SPM® QEM 3000

SPM™ Oil & Gas
A Caterpillar Company

Case Study

The SPM® QEM 3000 Frac Pump's high-horsepower and continuous duty design has allowed an operator to handle even the most extreme conditions with zero downtime and become the only company pumping for a global E&P company in Wyoming.

Zero
downtime in first 12 months

Dramatically
Lower NPT
created a competitive advantage that led to winning more contracts

Long-lasting Power End enabled
95%+
ready to pump time

Reliability to pump in any basin at any pressure

40%
fewer Frac Pump Units needed to reach required rate and pressure

Image provided by Kohl Koppinger of Rev

THE CHALLENGE

Being a newcomer in the oil and gas industry is especially challenging in a time when investors are curbing cash infusions and oil prices are below $50/barrel.

Oil and gas startup, REV Energy Services, launched in 2018 with a strategic focus to have a fleet their team could take anywhere – even Haynesville, which has the most extreme conditions of any basin. While extreme pressure jobs weren't the company's primary focus, the need for a fleet to have the reliability and durability to stand up to any environment was absolutely necessary. On the surface, a legacy 2500 fleet could have met REV's low-pressure pumping needs as their team didn't plan to pump more than 9,500 psi. But, with NPT as a priority in the current market as the metric that matters to keep revenues flowing, being able to confidently pump without major power end failures was high on REV'S priorities. As such, REV needed an extremely durable fleet that could provide the most pumping hours and greatly reduce NPT to win more jobs and build a solid reputation in the marketplace.

THE APPROACH

REV Energy Services selected the SPM Oil & Gas SPM® QEM 3000 for its fleet, purchasing 13 pumps. While the continuous duty SPM® QEM 3000 is rated to operate at 275,000 lbs. rod load 100% of the time, compared to legacy intermittent 2500 pumps' 80% restrictions, REV chose the SPM® QEM 3000 although the company planned to pump under 10,000 psi because of the 3000's long-lasting power ends and reduced maintenance requirements.

THE RESULT

With its fleet of SPM® QEM 3000 frac pumps, REV Energy Services reported zero downtime in its first 12 months of operation; an unheard of feat in the industry. The

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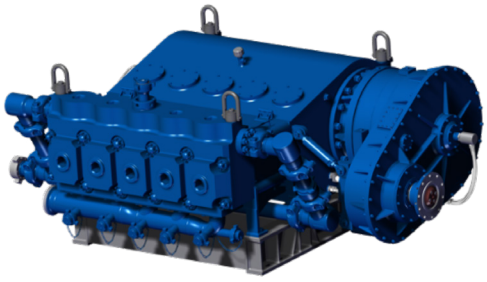
resulting extraordinarily low NPT REV has achieved has given the company a significant competitive advantage that has allowed it to win contracts over more established competitors. Because of its SPM® QEM 3000 fleet, REV is the only operator pumping for a global E&P company in Wyoming.

As a startup, which can inherently increase costs due to the culmination of new people, processes and equipment, total cost of ownership (TCO) was a critical factor for REV. The QEM 3000 surpassed the company's KPI's for:

- Power Ends – By following SPM® QEM 3000's recommended maintenance schedule, REV experienced zero failures. SPM® QEM 3000's Power End is rated to last 15,000+ hours with proper maintenance, which gave REV a formidable competitive advantage in its NPT.
- Fluid Ends – REV experienced the Fluid Ends lasting over 3,000 hours with proper maintenance and no over pressures or sand offs.
- Frac Pump Units – REV is able to reach the required rate and pressure with 40% less frac pump units than its competitors, resulting in fuel and other consumable cost savings, allowing the company to operate with a much smaller footprint at a fraction of the cost.

In addition to achieving a 95%+ ready to pump time, REV gained 3,700+ hours in its first year of pumping and improved site safety due to the increased reliability.

THE INNOVATION



The SPM® QEM 3000 is the industry's first high-horsepower frac pump built for continuous duty at 275,000 lbs. rod load. While designed to handle the most extreme conditions and 12,000+ psi jobs, the frac pump also enables low-pressure jobs to achieve zero downtime with proper recommended maintenance of the pump's robust power end. Dramatically lower NPT creates a powerful competitive advantage that lands jobs – even for disposal well locations.

As a true, continuous duty pump, fewer backup pumps are required on site. Synchronizing maintenance schedules with the engine and transmission reduces downtime and TCO even further. The frac pump increases fatigue life by moving welds to low-stress areas and introducing structural mounting and an engineered skid. At 25 inches, the pump features the industry's largest bearing which reduces roller contact loads, lessens the impact of shock loading and resists contamination damage.

The patent-pending dual-line lubrication system and onboard filtration system ensure each component receives the ideal lubrication pressure and flow required for optimized protection under extreme (or low-pressure) conditions while reducing contamination and delivering clean lubricant to all bearings and helping to prevent premature failure.

SPM® QEM 3000's Power End is unique in the industry, offering unprecedented levels of uptime for more pumping hours at a lower cost. A patent-pending gearbox design features double helical gears, engineered housing and mounted torque arms to minimize thrust load and deflection. The improved design also includes all-internal lube lines to reduce leak paths and catch points.

The patented geometry of the pump's SPM® Duralast® fluid end lowers crossbore stresses by 30% or more, and corrosion-resistant stainless steel delivers up to 5x the life compared to conventional SPM® fluid ends.

Applications: Fracturing	
Maximum Brake Horsepower Input	3000 BHP (2,237 kW)
Maximum Rod Load Capacity	275,000 lbf (1,223 kg)
Stroke Length	8" (203.2 mm)
Gear Ratio	6.963:1
Approximate Length	87" (2,210 mm)
Approximate Width	116" (2,946 mm)
Approximate Height	54" (1,372 mm)
Approximate Weight (Dry)	25,775 lb (13,381 kg)

Note: Pump dimensions and weights are approximate.
For full detailed drawings, please contact SPM Oil and Gas

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