



Case Study:

FloSure™ Autonomous Inflow Control Device (AICD) installed to increase oil production in China

FloSure AICD successfully restores production and maintains well integrity for global operator in China

Well Data

Location: China - Asia Pacific

Well Type: Oil Producer - Sandstone

Installation Date: November 2014

Depth: 1700 - 1945m



Tendeka was asked to provide a solution that would reduce water cut from oil producers to allow increase in oil production rates and increase field recovery rates.

The Challenge

Wells producing from the field were typically producing with high water break-through early in their life. The existing wells in the field were completed with stand-alone screens where oil production was declining due to increase in water cut. The length of the well is relatively short and production is minimal (1000m³/d liquid) therefore a challenge for inflow control.

Tendeka's Solution

Tendeka's FloSure Autonomous Inflow Control Device (AICD) provides the ability to choke water in the producing zone based on the difference in viscosity between oil and water. The retrofit application consists of installing AICD subs within existing stand-alone screens along with packers for zonal isolation.

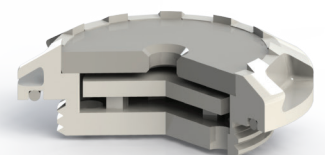
Project Results

Actual oil production indicates an increase of as much as 50% - 65% daily after AICD installation. Water cut was reduced from 95% prior to installation to 90% post installation resulting in a significant increase in oil production.

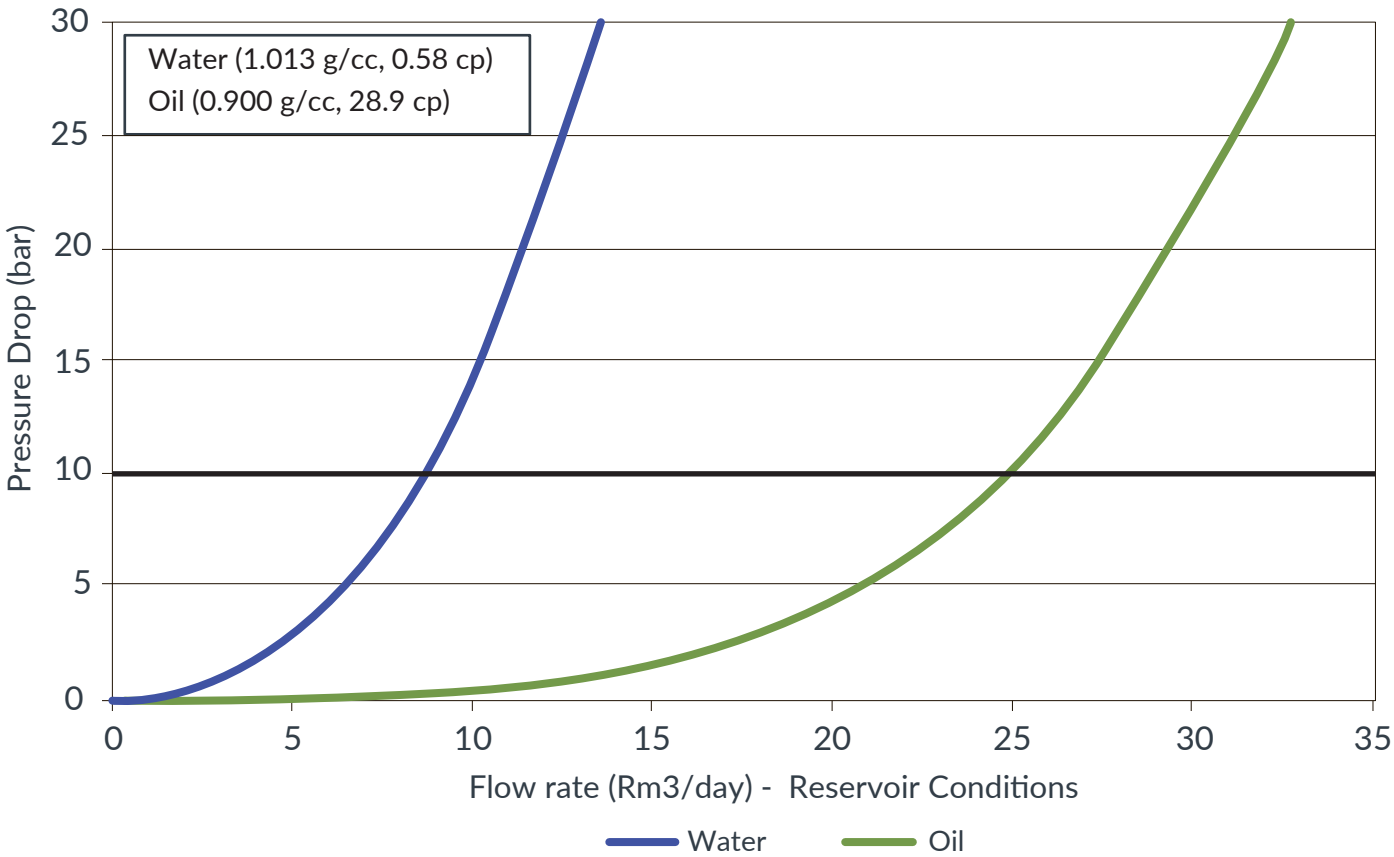
Retrofit solution

AICDs have been implemented in many brownfield wells as a retrofit solution after water cut typically reaches up to 96%.

