Providing Engineered Hydraulic Fracturing, Well Stimulation, and Cementing Equipment Solutions throughout the World for the Oil & Gas Industry.
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In 1988, The Freemyer Company formed with a focus on acidizing oil wells, before quickly expanding into Industrial Cleaning. By the end of the century, The Freemyer Company had further expanded to 5 divisions serving the Permian Basin: Well Service, Industrial Cleaning which had 14 locations and was licensed in 35 states, Manufacturing which serviced the industry domestically and internationally, Pump Rental, and Drum Recycling which received the Governors Award for Industrial Cleanliness. In 2000, the Well Service Division was sold to Cudd Pressure Control, and Freemyer Industrial Pressure, LP was formed with a focus on manufacturing.

With customers currently using FIP equipment in 26 countries across the globe, Freemyer Industrial Pressure has since evolved into one of the world’s leading manufacturers of oil and gas well service equipment. We have accomplished this by building the highest quality equipment in the world, while believing the relationship between a manufacturer and customer will always work best as a partnership.

For our customers to achieve optimal results, we recognize that different jobs have different requirements. With this in mind, our equipment is custom designed to meet the needs of our customers. FIP works with a vast array of high quality component manufacturers, with most major components being built in the USA. On average, we then deliver equipment in less than half the time needed by other manufacturers.

Whereas other manufacturers may feel equipment delivery effectively signals the end of the transaction, we believe this to simply be the beginning of a partnership. FIP’s Service Team will be available to provide training for your employees on your equipment. Our Field Service Crews are always available to provide equipment service and maintenance. We have a highly experienced team of experts specialized in Restoring and Refurbishing any and all equipment. We can even retrofit our systems into place on other manufacturer’s equipment.

At Freemyer Industrial Pressure, we believe our long term success is directly tied to that of our customers. With that in mind, everything we do is done with the sole goal of making our customers as successful as possible.
**DESCRIPTION:** Consisting of a trailer, engine, transmission, pump, hydraulic system, power end lubrication, packing lubrication, and all necessary valves and controls for normal operations. This unit is capable of being operated at the local control enclosure, remotely, or from data van. All engine, hydraulic, and job operation parameters will be transmitted to data van. The unit has work lights that will provide sufficient lighting to illuminate working stations in low light conditions and/or during night time operations. All discharge treating iron will be rated for 15,000 psi operating working pressure.

**TRAILER:** Standard 5th Wheel to Kingpin connection, air ride suspension, ICC DOT approved lighting featuring LED lighting package, brakes-DOT approved anti-lock brake system, tires: 14ply, 11R 24.5, with aluminum wheels, rear bumper with enclosed lights, rear tow connection, reflectors, and front and rear mud flaps.

**HORIZONTAL STYLE RADIATOR:** Radiator is designed for ambient conditions- 40°F to 127°F ambient and has hydraulic driven variable speed fan system. Radiator package is tested and includes water jacket radiator, ladder, fan shroud, fan guard, hinged core guard, fuel cooler, power end lube cooler, and hydraulic cooler.

**ENGINE (CAT, MTU, or CUMMINS):** Electric throttle control, digital engine monitor/display for all engine functions and readings i.e. tachometer, oil pressure, temperature, shutdowns, alerts, and other parameters; alternator, air compressor with air governor, hydraulic starter, electronic control system with safety shutdown for low oil pressure, high water temperature, engine over speed, and low coolant level.

**TRANSMISSION (CAT, ALLISON, or TWIN DISC):** Automatic transmission set up for power shifting Operator can change gears at the local control enclosure, at the remote control, and at the data van. Transmission cooler will be mounted near radiator or on engine.

**HIGH PRESSURE PUMPING SYSTEM:** Up to 2500 HP Triplex or Quintuplex pumps. Includes gauge connection, discharge flanges, suction manifold with clean out ports, and plunger size of choice.

**DISCHARGE MANIFOLD:** Installed on the unit will be a 3” 1502 dual discharge manifold rated to 15,000 psi.
QUINTUPLEX AND TRIPLEX FRAC PUMPS (continued)

CONTROL AND MONITORING SYSTEM:
Installed on the local panel will be the following:
• Engine emergency kill/shutdown control
• Touch screen monitor that displays real time operating parameters
• Digital engine monitor will display all engine functions and readings i.e. tachometer, oil pressure, temperature, and other parameters.

Local control enclosure will have a bulk head fitting to connect the remote control:
• Remote control exterior will be constructed of a heavy duty protective suitcase style with a stainless steel interior panel
• Engine emergency kill/shutdown
• Touch screen monitor:
  - Displays all real time frac operation parameters to include some engine, transmission, and pump parameters
  - Touch screen transmission
  - Touch Screen stop engine gear selector buttons
  - Touch screen keyboard will pop up when applicable to adjust settings
• Encoder Throttle controller

PLUNGER PACKING LUBRICATION SYSTEM: Grease pump lube system will be installed for packing lubrication that includes a quick refill kit. The lubrication system will be programmed to provide grease for up to five (5) plungers when the pump is stroking and automatically shuts off when the pump is not stroking.

HYDRAULIC SYSTEMS: Engine hydraulic starting system powered from customer supplied tractor with wet kit. The fan hydraulic system will be powered from the deck transmission or engine auxiliary drive.
QUINTUPLEX AND TRIPLEX FRAC PUMPS
with Pump Down Packages

PUMPDOWN PACKAGE OPTIONS INCLUDE:
- One (1) hydraulically driven 5x4 centrifugal pump
- One (1) prime up tank
- Low pressure valves and plumbing for centrifugal pump, prime up tank, and pump manifold
- External suction manifold for centrifugal pump
- 3" 1502 Treating Iron:
  - Two (2) 3" 1502 90s – Discharge
  - One (1) 3" 1502 Plug valve – no wheel valve – Discharge
  - Two (2) 3" 1502 Pup joints – Discharge
  - One (1) 3" x 2" 1502 Cross Over – To Tank
  - One (1) 2" 1502 90 – To Prime Up Tank
  - Two (2) 2" 1502 Plug Valves – To Prime Up Tank
- All discharge treating iron will be rated for 15,000 psi operating working pressure.
DESCRIPTION: The trailer or truck mounted blender is a fracturing fluid preparation and proppant-proportioning unit which can execute a fracturing pumping design controlling both suction and discharge functions. The blender unit is equipped with two (2) power units. A Hurricane Style or Conventional Tub is designed to automatically increase or decrease fluid based on the outgoing demand.

TRAILER: Standard 5th Wheel to kingpin connection, air ride suspension, ICC DOT approved lighting featuring LED lighting package, brakes – DOT approved anti-lock brake system, tires: 14ply, 11R 24.5, with aluminum wheels, rear bumper with enclosed lights, rear tow connection, reflectors, and mud flaps

POWER UNITS: Two (2) CAT, Detroit or Cummins Diesel Engines, radiator with anti static fan blade, anti static belts, and fan guard. Electric starter, alternator, air compressor, dry type air cleaner, and electronic control system with safety shutdown for low oil pressure, high water temperature, and low coolant level.

SUCTION PUMP: The unit is equipped with up to two (2) hydraulically driven centrifugal pumps.

HYDRAULIC SYSTEM: The hydraulic system on the blender is powered by a direct drive system via gear boxes off the power units. Located on the operator control console will be the following controllers for the following motors – two (2) or three (3) sand screws, six (6) liquid chemical pumps, two (2) dry additive meters, one (1) or two (2) suction centrifugal pumps, one (1) discharge centrifugal pump (if included), and one (1) Tub.

MIXING SYSTEM: Hurricane Style tub top mounted drive, single Stage Mixer utilized for blending of proppants with fluids, higher control of proppant concentrations and adjustments, and virtually instantaneous change due to low tub size. For Conventional units, an open top blender tub, hydraulically driven mixing paddle, and discharge centrifugal pump will be installed.

CHEMICAL TOTES AND PLATFORM: Four (4) 330 gallon DOT liquid chemical totes will be installed on the work platform. Tanks are constructed out of Poly material and have a surrounding cage with a single point lifting system. Tanks will be plumbed to operate independently and will have a 2” load line.
LIQUID CHEMICAL ADDITIVE PUMPS: The unit will have six (6) liquid additive pumps of your choice i.e.:
- Two (2) Waukesha U2 018 Pumps
- Two (2) Waukesha U2 015 Pumps
- Two (2) Waukesha U2 006 Pumps

Each pump can be controlled in manual or automatic mode and will each have coriolis flow meters with digital read outs.

One (1) transfer pump – Graco pump or equivocal will be installed at the rear of the unit to load chemical totes.

THE FIP SMART OP-ACQ SYSTEM BLENDER AUTOMATION & CONTROLS: Unit will have the ability to monitor sand, liquid additive pumps, dry additive pumps, down hole density, suction and discharge volume. This system is also designed to automatically or manually adjust and maintain preset set points of sand concentration, liquid additive concentration, and dry additive concentration.

Simulated Rate features can be used for training purposes, and also allow the operator to test sand screws, dry additives, and liquid additive pump concentration rates prior to pumping down-hole.

Touch Screen Color Monitors will allow the operator the ability to operate the unit in manual or automatic mode

Displays real time operating parameters, including Sand concentration, Liquid Additive Concentration, Dry Additive Concentration, Centrifugal & Tub Parameters, and Butterfly Valve Actuation Control

Current stage and total job volume totals including Suction Rate, Discharge Rate, Liquid Additives, Dry additives, and Sand Control.

Sand screws, dry additives, and liquid additive pumps can be slaved to blender clean rate or simulated rate.

Job parameters are transmitted to the data van for data acquisition and trending purposes.

Job Design has the ability to store up to 50 jobs with up to 100 stages

SUCTION AND DISCHARGE MANIFOLD: The suction manifold will have fourteen (14) hose connections. Each connection will have a 4” butterfly valve followed by a 4” figure 206 union connection (specify thread or wing half). The discharge side of the Tub will discharge into a manifold with fourteen (14) hose connections. Each connection will have a 4” butterfly valve followed by a 4” figure 206 union connection (specify thread or wing half).

Split stream designs are available.

SAND SCREWS: The unit can be equipped with double or triple sand screw systems. Sand screws are sized based on your desired sand concentration requirements. Sand screws are equipped with a hydraulic cylinder to raise and lower, hopper with expanded metal guards around sand screw openings, and hinged side and rear doors.

DRY ADDITIVE METER: Two (2) dry additive systems will be installed. One (1) 1” auger and one (1) with 2” auger. Magnetic pick-up will be used for product delivery analysis. The dry additive meters can be controlled in manual or automatic mode.
ARCTIC FRAC BLENDERS

Arctic Climate Controlled Cabin

Cat, Detroit, or Cummins Engines

Arctic Heating System for Engine coolant, In-line fuel heater, In-tank fuel heater, Hydraulic tank, and Chemical tank dimple jacket

Four (4) liquid additive pumps, each equipped with a stainless steel chemical tote featuring a dimple jacket that allows chemicals to be heated

Louvers engineered to prevent snow and ice accumulation. Frame designed for attachment of protective engine tarp

FIP Smart Op-Acq System allows for real time system monitoring
Dual Suction and Discharge Manifolds with two (2) Centrifugal Pumps (one (1) per manifold)
DESCRIPTION: Consisting of a trailer, engine, hydraulic system, open hydration tank, suction and discharge manifolds, chemical tanks, two (2) gel pumps, three (3) liquid chemical additive pumps, one (1) transfer pump, and all necessary valves and controls for normal operation. This unit can be controlled in manual or automatic mode from the operator control console. All hydraulic and operation parameters to be transmitted to data van.

TRAILER: Standard 5th Wheel to Kingpin connection, air ride suspension, ICC DOT approved lighting featuring LED lighting package, brakes-DOT, approved anti-lock brake system, tires: 14ply, 11R 24.5, with aluminum wheels, six (6) hydraulic leveling jacks – two (2) front, two (2) mid, and two (2) rear, rear tow connection, reflectors, and mud flaps.

