You have been logged in.

Optimizing Analytics Software to Manage ESP Assets

Because preventative maintenance isn't an option on ESPs, it is crucial that operators use analytics software to predict performance issues and prescriptively manage their assets.

Lone Star's MaxUp analytics software maximizes uptime by mitigating issues before they happen on up to 60 different failure modes and predicts when a replacement is required so the proper personnel, equipment and tools are available at the right time. (Source: Lone Star Analysis)

Share this article

Facebook

Twitter

LinkedIn

Email

36

7

By Jay Miller, Lone Star Analysis

Fri, 11/05/2021 - 05:00 PM

Listen to this article 6:02

Presented by:

Editor's note: This article appears in the E&P newsletter. Subscribe here.

Electric submersible pumps (ESPs) have been a popular method to produce oil and gas wells for many years. The ESP's ability to lift a higher volume of fluid has made it a common, fast-growing lift solution, but it is not without its issues.

ESPs are easy to use and can produce higher rates of fluid than other types of artificial lift

failure due to sand and other materials making their way into the pump.

Horizontal wells face issues that vertical wells don't. The fluid must fight gravity as it turns the corner into the vertical section of the well. This gravitational change causes a good part of the fluid to fall back into the horizontal section of the well. The well then must build pressure to overcome gravity to move the fluid to the surface. Every time the cycle happens, the added pressure needed to overcome the gravitational pull reopens the fractures.

Then, when the pressure builds high enough, a slug of fluid moves to the surface, the BHP lowers and sand is burped out of the open fracture and travels with the fluid into the pump. The sand vastly degrades the pump and impacts its performance. Ultimately, this can lead to very short run times for high-volume wells, sometimes as short as just a few weeks post-deployment.

Because preventative maintenance is not an option on ESPs, it is crucial that operators use analytics software to predict performance issues and prescriptively manage their assets. Once an ESP does fail, the process for pulling and replacing it is very expensive.

Preventative asset management means understanding how a pump is operating versus how it should be and taking steps to get it back to optimal health. Although pump failure is inevitable, taking steps to extend its lifetime, minimize time and associated costs between workovers and optimize pumping time can save engineers time and resources.

Ideal asset management process

Engineers can be responsible for as many as 1,500 wells. With high workloads, engineers need help managing these expensive assets properly. Without a comprehensive asset management system, it can be hard to keep track of poorer performing wells.

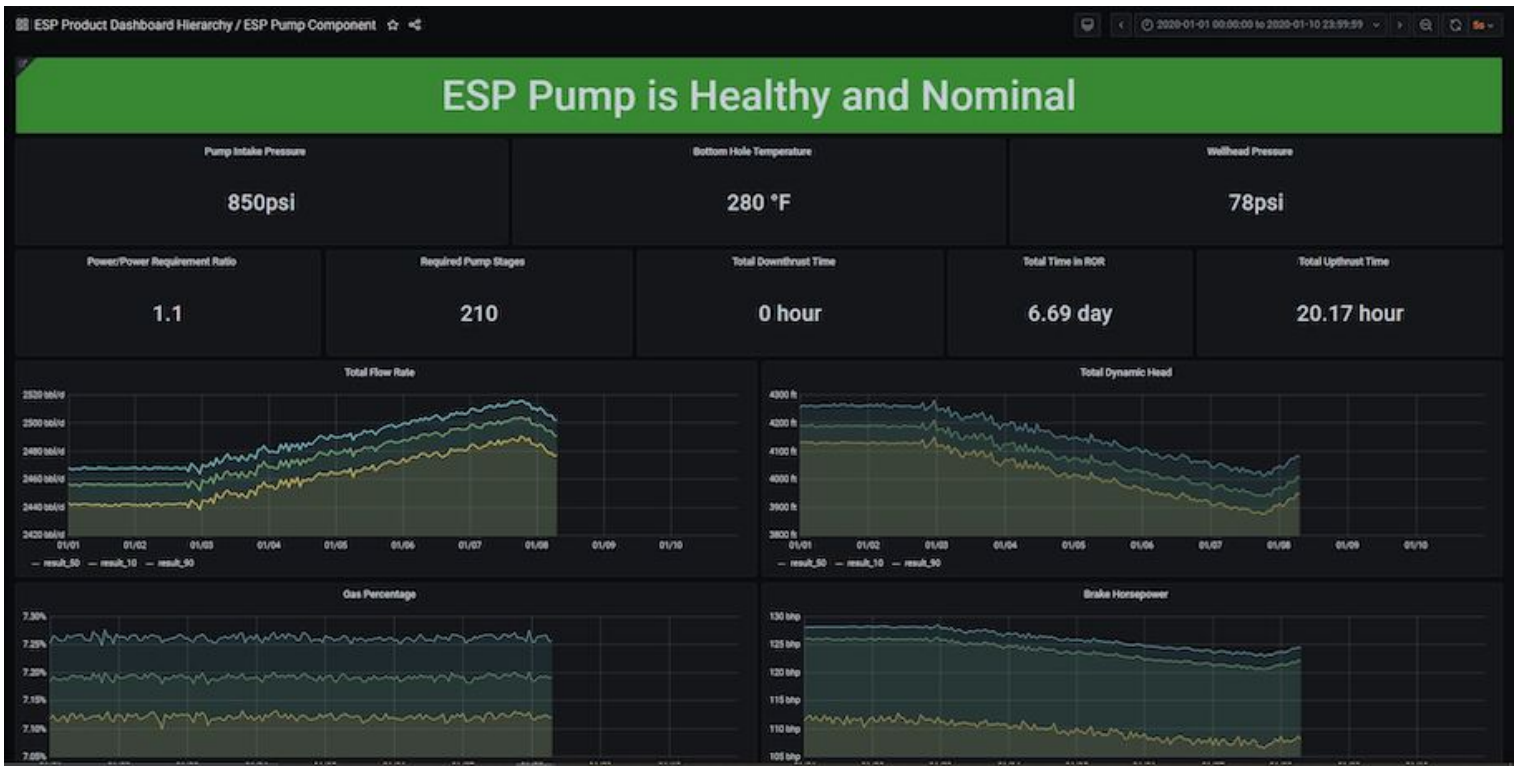
In today's environment, where the supply chain has become fractured and vague, operators have less visibility into when replacements will arrive. Implementing an asset management system can give operators the insight needed to make decisions and changes, if necessary. For engineers overseeing multiple wells, this means pinpointing potential issues to lessen the overall workload engineers face. To gain this insight, operators need a system that can be implemented on multiple assets and provide prescriptive actions. Understanding an arising issue is an excellent first step to take, but action to correct or reduce said issue should follow.

