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Study on gas hydrate blocking mechanism and precaution in well-bore of deep water drilling

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When natural gas reservoir is broached, gas hydrate is easy to assemble on throttle fill up line, marine riser, blow-out preventer and well head in sea floor etc., which bring great affection to petroleum exploration drilling in deep water. For this reason, study on the blocking mechanism of hydrate in annular of deep water drilling pit shaft, and advisable prevention bring important and profound sense to deep-water exploration drilling in future. When gas influx happens during deep-water drilling, most researchers thought the hydrate could be formed due to the high pressure, low temperature and predicted the formation area. However, it is wrong during the deep-water drilling according to the real gas kick conditions. The kinetics of gas hydrate should also be considered, such as the hydrate formation time. In generation, when the pressure and temperature of hydrate formation is reached, the generation speed is slow. There will be nucleation and growth. During this process, the fluid which may form the hydrate has flowed out of the well-bore and the blocking will not happen. Based on the gas liquid two phase flow in wellbore annuli, the gas hydrate formation and blocking mechanism are studied. The hydrate formation models are established based on the PVT equation, the flash theory, multiphase flow theory and kinetic theory. The effects of flow pattern, fluid velocity, the gas fraction are considered. Then the gas hydrate formation and blocking area are predicted.

Biography

Xiangfang Li completed his Phd and working as a professor in College of Petroleum Engineering from China University of Petroleum, China.

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