



Deepwater West Africa Passive Sand Control using Oriented Perforating

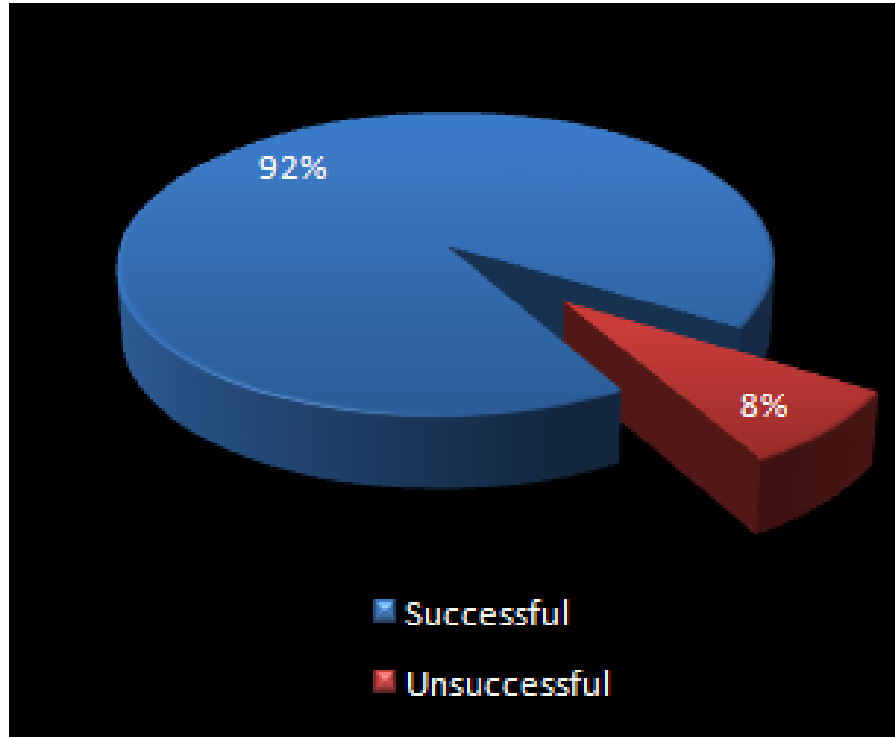
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Angola

