

Surface automation backed by AI-driven drilling intelligence delivers 68% reduction in drilling days

Challenge:

The operator needed to drill the 8½-in production sections in a single bit run while drilling with water-based mud. The sections are known for limestone, dolomite, and anhydrite formations that routinely generate high stick/slip and severe lateral vibrations, resulting in logging while drilling (LWD) tool damage and failures.

Offset wells on the same pad required three to four bottomhole assemblies (BHAs) per section to reach total depth, increasing drilling time, non-productive time (NPT), and overall well cost. The challenge was to control drilling dysfunction, protect downhole tools, and reliably deliver one-bit-run laterals without restricting the operating window or sacrificing performance.

Solution:

The operator deployed NOV's surface automation package, introducing NOVOS™, SoftSpeed™, and Kaizen™ Intelligent Drilling Optimizer to stabilize drilling performance and improve consistency. NOVOS automated safe, repeatable connections and provided the control framework for closed-loop drilling automation. SoftSpeed provided active stick/slip mitigation by dynamically managing torsional energy at the surface, while Kaizen enabled autonomous drilling by continuously adjusting weight on bit and rotations per minute in response to real-time downhole conditions. Working together, SoftSpeed and Kaizen reduced torsional oscillations and stabilized drilling through challenging formations.

Kaizen continuously learned and applied optimal drilling parameters while actively mitigating lateral, axial, and torsional vibrations without requiring additional or specialized downhole tools. This integrated approach expanded the safe drilling window, improved drilling stability, and contributed directly to the overall reduction in drilling days.

Location: Middle East

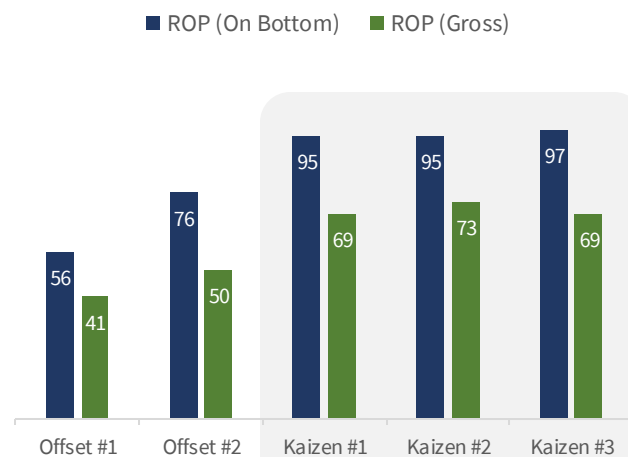
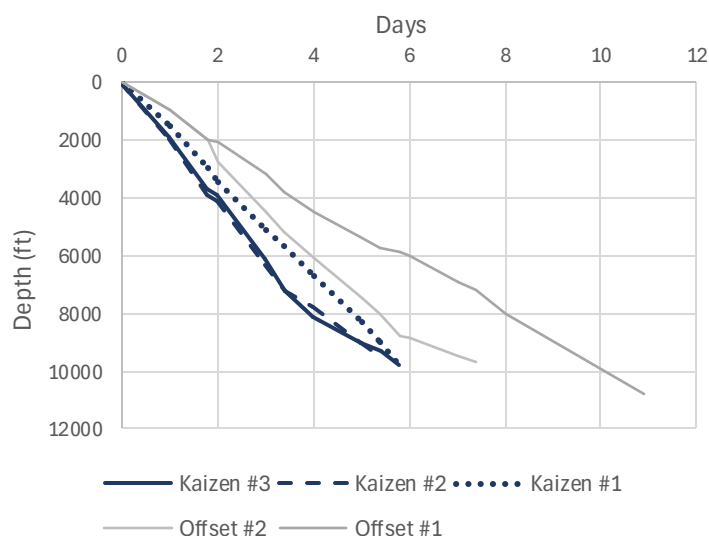
Timeframe: Q4 2025

Lithology: Limestone, Dolomite, and Anhydrite

Drive: Rotary Steerable System

Results:

- 68% reduction in total drilling days, reducing average well duration from 21.15 days to 6.8 days and saving 14.35 days per well
- 45% increase in on-bottom ROP compared to offset wells, contributing materially to overall time savings
- Consistent one-bit-run performances achieved, where offset wells required three to four BHAs to reach total depth
- Reduced LWD tool failures and NPT, improving operational reliability
- Improved drilling stability through challenging formations
- Expanded safe drilling window without added downhole complexity



26% faster than best offset