POWER UNIT (CAT, DETROIT, OR CUMMINS): Radiator with anti-static fan blade, static, and fan guard, electric starter, alternator, air compressor, dry type air cleaner, spark arresting muffler, and electronic control system with safety shutdown for low oil pressure, high water temperature, and low coolant level.

SUCTION/DISCHARGE CENTRIFUGAL PUMPS: The unit is equipped with the two (2) hydraulically driven centrifugal pumps.

HYDRAULIC SYSTEM: The hydraulic system on the unit is a direct drive system via gear box off the deck engine located on the operator control console will be the following controllers for the following motors/cylinders
- one (1) Suction Centrifugal Pump, one (1) Discharge Centrifugal Pump, two (2) Gel Pumps, three (3) liquid chemical pumps, two (2) chemical tank agitators, and six (6) cylinders.

Located at ground level near the operator platform will be a hydraulic valve manifold with a nameplate/labeled equipped with standard hydraulic control valves for the following:
• Driver side front hydraulic jack
• Passenger side front hydraulic jack
• Driver side mid hydraulic jack
• Passenger side mid hydraulic jack
• Driver side rear hydraulic jack
• Passenger side rear hydraulic jack

GEL AND LIQUID CHEMICAL PUMPS: The unit will have three (3) liquid additive pumps, and two (2) gel pumps can be controlled in manual or automatic mode and will each have coriolis flow meters. Each pump will have a three way ball valve to allow the operator to discharge or re-circulating back into the chemical tank.
LIQUID and/or DRY GEL HYDRATION UNITS (continued)

HYDRATION TANK: One (1) carbon steel hydration tank will be installed on the trailer. The tank will be within view of the operator console and equipped with baffles inside the hydration tank. Tank is designed and constructed to eliminate side wall pop out. Located next to the work platform and mounted on the external of the hydration tank will be ladder to allow the operator access into the hydration tank. A man lift will be installed on the unit—manually operated. Automatic tub leveling system, and two (2) Endress + Hauser over flow switches and probes will be installed inside the hydration tank.

DRY PRODUCT TANK: One (1) carbon steel dry product storage tank will be installed with capacity to hold 2,500 lbs. Dry product will discharge into the educator / auger system. Tank will be equipped with Lifting eye, Access for loading of dry product, Discharge valve and Vibrating pad.

DRY GEL AUGER SYSTEM: One (1) Stainless Steel dry gel auger system will be installed. The system will receive dry gel polymer from the dry add product storage tank. Auger system is hydraulically operated and designed to load dry polymer. Customer to specify range i.e. 0-25 lbs. per 1,000 gallons. System is designed to operate in automatic or manual mode.

SUCTION AND DISCHARGE MANIFOLDS: The unit will have manifolds on both sides of the unit and plumbed together so either manifold can be used as a suction or discharge manifold. The suction manifold will have thirteen (13) hose connections and the discharge manifold will have twelve (12) hose connections. Each connection will have a 4” butterfly valve followed by a 4” figure 206 female (thread or wing half) union connection. The piping of the unit is designed to all so that the operator can use either centrifugal pump as the suction or discharge depending on how the unit is rigged up. Flow meter will be installed on the tank fill line with a remote digital read out.

CHEMICAL TANKS: Two (2) 550 gallon capacity chemical tanks 304 stainless steel construction with the following features - one (1) hydraulically powered agitator per tank consisting of one (1) upper and one (1) lower drive unit, 42” X 48” base with an approximate overall height of 71”, four (4) legs providing 5½” clearance, and UN31A tested and labeled. Tanks will be plumbed to operate independently or simultaneously and will have a 2” load line. Three (3) 110 gallon capacity chemical tanks 302 stainless steel construction with the following features- 42” x 48” base with an approximate overall height of 20”, four (4) legs providing 5½” clearance, and UN31A tested and labeled.

VISCOMETER: For use in the measurement of fluid viscosity. Will be plumbed to dump into the hydration tank using air valves controlled at the operator console.

THE FIP SMART OP-ACQ SYSTEM HYDRATION AUTOMATION & CONTROL: Installed on an elevated walkway will be a UL Rated Stainless Steel operator control console or operator cabin. This console will be supplied with all necessary controls for the full and complete operation of this unit.

Capabilities include:
• The ability to monitor liquid gel pumps, liquid additive pumps, tub leveling, inlet flow volume, blender suction and discharge flow rate. This system is also designed to automatically or manually adjust and maintain preset set points of liquid gel concentration, liquid additive concentration, suction and discharge centrifugal control.
• Simulated Rate feature is used for training purposes and also allows the operator to test liquid gel and liquid additive pump concentration rates prior to pumping down-hole.
• Touch Screen Color Monitors will allow the operator to have the ability to operate the unit in manual or automatic mode.
• Displays real time operating parameters.
• Liquid gel and additive pumps can be slaved to the hydration flow source, blender clean rate, or simulated rate.
• Job parameters are transmitted to the data van for data acquisition and trending purposes.
• Job design has the ability to store up to 50 jobs with up to 100 stages.
LIQUID ADDITIVE UNITS

DESCRIPTION: Consisting of a trailer (can be van enclosure or wooden flatbed deck style) with a hydraulic system powered by deck engine, ten (10) chemical totes, ten (10) liquid chemical pumps, ten (10) hose reel assembly with chemical hoses, transfer pumps, and all necessary valves and controls for normal operations. This unit can be controlled in manual or automatic mode from the operator control console. All operation parameters to be transmitted to data van.

HYDRAULIC SYSTEM: The hydraulic system will be powered by a diesel engine via hydraulics located at the front of the unit on the gooseneck of the trailer. This system will have on the operator controls panel flow control/RPM speed increasers for the following hydraulic motors – ten (10) liquid chemical additive pumps.

CHEMICAL TOTES: Ten (10) 330 gallon DOT liquid chemical totes will be installed on the unit – five (5) on each side. Tanks are constructed out of Poly material and have a surrounding protective cage. Tanks will be plumbed to operate independently and will have a 2" load line.

Each chemical tote will have a mounting assembly located on the van enclosure that will secure the totes during transportation. Each tote/pump will have a manually operated hose reel assembly with 1” chemical hose approximately 50’.

LIQUID CHEMICAL ADDITIVE PUMPS: The unit will have ten (10) liquid additive pumps. Each pump can be controlled in manual or automatic mode and will each have coriolis flow meters with digital read outs. Transfer pumps will be installed at the rear of the unit to load chemical totes.

CONTROL AND MONITORING SYSTEM: The local control console or operator cabin will be constructed of Stainless Steel material. In addition, stand alone and remote operations at the data van.

Installed in the control panel will be the following controls:
• Deck Engine:
  - Engine start, run, stop switch
  - Engine emergency kill
  - Engine computer monitor-oil pressure, tachometer, oil temperature, water temperature, voltage, and other parameters
• Ten (10) liquid chemical pump speed controls
• One (1) touch screen monitor to monitor liquid additive parameters
• Ten (10) liquid chemical pump rate meter read outs
DESCRIPTION: Fully customizable to fit your requirements, this equipment shall comprise of an enclosed unit designed and developed to be operated in off-road environment of oil fields. The unit shall be entirely independent and designed/intended for joint operation with set of fracturing equipment.

COMPARTMENT OF EXTERNAL CONNECTIONS: The lockable compartment cable connector panel shall be connected to the corresponding electronic equipment installed in a compartment. Panel is capable of connecting up to 20 pumping units, 2 Blenders, 1 Hydration Unit, and 1 Liquid Additive Unit.

TRAILER: Customized to fit requirements. Standard option is 45.5’ overall length, 34.5’ long main deck, 11’ long gooseneck, 8’6” width, and +/-96” Interior Height, 45” Maximum Floor Ht.

Interior layout to consist of three (3) areas separated by a partition wall with an integral sliding door, rear area will be a pump control room, center area will be data control and customer seating, and front gooseneck riser to be lab area.

Pump Control Area – Bench seat along roadside wall, full length counter section along front wall. Includes ‘L’ section along roadside wall, bottom cabinets, electrical cabinets, overhead cabinets, and bank of drawers.

Lab Area – Bench seat along roadside wall, full length counter section along front wall. Includes ‘L’ Section along roadside wall, bottom cabinets, electrical cabinets, overhead cabinets, bank of drawers, kitchenette to include fridge, microwave, and coffee pot.

Generator – 30KW Diesel Generator. May vary according to power requirements.

Central Heat and Air Conditioning in all three (3) areas

CABLES AND SPOOLS: Universal metal cable spools with stopper and brake will be securely fastened inside the side compartment. Each of the spools is 150 feet of cable for connection of the various terminal devices and output devices for data gathering system.
MOBILE DATA & MONITORING VANS and TRAILERS (continued)

FRACTURING OPERATIONS CONTROL CENTER: This console will have the ability to monitor and control the Blender, Hydration Unit, Liquid Additive Unit, and up to 20 Frac Pumps.

Easy to use touch screens allow for manual or automatic control of your frac fleet, with features including:
- Emergency kill/shutdown button
- Transmission gear control
- Throttle Controller
- Instant neutral switch

FIP MASTER FRACQ DATA ACQUISITION SYSTEM: Data acquisition system will include components required for all the operational information recording.

The system will monitor:
- Pressure
- Flow rate
- Density

Displayed on the color monitor will be:
- Treatment pressure
- Proppant concentration
- Volume
- Other parameters as specified by customer

COMPUTER AND CORRESPONDING HARDWARE/SOFTWARE: Two (2) Super Servers will be installed with four (4) desktop monitors. Both computers will be used for data acquisition and will be used to display information in real time and plotting the graphs as per the data entered for the other auxiliary functions. Computer system will have network connection device to allow for multiple monitors and to display the information from the computers no less than four (4) LCD screens must be mounted with reliable, vibration-proof fasteners on the wall of the box van.


One (1) color laser printer, one (1) combo fax, copier, and printer.
**DESCRIPTION:** A high pressure acid pumping unit mounted on a trailer or truck capable of pumping inhibited acids and other oil well servicing fluids. The unit is comprised of a high pressure pumping system, all required controls, instrumentation, and a hydraulic system to drive fluid handling equipment.

**TRAILER:** Standard 5th wheel to kingpin connection, air ride suspension, ICC DOT approved lighting featuring LED lighting package, brakes – DOT approved anti-lock brake system, tires – 11R x 24.5, rear bumper with enclosed lights, rear tow connection, reflectors, and front & rear mud flaps.

**ENGINE (CAT, DETROIT/MTU, OR CUMMINS):** Diesel Engine, radiator with fan blade, fan guard and shroud, air compressor, dry type air cleaner, spark arresting muffler, electronic control system with safety shutdown for low oil pressure, high water temperature, and low coolant level, and flywheel adaptation for the Allison or CAT transmission.

**TRANSMISSION (ALLISON OR CAT):** Automatic transmission set up for power shifting, wet housing, output flange, electric shift, higher gears will be blocked to prevent the pump from over speeding, and PTO will be mounted on the transmission to power the power end lubrication system.

**HYDRAULIC SYSTEM:** This system will have flow controls/speed increasers for the following hydraulic motors - motor for the loading centrifugal pump, motor for the pressurizing centrifugal pump, motor for the sand auger, and one (1) hydraulic driven hydraulic cooler.

**HIGH PRESSURE PUMPING SYSTEM:** Triplex or Quintuplex Pump. Includes gauge connection, discharge flanges, suction manifold with clean out ports, and plunger size of choice.

**PLUNGER PACKING LUBRICATION SYSTEM:** An air over oil plunger lubrication system will be installed with flow controls and fittings for the pump. Pump will have an air powered plunger lubrication pump. Grease packing lubrication systems also available.

**CENTRIFUGAL PUMP (2):** Two hydraulically driven centrifugals will be installed on the unit a water centrifugal pump and a centrifugal pump to pressurize the down-hole pump.