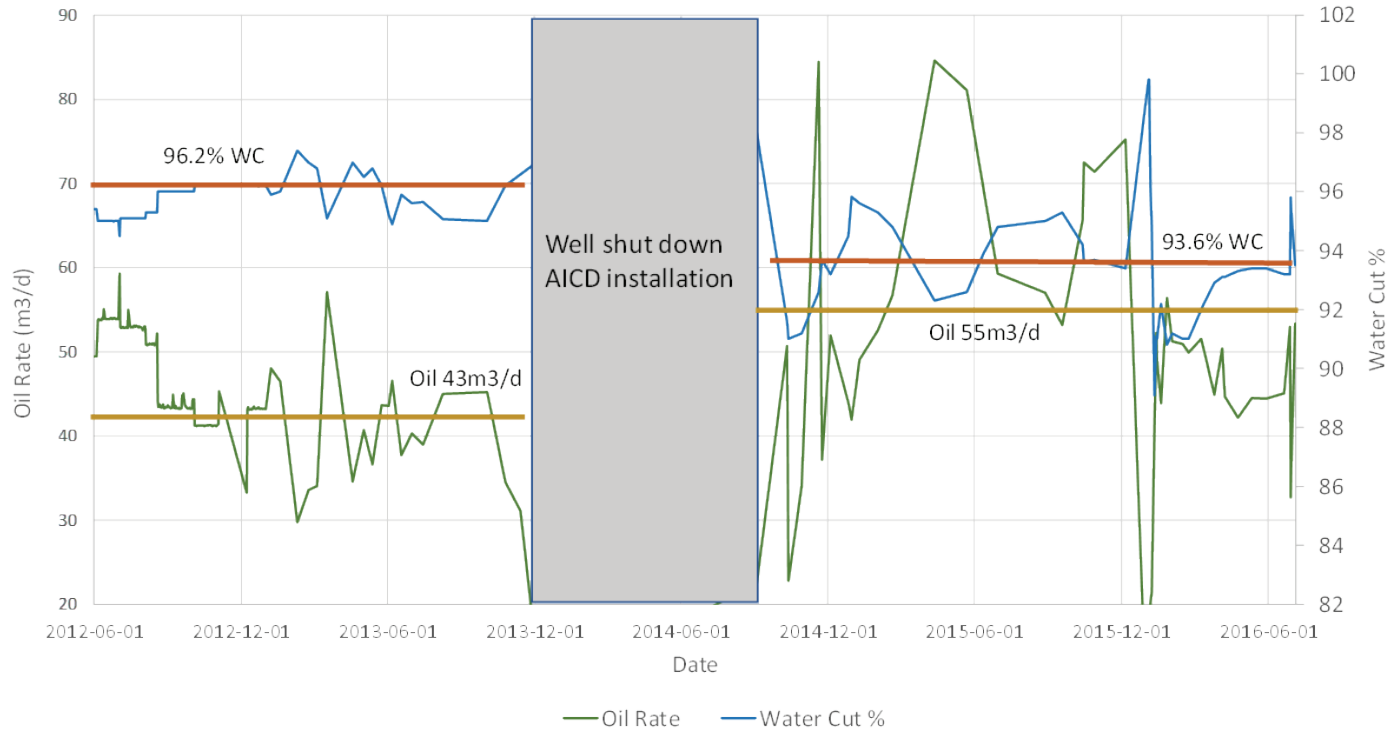
In China, one of the first AICD retrofit installations to control water cut in a heavy oil environment have shown a significant oil recovery, as shown in Figure 3. The results of the installation from 2014 have shown significant water cut reduction from average 96% water cut before AICD installation to around 93.6% water cut after AICD installation. This is a significant reduction of water cut for well that producing at 1000m³/day liquid rate. The water cut reduction have increase the oil production from 43m³/d to 55m³/d of oil production. The results of these wells have shown an increase of oil production for approximately 27% after installing AICD. Based on the positive results of these wells there have been many more well on the fields have been completed with AICD as retrofit solution or primary completion for new well.



FloSure Model "TR - 7" AICD Performance



Pressure drop versus flow rate for water and oil is plotted for visualisation of the mobility control imposed by the FloSure AICD. It illustrates flow rate through the valve increasing with 28cp oil compare to water. The mobility ratio between water and heavy is 2.5 times. This implies that water travels faster at similar pressure gradient compare to oil and lead to reduction in water flow at similar pressure drop.



- Improvement of oil production averaged from 43m³/d to 55m³/d ~ 20% to 30% Daily oil increments
- Reduction of water cut averaged from 96% WC to 93% WC ~ 5% WC% Reduction