



SPM™ Oil & Gas

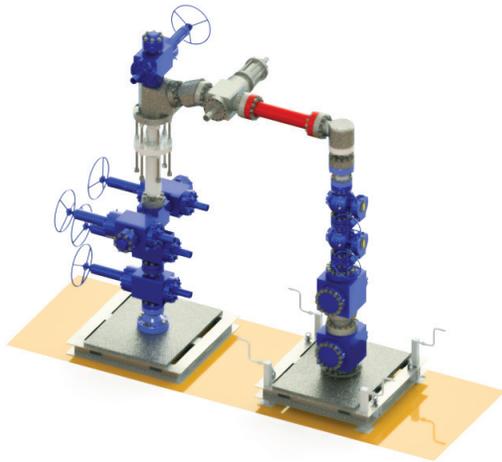
A Caterpillar Company

**Simplified Frac Iron
System**



SPM Oil & Gas
A Enterprise Company

The shortest distance between two points is a straight line. SPM Oil & Gas introduces that radical idea to the frac site.



Simplicity delivered

Consider the traditional frac site. There are multiple iron strings with numerous twists, turns, and connections. All of the iron and equipment require lengthy rig-up time and costly labor. Every connection is a potential leak path waiting to be checked or addressed. Every minute of non-productive time is profit lost.

With our new Simplified Frac Iron System, SPM Oil & Gas has transformed this disjointed process, dramatically reducing the amount of iron on site, replacing it with a simple, more robust, and reliable system. Featuring a much more streamlined and safer design that consists of large-bore iron, SPM Oil & Gas' Simplified Frac Iron System can be tailored to any basin or condition. It's a straight shot to greater performance and enhanced efficiency.

Efficiency re-engineered

SPM Oil & Gas' SPM® Simplified Frac Iron includes preassembled components on a modular skid design. With just a single connection at each end of each skid, assembly time is reduced, along with the number of field technicians needed.

The design also features redundant, seven-inch SPM® Isolation and Directional Valves, available with hydraulic actuators for safe remote operations.