**LOW PRESSURE SUCTION MANIFOLDING:** This system will allow one centrifugal pump to take suction from the acid tanks and boost the down-hole pump or take suction from the mixing tub and boost down-hole pump. The other centrifugal pump will take suction from both sides of the unit and load both acid tanks or provide fluids to the mixing tub. Down hole pump has the ability to take gravity suction from the acid tanks.

**TWIN D.O.T. TANKS:** Twin 500, 750, or 1000 Gallon Acid Tanks DOT-412 approved. Tnemec 120 or 390 internal lining. Man-way hatch on each tank with spill protection. Tombstone Rollover protection. Rubber lining and fiberglass lining also available.

**MIXING TUB:** One(1) BBL Capacity, adequate jetting/mixing rock salt or other chemicals, water inlets and baffles for flow direction and circulation-for adequate jetting and circulating for mixing rock salt and other chemicals and easy access for cleaning with 4” bottom drain.
DESCRIPTION: A high pressure acid pumping unit mounted on a trailer or truck capable of pumping inhibited acids and other oil well servicing fluids. The unit is comprised of a high pressure pumping system, all required controls, instrumentation, and a hydraulic system to drive fluid handling equipment.

ENGINES: One (1) Diesel CAT, Detroit, or Cummins Engine rated for 630 BHP, radiator with anti static fan blade, anti static belts, and fan guard, electric starter, alternator, air compressor, dry type air cleaner, spark arresting muffler, and electronic control system with safety shutdown for low pressure, high water temperature, and low coolant level.

TRANSMISSIONS: One (1) CAT or Allison automatic transmission, wet housing, 1810 output flanges, programmed for power shifting, with reverse blocked out, electric shift, and higher gears will be blocked to prevent the pump from over speeding.

HYDRAULIC SYSTEMS: Auxillary pony motor will power the hydraulic system with a direct mounted gear box. This system will have flow controls/speed increasers for the following hydraulic motors - motor for the loading centrifugal pump, motor for the recirculation centrifugal pump, motor for the pressurizing centrifugal pump, motor for mixing paddles, inlet cement valve, and equipped with one (1) hydraulic cooler.

CEMENT MIXING SYSTEM: This system is equipped with all components necessary to complete a Manual or Automatic Cement Mixing System. The system is designed for use with pneumatically delivered dry cement.

Details of the cement mixing system are as follows:
- Mix water is supplied to the mixing chamber from a hydraulically driven mix water centrifugal pumps
- The cement mixing system uses a hydraulically controlled valve educator system with an inlet where by cement is blown into the unit to produce highly consistent cement slurries.
- The cement slurry exits the Cement Mixing Chamber directly into mixing tank

Other components installed for the cement mixing system will be the following:
- Manually operated valves will be installed on the mixing head recirculation lines
- One (1) Non-Radioactive Micro Motion F Series 3” Densitometer,
- One (1) 3” Turbine style flow meter will be installed to measure mix water.
- One (1) 3” Y Strainer
FIP SMART OPERATING/ACQUISITION SYSTEMS:
Monitoring Capabilities include: Discharge pressure, auxiliary pressure, flow, total down-hole flow, density, and auxiliary density.

15" Touch Screen Color Monitors will allow the operator to have the ability to operate the unit in manual or automatic mode for cement mixing.

Job data is stored on the on-board IPC and retrieved via USB memory stick. It can be viewed in Excel text or graph format and saved on an external computer.

Ability to store up to 10 stages per job.

CENTRIFUGAL PUMPS:
Three (3) hydraulically driven centrifugals will be installed on the unit. One (1) centrifugal pump for loading tanks or providing mix water, one (1) centrifugal pump for recirculation, and one (1) and for pressurizing the down-hole pumps.

HIGH PRESSURE PUMPING SYSTEM:
One (1) compact 600HP triplex pump. Includes gauge connection, discharge flanges, suction manifold with clean out ports, and plunger size of choice.

PLUNGER PACKING LUBRICATION SYSTEM:
Grease pump lube system will be installed for packing lubrication that includes a quick refill kit.

DISPLACEMENT TANKS:
Slanted style sweeping bottom to provide full suction to the pumps. The fluid handling system includes two tanks carbon steel 20 barrel total capacity, 10 barrel each tank. These tanks are designed to eliminate side wall pop-out which can affect fluid displacement.

Other features:
- Enumerated lever markers
- Dump valves
- Tanks overflow piping
- Auxiliary mud/load line for external drilling fluids
- Drain sumps
- Removable rock/debris guard in each compartment

HIGH PRESSURE DISCHARGE MANIFOLD:
Installed on each triplex pump discharge connection facing the rear of the unit will be one (1) each 2" Fig. 1502 discharge union connection.

RELEASE MANIFOLD:
A complete release manifold will be installed on this unit for rolling fluids in the fluid holding tanks using the triplex pump or for releasing pumped fluids from the wellbore back to the fluid holding tanks.
**DOUBLE CEMENTING UNITS**

EQUIPMENT DESCRIPTION:
A high pressure pumping unit mounted on a skid, truck or a trailer. The unit is comprised of a high-pressure pumping system, all required controls, instrumentation, and a hydraulic system to drive fluid handling equipment.

ENGINES:
Two (2) Diesel CAT, Detroit, or Cummins Engines, rated for 630 BHP, radiator with anti static fan blade, anti static belts, and fan guard, electric starter, alternator, air compressor, dry type air cleaner, spark arresting muffler, and electronic control system with safety shutdown for low pressure, high water temperature, and low coolant level.

TRANSMISSIONS:
Two (2) CAT or Allison automatic transmissions, wet housing, 1810 output flanges, programmed for power shifting, with reverse blocked out, electric shift, and higher gears will be blocked to prevent the pump from over speeding.

HYDRAULIC SYSTEMS:
Auxiliary pony motor will power the hydraulic system with a direct mounted gear box. This system will have flow controls/speed increasers for the following hydraulic motors - motor for the loading centrifugal pump, motor for the recirculation centrifugal pump, motor for the pressurizing centrifugal pump, motor for mixing paddles, inlet cement valve, and equipped with one (1) hydraulic cooler.

HIGH PRESSURE PUMPING SYSTEM:
Two (2) compact 600HP triplex pumps. Includes gauge connection, discharge flanges, suction manifold with clean out ports, and plunger size of choice.

PLUNGER PACKING LUBRICATION SYSTEM:
Grease pump lube system will be installed for packing lubrication that includes a quick refill kit. The lubrication system will be programmed to provide grease to all three (3) plungers when the pump is stroking and automatically shut off when the pump is not stroking.
CEMENT MIXING SYSTEM:
This system is equipped with all components necessary to complete a Manual or Automatic Cement Mixing System. The system is designed for use with pneumatically delivered dry cement.

Details of the cement mixing system are as follows:
• Mix water is supplied to the mixing chamber from a hydraulically driven mix water centrifugal pumps
• The cement mixing system uses a hydraulically controlled valve educator system with an inlet where by cement is blown into the unit to produce highly consistent cement slurries.
• The cement slurry exits the Cement Mixing Chamber directly into mixing tank

Other components installed for the cement mixing system will be the following:
• Manually operated valves will be installed on the mixing head recirculation lines
• One (1) Non-Radioactive Micro Motion F Series 3” Densitometer,
• One (1) 3” Turbine style flow meter will be installed to measure mix water.
• One (1) 3” Y Strainer

FIP SMART OPERATING/ACQUISITION SYSTEMS:
Monitoring Capabilities include: Left side discharge pressure, right side discharge pressure, auxiliary pressure, left side flow, right side flow, total down-hole flow, density, and auxiliary density.

Two (2) 15” Touch Screen Color Monitors will allow the operator to have the ability to operate the unit in manual or automatic mode for cement mixing.

Job data is stored on the on-board IPC and retrieved via USB memory stick. It can be viewed in Excel text or graph format and saved on an external computer.

Ability to store up to 10 stages per job.
DOUBLE CEMENTING UNITS (continued)

**CENTRIFUGAL PUMPS:**
Four (4) hydraulically driven centrifugals will be installed on the unit. Two (2) centrifugal pumps for loading tanks or providing mix water, one (1) centrifugal pump for recirculation, and one (1) and for pressurizing the down-hole pumps.

**DISPLACEMENT TANKS:**
Slanted style sweeping bottom to provide full suction to the pumps. The fluid handling system includes two tanks carbon steel 20 barrel total capacity, 10 barrel each tank. These tanks are designed to eliminate side wall pop-out which can affect fluid displacement.

**HIGH PRESSURE DISCHARGE MANIFOLD:**
Installed on each triplex pump discharge connection facing the rear of the unit will be one (1) each 2” Fig. 1502 discharge union connection. It will connect each pump to a high pressure manifold.

**RELEASE MANIFOLD:**
A complete release manifold will be installed on this unit for rolling fluids in the fluid holding tanks using the triplex pumps or for releasing pumped fluids from the wellbore back to the fluid holding tanks.

Other features:
- Enumerated lever markers
- Dump valves
- Tanks overflow piping
- Auxiliary mud/load line for external drilling fluids
- Drain sumps
- Removable rock/debris guard in each compartment
COMBO DOUBLE CEMENTING - LIQUID ADDITIVE UNITS

EQUIPMENT DESCRIPTION:
A high pressure pumping unit mounted on a trailer. The unit is comprised of a high-pressure pumping system, all required controls, instrumentation, and a hydraulic system to drive fluid handling equipment. Up to ten (10) liquid chemical pumps are installed on the unit.

ENGINES:
Two (2) Diesel CAT, Detroit, or Cummins Engines, rated for 630 BHP, radiator with anti static fan blade, anti static belts, and fan guard. Hydraulic starter, alternator, air compressor, dry type air cleaner, and electronic control system with safety shutdown for low pressure, high water temperature, and low coolant level.

TRANSMISSIONS:
Two (2) CAT or Allison automatic transmissions, 1810 output flanges, programmed for power shifting with reverse blocked out, electric shift, and higher gears will be blocked to prevent the pump from over speeding.

HYDRAULIC SYSTEMS:
Individual power units will power the primary and secondary hydraulic systems, each via Durst pump drive gear box.

This system will have flow controls/speed increasers for the following hydraulic motors - motor for the mix water loading centrifugal pump, motor for the recirculation centrifugal pump, motor for the pressurizing centrifugal pump, motor for mixing paddles, inlet cement valve, mix water inlet valve, and liquid additive pumps.

GREASE PLUNGER PACKING LUBRICATION SYSTEM:
An air over oil plunger lubrication system will be installed with flow controls and fittings for each triplex pump. This system will have two reservoirs per triplex pump. The first reservoir will hold the packing lube oil and the second reservoir is to recover the excess oil lube with a ball valve for ease of drainage. Necessary relief and check valves to prevent over pressuring and flow reversals in the lube oil circuit will be installed.
CEMENT MIXING SYSTEM:
This system is equipped with all components necessary to complete a Manual or Automatic Cement Mixing System. The system is designed for use with pneumatically delivered dry cement.

Details of the cement mixing system are as follows:
• Mix water is supplied to the mixing chamber from a hydraulically driven mix water centrifugal pumps
• The cement mixing system uses a hydraulically controlled valve educator system with an inlet where by cement is blown into the unit to produce highly consistent cement slurries.
• The cement slurry exits the Cement Mixing Chamber directly into mixing tank
Other components installed for the cement mixing system will be the following:
• Manually operated valves will be installed on the mixing head recirculation lines
• One (1) Non-Radioactive Micro Motion F Series 3” Densitometer,
• One (1) 3” Turbine style flow meter will be installed to measure mix water.
• One (1) 3” Y Strainer

FIP SMART OPERATING/ACQUISITION SYSTEMS:
Monitoring Capabilities include: Left side discharge pressure, right side discharge pressure, auxiliary pressure, left side flow, right side flow, total down-hole flow, density, and auxiliary density.

