Corrosion Control Package Reduces Corrosion Rates in Deep Vertical Wells

ARGENTINA

CHALLENGE

In 2014, a combination of high fluid densities, deep wells, and elevated bottomhole temperatures proved to create a corrosive environment for an operator’s rented drillpipe. Corrosion rates in excess of 4 lb/ft²/yr were unacceptably high and risked damage or loss of the drillstring. Baroid was requested to provide a corrosion protection program in order to minimize these risks.

SOLUTION

The use of water-based fluids in high-temperature environments can lead to corrosion damage due to dissolved oxygen. Often, the action of corrosion inhibitors is not sufficient to provide protection of exposed steel in this hot, dynamic environment. In order to minimize corrosion damage, low oxygen concentrations had to be maintained by using chemical scavengers. An effective application of oxygen scavengers in a circulating system required the use of special mixing, circulating, and analytical procedures.

Baroid developed and tested a corrosion control package based on BARACOR® 700™ corrosion inhibitor and BARASCAV™ L™ oxygen scavenger in order to reduce corrosion damage to the drillstring.

BARACOR 700 corrosion inhibitor is a phosphonate-based inhibitor with an action that both films and passivates metal surfaces. BARASCAV L agent is a liquid-form inorganic oxygen scavenger. A direct reaction in solution reduces dissolved oxygen concentrations and its corrosive effects.

Prior to the use of the Baroid corrosion control package, drillpipe corrosion rates were in excess of 4 lb/ft²/yr. Industry standards suggest that drillpipe corrosion should not exceed 2 lb/ft²/yr. Implementation of the Baroid corrosion control package reduced corrosion rates down to acceptable levels and as low as 0.5 lb/ft²/yr.

RESULTS

Implementing the Baroid corrosion control package provided the following benefits:

» Reduced corrosion rates to minimal levels
» Realized immediate cost savings in all operations by minimizing drillpipe damage effects on rented drillpipe

This treatment helped extend the life of the drillstring and prevented the need for fishing operations. The Baroid corrosion control package has been successful in other subsequent wells associated with this development.