulating into the "annulus" between drill pipe and casing. The mud also carries the rock cuttings back to the rig above.



Typical deepwater well. [Click to enlarge](#)

Drillers often hit pockets of oil, gas or water, but the pressure of the "hydrostatic" column of heavy mud holds them in check. If gas threatens to overwhelm the mud and come up the casing or drill pipe, Chevron drillers can activate the BOPs to shut the well like fingers pinching a drinking straw. BOPs also can close automatically, but "in my view, the human element is more important than the mechanical," says Graff.

Activating BOPs causes delays (deepwater rigs cost up to \$500,000 a day) but, "We'd rather activate a BOP even when it isn't necessary than risk a blowout," says Payne. "An unsafe well is an uneconomic well, as the Gulf of Mexico accident has clearly shown."

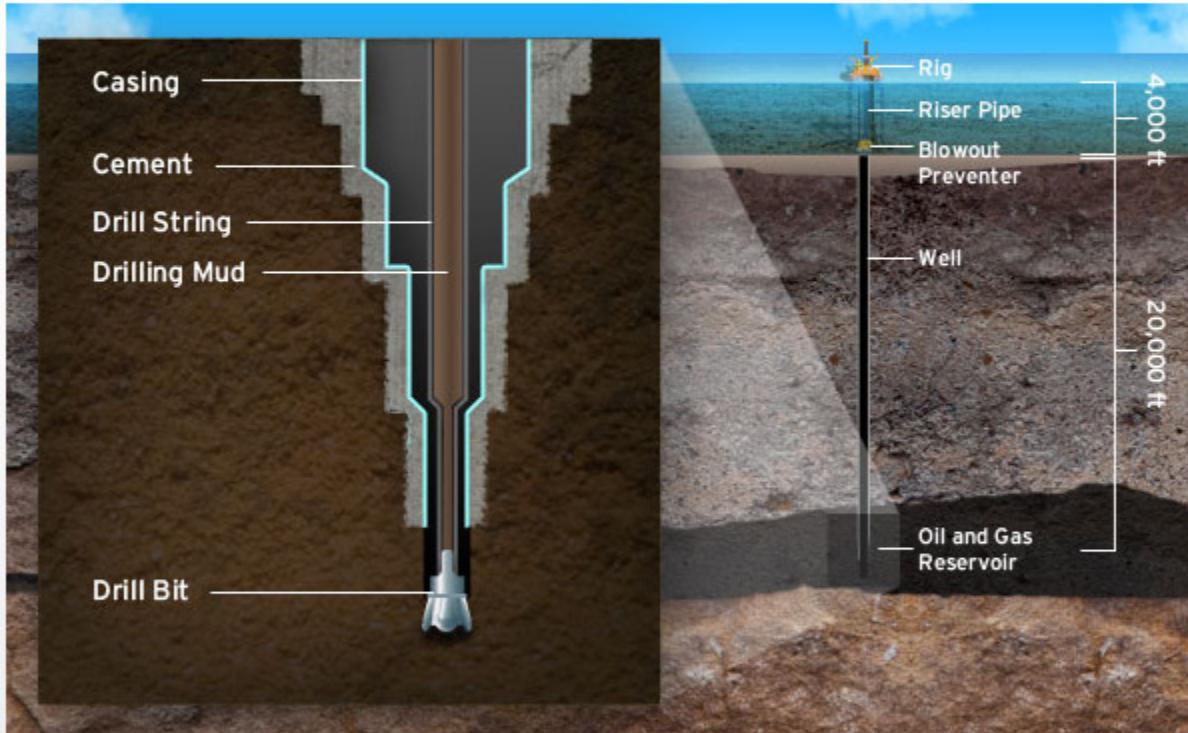
After the Macondo well incident, investigators focused on the BOP. But Payne sees BOPs like seat belts: essential, but it's better to correctly drive a car so you'll never crash.

[Print](#) | [Email](#)

[Comments \(9\)](#)

## A Typical Chevron Deepwater Well

[Return to Article](#)



Safe deepwater wells start with two fundamentals of safe offshore drilling: All work passes through a blowout preventer that can pinch pipe shut in an emergency; and heavy drilling mud holds back pressurized oil and gas until we're ready to bring it out. As drilling advances, steel casing is cemented in place and connections securely sealed to line the entire well. Shorter sections of additional steel liner are installed as drilling approaches the high-pressure reservoir. In the reservoir zone, special production casing is perforated to start oil and gas flowing up to a plug, into a steel production tube and up to the wellhead.

In this  
Issue...

September 2010



**Safe, Deep  
Drilling**



**Navigating the  
Options**



**Computer  
Memories**



**Test Your Knowledge Quiz**



**Voices: Your Earliest Computer Memories**

## Deepwater Drilling – Our Way



A deepwater drillship's pipe racking system.

Down close to a deepwater reservoir, the married disciplines of well control and completions keep our drilling safe.

During these most-risky final stages, Chevron doesn't leave safety just to mud, BOPs or long strings of casing, says Payne. Instead, we go slow, using "liners" to securely case the hole in sections with corrosion-resistant steel and — as we build the well — deploying "packers" or plugs to ensure oil and gas can't escape. We also test the integrity of our work, step by step.

But just as important as the equipment is the human element. When the well encounters the unexpected, drilling stops and there is a rigorous evaluation that is completed before we decide to move on.

Numerous other fundamentals keep our reservoirs contained. For example, we test our

cement, but because there's no way to be certain it's perfect, we design safe operating procedures in case issues arise. When all is secure, we shoot holes in the casing to start production flowing up to a specialized plug, which regulates the flow into a steel production tube installed within the well's secure casing. Fitted with safety valves, the tube feeds the oil and gas mix up to the sea floor into a massive "wellhead" or "tree" equipped with safety valves, which in turn directs production up through riser pipes to a processing facility at the ocean's surface.

It is impossible to know if anything will ever go wrong with a Chevron deepwater well, says Payne. But we can say with confidence, we are and will remain one of the world's safest deepwater operators.