Two (2) 15” Touch Screen Color Monitors will allow the operator to have the ability to operate the unit in manual or automatic mode for cement mixing.

Job data is stored on the on-board IPC and retrieved via USB memory stick. It can be viewed in Excel text or graph format and saved on an external computer.

Ability to store up to 10 stages per job.

CENTRIFUGAL PUMPS:
Four (4) hydraulically driven centrifugals will be installed on the unit. One (1) boost pump, one (1) pump for recirculation, and two (2) mix water / load pumps.
LIQUID CHEMICAL ADDITIVE PUMPS:
The unit will have up to ten (10) liquid additive pumps.

Each pump can be controlled in manual or automatic mode and each will have coriolis flow meters with digital read outs.

The discharge will have hammer union connectors followed by 2-way valve for chemical injection to either driver-side or passenger-side mix water pump. Injection quills will be installed on inlet centrifugal pump suction manifold followed by a safety ball valve.

Auxiliary discharge valve installed to recirculate back to tote/tank.

RELEASE MANIFOLD:
A complete release manifold will be installed on this unit for rolling fluids in the fluid holding tanks using the triplex pumps or for releasing pumped fluids from the wellbore back to the fluid holding tanks

DISPLACEMENT TANKS:
Slanted style sweeping bottom to provide full suction to the pumps. The fluid handling system includes two tanks carbon steel 20 barrel total capacity, 10 barrel each tank. These tanks are designed to eliminate side wall pop-out which can affect fluid displacement.

Other features:
• Enumerated lever markers
• Dump valves
• Tanks overflow piping
• Auxiliary mud/load line for external drilling fluids
• Drain sumps

UNITIZATION AND COMPLETION:
The above unit shall be fully unitized and completed to the customer’s specifications. Installation of LED work lights, and complete comprehensive test and test report.
COMBO BATCH - BULK TRAILERS

TRAILER:
5th Wheel to Kingpin connection, 2” Kingpin with 3/8” plate, Air ride suspension, ICC DOT approved lighting featuring LED lighting package, Brakes - DOT approved anti-lock brake system, Tires – 11R x 24.5 - Customer to specify at time of order, Two (2) Oil Bath Axles, Rear bumper with enclosed lights, Rear tow connection, Bare frame is prime coated before installation of components, Conspicuity tape, Document holder bubble, Reflectors, Rear Mud Flap.

CENTRIFUGAL PUMPS:
Two (2) hydraulically driven centrifugal pumps will be installed on the unit. One (1) 5 x 6 for recirculation and one (1) 5 x 6 to boost the down hole pump(s).

ENGINE:
- CAT, John Deere, Cummins or Perkins Diesel Engine
- Radiator with fan blade, fan guard and shroud
- Electric Start
- Dry type air cleaner
- Spark arresting muffler
- Alternator
- Electronic control system with monitor for engine temperature, oil pressure, tachometer, with safety shutdown for low oil pressure, high water temperature, and low coolant level.
- Flywheel adaptation for hydraulic gear box
- Dual batteries and battery boxes – 12 volt
- Battery disconnect

AIR COMPRESSOR:
Unit will be equipped with a hydraulic driven air compressor for bulk delivery. This Gardner Denver APOGAA air compressor will be located at the front of the unit on the gooseneck of the trailer alongside the power system. Piston type Air Compressor with unloader valve rated for maximum working pressure of 30 psi with adequate CFM for product delivery.
HYDRAULIC SYSTEM:
The deck engine will power the hydraulic system with a hydraulic gearbox.

This system will have on the operator control panel flow controls / RPM speed increasers for the following hydraulic motors:
- Motor for the recirculation centrifugal pump
- Motor for the boost centrifugal pump
- Motor for mixing paddle
- Motor for the air compressor

330 CUBIC FEET PNEUMATIC BULK TANK:
One (1) Vessel will be manufactured and ASME certified.

The Bulk Tank will have the ability to discharge into the mixing head or to an auxiliary source.

MAWP is 30 psig at 200°F.

Vessels are equipped with:
- 20” West Coast man way
- Four 2” air inlets under fluffing pad system
- One 5” discharge connection
- One each 4” fill and one 4” vent connections
- All connections end with vitriolic nipples
- Over pressure protection to be provided on incoming air manifold
- Air feed line to the pneumatic tank will be a safety pressure relief valve will be installed to prevent any over pressure to occur.

CONTROL & MONITORING:
Installed on an elevated walkway will be a UL Rated Stainless Steel operator control console. The control platform decking will be fabricated out of fiber glass grating with a Stainless Steel access ladder. This console will be supplied with all necessary controls for the full and complete operation of this unit during all possible phases of well servicing operations.

MIXING TANK:
The fluid handling system includes one (1) 50 barrel tank with 6” outlet. The tank will feature a cylindrical closed top with conical bottom made of Carbon Steel.

This tank is designed to eliminate side wall pop-out which can affect fluid displacement.

Other features:
- 20” West Coast man way
- Hydraulic driven mixing paddle
- Enumerated level marker
- Manual dump valves
- Load and suction valves will be manually operated butterfly valves with Buna seats.
- Tank discharge connections will be located on the bottom to allow for proper discharging of fluids.
- All piping will be constructed out of Schedule 40 pipe utilizing vitriolic connections for ease of maintenance.
- 3” F Series Non Nuclear Micro Motion Densitometer.
TRAILER:
- Standard 5th Wheel to Kingpin connection
- 2” Kingpin with 3/8” plate
- Air ride suspension
- ICC DOT approved lighting featuring LED lighting package
- Brakes - DOT approved anti-lock brake system
- Tires – 11R x 24.5 - Customer to specify at time of order
- Two (2) Oil Bath Axles
- Rear bumper with enclosed lights
- Rear tow connection
- Bare frame is prime coated before installation of components
- Conspicuity tape
- Document holder bubble
- Reflectors
- Rear Mud Flaps

CENTRIFUGAL PUMPS:
Two (2) hydraulically driven centrifugal pumps will be installed on the unit.
One (1) 5 x 6 for recirculation and one (1) 5 x 6 to boost the down hole pump (s).

ENGINE:
- CAT, John Deere, Cummins or Perkins Diesel Engine
- Radiator with fan blade, fan guard and shroud
- Electric Start
- Dry type air cleaner
- Spark arresting muffler
- Alternator
- Electronic control system with monitor for engine temperature, oil pressure, tachometer, with safety shutdown for low oil pressure, high water temperature, and low coolant level.
- Flywheel adaptation for hydraulic gear box
- Dual batteries and battery boxes – 12 volt
- Battery disconnect
HYDRAULIC SYSTEM:
The deck engine will power the hydraulic system with a hydraulic gearbox.

This system will have on the operator control panel flow controls / RPM speed increasers for the following hydraulic motors:
- Motor for the recirculation centrifugal pump
- Motor for the boost centrifugal pump
- Motor for mixing paddles

CONTROL & MONITORING:
Installed on an elevated walkway will be a UL Rated Stainless Steel operator control console. The control platform decking will be fabricated out of fiber glass grating with a Stainless Steel access ladder. This console will be supplied with all necessary controls for the full and complete operation of this unit during all possible phases of well servicing operations.

UNITIZATION AND COMPLETION:
The above unit shall be fully assembled, unitized and completed to the customer’s specifications, including installation of work lights, one (1) Tool Box or Fittings Box, and one (1) 100 gallon fuel tank.

MIXING TANKS:
The fluid handling system includes two (2) 50 barrel tanks (100 barrel total capacity) with 6” outlet. The tanks will feature a cylindrical closed top with conical bottom made of Carbon Steel.

The tanks are designed to eliminate side wall pop-out which can affect fluid displacement.

Other features:
- 20” man way
- Hydraulic driven mixing paddles
- Enumerated level markers
- Manual dump valves
- Load and suction valves will be manually operated butterfly valves with Buna seats.
- Tank discharge connections will be located on the bottom to allow for proper discharging of fluids.
- All piping will be constructed out of Schedule 40 pipe utilizing vitriolic connections for ease of maintenance.
- 3” F Series Non Nuclear Micro Motion Densitometer.
BULK CEMENT TRANSPORTS

**EQUIPMENT DESCRIPTION:**
This unit can be a truck, trailer, or skid mounted, suitable for use in rough terrain oil field environments. Two (2) vessels will be manufactured and certified to ASME standards.

**TRAILER:**
Standard 5th wheel to kingpin connection, air ride suspension, ICC DOT approved lighting featuring LED lighting package, brakes-DOT approved anti-lock brake system, tires-11R X 24.5, rear bumper with enclosed lights, rear tow connections, reflectors, and rear mud flaps.

**POWER SYSTEM:**
The air compressor will be powered by a diesel engine located at the front of the unit on the gooseneck of the trailer. Diesel Engine, radiator, with fan blade, fan guard and shroud, electric starter, dry type air cleaner, spark arresting muffler, flywheel housing, and engage/disengage PTO clutch.

**AIR COMPRESSOR:**
Unit will be equipped with a belt driven air compressor for bulk delivery. This Gardner Denver APOGAA air compressor will be located at the front of the unit on the gooseneck of the trailer alongside the power system. Piston type air compressor with unloader valve rated for maximum working pressure of 30psi with adequate CFM for product delivery.

**PNEUMATIC BULK TANKS:**
- Two (2) vessels will be manufactured and ASME certified.
  - Located behind the power system and air compressor
  - 200, 220, or 330 cubic feet capacity.
- The bulk tanks will have the ability to discharge at the rear of the trailer
- MAWP is 30psi at 200°F
- Vessels are equipped with
  - 20” west coast man way
  - Four (4) 2” air inlets under fluffing pad system
  - One (1) 5” discharge connection
  - One (1) each fill and vent connection
- All connections end with vitriolic nipples
- Over pressure protection to be provided on incoming air manifold
- Air supply to be rigged to provide air to tanks either individually or simultaneously

**TANK ACCESS AREA:**
In between the bulk tanks will be a small work platform that is accessible from the passenger side of the unit. Hand rails will be fabricated on the ladder and surround the work platform.
CEMENT MIXING SYSTEMS

EQUIPMENT DESCRIPTION:
Truck, trailer, skid mounted, or installed on your cement unit. This system is capable of mixing 14 bpm and densities up to 22 lbs./gal.

POWER:
Powered by hydraulics from your unit or driven by an auxiliary engine

CENTRIFUGAL PUMPS
Loading pump, pressurizing pump, and recirculating pump will be mission sandmaster style centrifugal pumps

CEMENT MIXING SYSTEM:
This system is equipped with all components necessary to complete a Manual or Automatic Cement Mixing System. The system is designed for use with pneumatically delivered dry cement.

Details of the cement mixing system are as follows:
• Mix water is supplied to the mixing chamber from a hydraulically driven mix water centrifugal pumps
• The cement mixing system uses a hydraulically controlled valve educator system with an inlet where by cement is blown into the unit to produce highly consistent cement slurries
• The cement slurry exits the Cement Mixing Chamber directly into mixing tank

Other components installed for the cement mixing system will be the following:
• Manually operated valves will be installed on the mixing head recirculation lines
• One (1) Non-Radioactive Micro Motion F Series 3” Densitometer,
• One (1) 3” Turbine style flow meter will be installed to measure mix water.
• One (1) 3” Y Strainer
ACID - CEMENT COMBO UNITS

EQUIPMENT DESCRIPTION:
A high pressure pumping unit mounted on a truck chassis or trailer. The unit is comprised of a high-pressure pumping system, all required controls, instrumentation, and a hydraulic system to drive fluid handling equipment.

The auxiliary engine will power the onboard hydraulics, the fluid handling system includes (2) 500 or 750 gallon DOT Acid Tanks. Three (3) centrifugals will be installed on the unit for mix water and load of acid tanks, recirculation of cement mixing tub, and for pressurizing the down-hole pump.