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Life Cycle Cost

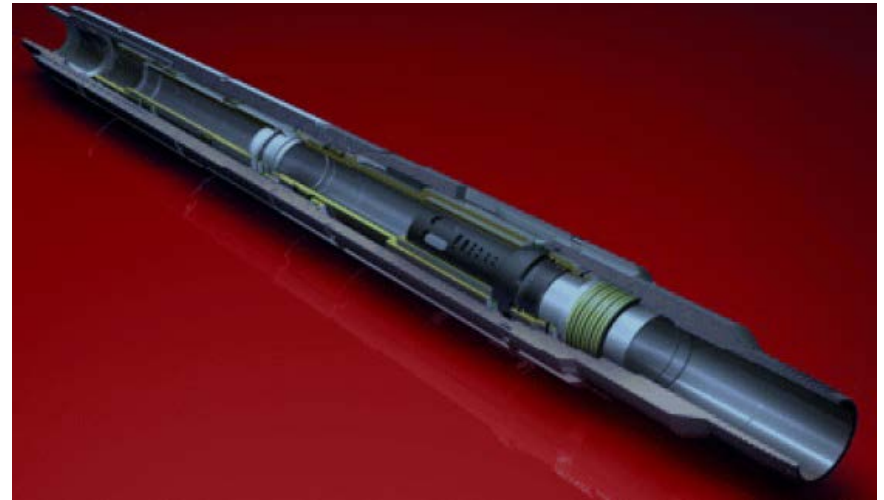


Orientation Failures- OTC 19130

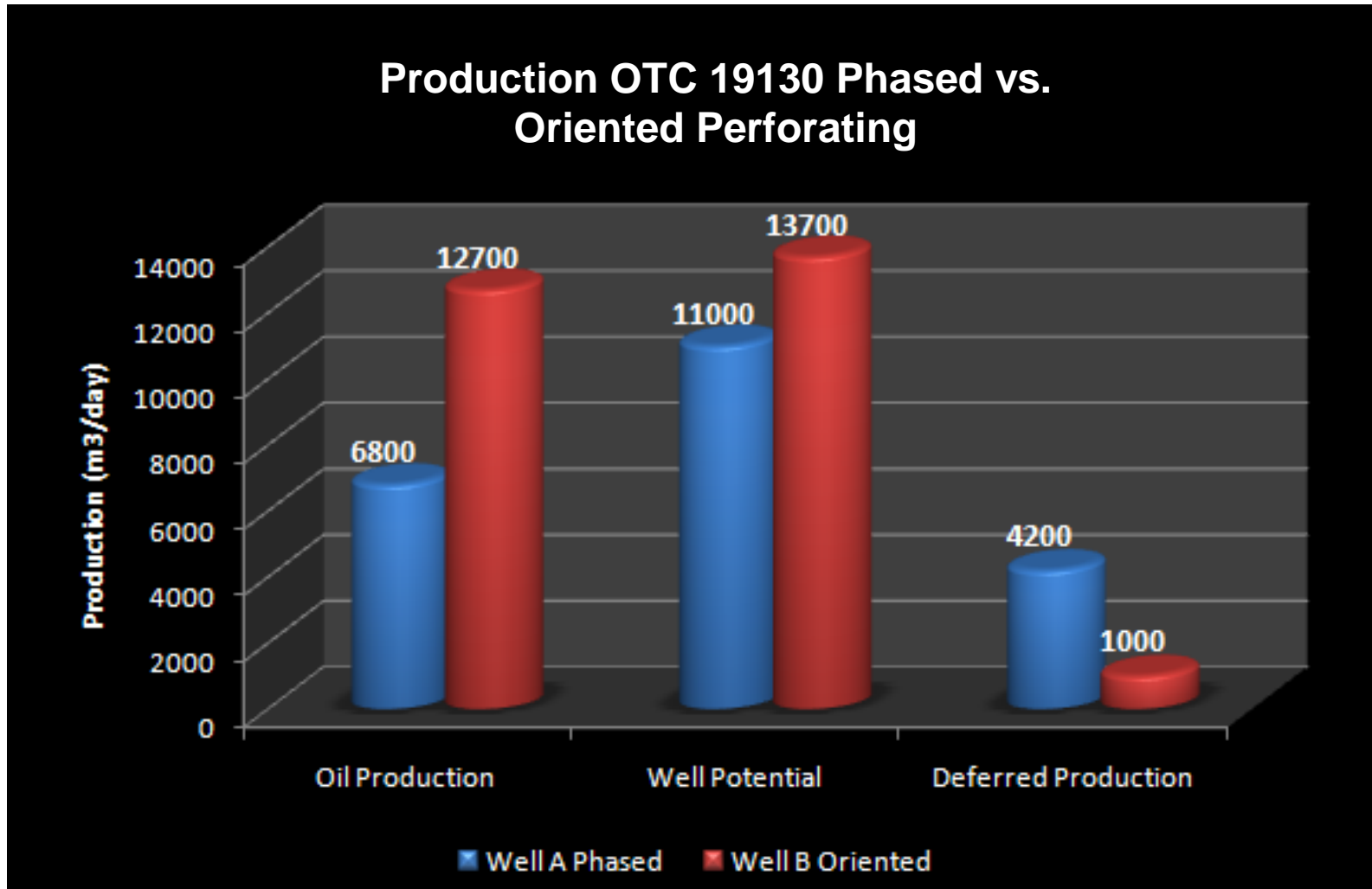


- Deviations from recommended design
- Challenging well parameters
- Poor operational practices.
- A few cases the causes of poor orientation accuracy remain unresolved.