[Comment on this article](#)



In this  
Issue...

September 2010



Safe, Deep  
Drilling



Navigating the  
Options



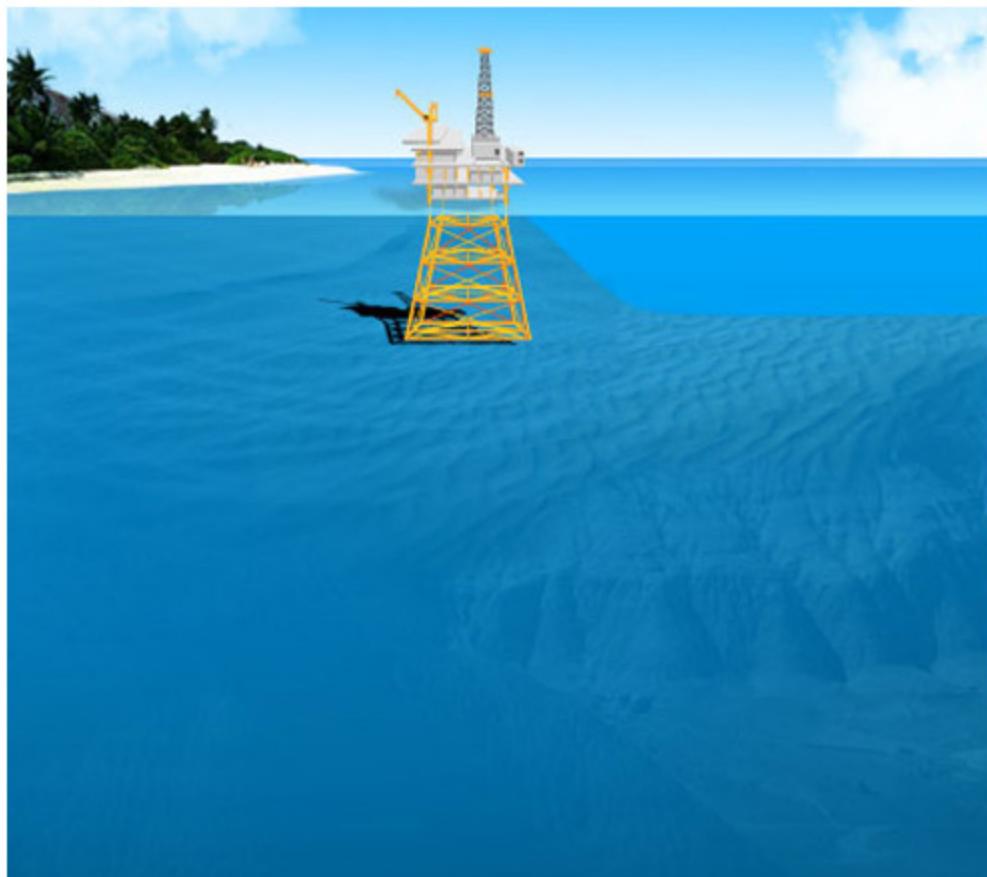
Computer  
Memories



Test Your Knowledge Quiz



Voices: Your Earliest Computer Memories



## Navigating the Offshore Options

See how Chevron meets the engineering challenges of moving production out to ever-deeper waters.

We use many technologies to explore for and produce oil and gas in diverse offshore environments around the world. So how do we decide which platform, floating rig or ship-shaped vessel is best for the job? And what will facilities engineers devise for our ultra-deepwater future?



[View Animation ▶](#)

*Left: A fixed jacket — the shallow water option.*

In this  
Issue...

September 2010



Safe, Deep  
Drilling



Navigating the  
Options



Computer  
Memories



Test Your Knowledge Quiz



Voices: Your Earliest Computer Memories

## Navigating the Offshore Options

[Print](#) | [Email](#)

[Comments \(11\)](#)

### Welcome

Take a virtual tour of the subsea world of fixed and floating structures. In our guide, we look at how facilities have been adapted for the variety of challenges – not just deep water, but hurricanes, ferocious waves and currents, unstable seabed conditions, and the demands of operating in new and complex environments. With each illustration, we provide a photo or artist's rendering of an existing or proposed Chevron development.

[Next ►](#)



1

Fixed Jacket

2

Compliant Tower

3

Tension Leg

4

Semisubmersible



In this  
Issue...