HYDRAULIC SYSTEM:
The auxiliary engine will power the hydraulic system. This system will have flow controls/speed increasers for the following hydraulic motors- motor for the loading centrifugal pump, motor for the recirculation centrifugal pump, motor for the boost centrifugal pump, motor for mixing paddles, inlet cement valve, and the unit is equipped with one hydraulic driven hydraulic cooler.

HIGH PRESSURE PUMPING SYSTEM:
One (1) compact 600 hp triplex pump. Includes gauge connection, discharge flanges, suction manifold with clean out ports, and plunger size of choice.

POWER END LUBRICATION SYSTEM:
The triplex pump power end will be lubricated with a force feed filtered back flow system driven from the road transmission.

PLUNGER PACKING LUBRICATION SYSTEM:
An air over oil plunger lubrication system will be installed with flow controls and fittings for each triplex pump. Triplex pump will have an air powered plunger lubrication pump. Grease packing lubrication system also available.

CENTRIFUGAL PUMPS:
Three (3) hydraulically driven centrifugals will be installed on the unit. One (1) centrifugal pump for loading tanks or providing mix water, one (1) centrifugal pump for recirculation, and one (1) centrifugal for pressurizing the down-hole pump.
CEMENT MIXING SYSTEM:
This system is equipped with all components necessary to complete a Manual or Automatic Cement Mixing System. The system is designed for use with pneumatically delivered dry cement.

Details of the cement mixing system are as follows:
• Mix water is supplied to the mixing chamber from a hydraulically driven mix water centrifugal pumps
• The cement mixing system uses a hydraulically controlled valve educator system with an inlet where by cement is blown into the unit to produce highly consistent cement slurries.
• The cement slurry exits the Cement Mixing Chamber directly into mixing tank

Other components installed for the cement mixing system will be the following:
• Manually operated valves will be installed on the mixing head recirculation lines
• One (1) Non-Radioactive Micro Motion F Series 3” Densitometer,
• One (1) 3” Turbine style flow meter will be installed to measure mix water.
• One (1) 3” Y Strainer

FIP SMART OPERATING/ACQUISITION SYSTEMS:
Monitoring Capabilities include: Discharge pressure, auxiliary pressure, flow, total down-hole flow, density, and auxiliary density.

15” Touch Screen Color Monitors will allow the operator to have the ability to operate the unit in manual or automatic mode for cement mixing.

Job data is stored on the on-board IPC and retrieved via USB memory stick. It can be viewed in Excel text or graph format and saved on an external computer.

Ability to store up to 10 stages per job.

TWIN D.O.T. TANKS:
Twin 500 or 750 Gallon Acid Tanks D.O.T-412 approved, Tnemec 120 internal lining, man-way hatch on each tank with spill protection, and 4” bottom suction connection.

RELEASE MANIFOLD:
A complete release manifold will be installed on this unit for releasing pumped fluids from the well bore back to the acid tanks.
AUTOMATED CONTROL SYSTEMS

EQUIPMENT DESCRIPTION:
If your company’s system is under performing, retrofitting with FIP Automated Control Systems is the ideal solution. Merge your frac fleets together with a simple and intuitive user friendly system. The ability to easily control and monitor your entire frac fleet from one location allows you to reduce the number of experienced workers needed on the job site.

FIP DATA VAN MASTER FRACQ CENTER CONTROL SYSTEM:
Equipped with a state of the art electronics system, giving the user full control and data monitoring capabilities. Touch screen monitors display real time operating parameters, while allowing the user to operate different units in manual or automatic modes.

- Bottom hole plot feature
- Customize Job Events as they occur
- Ability to view or export job date to remote users

Real Time Data Collection includes:
- Rate
- Pressure
- Density
- Temperature
- Analog
- Frequency

AUTOMATED CONTROL SYSTEMS:

FIP Frac Pump Controller:
- Master Frac Pump controller operates up to 20 pumps

Blender Automation and Control:
Monitors:
- Sand
- Liquid additive pumps
- Dry additive pumps
- Suction and discharge volume
Can adjust set points for:
- Sand concentration
- Liquid additive concentration
- Dry additive concentration

Hydration Automation and Control:
Monitors:
- Liquid gel pumps
- Liquid additive pumps
- Tub leveling
- Inlet flow volume
- Blender suction
- Discharge flow.
Can adjust set points for:
- Liquid gel concentration
- Liquid additive concentration

Liquid Additive Automation and Control:
Monitors and controls:
- Liquid additive pumps
Can adjust preset set points for:
- Liquid additive concentration

Freemeyer Industrial Pressure
EQUIPMENT DESCRIPTION:
The Freemyer Industrial Pressure Smart Operating/Acquisition System features a high quality touch screen monitor that displays operational information and user options in a practical and simplified manner. The result is a system that is extremely easy and intuitive for equipment operators to use, even in the most adverse of conditions. The FIP Smart Operating/Acquisition System is unique to the market and can seamlessly replace your cementer’s existing system.

The FIP Smart Op/Acq System is available for:
- Offshore skids
- Trailers
- Truck Mounted Units

FIP SMART OPERATING/ACQUISITION SYSTEMS:
Monitoring Capabilities include: Left side discharge pressure, right side discharge pressure, auxiliary pressure, left side flow, right side flow, total down-hole flow, density, and auxiliary density.

15” Touch Screen Color Monitors will allow the operator to have the ability to operate the unit in manual or automatic mode for cement mixing.

Job data is stored on the on-board IPC and retrieved via USB memory stick. It can be viewed in Excel text or graph format and saved on an external computer.

Ability to store up to 10 stages per job.
There are many factors considered when designing offshore facility layouts. Fixed minimum separation distances between pieces of equipment are at a minimum, putting extra demand on considerations such as safety, along with ease of access to the equipment. These challenges are made even more complex when considering things such as the relative processes between equipment, the timing in which different pieces of equipment are available for installation, and more.

With these considerations in mind, flexibility is a large asset. At Freemyer Industrial Pressure, our equipment can be designed to suit your space requirements, from multi skid configurations which give you more options when arranging equipment, to single skid configurations with narrow footprints which allow you to save space. Freemyer Industrial Pressure can also custom build any support or auxiliary equipment needed, including tanks, mud systems, and other structural fabrications. At FIP, we build equipment with the operators in mind, always maintaining a focus on Safety and Maintenance. For more information, please contact us today.
FIP offers flexible solutions that will allow your offshore equipment to be used in all parts of the world.

Our skid designs can be DNV 2.7-1 or ABS certified, while unit electronics can be designed to meet Class 1 Div 2 and Zone 2 ATEX specifications, allowing for operation in potentially hazardous areas.

At FIP, we build equipment with the operators in mind, always maintaining a focus on Safety and Maintenance.
OFFSHORE DOUBLE CEMENTING UNITS

EQUIPMENT DESCRIPTION:
A high pressure pumping unit mounted on an offshore skid design. Multi skid configurations and single skid configurations with narrow footprints are available. The unit is comprised of a high-pressure pumping system, all required controls, instrumentation, and a hydraulic system to drive fluid handling equipment.

ENGINES:
Two (2) Diesel CAT, Detroit, or Cummins Engines, rated for 630 BHP, radiator with anti static fan blade, anti static fan belts, and fan guard, electric starter, alternator, air compressor, dry type air cleaner, spark arresting muffler, and electronic control system with safety shutdown for low pressure, high water temperature, and low coolant level.

TRANSMISSIONS
Two (2) CAT or Allison automatic transmissions, wet housing, 1810 output flanges, programmed for power shifting, with reverse blocked out, electric shift, and higher gears will be blocked to prevent the pump from over speeding.

HYDRAULIC SYSTEM:
Deck engines and transmissions or auxiliary diesel engine can power the hydraulic system with a direct mounted gear box. This system will have flow controls/speed increasers for the following hydraulic motors - motor for the loading centrifugal pump, motor for the pressurizing centrifugal pump.

HIGH PRESSURE PUMPING SYSTEM:
Two (2) compact 600HP triplex pumps. Includes gauge connection, discharge flanges, suction manifold with clean out ports, and plunger size of choice.

PLUNGER PACKING LUBRICATION SYSTEM:
Grease pump lube system will be installed for packing lubrication that includes a quick refill kit. The lubrication system will be programmed to provide grease to all three (3) plungers when the pump is stroking and automatically shut off when the pump is not stroking.

CENTRIFUGAL PUMPS:
Four (4) hydraulically driven centrifugals will be installed on the unit. Two (2) centrifugal pumps for loading tanks; one (1) for pressurizing the down-hole pumps, and one (1) circulating centrifugal pump.
CEMENT MIXING SYSTEM:
This system is equipped with all components necessary to complete a Manual or Automatic Cement Mixing System. The system is designed for use with pneumatically delivered dry cement.

Details of the cement mixing system are as follows:
• Mix water is supplied to the mixing chamber from a hydraulically driven mix water centrifugal pumps
• The cement mixing system uses a hydraulically controlled valve educator system with an inlet where by cement is blown into the unit to produce highly consistent cement slurries.
• The cement slurry exits the Cement Mixing Chamber directly into mixing tank

Other components installed for the cement mixing system will be the following:
• Manually operated valves will be installed on the mixing head recirculation lines
• One (1) Non-Radioactive Micro Motion F Series 3" Densitometer,
• One (1) 3" Turbine style flow meter will be installed to measure mix water.
• One (1) 3" Y Strainer

FIP SMART OPERATING/ACQUISITION SYSTEMS:
Monitoring Capabilities include: Left side discharge pressure, right side discharge pressure, auxiliary pressure, left side flow, right side flow, total down-hole flow, density, and auxiliary density.

15" Touch Screen Color Monitor will allow the operator to have the ability to operate the unit in manual or automatic mode for cement mixing.

Job data is stored on the on-board IPC and retrieved via USB memory stick. It can be viewed in Excel text or graph format and saved on an external computer.

Ability to store up to 10 stages per job.

SURGE TANKS:
One (1) ASME 70 cubic feet surge tank will be mounted on the unit to allow dry product discharge to the cement mixing head. This surge tank will be removable.

DISPLACEMENT TANKS:
Slanted style sweeping bottom to provide full suction to the pumps. The fluid handling system includes two tanks carbon steel 20 barrel total capacity, 10 barrel each tank. Mounted above the displacement tanks will be a four (4) compartment chemical tank, 1-50 gallon capacity, 1-35 gallon capacity, 1-20 gallon capacity, and 1-10 gallon capacity. Each compartment will have an inlet, and outlet with option to dump into left or right side of displacement tanks with air operated valves and switches mounted on a separate control panel near the displacement tanks.

CHEMICAL TANKS:
Designed to store four (4) Stainless Steel Chemical Totes and four (4) air powered Wilden liquid additive pumps.

Four (4) Wilden air operated pumps will be mounted below the chemical tanks and plumbed to allow suction from the chemical tank and discharge to the four (4) compartment chemical tanks mounted over the displacement tanks.
OFFSHORE SKID MOUNTED 1,000 BHP FRAC PUMPS

DESCRIPTION: Consisting of an offshore skid design engine, transmission, pump, power end lubrication, packing lubrication, and all necessary valves and controls for normal operations. Unit electronics can be designed to meet Class 1 Div 2 and Zone 2 ATEX specifications, allowing for operation in potentially hazardous areas. It will be operated locally or remotely at control room. All engine, and operation parameters will be transmitted to control room. This equipment shall comprise of a pumping unit designed and developed for offshore Zone 2 environments. Zone 2 work lights will provide sufficient lighting to illuminate working stations in low light conditions and/or during night time operations. All discharge treating iron will be rated for 15,000 psi operating working pressure.

SKID: Single or multi skid designs, depending on weight limitations, that are DNV 2.7-1 or ABS certified

TRANSMISSION: Customized valve body for Zone 2 operation. Operator can change gears at the local control enclosure, at the remote control, or at the Master Frac Controller located in the control room.

