

Connections Enable Longer Laterals

By Colter Cookson

The companies that manufacture oil country tubular goods say that customer needs drive their research and development. The message they are getting from many shale play operators is "We want to drill longer laterals, and to do that, we need to be able to rotate casing without worrying about connections breaking."

In response, several OCTG manufacturers have introduced premium and semi-premium connections with high torque ratings and strong fatigue resistance. Other companies are helping operators

improve horizontal wells' long-term economics by expanding the application window for solid expandable tubulars, including refracturing liners, and developing bearings that can endure the loads the laterals place on top drives, mud pumps, and hydraulic fracturing pumps.

"The average lateral exceeds 8,800 feet in length, and the number of laterals longer than 8,000 feet has increased 73 percent in the past 12 months," says David Diederich, vice president of research, engineering and product development at TMK IPSCO. "We have one customer drilling wells with laterals approaching

four miles in length, and we expect lateral lengths to continue growing."

In long laterals, drillers rotate the casing string while landing it and during cementing. "Rotation shortens casing running times and improves the quality of the cement job, but it also generates torque and fatigue," Diederich notes. "This has increased demand for high-torque solutions."

To meet that demand, TMK IPSCO has introduced a new series of high-torque casing connections. "Many of these connections achieve torque values beyond the capacity of most onshore rigs' top drives, with nearly double the torque capacities of our traditional shouldered premium connections," Diederich reports.

"The connections have excellent galling resistance," he continues. "We have focused on designing for rotational fatigue resistance and have achieved two-three times the generally accepted design value of 100,000 cycles at 10 degrees for every 100 feet of bending."

Diederich attributes the connection's torque and fatigue resistance in part to a dovetail connection that improves on traditional wedge concepts. He says the high-torque connection series includes a semiflush connection for slimline applications, a threaded-and-coupled sealing connection, and a threaded-and-coupled connection without a specific sealing surface.

The semiflush connection and the sealing threaded-and-coupled connection are



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being deployed in the Haynesville Shale, while the non-sealing connection is being used in the Mid-Continent, Rocky Mountain, and Northeast regions, Diederich reports. “We are getting great feedback on their performance,” he comments.

Stronger Steel Grades

To reduce drilling costs, Diederich says TMK IPSCO also is developing stronger grades of steel that will decrease string weights, and therefore, the cost

for every foot of steel consumed. “A few years ago, operators would generally specify steel with yield strengths around 110 ksi,” he recalls. “Today, they often want 125 ksi, and we are developing grades with yield strengths between 140 ksi and 150 ksi.”

Diederich adds that the company is expanding its well services to include basic well design. “By deepening our knowledge of well design, we will be able to communicate more effectively

with customers, understand their problems, and identify solutions,” he explains. “This will contribute to cost savings for the operator by ensuring they have the right technology for the job.”

To address gathering line shortages in the Permian and Williston basins, TMK IPSCO plans to open a coating plant next to its 16-inch electric resistance welded-mill in Wilder, Ky., Diederich shares. He says the plant will be highly automated and extremely efficient. □