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PRODUCTS & TECHNOLOGY



A BIT FOCUSED: A decentralized decision-making process is part of the culture at Ultrerra Drilling Technologies, enabling it to develop solutions for E&P companies, directional shale drillers and drilling mud companies.

PHOTO: ULTERRA DRILLING TECHNOLOGIES

DRILLING AT THE SHARP END

Born in the shale oil fields of Canada and the U.S., Ultrerra Drilling Technologies emerged from the latest oil downturn stronger than ever. The Fort Worth firm is now a prime source of where drilling efficiencies come from

By Patrick C. Miller

In military circles, the soldiers in the field who see their enemies eye-to-eye and engage in fierce close-quarters combat are known as the sharp end of the spear. If there's an oilfield technology equivalent for shale operators, it's the drill bit.

The well-known challenge with shale oil and gas is to drill vertically through thousands of feet of hard rock and then transition to horizontal drilling through a formation where the drill bit is directionally steered to create the lateral where fracking occurs. A drill bit problem can compromise the entire operation.

Based in Fort Worth, Texas, Ultrerra Drilling Technologies LP has described itself as "the rock destruction company." It focuses on the sharp end of drilling technologies by designing, manufacturing and renting polycrystalline diamond compact (PDC) drill bits for oil and gas drilling operations around the world. It was formed in 2005 by com-

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THE TIP OF THE SPEAR: Ulterra manufactures a wide variety of drill bits at its facilities in the U.S. and Canada. From the top left clockwise: a FastBack bit for enhanced rate of penetration; a CounterForce bit for vibration control; a bit developed for drilling in China; and a SplitBlade bit for improved cuttings evacuation.

PHOTOS: ULTERRA DRILLING TECHNOLOGIES

binning two companies—Canada-based United Diamond located in Leduc, Alberta, and Ulterra in Texas.

“If the drill bit doesn’t work, you don’t make holes, you don’t drill,” says Aron Deen, Ulterra’s director of marketing and business development—who also has an engineering background. Since its founding, Ulterra has remained what Deen calls a “pure play” company, steadfastly focused on providing industry with improved drill bits and downhole tools to drill faster and more efficiently while lowering costs. “It’s really about making sure we have the technology on the end of the drill string that allows all the rest of the technology in the string to do its job,” he explains.

“Something that costs so

little in relative terms has a huge impact on the overall cost of drilling the well,” Deen notes. “It’s gotten a lot of attention the last couple of years, especially as everyone has become cost-conscious and as drilling engineers have really been able to focus on performance improvement.”

More to the point, the last couple of years is in reference to the low-oil-price environment which severely impacted the North American shale oil and gas industry. Ulterra not only weathered that storm, but also emerged from it as one of the fastest growing drill bit manufacturers in the world. The company has continued its expansion into international markets, increasing its manufacturing output by 60 percent and last year doubling its

workforce. It’s worked with more than 600 different operators in the past year and has customers in 25 different countries.

According to Maria Mejia, Ulterra’s chief financial officer, this can be attributed to a company culture that stresses finding solutions for every customer individually, no matter how big or how small. Those customers range from national oil companies in the Middle East and Latin America to major global producers to top technology-focused, independent E&P companies in North America to companies that occasionally operate a drilling rig in one county of the U.S.

“Our only interest is to drill faster,” she explains. “We don’t have daily rental rates coming from anywhere else in the drill string. We have no other interest other than to help customers reach their goal faster and drill faster. That’s what helped us during the downturn. Capital efficiency and drilling efficiency has increasingly become a focus for all our E&P customers. Making sure they remain competitive has allowed us to become one of the market leaders, especially in the U.S. shale plays.”

Another aspect that’s helped Ulterra through difficult times has been maintaining low product inventories, which means it isn’t stuck trying to sell products industry no longer needs. This enables the company to remain flexible and focused on developing new technologies specifically tailored to meet customers’ needs and solve problems as they arise.

“In some cases, the most forward-looking operators don’t come to us with a pre-defined problem,” Deen explains. “They come to us with a goal of wanting to drill faster and wanting to know what we think. Being primarily a drill bit company, we work collaboratively with directional companies and with mud companies. We’ve worked with a whole host of companies that are trying to develop more rotary steerable options that make sense in North American shale plays. We’ve become the drill bit of choice.”

