

Reliable Power from Associated Gas with H₂S

Case Study

Location: Alberta, Canada

Challenge

Access to power in remote areas is an ongoing problem for the oil and gas industry. Reliable, continuous electricity at facilities is needed to run the artificial lifts, ESPs, transfer pumps, and other equipment, so the production revenue is realized. When the site gas contains H₂S (Hydrogen Sulfide), producers are forced to run diesel generators since natural gas engines are corroded by the sulfur in the fuel. Using diesel generators contributes to high lease operating expenses with the diesel fuel cost and downtime for frequent generator maintenance. Bad weather limits access to remote sites making fuel deliveries and required monthly service calls very difficult during stormy or wintry conditions.



Solution

The Flex Turbine®, from Flex Leasing Power and Service, is built for running on a wide range of gases containing H₂S (±1%). The problematic gas is now a fuel source for reliable, onsite power. The Flex Turbine delivers high uptime power, requiring only one 8-hour scheduled maintenance per year, even on H₂S gas. The Flex Turbine reduces the lease operating expense by turning unusable waste gas directly into clean, over 99% available power, while avoiding diesel expense.

The Flex Leasing Power and Service fleet has accumulated almost two million operating hours, with proven runtime availability of over 99%. Each Flex Turbine is remotely monitored 24/7 through a turbine control and data system. Full, 24/7 service coverage is included with any customized lease package.

Flex Leasing Power and Service deploys the modular Flex Turbine to fit the remote power site's needs. Multiple units self-parallel and automatically actively synchronize to run high horsepower loads. When the producer expands the production, adding higher load ESPs or additional pump

jacks, more Flex Turbines are deployed to run the increased site loads. A site has built-in redundancy when multiple Flex Turbines are operating.

Flex Leasing Power and Service sets up the Flex Turbine to operate on primary fuel gas (casing gas, wellhead gas, flare gas, tank vapors) and offers the option to automatically switch to a backup fuel gas such as propane or other available gas when the primary fuel gas is not available. The Flex Turbines will continue to run when the primary fuel switches back on. This seamless fuel supply switching is only available with the fuel gas tolerant Flex Turbines from Flex Leasing Power and Service.

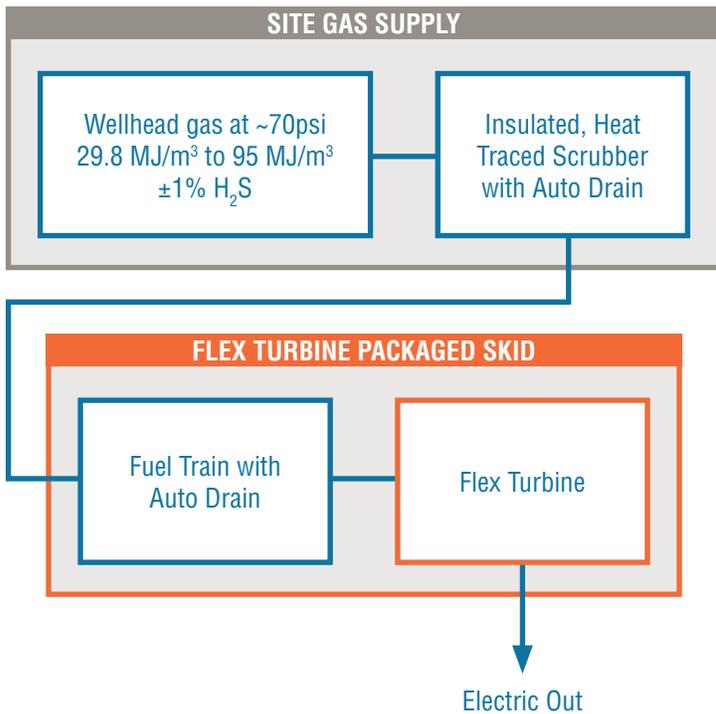
Flex Leasing Power and Service partners with the producers to supply the correct capacity Flex Turbine power system for the specific well pad or facility needs. The Flex Turbine technology has been engineered to match the oil and gas power application. The increased uptime through fuel tolerance and low maintenance that's realized by using Flex Turbines is especially valuable for remote locations.

Site Setup

Up to 10000 ppmv (±1%) H₂S in Wellhead Gas

The Flex Turbine® is able to use the widest range of oil field gases. The standard system fuel tolerance includes gas heating values from 29.8 MJ/m³ to 95 MJ/m³ (800 Btu/scf to 2500 Btu/scf). The diagram below illustrates the simple connection required at a field site to use the wellhead gas supplied at approximately ~70psi.

- 1.) Site's existing gas collection delivers ~70psi gas to a two phase separator or gas scrubber.
- 2.) The liquids are knocked out of the wellhead gas.
- 3.) The wellhead gas is fed to the Flex Turbine Packaged Skid with onboard final liquid knockout.
- 4.) The Flex Turbine turns the problematic gas into valuable, reliable power for ESPs, pump jacks and facility loads.



Results

The fuel tolerant capability of the Flex Turbine enables producers to use their problematic gas for reliable power. At sites with H₂S gas, the Flex Turbine helps by using the available onsite gas and avoids multiple diesel deliveries each month. For example, a remote site with a 200 kW power requirement, will spend over \$30,000 CAD per month on diesel fuel alone. Partnering with Flex Leasing Power and Service, that diesel fuel cost is reduced to zero by utilizing the H₂S gas.

The producer gets the over 99% runtime availability from the Flex Turbine, which results in increased production revenue while reducing their lease operating expense.

Benefits

- Reliable clean power for production loads on pipeline gas, propane, tank vapors, or a mixture of gases
- One 8-hour scheduled maintenance per year, even with H₂S in the wellhead gas
- High uptime remote power increases production revenue by avoiding power outages.
- Reduction/use of Flare Gas and Tank Vapors, complying with environmental regulations

Site Overview/List

Flex Leasing Power and Service currently has its fleet of Flex Turbines operating in North Dakota (Bakken), Texas (Permian), and Canada (Alberta – Montney/Duvernay). Flex Turbines are also providing critical power directly for producers in California, Pennsylvania (Marcellus), and Indonesia.

Testimonial

"We've used the Flex Turbine in a remote field for over two years, simply using our on-lease produced sour gas (~0.25% H₂S). Its reliability and performance is great, powering four of our production wells. We have avoided spending hundreds of thousands of dollars by eliminating the need for diesel fuel and the maintenance related to diesel generated power. Our operations staff in the field have been impressed!"