Method to Maximize Liquid Oil Production in Shale Gas Condensate Reservoirs

Currently, the standard practice to produce a conventional (high-permeability) gas condensate, is to inject gas and/or water to flood the gas condensate while maintaining the lower bottom-hole flowing pressure above the dew point pressure. However, keeping the flowing pressure above the dew point results in a lower pressure difference between the reservoir and the flowing pressure which negatively impacts oil recovery. Additionally, since formation permeability is low in shale and tight reservoirs, a flooding technique is not feasible because the pressure drop from an injector to a producer is large.

The disclosed technology proposes a solution to these problems that involves a ‘Huff-n-Puff’ gas injection mode while maintaining flowing bottom-hole pressure lower than the dew point pressure. This ensures a maximum liquid oil offtake and production while ensuring that the phenomenon of retrograde condensate does not occur through huff-n-puff gas injection.

Market Applications:

The technology would apply to the oil industry. Specifically, this technology would be of interest to any operating or drilling company wanting to maximize liquid oil production from shale reservoirs.

Features, Benefits, & Advantages:

• Maximum oil production rate
• Maximum liquid oil offtake
• Alternative to the gas or water flooding methods that are not feasible for the low permeability shale reservoirs
Development Stage:

Detailed simulations have been conducted to prove that this injection process works.

Inventors

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Dr. Sheng's research interests include Enhanced Oil Recovery, Development of unconventional resources, Well-Testing Analysis, Reservoir Simulation, Reservoir Management