

Improving gas production and well integrity in subsea applications

Intervention using 3M™ Ceramic Sand Screens

Customer challenge

- ▶ Site was a former oil well with an unexploited gas cap
- ▶ An intervention was needed to convert the well to natural gas production
- ▶ High velocities were expected in the gas cap perforations, which threatened the integrity of the well due to erosion
- ▶ Intervention was conducted using a light well intervention vessel (LWIV)

Why ceramic sand screens?

- ▶ Increased well lifecycle longevity helps lower capital expenditures
- ▶ Increased production envelope enables higher production rates
- ▶ Suitable for gas wells expecting high risk of erosion due to high production rates
- ▶ Simplicity of deployment, especially for subsea applications

Results

One well was equipped with a 3M™ Ceramic Sand Screen System in April 2016 and has been producing since August 2016.

- ▶ Production rates: 42MMSCFD
- ▶ Easy rig-less operation from LWIV with E-Packer
- ▶ 30ft screen was set directly across the new perforations
- ▶ Achieved above 40ft/s velocity in the perforations without sand production

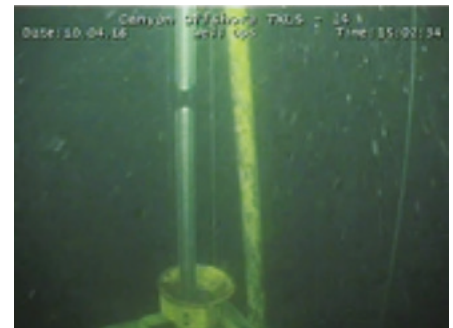
Customer key decision drivers

The decision matrix included:

- ▶ Robust sand control
- ▶ Reliability in erosive subsea environment
- ▶ Simplicity of intervention

Economic comparison with other options

- ▶ Metallic non-erosion resistant screens with possible flow rate restrictions to mitigate erosion were considered
- ▶ Sand management



Photos courtesy of Royal Dutch Shell and Helix ESG

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 Solution for Old and Challenging Cased Holes – BG Group

MOC-Egypt- April 2016: Ceramic Sand Screen Systems - A Unique Down-Hole Solution for Sand Control

Sand Control with Ceramic Screens in Unconsolidated Reservoirs Demonstrated in the Mature Gaiselberg Oilfield. OIL GAS European Magazine, 2/2012, p. 74–78

SPE-182278-MS: Sand Control in Corrosive and Erosive Downhole Conditions at High Temperatures- 3M Technical Ceramics

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3M Technical Ceramics

Zweigniederlassung der 3M Deutschland GmbH
Max-Schaidhauf-Str. 25, 87437 Kempten, Germany

Phone +49 (0)831 5618-0
Web 3M.com/ceramicsandscreens

3M Advanced Materials Division

3M Center
St. Paul, MN 55144 USA

Phone 1-800-367-8905
Web www.3M.com/advancedmaterials

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