

Importance of Solubility and Bubble Pressure Models to Predict Pressure of Nitrified Oil Based Drilling Fluid in Dual Gradient Drilling

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Abstract : Gas-lift dual gradient drilling is a solution for deepwater drilling challenges. As well, Continuous development of drilling technology leads to increase employment of mineral oil based drilling fluids and synthetic-based drilling fluids, which have adequate characteristics such as: high rate of penetration, lubricity, shale inhibition and low toxicity. The paper discusses utilization of nitrified mineral oil base drilling for deepwater drilling and for more accurate prediction of pressure in DGD at marine riser, solubility and bubble pressure were considered in steady state hydraulic model. The Standing bubble pressure and solubility correlations, and two models which were acquired from experimental determination were applied in hydraulic model. The effect of the black oil correlations, and new solubility and bubble pressure models was evaluated on the PVT parameters such as oil formation volume factor, density, viscosity, volumetric flow rate. Eventually, the consequent simulated pressure profile due to these models was presented.

Keywords : solubility, bubble pressure, gas-lift dual gradient drilling, steady state hydraulic model

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