SLAP-32

Passive sand control through efficient oriented perforating offshore deep water West Africa
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ABSTRACT:
Drilling for and producing oil and gas from deep-water African reservoirs creates many engineering and technical challenges. The oil and gas reservoir itself can be as much as 10 kilometers below sea-level, under kilometers of water, hard rock, thick salt and tightly-packed sands.

Increasing hydrocarbon production, while maintaining a moderate-to-low associated risk and cost, is a primary challenge for African operators in deep-water operations. The method enabled the operator to eliminate runs to confirm the orientation of the previous oriented systems. The operator has also implemented dynamic underbalance and the critical prejob and post job analysis have shown that the safe surge pressure for these wells have not been compromised as confirmed by the pressure gauges.

Life Cycle Cost
- Life Cycle cost of a Production platform paper
- Developing a formula for determining the cost of a production facility... and it broke it into three areas.
- Capital: Talk about costs i.e. - construction, license, permits, commissioning, shipping, cranes, personnel, etc.
- Operating: Fuel, communications, supply boats, crew boats, helicopter, catering, staff, etc.
- Deferred production

Asset Effects
- On the simplest end you may have to shut in a well in order to get a Coil unit to clean out sand if possible (subsea)
- Erosion downhole can leave the casing unsupported and there have been cases of collapsed casing.
- If you are trying to use smart well smart well completions, these can be fouled or eroded by the sand.
- And the worst case is if we have something like this, a cut out surface choke, which could threaten the staff and production equipment.

Increasing the Reliability
- On Deep-water field in particular was trying to use a previous generation of orientation for sand control. These systems and many still used in the industry today allow the casing, friction and well bore debris to interfere with the orientation of the guns. In order to make sure the charges were oriented towards the max stress plan a wireline gyroscope would be run in to verify orientation.

If it was found to be out of orientation, rotation and manipulation of the string were required and the gyro run again. Despite this some of the concerns identified in OTC 19130 found there way into the completion and orientation was not as precise as needed.

Adapted to Angola Requirements
- 5 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.

What questions does oriented perforating need to answer for you?

Halliburton

Effects on Production

Sand Control - Active vs. Passive
The Operator in Angola followed two sand control strategies. The primary was active sand control which is similar to building a down hole version of an oil filter.
The other strategy is cased hole Oriented Perforating or CHOP. CHOP completion rely on orientation of the Perforation to be parallel to the Maximum Stress Plane.

Changing to Oriented the stress has a smaller area to work on and the rock retains its strength longer during depletion.

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.

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