September 2010



Safe, Deep  
Drilling



Navigating the  
Options



Computer  
Memories



Test Your Knowledge Quiz

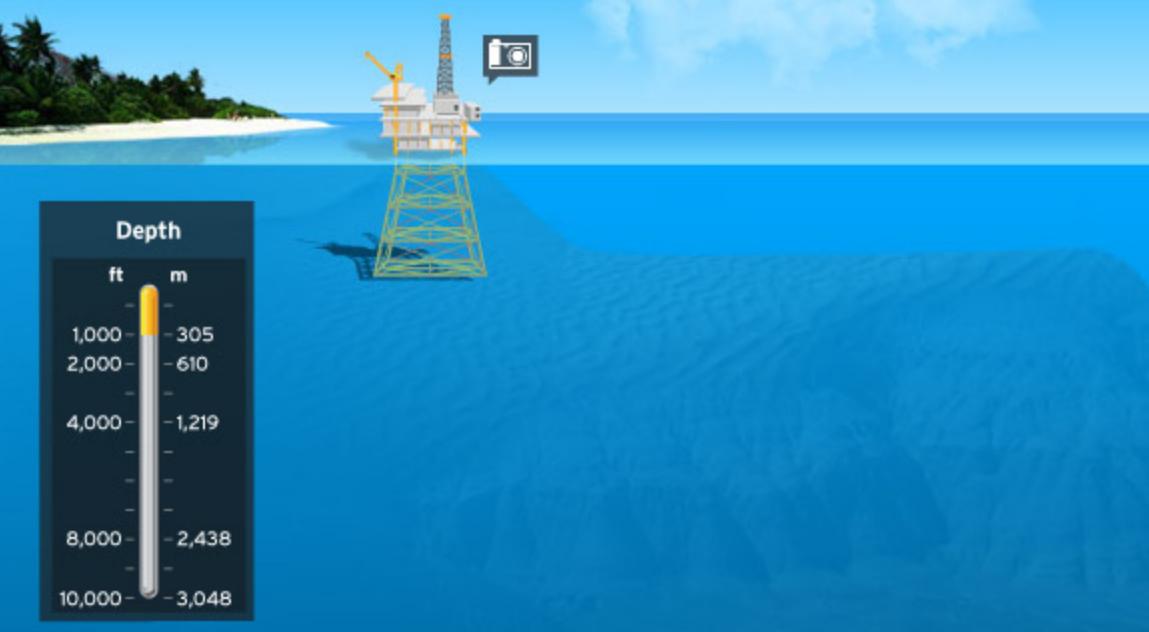


Voices: Your Earliest Computer Memories

## Navigating the Offshore Options

[Print](#) | [Email](#)

[Comments \(11\)](#)



### 1 Fixed Jacket

In depths of up to 1,000 feet (305 m) - primarily at 500 feet (152 m) or shallower - fixed jacket structures represent the "bread and butter" of our industry, beginning in the 1940s. New applications are on the rise though (see panel 7) to handle tough weather and soil conditions. Today, you can see Chevron's fixed structures in the shallower waters of the North Sea (for example, Britannia), the U.S. Gulf of Mexico (example: Bay Marchand), west coast of Africa, offshore Angola and Nigeria, and in the Gulf of Thailand (Platong I/II).

◀ Previous Next ▶



1

Fixed Jacket

2

Compliant Tower

3

Tension Leg

4

Semisubmersible



In this  
Issue...

September 2010



Safe, Deep  
Drilling



Navigating the  
Options



Computer  
Memories



Test Your Knowledge Quiz



Voices: Your Earliest Computer Memories

## Navigating the Offshore Options

[Print](#) | [Email](#)

[Comments \(11\)](#)

### Britannia, North Sea

close x



The Britannia Platform, jointly operated with ConocoPhillips, is located 130 miles (209 km) northeast of Aberdeen in the U.K. sector of the North Sea. It's a fixed drilling and production platform that sits in about 492 feet (150 m) of water.



1

Fixed Jacket

2

Compliant Tower

3

Tension Leg

4

Semisubmersible



In this  
Issue...

September 2010



Safe, Deep  
Drilling



Navigating the  
Options



Computer  
Memories



Test Your Knowledge Quiz

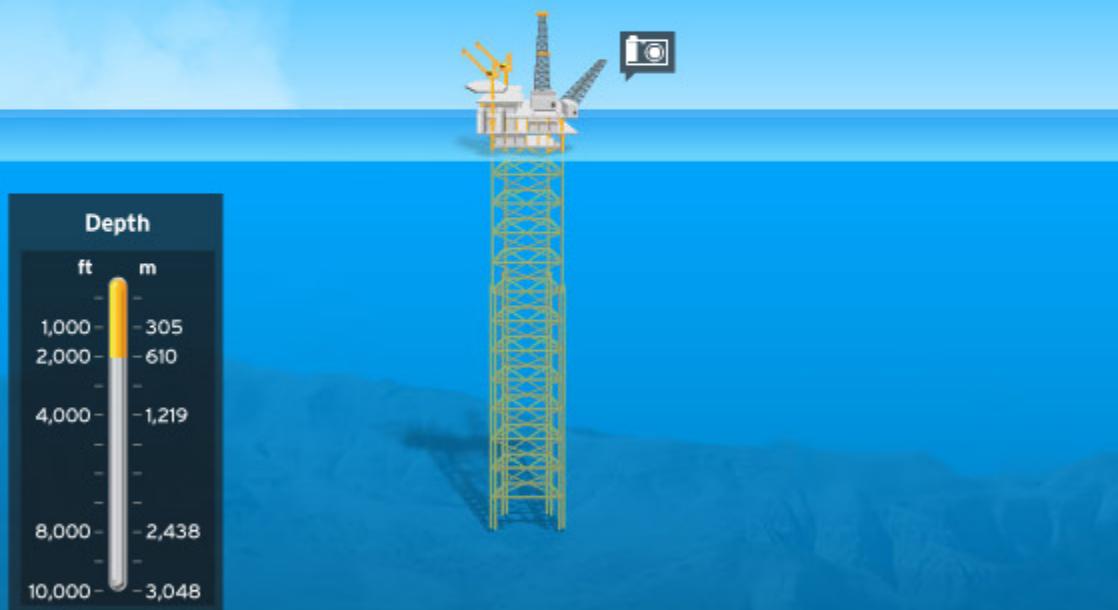


Voices: Your Earliest Computer Memories

## Navigating the Offshore Options

[Print](#) | [Email](#)

[Comments \(11\)](#)



### ② Compliant Tower

Like giant submerged skyscrapers, compliant towers work in water depths of just 1,000 feet - 2,000 feet (305 m - 610 m). Because they enable "dry trees" - wellheads situated directly on the platform - they offer better opportunity for greater oil recovery at this depth compared to floating structures. And their ability to sway with the sea enables them to go deeper than the traditional fixed structure. Chevron has three: Tombua Landana and Benguela Belize, both in Angola in about 1,200 feet (366 m) of water; and our Petronius tower, installed in the Gulf of Mexico in 1998, is the tallest in the industry, measuring 1,742 feet (541 m).

◀ Previous Next ▶



①

Fixed Jacket

②

Compliant Tower

③

Tension Leg

④

Semisubmersible



In this  
Issue...

