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Lift IQ Service Improves ESP Efficiency and Reduces Deferred Production in Permian Basin Fields

Real-time surveillance service monitors downhole pump performance and enables improved production and pump uptime in two unconventional fields

CHALLENGE

Reduce deferred production and improve ESP lifetime in two unconventional fields by improving ESP efficiency and uptime under challenging downhole conditions, including high gas-to-oil production ratio and scaling issues.

SOLUTION

Monitor ESP operations remotely with the Lift IQ* production life cycle management service to analyze pump performance, determine likely causes, and proactively adjust pump operation regimes to avoid shutdowns, improve operations, or restart pumps that have shut down.

RESULTS

Achieved the following results in one month:

- Produced 3,582 bbl of oil that would otherwise have been deferred.
- Reduced ESP shutdowns by 28%.
- Reduced ESP downtime by 38% through remote interventions.
- Cut overall ESP downtime by more than half.

Challenging the downhole pumps

An operator working in the Permian basin found that downhole conditions severely challenged the performance and reliability of downhole pumps. Because of the high GOR encountered in the wells, gas locking and downhole motor overheating would stop the pumps; the downhole environment was also prone to scale formation that would constrain pump performance.

The combination of problems reduced pump reliability, requiring time-consuming hands-on interventions to restart pumps or modify their operational regimes, which in turn reduced or deferred oil production from affected wells. Because the fields lacked remote surveillance systems, pump performance changes were not possible without field intervention; field personnel arriving on location would have to diagnose the reasons for a shutdown, perform any necessary remediation, and then restart the pumps. The process was repetitive, time-consuming, and inefficient, requiring daily visits to particularly troublesome wells.

Analyzing pumps remotely

The Lift IQ 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).

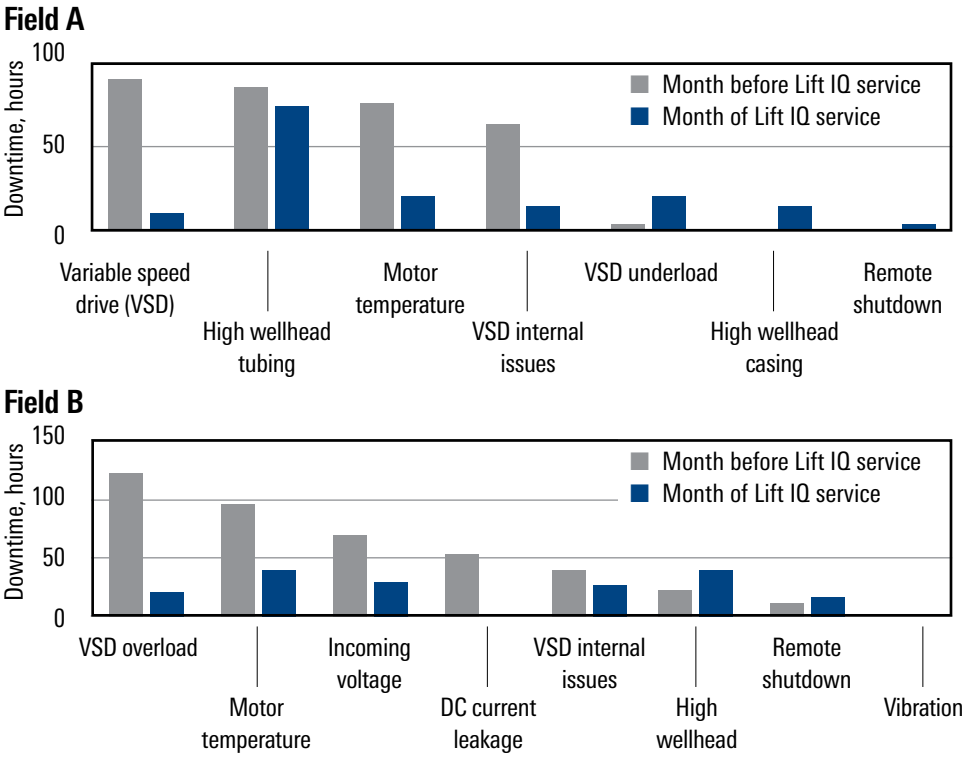
When ALSC engineers receive alarms and alerts, they use their expertise, experience, data resources, and Schlumberger best practices to identify possible causes and remediation options. Some recommendations can be implemented remotely, enabling immediate intervention to prevent shutdowns or restart pumps; others are relayed to field personnel for action, which can be completed rapidly because they know the most likely diagnosis before they arrive on the location.

Increasing pump performance and oil production

For the Permian wells, Schlumberger engineers used a proactive surveillance plan to remotely change settings on pumps to optimize performance, prevent motor overheating, and keep pumps running.

In several cases, upon seeing data indicating that downhole motors were in danger of overheating, engineers recommended new operational settings or regimes to limit further temperature increases, thereby avoiding pump shutdowns that would have deferred production until the pumps could be restarted. In other cases, the engineers remotely restarted ESPs after receiving operator approval by phone.

After just one month, remote interventions by Lift IQ service engineers in two fields reduced pump shutdowns by 28%. In situations in which the service was unable to prevent a shutdown, the engineers could restart the pumps remotely or dispatch field personnel to remediate the problems more quickly than was possible without the surveillance program, reducing ESP downtime by 38%. In addition, the Lift IQ service engineers continuously optimized other pumps—those without critical failure conditions but still working inefficiently—to achieve an overall ESP downtime reduction by more than 56%. The efficiency improvements had a marked effect on deferred production, allowing production of 3,582 bbl of oil that would otherwise have been deferred.



The Lift IQ service reduced the number of ESP shutdowns by 28% and downtime by 56% in two Permian basin fields.

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