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Why We Use...

Magnetic Drives

Long ago, people were generally drilling for water, not for oil. The earliest records of well drilling date back to the third century BC in China. The relatively-advanced Chinese would drop a heavy metal drilling tool and remove the pulverized rock with a tubular container. They are also credited with the first intentional use of fluids (water) in the process of drilling. It softened the rock, making penetration easier, and aided in the removal of the “cuttings” of pulverized rock so the drill bit was free to dig further.

In modern oil- and gas-well rotary drilling, specially formulated drilling fluids, called mud, are used for many functions, including keeping reservoir fluids in place. Mud is constantly circulated into the well through the drill pipe, and out of the well through the annular space between the drilling pipe and the well bore. The returning drilling fluid is continuously monitored to detect the presence of gas, a marker for the possibility of a blowout. If gas is detected, higher density mud is injected down through the drill pipe and up through the annulus, choking out annulus fluid to remove the gas and the lighter mud while maintaining the pressure. Drilling resumes once the heavier mud is in place and the reservoir fluids are contained.



M-I/SWACO, Houston, TX, is a supplier of drilling and completion fluid systems, solids control and waste management services to the oilfield industry. Among the equipment they’ve manufactured for years are centrifuges that process muds for re-use, separating out the heavier solids and cuttings. A variable-speed centrifuge improves the machine’s output — low speed increases barite recovery, medium speed allows for

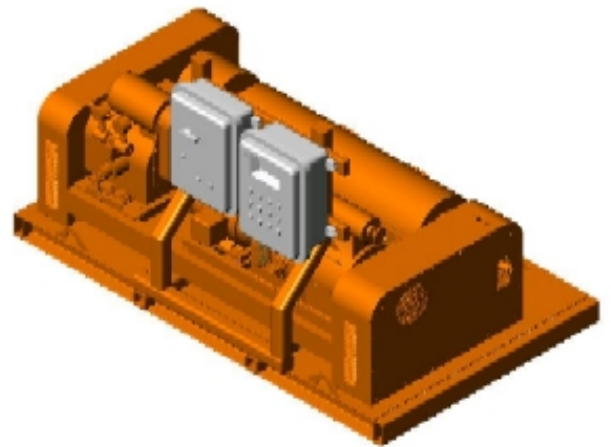


high volume, while high speed produces a finer separation. According to special projects manager Gary Fout, past systems have used

hydraulic drives, variable-frequency drives, even belts that had to be manually changed between sheaves. But the belts were too unwieldy, hydraulics overly sophisticated. And electronic drives? “Our equipment operates in environments of ‘dirty power,’” says Fout, “where spikes can knock PLCs off-line. VF drives are also prone to spikes, such as those caused by lightning strikes on the power grid.”

Last year, the company tried using magnetic adjustable speed drives on its centrifuges with 40 hp motors. A magnetic ASD works by transmitting torque from the motor to the load across an air gap, creating torque by the interaction of powerful rare-earth magnets on one side of the drive with induced magnetic fields on the other side. By varying the air gap spacing, the amount of transmitted torque can be controlled, thus permitting speed control. “Not only can magnetic drive function in the explosive and off-shore environments where our equipment is installed,” says Fout, “but speeds can be changed manually if there’s any problem with controls. Training is easy, too.”

According to SWACO senior vice president Larry Barker, “The implementation of this technology will yield much simpler systems, resulting in a reduction in maintenance costs as well as an increase in reliability and safety. We also see an opportunity to apply these drives to pumps and a variety of other oilfield equipment.”



The drives are manufactured by MagnaDrive Corp, Seattle, WA. Suited for motors from 10 to 1000 hp, the company’s drives and couplings, according to Ron Woodard, MagnaDrive president and CEO, “also eliminate hard starts and much of the vibration associated with power transfer, allowing M-I/SWACO to redesign their oil centrifuges with fewer control systems and with a smaller footprint.”

—RM

For more information:

M-I/SWACO—connect directly to their website via the Online Reader Service Program at www.rsleads.com/303df-256

MagnaDrive—connect directly to their website via the Online Reader Service Program at www.rsleads.com/303df-257

An animated demonstration of magnetic drive can be seen at www.rsleads.com/303df-259

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