Cutting completion costs of marginal reservoirs

CAPEX reduction with 3M™ Ceramic Sand Screens

Customer challenge
Several potential solutions posed significant technical challenges in the zones to be completed.

- Multi-zone single trip gravel packs would be complex to implement, and had limitations with regard to the total gross distance between the uppermost and lowermost reservoirs.
- Wire-wrap screens are prone to “hot spots”; an accelerated erosional effect generally leading to sand control failures.

The customer’s goal was to more quickly identify and implement a simplified, standardized and commercially acceptable technical solution that would ensure acceptable well productivity.

Why ceramics?
Wire-wrap screens failed every erosion test (lower photo). The ceramic screens did not show any visible wear or material loss.

Erosion test results

Made of abrasion-resistant silicon carbide, 3M™ Ceramic Sand Screens mitigate wash-out erosion compared to all steels and hard coated steels tested.

Results

- 4 wells equipped with ceramic sand screen technology in multiple zone single trip
- Proved simple, cost effective and required no gravel pack stimulation
- Simplified design and shortening the time of completions which reduced total well cost
- Demonstrated good performance holding sand at sand face

Customer key decision drivers
Overcome technical limits of existing sand control and CAPEX reduction

Decision matrix included:

- Reduce overall well cost
- Resist erosion/hotspotting while placing across perforation as stand alone
- Simplify logistics and operation

Economic comparison with other options includes:

- Gravel pack completions

Cost comparison: MZ-STGP vs. ceramic screen

Using a cased hole stand alone ceramic screen as an alternative removes the necessity for a gravel pack – potentially reducing time and cost.
Technical references

SPE 176225-MS: cased hole ceramic screen cutting completion cost for marginal reservoir: application in Tunu Field

OTC 25106-MS: an innovative approach of revival for damaged wells in high erosive environment using ceramic sand screens – BG Group

SPE 146721: An innovative milestone in sand control – Maersk Oil & Gas

SPE 160327: ceramic sand screens for sand control in unconsolidated reservoirs (with fines content) – RAG

SPE 166092-MS: ceramic sand screen: ceramic sand screen – an innovative downhole sand control solutions for old & challenging cased holes – BG Group

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