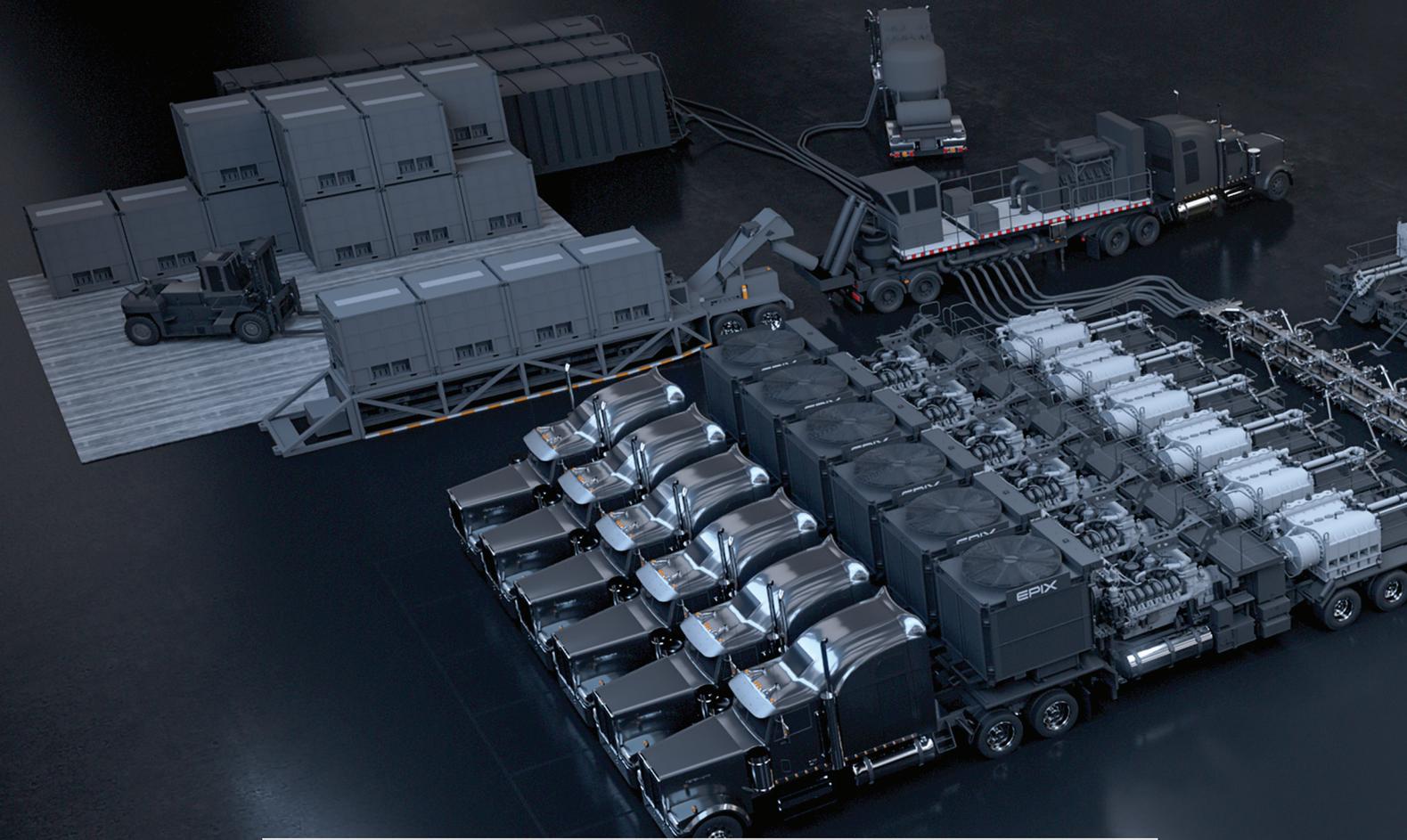
Iron reduction

Additional components of the system include the SPM Oil & Gas Vertical Zipper Manifold utilizing Plug Valves, the patent-pending SPM Oil & Gas One Straight Line (OSL) Frac Connection, the SPM Oil & Gas Frac Stack utilizing Plug Valves, and the

SPM Oil & Gas Grease Manifold. Multiple connections and angled flow paths have been replaced with large-bore iron and a single line of flow—that's 84% fewer connections per well from the zipper to the frac stack.

Throughout the system, we've also replaced many of the hammer-union connections with safer API flange connections, which rarely require tightening in the field and feature reliable metal-seal gaskets. Rotating spools on the Zipper stack allow for quick alignment with the OSL Frac Connection and the trunk line.

The linear-flow-path design also minimizes directional fluid changes that create accelerated wear, resulting in a more reliable product and reduced pressure drops in demanding conditions.



