CASE STUDY

HALLIBURTON

Offshore Indonesia

Single-trip, multizone, cased-hole frac packs and intelligent completions improve recovery in subsea gas field

Advanced completion solution enables wells to remain fully functional after five years of production

CHALLENGE

Complex subsea development

- Weakly consolidated sands
- Six target zones
- Potential for early water breakthrough

SOLUTION

Advanced Completion solution comprising of:

- ESTMZ™ services to optimize operations and control sand production
- ROC™ gauges and HS-ICVs to monitor and control each zone

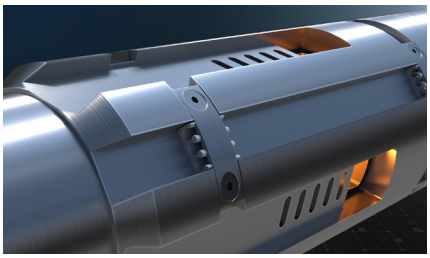
RESULT

100% success rate after five years of production

- Successfully deployed ESTMZ™ services, to save operator 65 days for nine wells
- Exceeded expectations for gas flow rates
- Significantly improved recovery by shutting in zones that produced excessive water
- Ultimately, enabled wells to continue successful operation for five years

Overview

To help improve recovery from a series of shallow, low-pressure, gas reservoirs offshore Indonesia for a major operator, a nine-well subsea development project was completed with Halliburton cased-hole frac packs for sand control and multizone intelligent completion technology. The system was installed efficiently and has operated flawlessly for five years. The combination of successful sand control and intelligent completions has significantly improved gas recovery without the need for rig intervention.



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Challenge

The operator needed to improve operational efficiencies for this complex subsea field of shallow, low-pressure, and weakly consolidated gas reservoirs. The field required a method to address unconsolidated sands, along with the capability to monitor and control each of the six potential layers as the economics of the project required a single wellbore to access multiple reservoirs. Early water breakthrough was also a concern, with the potential impact of loading the production string with heavy water and curtailing ultimate recovery.

Solution

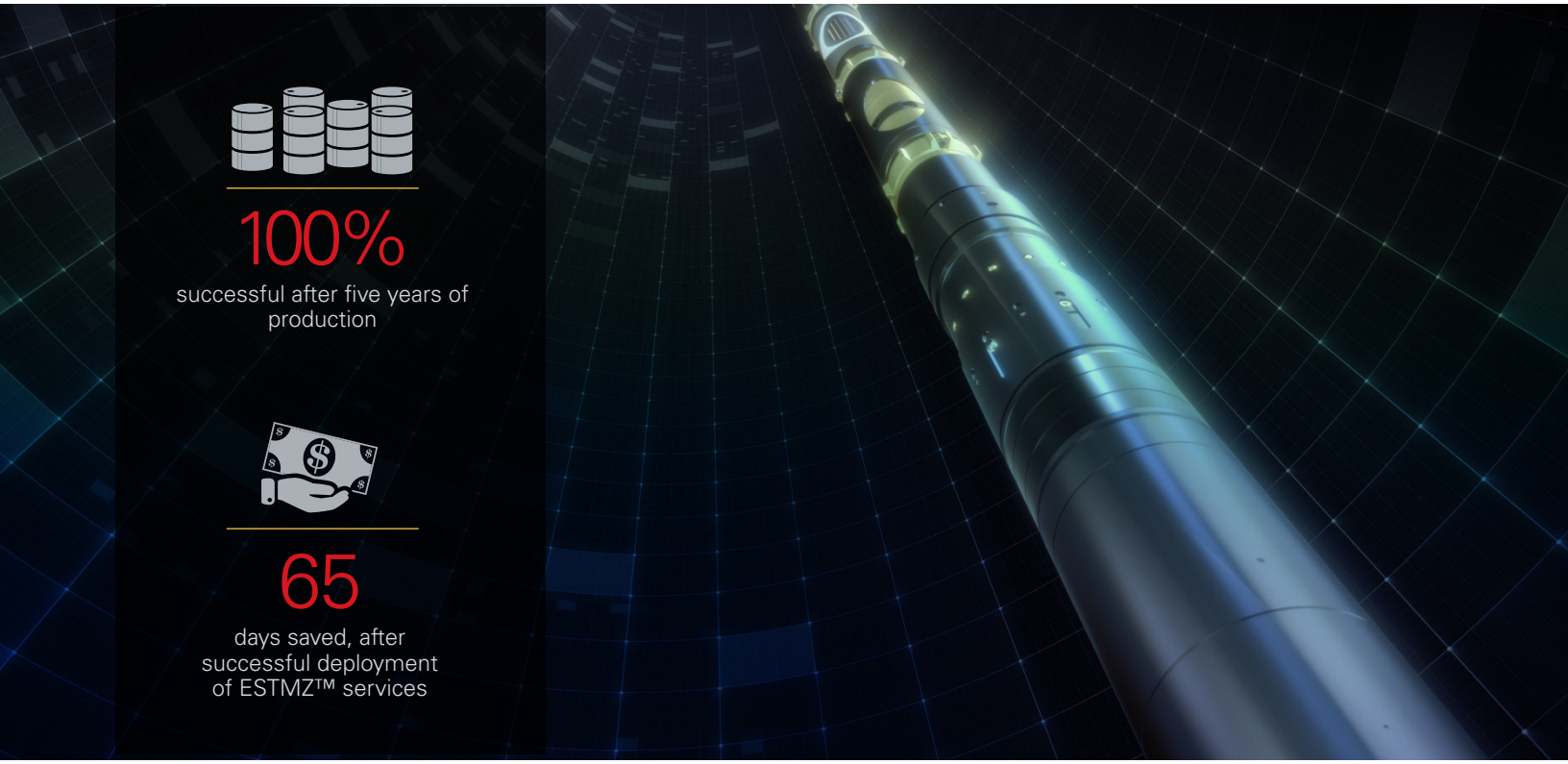
The Halliburton ESTMZ™ fracturing services (enhanced single-trip multizone completion system) was chosen for its capability to significantly improve operational efficiency. These services allow the sand control tools and frac pack to be run in a single trip, and enable the intelligent completion system to be run inside the sand control system to monitor and control each reservoir. Halliburton interval control valves (HS-ICVs) and ROC™ pressure and temperature gauges provided the operator the advantage to perform multi-rate tests and clean up each zone individually.

The HS-ICVs were also used to permanently shut in several zones that produced excessive water which would have jeopardized recovery from offset zones.

Result

The ESTMZ™ services frac-pack completion system was successfully deployed, which saved the operator 65 operational days on nine subsea wells versus using a conventional frac-pack system. The intelligent completion string was successfully drifted and set inside the ESTMZ services system in each of the nine wells, which allowed zonal control of 34 different gas zones. The first well was a six-zone intelligent completion that was drifted and set through the lower completion frac pack, which was an industry first and a true union of intelligent completions with sand control systems. Four of the 34 HS-ICVs have been shut in to prevent water flow into the production string, which could lessen ultimate recovery of the entire field. After five years of production, the field gas flow rates are exceed expectations, with no known sand control failures and each of the 34 HS-ICVs still fully operational.

(Reference SPE-187075-MS)



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