September 2010



Safe, Deep  
Drilling



Navigating the  
Options



Computer  
Memories



Test Your Knowledge Quiz



Voices: Your Earliest Computer Memories

## Navigating the Offshore Options

[Print](#) | [Email](#)

[Comments \(11\)](#)

### Tombua Landana, Angola

close X



In 2009, we announced first oil from compliant tower development Tombua Landana, situated offshore Angola in about 1,200 feet (366 m) of water and standing at about 1,554 feet (474 m) – one of the world's tallest man-made structures.



1

Fixed Jacket

2

Compliant Tower

3

Tension Leg

4

Semisubmersible



In this  
Issue...

September 2010



Safe, Deep  
Drilling



Navigating the  
Options



Computer  
Memories



Test Your Knowledge Quiz

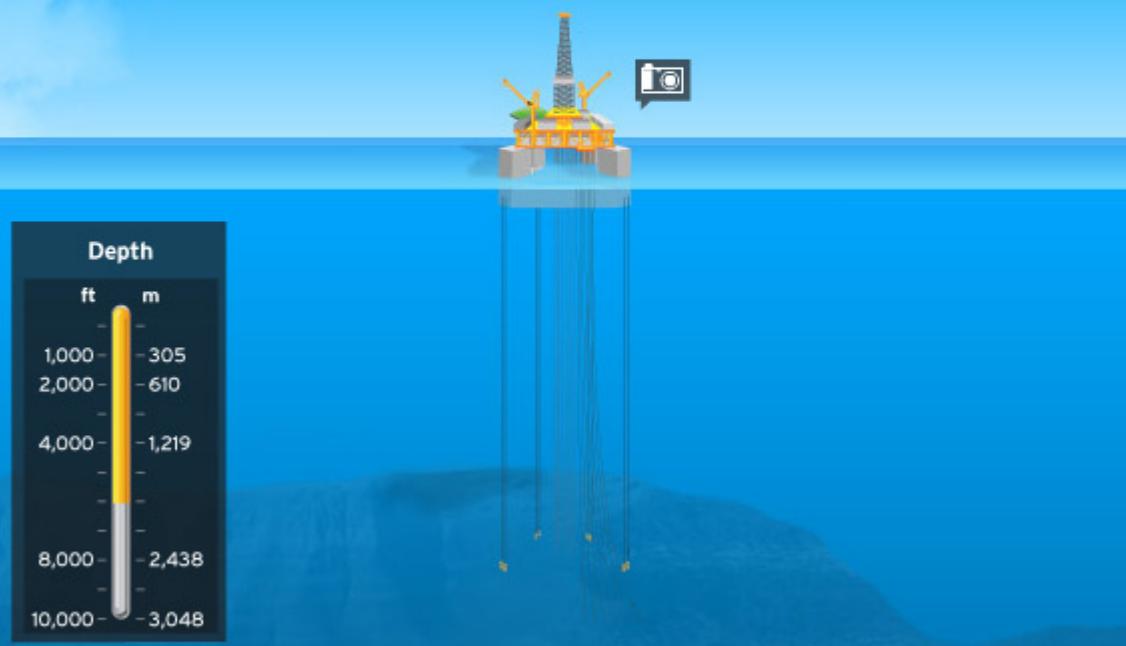


Voices: Your Earliest Computer Memories

## Navigating the Offshore Options

[Print](#) | [Email](#)

[Comments \(11\)](#)



### ③ Tension Leg Platform

Attached to the seabed by rigid, steel tube "tendons," these buoyant-hulled facilities are pulled into tension - becoming stable drilling platforms in the process. They are cost effective up to water depths of about 6,000 feet (1,829 m), as longer tendons are less stable and more costly. Because they enable dry trees in harsh environments, TLPs have been used in hurricane-prone areas - although one was wrecked in a severe storm. In recent years, we've improved tendon quality and size, and improved overall system survivability by increasing attention to design, fabrication and installation.

[◀ Previous](#) [Next ▶](#)



①

Fixed Jacket

②

Compliant Tower

③

Tension Leg

④

Semisubmersible



In this  
Issue...

September 2010



Safe, Deep  
Drilling



Navigating the  
Options



Computer  
Memories



Test Your Knowledge Quiz



Voices: Your Earliest Computer Memories

## Navigating the Offshore Options

[Print](#) | [Email](#)

[Comments \(11\)](#)

### West Seno, Indonesia

close X



Our West Seno development in deepwater Indonesia features a hybrid of two platform types - the TLP connected to a floating production, storage and offloading vessel (see panel 6). Once built, our Papa Terra facility (part of a joint venture) in Brazil will be similar.



1

Fixed Jacket

2

Compliant Tower

3

Tension Leg

4

Semisubmersible



In this  
Issue...

September 2010



Safe, Deep  
Drilling



Navigating the  
Options



Computer  
Memories



Test Your Knowledge Quiz



Voices: Your Earliest Computer Memories

## Navigating the Offshore Options

[Print](#) | [Email](#)

[Comments \(11\)](#)



### ④ Semisubmersible

This four-legged floating structure looks similar above water to the TLP; but below the surface, the differences are clear. Instead of steel tendons, steel or polyester mooring lines enable greater depths, good motion characteristics and sufficient stability for most fields in water of 2,000 feet (610 m) and deeper. A number of manufacturing sites also make it a cost-effective alternative to a spar (next panel) for similar operating environments.

[◀ Previous](#) [Next ▶](#)



①

Fixed Jacket

②

Compliant Tower

③

Tension Leg

④

Semisubmersible



In this  
Issue...

September 2010



Safe, Deep  
Drilling



Navigating the  
Options



Computer  
Memories



Test Your Knowledge Quiz



Voices: Your Earliest Computer Memories

## Navigating the Offshore Options

[Print](#) | [Email](#)

[Comments \(11\)](#)



### Blind Faith, Gulf of Mexico

[close x](#)



Blind Faith in the deepwater U.S. Gulf of Mexico is one of the industry's deepest semis, hitting the seabed nearly 6,500 feet (1,981 m) below the surface.



1

Fixed Jacket

2

Compliant Tower

3

Tension Leg

4

Semisubmersible



In this  
Issue...