Field-tested, field-proven

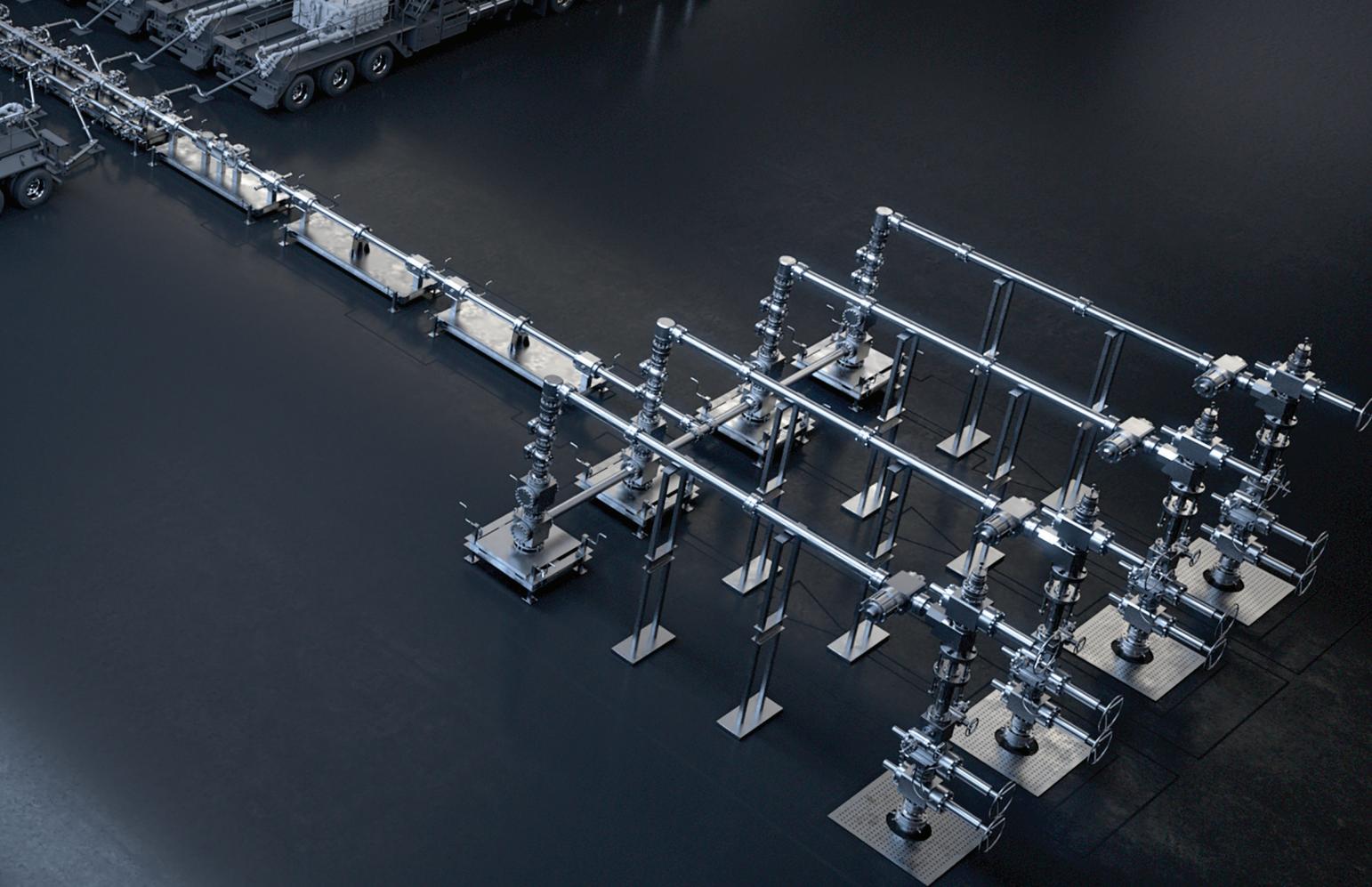
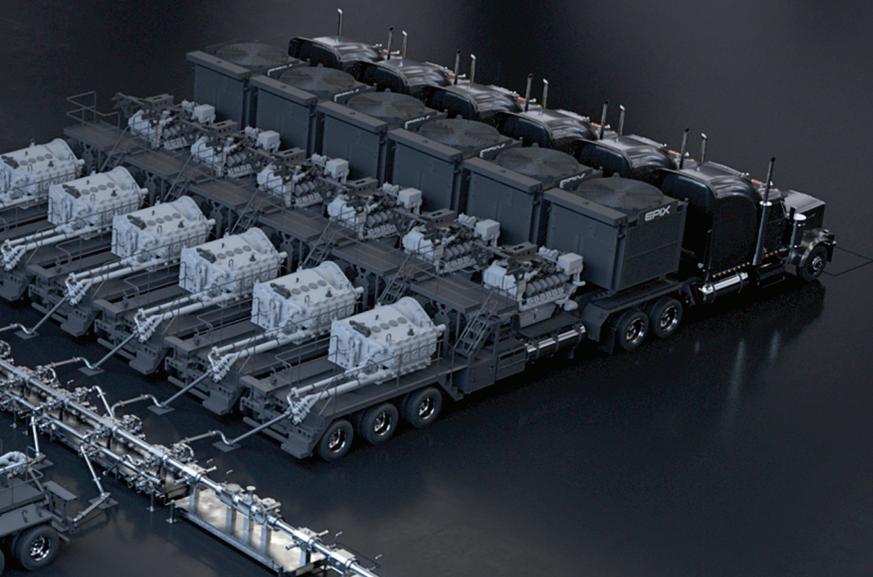
In a recent field test, all tested components of SPM Oil & Gas' Simplified Frac Iron System lasted more than three times longer than a competitor's previous configuration, which also featured a single-line zipper tie-in. An internal CFD analysis of the SPM Oil & Gas configuration predicted approximately 70 percent less pipe erosion compared to similar designs.²

