Case study: Permian Basin, Texas

ACE Plus GH1400 pump successfully handled GVF over 60%, improved drawdown, production uptime by 300%

An operator in Texas was unable to handle the amount of gas being produced with the existing electrical submersible pump (ESP) system. The ESP system suffered frequent gas locking shutdowns (several a week) due to insufficient gas handling ability.

The repeated shutdowns due to pump gas lock were reducing the well's daily production rate and lowering system efficiency, both of which negatively affected well economics. It was clear to the operator that the system was not effectively drawing down the well and producing without cycling, leading to an ESP failure due to geothermal district heating (GDH).

The Baker Hughes artificial lift systems team recommended a new ESP design including the **Ace Plus™ GH1400 gas handling pump** as the best option to improve ESP performance, eliminating equipment shutdowns related to gas lock conditions. The pump's design increases lift efficiency and extends gas production capabilities by handling up to 75% free gas.

The key to the superior gas handling capability of the ACE Plus GH pump is the sophisticatedly designed tandem vane helicon-axial stages that mix the multiphase flow and provide great momentum to the high GVF mixture. This combination ensures the well is mixed and the flow continuously moves into the next pump with sufficient energy. The pump is field proven to dramatically increase ESP gas handling ability especially under low intake pressure.

The new ESP system with the ACE Plus GH1400 pump considerably reduced cycling and shutdowns that were associated with gas interference. The gas handling system enhanced the well drawdown and increased production by eliminating the nonproductive down time, improving the operator's well economics.

Challenges

- High gas liquid ratio
- Low flowrates
- Limited well draw down
- ESP operating below bubble point
- Frequent ESP shutdown due to gas lock

Results

- Improved well drawdown
- Improved ESP uptime leading to more stable and higher production
- Mitigated gas interference in downhole pumping system, successfully handling high gas volume fraction (GVF)
- Reduced nonproductive time due to pump shutdowns caused by gas interference