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Lift IQ Service Remotely Resolves ESP Gas Locking and Saves USD 313,000 for Alianza Casabe

Real-time surveillance service stabilizes produced fluids to prevent well shutdown and ESP failure

CHALLENGE

Keep pumps running and prevent ESP failure after gas is produced in well.

SOLUTION

Monitor ESP operations remotely with the Lift IQ* production life cycle management service to analyze pump performance, determine likely cause of gas lock, and perform remote actions to eliminate gas lock.

RESULTS

Saved USD 313,000 by preventing shutdown, deferred production, workover intervention, and replacement of the main BHA components.

High gas volume threatens artificial lift system

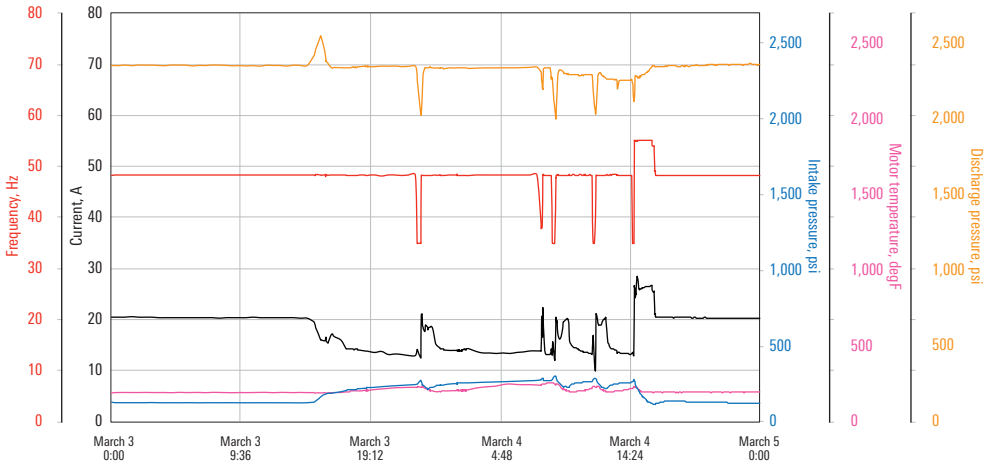
Gas lock events are common for electric submersible pumps (ESPs) when high volumes of gas are produced, and the impact of these events varies in severity depending on the downhole equipment installed, operating conditions, and operational challenges. ESP ingestion of free gas causes gas pockets to form on the low-pressure side of the impeller. The gas bubble continues to grow until it prevents the passage of fluid—a phenomenon called gas locking. When severe gas locking occurs, the ESP will automatically shut down owing to the reduced load on the motor. Gas lock events put ESPs at risk from high motor temperatures, which can threaten the ESP system and cause production losses.

Alianza Casabe faced this issue on the night of March 3, 2017, in the Peñas Blancas 3R well in the Casabe field, Colombia. The well's remote location and the time of the gas lock event made on-site troubleshooting risky. Alianza Casabe needed a solution that would keep its staff safe and prevent ESP failure.

Engineers analyze the pump remotely

The ESP system—which had been installed 94 days earlier—did not fail because Alianza Casabe was using the Lift IQ service in the wells with the most challenging field environments in the Casabe field. The service delivers round-the clock remote surveillance of all artificial lift systems, preventing or resolving ESP downtime, misuse, or failure. Experienced engineers monitor alarms and analyze data transmitted from multiple wells across fields simultaneously in real time, up to 24/7/365, at one of many Schlumberger Artificial Lift Surveillance Centers (ALSCs).

When ALSC engineers receive alarms and alerts, they use their expertise, experience, data resources, and Schlumberger best practices to identify possible causes and remediation options. So, when the engineers monitoring the Peñas Blancas 3R well saw a 30% drop in average motor current, they knew an event had taken place at the well.



ALSC engineers confirmed a gas lock event after Lift IQ service data showed the drop in motor amperage and increases in motor temperature and intake pressure. The engineers were able to cycle the frequency remotely using the Lift IQ service, eliminating the gas lock and restoring the well to normal operation.

Remote actions keep the well online

The ALSC engineers monitored the well remotely for 7 hours after the event. During that time, the engineers watched the drop in motor amperage and increase in motor temperature and intake pressure, which confirmed that a gas lock event had taken place. A remote drop in frequency was recommended, from 48.3 to 35 Hz, to reduce the discharge pressure to free the gas from the well. This was done without going to the wellsite through the Lift IQ system's two-way contol system. When the ESP performance did not improve, the engineers raised the frequency after the initial drop, cycling it from 48 to 35 to 55 and back to 48 Hz. This increase in frequency raised the discharge pressure, eliminating the gas lock. The process took about 17 hours from diagnosis to restored normalcy, as opposed to the days that could have been lost had the ESP system failed.

Schlumberger engineers working closely with field operators proactively and remotely changed settings on pumps to optimize performance, prevent motor overheating, and keep pumps running. The method used in this case was to temporarily increase frequency to compensate for head loss, which cleared the gas lock and reestablished stable discharge pressure and current. This proactive remote intervention saved USD 313,000 related to deferred production, mobilization costs, workover intervention, and main BHA components replacement.

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