September 2010



Safe, Deep  
Drilling



Navigating the  
Options



Computer  
Memories



Test Your Knowledge Quiz



Voices: Your Earliest Computer Memories

## Navigating the Offshore Options

[Print](#) | [Email](#)

[Comments \(11\)](#)



### Polyester Mooring Lines

close 



Traditional mooring lines that tether a structure to the sea floor are chain or steel-wire rope, fine for shallower water. But as you go deeper, those metal moorings become heavy, impinging on the buoyancy of the platform above and offsetting the floater - which is why we turned to polyester. Chevron is an industry leader for the number of polyester lines in deployment.



1

Fixed Jacket

2

Compliant Tower

3

Tension Leg

4

Semisubmersible





In this  
Issue...

September 2010



Safe, Deep  
Drilling



Navigating the  
Options



Computer  
Memories



Test Your Knowledge Quiz



Voices: Your Earliest Computer Memories

## Navigating the Offshore Options

[Print](#) | [Email](#)

[Comments \(11\)](#)



### 5 Spar

Like giant floating aluminum cans with flowlines rising up from subsea wells, spars ride the waves, making them ideal in harsh weather environments. But they are made by only two companies. There are 17 spars in the world; all but one are in the rough waters of the Gulf of Mexico, a perfect environmental match for the structures. Ours are Genesis, Tahiti and Perdido (where we recently announced first oil as a non-operating partner) – the deepest at 7,816 feet (2,382 m).

[◀ Previous](#) [Next ▶](#)



5

Spar

6

FPSO

7

Next Generation

8

The Future





In this  
Issue...

September 2010



Safe, Deep  
Drilling



Navigating the  
Options



Computer  
Memories



Test Your Knowledge Quiz



Voices: Your Earliest Computer Memories

## Navigating the Offshore Options

[Print](#) | [Email](#)

[Comments \(11\)](#)



### Tahiti, Gulf of Mexico

[close X](#)



In May of 2009, we announced first oil at Tahiti, a spar development and one of the largest fields in the Gulf of Mexico, discovered in 2002.



5

Spar

6

FPSO

7

Next Generation

8

The Future





In this  
Issue...

September 2010



Safe, Deep  
Drilling



Navigating the  
Options



Computer  
Memories



Test Your Knowledge Quiz

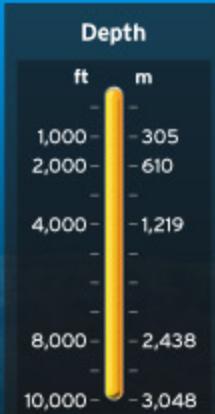


Voices: Your Earliest Computer Memories

## Navigating the Offshore Options

[Print](#) | [Email](#)

[Comments \(11\)](#)



### 6 FPSO

In the 1970s floating production, storage and offloading (FPSO) vessels were born as an inexpensive way to develop smaller fields using converted tankers. Now, they are a preferred solution for larger deepwater fields – particularly those that are very remote and lack significant pipeline infrastructure, like in West Africa. No longer just old ships, they're now often newly constructed. Favored for their ability to support significant topside equipment and produce and store oil, FPSOs are suitable in unlimited water depths and easy to "install" due to their ship shape.

[◀ Previous](#) [Next ▶](#)



5

Spar

6

FPSO

7

Next Generation

8

The Future



In this  
Issue...

September 2010



Safe, Deep  
Drilling



Navigating the  
Options



Computer  
Memories



Test Your Knowledge Quiz



Voices: Your Earliest Computer Memories

## Navigating the Offshore Options

[Print](#) | [Email](#)

[Comments \(11\)](#)

### Agbami FPSO, Nigeria

[close](#) 



Our Agbami FPSO, offshore Nigeria, is a feat of modern engineering - and it's massive. A completely new construction, this facility supported first oil from the Agbami Field in 2008. No FPSOs can be seen in the U.S. Gulf of Mexico, but that will soon change: In 2008 the U.S. government approved a Petrobras project that will employ the first FPSO in the region.



5

Spar

6

FPSO

7

Next Generation

8

The Future



In this  
Issue...

September 2010



Safe, Deep  
Drilling



Navigating the  
Options



Computer  
Memories



Test Your Knowledge Quiz



Voices: Your Earliest Computer Memories

## Navigating the Offshore Options

[Print](#) | [Email](#)

[Comments \(11\)](#)



### 7 Next Generation: Fixed

Now that our structures are getting larger and more complex, we're finding new ways to ensure they survive in deepwater or harsh conditions. The next generation of testing relies on computational fluid dynamics – similar to what's used to test racecars. For us, it simulates waves and currents and their interaction with our platforms, so we can mitigate their effects.

We also are designing structures with larger air gaps between the water surface and the topsides, enabling hurricane waves to pass through without damaging the platform.

[◀ Previous](#) [Next ▶](#)



5

Spar

6

FPSO

7

Next Generation

8

The Future





In this  
Issue...

September 2010



Safe, Deep  
Drilling



Navigating the  
Options



Computer  
Memories



Test Your Knowledge Quiz



Voices: Your Earliest Computer Memories

## Navigating the Offshore Options

[Print](#) | [Email](#)

[Comments \(11\)](#)

### Next Generation: Fixed

close X



In their search for stronger fixed structures, facilities engineers also are taking a fresh look at gravity-based structures. Typically made with concrete (example: Hibernia, designed to withstand icebergs), Chevron plans to develop one made of steel, as shown here, for our Wheatstone platform offshore Western Australia. Steel was chosen to handle the region's unique, loose "calcarenite" soil.



5

Spar

6

FPSO

7

Next Generation

8

The Future



In this  
Issue...