Overall, this new design minimizes non-productive time, rig-up time, risks, and labor costs by reducing the footprint, the amount of iron, and number of connections associated with traditional frac sites. It all adds up to an unprecedented advantage.

Simplified Frac Iron System Features and Benefits²

- Employs standard API-6A gaskets for seal faces
- Accommodates 4" to 7" connections at 15,000 psi
- Fit-for-purpose system can be used for any well and tailored to any condition or basin—ideal for demanding frac applications
- Equipment available for rent, with service centers in every basin; fully inspected and recertified after every job
- Straight line of flow minimizes pressure drop and erosion
- Less NPT, rig-up time, and labor costs

² Refers to the combined configuration of the SPM Oil & Gas Vertical Zipper Manifold, the SPM Oil & Gas One Straight Line Frac Connection, and the SPM Oil & Gas Frac Stack. Comparisons to traditional configurations assume six frac lines per well and, in both cases, the manifold will be joined together with a flanged trunk line.



SPM® Simplified Frac Iron

A streamlined, modular design minimizes time, iron, and fluid pressure drop.

Efficiency, straight and simple

With far fewer connections, the SPM Simplified Frac Iron from SPM Oil & Gas reduces rig-up time and eliminates much of the ground iron. The linear flow path maximizes power between the pump and wellhead with a marked reduction in fluid pressure drop and component erosion. Hammer-union connections have been replaced with robust API flange connections, improving reliability while enhancing safety margins and fastener redundancy.



Modular skids for quick, safe installation

Simplified Frac Iron components are pre-assembled on modular skids, with single connections at either end of each skid. This design not only allows for a much faster and safer setup, it accommodates a variety of customer site configurations.

Another feature is redundant, seven-inch SPM® Isolation and Directional Valves, available with hydraulic actuators for safe, remote operations. Unique to the industry, it provides reliable control, letting you keep high-pressure fluid in check.

Features and Benefits

- Modular skids for low-pressure manifold header, manifolds, valves, and piping
- Manifold skid features robust 3" 15K Safety Iron® inlets
- Features unique combination of gear-operated/hydraulic-actuated isolation valves and directional valves for predictable and repeatable control
- Piping skid facilitates spacing for on-site customer needs and features studded blocks allowing flange adapters to connect additional components
- 7-1/16" 15K API-6A style flanged iron
- 123 bbl/min maximum flow rate

SPM Oil & Gas Vertical Zipper Manifold utilizing Plug Valves

With a vertical zipper design, advantages stack up—beginning with a smaller footprint.

Fewer connections

Allowing simultaneous operations across multiple wells, zipper manifold technologies have improved efficiency at the frac site. With the SPM Oil & Gas Vertical Zipper Manifold utilizing Plug Valves, SPM Oil & Gas extends that efficiency further.

Configured with the SPM Oil & Gas One Straight Line (OSL) Frac Connection, the single large-bore outlet replaces the 3-6 tie-in lines found on traditional manifolds. This reduces non-productive time, labor costs, potential leak paths, and safety hazards.

Reduced friction

The linear flow-path design minimizes fluid turbulence, pressure drop, and erosion, which extends equipment life. Vertical orientation of the manifold not only allows for a smaller footprint, but helps prevent the accumulation of erosive proppant around the valves.

Less grease with Integrated plug valves

Replacing conventional gate valves with plug valves boosts efficiency even more. Plug valves use less than two percent of the grease, so greasing takes significantly less time and material. They're also more durable and easier to maintain.



