

Spiralbanding Case History

Region: Bakken region of North Dakota, USA

Drilling Contractor: Helmerich & Payne, Inc - Rig #259

Hardbanding and Inspection Services: Pathfinder Inspections and Field Services

Challenge

In this case study, the common practice by the operating company is to use class 2 pipe for the lateral section of their drill string until rejected at class 3. More inspection has been required as the wear happens in a short period of time of drilling.

Typically, the tool joints are in premium condition, but the drill pipe has been downgraded due to exterior wear of the tube body. The drill pipe can meet the operational demands for their drilling program, but there is not much remaining useful life due to body wall loss.

Environment

As a test, Sprialband[®]NC was chosen to be applied to protect 27 lengths of 4" O.D. Range II Drill Pipe which had experienced moderate loss of the body wall thickness. All pipe bodies were defined as Class II per TH Hill/Bureau Veritas DS-1. This drilling program takes place in the Three Forks and Bakken region of North Dakota in the United States.



The down hole parameters were:

- ✓ Wells drilled – 13 Total
- ✓ Total Depth – 21,075 feet on average per well
- ✓ Vertical – 11,130 feet on average per well
- ✓ Lateral – 9,945 feet on average per well
- ✓ Total Footage Drilled – 274,000 +/- feet
- ✓ ROP – 238 feet per hour (average)
- ✓ Tool Joint Physical Parameters 4-7/8" Nominal O.D.
- ✓ Hardbanding proud 3/32"-1/8

Results

Spiralband NC was applied to protect 27 lengths of 4" – 14 lb S135 Range 2 drill pipe. The Spiralbanding was applied by Pathfinder Inspections and Field Services based in Dickinson, North Dakota. Pathfinder specifically developed a hardbanding unit in Dickinson to perform the Spiralbanding application.

By applying spiral banding to the downgraded pipe, the pipe has been able to retain Class 2 condition tube bodies with no further downgrades or wall thickness reduction. By using Spiralbanding the operating company has successfully been able to continue to utilize these pipe sections in the laterals and reduce costs by not further downgrading their pipe.

There was documented 60% wear loss in the Spiralbanding after 13 wells. Following multiple inspections, there was no documented loss in the wall thickness of the drill pipe body. Additionally, there was no evidence of cracking or spalling in the Spiralbanding. The wear displayed in the Spiralbanding performed as expected considering the pipe was not rotated top to bottom.

The drill pipe was inspected after the 13th well program to DS-1 Category IV inspection criteria by Pathfinder Inspection and Field Services. Special inspection procedures were developed for tube and Spiralband inspection. Additionally, the hardbanding on the tool joints was applied with Duraband NC and all tool joint hardbanding was deemed "Acceptable" and remained 100% crack free.

Inspection reports are available upon request.

Solution

Maximum Tool Joint and Drill Pipe Protection

Under actual downhole field testing, Spiralband NC & Duraband[®] NC consistently provides superior wear resistance. *Field and laboratory test reports are available upon request.*

Fatigue Resistance

Every time drill pipe is utilized downhole, stress and fatigue are multiplied. Spiralband NC has consistently proven its resistance to cracking and spalling. *Test results are available upon request.*

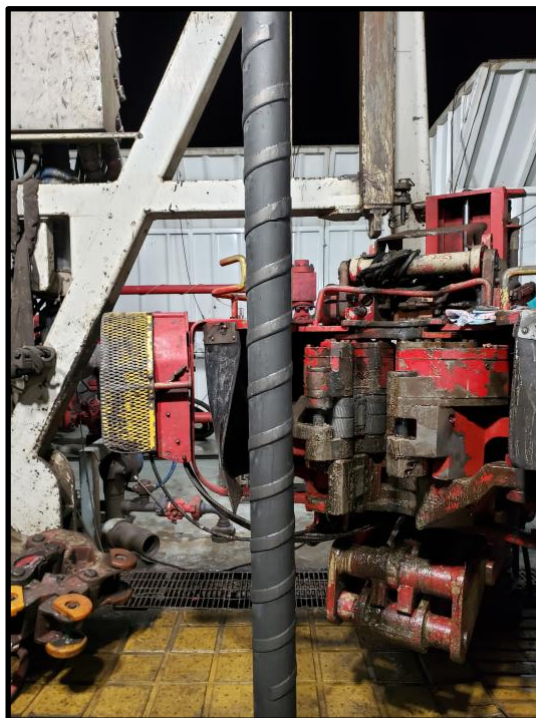
Wear Resistance

This case study along with numerous field trials have proven that Spiralband NC provides excellent wear resistance against the harshest drilling environments.

PHOTOS



40% of the Spiralbanding remaining after 13 wells drilled



Condition of Spiralbanding after 4 wells, pictured on the rig floor

SPIRALBANDING[®] TECHNOLOGY

by Postle

