# A hawk lands at Chayvo

**Russia's Sakhalin-1 project features the world's most powerful land drilling rig**



Story by Greg Belyakov Illustration by John Perez Graphics & Design

**Remoteness** takes on a special meaning during the long Russian winter, particularly as you attempt to reach one of the world's most advanced drilling projects on Sakhalin Island in the Russian Far East.

**Facilities for developing the Chayvo field, with the Yastreb rig shown in the center, take on the look of a small town along the Sakhalin Island shoreline. At top, a train makes its way through the Sakhalin countryside.**

From the capital city of Yuzhno-Sakhalinsk, it requires 16 hours by train across long snowy stretches and two hours by car to complete the 400-mile (650-kilometer) trip. You could fly there in less than three hours, but severe winter weather often makes such flights unreliable. And travel by boat isn't feasible, since the Sea of Okhotsk is frozen over with sheet ice up to 6 feet (1.8 meters) thick and ice ridges and rubble ice that can be 33 to 65 feet (10 to 20 meters) thick.

As you finally near your destination, what appears to be a tall, modern building comes into view. Upon edging closer, you might even mistake the structure for a space shuttle launching pad. However, as your car comes to a stop, and you get out to peer up at the blue, steel edifice, you realize it's nothing like anything you've ever seen.

Standing 230 feet tall (70 meters), the structure before you is the world's most powerful land drilling rig. It has been assembled here on this isolated stretch of sandbar in the Russian Far East to develop the Chayvo offshore oil and gas field for the Sakhalin-1 project (ExxonMobil interest, 30 percent), operated by Exxon Neftegas Limited (ENL).

A land rig that drills wells for an offshore field? Indeed, the rig, owned by the Sakhalin-1 Consortium and operated by Parker Drilling Company, was designed specifically for drilling wells from shore to the Chayvo field some 5 to 6 miles (8 to 10 kilometers) offshore. These will be some of the longest extended-reach wells in the world (see illustration, page 3).

By drilling from shore, the consortium saves on offshore platform costs.

The Sakhalin-1 project is an example of how new technology supports the development of resources that previously could not be economically recovered. The Chayvo field was discovered in 1979 and had lain dormant until the 1990s, when new drilling and development techniques became available.