Features and Benefits

- Designed for use with the SPM Oil & Gas OSL Frac Connection and SPM Oil & Gas Frac Stack
- Temperature rating: L-U
- Easy-to-maintain plug valves, both hydraulic and manually operated, offer greater durability and requires less than 2% of the grease needed for gate valves
- 2-3 spools with rotating flanges allow for quick alignment with the SPM Oil & Gas OSL Frac Connection and trunk line
- One simple, large-bore outlet connection—versus 4-6 goat-head connections on a traditional configuration
- Straight design with fewer bends for an overall reduction of friction between iron components and fluids²
- API-6A bolted, controlled-torque connections, standard tooling and known values for connection makeup
- Secure skid with vertically adjustable legs and integral lifting points
- Smaller wellsite footprint
- Fewer leak paths, failure points, and potential safety hazards²
- Vertical design keeps sand and proppant from settling in components

² Refers to the combined configuration of the SPM Oil & Gas Vertical Zipper Manifold, the SPM Oil & Gas One Straight Line Frac Connection, and the SPM Oil & Gas Frac Stack. Comparisons to traditional configurations assume six frac lines per well and, in both cases, the manifold will be joined together with a flanged trunk line.

SPM Oil & Gas One Straight Line (OSL) Frac Connection

The single, linear, large-bore design is a straight path to unprecedented efficiency and safety.

Less—and more of it

Featuring a revolutionary, patent-pending design, the SPM Oil & Gas One Straight Line (OSL) Frac Connection is quickly aligned between the SPM Oil & Gas Vertical Zipper Manifold and the SPM Oil & Gas Frac Stack—requiring far less iron and only a single controlled-torque connection on either end.

Simpler and safer

This means a corresponding reduction in non-productive time, rig-up time, labor costs, potential leak paths, and safety hazards. API flange connections replace hazardous and less-reliable hammer-union connections. With a direct line of flow, fluid friction, pressure drop, and erosion are minimized.

Engineered for demanding applications and tailored to any condition or basin, the SPM Oil & Gas OSL Frac Connection offers you a direct route to greater performance.

Features and Benefits

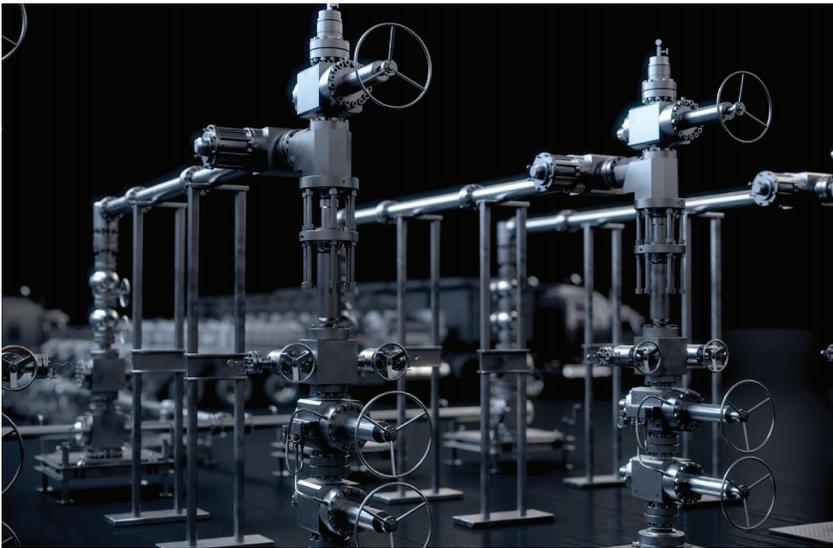
- Patent-pending design, connecting the SPM Oil & Gas Vertical Zipper Manifold and the SPM Oil & Gas Frac Stack
- Employs standard API-6A gaskets for seal faces
- Accommodates 4" to 7" connections at 15,000 psi
- One simple, large-bore flow line between the frac manifold and the wellhead—compared to 4-6 flow lines on a typical configuration
- Straight design with fewer bends for an overall reduction of friction and erosion between iron components and fluids
- API-6A bolted, controlled-torque connections, standard tooling and known values for connection makeup
- Reduction of wellsite footprint—one large-bore pipe vs. multiple pipes wrapped with safety restraints
- Fewer leak paths, failure points, and potential safety hazards
- Less NPT, rig-up time, and labor costs²
- Minimization of fluid friction, pressure drop, and erosion



