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Mature offshore heavy oil field development utilizing pioneer intervention method: case study in Egypt

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A pioneer coiled tubing methodology applied to overcome production-logging challenges in mature viscous and heavy oil reservoirs drilled by horizontal/deviated wells in order to determine flow profile and zonal phase contribution to maximize the productivity from the current wells. A combination of high deviation, viscous and heavy oil was almost restricting conventional intervention in these wells especially in flowing condition which affected the recovery of the field. A long history of unsuccessful intervention operations is recorded when conventional logging operations are restricted due to such friction forces. Smart E-coil (coiled tubing with mono conductor cable) was used to deploy the production logging tools (PLT and Pulse Neutron log) also to perform perforation moreover it has the capability to perform conventional coiled tubing applications as well. Shut-in and flowing surveys were performed to identify water saturation, zonal contribution, and water entry zones. The data acquired using Smart E-coil provided the zonal contribution and water saturation profile, which resulted in a clear vision to take, have better reservoir management and ways to improve field recovery. GUPCO utilized E-Spectrum as the first time in Egypt, Middle East and offshore globally, 27 successful runs in six wells were done using single reel and single power pack unit also. More than 20 days working in sour wells with adequate corrosion protection finally added 2000 BOPD and Saved \$ 1.6 MM (34% of the budget).

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