Customized Extended-Life ESPs and Chemical Well Treatment Program Increase ESP Run Life by 38%

Integrated approach addresses multiple risks of unconventional environment

Oasis Petroleum North America LLC (Oasis), a subsidiary of Oasis Petroleum Inc., is a leading operator in the Williston Basin—part of the Bakken unconventional shale play—producing from hydraulically fractured horizontal wells. A number of variables, including high initial flow rates, make ESPs the artificial lift method of choice in certain parts of the basin.

Artificial lift challenges in shale wells

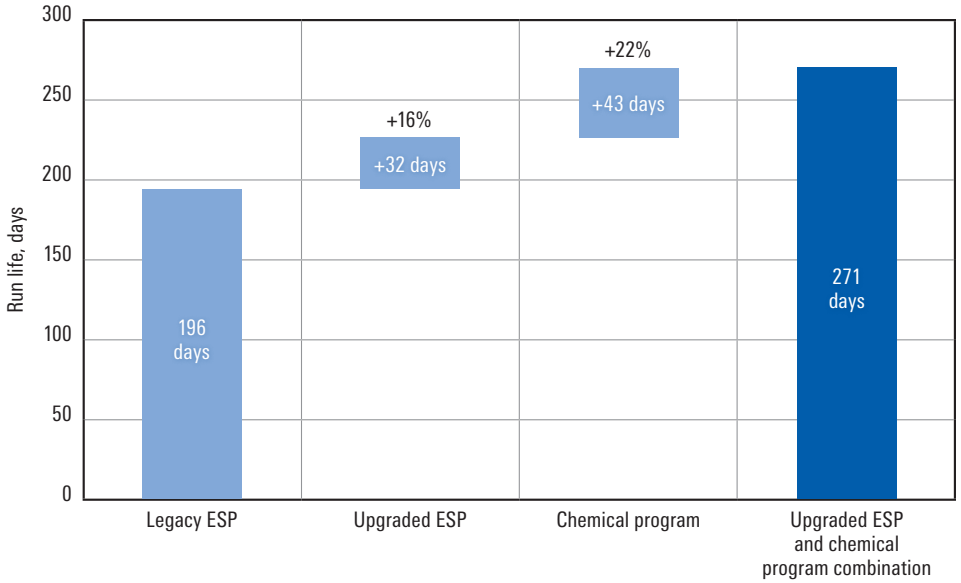
Unconventional well environments pose many challenges to artificial lift equipment, including heavy sand flowback, high gas rates, excessive temperatures that contribute to scaling tendencies, and corrosive fluids.

Reliable ESP pump and custom chemical treatment

A multidisciplinary approach was required. A Schlumberger production technologies team conducted an extensive field survey, collecting well fluid samples for laboratory analysis to better understand the wellbore chemistry. The artificial lift team used this information to improve and update the design of the pump with metallurgy and elastomers tailored to combat the corrosive environment. The laboratory data was also used to create a customized well treatment program, which included KI-38021—a newly developed combination scale and corrosion inhibitor—that would prevent corrosion at its source.

ESP run life improvements and few corrosion failures

The redesigned REDA Continuum* extended-life ESP pumps were deployed together with MGH* multiphase gas-handling systems and an advanced gas-locking control algorithm, improving ESP run life by 16%. The following year Schlumberger implemented the customized chemical treatment plan, which increased run life by an additional 22%.



Upgrading ESP components increased run life by 16%, while a custom chemical treatment plan extended it by a further 22% to an average of 271 days.

The REDA Continuum ESP pump was selected because it is suitable for gassy and abrasive environments, reservoirs with uncertain productivity, wells with steep production decline, and unconventional resources. The Schlumberger chemical treatment program was customized for the pump to maximize pump life synergistically.

The rate of failures caused by corrosion, which was previously the primary cause of ESP failures, has dropped to 6%. Schlumberger also deployed the ChemWatcher* integrated chemical management system, a proprietary surveillance platform, to monitor chemical inventories and ensure continuous injection, resulting in a treatment uptime of 96% during ESP operation.