

Reliable downhole data doubles beam pump operation uptime to 100%

CHALLENGE

The operator was losing uptime on a number of wells despite sufficient increase in intake pressure — rod pump controllers were frequently tripping pumps based on “incomplete fillage” due to gas interference.

SOLUTION

The Zenith C-Series downhole gauge advances the level of data traditionally used to control rod lift systems. Pump off trip mode can be based on real-time measured pump intake pressure rather than on fillage setpoint.

RESULTS

Pump control based on accurate data allowed the operator to maximize well performance and production, eliminating frequent unnecessary shut downs and increasing run time from 50% to 92%, then upward to 100%.

Middle East operator implements Zenith® gauge to obtain real-time downhole measurements, enabling continuous flow and an additional 180 BFPD.

Challenge

A well located in North Oman was producing from the reservoir under secondary recovery supported by water injection. Well control was based on the surface rod pump controller (RPC) only.

Well history from the RPC showed pump uptime at only 50-60% of daily running hours due to low pump fillage calculated by the RPC. This calculation was found to be misleading due to high gas oil ratio.

Solution

Zenith C-Series cable-to-surface gauges for artificial lift systems deliver accurate, real-time measurements to enable fast, appropriate and confident assessment of well and lift system performance.

In order to enable improved monitoring and control, the well was equipped with a Zenith C-Series (C2) permanent downhole gauge, providing real-time pressure and temperature measurement looped with the surface RPC to automate and optimise pump operation based on downhole pressure readings, as well as providing the calculated pump fillage.

Results

The integrated RPC with downhole gauge control allowed pump off trip mode to be based on real-time measured pump intake pressure rather than on the downhole card pump fillage setpoint, eliminating frequent, unnecessary shut downs.

Various advantages were realised using the integrated RPC with downhole gauge solution. These included the ability to trip the pump based on the real-time measured intake pressure, reduced cost and improved control of pump speed when using a VSD.

In addition, the operator achieved a significant enhancement in run time; increasing from 50% to 92%, then upward to 100%.

Converting the well from intermittent to continuous flow—with 24hr production testing—enabled a significant production increase from 100BFPD to 280BFPD.

Average speed increased from only 1.5 SPM due to rod floating, to 5.2 SPM. Significant enhancement in the stroke resulted in a longer effective downhole stroke length.

Moreover, the smart RPC/VSD system reduced previously frequent rod failures and improved well reliability.

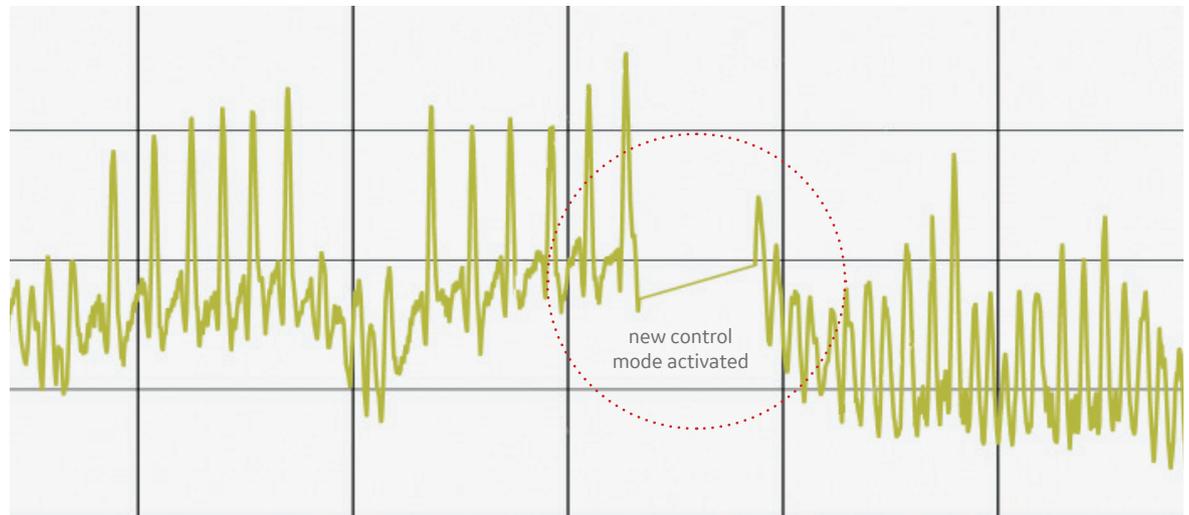
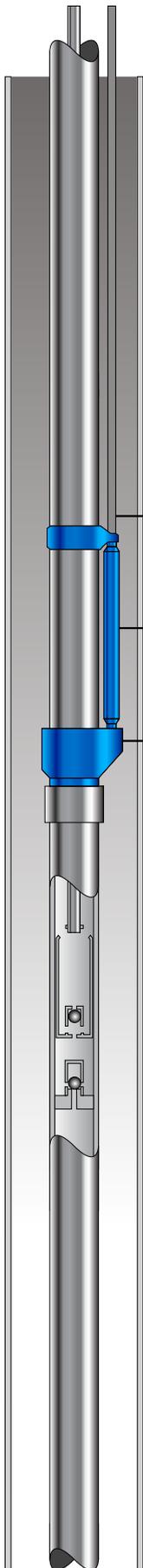
“The beam pump continued to run without tripping, delivering optimised uptime and production.

The operator has since applied the same reconfiguration of pump control to other wells with the same issue, replicating the proven benefits..”

Ayham Sbeih

Regional Sales Oman, Zenith Sensors & Monitoring, BHGE

The well operated for 12 months without failure before being converted to RDPCP.



Data showing beam pump maintaining production without tripping due to high pump intake at 650 psi.

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