Retrofit Solution to Reduce Over Injection of Chemicals

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Background

Most oil and gas wells feature some sort of chemical injection, whether it is corrosion inhibitor, wax solvent, or methanol. The existing chemical injection pumps installed on wells throughout North America and around the world have a number of different problems which are costing producers tens of thousands of dollars per well per year.

The most common problem is over injection. Most fuel gas injection pumps cannot deliver injection rates below 5 L/day without stalling. For wells that require a lesser rate, the pump is left injecting at 5L/day or higher anyway. This is done to ensure that the pump will continue to run, but the drawback is that chemical is simply wasted.

When it comes to higher rate applications such as methanol injection, the problem is that the pumps are typically set to a constant rate based on an anticipated low temperature. When the temperature rises, the injection rate is not reduced, wasting methanol. The temperature fluctuations in Alberta can be frequent enough that is just isn't possible for operators to visit the site often enough to continuously adjust the rates up and down. The easy solution is to just leave the pump set to inject at a rate that will ensure proper operation of the well at a much colder temperature.

There are lower rate solar systems available on the market today that address some of these issues. The biggest issue with these systems is that they simply slow down the injection of chemical, often to the point where chemical is only being injected every 20 or 30 minutes. This leads to chemical that becomes stagnant, which can plug up lines, leading to higher maintenance costs. In addition, this causes long periods of time where no chemical is being injected into the well. They simply cannot achieve the constant injection that is required.

Abstract

Extreme Telematics Corp., leaders in reliable electronics for plunger lift has partnered with Voodoo Injection Management to bring a revolutionary new idea to chemical injection. The Voodoo Injection Management System works with any existing chemical injection pump to reduce chemical costs and provide the ability to remotely manage your pump.

With the Voodoo Injection Management Controller you set the pump where it operates best and leave it there. This eliminates the need for constant adjustments to the trim on the pump and prevents the pump from stalling at low rates. This rate along with a target rate is entered into the controller and it does the work required to achieve the target rate.

The patent pending algorithm in the controller uses a combination of well pressure, build time, pump rate, and target rate to determine how long to inject during a given cycle. When not injecting, a motor valve is actuated, allowing the chemical to recycle instead of simply stopping the flow of the chemical. Because the cycle time is limited to 2 minutes, your well doesn't go long periods without seeing any chemical. Also, because the system recycles, this means that the tank is constantly rolling over and the chemical in the lines remains fresh. This prevents the chemical from becoming stagnant, reducing the amount of maintenance required.

The Voodoo Injection Management controller can also reduce the amount chemical used at different temperatures. Simply enable the temperature optimization and the target injection rate is automatically adjusted up and down based on the current temperature. The temperature can be read by an onboard temperature sensor or it can be provided by a connected SCADA system. This allows chemicals such as methanol to be greatly reduced if the temperature increases temporarily in the middle of winter.

Connecting the Voodoo Injection Management Controller to a SCADA system has a number of other benefits. All parameters can be viewed and changed remotely, avoiding costly site visits. Also, history information is remotely accessible, allowing the operator to see how long the controller has been injecting or recycling in a given day. The addition of a pressure sensor allows the operator to see the pump working. The line pressure climbs up to process pressure as the chemical is pumped into the well indicating the pump is doing its job and chemical is actually making its way into the well.

This solution is easily implemented on any well with any chemical and translates to instant savings. As we continue to work with producers to roll out this solution, more enhancements are being made all the time to work with different types of valves, provide more optimization modes, and provide more reporting and monitoring options.