Not all Ulterra solutions involve technology. “Some of the innovations that have popped up industrywide in North American shale are new to the rest of the world,” Deen says. “We worked with an operator in another country to implement a rental model into their procurement method to really change the way they do things. They now rent drill bits and save millions of dollars annually because we converted them from a purchase model to a rental model. We really look at innovation holistically. It’s not just technology driven, it’s value driven.”

Using the latest in social networking and IT technology enables Ulterra to use its global reach to its advantage. “Our engineers in Thailand can talk to our engineers in Fort Worth who are talking to people in the Delaware Basin or talking to people inhouse working with engineers at Chevron,” Deen relates. “They can work on a

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problem such as trying to drill an 8 3/4 inch hole with an AC top-drive rig through 15,000 PSI carbonate with dolomite collaborating with anyone who has dealt with these kinds of things.”

Bit Building

Ulterra has manufacturing centers in Fort Worth and Leduc. The company offers a suite of products that includes: Matrix PDC, a proprietary mold technology; steel PDC shankless, single-piece bits; TorkBuster, which reduces bit-related torque and stick-slip problems; and Tru-Gauge, a short, near-bit stabilizer that reduces hole spiraling and increases directional control.

Deen says Ulterra’s technology is developed to address drilling disfunctions identified by its engineers and customers. Some of the most common problems relate to drilling vibration, lateral vibration and bit whirl. “We have applications engineers in most of the major basins around the world who really understand everything from the geology to the drilling application to the experience and abilities of the drilling engineers and the directional drillers,” he explains. “That’s key to unconventional shale in North America.”

Designed specifically to address drilling vibration, CounterForce is one of Ulterra’s more recent technologies. “Drilling vibration is a destructive energy loss that causes damage to expensive downhole tools and potential damage to the well bore,” Deen says. “We designed and built a drill bit that actually harnesses otherwise wasted drilling vibration energy into proactively making hole and reducing vibrational damage on downhole tools. That’s been our

showcase technology. We’re right at the threshold of drilling 100 million feet with CounterForce technology.”

As the speed of drilling continues to increase, another disfunction Ulterra identified is cuttings evacuation from the well bore. “Shale laterals are being drilled at such fast penetration rates they’re at nearly an order of magnitude faster than they were five or 10 years ago,” Deen relates. “Where they were drilling 20 to 40 feet an hour, now they’re drilling instantaneously at 200 or 300 feet per hour. Getting all those new cuttings and formation out of the hole requires new thinking.”

To deal with the problem, the company recently introduced its SplitBlade technology. “SplitBlade is completely focused on cuttings to increase the rate of penetration (ROP). We’ve seen case studies in multiple basins now where we’ve been able to increase instantaneous rates of penetration by 30 to 50 percent—in some cases just by making sure the cuttings being generated are exiting the bit and removed from the hole efficiently.”

Dealing With A Downturn

As Deen notes, the oil price downturn that hit the U.S. shale oil and gas industry primarily in 2015 and 2016 had a negative impact on producers and related businesses around the world. But it wasn’t the first time Ulterra had to cope with a downturn. It was around for and survived the oil price collapse of 2008 and 2009. The most recent downturn provided the company with an opportunity to demonstrate how its approach was not only different, but also better.

“What a downturn does in oil

and gas is separate the wheat from the chaff,” Deen says. “We were able to keep doing what we were doing. It’s a little bit of a different take on risk aversion.” In other words, rather than going the route with drilling solutions from what Deen refers to as “the big-box brands,” E&P companies began looking to the faster and nimbler Ulterra for solutions.

“One of the things that happened that we’re most proud of is that as we grew through the downturn, drilling engineers started to see us in a different light,” Deen notes. “These are individuals whose jobs may have been on the line when they had to make decisions based on what was best for them and what was best for their company. That’s when things really started swinging toward Ulterra. When drilling engineers had to make decisions, every single decision counted, and they started trusting us more.”

Mejia says it was Ulterra’s decentralized decision-making culture that enabled it not just to survive, but to thrive.

“If you look at our market share and financial performance through the downturn, that’s when we made our biggest strides,” she states. “It happened when it became important to realize efficiencies, drill faster and bring new products to the field. When the majors were dealing with stopped production, layoffs and trying to sell what they had to conserve some cash, we were innovating and bringing the latest technologies to develop some economic value for the customer.

