CAMShale
Fracturing fluid delivery and flowback service
Maximize stage count per day, minimize risk. CAMShale* fracturing fluid delivery and flowback service optimizes unconventional completion efficiency with seamless delivery of hydraulic fracturing fluid from the pumping service provider’s missile trailer to the wellbore and through to flowback and well testing. This comprehensive, integrated service from a single provider minimizes NPT and helps reach first oil or gas faster.
Applications

- High-operational-intensity fracturing environments
- Unconventional plays with challenging economics
- Multiwell pad or single well

Benefits

- Increased operational efficiencies and lower costs and HSE risk with innovative equipment designs and streamlined processes
- Fewer personnel on site and greater continuity with a multiskilled crew
- Significantly reduced NPT and enhanced safety with reliable and compatible OEM equipment supported by a structured maintenance program
- Smaller equipment footprint and environmental impact through compact, fit-for-purpose technology
- Simplified logistics and a single point of contact for the entire surface completion beyond the pressure pumping provider

Features

- Multiskilled trained personnel for rig-up, rig-down, operation, and maintenance
- Standard procedures developed through a Schlumberger process improvement methodology
- Reliable frac tree systems and frac manifolds
- Monoline* flanged-connection fracturing fluid delivery technology for multiwell pads
- Flowback and well testing equipment tailored to operating conditions and regulatory requirements
With the CAMShale service, a multiskilled crew is on site from the time fracturing fluid delivery equipment is installed throughout fracturing, flowback, and well testing operations. The continuity of ownership and competency streamlines operations and provides a single point of contact for the scope of the surface completion.
Integrated technologies for streamlined operations

Flexible, modular frac manifolds control fluid flow to multiple wells, eliminating rig-up and rig-down between stages.

Monoline technology arrives preassembled — reducing installation time — and eliminates multiple potential leak paths.

Available frac trees include composite frac trees that are shorter and lighter than conventional models.

Durable and reliable frac valves provide three times more uptime than valves from other suppliers.

Flowback equipment and well test separators are tailored to operating conditions and local regulatory requirements.
Monoline technology: More speed, less cost and risk

Monoline flanged-connection fracturing fluid delivery technology comprises straight, high-pressure pipe segments, 90° elbows, and swivel flanges bolted together. Replacing multiple hammer unions with significantly fewer measurably torqued flanged connections and metal sealing gaskets promotes a higher level of system integrity, safety, reliability, and lower NPT.

The technology arrives on location preassembled and can be installed outside the critical path of operations. Total installation time is reduced by more than 60%.

Using the Monoline technology, one Canadian operator eliminated more than 150 hammer unions and 300 flow restraints on a 9-well pad, achieving 99% uptime. No leaks. No hammers. No failures.

Advantages
- Reduced rig-up and rig-down times
- Enhanced safety and fewer potential leak points
- Reduced frac tree height
- Reduced wellsite footprint
- Fewer technicians required on location

Monoline technology presents a safer, faster, cleaner alternative to conventional frac iron on multiwell pads.
Reliable valves for maximum fracturing uptime

**FracServ enhanced valve-reliability program**
Gate valves in frac trees and manifolds withstand the effects of flowing and controlling high-pressure, high-volume, abrasive, corrosive, and sometimes sour fracturing and flowback fluids for days—and even weeks. If ignored, the valve body, seals, seat, gate, or other components can fail, resulting in shutdown of the entire fracturing spread.

To maximize reliability, in addition to rigorous maintenance in the workshop, the crew already present at the wellsite provides regular onsite maintenance via the FracServ® enhanced valve-reliability program.

The program
- maximizes use of fracturing hours
- minimizes valve leaks
- minimizes standby costs.

**Frac valve designs**

Cameron frac valves are trimmed for maximum corrosion and erosion protection. They provide three times more uptime compared with other suppliers, minimizing NPT and related costs.
During the postfracturing flowback and well cleanup phase, CAMShale service provides efficient mobile technologies to effectively handle solids removal, fluid separation, and accurate flow rate measurements.

**Ready solution for screenout contingencies**
When these services are provided as part of the CAMShale service, multiskilled technicians are on site from the time the fracturing fluid delivery system is rigged up—fully prepared to handle screenout contingencies that may occur during hydraulic fracturing operations and clean the wellbore without delay.

