

PACE rigs aim to shorten drilling cycle

NABORS INDUSTRIES RECENTLY introduced a series of programmable A/C electric or PACE rigs equipped with technology that is shortening the drilling cycle.

“The drilling customers of today are looking for the latest technology, compact but powerful equipment, increased pump capacity, top drives, faster moving features, enhanced safety elements, electronic drilling controls, better power distribution and greater control of torque and rate of penetration—all features of the PACE rig,” said **Gene Isenberg**, Chairman and CEO of Nabors Industries. “These features are allowing operators to drill more efficiently and move more rapidly. They are also helping to attract and retain experienced crews.”

A key feature of the new PACE rig is that it uses variable frequency A/C drives (VFD) and Programmable Logic Control (PLC) technology.

“This gives the driller more finite control of the drawworks, the top drive, the mud pumps and virtually every other significant piece of equipment from a central control center,” Mr Isenberg said. “They are also equipped with advanced technology. This includes integrated electronic instrumentation systems and the innovative Commander Class Drawworks, which is exclusive to Nabors.”

LOGISTICS OF THE PACE RIG

Nabors developed the PACE rig at its **Academy Services** subsidiary in Calgary, Alberta, Canada. Now the technology behind the rig is being exported worldwide, with fabrication taking place at several international venues.

Academy also developed the Commander Class Drawworks, a fixture on many PACE rigs. This proprietary gear driven design features no chains or sprockets. Technical specifications are:

Commander 650

- Single motor input
- Nominal capacity = 650,000 pounds, 10 lines
- Eaton 336 air brake
- Total weight = 43,000 pounds

Commander 800



Above, sensors placed around the rig send critical information to the sophisticated drilling console, which controls operations of the rig. Below, a PACE rig, Rig 669, drills for Sincor in Venezuela.



- Single motor input
- Nominal capacity = 800,000 pounds, 10 lines
- Eaton 436 air brake
- Total weight = 46,350 pounds

Commander 1200

- Dual motor input
- Nominal capacity = 1,200,000 pounds, 14 lines
- Eaton air brake = one
- Total weight = 64,000 pounds

Commander 3000

- Dual motor input
- Dual gearbox/dual brakes
- Nominal capacity = 1,500,000 pounds, 14 lines
- Total weight = 97,000 pounds

“The Commander Class Drawworks has many performance advantages,” said **Derek Lowe**, Vice President of Manufacturing for **Nabors Canada**. “It provides superior control, regenerative braking and a safe high-tech control system. It is lightweight, reliable and extremely cost-effective.”

THE HEART OF THE RIG

The PACE rig offers an advanced, Academy-built rig control center that allows the driller to view all facets of the drilling operation. All instrumentation is within arm's reach, including the auto-drill touch screen and the driller console monitoring system.

All data monitoring is integrated with equipment control through PLC technology, providing a system of checks and balances prior to operating any piece of equipment.

The benefits of this advanced technology are many. For instance, fewer, less cumbersome electrical connections ensure ease of rig up and rig down. PLC technology also promotes improved motor and fuel efficiency, fewer emissions, enhanced power distribution and less electrical noise. Finally, greater control

of torque and rate of penetration results in faster and better holes.

FAST MOVING RIGS

The increasing cost of finding and developing oil and gas has further increased the industry's emphasis on improving drilling efficiency and economy in an effort to shorten the drilling cycle. This is why PACE rigs were designed to move rapidly from well to well.

Moving time is even shorter in a pad configuration, where the company drew on its 40-plus years of pad drilling experience in Alaska to design a rig that can move in a fraction of the time of more conventional rigs. Well-to-well rigs can move from well center to well center in a matter of minutes. Pipe is racked back in the derrick, the BOP is attached to the substructure and the rig is skidded. The backyard remains in place and is only moved after several wells have been drilled. PACE rigs can accomplish moves in half the time. Nabors is also designing rigs to move efficiently from pad-to-pad. This includes building rigs with one-piece substructures and integrated top drives, features that make rig moving not only faster but safer.



Drilling on the programmable A/C Electric, or PACE rig, is accomplished with a joystick instead of the brake that generally controls drilling on mechanical rigs.

WHY PACE RIGS?

“The US rig count is at a high point and continuing to steadily rise,” Mr Isenberg said. “There have been very few new-build rigs over the past 20 years because of an overhang of available rigs from the oilfield boom of the late '70s and early '80s. The rig supply and demand has now come into balance, and new construction has become viable, stimulated by the customers' desire for increased efficiency.

“These factors, combined with our belief that this market is sustainable, resulted in the development of our new PACE rigs, which have been well-proven in Canada, the US and internationally,” Mr Isenberg added. “PACE rigs have demonstrated low downtime and the value of a multitude of performance enhancing features that are maximizing ROP, hole stability and safety for our customers' goals.”

A PROVEN HISTORY

PACE rigs have been going to work on long-term contracts. These projects include pad drilling operations in environmentally sensitive areas such as the Rocky Mountains and in Canada's Athabasca tar sands, as well as in other active areas such as Saudi Arabia, Venezuela and the US Gulf of Mexico.

As of end of 2005, Nabors had 12 PACE rigs in service and will have nearly 100 operating by mid-2007. ■