

Case study: Mexico

BRIDGEFORM provided innovative alternative for wellbore strengthening

The Tsimin-Xux oil field off the coast of Mexico presents a number of technical challenges due its complex formations and high-pressure, high-temperature (HP/HT) environment (more than 10,000 psi [68,947 kPa] and 340°F [171°C]). The narrow mud window through the wellbore and the low-pressure, high-permeability sandstone and shale layers required help to reduce pore pressure, improve lubricity, and maintain borehole stability.

In the initial stage of the project, a 26-in. section of the Tsimin 74 well was drilled from 656 to 3,609 ft (200 to 1100 m) with a potassium chloride polymer water-based mud (WBM). The last 492 ft (150 m) of the section crossed a low-pressure, high-permeability sandstone that caused significant problems.

The overbalances ranged from 350 to 3200 psi. The operator increased the weight of the WBM used, added an oil-based lubricant, and used calcium carbonate to bridge, provide borehole

stability, reduce torque and drag, and reduce differential pressure in the formations. The results, however, were poor. Several 20-in. casings became stuck, and the increase in mud weight increased pressure, resulting in fluid losses.

Baker Hughes delivered its **BRIDGEFORM™ single-sack wellbore strengthening system** as an innovative alternative to provide lubricity, reduce pore pressure, and reduce mud losses. The BRIDGEFORM pill was placed from 2,953 to 3609 ft (900 to 1100 m) before successfully running 20-in. casing in record time. The cementing was accomplished according to the original program and the low-pressure zone was isolated without problems.

The BRIDGEFORM system addressed the issues associated with pore pressure transmission and borehole instability and provided significant technical, logistical, and economic advantages.

Challenges

- Offshore field included complex formations and a narrow mud window
- Low-pressure, high-permeability sandstone that caused
 - Bad quality cementing due to mud losses
 - Casing differential sticking problems
 - Poor shoe integrity

Results

- Cemented casing at total depth as planned
- Sealed low-pressure sands successfully
- Avoided fluid losses during cementing
- Improved offshore logistics