



Client: ProFrac Services

Project Location: East Texas, South Texas, West Texas, Colorado

The Challenge

ProFrac Services, a leader in well stimulation, required a reliable and scalable power generation solution to meet the demands of their expanding electric frac fleet. The electric hydraulic fracturing operation is a tolling operation that utilizes a microgrid with multiple power generation sources (gas turbines, reciprocating engines, and BESS), which is mobilized and commissioned in 72 hours. It operates for 4-6 weeks before being demobilized and recommissioned at the next site.

Electric hydraulic fracturing is an intermittent duty. During the pressure pumping stage, loads frequently exceed 25 MWe (e.g., 100 bpm at 11,500 psi plus other BOP loads) for an hour or more, followed by a load drop to less than 0.75 MWe during the 15- to 45-minute transition period. The challenge is ensuring cost efficiency and ~100% reliable operations during pumping stages, providing 24/7 flexibility, while minimizing environmental impact by leveraging diesel substitution with natural gas.

LiveWire Power Solutions

1.) Hybrid Power Generation Solution featuring:

- *Natural Gas Reciprocating Engines*
 - CAT G3520 gas reciprocating engines (2.6 MW each).
 - Deployed four gas reciprocating engines to deliver 10 MW of power.
 - Combined with one switchgear unit for power distribution.
- *Flexible Hybrid Configuration*
 - Integration of electric frac fleets powered by 10 MW of electricity alongside dual-fuel engine-driven frac pumps.
 - This setup provided redundancy and operational flexibility, ensuring seamless performance under varying load conditions.
- *Natural gas distribution solutions*
 - Deployment of F3 natural gas distribution trailers to measure gas consumption and substitution rates accurately.
 - Gas conditioning trailers/emergency shutdown (ESD) equipped with real-time analytics for gas quality and asset protection.

2. Full Reciprocating Engine Power Generation Solution featuring:

- *Natural Gas Reciprocating Engines*
 - CAT G3520 gas reciprocating engines (2.6 MW each).
 - Deployed 12 gas reciprocating engines to deliver 25 MW of power, plus backup.
 - Combined with one switchgear unit for power distribution.
- *Natural Gas Distribution Solutions*
 - Deployment of F3 natural gas distribution trailers to accurately measure gas consumption and substitution rates.
 - Gas conditioning trailers/emergency shutdown (ESD) equipped with real-time analytics for gas quality and asset protection.

3.) Reciprocating Engine + Gas Turbine Power Generation Solution featuring:

- *Natural Gas Reciprocating Engines*
 - CAT G3520 gas reciprocating engines (2.6 MW each).
 - Deployed four gas reciprocating engines to deliver 7 MW of power, plus backup.
 - Combined with one switchgear unit for power distribution.
- *Gas Turbine*
 - Gas turbine (31 MW rated in ISO conditions).
 - Deployed one gas turbine to deliver 18 MW of power.
 - Combined with one switchgear unit for power distribution.
- *Natural Gas Distribution Solutions*
 - Deployment of F3 natural gas distribution trailers to accurately measure gas consumption and substitution rates.

- Gas conditioning trailers/emergency shutdown (ESD) equipped with real-time analytics for gas quality and asset protection.

Results

1.) Reliability, Operational Efficiency and Flexibility

- With each configuration, Livewire Power provided uninterrupted operations, delivering reliable power.
- Different power blocks in Livewire Power's asset position provide the ability to scale up or down as required by ProFrac's hydraulic fracturing needs on the job.
- Eliminates NPT associated with maintenance-intensive diesel engines, transmissions, and hydraulics.
- Remote equipment monitoring reduces personnel exposure and provides real-time guidance for optimal performance.
- Natural gas substitution significantly reduces fuel costs, enhancing cost efficiency for well stimulation projects.

2.) Environmental and Economic Impact

- Lowered emissions well below Tier IV levels through the use of natural gas and minimized reliance on diesel, meeting sustainability targets.
- Scalable, modular assets reduced unnecessary power consumption, leading to additional operational savings.

3.) Future Scalability

- ProFrac's plans to expand by 2 to 4 more electric fleets align with LiveWire Power's scale-up of power generation assets.

Conclusion

LiveWire Power's advanced power generation solutions provided ProFrac with a reliable, cost-effective, and flexible power supply for its electric frac fleet. By integrating scalable gas reciprocating engines and gas distribution systems, LiveWire Power helped ProFrac achieve greater operational efficiency, reduced emissions, and enhanced long-term sustainability.

Key Takeaway:

"Powering innovation through scalable solutions – LiveWire Power delivers the power, ProFrac drives the performance."