

Nabors USA beefs up 3,000-hp rig with latest tech

NABORS DRILLING USA recently completed refurbishing a uniquely equipped deep drilling rig in Laredo, Texas. Mobilization of the 3,000-hp rig to a customer's location near Lake Arthur, La, will commence shortly.

"Nabors Rig 304 is being built with the latest technology in all its significant operating systems," said Nabors Vice President of Sales **Bob Wilder**. "It is unique for several reasons, most notably in that it is essentially a new build with completely new or unused parts. It is also the largest land rig to use an Electronic Driller."

The electronic driller is an M/D **Totco** Electronic Drilling System with 2 **Eaton** 436 disc brakes, with band brakes installed as a failsafe buildup system. The Electronic Driller allows finite control of factors affecting rate of penetration and bit life never before offered on a land rig of this size. Continuous line feed available with the Electronic Driller, instead of the drill off procedure commonly occurring with band brakes, allows constant weight on bit.

"This feature not only increases rate of penetration, but also increases bit life by eliminating torque and chatter routinely experienced with PDC bits," said **Jerome Reese**, Nabors Superintendent of Refurbishment. "It does everything the driller asks except go for coffee."

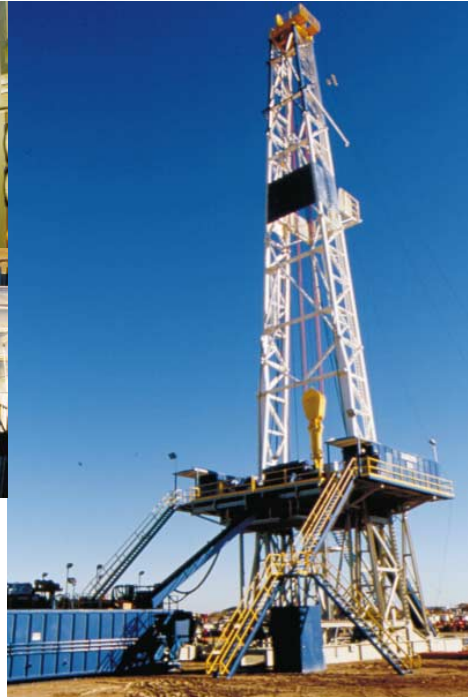
The rig is completely state-of-the-art. The IPS SCR uses **Allen-Bradley** programmable logic controllers (PLCs) for



Nabors USA 304 revamped: The sweeping upgrades to this 3,000-hp rig included an SCR system with programmable-logic controllers (top) powered by four 1,475-hp Cat engines. The rig boasts a 1.65 MM lb capacity mast.

DC logic and communication to the driller's console. This is delivered through a pair of twisted, shielded cables rather than through the customary trio of 20 conductor cables, with DC logic and engine/generator information displayed with an **Allen-Bradley** panel view.

"This allows the driller to have touch screen diagnostics for troubleshooting and monitoring system performance," Mr Wilder explained. "It can also be custom designed to customer preference, all of which contributes to more problem-free rig performance."



Rig 304 is a **Gardner Denver** E-3000 with a 1,650,000-lb capacity mast and self-elevating substructure. The power package consists of four 3512 B **Caterpillar** electronically controlled 1,475-hp engines driving 1,505-kw generators to power an IPS 5-bay SCR house.

Three FB-1600 mud pumps are capable of simultaneous operation at manufacturer's hydraulic horsepower rating. The 4-tank, 2,100-bbl mud system is equipped with a complete **SWACO** fluid processing system and a custom designed collection tank complete with augers for cuttings transfer.



Mud and fluid processing: Nabors USA Rig 304 features 3 FB-1600 mud pumps, all capable of simultaneous operation at the manufacturer's hydraulic horsepower rating. The 4-tank, 2,100-bbl mud system is equipped with a **SWACO** fluid-processing system and a custom-designed collection tank complete with augers for cuttings transfer. The mud system can be configured for 1,100 bbl, 1,600 bbl or 2,100 bbl simply by switching valves.

"This allows us to provide a closed loop operation which meets the most rigid environmental regulations," Mr Wilder said. "It is part of an advanced system for containing drilling wastes."