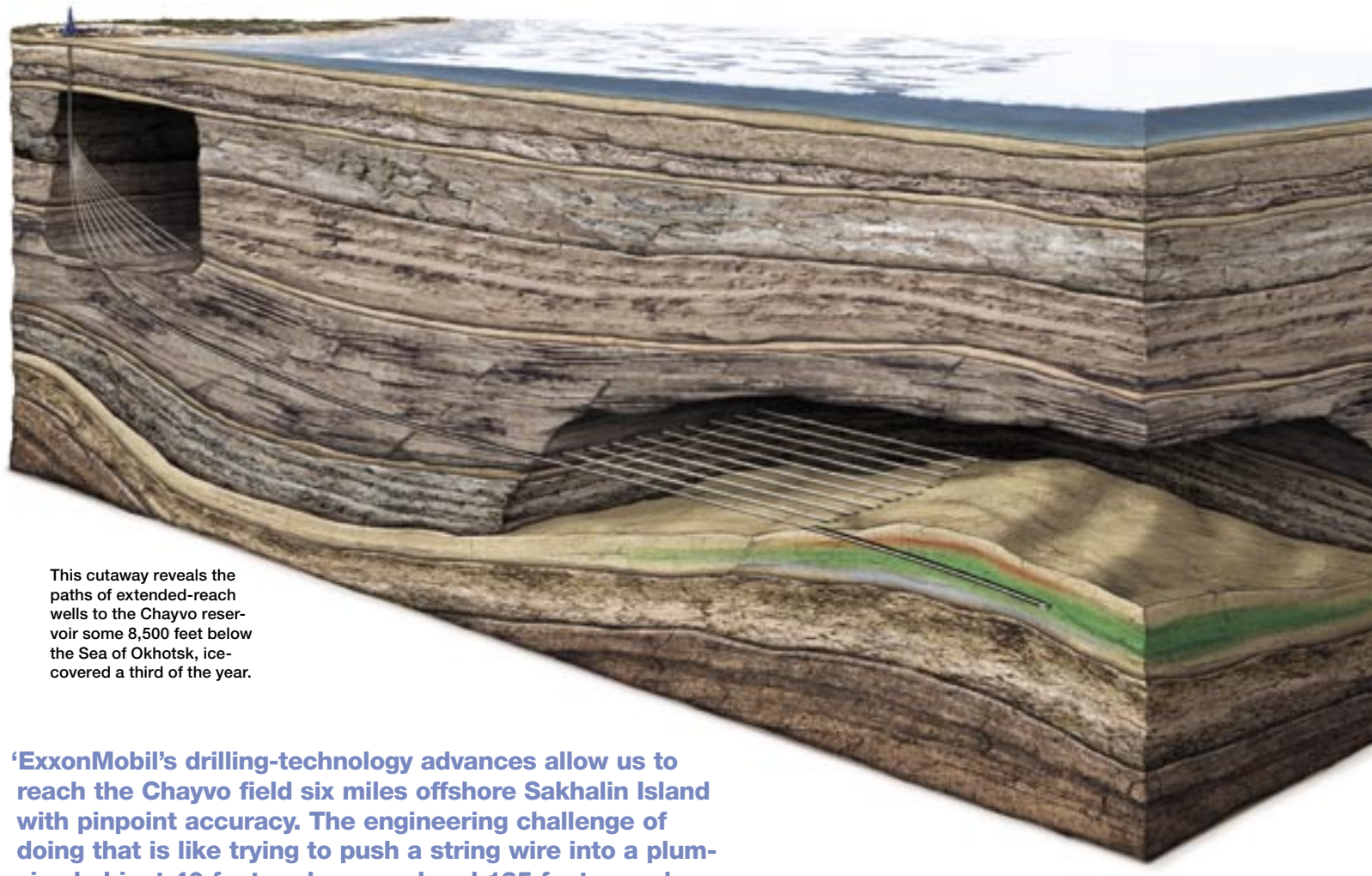
ExxonMobil initiated Sakhalin-exploration studies in the late 1980s. Later, as Sakhalin-1 project operator, Exxon Neftegas completed a production sharing agreement with the Russian Federation and Sakhalin governments that became effective in 1996.

**Bird of the 'town by the bay'**

The name "Chayvo," in the indigenous Nivkh language, means "town by the bay." True to the field's name, over the past year and a half a multinational team of workers drawn from around the globe has managed to build a small town. At the center of this town is the giant land rig, Yastreb.

"We named the rig Yastreb, the Russian word for 'hawk,' because it stands for strength, precision and speed," says ENL President Steve Terni. "So far, the rig has fully justified its name. Since drilling start-up last July, we've already completed the second extended-reach well."

More than 20 extended-reach wells are planned from shore, making this the largest cluster of such wells in the world.



This cutaway reveals the paths of extended-reach wells to the Chayvo reservoir some 8,500 feet below the Sea of Okhotsk, ice-covered a third of the year.

**'ExxonMobil's drilling-technology advances allow us to reach the Chayvo field six miles offshore Sakhalin Island with pinpoint accuracy. The engineering challenge of doing that is like trying to push a string wire into a plum-sized object 40 feet underground and 135 feet away.'**

**Juan Garcia, drilling manager**
**ExxonMobil Development Company**

Richard Rush, field drilling manager, notes, "The rig incorporates the best of conventional time-proven and leading-edge technologies."

"It includes three major components — the mast, drilling-support module (DSM) and pipe barn — and everything is enclosed," adds Larry Peel, drilling operations superintendent. "The DSM houses the power equipment, which includes six generators capable of producing a total of 13,758 horsepower. These make Yastreb the world's most powerful land-based rig. The pipe barn is used for storage, preparation and transfer of the pipe to the rig floor."

"The pipe stands are made up horizontally in the pipe barn rather than vertically in the mast and are transferred directly to the rig floor," says Rush. "This allows us to improve structure safety."

