CASE HISTORY CH-0165

ULTRAFAB™ SOLUTION PREVENTS GATHERING SYSTEM SHUT-IN

SITUATION

H_2S removal in North America has historically been managed using large amine facilities or, in cases of lower H2S concentrations, by injecting H_2S scavenger directly into the pipeline to keep gas within specification. In recent years, unconventional shale gas plays throughout North America have changed the face of gas production with their prolific reserves and productivity. One challenge that has emerged with these unconventional gas wells is the high concentrations of H_2S being produced in traditionally sweet gas producing provinces.

CHALLENGE

Historically, H_2S has not been a major issue for operators working in the Haynesville region gas fields of Louisiana and Texas. "Sweet" gathering systems in the area have been designed to meet a 4 ppm H_2S concentration specification in some areas; 16 ppm in others. Operators have historically used inline injection methods to effectively remove nominal H_2S concentrations. However, as unconventional gas wells with higher production rates and higher H_2S concentrations began coming online, producers discovered that inline treatment was ineffective.

In this particular situation, the operator used inline injection to treat an unconventional well in the Haynesville producing gas at a high flow rate with more than 400 ppm H_2S. The operator injected uneconomically large volumes of chemical scavenger, but even reducing well flow rate by 50% could not come close to meeting the local H_2S concentration limit. When inline injection failed to effectively reduce H_2S concentration, the entire leg of the gathering system had to be shut-in, adversely affecting all other producers in the area. The operator wanted to treat sour gas produced by the subject well to below the H_2S specification of 8 ppm and also produce the well at full flow rate. Reducing chemical costs, operating costs and downtime while successfully increasing the gas production rate were mandatory objectives.

Initial Operating Conditions at the Well

- Flow Rate: 7 MMscfd
- Pressure: 900 psig
- Temperature: 120 °F
- Outlet H_2S: 120 ppm (best case)

SOLUTION

UltraFab Flooded H_2S Removal Systems cost effectively treat a wide range of operating conditions, presenting an effective solution for most Haynesville wells exhibiting high initial flow rates followed by steep declines in gas volume and moderate drop in pressure.

The UltraFab system was quickly installed and set to maintain H_2S concentration at 4 ppm. The system was also set to shut-in the subject well if H_2S concentration reached 8 ppm so gas production could continue from the other wells flowing into the gathering system.

The majority of UltraFab piping and controls is integral to the compact, self-contained skid, so installation cost was reasonable and confined to making gas-in and gas-out connections. UltraFab units are self-regulating and semi-automated so minimal intervention is required by the operator. This enables operations personnel to focus on field-wide management and optimization tasks rather than monitoring well-specific H_2S removal challenges.

RESULTS

The UltraFab solution removed the concerns of routine shut-ins and operational problems, and the process operated at an optimized efficiency on a continuous basis. The operator successfully increased well production from less than 7 MMscfd to more than 11 MMScfd within one week of startup while maintaining outlet H_2S concentration at 4 ppm. This is exceptional as prior to installing the UltraFab system, the producer could not reduce H_2S to less than 120 ppm regardless of chemical injection rate. After optimizing system efficiency, chemical consumption and operating cost was reduced by approximately 70%. Reducing this largest cost component paid for the UltraFab capital investment in just a few months.

THE ULTRAFAB ADVANTAGE

UltraFab Flooded H_2S Removal Systems offer operators an operationally efficient, cost effective solution. Superior UltraFab design, coupled with Nalco Champion's technical expertise and wide-ranging field experience result in greater operational efficiency and lower chemical cost.

UltraFab solutions are available in a wide range of sizes and variations, treating gas volumes ranging from a few MMscfd to several hundred MMscfd and reducing H_2S concentration to virtually any outlet specification, including zero ppm. The UltraFab Flooded H_2S Removal System is designed to handle the fluctuations in gas flow and H_2S concentration that occur throughout the life of a well and "continuously self-optimizes" when properly installed and calibrated. The compact design also means UltraFab equipment can be moved from location to location, as necessary.

GOALZERO
SAFETY MATTERS

The safety of our associates, customers and communities is vitally important. From the way we operate, to the products we develop, to how we partner with customers, our goal is zero: zero accidents, zero incidents and zero environmental releases.

At Nalco Champion, safety is more than a metric, it's a mindset. It's how we conduct ourselves, every day, everywhere it matters.

Nalco Champion
Global Headquarters
11177 S. Stadium Dr.
Sugar Land, TX 77478
Telephone: +1-281-263-7000

nalcochampion.com

Taking Energy Further™

UltraFab
A Nalco Champion Company