September 2010



Safe, Deep  
Drilling



Navigating the  
Options



Computer  
Memories



Test Your Knowledge Quiz



Voices: Your Earliest Computer Memories

## Navigating the Offshore Options

[Print](#) | [Email](#)

[Comments \(11\)](#)



### 8 Platform of the Future

As we look to the future, we're focused on solutions that handle water depths of up to 10,000 feet (3,048 m), suitable for all foreseeable Chevron needs. We are developing dry-tree semisubmersibles, which enable direct well contact with a large, deepwater field (typical semis move too much).

The circular FPSO could be the shape of the future - at twice the diameter of a spar, it does not need a turret or buoys because of its stability in rough seas. It is also easier and cheaper to fabricate: It can be built in wedges, like slices of a cake; requires less steel; and can be built faster and in more places than the ship-shaped version.

[◀ Previous](#) [Next ▶](#)



5

Spar

6

FPSO

7

Next Generation

8

The Future





In this  
Issue...

September 2010



Safe, Deep  
Drilling



Navigating the  
Options



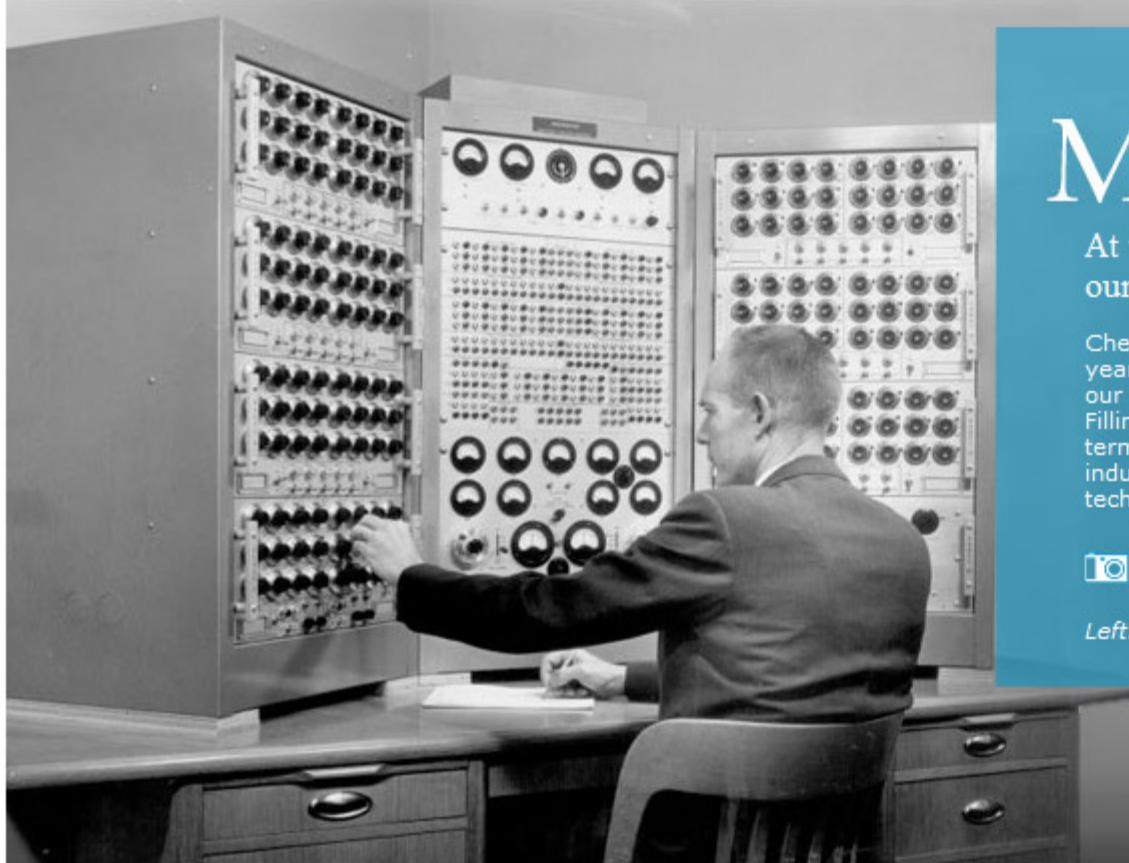
Computer  
Memories



Test Your Knowledge Quiz



Voices: Your Earliest Computer Memories



## Computer Memories

At the end of the mainframe era, we recognize our company's pioneering computing history.

Chevron retired its last mainframe computer in April this year, roughly half a century after the first machines moved our company into the high-performance information era. Filling an entire room, these giants connected our desktop terminals via some of the earliest computer networks in industry. Chevron has a history of pioneering in computer technology, a tradition that is continuing to this day.

[View photo essay ▶](#)

*Left: The shape of things to come - in 1956.*

In this  
Issue...

September 2010



Safe, Deep  
Drilling



Navigating the  
Options



Computer  
Memories



Test Your Knowledge Quiz



Voices: Your Earliest Computer Memories

## Computer Memories

[Print](#) | [Email](#)

[Comments \(13\)](#)



1 of 8 photos

[Play Slideshow ▶](#)



### Pioneer Eugene Reid Tells His Amazing Story

One of Standard Oil of California's (SoCal's) early electronic computers capable of making large calculations was a Datatron, which scientist Eugene Reid brought into the Richmond, Calif., research laboratory in 1956.

Now 96, Reid returned to Chevron in June to address staff at a meeting to honor him as a technology groundbreaker. A brilliant scientist and clearly still very nimble of mind, he described how he envisioned computers would "develop linear programming, which allowed us to improve the efficiency of our refineries, reduce emissions, develop chemical products, improve our fuels and additives, and drive other aspects of our business."

Chief Information Officer Louie Ehrlich, attending the event, called Reid "one of Chevron's technology pioneers." Ehrlich added, "At that time, most people didn't really understand computers and what they could do for the business. Eugene wasn't asked to bring in this machine; he simply made the time to think outside of the box."

Reid is pictured here with Ehrlich at the event and, on previous page, in 1956 at age 42 with his original Datatron machine.

**Click thumbnail photos to view the essay.**

In this  
Issue...