ENGINE: Display monitor, Over-speed sensor, High water temperature switch, Low oil pressure switch, High exhaust temperature switch, Gas sensing head, Gas bottle, Pressure regulator switch, Air valve control solenoid, Emergency stop switch. Electronic shutdown and gas detection system. Radiator with anti static fan blade, anti static belts, and fan guard. Explosion proof air starter with non-spark engagement

HIGH PRESSURE PUMPING SYSTEM: Triplex or Quintuplex pumps. Includes gauge connection, discharge connection, suction manifold with clean out ports.

DISCHARGE MANIFOLD: Installed on the unit will be a 3" 1502 single discharge manifold rated to 15,000 psi.
CONTROL AND MONITORING SYSTEM:
Installed on the local panel will be the following:
• Engine shutdown control
• Touch screen monitor that displays real time operating parameters
• Digital engine monitor / display for all engine functions and readings i.e. tachometer, oil pressure, temperature, and other parameters

Remote control exterior will be constructed of a heavy duty protective suitcase style with a stainless steel interior panel
• Engine emergency kill/shutdown
• Touch screen monitor:
  - Displays all real timefrac operation parameters to include some engine, transmission, and pump parameters.
  - Touch screen transmission gear selector
  - Touch screen stop button
  - Touch screen keyboard will pop up when applicable to adjust settings.

POWER END LUBRICATION SYSTEM: Power end will be lubricated with a force feed filtered back flow system direct driven from the deck engine or transmission. This system will be comprised of the following components: Lube pump, Stainless Steel Lubrication Tank built into skid frame, Pump inlet suction strainer, Sight level glass, Man-way style access hatch, Baffle protection, Drainage connection and valve, Lube oil temperature gauge located on the monitoring box, Lube oil filter, Power end lube manifold will be installed for oil analysis.

PLUNGER PACKING LUBRICATION SYSTEM: An air over oil plunger lubrication system will be installed with flow controls and fittings. Necessary relief and check valves to prevent over pressuring and flow reversals in the lube oil circuit will be installed. The system will have a back-up that features a TEE followed by a ball valve to allow oil to drip directly on to the plunger.
OFFSHORE SKID MOUNTED FRAC BLENDDERS

DESCRIPTION: The offshore skid mounted blender is a fracturing fluid preparation and proppant-proportioning unit which can execute a fracturing pumping design controlling both suction and discharge functions. Unit electronics can be designed to meet Class 1 Div 2 and Zone 2 ATEX specifications, allowing for operation in potentially hazardous areas. The blender unit is equipped with one (1) power unit. The Conventional or Hurricane Style Tub is designed to automatically increase or decrease fluid based on the outgoing demand.

SKID: Single or multi skid designs, depending on weight limitations, that are DNV 2.7-1 or ABS certified.

POWER UNIT: One (1) Diesel Engine, radiator, fan drive assembly complete with belts, Explosion Proof Air Starter with non-spark engagement. Safety shutdown for low oil pressure, high water temperature, and low coolant level. Engine will also have over speed and over pressure shutdowns.

HYDRAULIC SYSTEM: The hydraulic on the blender powered by a direct drive system via gear box off the power unit. Located on the operator control console will be the following controllers for the following motors: Two (2) sand screws. Three (3) liquid chemical pumps, Two (2) dry additive meters hydraulically driven, One (1) suction centrifugal pump, One (1) discharge centrifugal pump (if included), and One (1) Tub.
MIXING SYSTEM:
Hurricane Style tub top mounted drive, single Stage Mixer utilized for blending of proppants with fluids, higher control of proppant concentrations and adjustments, and virtually instantaneous change due to low tub size. For Conventional units, an open top blender tub, hydraulically driven mixing paddle, and discharge centrifugal pump will be installed.

SUCTION PUMP: The unit is equipped with one (1) hydraulically driven centrifugal pumps.

SUCTION AND DISCHARGE MANIFOLD: The suction manifold will have ten (10) hose connections. Each connection will have a 4” butterfly valve followed by a 4” figure 206 union connection (specify thread or wing half). The discharge side of the Tub will discharge into a manifold with ten (10) hose connections. Each connection will have a 4” butterfly valve followed by a 4” figure 206 union connection (specify thread or wing half).

LIQUID CHEMICAL ADDITIVE PUMPS: The unit will have three (3) Waukesha U2 018 Pump rated up to 15 gpm each. Additional pumps can be installed. Each pump can be controlled in manual or automatic mode and will each have coriolis flow meters with digital rate readouts.

DRY ADDITIVE METER: Two (2) dry additive systems will be installed. Magnetic pick-up will be used for product delivery analysis. The dry additive meters can be controlled in manual or automatic mode.

SAND SCREWS: The unit will be equipped with two (2) 12” sand screw. Sand screw is sized based on your desired sand concentration requirements. This unit is capable of controlling and monitoring sand delivery with the electronic system.

THE FIP SMART OP-ACQ SYSTEM BLENDER AUTOMATION & CONTROLS:
Unit can be controlled locally or remotely in the control room.

Unit will have the ability to monitor sand, liquid additive pumps, dry additive pumps, down hole density, suction and discharge volume. This system is also designed to automatically or manually adjust and maintain preset set points of sand concentration, liquid additive concentration, and dry additive concentration.

Touch Screen Color Monitors will allow the operator the ability to operate the unit in manual or automatic mode.

Displays real time operating parameters, including Sand concentration, Liquid Additive Concentration, Dry Additive Concentration, Centrifugal & Tub Parameters, and more.

Current stage and total job volume totals including Suction Rate, Discharge Rate, Liquid Additives, Dry additives, and Sand Control.

Sand screws, dry additives, and liquid additive pumps can be slaved to blender clean rate or simulated rate.

Job data and job parameters are transmitted for data acquisition and trending purposes to the control room.

Job Design has the ability to store up to 50 jobs with up to 100 stages.
**OFFSHORE SKID MOUNTED BATCH MIXERS**

**UNIT DESCRIPTION:** Unit electronics can be designed to meet Class 1 Div 2 and Zone 2 ATEX specifications, allowing for operation in potentially hazardous areas.

**SKID:** Single or multi skid designs, depending on weight limitations, that are DNV 2.7-1 or ABS certified

**ENGINE:**
- One (1) Diesel Engine
- Radiator with fan blade, fan guard and shroud
- Electronic shutdown and gas detection system
- Butterfly shutdown valve
- Exhaust cooler
- Display unit, over-speed sensor, high water temperature switch, low oil pressure switch, high exhaust temperature switch, gas sensing head x 2, gas bottle, pressure regulator switch, air valve control solenoid x 1, and emergency stop switch x 1

**CENTRIFUGAL PUMPS:**
Two (2) hydraulically driven Gardner Denver centrifugal pumps will be installed on the unit. One (1) 5 x 6 for recirculation and one (1) 5 x 6 to boost the down hole pump (s).

**MIXING TANKS:**
The fluid handling system includes two (2) 50 barrel tanks (100 barrel total capacity) with 6” outlets. The tanks will feature a cylindrical open top with conical bottom made of Carbon or Stainless Steel.

The tanks are designed to eliminate side wall pop-out which can affect fluid displacement.

Other features:
- Hydraulic driven mixing paddle
- Enumerated level markers
- Manual dump valves
- Load and suction valves will be manually operated butterfly valves with Buna seats.
- Tank discharge connections will be located on the bottom to allow for proper discharging of fluids.
- All piping will be constructed out of Schedule 40 pipe utilizing vitriolic connections for ease of maintenance.

**HYDRAULIC SYSTEM:**
The deck engine will power the hydraulic system with a hydraulic gearbox.

This system will have on the operator control panel, controllers for the following hydraulic motors:
- Motor for the recirculation/boost centrifugal pump
- Motor for the water/load centrifugal pump
- Motor for mixing paddles

**CONTROL & MONITORING:**
Unit can be controlled locally or remotely in the control room. Touch Screen Color Monitors will allow the operator the ability to operate the unit in manual or automatic mode. The local console will be supplied with all necessary controls for all phases of well servicing operations.
OFFSHORE SKID MOUNTED DOUBLE PUMPING UNITS

DESCRIPTION: A high pressure pumping unit mounted on an offshore skid design. The unit is comprised of a high-pressure pumping system, all required controls, instrumentation, and a hydraulic system to drive fluid handling equipment. Unit electronics can be designed to meet Class 1 Div 2 and Zone 2 ATEX specifications, allowing for operation in potentially hazardous areas. Unit will be operated locally or remotely at control room. This equipment will be designed and developed for offshore Zone 2 environments.

SKID: Single or multi skid designs, depending on weight limitations, that are DNV 2.7-1 or ABS certified


TRANSMISSIONS: Two (2) transmissions, Wet housing, Remote transmission filters, Programmed for power shifting, with reverse blocked out, Lockup converters for direct drive, Fail to neutral, Engine cooling system will provide adequate cooling of transmissions, Higher gears will be blocked to prevent the pump from over speeding.

HIGH PRESSURE PUMPING SYSTEM:
Two (2) compact quintuplex or triplex pumps. Includes gauge connection, discharge flanges, suction manifold, and plunger size of choice.

DISPLACEMENT TANKS:
Slanted style sweeping bottom to provide full suction to the pumps. The fluid handling system includes two tanks carbon steel 20 barrel total capacity, 10 barrel each tank. These tanks are designed to eliminate side wall pop-out which can affect fluid displacement.

Other features:
• Enumerated lever markers
• Dump valves
• Tanks overflow piping
• Auxiliary mud/load line for external drilling fluids
• Drain sumps
• Removable rock/debris guard in each compartment

HIGH PRESSURE DISCHARGE MANIFOLD:
Installed on each pump discharge connection facing the rear of the unit will be one (1) each 2" Fig. 1502 discharge union connection. It will connect each pump to a high pressure manifold.

RELEASE MANIFOLD:
A complete release manifold will be installed on this unit for rolling fluids in the fluid holding tanks using the pumps or for releasing pumped fluids from the wellbore back to the fluid holding tanks.

FIP SMART OPERATING/ACQUISITION SYSTEMS:
Monitoring Capabilities include: Left side discharge pressure, right side discharge pressure, auxiliary pressure, left side flow, right side flow, total down-hole flow, density, and auxiliary density.

One (1) 15" Touch Screen Color Monitor.

Job data is stored on the on-board IPC and retrieved via USB memory stick. It can be viewed in Excel text or graph format and saved on an external computer.

Ability to store up to 10 stages per job.
AUTOMATED FRAC CONTROLS

Equipped with a state of the art electronics system, giving the user full control and data monitoring capabilities. Touch screen monitors display real time operating parameters, while allowing the user to operate different units in manual or automatic modes.

- 1 - Master Frac Pump Controller operates up to 10 pumps
- 1 - Blender Controller
- 1 - Batch Mixer Controller

INTERIOR WILL BE CUSTOMIZED TO SUIT CUSTOMER’S NEEDS

MASTER FRACQ DATA ACQUISITION SYSTEMS:

High quality touch screen monitors that displays operational information and user options in a practical and simplified manner. The result is a system that is extremely easy and intuitive for equipment operators to use, even in the most adverse of conditions.

- Includes 2 servers and 6 monitors
**COMBO LN2 - FLUID PUMP UNITS**

**EQUIPMENT DESCRIPTION:**
The combo unit will be fabricated on a trailer. The completed unit will consist of two separate systems with the operation console in the center.

The nitrogen pumping system will consist of the following engine, hydraulic system, liquid nitrogen triplex pump, nitrogen boost pump, water bath vaporizer, after cooler heating system, hydraulic heating system, coolant circulating pump, and all valves, and controls for normal operations.

**NITROGEN PUMPING SYSTEM PRINCIPLES OF OPERATION:**
The liquid nitrogen is delivered from the tank to the triplex high pressure pump by a centrifugal. The liquid nitrogen is pumped through a water bath vaporizer where the liquid is converted into a gas at 70° F plus. It then passes through a high pressure discharge line to leave the unit and go down hole. The nitrogen is converted from liquid up to 180° F by using heat generated from the hydraulic system, engine coolant system, and engine exhaust system.