Zeljko Runje, senior drilling supervisor, adds that the Yastreb rig is designed to operate year-round in temperatures as low as minus 40 F and to withstand the earthquakes that plague the region.

### The first link

Yastreb is only the first link in the development-and-production chain that will be created in the project's initial phase. Another component is the Orlan platform — an offshore concrete island drilling structure.

Towed to the Russian Far East from Canada's Beaufort Sea in 2001, Orlan is being upgraded at a Russian shipyard in Sovetskaya Gavan. The 20-well concrete structure will serve as both a year-round offshore drilling platform and living quarters. Installation is scheduled for 2005.

Oil produced from Yastreb and Orlan will move by pipeline to the Chayvo onshore processing facility near the Yastreb rig. It will then be transported at a rate of up to 250,000 barrels a day, or about 12 million metric tons a year, via a 24-inch, 136-mile (220-kilometer) pipeline across the Tatar Strait to an export terminal near the town of De-Kastri on the Russian mainland. There it will be offloaded to tankers for year-round shipment to Far East markets.

### A lesson in ice management

The northern section of the Tatar Strait, separating Sakhalin Island from mainland Russia, is covered with ice for part of the year. To prove the feasibility of transportation in these conditions, ENL conducted ice tanker trials using a double-hulled tanker. The tanker was fitted with instrumentation to gather data on impact loads on the vessel's hull as it moved through the ice.

"We encountered ice up to 28 inches (70 centimeters) thick,

which clearly illustrates the local conditions," says Jim Marcello, ExxonMobil tanker ice trials field manager. "After processing the data, we concluded that the proposed crude-transportation plan will be safe and efficient."

Last year, ENL awarded contracts to two Russian shipping companies for transportation of Sakhalin-1 crude. The 110,000-dwt tankers will be built to meet requirements specified during the trials.

**A milestone investment for Russia**

The Sakhalin-1 project will develop three oil and gas fields — Chayvo, Odoptu and Arkutun-Dagi — with total anticipated recovery of 2.3 billion barrels of oil (307 million tons) and 17.1 trillion cubic feet of natural gas (485 billion cubic meters). Chayvo production is scheduled for start-up in late 2005.

The project is expected to drive economic growth in the Russian Far East, with as many as 13,000 direct and indirect jobs created during initial construction and operations. Capital investment could reach $12 billion, making it the largest foreign direct investment in Russia.

In fact, the economic impact has already been felt. In 2003, construction became Sakhalin's fastest-growing industry and doubled its tax contribution. This reflected a consistent effort to involve as many Sakhalin and Russian businesses as possible.

"We are committed to maximizing local participation in this project and have already generated more than $2.8 billion in contract work for Russian companies and joint ventures," says Terni. "This means jobs and other indirect benefits for the people of Sakhalin."

"We have been working very closely with the Russian and Sakhalin governments on the issue of local participation since the earliest days of the project," adds ENL Vice President Larry Smith.

"In addition to the economic pluses, we gain from the experience of Russian and Sakhalin companies because they understand the local operating environment. At the same time, we offer new operational and safety standards and the latest construction, drilling, production, pipeline and other technologies. Indeed there are benefits for all." the**Lamp**


**The 22-story Yastreb rig will drill more than 20 extended-reach wells, including some of the world's longest.**


**Russian workers pass a Nobody Gets Hurt safety poster on the way to their next shift at Amur Shipbuilding, where the Orlan platform is being upgraded for year-round offshore operations.**

Note: Estimates and business plans in this article are forward-looking statements. Actual future results, including resource recoveries, project plans and schedules, and costs could differ materially due to changes in long-term oil and gas prices or other market factors affecting the oil and gas industry; political or regulatory events; reservoir performance; changes in technical or operating conditions; and other factors, including those discussed under the heading "Factors Affecting Future Results" on our Web site and in Item 1 of ExxonMobil's latest Form 10-K. References to recoverable resources include quantities of oil and gas that are not yet classified as proved reserves but that we believe will ultimately be produced.