September 2010



Safe, Deep  
Drilling



Navigating the  
Options



Computer  
Memories



Test Your Knowledge Quiz



Voices: Your Earliest Computer Memories

## Computer Memories

[Print](#) | [Email](#)

[Comments \(13\)](#)



2 of 8 photos

[Play Slideshow ▶](#)



### Leading With a 'Huge Electronic Brain'

The *San Francisco Chronicle* headline announced the news on Aug. 22, 1957: "Standard Oil Installs Huge Electronic Brain," identifying the new computer as "An Industry First."

The story signaled that Socal had become the first energy company to order an IBM 704 computer (pictured) – the largest commercial machine designed for scientific and technical calculations. The new electronic brain's main applications involved research into new methods in underground reservoir production, refinery efficiency studies, economic analysis and supply/demand planning.

Howard Crandall, original head of our corporate computer center, wrote that, "It operated at 40,000 instructions per second, which seemed astronomical at the time." At that speed, it achieved in one hour what would necessitate a year's work by 180 technicians, making possible the solution of problems of previously unimagined magnitude.

**Click thumbnail photos to view the essay.**



In this  
Issue...

September 2010



Safe, Deep  
Drilling



Navigating the  
Options



Computer  
Memories



Test Your Knowledge Quiz



Voices: Your Earliest Computer Memories

## Computer Memories

[Print](#) | [Email](#)

[Comments \(13\)](#)



3 of 8 photos



[Play Slideshow ▶](#)

### Industry's First Link for Computer Data

Socal pioneered again in 1962 when it created a microwave link for computer data from our San Francisco headquarters to our Richmond Refinery and adjacent Research Department.

This initiative was the first private commercial link of its kind outside government work. With a speed of more than 1 million bits per second, the recently installed IBM 7090 computer could be used by Richmond employees as if it were located on their premises. One of the machine's earliest applications involved automating the control of the El Segundo, Calif., fluid catalytic cracker.

Photo shows the IBM 7090 portrayed in a contemporary brochure.

**Click thumbnail photos to view the essay.**



In this  
Issue...

September 2010



Safe, Deep  
Drilling



Navigating the  
Options



Computer  
Memories



Test Your Knowledge Quiz



Voices: Your Earliest Computer Memories

## Computer Memories

[Print](#) | [Email](#)

[Comments \(13\)](#)



4 of 8 photos

[Play Slideshow ▶](#)



### Enter the Supercomputer

A new computing era began in 1982, when the former La Habra, Calif., laboratory introduced a Cray-1S™ supercomputer (left) to process seismic data from U.S. Gulf Coast exploration acreage, saving the company more than \$10 million in submitting its winning bid.

As one of the first oil companies to use a supercomputer, SoCal quickly adopted more advanced Cray parallel computers that sped seismic processing and reduced costs exponentially. By 1987, Chevron's use of the supercomputer enabled us to become the first to "see" under the sea in the Gulf of Mexico.

Our legacy company Gulf Oil had pioneered in 3-D seismic interpretation in 1980, when it developed its Central Memory Processing System, which achieved previously unprecedented speed of processing data by using random access.

**Click thumbnail photos to view the essay.**



In this  
Issue...

September 2010



Safe, Deep  
Drilling



Navigating the  
Options



Computer  
Memories



Test Your Knowledge Quiz

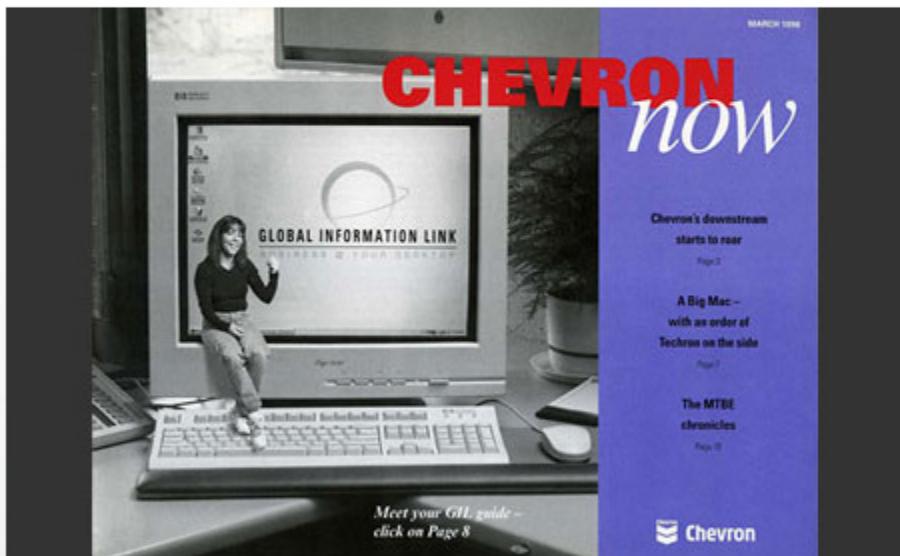


Voices: Your Earliest Computer Memories

## Computer Memories

[Print](#) | [Email](#)

[Comments \(13\)](#)



5 of 8 photos



[Play Slideshow ▶](#)

### Supercharging the Growth of the Intranet

Chevron took advantage of the fast-growing Internet age when we rolled out the Global Information Link (GIL), a common desktop computer environment, in 1998, and today in its third release – GIL3.

CEO Ken Derr hailed it as a company milestone, saying: "We replaced every PC in the company with a common machine and software, and network connection, creating a single desktop and operating environment, worldwide. This was a huge undertaking – about 30,000 computers, with full intranet capability and Internet access for those who need it, advanced e-mail, scheduling and presentation tools – the whole works."

He added, "GIL has supercharged the already rapid growth in the scope and usage of our Intranet. Yesterday's learning curve has become today's race track, and that means building a superior learning organization is now a necessity for any company that wants to be a top competitor."

The photo shows how the former *Chevron Now*™ magazine covered the story in 1998.

