450 Voyager OH System

Hybrid system reduces frac time, chemical costs

Background

One of the major operators in the Western Canadian Sedimentary Basin tasked NOV with deriving a method of uniquely optimizing our Voyager™ open hole (OH) frac system in the Montney formation. More specifically they wished to reduce the pressure losses when deploying ball seats in a typical Montney Formation fracture stimulation. Our engineering team worked with the client to come up with a strategy to save them money on their completions. We used shared knowledge of the customer's completion design to improve the efficiency of future projects.

Solution

A hybrid approach combining our 6,000-psi seats with a range of the 8,000-psi seats was chosen as the best solution. The selection of the number of 6,000- and 8,000-psi seats was done by analyzing each stage's individual pressures, frac gradient, and pressure losses at rate. Working with the client, we used our pressure loss analysis to de-risk this operation. Each proposed hybrid well was looked at on a individual-well basis to ensure the pressure assumptions we made in our modeling was valid as compared to the actual as-pumped results. Those results were then used to calibrate the modeling for future installations.

Challenges

The main challenge was to achieve maximum flow rate as soon as possible by optimizing the seat design to reduce pumping time, reduce chemical dependency, and reduce pumping horse power. Additionally, when creating the system, maintaining open lines of communication is required with the customer to ensure a successful arrangement is selected. Operational success relies heavily on everyone in our organization working together to provide a high level of service, especially when deploying non-standard product offering unique to our clients needs.

Results

- Hybrid system generated a more efficient system and ultimately saved the client money
- Higher pump rates and lower friction reducing chemical costs, reduced the overall stimulation costs amounting to dramatic savings in each well where deployed