



# ARCTIC RECIRC SKID (ARS)<sup>®</sup>

Well Cleanout Recirculatory Filtration System  
*SAVING WATER, CHEMICALS & ENERGY*

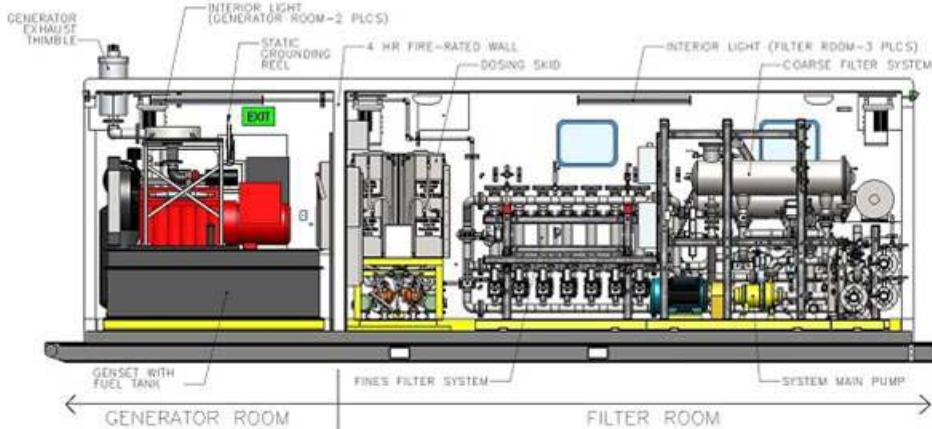
The portable Recirc Skid is a self-contained, complete packaged, fully-automated, stand-alone mobile filtration system for oilfield services and produced water management. It was developed primarily for use in coiled tubing operations as a solution to the excessive use of water in oil and gas well fill cleanouts in the arctic. The Recirc Skid allows reuse of on-site produced water, thereby reducing the amount of fresh water needed for produced water applications and minimizing the hazards associated with hauler transport and disposal of this water. Now, coiled tubing fluids may be returned downhole, thereby saving on otherwise single-use drilling fluids. The Recirc Skid promotes efficiency in high capacity fluids management of friction reducers, drag reducers, produced water and other chemicals.

A compact self-cleaning 2-stage filtration system filters particulate down to 5 micron and is used in conjunction with a settling basin or tank farm. The Recirc Skid continuously and automatically self-cleans internal filter elements and returns backwash water to the tank farm.

Skids are customizable, scalable, and designed to meet your specific application requirements. The Recirc Skid's robust design makes it ideal for the most rugged oil and gas field applications.

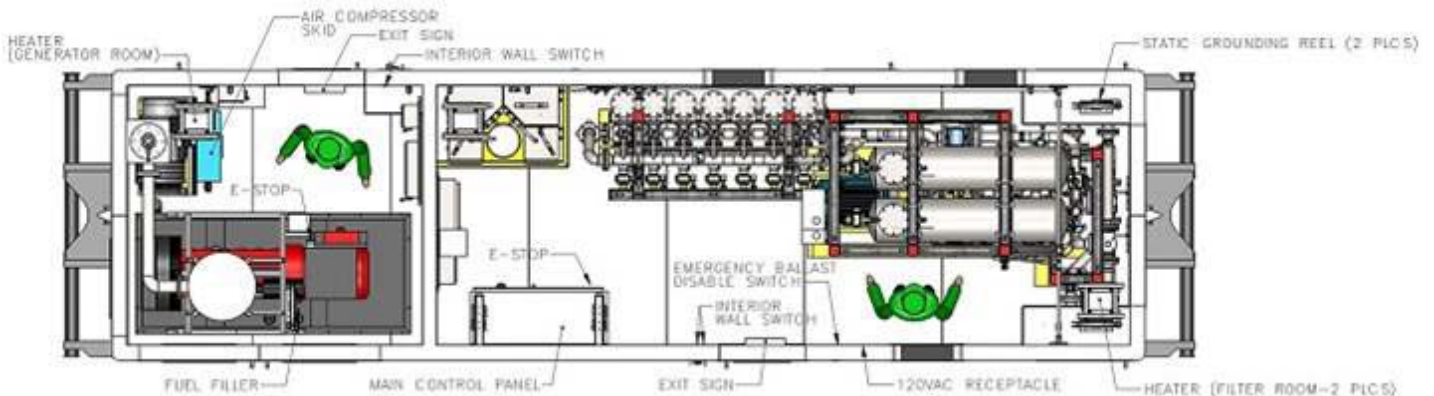
**PROBLEM:**

Excessive high maintenance, transportation and disposal costs associated with single-use well clean-out water and other fluids



**SOLUTION:**

Provide self-contained complete packaged fully automated self-cleaning water filtration system allowing recirculatory reuse of well clean-out water



## **BASIC DESIGN PARAMETERS**

- -50 °F storage / -40 °F operating cutoff
- Suitability in high winds in excess of 100 mph
- Extreme cold weather rated
- 110% hydraulic containment
- Genset package with 200-gal diesel subtank for onboard electrical power
- Adjustable flowrates from 0-10 bpm
- Constant flow or constant pressure output controls
- Particle filtration down to 5-micron removal
- Friction reducer dosing rate based on dose pump

