Operator Drills Offshore Exploratory Well in Unstable Formation and HPHT Environment

INNOVERT® FLUID SYSTEM WITH SPECIALIZED CHEMICAL PACKAGE PROVIDED SUPERIOR CAPABILITIES TO WITHSTAND 416°F (213°C) BOTTOMHOLE TEMPERATURE

CHALLENGE
- Maintain wellbore stability in carbonate, sandstone, and siltstone formation
- Limit High Pressure High Temperature (HPHT) fluid loss to less than 3 ml while drilling with BHT of 416°F
- Prevent barite sag while logging
- Achieve required mud properties with effective chemical treatment plan
- Minimize NPT

SOLUTION
Halliburton Baroid implemented an engineered solution, centering around the INNOVERT® fluid system, including:
- Chemicals with higher thermal stability – to overcome the elevated BHT
- BaraFLC®-IE 513 high-temperature fluid loss control agent – to minimize filtrate invasion and differential stuck pipe events
- TAU-MOD® viscosifier – to improve suspension and minimize filtration into the rock matrix
- Management of chemical concentrations – to eliminate overtreatment and achieve target properties

RESULTS
- Provided fluid stability at 416°F with no thermal degradation
- Kept HPHT fluid loss below 3 ml, as required
- Experienced no wellbore issues while drilling and tripping
- Conducted three days of logging without any recorded barite sag
- Required no additional time to condition fluid after logging phase
- Avoided reduction in mud weight and/or modification in mud specifications
- Reduced chemical mixing time
- Lessened amount of chemical stock due to reduced fluid treatment

RESULTS
- The INNOVERT fluid system and high-temperature chemical package was the right solution, as it enabled vertical drilling of the well to a total depth of 19,050 ft MD without any downhole problems or NPT. The capability of the fluid system to overcome all the well challenges was translated into a saving of three days and USD 450k. Some specific accomplishments of this project were:
  » The clay-free, non-aqueous fluid (NAF) delivered low ECD, which led to improving the drilling parameters and reaching the reservoir safely in less time.
  » The improved suspension package delivered superior sag prevention over an extended period of time, which allowed the operator to perform the logging phase without additional conditioning trips.
  » The chemical package, compared to conventional NAFs, reduced fluid treatment amount and, consequently, lowered cost.