² Refers to the combined configuration of the SPM Oil & Gas Vertical Zipper Manifold, the SPM Oil & Gas One Straight Line Frac Connection, and the SPM Oil & Gas Frac Stack. Comparisons to traditional configurations assume six frac lines per well and, in both cases, the manifold will be joined together with a flanged trunk line.

SPM Oil & Gas Frac Stack utilizing Plug Valves

Streamlined performance is delivered precisely where you need it.



Quick, simple setup

Featuring an adjustable-height spool and rotating flange, the SPM Oil & Gas Frac Stack can be quickly secured to the SPM Oil & Gas OSL Frac Connection. A single large-bore inlet replaces the multiple tie-in lines on a conventional frac tree, reducing non-productive time, labor costs, potential leak paths, and safety hazards.

Less grease with proven plug-valve technology

Like the SPM Oil & Gas Vertical Zipper Manifold, SPM Oil & Gas' design also features a plug valve, a decades-proven technology that uses less than two percent of the grease required for conventional gate valves. Greasing takes significantly less time, plus the valve is easier and less costly to maintain.

Features and Benefits

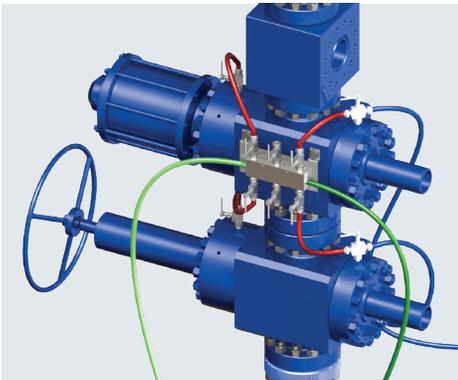
- Designed for use with the SPM Oil & Gas OSL Frac Connection and SPM Oil & Gas Vertical Zipper Manifold
- Employs standard API-6A gaskets for seal faces
- Accommodates 4" to 7" connections at 15,000 psi
- Field services include installation, on-site testing, operation, maintenance, removal, torque and testing
- Easy-to-maintain plug valves, both hydraulic and manually operated
- Rotating flange on frac tree allows for quick alignment with the OSL Frac Connection
- One simple, large-bore inlet connection—versus multiple goat-head connections on a typical configuration
- API-6A bolted, controlled-torque connections, standard tooling and known values for connection makeup
- Options include grease manifold, frac-ball launcher, grease manifold, and coiled-tubing frac heads—contact us for details
- Plug valve offers greater durability and requires less than two percent of the grease needed for gate valves
- Easily closed with minimal force, resulting in elimination of potential valve cavity pressure lock

SPM Oil & Gas Grease Manifold

Pumping grease just became a lot less complicated.

Yet another advantage

Designed to accommodate gate or plug valves, the SPM Oil & Gas Grease Manifold improves safety and efficiency at the wellsite. With the pumping and distribution of valve grease controlled at a single manifold, the process is greatly simplified. This helps reduce labor costs and eliminates the need for employees to perform these functions at hazardous elevations for access to the frac tree.

