Challenge
Complete shallow horizontal well in difficult drilling environment.

Solution
Directional drilling using PowerPak* steerable motors and real-time measurements from SlimPulse* retrievable MWD service.

Results
Drilled smooth wellbore, which eased completion of the well. Achieved oil production target within 3 days.

The smooth wellbore achieved with the PowerPak motors through good drilling practices and real-time monitoring allowed successful completion of the shallow Suplac H2E well.

Evaluate shallow reservoir
OMV Petrom faced a number of challenges in Suplac H2E, the third and final well of a horizontal drilling campaign to evaluate the feasibility of producing heavy oil from a shallow reservoir in Suplac field in northwestern Romania. The reservoir is located on a shallow monocline structure, sealed by a major fault in the east-west direction, and the zone of interest—the Pannonian—is categorized into Pannonian 1 and Pannonian 2, both of which were expected to be difficult to drill.

Pannonian 1—composed of poorly consolidated sands saturated with viscous oil—is 25 to 30 m thick in the western part of the structure and decreases toward the southeast, while Pannonian 2—composed of conglomerates, microconglomerate, coarse sands, and marls—develops discontinuously over the structure. To add to the challenge, the well plan called for drilling close to the reservoir boundary, and zones of total losses were likely to be encountered.

Optimize well trajectory
Schlumberger helped OMV Petrom overcome the drilling challenges—and achieve its target production rate in Suplac H2E—with directional drilling using PowerPak steerable motors and real-time direction and inclination, gamma ray, and shock and vibration measurements from SlimPulse retrievable MWD service. The well’s 12½-in section was kicked off from vertical and landed at an inclination of 90.57° at 200.35 m TVD and 300 m MD. To counter formation effects, a sidetrack was successfully performed at 330 m MD and 200.93 m TVD.

Following the injection of 1,000 m³ of steam into the 300-m drain, the Suplac H2E well reached its target oil production rate of 50 m³/d in only 3 days.

<table>
<thead>
<tr>
<th>Day</th>
<th>Oil (m³)</th>
<th>Water (m³)</th>
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</thead>
<tbody>
<tr>
<td>Day 1</td>
<td>20</td>
<td>50</td>
</tr>
<tr>
<td>Day 2</td>
<td>40</td>
<td>60</td>
</tr>
<tr>
<td>Day 3</td>
<td>50</td>
<td>70</td>
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</tbody>
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Production volume, m³
CASE STUDY: PowerPak motors and SlimPulse MWD help OMV Petrom complete horizontal well in challenging Suplac field

Sidetracks were performed to counter formation effects and optimize the trajectory of Suplac H2E.

Three additional sidetracks were successfully performed to optimize the well’s trajectory. Flow rate control and monitoring of circulation duration allowed the drilling team to steer the well in softer sands. In the 8½-in horizontal drain section, the PowerPak motor’s bent housing was set at a 1.59° angle to counter formation effects on directional control. Diligent monitoring of real-time measurements enabled the team to take appropriate measures to control mud losses, maintain well control, and avoid the risk of losing the drilling assembly while steering close to the edge of the reservoir.

Achieve oil production target in 3 days
The smooth wellbore achieved with the PowerPak motors through proper drilling practices and real-time monitoring enabled successful completion of the shallow Suplac H2E well. Following the injection of 1,000 m³ of steam into the 300-m drain, the well reached its target oil production rate of 50 m³/d in only 3 days.

Contact your local Schlumberger representative to learn more.

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