Case History

First Subsea Openhole Gravel Pack Successfully Completed in Egypt

Baker Hughes delivered 100% sand placement in the openhole completion

In 2009, a customer in the Mediterranean Sea – Egypt was concerned about possible bridging during a gravel pack job as a result of excessive leakoff in a highly permeable formation due to filter cake integrity loss in a newly drilled openhole well. Baker Hughes recommended running a DIRECT PAK™ Ultra screen to mitigate the problem. The well was completed as an openhole section, reaching 50 m of highly permeable unconsolidated sand. This formation type can lead to hole collapse, swelling, migration of solids, and excessive leakoff. In many cases, packing the openhole/screen annulus and wellbore stability are affected by pumping gravel-laden slurries past these unstable sections and can lead to premature bridging and incomplete annular packs, i.e. voids in the gravel pack: the matter that would be unavoidable (when using conventional screen).

Baker Hughes optimized the well design to maximize the production interval, requiring critical assessment of measurement and logging, and accurately setting the production casing shoe and openhole length to avoid reactive shales. Extensive drilling and completion fluids formulation testing was performed before the completion to mitigate formation damage.

The Baker Hughes DIRECT PAK Ultra screen was used to gravel pack the entire interval, regardless of instances where the hole might collapse due to reactive shales, using its slurry bypass capabilities. This is accomplished via kidney shaped tubes distributed around the circumference of the screens with slurry transition points located every five feet along the distribution tube. A total of 195 ft (59 m) of DIRECT PAK Ultra screen was delivered to total depth and was used to gravel pack the entire 10 ½-in. openhole section.

This was the operator’s first subsea openhole gravel pack completion using the 5 ½-in. DIRECT PAK Ultra sand screens through a drill-through horizontal tree, and their first global deployment of DIRECT PAK Ultra screens in an openhole application. The well completion took 20 days of total completion time, which was below the projected P-10 value.

Based on the openhole caliper log run before the completion, the resulting gravel pumped indicated a 100% annular pack was achieved. The well was tested up to 51.7 MMscfd on an 88/64-in. choke — 20% higher than originally projected. The mechanical skin was only 1.9 as a result of the optimized fluid selection.

There were no accidents, no incidents, and no near miss events during this job.

This case history is presented for illustration purposes only, and results may vary between applications.

www.bakerhughes.com

Disclaimer of Liability: This information is provided for general information purposes only and is believed to be accurate as of the date hereof; however, Baker Hughes Incorporated and its affiliates do not make any warranties or representations of any kind regarding the information and disclaims all express and implied warranties or representations to the fullest extent permissible by law, including those of merchantability, fitness for a particular purpose or use, title, non-infringement, accuracy, completeness or completeness of the information provided herein. All information is furnished “as is” and without any license to distribute. The user agrees to assume all liabilities related to the use of or reliance on such information. BAKER HUGHES INCORPORATED AND ITS AFFILIATES SHALL NOT BE LIABLE FOR ANY DIRECT, INDIRECT, SPECIAL, PUNITIVE, EXEMPLARY OR CONSEQUENTIAL DAMAGES FROM ANY CAUSE WHATSOEVER INCLUDING BUT NOT LIMITED TO ITS NEGLIGE.