Hydraulic Fracturing Designs For Low Permeability Gas Condensate Reservoirs Having Lean and Rich Condensate Compositions

Karanthakarn Mekmok
Department of Mining and Petroleum Engineering
Chulalongkorn University
Bangkok, Thailand
Karanthakarn.m@gmail.com

Jirawat Chewaroungroaj
Department of Mining and Petroleum Engineering
Chulalongkorn University
Bangkok, Thailand
jirawat.c@chula.ac.th

***Abstract*— Gas condensate reservoirs have been challenging many researchers in petroleum industry for decades because of their complexities in flow behavior. After dew point pressure is reached, gas condensate will drop liquid out and increase liquid saturation near wellbore vicinity called condensate banking or condensate blockage. Hydraulic fracturing in horizontal direction has been proved to be a reliable method to mitigate condensate blockage and increase productivity of gas condensate well by means of pressure redistribution in the near wellbore vicinity. In this paper the parameters of dimensionless fracture conductivity and Stimulated Reservoir Volume (SRV) designs of lean and rich condensate compositions are studied. Well productivity and saturation profile of each design had been observed. The results from this study indicate that the higher dimensionless fracture conductivity gives the higher well productivity in every studied parameter in lean condensate composition. However, in rich condensate composition shows different trend of results because it has higher heavy ends (C_{7+}) that drop into liquid easier once pressure falls below dew point pressure. The maximum number of fracture and fracture permeability can be recognized in the study of rich condensate. In the study of SRV indicates that number of fracture is superior to fracture width in both gas and condensate productivity. Moreover, performing hydraulic fracturing can decrease pressure drawdown, production time and liquid dropout which leads to the mitigation of condensate banking near wellbore that can be recognized in the study of condensate saturation profile.**

***Index Terms*—Hydraulic fracturing, Horizontal well, Low permeability gas condensate reservoir, Condensate blockage**

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