

RESMAN tracers provide inflow assurance

Operator confirms completion integrity and zonal performance

Challenge

An operator wanted to confirm flow control valve functionality and ensure packer sealing integrity in two of the three monitored intervals of a subsea well. Due to an extensive well length (18000 feet) and a long tie-back (two miles), monitoring by well intervention was difficult.

Solution

RESMAN oil tracers (RES•OIL) with uniquely identifiable signatures were installed in two reservoir compartments (Fig. 1). The produced oil-phase was sampled, and tracers were analyzed to interpret the well performance.

Application

The RES•OIL systems were installed in purpose-built carriers on the outside of the production tubing. The carriers were run in hole without deviating from normal procedures and without additional rig time or extra personnel at the site. The well was initially produced from a lower zone (zone 3) that was not controlled by a smart valve. Zones 1 and 2 were controlled by smart valves that were closed for several hours. As Fig. 2 shows, no intelligent tracer molecules were present in the flow, thereby providing assurance the flow control valves and packers were performing as intended. The smart valve in Zone 2 was opened while the smart valve in Zone 1 remained closed. Analysis of intelligent tracer concentration revealed that: (a) the smart valve in Zone 2 successfully opened; (b) the mechanical packer between zones 1 and 2 continued to provide isolation and (c) the smart valve in zone 1 functioned properly and provided a seal. Subsequently, the smart valve in Zone 1 was opened. Analysis of the tracer concentration showed that the valve opened successfully.

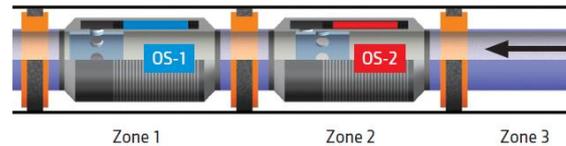


Fig 1: Completion schematics illustrating the RES•OIL systems installed in zone 1 and zone 2

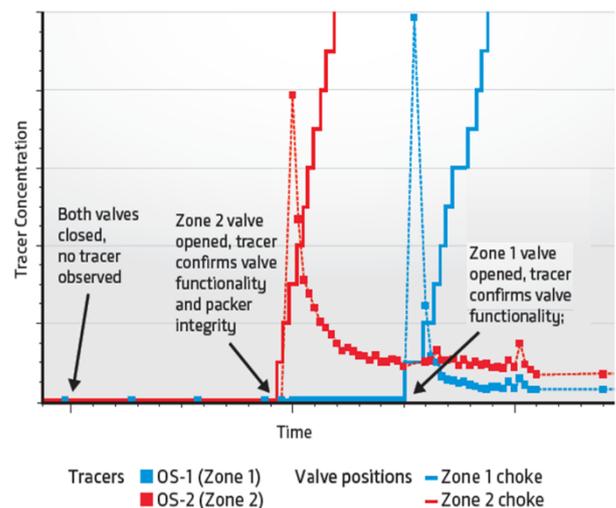


Fig 2: Tracer analysis observations confirmed packer integrity and that the two smart valves operated correctly.

Results

By using RESMAN, the operator was able to confirm the successful operation of the flow control valves and sealing integrity of the packers. In addition, quantitative analysis revealed that Zone 1 was a significantly better producer than Zone 2.

With an up to 10 years longevity, RESMAN tracer can be used periodically to confirm the integrity of completion equipment and to recalculate zonal inflow contribution without intervention into the well strategy.

MUST HAVE TECHNOLOGY TO UNDERSTAND YOUR WELL.

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