**Click thumbnail photos to view the essay.**

In this  
Issue...

September 2010



Safe, Deep  
Drilling



Navigating the  
Options



Computer  
Memories



Test Your Knowledge Quiz

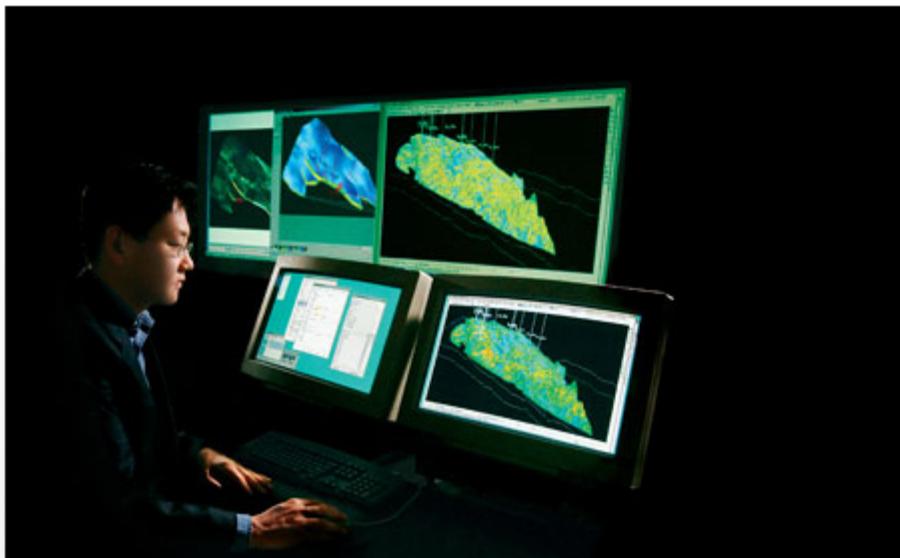


Voices: Your Earliest Computer Memories

## Computer Memories

[Print](#) | [Email](#)

[Comments \(13\)](#)



6 of 8 photos



[Play Slideshow ▶](#)

### Calculating the Future of Computers

What lies ahead in computer programming at Chevron? "In Upstream, ever higher resolution will translate into more data, and throughout the enterprise, more sensors will lead to more data," says Peter Breunig, general manager of technology management and architecture in our Information Technology Co.

"The turnaround times will be shorter. There will be a constant need for analyzing information quicker while the volumes of data are increasing. The overarching need in Upstream is for better images of the subsurface, but in other areas – finance, risk analysis, decision analysis and process control, to name a few – dramatic advances in memory – speed and amount – will lead to new decision processes that haven't yet been considered."

One example of Chevron's commitment to the future of computing is Intersect (pictured). The next generation reservoir simulation platform uses parallel computing, dividing large problems into smaller pieces and solving them simultaneously.

"In addition," says Breunig, "Intersect uses unstructured gridding that is more matched to what the Earth actually looks like, depicting reservoirs like 3-D jigsaw puzzles. It offers great opportunities and will drive better integrated workflows."

**Click thumbnail photos to view the essay.**

In this  
Issue...

September 2010



Safe, Deep  
Drilling



Navigating the  
Options



Computer  
Memories



Test Your Knowledge Quiz



Voices: Your Earliest Computer Memories

## Computer Memories

[Print](#) | [Email](#)

[Comments \(13\)](#)



7 of 8 photos

[Play Slideshow ▶](#)



### Mainframe Led the Way to Today's Advances

Vice President and Chief Technology Officer John McDonald praised the mainframe as "the idea that kept on giving for decades," and the foundation for the transformational advances currently being made in IT.

"Today we're creating massive amounts of data from sensors attached to pumps, motors, valves, reactors, reservoirs, drilling, wells, seismic data and million-cell reservoir simulations, at rates of 6 terabytes per day." He notes, by comparison, the United States Library of Congress reputedly holds about 160 terabytes of digital data.

"The first Chevron mainframe could handle the equivalent of a few thousand words, but it improved productivity many fold. Now we have high-performance computing, parallel computing, computing clusters, virtual servers and networks, process control networks, complex mathematical algorithms and predictive models and the like. But current applications wouldn't have occurred without that older technology. The mainframe enabled us to crank through prodigious amounts of data and free up productive time for thinkers to have bigger thoughts."

**Click thumbnail photos to view the essay.**



In this  
Issue...  
September 2010



Safe, Deep  
Drilling



Navigating the  
Options



Computer  
Memories



Test Your Knowledge Quiz



Voices: Your Earliest Computer Memories

## Computer Memories

[Print](#) | [Email](#)

[Comments \(13\)](#)



8 of 8 photos

[Play Slideshow ▶](#)



### Milestones in Our Computing History

- 1954** – Standard Oil of California (SoCal)'s La Habra, Calif., laboratory installs first electronic digital computer.
- 1956** – SoCal introduces Electro Data Datatron.
- 1957** – SoCal acquires industry's first IBM 704 computer.
- 1959** – Texaco is first company to use a computer to run an industry process when polymerization unit starts at Port Arthur, Texas, refinery.
- 1960** – SoCal purchases transistorized IBM 7090, six times faster and occupying half the space of the 704. Enables creation of network between headquarters and Richmond, Calif., offices.
- 1973** – SoCal's credit card unit installs showcase Customer Information Control System software.
- 1980** – Gulf Oil pioneers 3-D seismic interpretation.
- 1982** – La Habra laboratory introduces Cray-1S™ supercomputer to process seismic data.
- 1985** – Introduction of the PC into general use at Chevron.
- 1997** – Texaco introduces industry's first 3-D visualization centers, speeding exploration analysis.
- 1998** – Global Information Link launched, connecting workforce to Web.
- 2000** – First cluster computer (arrays of high-powered PCs) installed.
- Today** – Cluster computing is standard architecture and continues to grow.

Pictured: Computer pioneer Eugene Reid visits Chevron's Data Center.

[Comment on this article](#)