FluidControl Case Study

TUNDRA™ MAX Mud Chiller Extends Advanced Drilling Automation Tool Life

Challenges

- High bottomhole temperature limiting use of downhole tools, decreased drilling rate and increased non-productive time.

Well Information

- Location: South Texas, US

Solution & Results

- Implemented TUNDRA MAX land mud chillers to combat detrimental effects of high bottomhole temperature on downhole tools.
- Assisted in achieving near maximum capacity for downhole tool battery life with downhole temperatures exceeding 300°F.
- Reduced downhole tool failures, resulting in faster drilling time.

A breakthrough in land rig mud cooling technology now allows for much lower, safer downhole temperature gradients for the safe and improved use of the necessary downhole dynamic tools to fully automate the drilling process.

As the bottomhole temperature rises above the functional thresholds of downhole electronics packages, the life and performance of the downhole tools and sensors deteriorate, making it uneconomical to perform closed-loop control that depends on the high-speed data. The high-speed downhole dynamics data is delivered to surface with sensors that measure vibration, loads, temperature and pressure to aid in drilling rate and performance.

The TUNDRA MAX closed-loop mud chiller was used on a series of wells in South Texas with advanced drilling automation tools to compare the results of drilling speed, efficiency and downhole tool operational safety with the mud chiller either activated or deactivated.

During the tests, the frequency of downhole tool failures diminished from two temperature-related failures per well to no tool failures, when the TUNDRA MAX mud chiller was activated, which in turn reduced the need for bit trips and expedited the overall drilling rate. The operator drilled the well three days faster than the previous well.

The high-speed downhole dynamics measurement tool that controls the automated driller at surface has a maximum battery life of 250 hours. Previously, maximum tool life achieved was only 167 hours (67 percent of total battery capacity) during operations. With the use of the TUNDRA MAX mud chiller, the bottomhole temperature dropped by up to 22°F, and the downhole dynamics tool achieved an unprecedented 240 hours of life (96 percent of total battery capacity), a 44 percent increase, in an environment where temperatures exceeded 300°F.

To learn more about the TUNDRA MAX closed-loop mud chiller, contact your nearest WSS FluidControl representative.

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