Tundra Max Mud Chiller and TK-Drakōn Coating lower bottomhole temperature by 57°F (37.2°C)

A major operator drilling in the South Texas Eagle Ford shale faced extreme bottomhole temperatures during long lateral drilling. Historically, temperatures in these wells reached 385°F (196.1°C), presenting a significant risk to the integrity of downhole tools, electronics, and mud properties. High heat exposure can lead to premature tool failures, inconsistent fluid performance, and excessive nonproductive time (NPT) from unplanned trips to retrieve or replace damaged equipment.

To counter the potential of these challenges, the operator deployed NOV's temperature control solution: the Tundra Max™ Mud Chiller and TK™-Drakōn Thermally Coated Drill Pipe. The Tundra Max system provided surface cooling through a closed-loop, dual-stage chiller, achieving an average 53°F (29.5°C) temperature drop—from 143°F (61.7°C) inlet to 90°F (32.2°C) outlet. This immediately improved the quality of fluid circulated downhole, creating a cooler, more stable drilling environment.

When used on its own, the mud chiller helped reduce bottomhole temperatures to approximately 366°F. However, when paired with the TK-Drakōn coated pipe, which reduces thermal conductivity within the drill string, bottomhole temperature dropped even further—to an average of 318°F (158.9°C). This combination not only preserved the performance of high-value downhole electronics, but also allowed tools to operate closer to their maximum rated lifespans, including batteries and sensors critical for automated drilling and formation evaluation.

In addition to extending tool life, the solution enhanced fluid rheology control, reducing reliance on costly chemical additives to compensate for heat-related breakdown. The improved thermal consistency minimized risk at surface and downhole, enhancing HSE performance by lowering the exposure to hot fluid returns.

The synergy between surface cooling and thermally coated drill pipe allowed the client to avoid tool-related trips, maintain higher rates of penetration (ROP), and reduce overall NPT. These performance gains will translate into faster, more efficient wells with lowered operational risk, helping the operator meet its project goals on time and under budget.

Case study facts

Location: South Texas Eagle Ford

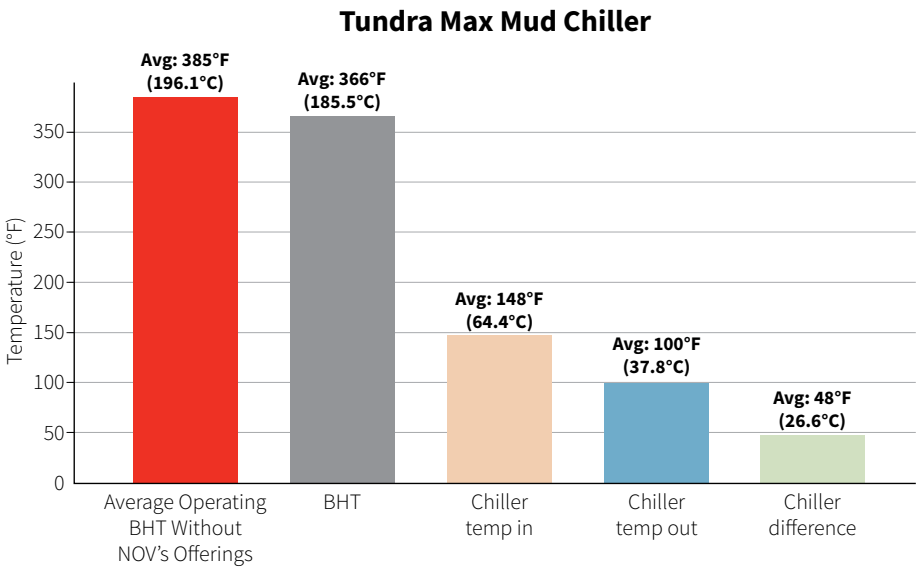
Challenges

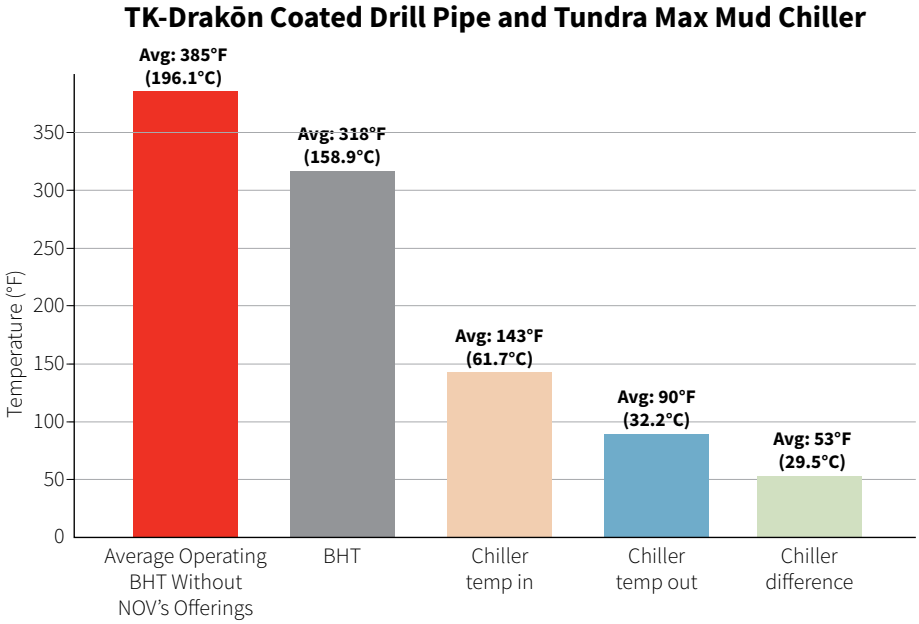
- Bottomhole temperatures (BHT) in offset wells exceeded 385°F (196.1°C), restricting the use of critical downhole tools.
- Elevated temperatures led to tool degradation, increased nonproductive time (NPT), and heightened HSE risk from hot fluid returns.
- Cooling became increasingly difficult in lateral sections extending beyond 20,000 ft total depth.

Solution & Results

- Deployed the Tundra Max™ Mud Chiller to pre cool drilling fluids prior to circulation.
- Integrated TK™-Drakōn thermally coated drill pipe to reduce heat transfer and safeguard internal tool components.
- Lowered BHT by up to 67°F (37.2°C), achieving a more manageable 318°F (158.9°C).
- Achieved chiller outlet temperatures as low as 90 °F (32.2°C), with an average system-wide differential of 53°F (29.5°C).
- Extended tool and pipe life, reduced additive consumption, and saved rig time by eliminating tool-change trips.

Tundra Max Mud Chiller and TK-Drakōn Thermal Insulated Coating





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