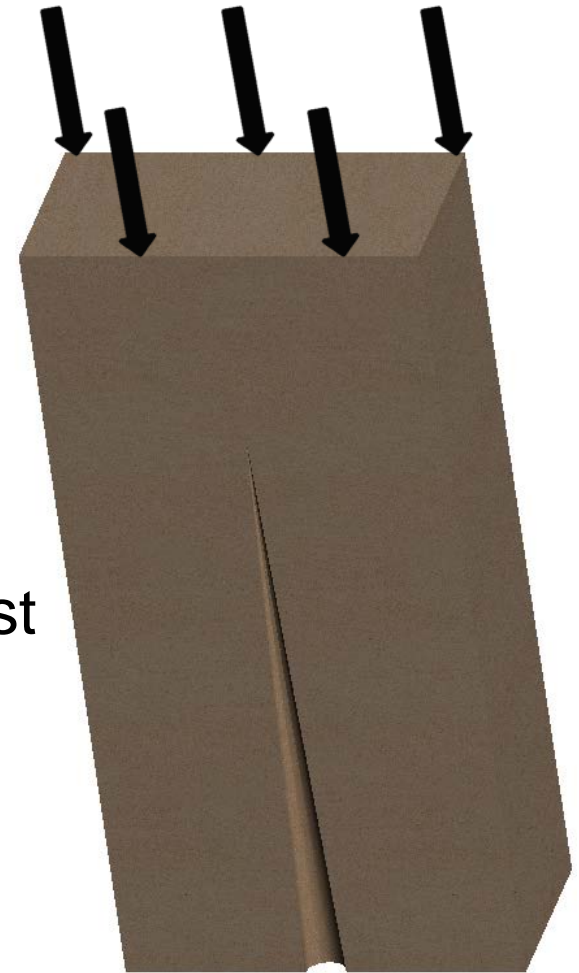
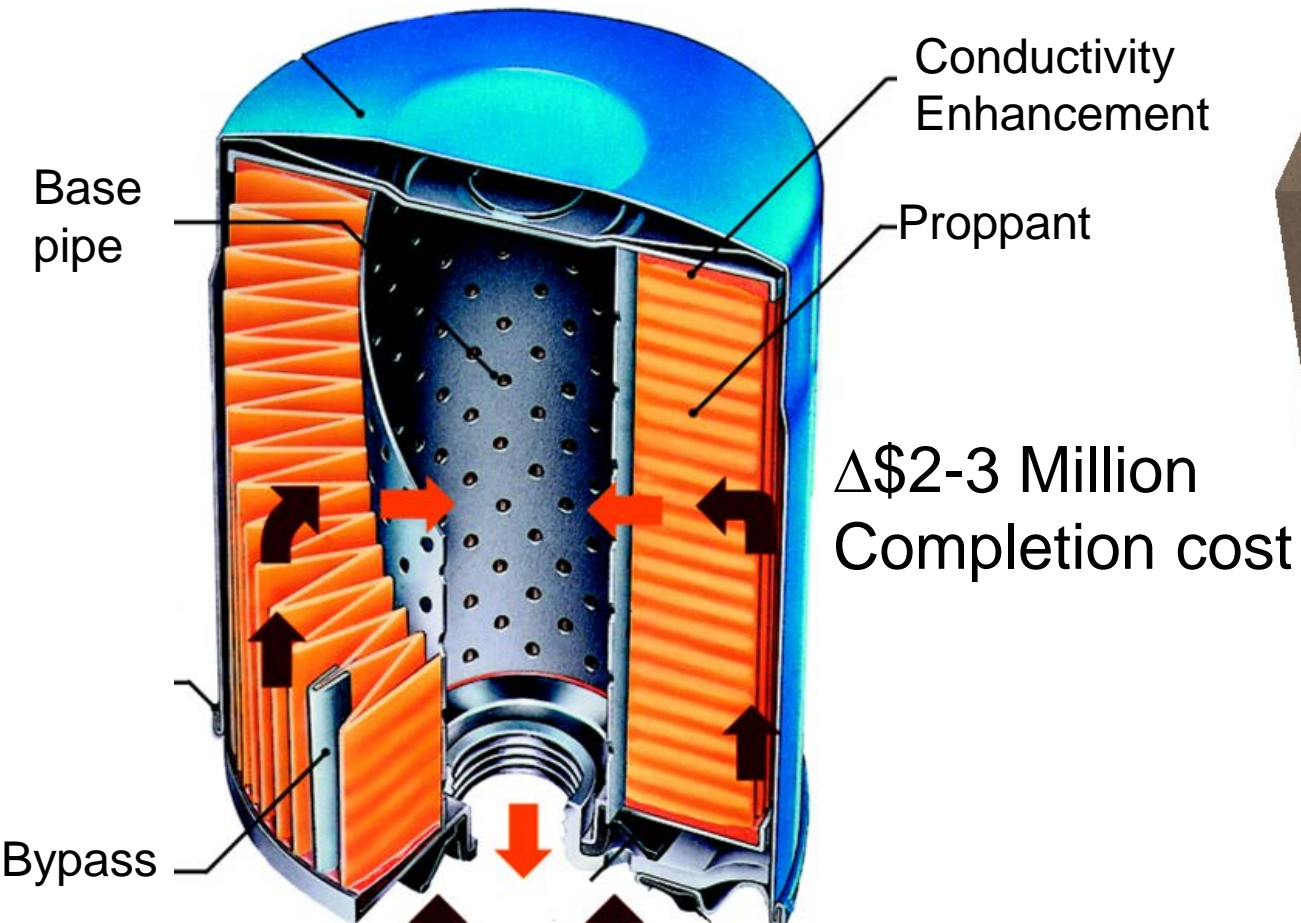
Asset Effects



