

Hydraulic Fracture Modeling and the Road to Prediction-A Finite Element Approach

Jason Pitcher

Cameron

Abstract

In unconventional play development programs the concept of a resource or statistical play is used to define production success or failure for a field rather than individual well performance. A complex challenge in is the predictability of any single well in the program, with statistical variation of production being an accepted facet in the development program.

A potential solution to the problem is to use a combination of a first principles approach in combination with a data driven model. A calibrated model representing all relevant anisotropic reservoir conditions (deformation, stress, strength) and the hydraulic stimulation mechanism is used to test changes to the design of the well and the completion in the virtual environment. This approach attempts to integrate many discrete datasets to eliminate uncertainty.

The methodology used, data requirements, pitfalls and successes of this solution are discussed and examples of the predictability of this approach that have recently been published, with the impact on EUR, are examined.