



Case Study

Wellbore Cleanup and Debris Removal

Trial Test Removes Hard Scale From Production Tubing Using Mechanical Means

The Challenge

During a drift run in 2013, a customer detected accumulated scale in the production tubing of an oil well. The well had a history of scale buildup and a previous downhole solid sample presented 95% iron compounds – iron oxide, siderite, mackinawite and pyrrhotite, as well as calcium carbonate.

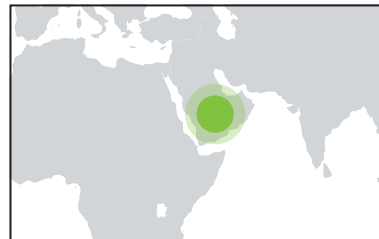
Several attempts at acid descaling using 15 per cent and 20 per cent Hydrogen Chloride (HCl) yielded moderate results, but it was unable to fully clear the obstructions just below surface.

Scale left in the completion as a bridge was not acceptable to the customer and a trial test was proposed to attempt to break the hard scale using mechanical means.

Considerations

The following key requirements and concerns were highlighted:

- A timely and effective intervention was critical
- A mechanical means of descaling was required
- The solution needed to be simple and easy to perform



Location: Middle East

Customer: National Oil Company

Well Type: Vertical oil well

Casing Sizes: 4 ½-in tubing size

Products/Services:

Torque-Action Debris Breaker
- 2 ½-in torque mandrel with
3.7-in and 3.83-in cutter subs

95%

Downhole sample presented 95 per cent iron compounds

1,350ftkb

Depth of hard scale cleared to before trial was ended

Peak's Solution

A trial test of Peak's Torque-Action Debris Breaker was initiated to remove the hard scale in 4 ½-in production tubing. A 3.83-in Torque-Action Debris Breaker was run in hole and tagged an obstruction at 450 ftkb. The tool was jarred down mechanically in the well using 10 ft of 1.875-in toolstring. With each downward jar, the unique helically split torque sub applied a short duration of rotational torque to the cutter below, clearing 30 ft of obstruction to reach 512 ftkb.

Further jarring cleared this obstruction and continued to 539 ftkb. A smaller 3.7-in OD cutter was then run in hole. Many areas of tight and hard scale were consistently cleared at a rate of 3,000 ft/hr, until the crossover was reached at 6,770 frkb.

The 3.83-in Torque-Action Debris Breaker was re-run in hole with 5 ft of 1.875-in additional stem, for added weight, and continued to clear the scale to 1,350 ftkb before the trial was ended.

The hard scale was successfully cleared using the 3.83-in Torque-Action Debris Breaker where previous acidizing attempts were not as successful.

Value to Customer

The trial was declared a success by the customer with all operations carried out safely and efficiently.

- The operation demonstrated a future time and cost saving - eliminating the need for additional costs associated with an acidizing operation
- Well accessibility was restored using a simple slickline tool that reduced well intervention time and the costs associated with other mechanical scale removal methods, ie. CT milling
- Less personnel and equipment were required
- Well potential and integrity was restored quicker than alternative methods



▲ Torque-Action Debris Breaker

Product Code(s): Torque-Action Debris Breaker – 117

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▲ Torque-Action Debris Breaker

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