



BlueCoil® technology ensures smooth operations in Eagle Ford

Tenaris's new coiled tubing technology offered many advantages to customer in the field. Subsequent testing of the product further confirmed its extended capabilities.

Summary

A major oil and gas service company needed coiled tubing strong enough to conduct milling of frac plugs and perform other activities in multiple wells of the challenging Eagle Ford shale region.

The company chose BlueCoil® technology, a new coiled tubing manufacturing process developed by Tenaris to help customers overcome the challenges posed by harsher environments and improve cost effectiveness in operations.

Between March and April 2015, the company successfully ran a string of BlueCoil® technology in multiple wells with outstanding results. After the operation, the used string was jointly tested at Tenaris facilities, further confirming the extended capabilities of this innovative technology.

Challenges

A complicated environment

In recent years drilling has become more complex, and oil and gas companies are moving towards deeper wells with longer laterals that often necessitate higher coiled tubing pressures and operations with more corrosive fluids.

This particular operation in the Eagle Ford shale play involved coiled tubing work in multiple wells at depths ranging between 15,000 and 20,000 feet and coiled tubing pressures in excess of 8,000 psi while pumping reused fluids.

In search for an innovative solution

The service company needed coiled tubing with outstanding performance and qualities to conduct milling of frac plugs in multiple horizontal wells of this harsh operating environment. Coiled tubing was also used for other operations, such as cleaning the wellbore and fishing operations.

PROJECT PROFILE

Location

Eagle Ford Shale
Texas, USA

Products highlighted

2.375" x 0.204"
HT-125 BlueCoil® technology



▲ BlueCoil® technology is based on new steel designs and new manufacturing processes developed by Tenaris.

Solutions

A new solution for harshest environments

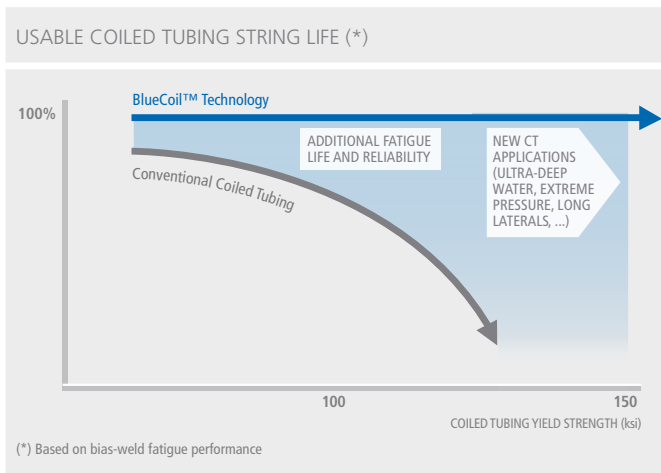
The company decided to run 20,500 feet of 2.375" x 0.204" HT-125 BlueCoil® technology in the months of March and April, 2015. This technology is based on new steel designs and new manufacturing processes developed by Tenaris to produce coiled tubing that is stronger and more fatigue and environmentally resistant throughout its structure.

Advantages that make a difference

The life of a conventional coiled tubing string is normally limited by the reduced fatigue life of its bias welds that are required to produce the necessary length of coiled tubing strings.

As the required yield strength of coiled tubing increases, the fatigue life of the conventional bias welds further decreases relative to the rest of the string. In contrast, the bias weld and base tube fatigue performance of a BlueCoil® string are both not only greatly improved but also remain the same for high strength coiled tubing grades, allowing greater utilization of the entire string and bringing additional strength, reliability and longer string life to coiled tubing applications. BlueCoil® technology applies a full heat treatment at the last stage of the string manufacturing process to improve its capabilities and limit local variations throughout its structure.

Leveraging its extensive steelmaking experience and welding know-how, Tenaris is the first company to develop a continuous heat treatment process for coiled tubing for a full microstructure transformation of the entire coiled tubing string including its welds. BlueCoil® technology brings extra ballooning resistance over conventional coiled tubing grades. Fatigue performance of BlueCoil® products after sour (aqueous H₂S) exposure and sulfide stress cracking (SSC) resistance are also markedly improved.



- ▶ BlueCoil® technology provides extra strength and longer string life compared to conventional coiled tubing.

Results

A successful field experience

The operation in the Eagle Ford was conducted successfully. The service company did not register any failures in the BlueCoil® string during its usage. Subsequent extensive testing confirmed that BlueCoil® technology could have been utilized more than twice longer than already used in this challenging field, showing remarkably improved life over conventional coiled tubing. Conventional coiled tubing with the same dimensions as the BlueCoil® string would have already exceeded its safe life, significantly increasing the risk of failures. In comparison, the fatigue life of BlueCoil® technology was about 2.7 times longer.

Testing evidence

After the field operations, the used product was sent back to Tenaris facilities to conduct a series of jointly agreed tests and evaluations. The BlueCoil® string was cut into sections to assess the fatigue life, corrosion resistance, tensile strength, and maximum ballooning.

Numerous full-body samples containing the base tube and bias welds were tested in a fatigue machine. All tests confirmed vastly improved fatigue performance of BlueCoil® technology over conventional coiled tubing.

Even though light to moderate corrosion pitting was observed on the string's internal surface, the damage did not have significant impact on the fatigue life of the string including the bias welds. The entire string's improved and more uniform microstructure can better resist crack initiation and propagation even after it is damaged mechanically or by corrosion.

No tensile strength degradation was observed in the BlueCoil® product, and no significant changes in the product's hardness were generated during the field running. In addition, the BlueCoil® string's maximum ballooning stood at only 1.1% while its ovality reached 1.0% at the end of these mostly high-pressure field operations, showing greatly improved performance over conventional coiled tubing.

The many advantages provided by BlueCoil® technology were confirmed in both the running of the product in the Eagle Ford shale play and the subsequent extensive tests conducted at Tenaris facilities. In harsh operating environments in which conventional coiled tubing offers limited performance and reliability, BlueCoil® technology has become a reliable solution.



For contact information, please visit our site:
www.tenaris.com