Fiber Optic Downhole Monitoring System

Survives High-Electric Submersible Pumping Vibrations, Unlocks DAS/DTS Data to Extend Lifespan

Objectives

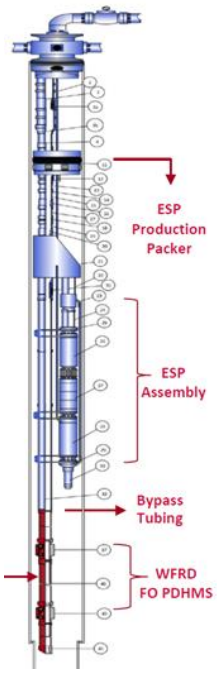
- Deliver a reliable, downhole reservoir monitoring system to survive electric submersible pumping (ESP) start-up and operation. Downhole monitoring efforts from other providers, such as electronic or quartz, failed due to excessive vibrations from ESP and electromagnetic interference (EMI) noise from ESP cable resulting in electronic data dropouts.
- Utilize fiber optic data to help with ESP health monitoring and preventative maintenance such as slug detection, ESP performance monitoring, and failure analysis potential.

Our Approach

- After an assessment of the project requirements, Weatherford experts proposed an in-country, fiber optic monitoring system with a proven record of reliability and backed by data from a gas well completion monitoring system.
- The fiber optic downhole monitoring system provides an intelligent solution to monitor conditions downhole to better optimize and increase production.
- Weatherford collaborated with an analytics partner to demonstrate the distributed acoustic sensing (DAS) and distributed temperature sensing (DTS) solution to the operator using data taken from the first well on the platform during flow tests.
- The results of the flow tests were corroborated with specific surface test results to confirm alignment.

Value to Customer

- The Weatherford fiber optic downhole monitoring system provided real-time reservoir pressure and temperature monitoring in a high-vibration environment offshore.
- The system allowed for reliable monitoring and analysis of the ESP performance to predict potential failure and identify failure modes as well as defer ESP workover by extending ESP life-sustaining production for longer periods.
- Given the successful viability during the ESP startup operation, the fiber optic system is expected to provide double the life over the current lifespan of 12-15 months in the region.



Completion schematic showing client/the customer's ESP packer and ESP assembly with the Weatherford fiber optic downhole monitoring system.

LOCATION
Middle East

WELL TYPE
Offshore

CASING SIZE AND TYPE
9 5/8-in. 40# L80

LINER SIZE AND TYPE
7-in. 26# L80

DEPTH
Liner Depth = 10,300 ft (3,139 m)
FO Gauge Depths = 5,500 and 5,300 ft (1,676 and 1,616 m)
ESP Depth = 5,100 ft (1,554 m)
ESP Packer Depth = 5,000 ft (1,524 m)
TRSSSV Depth = 300 ft (91 m)

PRODUCTS/SERVICES
- Reservoir Monitoring System
- Fiber Optic Downhole Monitoring System
- Distributed Sensing (DTS/DAS)

