

FA VALVE ENSURES U-TUBE PROTECTION AND DUAL BARRIER CRITERIA

CASE STUDY – WEST AFRICA – 2020

TCO FA Valve ensures U-tube protection and dual barrier criteria, and enabled chemical injection capability from first production in challenging offshore wells

CHALLENGE

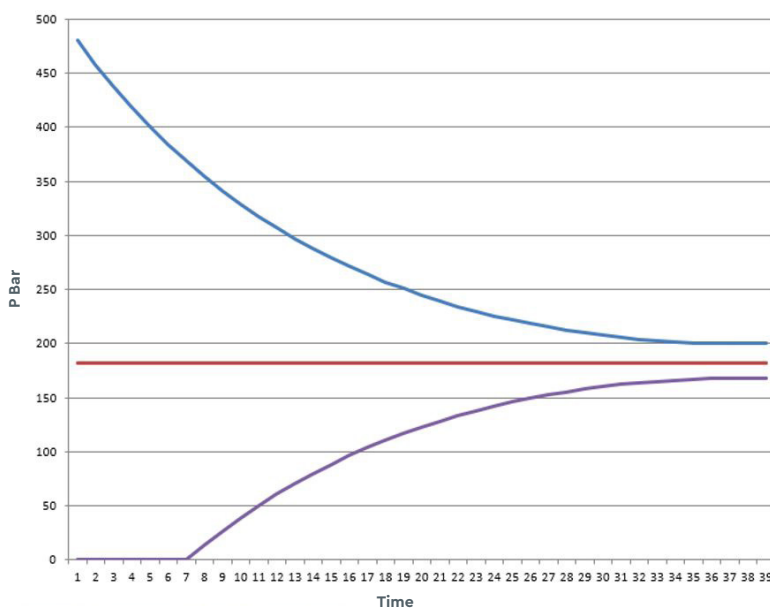
TCO were approached by a major operator and asked to deliver a dual mandrel system for the upper completion for scale inhibitor and asphaltene inhibitor injection. The operator had experienced issues during the first wells, where their conventional chemical injection valves were not supporting sufficient back-pressure to prevent control line U-tubing, and the valves were not meeting the dual check valve barrier criteria.

Another challenge was the operator's surface pump capacity, where the addition of conventional fixed back-pressure valves exceeded the capacity and did not allow for injection during initial production when reservoir pressures were high.

The client gave TCO a challenge, regarding well specifications and short deadline. TCO were able to meet the requirements and the challenge. Within 2 months from first contact with the operator, TCO's experienced field engineers delivered a successful installation offshore for the first well, marking the first Chemical Injection System for TCO to be run in West Africa.

PRODUCT

DOWNHOLE CHEMICAL INJECTION SYSTEM
- FA VALVE



SOLUTION

The TCO FA Valve was chosen to prevent U-tubing and provide the dual check valve barrier criteria, and to allow delivery of continuous injection for scale inhibitor and asphaltene inhibitor from first production.

2 FA Valves were placed in a deep-set dual chemical injection mandrel, below a series of gas lift valves and the down hole gauge.

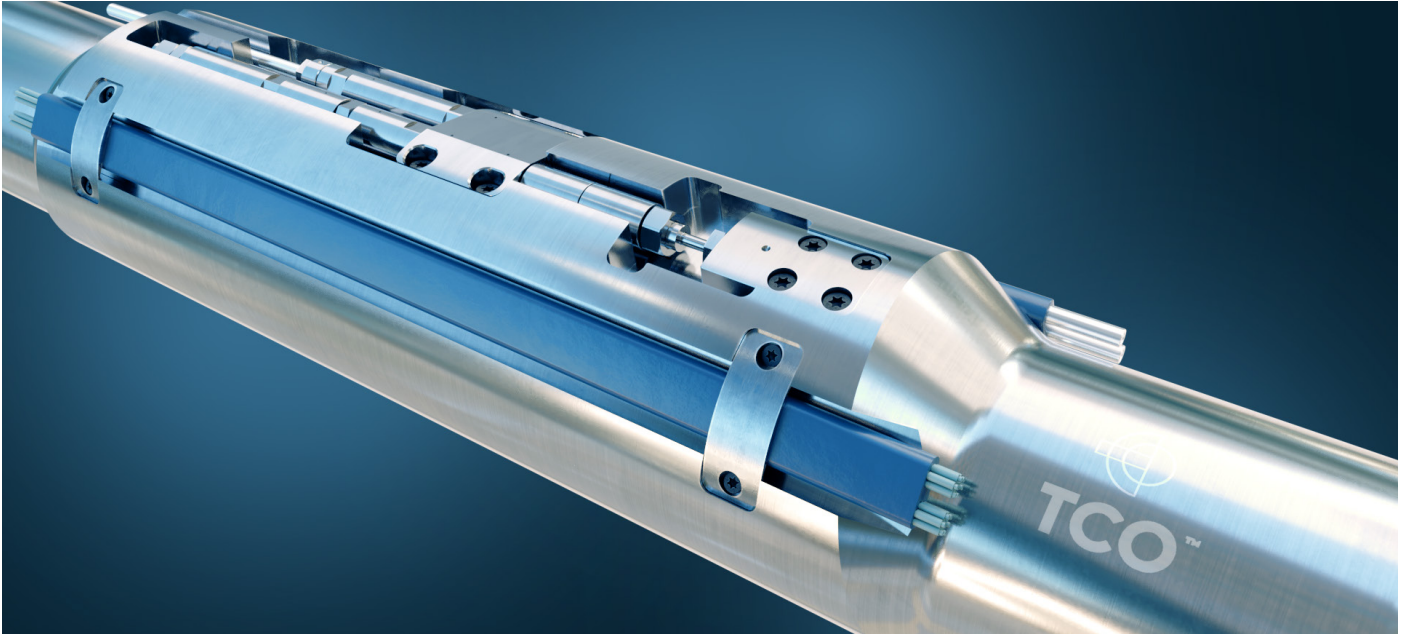
Figure 1 - Pressure profile for FA device in well

— Reservoir Pressure
— Surface Pump Injection Pressure
— Back Pressure Support FA Device

RESULT

Chemical injection capability was enabled from initial production, as the FA Valve remains passive during initial production when well pressures are high, and only activates once the well depletes and back-pressure support is required.

The FA Valves further secured the U-tube protection and the dual check-valve barrier criteria. The feedback from the operator after fist well installation was positive, and TCO were rewarded the remaining scope and successfully deployed the FA Valve and dual mandrel system for the 6 remaining production wells on the field.



WELL AND EQUIPMENT PARAMETER	VALUE
CIM Installation Depth TVD	3900m
Max Shut in Wellbore Pressure at CIM	480 bar
Temperature at Installation Depth	130°C
CIM Size and Material	4 1/2" #15.1 Super 13%Cr 110ksi
Injection Fluids	Scale Inhibitor 1.26sg & Xylene 0.90sg
Back-pressure Requirement Scale Inhibitor	490 bar
Back-pressure Requirement Xylene	340 bar
Control Line and Connections	3/8" Inc 825 – Testable TCO Fittings

CONTACT

If you have a challenge with your chemical injection system and need advice or expertise for a solution, please contact:

Robert Jay Abercrombie

Product Line Manager

E-mail: Robert.Abercrombie@tcogroup.com