

Case Study - 1

90% reduction in gas production using AICV® technology in a carbonate reservoir producing ultra-light oil

IPTC-20195-MS & SPE-200168

A major mature field in the Middle East is producing ultra-light oil (0.4-0.6 cP). Due to the fractured nature of the carbonate reservoir and overlaying gas-cap, well production used to suffer from a significantly high GOR, often beyond the handling capacity. As a result, wells need to shut down to manage the gas production, leaving behind significant and considerable oil reserves, resulting in a lower recovery.

Challenges and Objectives

Due to excessive gas production, predominately from the fractures, often well GOR would exceed 10,000 scf/bbl, affecting the oil production adversely. There were limited completion options to manage the gas production at the reservoir level. Conventional ICD technology was found unsuitable due to fixed flow path, thus lacking choking effect and potential erosion of the completion equipment due to extremely high velocity.

The objective was to choke back the gas production at the subsurface level and increase the oil production across the entire wellbore to achieve the higher estimated ultimate recovery (EUR).

Solutions

AICV® is the only device that identifies the fluid flowing through it based on the fluid properties and shut off the production of unwanted fluids such as water and gas autonomously. The operator decided to install AICV® technology in one of their existing wells. InflowControl collaborated with the operator's asset team in designing the AICV® completion and the well was retrofitted with 44 AICV® units in 10 compartments. Swell packers and mechanical open hole packers were used to achieve the required zonal isolations.

Results

The well was completed without any service quality issues. Based on the stable production results, the gas production dropped by 90% after the AICV® was retrofitted. Upon comparing the pre-installation and post-installation PLT results, it was evident that due to the shutting-off of the gas-producing zones, the drawdown is redistributed, resulting in an oil production contribution from the entire well. The results are both increased daily oil production and increased oil recovery. The well is still producing at the lower and stable GOR after 30 months of production. Thus, AICV® technology helped reducing the gas production and increasing the oil production, and also managed to keep the gas in the reservoir thus preserving the energy of the reservoir to maximize the recovery.

LOCATION
Middle East

OPERATOR
Major Middle East E&P

DEPLOYMENT
Onshore, Mature Brownfield

RESERVOIR
Fractured Carbonate with free gas-cap

COMPLETION
4-1/2" AICV® with 10 packers and
44 AICV® joints

Results

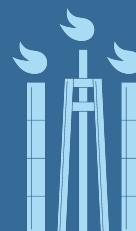


5x

Increased oil production from the lower section of the well

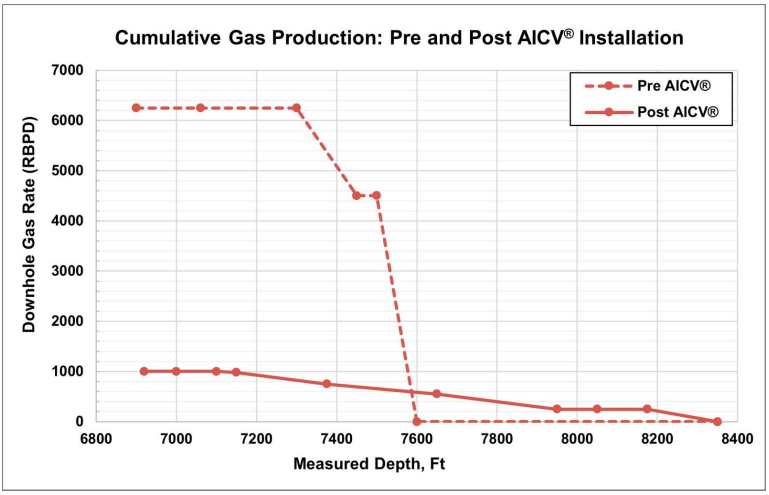
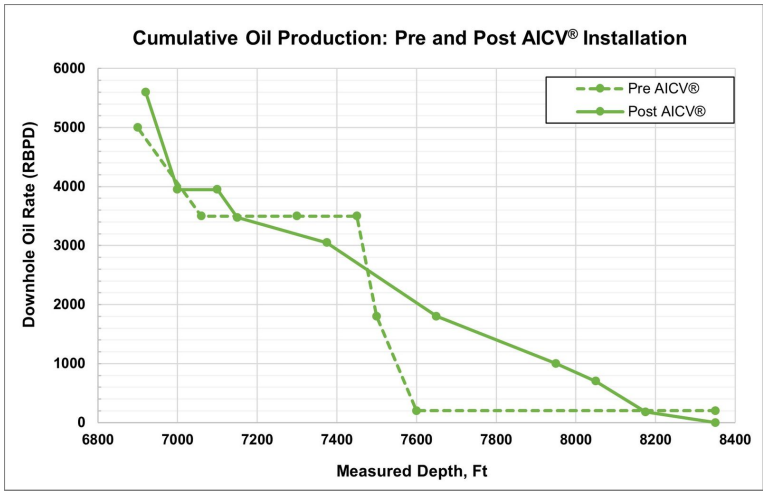


Stable and low GOR after 30 months of production



90%

Gas reduction



PLT LOG DATA

Pre-AICV®

Post-AICV®

