

# AxeBlade Bit Helps Kuwait Oil Company Exceed Field ROP While Saving USD 32,600

Bit with ridged diamond elements exceeds field-best ROP benchmark by 63%

**CHALLENGE**

Increase ROP while drilling through formations that cause severe stick/slip.

**SOLUTION**

Deploy the AxeBlade\* ridged diamond element bit to increase rock failure while reducing torque fluctuation for improved ROP.

**RESULTS**

- Exceeded best field ROP by 63%.
- Increased ROP by 84% versus field-average ROP.
- Achieved TD in single run, saving one drilling day.
- Reduced well costs by USD 32,600.



**Mitigate stick/slip and improve ROP while drilling through hard formations**

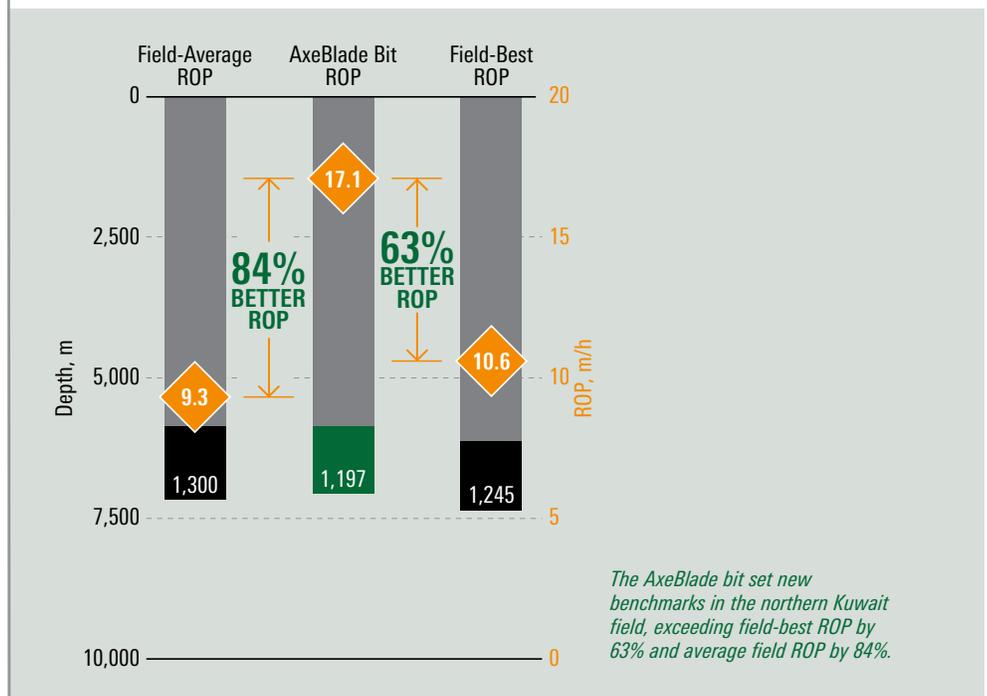
The plan required building angle from vertical to 30° through the challenging limestone formations. These are hard and heterogeneous carbonates with 15,000- to 20,000-psi unconfined compressive strength (UCS) and interbeds of swelling shale. To control the severe stick/slip, operators typically have to limit WOB, which had previously lowered the ROP in offsets wells to an average of 9.1-m/h [30-ft/h] while drilling to 1,789.2-m [5,870-ft] MD.

**Reduce torque fluctuation and improve ROP with ridged diamond element bit**

Based on analysis from the IDEAS\* integrated dynamic design and analysis platform, Schlumberger recommended that KOC deploy an AxeBlade bit. Projections showed that due to the unique geometry of the ridged diamond elements, the AxeBlade bit would create less torque fluctuation, which, in turn, would help mitigate stick/slip. This would also permit more WOB, enabling a higher ROP.



*Examination of the AxeBlade bit after pulling out of the hole revealed that it was in excellent condition and rated as rerunnable.*



**Exceeded field ROP benchmarks while saving KOC USD 32,600**

Using the AxeBlade bit, the operator achieved TD in a single run while establishing new ROP benchmarks for directional drilling in the northern Kuwait fields. The benchmarks showed an increase of ROP to more than 56 ft/h, exceeding the field's ROP record by 63%. The AxeBlade bit also improved on the average field ROP by 84%. The angle was built to 30° as required while experiencing significant reduction in stick/slip with torque mitigation.



*Close-up images of undamaged AxeBlade bit cutting elements after drilling 365 m [1,197 ft] through a variety of challenging sections.*

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**SMITH BITS**

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