**Services include**
- operation and maintenance of fit-for-purpose equipment (e.g., plug and debris catchers)
- management of hydraulic manifolds during drillout and flowback
- control and measurement of well effluents during well cleanup
- solids recovery, separation, and removal
- separation of oil, water, and gas
- well testing
- fluid sampling and analysis.
Case Study

Eagle Ford Operator Reduces Hydraulic Fracturing Costs by Approximately USD 2.7 Million per Month

**Operator needed to improve reliability of fracturing equipment**
Hydraulic fracturing is the completion technique of choice for most unconventional wells, but it is tough on equipment. Erosion of flowbores, corrosion of wetted surfaces, and high and variable loads all have a negative impact. Frac tree and manifold fatigue is caused by pressure variations during fracturing cycles, vibrations due to high-pressure pump surges, unplanned pressure spikes resulting from upstream control anomalies, and erosive metal loss caused by high-volume flow of sand slurry and debris.

An operator in the Eagle Ford Shale play was experiencing 3–4 failures of hydraulic fracturing equipment per week and the resulting NPT was costing an average of about USD 2.7 million per month. In an effort to reduce downtime and improve operating efficiency, the operator signed a two-year agreement with Cameron for the CAMShale fracturing fluid delivery and flowback service.

**100% valve integrity success rate eliminated USD 2.7 million of NPT per month**
Since the beginning of the agreement, Cameron has supplied up to 16 frac trees per week with zero spills and zero HSE incidents. In addition, the valve integrity success rate has been 100% on 189 frac trees and 72 zipper manifolds. Pleased with this performance, the operator has selected Cameron as its sole supplier of zipper manifolds and frac trees.

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**Challenge**
Reduce NPT related to hydraulic fracturing equipment in the Eagle Ford Shale play.

**Solution**
Use the CAMShale fracturing fluid delivery and flowback service to deploy and proactively manage and service fracturing equipment.

**Results**
Achieved a 100% valve integrity success rate and saved the operator an average of USD 2.7 million of NPT per month.
Canadian operator wanted to optimize hydraulic fracturing

An operator in the Duvernay Shale play sought to streamline fracturing operations. A typical eight-well pad was taking 90 to 120 days to fracture and the operator wanted to reduce costs by 30%. The conventional setup was not only time-consuming and expensive, it incorporated a maze of flowlines, which presented a wellsite hazard. Because of high fracturing pressures, if any one of the threaded hammer-type connections failed during a pumping operation, the potential for equipment damage and personnel injury was high. The operator approached Cameron for a solution.

CAMShale service reduced costs across 27 wells while improving uptime and safety

Using the F-T90 horizontal frac tree, a modular manifold design, and Monoline flanged connection fracturing fluid delivery technology, which replaces four separate flowlines to the frac tree with a single line, Cameron helped optimize overall performance. The operator fractured more than 925 stages in 27 wells during the course of 286 days with an estimated 99% uptime. The Monoline technology required 75% fewer connections—eliminating more than 150 hammer unions and 300 tiedowns on a nine-well pad—and was 60% faster to install compared with conventional frac iron. These efficiencies, together with lower equipment rentals costs, helped the operator reduce fracturing costs more than 30%.
Operator needed reliable valves for uninterrupted hydraulic fracturing

An operator in the Fayetteville Shale play had a multiwall fracturing backlog and an ambitious deadline. A service and equipment provider capable of helping the operator achieve its goals safely and efficiently was required. Excellent safety performance, good quality and reliable equipment and service, and proven fracturing knowledge were essential.

After previous experiences with NPT, the operator wanted to maintain continuous fracturing operations without unexpected shutdowns for valve repairs. Conventional valve failure rates can range from 10% to 30% and cost USD 2,500–USD 100,000 per day; in the event of loss of well control, costs can exceed USD 2.4 million for the operation. Each new valve costs the operator approximately USD 1.5 million in time and equipment. The operator approached Cameron for a solution.

CAMShale service saved USD 676,000 and multiple valve replacements in one year

Cameron implemented the CAMShale fracturing fluid delivery and flowback service, incorporating frac trees, frac manifolds, frac iron, and the FracServ enhanced valve-reliability program. On-time delivery of a large number of composite block trees and the need for fewer contractors on site reduced equipment delivery and installation costs by about 50%. For 75 wells over one year, the operator saved approximately USD 400,000. In addition, use of only one contractor on location lowered costs by about USD 276,000. With 99% valve uptime, the operator also avoided multiple valve replacements at USD 1.5 million each.
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