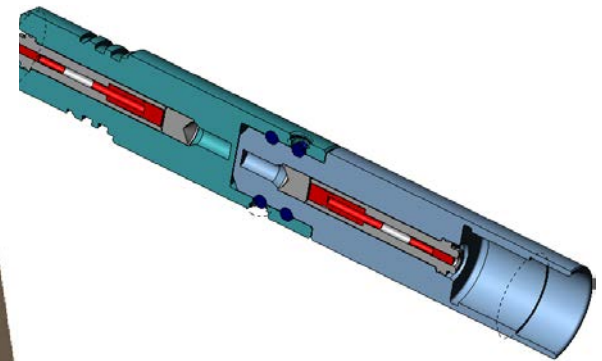
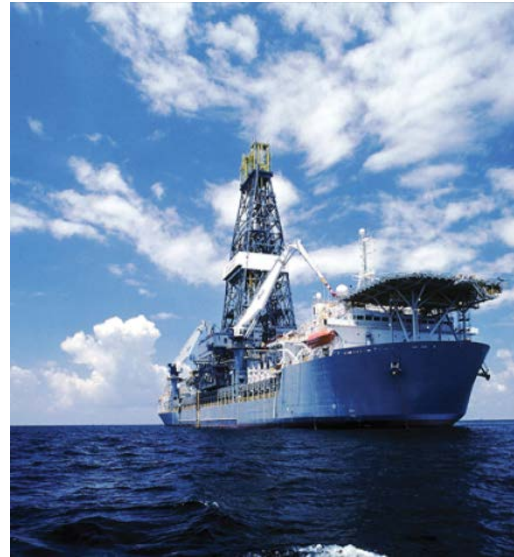
Effects on Production



Sand Control - Active vs. Passive



Increasing the Reliability



Transferrable Solutions



- Guaranteed flow assurance with an rate of 6,000 m³/day(37,600 BOPD)
- 20 percent increase in Norne Field production

Adapted to Angola Requirements



- 9 5/8 Casing,
- Permanent Completion
- Gyro Elimination
- Well Integrity
- Dynamic Underbalance
- Operational savings of 50 Hours
- 6 wells on production – no additional sand accumulation
- “We have not seen evidence of continuous sand production on the wells even with 70% water cut.”

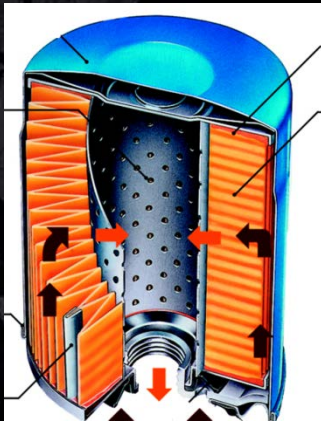
Client Value Added

- “An Estimated 36 hours of rig time has been eliminated, since it is no longer necessary to have the orientation of the guns verified by a Gyro, and the overall perforating interval can be increased to enable one run in the hole.... cost savings of \$1,462,500 USD .”

Adapted to Angola Requirements



- North Sea Operator Primary completion in 7" casing
- Shallow Gas Zone in 9 5/8 Discovered
- Used 7" Internally oriented system to capture additional production



Summary

What questions does oriented perforating need to answer for you?

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