



TenarisHydril Blue™ connection achieves first qualification under new protocol for thermal well applications

Tenaris partners with industry to develop globally recognized standard for demanding temperature applications.

Summary

With temperatures up to 350 degrees C and multiple heating-cooling cycles, thermal oil production presents down hole tubulars and connections with the most severe conditions found in the industry. As a result, it is critical that operators of SAGD (Steam Assisted Gravity Drainage) and CSS (Cyclic Steam Stimulation) projects, popular in Canada's heavy oil reservoirs, have complete confidence in the casing & connections they install in their wells, as the potential consequences of failure are severe.

Previously, no recognized industry standard existed to evaluate candidate connections for thermal operations where temperatures range from 240°C to 350°C and stresses beyond the elastic limit of the steel tubulars are generated. Operators were left to rely on internally developed qualification guidelines for specific projects, and in this rapidly growing and fast moving segment, there was a clear need for a detailed, globally recognized standard for these high temperature and severe service environments.

Together with several thermal well operators, other manufacturers and industry resources, Tenaris participated in a multi-party project that resulted in the development of the Thermal Well Casing Connection Evaluation Protocol (TWCCEP).

Furthermore, Tenaris together with industry partners tested and qualified the TenarisHydril Blue™ connection to the new industry standard.

PROJECT PROFILE

Location

Campana, Argentina

Well Type

Steam-Assisted Gravity Drainage (SAGD) wells

Products Highlighted

TenarisHydril Blue™

Challenge

Establishing an industry protocol

Rigorous tests were required to ensure connections used in these demanding applications could withstand the high temperatures and maintain optimal performance. With no preexisting industry standard for how best to achieve these results, a new protocol for scientific testing needed to be established.

Meeting regulations

Major CSS projects have been operating in Canada for more than 25 years, and the newer SAGD application has been implemented at several projects in the last 10 years. The industry has been witness to catastrophic failures that have occurred intermittently in the past, but with massive expansion of thermal projects planned in the future, there was a clear need to implement a qualification protocol to ensure that the risk of casing connection failures was minimized.

Solution

The Thermal Well Casing Connection Evaluation Protocol (TWCCEP) requires testing connections representing the worst-case scenario for the particular design considering the assemblage in the well and the operation during both steaming and producing. In all cases test specimens shall comply with the very demanding seepage thresholds representing the operation in the well.

The next step following the release of the testing protocol was to conduct a full-scale physical test of a casing connection in accordance to the new TWCCEP guidelines. The testing was undertaken at Tenaris's R&D facility in Campana, Argentina.

A 9 5/8" TenarisHydril Blue™ connection was chosen, as this casing size will be utilized in several planned SAGD projects. Additionally, the TenarisHydril Blue™ connection was deemed an appropriate connection for testing due to its suitability for intermediate casing applications, where thermal wells endure the most rigorous demands.

Six different specimens were tested and in accordance with the protocol four of them were subjected to ten thermal cycles each, in various specification combinations. To ensure the simulation represented the "worst case scenario," different combinations of thread interference and seal interference were tested.

Results

The test results exceeded expectations, with seepage rates well below the requirements of the protocol. A Canadian thermal operator participated in the testing program and had third party inspectors monitoring all test activities, with no non-conformances being noted.

With the new TWCCEP protocol now available and accepted by industry, thermal well operators in Canada will no longer have to design and implement their own qualification programs, with the possibility of sharing know-how, resources, and infrastructure making the industry more efficient overall. The successful first test of 9 5/8" TenarisHydril Blue™ will help build the future foundation of Tenaris participation in the thermal segment in Canada.

The TenarisHydril Blue™ connection is the first connection to successfully complete a testing program in accordance with the new protocol, demonstrating Tenaris's dedicated response to its customers' most demanding application needs.



TenarisHydril Blue™