



MATURE FIELDS



UNCONVENTIONALS

Versatile Completion Results in 72% GOR Reduction Without Affecting Oil Production

HALLIBURTON DELIVERS THE MOST RELIABLE, COST-EFFECTIVE COMPLETION OVER THE COMPETITION

ALGERIA

CHALLENGES

- » Control gas/water breakthrough to enhance oil recovery in mature field
- » Provide reliable and cost-effective completion
- » Control well flow at minimum intervention cost

SOLUTIONS

Halliburton proposed a suite of Unconventional Completion solutions.

- » Swellpacker® systems
- » Mechanical RapidShift® sleeves with customized flow area (ports)

RESULTS

- » Achieved 100% zonal isolation and sleeve activation
- » Reduced GOR by 72%

OVERVIEW

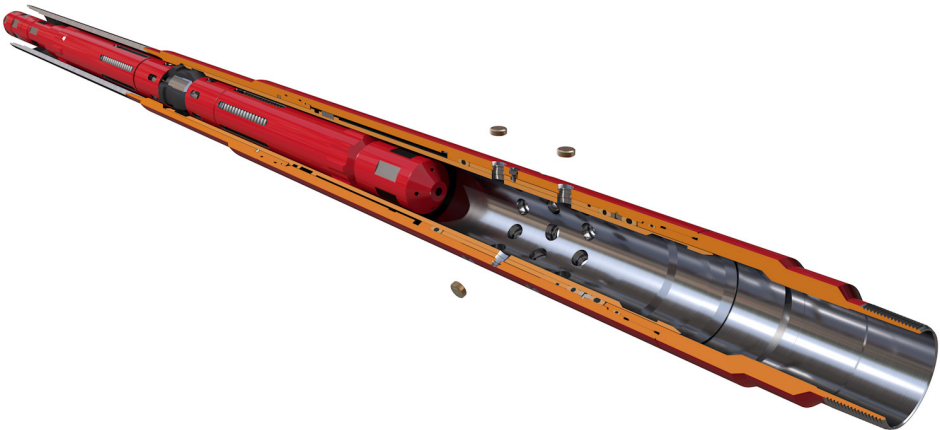
For an operator in Algeria, high gas breakthrough was creating significant issues, as gas inflow reduced oil production to the point of leading to well shut-in in some cases. Halliburton proposed an economical and functional completion that combined Swellpacker® isolation systems, mechanical RapidShift® sleeves, and a VersaFlex® expandable liner hanger to control gas inflow.

All sleeves were successfully operated in a single coiled-tubing trip. Subject well production suffered a noticeable reduction in gas/oil ratio (GOR) without affecting net oil production. Halliburton delivered a superior performance and cost-effective solution in a flawless operation, once again augmenting Halliburton prestige as the "execution company".

CHALLENGES

Gas/water breakthrough – a common issue in mature fields – was limiting oil production from an operator’s wells in Algeria. The required solution needed to be economically feasible for a mature field scenario, as well as reliable. The proposed solution must include field-proven zonal isolation with the ability to control the flow of each zone whenever needed, while also providing the option of intervention later on to help eliminate potential salts, scale, or asphaltenes buildup. The operator tried several technologies in order to find a solution, but none had the right combination of versatility, reliability, and cost.

GOR
72%
 Reduction



RapidShift® sleeve, shown in cross-section with running tool engaged. The flow ports are shown fully open with all the port plugs removed.

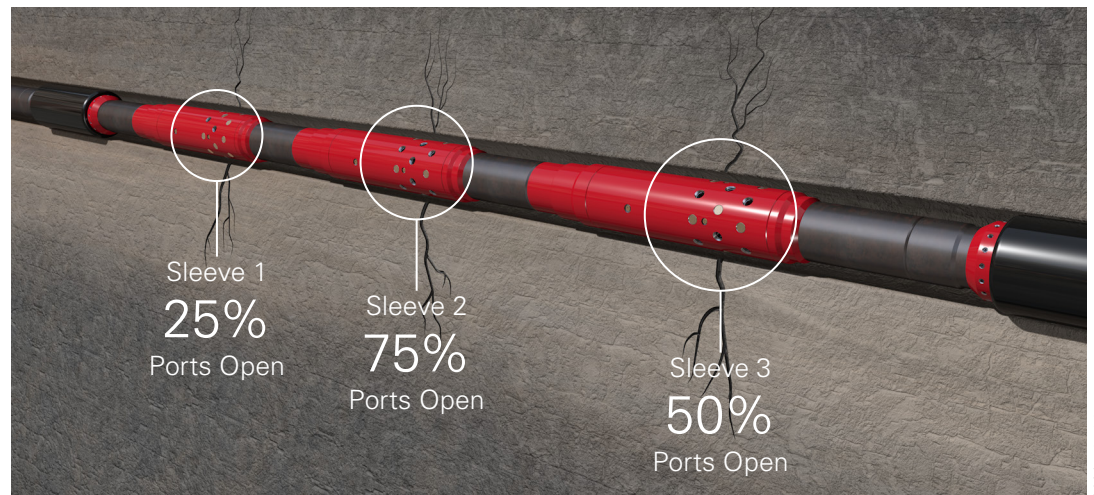
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Reducing GOR
lowered cost per
BOE



SOLUTIONS

Intelligent completions were initially considered so that the operator could remotely control each producing interval. However, the ability to stimulate the well later on would be severely limited. Halliburton proposed an effective and reliable completion that matched the operator’s expectations. Five 11-meter-long (36-foot-long) Swellpacker systems were proposed to ensure zonal isolation and compartmentalization. In order to control the flow of individual zones, three RapidShift sleeves were placed in every zone, all of them with different flow areas. This was achieved by plugging a different amount of ports on each sleeve. That way, in every single zone, there was a RapidShift sleeve with 25% of the ports open, a second RapidShift sleeve with 75% of the ports open, and a third one with 50% of the ports open.



Swellpacker® systems were used to isolate each zone. Three RapidShift® sleeves were used to straddle each zone with flow through each valve controlled by removing the port plugs prior to deployment.

By closing and opening specific sleeves within the compartment, the flow area or downhole choke could be adjusted. This method provided the customer with eight different choke positions by manipulating the sliding sleeves placed in a compartment interval.

RESULTS

Halliburton Unconventional Completion systems achieved 100% zonal isolation regardless of the harsh well conditions, and no quality or safety issues were faced during the deployment of the lower completion. After rig release, all of the mechanical RapidShift sleeves shifted open with the Halliburton coiled-tubing crew in a single run, providing a positive and clear opening indication at surface. The operator noticed that, despite the oil production remaining unaltered, the GOR was reduced by 72% with the proposed Halliburton solution, which:

- » Delivered superior quality and reliability performance over the competition
- » Achieved customer’s objective at minimum cost – 72% reduction in GOR without altering oil production
- » Involved no sensitive, costly equipment (screens or control lines)
- » Provided versatile solution that enabled later stimulation treatments to be placed in the required compartments/intervals.

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