Baker Hughes

Case study: North Dakota, United States

# Electrospeed Advantage VSD Backspin Start capability decreases downtime over 50%

An operator in North Dakota's Williston Basin was experiencing significant downtime of an electrical submersible pumping system (ESP) due to incoming power-related shutdowns. After each shutdown, the ESP was not able to restart until the restart delay timer counted down to zero. For most shutdowns, the restart delay was based on the estimated time it takes for fluid to flow backwards through the pump, plus a safety factor. This backwards flow is due to the tubing string above the ESP draining after a shutdown, and it causes the pump stages to backspin.

If an ESP tries to restart while backspinning, high torque can break the pump shaft. In some applications, especially lower-flow pumps, the automatic restart delay was set as high as three hours to ensure the ESP did not restart while backspining. In this case, this meant that a few minutes of incoming power problems would shut the ESP down for hours.

To help with this issue, Baker Hughes Artificial Lift Systems had a service technician set the Backspin Start feature of the **Electrospeed Advantage™ Variable Speed Drive (VSD)**. This feature can detect a back-spinning pump and restart the ESP as soon as the pump stops backspinning instead of the automatic restart delay of up to 3 hours. This allowed the customer to reduce the

restart delay, without fear of restarting the pump too soon. In some instances, downtime for a shutdown was reduced by more than 50%.

By using the Backspin Start feature on the Electrospeed Advantage VSD, the operator was able to minimize the downtime from their nuisance power-related shutdowns, while reducing the risk of a broken pump shaft. Ultimately, the ESPs were able to spend less time idle and more time producing fluid.
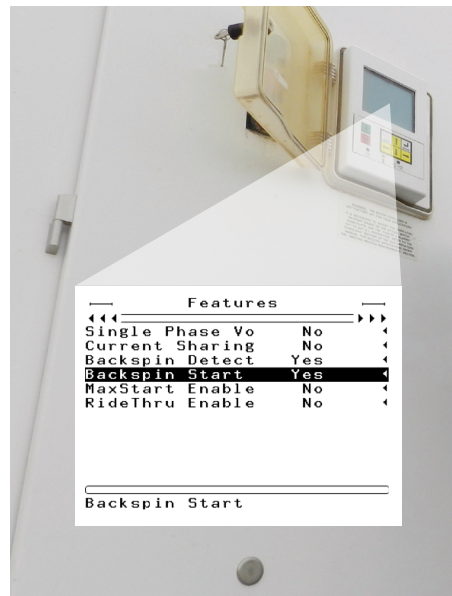
The Backspin Start feature.

Challenges

- Unconventional wells
- Frequent power-related shutdowns
- Deep wells and deep pump setting depths required long restart delays to prevent the ESP from restarting while fluid was back-flowing though the pump after a shutdown

Results

- Mitigated the risk of broken shafts
- Reduced downtime by over 50% in some instances
- Detected a back-spinning pump and automatically restarted the ESP when the pump was no longer backspinning using the Backspin Start feature of the Electrospeed Advantage VSD
- Reduced downtime after shutdowns once Backspin Start feature was active

bakerhughes.com