

Case study: Caspian Sea

DeepConnect reservoir-driven perforating charges increased production 20%

SOCAR the National Oil Company of Azerbaijan had been seeking improved production from one of its most important and highest producing fields. The Baker Hughes team recommended the **SnapShot™ live well deployment system** coupled with **DeepConnect™ reservoir-driven perforating charges** as a potential solution. This deep gas reservoir, below 19,000 feet (6,000 m) has an average permeability of 10 mD and a porosity of 12% with a reservoir pressure of 12,500 psi (860 Bar).

Extensive modelling work was done by the customer to evaluate the performance of conventional (API Section I) and deep penetrating special charges (API Section II/IV) from different providers. The chosen option of 3/8-in. perforating guns and 3123 DeepConnect charges from Baker Hughes showed the most optimized results.

Unlike conventional perforating systems optimized for performance in a concrete test target, the DeepConnect charge is designed for performance in reservoir rock, at reservoir conditions. The DeepConnect technology was developed using an iterative testing and design process that replicates as closely as possible reservoir conditions, in terms of rock properties, downhole pressures, fluids, and temperatures, resulting in a best-in-class shaped charge product

family. Our global SME's and local technical team and the customer collaborated to plan and execute the completion. The operation entailed perforating 426 feet (130 m) of reservoir, using Baker Hughes SnapShot Live Well Deployment system in a single coiled tubing conveyed run. The deployment was executed flawlessly, completed with zero NPT.

The well showed a 20% increase in gas flow rate, compared to the reference wells previously perforated with concrete-optimized charges



Challenges

- Improve production in one of the SOCAR's major reservoirs
- Introduce perforating technology based on in-situ formation penetration, not concrete test data
- High pressure environment
- 19,600 ft (6,000 m) perforating depth
- Deploy and recover the 426 ft (130 m) gun string in one run without killing the well

Results

- Increased production 20%, or 17 MMCFD (500,000 m³) compared to offset wells in the immediate area
- Flawless deployment of the SnapShot live well deployment system in a challenging environment
- Successful perforation of 426 ft (130 m) of interval with 3/8-in. OD 6 SPF HMX DeepConnect charges