## **MAIN SYSTEM COMPONENTS & FEATURES**

- Heavy duty arctic enclosure on steel skid
- Space heaters
- Electric switchgear
- Ground reels
- Interior and exterior lighting w/emergency backup
- Master controller on vibration mitigating mounts
- Main process and chemical dosing pumps
- Electric drive motors w/low temp grease
- Chemical dosing system
- Variable frequency drives
- Piping
- Instrumentation
- Process control valves w/automatic actuation
- Air compressor and dryer
- Generator w/subtank and shore power hook-up
- Skidded / mobile / portable
- Tail roll design
- Easily transported on hauler truck or integrated trailer
- Vibration mitigation
- Fully-packaged
- Automated
- Stand alone
- Removable and easily accessible equipment within for easy maintenance
- Maintainable & accessible equipment
- Fire-rated dividing wall construction compartmentalizes filter room from generator room
- R35 wall and floor insulation
- Nonskid floor coating
- Heavy duty freezer door hardware
- Double-pane thermal windows w/thermal breaks

speed or % of process flow

- Operability in high winds, extreme cold and blizzard conditions
- Extreme cold weather rating for wire & electricals
- Portability (skidded tail roll)
- Heavy duty robust ruggedized design
- On demand option for onboard genset power or shore power
- Used in conjunction with conventional coiled tubing operation equipment

## **TEMPERATURE**

- Arctic duty (-40 °F operation / -50 °F storage)
- Temperature control via automatic louver modulation and temp switch
- Start/stop thermostatic temperature control
- Automated condensate management
- Electric space heaters
- Thermowells for detecting freeze potential

## **ELECTRICAL**

- Self-powered generator or shore power hookup
- Interior and exterior E-stop switches
- Phase monitor light for shore power hook-up
- Interior and exterior convenience receptacles

## **PROCESS**

- Inlet & outlet hydraulic hook-up connections on both sides of enclosure
- Manual & automatic hydraulic by-pass
- User adjustable output pressure & flowrate
- 2-stage filtration system (25/5 micron)
- Quick and easy shutdown/blowdown provisions
- PLC-driven controls (centralized controls)
- Self-cleaning autobackwash filters
- Overpressure protection with notification
- Flowrate and pressure control
- Friction reducer dosing system
- Blow out ports and drains
- Physical treatment of returns upstream of high pressure coiled tubing pump
- Easy installation and hookup

## **RECIRC SKID REDUCES**

- Transportation costs by recycling
- Maintenance costs
- Chemical consumption
- Treatment and disposal costs
- Environmental burden

## **SPECIFICATIONS**

- Principle of operation: mechanical filtration with automatic backwashing
- Assembly: skidded, self-contained fully packaged filtration treatment train with dosing capability
- Footprint: 8-1/2' wide x 30' long x 10' high
- Weight: 16,000 lb empty / 32,000 lb wet
- Hydraulic capacity: 0-10 bpm
- Particulate removal: 5 micron
- Operating temperature range: -40 °F
- Electrical power: 480 VAC / 3-ph / 60 hz

## **CUSTOM OPTIONS**

- Chemical pre & post treatment
- DCS communications
- Enclosure venting
- Expansion capability
- Finer solids filtration and water treatment
- Fire & gas protection systems
- Hazardous environment rating
- Non-arctic designs
- Ongoing operation & maintenance support
- Over pressure protection notifications
- Remote alarming

## **SERVICES**

- Laboratory testing
- Multiple uses
- Customized and standard offerings
- Ongoing operation and maintenance support
- Pilot testing

## **CUSTOMIZABLE OPTIONS**

- Gel sweeps
- Ability to work with cleanout wells containing gels & friction reducers
- Multiple uses
- Customized designs
- Exterior and interior lighting options
- Fire and gas
- Ceiling vent
- Dosing options
- Freeze protection subsystems

- PSV notification
- Filtration options
- Conspicuity tape
- Remote communications/DCS/audible and visual alarms
- Louver hoods and hinged flip stair steps with short angled hand rails inside doors.
- Vibration mitigation
- Spare parts: Comm, 1-year, 2-year, capital
- Hose hangers on inside and outside
- Cabinets
- Caution striping and step up placard
- Warming devices as needed and cooling
- Hazardous working environment designs
- Hydraulic valves
- Flip step with handrail

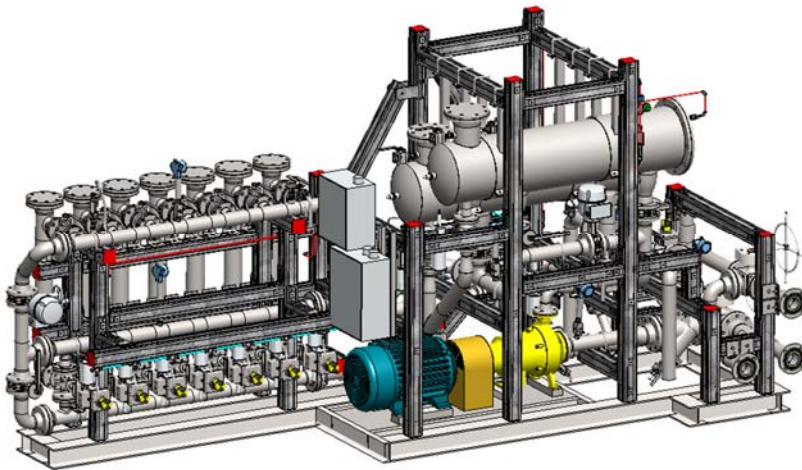
## **ACCESSORIES**

- Grounds reels
- Vent



**Mobile Recirc Skid built to reduce excessive transport costs & automate filtration systems**

**Mobile Recirc Skid was designed and built to automate process filtration and reduce otherwise excessive water hauling costs**



#### Product Registration

*Arctic Recirc Skid (ARS)* is a patent protected technology registered by **ENGINEERING FLUID SOLUTIONS** with the U.S. Patent & Trademark Office (US Patent No. 8,469,100; others patents pending). The *Arctic Recirc Skid (ARS)* name and logos are registered trademarks owned by **ENGINEERING FLUID SOLUTIONS**.

**Cost Saving Equipment & Strategies  
in Fluids Management**



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