The Benefits of Coiled or Continuous Rod

Pro-Rod® coiled rod provides a superior alternative to conventional sucker rod for both reciprocating and PC pump systems. Removing almost all the connections from the rod string can substantially increase the overall efficiency of the artificial lift system which equates into cost savings to the producer.

Production Benefits

- Decreased interventions due to tubing wear
- Decreased interventions due to rod breaks at the connections (70% of all failures)
- Increased production by decreasing back-pressure at the pump. Removing the couplings will minimize pressure losses
- Increased pump life
- Smaller pumping units at surface due to lighter loads
- Wells can be serviced quicker utilizing coiled rod
- Constant velocity of fluid and solids in the tubing (reduced bridging of solids)
- Larger rod can be ran in smaller diameter tubing sizes
- Eliminate polish rods in the drive string
- Ability to set-up wellhead for coiled tubing clean-outs inside tubing without removing rod string and rotor

Logistical Benefits

- Ability to pre-cut and weld strings into custom lengths per well
- Ability to several strings to location(s),
- Trailers are disconnected at location for systematic installation of strings
- Maximized volume of rod per trip for decreased public road exposure per meter of rod utilized

Safety Benefits

- Reduces the human element from running/pulling rod strings
- Lessens exposure to injuries related to sucker rod handling
- Decreased public road exposure per meter of rod utilized

Well Life-Cycle Benefits to Support the Value Proposition of Coiled Rod

- Reduced intervention frequency over the life-cycle of an artificially lifted well
• Increased production
• Lower over-all production costs with longer pump life and reduced energy consumption
• Most benefits are also realized in vertical well applications
• Any premium paid in product or servicing costs are far outweighed by the numerous benefits which equate to lower production costs. Eliminating even one service intervention over the life-cycle of the well can mean big cost savings to the producer

Minimum Servicing Package for Coiled Rod Handling

• **TMX (Truck Mounted X-celerator®)**
  - Coiled rod injector mounted on a tandem truck chassis
  - Rig assist unit developed to work in conjunction with most well servicing units with masts
  - Self-contained, hydraulic powered
  - Hydra-crane for the safe transfer of the injector to the rig
  - Up to 30,000 lb string weight capacity
• FireBlade™ Welding System
  o Oxygen/Acetylene powered, reliable energy source
  o Small package, fits easily into a pick-up truck box or can be fit onto a TMX
  o Proven more reliable than the traditional DC electric welders with lower maintenance costs
  o Greatly reduced capital cost from DC units
• Coiled Rod Transport Trailers
  o B-Train configuration
  o Designed to transport 19’ diameter reels
  o Separated at the well-site for easy installation
  o Multiple strings transported per trip to production area
Other Options to consider for a complete Coiled Rod Servicing Suit

- **RSRX** *(Rapid Service Rig with a coiled rod injector)*

  Rapid Service Rig (RSR) is a truck chassis mounted well servicing rig that is designed for lifecycle support of artificial lift systems including installation, testing, in-situ remediation, optimization and maintenance. The RSRX design includes coiled rod handling capability (injector) integrated into the derrick which is unique in the well servicing industry and differentiates the rig from a Flush-by Unit.

  - Hybrid service rig designed for the rapid and efficient handling of rod strings
  - Can handle both coiled and jointed rod strings – coiled rod does not require an additional piece of equipment
  - Free-standing for quick rig up/down
  - Triplex pump and tank
  - Lower hourly cost than a conventional service rig
  - Smaller crew size – reduction in cost and mitigates safety risks
  - Smaller equipment footprint – less impact on roads and infrastructure
  - Self-contained & mobile

**RSRX Performs:**

- Run/pull conventional sucker rod
- Run/pull coiled sucker rod
- Well control
- Full well diagnostics
- Quick pump/rotor changes
- Fishing jobs
- Flush sanded wells
- Production flushes
- Displacement of treatment fluid
- Pressure test tubing
- Polish rod changes
# Rig Job Comparison

Example -- 7500 ft Permian pump change with jointed rod

<table>
<thead>
<tr>
<th></th>
<th>RSR</th>
<th>Well Service Rig</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crew Size</td>
<td>4 people</td>
<td>6 people</td>
</tr>
<tr>
<td>Service Time</td>
<td>10 hours</td>
<td>12 hour</td>
</tr>
<tr>
<td>SetupTime</td>
<td>30-45 minutes</td>
<td>2-3 hours</td>
</tr>
<tr>
<td><strong>Total Rig time</strong></td>
<td><strong>11.5 hours</strong></td>
<td><strong>18 hours</strong></td>
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• **MRTU**  (Mobile Rod Transfer Unit)
  - Transport rod
  - Pinch-roller & shearing capabilities
  - Perform reel to reel transfers in the field
  - Load out surfaced rod on location and transport for transfer, inventory, inspection, disposal
  - New string assembly for fit to measure strings
  - Shear-rod for disposal
  - Ability to carry a service reel for return to base or relocation
• Quills & Bases for Coiled Rod Reel Handling, String Assembly and Inspection