The FPS system has 5 linear motion shakers, one functioning as a desanding mud cleaner and one as a desilting mud cleaner, mounted on a newly designed tank system.

"This permits the simultaneous mixing of multiple slugs or pills of varying densities and chemical compositions for the most difficult downhole conditions," Mr Wilder remarked.

The tank system has external piping and valving and specially configured tanks that allow for minimization of mud volumes when possible and quicker cleanout for changing mud systems or preparing to move. The mud system is capable of being configured as an 1,100-, 1,600-, or 2,100-bbl operating system by simply switching the appropriate valves. A prototype self-cleaning tank system developed and patented by Nabors is also installed on the rig.

Rig 304 has been configured with every safety feature proven effective in daily operations. These include the latest in tongs, which are ergonomically designed to minimize hand injuries. The skid-resistant floor mats are color coded to remind crewmen where it is safe to stand and work while tripping pipe.

Rig 304 has been modified to minimize the time and effort required to rig up and rig down. Retractable piping, lines and control cables and minimal tear-down of components will allow this 30,000-ft capacity rig to move in four days or less.

"Nabors is refurbishing 2 other rigs at the same time as 304," Mr Wilder noted. "Rig 196 is virtually identical to 304 except it has a different drawworks and does not have an electronic driller. It will soon be working in the deep Anadarko Basin in Oklahoma.

Rig 725 has a new mast and substructure and a new mud system. It will soon begin drilling in South Texas. ■

DRILLING CONTRACTOR

CONTRACTOR NEWS



5th Noble EVA semi completed

NOBLE DRILLING RECENTLY said that its 5th EVA-4000 semisubmersible conversion, the Noble Max Smith, has been mobilized to its first location—Alaminos Canyon for **Amerada Hess Corp.** The conversion from a submersible unit took 14 months, 8 months faster than for the first EVA, the Noble Paul Romano. In addition, Noble anticipates that the estimated total conversion cost will be some 4% below budget.

In other Noble news, the company, in a 50-50 joint venture with **Lime Rock Partners**, has acquired the North Sea jackup Ocean Scotian for \$32.7 million.

The rig, which was renamed the Noble Julie Robertson, will be upgraded to conform with new North Sea regulations and should be ready for service in mid-2000. ■

Crosco opens shop in Oman

CROSCO INTEGRATED Drilling and Well Services Co has opened shop in Oman. Under a 5-year contract, the Croatian firm will provide field maintenance, services for **Petroleum Development Oman**. Crosco will operate through a joint venture with **Riyam Engineering** called **Mideast Integrated Drilling and Well Services Co.**



Crosco Oman move: Crosco will conduct workovers and other services in Oman.

By the end of February, the joint venture, **Midwesco**, will be operating 2 workover rigs, 7 wireline units and a pumpunit in Oman, according to Crosco. Some 200 workers will be involved in the project, operating from 2 mobile camps. ■

DRILLING CONTRACTOR

DRILLING SERVICES



Cabot formate fluid works well in 3 North Sea jobs

A NEW HIGH-DENSITY, solids-free cesium formate drilling and completion fluid could mark a major breakthrough in fluid technology, especially for underbalanced operations and HTHP applications. The fluid, developed by **Cabot Specialty Fluids**, has been in the works for some time (**DRILLING CONTRACTOR**, November 1997). However, has only recently been applied in the field. Recently, Cabot announced the fluid's third successful application, in an HPHT well completion for **Elf Exploration UK** in the Elgin/Franklin development in the

Central Graben area of the North Sea. The well was originally suspended with 18.0 lb/gal oil-mud. Upon reentry, this was displaced to a synthetic oil-base mud that then suffered severe barite sag. Given the well's high temperature and deviation, it was difficult to correct the high-solids mud, Cabot says. Elf switched to 18.3 lb/gal cesium formate and completed the well successfully.

The fluid was first used in the field in an HPHT completion for **Shell Expro** and succeeded admirably, Cabot says. The operator used the fluid in its HTHP Shearwater project.

The cesium formate formulation has also been used by **Total Oil Marine**. ■