

Completion Solutions

First intelligent completion in UAE field maximizes production and alleviates infrastructure constraints

Location: UAE, Middle East

Overview – This was the first intelligent completion in the United Arab Emirates (UAE) offshore field. The client was evaluating the technology and its economic benefits and how it could alleviate some of the infrastructure constraints, like limitation of well slots that it faced with offshore platforms. The pilot well-chosen was a single zone producer, subdivided into A1, A2 and A3. This well had potential to produce water from A3 without zonal control. Needless to say, the dynamic behavior of this reservoir was not completely understood.

Solution – A three zone intelligent completion utilizing direct hydraulics and a downhole control system was proposed. Two Halliburton multi-position HS interval control valves (ICVs) integrated with an Accu-Pulse™ valve positioning control module was used to control the problematic high permeable Zone A3, and to gather dynamic data from Zone B for appraisal. HF1 feed-through packers were used for production and zonal isolation, while permanent downhole ROC™ gauges provided real time monitoring of the reservoir data. Surface control panels and data acquisition panels were installed to control the ICVs and communicate with the downhole gauges.



CHALLENGES	SOLUTIONS	RESULTS
<ul style="list-style-type: none"> • Infrastructure constraints 	<ul style="list-style-type: none"> • Halliburton Intelligent Completions 	<ul style="list-style-type: none"> • Fewer wells for field development
<ul style="list-style-type: none"> • Comingling and controlled production from zones 	<ul style="list-style-type: none"> • HS-ICVs integrated with an Accu-Pulse™ valve positioning control module 	<ul style="list-style-type: none"> • Controlled high permeable zones and to gathered dynamic data for appraisal
<ul style="list-style-type: none"> • Maximizing production and ultimate recovery 	<ul style="list-style-type: none"> • HS-ICV and ROC™ gauges 	<ul style="list-style-type: none"> • Zonal monitoring and control

Result – The pilot intelligent completion well successfully passed the different stages of a project lifecycle; feasibility, execution and evaluation. Reservoir simulations were conducted to understand well life and, ultimately, recoverable hydrocarbons. Sensitivity analysis of the pilot well was done using Nodal analysis. Since this was the first intelligent completion deployment for the client, several discussions were held to finalize completions design, running procedure and testing. A detailed critical well review (CWR) was conducted prior to the completion, in order to ensure successful deployment. Production evaluation carried out post acid stimulation, showed outstanding performance of each zone and a commingled test of the three zones was able to achieve and sustain a target oil rate of 5,500 bopd.

Tremendous cost savings can be achieved when utilizing intelligent completions for commingled productions from multiple reservoir horizons, thus, requiring fewer wells for field development. This in turn, helps alleviate the infrastructure constrains. The success of the pilot intelligent completions has provided the client with the confidence to efficiently exploit their reservoirs in a multi-zone field. *Reference SPE 172166*