**NITROGEN MAJOR COMPONENT SPECIFICATIONS:**

**ENGINE:**
- Choice of engine CAT, Detroit, or Cummins Diesel
- Radiator with fan blade, fan guard, and shroud
- Water cooled manifold
- Charge air cooler
- Electric starter
- Air compressor
- Dry type air cleaner
- Spark arresting muffler
- Electronic engine control system

**VAPORIZERS / HEAT EXCHANGERS:**
- Exhaust vaporizer
- Water bath vaporizer
- Hydraulic heat exchanger
- Lube oil heat exchanger
- Engine coolant heat exchanger

**NITROGEN TRIPLEX PUMP:**
- GUPD, GMPD, or ICP 200 warm end or equivalent with choice of cold ends

**LIQUID NITROGEN BOOST PUMP:**
- 1-1/2" X 2-1/2" X 6" centrifugal boost pump

**COOLANT PUMP:**
- Viking gear pump or equivalent

**NITROGEN TANK:**
- 2,000 or 3,000 gallon capacity double walled and vacuum insulated
- Complete gauge panel
- Side mounted vaporizer
- Complete with vent assembly
- Maximum allowable working pressure is 45 psi
- Service temperature -320° F
- Pressure building coils
FLUID PUMPING SYSTEM:
The unit is comprised of a high pressure pumping system, engine, automatic transmission, triplex pump, all required controls and instrumentation for normal operation. The fluid handling system includes two (2) 10 bbl capacity displacement tanks for a total of 20 bbl capacity. Each tank is constructed out of carbon steel. Two (2) centrifugals will be installed on the unit for loading tanks, mixing, and pressurizing the down hole pump.

ENGINE:
• Choice of engine: CAT, Detroit, or Cummins Diesel
• Radiator with fan blade, fan guard, and shroud
• Charge air cooler
• Electric starter
• Air compressor
• Dry type air cleaner
• Spark arresting muffler
• Electronic engine control system

TRANSMISSION:
• Allison 4750 OFS Series transmission with wet housing.

TRIPLEX PUMP:
• 600 hp triplex pump. Plunger size of choice.

CENTRIFUGAL PUMPS (2)
• Two (2) centrifugals will be installed on the unit, Mission Magnum 3” x 4” centrifugal pumps. One centrifugal will pressurize the down hole pump, recirculate to the displacement tanks, and load the displacement tanks. The other centrifugal will load the displacement tanks, recirculate to the displacement tanks, and pressurize the down hole pump.

DISCHARGE RELIEF VALVE:
• 2” 1502 connection adjustable relief valve from 0-15,000 psi.

DISPLACEMENT TANKS:
• The fluid handling system includes two (2) tanks 20 bbl total capacity, 10 bbl each tank carbon steel construction.

SHARED COMPONENTS
TRAILER:
• Standard 5th Wheel to Kingpin connection
• Spread axle
• ICC DOT approved lighting
• Brakes: DOT approved anti-lock brake system
• Tires: 14 ply, 105 psi, 11R 22.5, rated 6175 lbs. with steel wheels
• 70,000 lbs. GVW (approx.)
• Jacks rated 50,000 lbs. (120,000 lbs static), reservoirs mounted integral to frame
• Step up fenders with hand holds for reservoir fluid access and protective coating to prevent paint wear
• Rear bumper with enclosed lights
• Rear tow connection
• Bare frame is prime coated before installation of components
• Air ride suspension

CLIMATE CONTROLLED CABIN:
Controls for both pumping systems will be located in the climate control cabin. The control cabin shall be supported by square framework bolted to the trailer.

Exterior Sheet Metal:
• The exterior of the walls and roof of the control cabin enclosure shall be covered with Stainless Steel sheets
• The exterior floor of the control cabin shall be covered with aluminum sheets
• Riveted; no exterior screws

Windows:
• The window panes of the control cabin shall be secured in place using EPDM compound one-piece weather stripping
• The windows shall be labeled and function as OSHA approved “kick-out” windows for safety purposes
• Front (facing displacement tanks) and rear (facing nitrogen tank) windows will be nearly the entire width of the control cabin

Doors:
• The cabin will have doors on both sides that will allow the operator access from both the passenger and driver side
• The closing/locking mechanism of the control cabin door shall be a keyed cylinder, industrial refrigerator type latch with an internal opening mechanism

Air Conditioning System:
• The control cabin shall come equipped with an automotive style air conditioning unit powered off both engines

Heating Unit:
• The control cabin shall come equipped with a radiator style heater to transfer heat from engine coolant to the Control Cabin air
**EQUIPMENT DESCRIPTION:**
The completed unit will consist of the following engine, hydraulic system, liquid nitrogen triplex pump, nitrogen boost pump, water bath vaporizer, after cooler heating system, hydraulic heating system, necessary valves and controls for normal operations

**ENGINE (CAT, DETROIT OR CUMMINS):**
Diesel engine, air starter, air compressor, dry type air cleaner, spark arresting muffler, and flywheel adaptation for a hydraulic gear box.

**TRIPLEX PUMP:**
3-GUPD warm end or equivalent with 1-5/8” cold end assemblies, external power end lube, hydraulically set to prevent the pump from over speeding, maximum working pressure - 10,000psi, maximum pump rate - 3,000 scf/minute, and air actuated 2” X 1” discharge plug valve-switch located on the control console.

**BOOST PUMP:**
AC-18HD 1 1/2 " X 2 ½” X 6” centrifugal boost pump or equivocal, hydraulically driven, compact design is lightweight, and stainless steel bearing housing designed for well service, heavy duty applications.

**COOLANT PUMP:**
Hydraulically driven Viking gear pump or equivalent.

**VAPORIZERS/SHELL PLATE HEAT EXCHANGERS:**
Water bath vaporizer, hydraulic heat exchanger, lube oil heat exchanger, and engine coolant heat exchanger.

**HYDRAULIC SYSTEM:**
Powered by the deck engine via hydraulic gear box. This system will have on the operator control panel speed increasers and the following hydraulic motors- motor for the liquid nitrogen box, motor for the liquid nitrogen boost centrifugal pump, and motor for the coolant pump.

**CONTROLS AND GAUGES:**
This console will be UL Rated and fabricated out of stainless steel. It will be supplied with all necessary controls and gauges for the full and complete operation of this unit during all possible phases of well servicing operations.

The control panel will feature a corrosion resistant panel with permanent labeling. The console will be supplied with a protective cover.
DOUBLE PUMPING UNITS

EQUIPMENT DESCRIPTION:
A high pressure pumping unit mounted on a skid, truck or a trailer. The unit is comprised of a high-pressure pumping system, all required controls, instrumentation, and a hydraulic system to drive fluid handling equipment.

ENGINES:
Two (2) Diesel CAT, Detroit, or Cummins Engines, rated for 630 BHP, radiator with anti static fan blade, anti static belts, and fan guard, electric starter, alternator, air compressor, dry type air cleaner, spark arresting muffler, and electronic control system with safety shutdown for low pressure, high water temperature, and low coolant level.

TRANSMISSIONS:
Two (2) CAT or Allison automatic transmissions, wet housing, 1810 output flanges, programmed for power shifting, with reverse blocked out, electric shift, and higher gears will be blocked to prevent the pump from over speeding.

HIGH PRESSURE PUMPING SYSTEM:
Two (2) compact quintuplex or triplex pumps. Includes gauge connection, discharge flanges, suction manifold with clean out ports, and plunger size of choice.

PLUNGER PACKING LUBRICATION SYSTEM:
Grease pump lube system will be installed for packing lubrication that includes a quick refill kit. The lubrication system will be programmed to provide grease to all plungers when the pump is stroking and automatically shut off when the pump is not stroking.

HYDRAULIC SYSTEM:
Deck engines and transmissions or auxiliary diesel engine will power the hydraulic system with a direct mounted gear box. This system will have flow controls/speed increasers for the following hydraulic motors - motor for the loading centrifugal pump, motor for the pressurizing centrifugal pump.
DISPLACEMENT TANKS:
Slanted style sweeping bottom to provide full suction to the pumps. The fluid handling system includes two tanks carbon steel 20 barrel total capacity, 10 barrel each tank. These tanks are designed to eliminate side wall pop-out which can affect fluid displacement.

Other features:
- Enumerated lever markers
- Dump valves
- Tanks overflow piping
- Auxiliary mud/load line for external drilling fluids
- Drain sumps
- Removable rock/debris guard in each compartment

FIP SMART OPERATING/ACQUISITION SYSTEMS:
Monitoring Capabilities include: Left side discharge pressure, right side discharge pressure, auxiliary pressure, left side flow, right side flow, total down-hole flow, density, and auxiliary density.

Job data is stored on the on-board IPC and retrieved via USB memory stick. It can be viewed in Excel text or graph format and saved on an external computer.

Ability to store up to 10 stages per job.

RELEASE MANIFOLD:
A complete release manifold will be installed on this unit for rolling fluids in the fluid holding tanks using the triplex pumps or for releasing pumped fluids from the wellbore back to the fluid holding tanks

HIGH PRESSURE DISCHARGE MANIFOLD:
Installed on each triplex pump discharge connection facing the rear of the unit will be one (1) each 2" Fig. 1502 discharge union connection. It will connect each pump to a high pressure manifold.
ACID KILL TRAILERS

EQUIPMENT DESCRIPTION:
Acid Kill Trailers consist of a chassis, pump, hydraulic system, all necessary valves, and controls for normal well servicing operations. The triplex pump will be powered by the road engine via a transfer case. The mixing and charge pumps will be powered hydraulically. All well service operations can be accomplished via in-cab controls and monitoring system.

TRUCK CHASSIS:
Chassis built to customer specification. Frame to be stretched to proper length and double framed with transfer case installed.

TRIPLEX PUMP:
OPI style triplex pump. Plunger size of choice. One (1) set of standard maintenance tools.

CENTRIFUGAL PUMPS & HYDRAULICS:
Two (2) centrifugal pumps for product suction and boosting the triplex pump. Centrifugal pumps will be hydraulically driven. The hydraulics will be powered by the road transmission.

CONTROL AND MONITORING SYSTEM:
All well functions will be operated from the control panel installed outside the cab. The control panel can include, but is not limited to the following controls:
- Pump discharge pressure
- Pump rate total meter
- Pump rate flow meter
- Variable throttle control
- Controls for remote air actuated valves
- Suction centrifugal pump pressure with speed control
- Boost centrifugal pump pressure with speed control
- Triplex lube pressure gauge
- Triplex lube temperature gauge
- Hydraulic oil temperature gauge
- Work lights switch

SIDE SADDLE TUB:
Optional: Side saddle tub for rock salt and chemical additives. 1 bbl capacity. Adequate jetting and circulating system for mixing rock salt or other chemicals. Baffles for flow direction and circulation. Safety sand grate. Easy access for cleaning with 2” bottom drain.

ACID TRANSPORT:
The fluid handling system includes up to three (3) compartments, 4,000 or 5,000 gallon trailer mounted acid transport, which can be utilized to convey acid to and from the well site. This unit is internally coated and designed to meet DOT 412 specifications.
ACID TRANSPORTS

EQUIPMENT DESCRIPTION:
The fluid handling system includes up to three (3) compartments, 4,000 or 5,000 gallon trailer mounted acid transport, which can be utilized to convey acid to and from the well site. This unit is internally coated and designed to meet DOT 412 specifications.

