



Completion Solutions

SmartWell® System Collaboration Driving Success in Indonesia

Location: Jakarta, Indonesia

Overview

Collaboration was the key to success for a recent project in Jakarta, Indonesia, when two key Halliburton technologies helped a customer successfully complete its well and prompted significant interest in SmartWell® completion systems throughout Indonesia and the Asia Pacific Region.

Challenged with completing an offshore well located in a block characterized by large gas caps within several structures with relatively thin, and also thick, oil zones as well as strong water reservoirs immediately below the oil zone, Halliburton and the operator developed a solution that featured a SmartWell® Auto-Gas Lift (AGL) completion. Previously, the wells in this offshore field had been developed as conventional gas-lift completions that used gas supplied from outside the platform.

Solution

The application of Halliburton’s AGL system using intelligent well technology removed the capital equipment associated with conventional gas lift completions as well as the conventional downhole completion gas lift equipment. In developing the AGL system, some key challenges were considered. With an AGL intelligent well, production of the gas is uncertain and will change with time.

In addition, equipment specifications must be suitable for the range of performance of the gas and oil reservoir, the fluid composition and the reservoir pressures. The AGL interval control valve (ICV) system eliminates well intervention that would be required to adjust the port size when compared to the conventional gas lift mandrel that requires a slickline operation and shut-in of the well during the slickline operation.

Another notable technology used for this customer was the EquiFlow® inflow control device and Swellpacker® systems in the horizontal section of the well. The EquiFlow inflow control device helped to control the drawdown in the horizontal section, thereby delaying the onset of water production, and minimized the production of unwanted water once it reached the well.

The application of Swellpacker systems in SmartWell system completions has long been successful in achieving zonal isolation.

CHALLENGES	SOLUTIONS	RESULTS
Large gas caps with relatively thin, and also thick, oil zones	SmartWell® Auto-Gas Lift (AGL) system for control the gas cap required to produce the hydrocarbons	Reduce CAPEX , as a conventional gas lift infrastructure was eliminated
Strong water reservoirs immediately below the oil zone	EquiFlow inflow control device to delay the onset of water production and minimize the production of unwanted water	Maximize recovery by controlling reservoir uncertainty

However, the combination of the AGL ICV system and the inflow control device is believed to be the first such collaboration of its kind that features both passive and dynamic control of the reservoir(s) within the same completion.

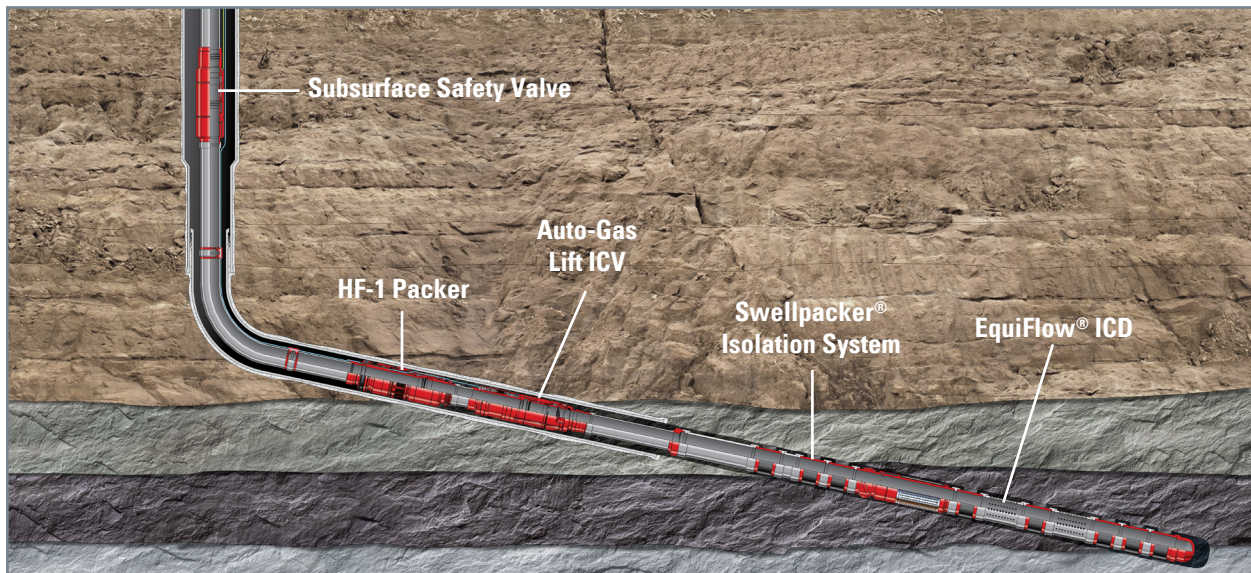
The system was used in a controlled process to commingle gas-cap production with the principal production from an oil reservoir. Doing so reduced the pressure of the hydrostatic head of the produced fluid, which allows the lighter commingled fluid to reach the surface at higher production rates and, ultimately, produce more oil.

Result

The customer received immediate value from this project because the gas energy was used instantly without having to wait for gas-lift infrastructure to be built, allowing the customer to benefit from early production as well as capital reduction.

The solution also helped the customer to exploit reserves and reduce the capital investment required for the platform to install and operate a legacy gas-lift operation. The elimination of the compressor package and subsea pipeline saved approximately \$20 million U.S. dollars. Furthermore, the additional oil production is around 200 barrels of oil per day, which is approximately 10 percent higher than with a conventional gas lift valve, because the ICV is capable of being installed in the deepest setting depth without being limited by the installation angle.

The AGL system has provided improved efficiency in optimizing all phases of the oil production for the gas cap oil reservoir by using an in-situ gas-lift system that does not require another artificial lift system. In addition, the reduction of intervention needs improves every aspect of safety.



Auto-Gas Lift System with Swellpacker® systems helps improve efficiency in optimizing all phases of oil production.

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