“The downturn was definitely helpful to us,” Mejia continues, “because decision making became a question of ‘Who can make a

difference for me now?’ and not ‘Who can make a difference for me two months from now?’ When we could realize efficiencies faster and save money faster, that’s when we became one of the market leaders. We became a true partner with our customers to help them deliver efficiencies and savings at the local level.”

Last year’s uptick in oil and gas activity in North America helped Ulterra to further expand its business to overseas markets. “It’s made sense for us to do that in international markets where we sowed seeds up to 10 years ago,” Deen says. “A lot of that growth is really just a response to this. We’ve been very excited, not only keeping up with the market rebound and drilling activity in North America, but growing significantly faster in our own right.”

But, as Deen also notes, Ulterra’s success has provided it with new and different issues. “One of the things we’re struggling with is to scale up as fast as our customers are demanding while maintaining our culture. That’s really the biggest challenge that we’re facing right now.”

Mejia describes Ulterra’s new challenge as both fun and exciting. “The challenge from an administrative perspective becomes trying to keep up with the growth and trying to build the legal framework and infrastructure that we need to service the client with the same level of speed that we do in North America,” she says. “That’s the goal. Once we penetrate a new market, we don’t want to sacrifice the quality. We want to make sure our manufacturing capabilities have the same ISO and API certificates in Saudi Arabia that we have in North America.”

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Shale drilling activity rises in the U.S., falls in Canada

Although rising oil prices have led to increased drilling rig activity and a rise in U.S. rig counts, it's been a mixed bag of news for some drilling companies.

Located in Calgary, Alberta, Trinidad Drilling announced earlier this year that it's transferring eight rigs—including three from Saudi Arabia—to the Permian basin in Texas, noting that the upward momentum seen in the U.S. is not occurring to the same extent in the Canadian industry.

"By moving under-utilized rigs to the Permian Basin, we are able to continue to drive improved activity levels and better profitability," said Brent Conway, Trinidad's president and CEO.

Trinidad reported that it has 39 rigs (59 percent) from its fleet operating in the U.S.—nearly 80 percent of those in the Permian Basin. Because of flat activity in Canada, the company launched a strategic review process to consider alternatives such as a selected asset sale, a merger, a corporate sale, a strategic partnership or capital re-deployment opportunities.

Another Calgary-based company, Akita Drilling, announced the transfer of its Rig 90—designed for deep-capacity, ultra-high specification drilling—from the gas basin of western Canada to the Permian where it will work for a major operator. The company said it expects to find more work opportunities in the U.S., citing low activity and low profit margins prevailing in the Canadian market.

Conway said Canadian drilling companies are facing the issues of trapped oil and gas, as well as wide differentials. "They're living in a world where their costs are going up, our costs are going up in terms of just drilling contractors and what we are being asked to do with our workforce," he explained.

ConocoPhillips announced its three-year plans for its U.S. shale assts. The company expects to increase production by 25 percent in the Eagle Ford where it will operate six rigs through 2020. In the Delaware, ConocoPhillips plans to increase production to more than 85,000 barrels per day with the three-rig program. The company plans to grow its Bakken production to more than 400,000 barrels per day with an 11-rig program.

In another development, Tally Energy Services of Houston acquired Texas-based Premier Directional Drilling complement its portfolio of oil field services companies. Premier provides directional drilling services to U.S. land-based and Gulf Coast offshore markets.

Providing solutions to technical problems is the easy part because, according to Deen, it's how Ultrerra is hard-wired to operate. "The subterranean lithology doesn't know the political boundaries that we've drawn up top," Deen relates. "What's harder to deal with are the corporate and geopolitical cultures. How do we do business with Saudi Aramco or the Kuwaiti Oil Co. or the Chinese National Oil Co. and do business with XTO and a small company that has one rig running three months out of the year? How do we serve each one of those clients in a way that makes sense to them and still be true to who we are? We struggle more on the side of dealing with really big, bureaucratic companies and very small companies and the challenges that go along with those."

For 2018 and 2019, Deen says Ultrerra plans to continue moving forward as the oil and gas markets catch up and recover from the most recent downturn. "We plan on doing more of the same," he says. "To us, that means continually changing and evolving and solving the problems of today that didn't exist yesterday."

However, Deen's also realistic about the future, knowing that it's a matter of time before the industry experiences another market slump. Once again, he believes operators will look to Ultrerra's experience and technology to deliver the drilling optimization that's yet to be done.

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