TANK BODY:
- Capacity: 4,000 or 5,000 US gallon (+/- 3%) compartments: Up to three (3) compartments
- Commodity: Unspecified fluids (regulated as hazardous material)
- Tank Construction: 51” ID straight round X 30’-0” Seam/Seam (40’-0” OAL)
- Tank Material: 1/4” SA-36 shell, 3/8” heads Stiffening Rings: 3/8” A36 x 2-1/2” flat bar
- Bulkheads: Two (2) 1/4” SA-36 materials

DOT 412 specification, 20” x 8” acid manways, fiberglass spill wells at each manway with 1-1/4” drains with two (2) double wall connected Tombstones at each manway.

CHASSIS RUNNING GEAR:
Standard 5th Wheel, landing legs, Hutch CH9700 suspension with 8-leaf springs or air ride suspension, axles (22,500 lbs. capacity per axle), 16-1/2” x 7” S-cam brakes with autoslack adjusters & Rockwell-Wabco 4S/2M anti-lock brake system.

COATING SYSTEM:
Interior:
- Sandblast and coat with Tnemec 120, Tnemec 390, rubber or fiber glass lining.
- Superior protection against organic and inorganic acids and sour crude.
- The spray-able lining for tanks and vessels, provides splash, spillage and fumes protection for structural surfaces. Frequently used as a top coat for additional chemical resistance.

Exterior:
- Sandblast, epoxy prime, polyurethane top coat, single color, clear coat finish.
- Full compliment of safety decals

TANK FITTINGS & PIPING:
- Venting: Girard Stainless Steel relief vents, One (1) each at top front of each compartment, also, positive venting provided by 3” air operated valve in each compartment. Mounted on top.
- Emergency Valves: 4” valves
- Piping: One (1) 4” outlet bottom rear of each compartment, 4” steel pipe manifold runs from the rear of the tank forward to 36” behind landing gear or as specified by customer.
- Outlet Valves: Two (2) 4” manual butterfly valves, one (1) isolation valve
- Outlet Adapters: 4” Hammer Unions with dust caps and chain tethers.
- Gaskets: All gaskets are Viton
EQUIPMENT DESCRIPTION:

- Type & Size - 5,000 gallon 3 compartment MC412MS tank trailer. Compartment sizes of choice. Radar level indicators.
- Product - Various gel and acid fluids
- Suspension - Heavy duty air ride suspension assembly
- Axles - 2-D22 22,500lbs axles Dana with spring brakes and outboard drums
- Brakes - 16- ½" X 7" X ¾" and Sealco 4S/2M ABS Air System
- Tires and Wheels - 11R 24.5 radial tires on aluminum wheels
- Landing gear - 2 speed roll-up 50K lift, 140K static load
- Lights - 12 volt LED work lights powered off the customer supplied tractor for night time operations. Work light will illuminate all work areas and ladders.
- Domes - Three (3) -18” Clay and Bailey with drip pan and drain hoses
- Overturn Rails - Overturn protection, Tombstone type for each compartment
- Ladder/Walkway - Ladder at center drivers side to walkway with handrails. Meets OSHA standards

PLUMBING:
Stainless steel hosing with convoluted Teflon liner on hosing coming from each compartment. Six (6) 1” manually operated hose reel assemblies capable of holding up to 100’ of chemical hose.

LIQUID CHEMICAL PUMP:
Six (6) hydraulically operated liquid chemical pumps will be installed to load tanks or discharge to hose reel. Equipped with E&H or Micro Motion flow meters.

CONTROL AND MONITORING:
Installed at the rear of the unit will be a control console with all necessary controls and gauges for the full and complete operation of this unit during all possible phases:

Hydraulic Controls
- Three (3) liquid chemical pump speed controllers

Miscellaneous
- Work light switches
- Butterfly switches will be open/closed style

OTHER SPECS:
One (1) hose trough, flip placards, fire extinguisher, 150 gallon fuel tank.

COATING:
Internally lined with Tnemec 120, 390, fiber glass or rubber lining.
EQUIPMENT DESCRIPTION:
5,000 gallon, two (2) compartment MC412MS tank trailer. Compartment size of choice.

Two (2) hydraulically mixing paddle assemblies will be installed above the compartment outlets. One (1) per compartment. Blind flanges will be provided to install in place of each hydraulic motor for acid service use.

- Product - Various gel and acid fluids
- Suspension - Heavy duty air ride suspension assembly
- Axles - 2-D22 22,500lbs axles Dana with spring brakes and outboard drums
- Brakes - 16- ½” X 7” X ¾” and Sealco 4S/2M ABS Air System
- Tires and Wheels - 11R 24.5 radial tires on aluminum wheels
- Landing gear - 2 speed roll-up 50K lift, 140K static load.
- Lights - 12 volt LED work lights powered off the customer supplied tractor for night time operations. Work light will illuminate all work areas and ladders.
- Domes - 2-18” Clay and Bailey with drip pan and drain hoses.
- Overturn Rails - Overturn protection, Tombstone type for each compartment
- Ladder/Walkway - Ladder at center drivers side to walkway with handrails. Meets OSHA standards.

HYDRAULIC SYSTEM:
The customer supplied wet kit mounted on the tractor will power the hydraulic system. This system will have on the operator control panel flow control/ RPM speed increasers or the following - one (1) centrifugal pump and two (2) mixing paddles.

PLUMBING:
The unit will have the ability to take suction from the driver’s side of the unit and from two (2) inlets located at the rear of the unit via 4” manually operated butterfly valve.

Two (2) 4” air open/spring closed butterfly valves located underneath each compartment, two (2) 2” load lines will be located topside of the unit, one (1) per compartment, and 2” piping will run along the exterior of the tank on the passenger side.

Each compartment will have internal removable jets angled at a 35 degree angle to provide additional mixing. The unit will have a 2” discharge connection at the rear of the unit.

CENTRIFUGAL PUMP:
A hydraulically operated centrifugal pump will be installed to load tanks, recirculation, or boost downstream.

CONTROL AND MONITORING:
Installed at the rear of the unit will be a control console with all necessary controls and gauges for the full and complete operation of this unit during all possible phases:

Hydraulic Controls
- One (1) centrifugal pump speed controller, two (2) mixing paddle speed controllers

Miscellaneous
- Work light switches
- Butterfly switches will be open/closed style

OTHER SPECS:
- One (1) 2” X 75’ transfer hose with hammer union connections
- One (1) manual hose reel assembly to store 2” X 75’ transfer hose

COATING:
Internally line with TNEMEC Epoxy coating
WELL SERVICE PUMPS

EQUIPMENT DESCRIPTION:
A high pressure pumping unit mounted on a heavy duty oilfield style skid or trailer. The unit is comprised of a high-pressure pumping system, all required controls, and instrumentation.

SKID:
Single piece skid will have loading bars on each end. In addition, all four (4) corners of the skid will have a lock down feature to secure the skid during transportation.

ENGINE (CAT, DETROIT, OR CUMMINS):
Diesel Engine, radiator rated with fan blade, fan guard, and shroud, electric start, dry type air cleaner, spark arresting muffler, and electronic control system with monitor for engine temperature, oil pressure, tachometer, with safety shutdown for low oil pressure, high water temperature, and low coolant level.

TRANSMISSION (ALLISON, OR EATON):
Manual or automatic transmission, higher gears will be blocked to prevent the pump from over speeding, reverse will be blocked to prevent pump from spinning in the opposite direction, and transmission output flange.

TRIPLEX PUMP:
Gardner Denver TGE Well Servicing Pumps combine the tried and proven TEE designs with a gear reducer for superior service in oil fields throughout the world. The triplex pump power end will be lubricated by the TGE's internal design system which features an internal oil pump and internal reservoir. Other pump models available to suit your pumping requirements.

DISCHARGE MANIFOLD:
Installed on the unit will be a dual discharge manifold, and a bladder style discharge dampener will be installed on the triplex.

CONTROL AND MONITORING:
Installed on the unit will be a UL rated stainless steel enclosure with an operated control console. This console will be supplied with all necessary controls and gauges for the full and complete operation of this unit during all possible phases of well servicing operations.
Freemyer Industrial Pressure will refurbish your high hour unit back to near zero hour condition, and do so at a fraction of the cost of purchasing a new unit. Your equipment will be re-manufactured and tested to meet our high standards, while saving your company time and money.
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SYSTEM OVERVIEW:
The F.A.S.T. FirEndR System features the most innovative cold foam technology in the industry. The system uses cold compressed air or nitrogen to propel foam, which can be used to fight active fires or seal fuel or vapor spills that could potentially lead to a fire.

- 30 gallon Premixed tank
- Stainless Steel Piping and Foam Nozzle System
- Secondary Fire Hose System
- Uses AFFF fire suppressing foam

WHY CHOOSE US?:
In the event of fire, the goal before all others is the safety of all personnel. The secondary goal is to mitigate the expenses associated with the incident.

If your equipment is being protected by fire extinguishers, you may not accomplish either goal. With fire extinguishers, you are asking several members of your team to actually go into the fire, then stay and fight it until that fire has been completely overwhelmed.

Conversely, The F.A.S.T. FirEndR System allows for one man to quickly activate the system with as little as one turn of a knob, before quickly fleeing to safety. The fire will then likely be overwhelmed, as the system releases 300-600 gallons of cold AFFF Foam, with all of your personnel safely out of harm’s way.

There really is no choice to make. We believe The F.A.S.T. FirEndR System is the most effective and safest option in our industry

- Custom Configuration & Integration
- Patented Manifold System
- 2000% foam expansion
- Up to 800°F Temperature Reduction in less than 10 seconds
- Extreme Operating Conditions
- Inland and Offshore Equipment
- Training, Support, Service

WHY SHOULD YOU USE AFFF AGENTS?:
Class B fires are fires involving flammable liquids and gases like petroleum oil, gasoline, tar, and more. These fires can be fought with dry powder, carbon dioxide, or AFFF Foam.

One disadvantage with Dry Powder is that most often there is not enough powder to extinguish a major petroleum fire. Dry Powder also leaves a powder residue, which settles into nooks and crannies. The chemicals involved can then undergo hydrolysis to form phosphoric acid, which corrodes metal, rubber, and coatings. The result is equipment will at times have to be disassembled to ensure every particle of the powder is cleaned up, in order to prevent damaging that piece of machinery.

Carbon Dioxide on the other hand, leaves no residue. However, the effectiveness of Carbon Dioxide decreases as the temperature of the fire increases. The result is that carbon dioxide is ineffective at preventing the fire from re-igniting.

AFFF Foam, such as that used by The F.A.S.T. FirEndR System, covers the fire with a layer of cold foam, rapidly cooling the fire while also starving it of the oxygen required for fires to re-ignite. In addition, AFFF Foam is environmentally green, and in itself requires no cleanup.

SAFETY, SAVINGS, INNOVATION, PERFORMANCE, & CONFIDENCE:
- Personnel Safety
- Mitigated Expenses
  - Insurance Premiums
  - Clean-up
  - Equipment loss
  - Damage to the well
  - Environmental impact
- Land Owners Confidence
Nozzles will be placed strategically, targeting the most likely areas of potential fire sources. The cold foam creates a vapor sealing cover that can suffocate the fire.

A secondary hose system can eliminate any fires not suffocated by the nozzle system.

Our engineers will integrate the system onto any unit we manufacture, any existing well service equipment, and any other equipment in the oil and gas industry, such as tank battery equipment, test stand equipment, salt water disposal equipment, rig equipment, and more.
STAINLESS STEEL FLUID END ASSEMBLIES

- Freemyer Fluid End Assemblies are constructed of 100% premium stainless steel machined for its ability to endure and exceed industry standards.
- Ultrasonic tested in 3 directions by ASNT-TC1A certified inspectors in accordance with API 6A Standards.
- Undergo 100% Hardness Testing, with 2 tests per block performed.
- Along with our certifications, every Freemyer Fluid End comes complete with:
  - Chemistry Report
  - Mechanicals Report
  - Hardness Report
  - Ultrasonic Test Report
- If a Freemyer Fluid End ever fails, failure analysis will always be performed by a 3rd party, with the goal of getting it back to the customer as soon as possible.