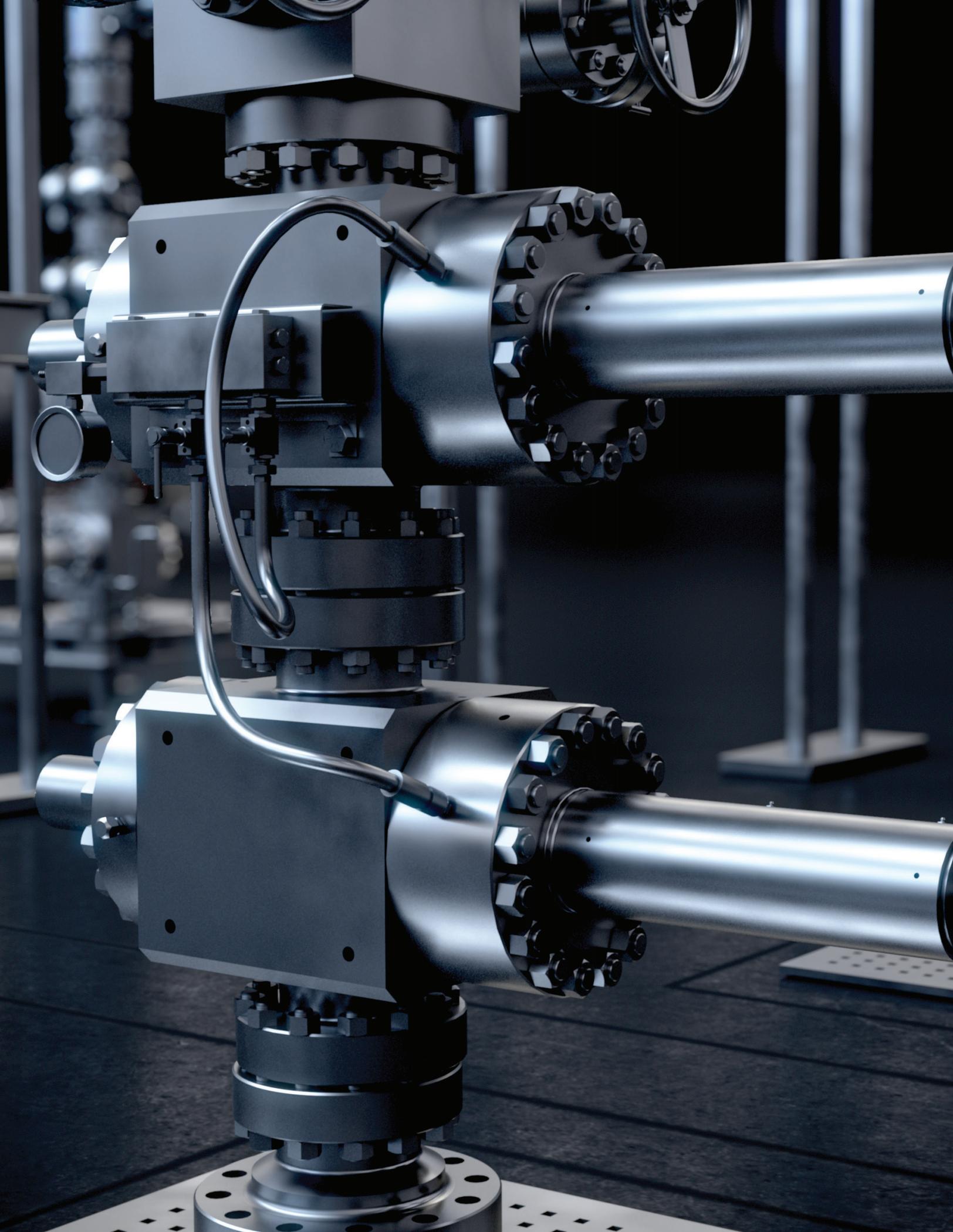


Features and Benefits

- Can be configured to any number of valves or valve types on any frac tree, including the SPM Oil & Gas Frac Stack
- All components meet or exceed applicable API standards
- Rated up to 15,000 psi
- Available for rent, with service centers in every basin; fully inspected and recertified after every job
- Designed to work with either gate or plug valves
- Manifold magnetically mounts to the valves on the SPM Oil & Gas Vertical Zipper and the SPM Oil & Gas Frac Stack
- Improves safety, eliminating the need to pump grease to each individual valve
- Reduces labor costs
- Cleaner, less complicated process
- Requires no modification of existing valves



For more information on SPM Oil & Gas' Simplified Frac-Iron System, visit global.spmoilandgas/simplefrac.



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