O&G Case Study - Flow

Challenge

Industry's first water shut off operation informed by Distributed Fiber Optic Sensing (DFOS) and LYTT's Hybrid Analytics

A week after initial start-up, an offshore high-rate oil producer equipped with Zonal flow control completion and fiber optic cables across the reservoir, started to produce water. This consequently had an adverse impact on the lifting performance and topside separation facilities. Water cut continued to increase over the proceeding months up to 75%, which stipulated the need for a water shut-off intervention.

Solution

LYTT's inflow profiling algorithm was used to identify the zones of water entry and inform the industry's first ever water shut off operation purely informed by fiber optic sensing (without intervention-based production logging). LYTT's inflow profiling application was used to answer four fundamental production monitoring questions as seen below:

- Where is the inflow coming from? – **Inflow detection**
- What is the phase of the inflowing fluid (Oil/water/gas) – **Phase Classification**
- How much of each fluid type is influxing? – **Relative rate allocation**
- When do they get produced? – **Dynamic and real time monitoring**

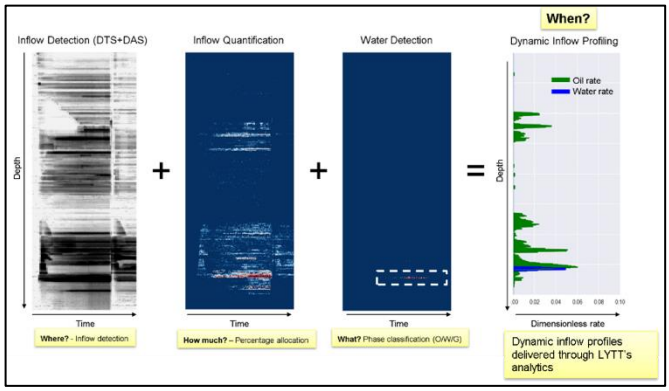
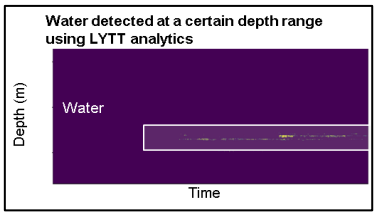


Figure showing inflow profiling application outputs with depth along the vertical axis, time along the horizontal axis and flow contributions across each of the producing intervals shown as a heat map.

Result

LYTT's inflow app detected water consistently being produced from a section in the reservoir.



LYTT's inflow profiling app showing location of water breakthrough

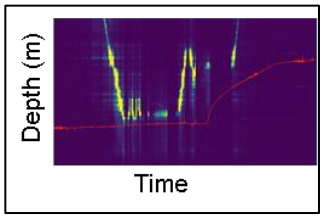


Figure showing the intervention operation as observed on DAS

A water shut off operation was conducted and the intervention job (the run in hole, holds at sleeve depths for closing of sleeves across the water producing zone, and pull out of hole) was monitored using the DAS measurements.

Value

The well was brought back into production post water shut-off and while the well experienced much higher drawdown pressures (~2 times its historical maximum). No water production was measured, as confirmed by the client, which validated LYTT's analytics. The well is currently producing significantly more oil than prior to remediation.

Visit

www.lytt.com

Contact

sales@lytt.com

Reference available on request