KATHAIROS

WHITEPAPER

Utilization of Existing Gas Pipeline to Convert All Pneumatics from Wellhead Gas to Nitrogen:

400 wells and 1,400 devices brought to zero vent in 4 weeks with 3 tanks

KATHAIROS

TITLE

Utilization of Existing Gas Pipeline to Convert All Pneumatics from Wellhead Gas to Nitrogen: 400 wells and 1,400 devices brought to zero vent in 4 weeks

CUSTOMER

E&P Operator in the Rockies

SITE TYPE

Existing Gas Injection Pipeline Feeding 400+ Wells

APPLICATION

Pneumatic device conversion at scale, using existing infrastructure and 3 tandem liquid nitrogen tanks

Scenario

An E&P operator in the Rockies faced a challenge with an existing gas injection pipeline. This pipeline, spanning approximately 5 miles and feeding over 400 wells on multiple pads, was no longer in use for the wells but remained under approximately 60 psi of pressure, indicating that its integrity was intact.

The operator had considered using this pipeline network to install a centralized instrument air compressor to provide instrument gas to the pneumatics. However, engineering analysis revealed significant risks. The long, buried pipeline network was prone to moisture accumulation, which could lead to freeze-ups in cold temperatures. Additionally, the costs associated with heating the lines to prevent these issues were deemed prohibitive.

Project

In search of a viable solution, the Operator approached Kathairos. Collaboratively, we designed a system to overcome the challenges with a solution that involved locating multiple large nitrogen (N2) tanks in a centralized location to efficiently feed all the pneumatics at the 400 wells.

Within just three weeks, Kathairos successfully delivered and operationalized three 5500L nitrogen tanks operating in parallel. This innovative approach not only mitigated the risks associated with the original pipeline but ensured a rapid and effective deployment, demonstrating Kathairos' commitment to providing flexible and efficient solutions in the cleantech space.

Results and Next Steps

The Kathairos engineering and operations team conducted a meticulous design review to optimize the installation of the nitrogen units. The tanks were strategically installed in parallel, with one designated as the primary, providing a consistent flow of nitrogen. As the nitrogen level in the primary tank diminishes and pressure decreases, the second tank seamlessly takes over, ensuring the required nitrogen flow is maintained. Subsequently, as the second tank's supply nears depletion, the third tank activates. In a well-coordinated effort, Kathairos dispatches a nitrogen truck to the site to replenish all three tanks, guaranteeing an uninterrupted supply to operate the pneumatic devices.

Simultaneously, as the tanks were being finalized and shipped to the job site, the operator efficiently executed the tie-ins at each pad. This involved installing stainless steel tubing from the gas injection header to the existing wellhead gas lines that feed the pneumatics. Each tank was connected to a common supply header, and upon opening the manual valve, the tanks began to pressurize the entire pipeline network with nitrogen, ensuring a reliable and effective system to meet the site's needs.

Project Specifics

- **Kathairos nitrogen system size: Three units of 5500L each**
- **Location and coverage: Serving an area spanning 5 miles with more than 400 wells on multiple pads in the Rockies**
- **Application: Conversion of all pneumatics from wellhead gas to nitrogen using an existing gas injection pipeline**
- **Project duration: Four weeks from initial discussion to full operation**
- **Operational start: End of December 2023**
- **Operational reliability: 100% uptime since commissioning**
- **Number of pneumatic devices converted from fuel fas to nitrogen: Approximately 1,400**