



CASE STUDY

Felderhoff Brothers Drilling Implements OPS Intelli-Pur™ System on Drill Rig Equipment

System meets unique challenges of oil and gas industry, helping company increase equipment uptime and save \$300,000 in oil maintenance costs annually

Company:

Felderhoff Brothers Drilling, a Complete Production Services Company, was started by Al and Vince Felderhoff in 1950, and has served the North Central Texas oil and gas industry for more than 57 years. Today, Felderhoff operates up to 26 rigs with the capability of drilling up to 18,000 feet. Felderhoff's fleet includes diesel electric rigs, modern design "Super Single" rigs, rigs with sound attenuation for urban drilling, and rigs with walking substructures for pad drilling locations with multiple wellheads. The rigs are fully supported by experienced superintendents, tool pushers, mechanics and electricians, and yard locations include Gainesville and Jacksboro, Texas.

Complete Production Services is one of North America's leading oilfield service providers, offering all-inclusive field support solutions, equipment and well-production optimization and enhancement to the world's largest oil and gas companies.

Challenges:

The oil and gas industry has a unique set of challenges, in that companies are often required to get in and out of a drilling location very quickly. A typical drilling job for Felderhoff spans about 20 days, with the drilling operator allowing for only four hours of downtime. After the four hours, there is a negative impact to the drilling company. Too much downtime and the rig could risk not being profitable, or even worse, be released from the job. Equally important is the fact that while oil and gas is a large industry, it is a relatively small community that relies heavily on word of mouth. Too much downtime on a job can significantly

impact Felderhoff's reputation and the company's ability to secure future jobs.

Making it especially challenging to meet these tight deadlines is the fact that harsh conditions in the oil and gas industry can often cause lubricating fluids to degrade very quickly on oil rigs. Gear lube changes are performed frequently – about every 1,000 hours – and are expensive. Yet many times equipment is still operated with oil that has deteriorated beyond “acceptable” limits. This leads to greater downtime and high repair costs on a rig, in addition to the high cost of lube oil changes. A mud pump is one of the most vital pieces of equipment on a drilling rig, and there are typically only two per rig. Traditionally, this is also the most problematic equipment as a result of gear oil contamination. When this equipment goes down due to maintenance problems, or even needs to be voluntarily shut down for a regularly-scheduled oil change, the cost can be detrimental to Felderhoff and other drilling companies.

Solution:

In early 2007, Felderhoff was introduced to Oil Purification Systems (OPS) and its signature product, the OPS-1™ onboard oil refining system, when four units were installed and evaluated on Felderhoff's draw work engines. With early success on these four evaluation units, Felderhoff and OPS began to explore opportunities for developing a solution that could also clean gear oil in the mud pumps used on an oil rig. OPS worked closely with Felderhoff to study operating requirements on a mud pump, then applied its existing fluid cleaning technology specifically to this equipment for use in the oil and gas industry.

The OPS Intelli-Pur™ system is a patented on-board fluid cleaning system that cleans gear lube while the rig is running, helping maximize uptime and reducing equipment breakdown. OPS' fluid cleaning technology works in two stages, beginning with the filtration process, where solid contaminants are removed down to two microns through the system's synthetic microglass filtration media. During the evaporation process, liquid contaminants are removed as fluids pass through the OPS evaporation process.

In April and May 2008, two prototype units of the Intelli-Pur™ system were installed on Felderhoff's mud pumps. The company very quickly saw positive results from the prototypes, and began installing 16 additional units through the remainder of 2008.

“In the oil and gas industry, it is extremely important to get in and out of a drilling location very quickly,” said Tom Burke, president of Felderhoff Brothers Drilling. “The Intelli-Pur™ system allows us to basically eliminate oil changes to keep our equipment up and running almost constantly.”

Results:

Before implementing the Intelli-Pur™ system, Felderhoff was typically changing the oil on a 100-gallon sump every 1,000 hours, or about every 42-60 days. One oil change on a piece of equipment would cost the company \$1,100 on average. With about 6-8 oil changes a year, Felderhoff was spending as much as \$8,800 a year per mud pump. With the Intelli-Pur™ system, Felderhoff now only changes the oil once a year on each piece of equipment, resulting in savings of up to \$7,700 per year on one mud pump.

“In less than a year we have already been able to save more than \$300,000,” said Jeff McInnish, preventative maintenance manager at Felderhoff. “This is only having about half of our mud pumps operating with the Intelli-Pur™ system, and using the OPS-1™ system for engine oil filtration on all of our smaller engines. Once we have installed the Intelli-Pur™ on all our mud pumps, we expect to save more than \$500,000 annually per rig in repair and rebuilding costs alone. This is in addition to the savings we will see in the cost of lube.”

Implementation of the Intelli-Pur™ system on Felderhoff’s equipment has also led to consistent oil sampling, which results in increased equipment predictability. To ensure that oil is running clean for Felderhoff, OPS works with an independent third party lab to provide written analysis of lubrication sample results on all rigs equipped with the Intelli-Pur™ system. By keeping gear lube oil clean from water and other contaminants, scheduled maintenance can be extended and crisis maintenance avoided, allowing Felderhoff to maintain operating performance at the highest level possible.

“The oil sampling is the foundation for true predictive maintenance,” said McInnish. “Once a month we pull a sample from the Intelli-Pur’s™ clean sampling valve and send it to the lab. We can then see the results within 48 hours of the lab receiving the sample, providing us with an

early indication of problems on a piece of equipment before there is a catastrophic failure.”

Additionally, with heavily monitored EPA regulations in the oil and gas industry, the Intelli-Pur™ system helps to reduce oil consumption, saving hundreds of thousands of gallons of waste lube each year and minimizing waste for a cleaner environment. This also helps Felderhoff’s “green” sales and marketing efforts, making the company even more attractive to operators drilling in environmentally-conscious locations.

“The Intelli-Pur™ implementation has had a significant impact on our personnel’s awareness of equipment and oil maintenance,” said Burke. “The rig managers and rig hands are much smarter now about the impact of having clean oil and clean equipment, and ultimately the effects on downtime. It has become apparent in our company that the impact of guessing without facts is costly and the ‘hope and pray’ strategy is no longer an option.”

About Oil Purification Systems

Oil Purification Systems, Inc. is the leader in fluid cleaning technology. The OPS-1™ on-board oil refining system removes the solid and liquid contaminants from engine oil, virtually eliminating the need for routine oil changes. Developed specifically for the oil and gas industry, the Intelli-Pur™ fluid cleaning system maintains the quality of lubricating fluids used by all types of drill rig equipment, and by reducing the overall consumption of those fluids. OPS’ fluid cleaning technology is used by hundreds of fleets on thousands of vehicles, generators and large equipment in trucking, waste management, oil and gas, busing, construction, mining and many other applications. Founded in 2002, OPS is headquartered in Shelton, Conn. and have production facilities in Waterbury, Conn. For more information, please call 866-645-7873 or visit <http://www.ops-1.com>.