TG08

New Methodology of Mini-Fall-Off Test to Optimize Hydraulic Fracturing in Unconventional Reservoirs

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SUMMARY

Operative and economical optimization of hydraulic fracture stimulation designs requires accurate reservoir description.

For unconventional tight gas reservoirs it is commonly difficult to obtain reliable results from conventional build up analysis after flow testing a well because the time required to reach the IARF (Infinite Acting Radial Flow) could be much longer than normal rig time operations will practically allow. In many cases the impossibility of the well to produce after perforation makes the scenario even worst.

Mini-Fall-Off injection test is economical and efficient technical solution to solve this problem providing an excellent starting point to understand unconventional plays and optimize the entire process of hydraulic fracturing technique.

The scope of this work is to present an optimal operative processes which will allow understanding how, when and where it is recommended to apply this technology with the objective to optimize the hydraulic fracture stimulation. Following a theoretical description of this new methodology, several field applications studies in oil and gas fields are provided.

In addition, this work includes a detailed guideline for planning execution and interpretation of the falloff pressure to obtain reliable reservoir transmissibility, reservoir pressure and closure pressure.

Finally, the results of two cases were evaluated and it was determined that a simple field implementation could be adopted as a standard to be used in conventional pre-frac pumping procedures.