For example, if a well is showing signs of rapid deterioration, the system might communicate an alert of less-than-optimal performance to the operator, then it would prescribe an action for the operator to change the amount of oil being pumped and the rate at which it's being pumped. Slowing down the pumping process will delay deterioration and give the operator time to make necessary arrangements. By pulling data in about each well, a good asset management system can see how an asset is functioning and how it might operate in the future. Engineers can then make decisions that factor in any challenges associated with the supply chain, personnel resourcing availability and the necessary time to perform workovers. Proactively planning for these changes can significantly reduce the amount of downtime a well faces prior to workovers.

Once a pump is run into a well, it stays there until it fails. Once failure occurs, there is no other option than to shut down the well, remove the broken pump and replace it with a new one. Workover time for this changeout can be long, depending on the site location and the time it takes to get a rig out to perform its task. Once on site, it can also be laborious to remove the wellhead, pull the tubing out of the ground and replace everything. Regardless of how long it is, workover time is inevitable. The time around it and the potential losses associated, however, can be significantly reduced if planned correctly.

Implementing asset management analytics

A solid asset management program diagnoses, predicts and prescribes. An ESP produces data such as revolutions per minute, temperature and power usage. Predictive and prescriptive analytics-focused software, like Lone Star Analysis' MaxUp Energy, can predict an asset's performance by factoring in the physics-based parameters the ESP normally operates in to stay healthy, gathered from the original equipment manufacturer. If it is trending out of those norms, the software prescribes a corrective action to bring the pump back into the normal operating range.



Lone Star's MaxUp analytics software maximizes uptime by mitigating issues before they happen on up to 60 different failure modes and predicts when a replacement is required so the proper personnel, equipment and tools are available at the right time. (Source: Lone Star Analysis)

By plugging in failure modes, everyday events most likely to cause damage, such as heat in the motor or excessive vibration, the software is able to monitor for and report against those specifically. Another key feature of a valuable system is timeliness. When considering options, operators should look for software able to pull in data and provide analytics and diagnoses in real time.

To keep ESPs running as optimally as possible, operators should consider adding an analytics program to monitor pump operation, usage, conditions, flow rate and other key factors impacting a pump's operation. A good program predicts potential failures, prescribes comprehensive action, ensures issues are identified rapidly and allows operators the time needed to adjust. Adding analytics capabilities to high-value pumps will enable operators to get the most out of their expensive assets, improve productivity, improve time to failure, increase the time between high-cost workovers and ultimately increase their return.

Sign up for the E&P Newsletter

Get the latest updates every Tuesday on exploration, drilling, production and offshore.

Enter your email address.

Sign Up

By signing up, you agree to and acknowledge the data practices in our Privacy Policy.

Recommended Reading

Permian Basin Poised to Lead Low-carbon Transition, Occidental Exec Says

The Permian Basin is poised to become the leader in the world's low-carbon transition and those already working in the basin will be the pioneers of that transition, Occidental Petroleum's William Barrett told attendees of Hart Energy's Carbon Management Forum.

Chisholm Energy Launches First-of-its-kind Pilot Project in Permian Basin

The pilot agreement with Project Canary marks the first responsibly sourced gas partnership with a Permian Basin operator in New Mexico where Chisholm Energy's operations are focused, according to a company release.

Talos Energy Furthers Carbon Capture Drive with New Partnership

One of the U.S. Gulf of Mexico's largest public independent producers, Talos Energy launched an initiative earlier this year to target carbon capture and storage opportunities along the U.S. Gulf Coast.

Newsletter Sign Up

Subscribe for free to our newsletters for the latest energy news

Sign up today

FOLLOW US

TOPICS

Markets
Business
Technology
Exploration & Production
Transactions
Policy & Regulations
Midstream
Shale Plays
Energy Transition

DATABASES

Drilling Activity
Transactions
New Financings
Who's Who
Markets Data
Energy Datalink

PUBLICATIONS

Oil and Gas Investor
E&P Magazine
Midstream Business
Playbooks
Special Reports
Newsletter Archive
White Papers

MORE

Video
Events
IndustryVoice®
Hart Energy Conferences
Rextag
Stratas Advisors
Hart Energy Store

SHOP

Best Sellers
Directories
Maps
Reports
Data & GIS
Books & Supplements
Package Deals

GET HART ENERGY

Subscribe now for unlimited access

Email Newsletters
Group Subscriptions
Mobile Applications

ESG

© 2021 Hart Energy. All rights reserved. Reproduction in whole or in part, in any form or medium without express written permission is prohibited.