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Joint Stimulation-Water Shut-off Technologies Lead to Extra Oil from Mature Fields

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Abstract

There are number of challenges encountered in oil production of mature, depleted fields like naturally/hydraulically fractured complex reservoirs. These include production under high water cut ranging from 80 to 99%, the presence of conductive fractures connected to the aquifer in the producing zones, multi-zone production and reservoir heterogeneities encountered in each zone.

Conventional stimulation at such reservoir conditions is rather questionable, showing no economic value and exhibits very high risk of losing the remaining oil production with unwanted, further increased water production. However, stimulation combined water control gives good opportunity for recovering extra oil using hydrophobic chains containing associative polymer.

The polymer adsorption has double roles during and after the reservoir stimulation acting as an acid diverter/fluid leak-off controlling additive plus water control agent as relative permeability modifier. In fractured producing zones, this combined method shows lower risk and better potential than in those zones where matrix flow exists only.

In summary, this presentation will cover the theory behind the above-mentioned method, candidate selection, case histories and the results.