Heavy Oil Drilling Solution Highlights Potential in Eastern Europe

Case study: SAGD success in challenging environment

Challenge
Without local drilling experience, pinpoint pilot SAGD* steam assisted gravity drainage wells in a remote field crisscrossed by tunnels left from oil-mining operations.

Solution
Schlumberger Integrated Project Management (IPM) expertise in well construction under severe conditions. Specialized technologies, products, services for recovery of heavy oil.

Results
Cost-effective heavy oil production proved feasibility of recovery through SAGD techniques. The operator plans more SAGD wells for this area.

Heavy oil reservoir requires unconventional technique
Oil mining was the standard method of recovery in this region of eastern Europe, but was no longer economical. With oil viscosity at 12,000 cp and gravity at 17° API, SAGD was a production option but had never been tried. The operator knew that advanced technologies would be essential to determining the feasibility of this alternative means of recovery.

SAGD well construction presented multiple well engineering issues: 300-m horizontal sections at a TVD of 228 m, temperatures approaching 250 degC, high stresses on the cement, and the need for specialized equipment and materials. The target was fine quartz sandstone, 18-m thick at a depth of 219 m. Mine tunnels greatly increased the risk of washouts and sidetracking.

The operator selected IPM for the project because of its global reputation for planning and executing well construction under severe conditions and its expertise in advanced oilfield service technologies.

SAGD pilot delivers cost-effective production
IPM used specialized tools and processes for this unconventional job. The results over the entire project were two days cut from the drilling plan and more than half a million dollars saved through other efficiencies.

Despite the mining tunnels, a ranging tool enabled precise placement of the horizontal sections of the injector and producer wells—within 5±1 m of each other.

The risk of washouts in the soft, tunneled formation was reduced by using the E-Pulse* electromagnetic telemetry tool, which transmitted data to surface without drillpipe circulation and at faster rates than other methods.

Advanced FlexSTONE* cement was selected because its design provides the flexibility to withstand the stresses and high temperatures of thermal production cycles. A good bond is essential to maintain long-term zonal isolation, which is crucial to the success of an SAGD well.

Drilling with water instead of mud optimized cementing procedures, and other efficiencies saved more than USD 500,000 versus plan. Additional SAGD wells are being planned because of the successful pilot.

E-mail ipm@slb.com or contact your local Schlumberger representative to learn more.