

## Pressure Pumping

WHEN TO COMPLETE – Before the start of any Pressure Pumping activities

Confirm each control / safeguard below before starting work	Guidance for confirming each control / safeguard	Person(s) Performing Work	Start-Work Verifier
<b>I HAVE CONFIRMED:</b>			
<b>1</b> <b>Competency person provided start work authority</b>	<ul style="list-style-type: none"> <li>If pumping within pressure envelope, person with required competency provided start work authority or is on location, if applicable</li> <li>Ensure Category Requirements listed in the OE standard are followed for scope of work:               <ul style="list-style-type: none"> <li>Category 1 (Less than 2,500 PSI)</li> <li>Category 2 (2,500 PSI to 5,000 PSI)</li> <li>Category 3 (5,000 PSI and above)</li> </ul> </li> </ul>		
<b>2</b> <b>System is rated more than anticipated maximum pressure and designed for expected pump rates and fluid properties</b>	<ul style="list-style-type: none"> <li>Verify pressure rating on all equipment is designed for the energy source and expected pump rates. All equipment is tested and certified per API requirements. This requirement applies to both the pump and discharge sides of the system.</li> <li>Verify restraints that are rated for the anticipated maximum force are installed on the system. System components are compatible with fluid/chemical properties</li> <li>Verify expected pump rates</li> <li>Refer to safety data sheet (SDS)/ product sheet as needed)</li> </ul>		
<b>3</b> <b>Diagram properly identifies all system equipment and their required alignment</b>	<ul style="list-style-type: none"> <li>Use approved diagrams, Equipment Isolation Procedures, Piping and Instrumentation Diagram (P&amp;IDs) or process Flow Diagrams to physically confirm by physical inspection of the system that all system equipment is in proper alignment.</li> <li>Verify the integrity of installed wellhead components prior to opening valve and beginning pumping operations.</li> <li>Verify discharge and pressure relief lines are free of obstructions</li> <li>Verify that all connections are compatible.</li> <li>Ensure low pressure systems are isolated from high pressure systems by an atmospheric gap.</li> <li>Competent person must walk down system prior to operations beginning.</li> <li>If working in the pressure envelope a safety factor of 500 PSI is required.</li> </ul>		
<b>4</b> <b>Exclusion zones for non-essential personnel are established and communicated to the workforce.</b>	<ul style="list-style-type: none"> <li>Follow safe distance standards and guidelines for the current operation.</li> <li>Communication method for safe zone is established: signage, physical barrier, site briefing</li> <li>Non-essential personnel are verified clear of exclusion zones prior to pressure in system</li> <li>Communication methods (e.g., radios, hand signals) have been determined</li> </ul>		
<b>5</b> <b>Appropriately sized restraints and pressure relief device(s) set at or below maximum allowable working pressure</b>	<ul style="list-style-type: none"> <li>Pressure Relieving Devices (PRD) or any other overpressure devices shall be properly aligned without restrictions or being bypassed.</li> <li>Inspect Pressure Relieving Devices (PRDs)</li> <li>Verify that the PRD is set below the maximum allowable working pressure of the system to protect personnel and equipment.</li> <li>Maximum limits for job have been established and communicated</li> <li>Roles and responsibilities for well control and well securement in the event of failure are understood and communicated.</li> <li>Verify positioning of the PRD matches the approved diagram.</li> </ul>		
<b>6</b> <b>System is pressure tested to procedure requirements prior to starting full pumping operation</b>	<ul style="list-style-type: none"> <li>During pressure test, monitor system for unexpected pressure fluctuations and/or visual indicators such as pinholes, leaks, etc. from a safe distance</li> <li>Verify system is tested to maximum anticipated pressure plus safety factor documented in job procedure</li> <li>System includes all equipment that has potential to be exposed to pressure</li> </ul>		
<b>7</b> <b>The system is verified to not have any restrictions preventing</b>	<ul style="list-style-type: none"> <li>Re-verify that Exclusion Zone Management is in place</li> <li>Verify discharge lines are free of obstructions by: flushing lines, checking valve alignment, and verifying that well is secured.</li> </ul>		

<p><b>pressure from being relieved to a safe area.</b></p>	<ul style="list-style-type: none"> <li>• Ensure that valve manipulation is being performed by authorized personnel only</li> <li>• Competent person walk down system</li> <li>• Pressure relief lines and valves relieve to an area that does not impact personnel or adjacent equipment</li> <li>• Verify gas testing and atmospheric monitoring is in place if relieving a flammable or toxic vapor from the source</li> <li>• Verify and communicate that zero pressure using gauges / bleeders prior to breaking containment on system</li> </ul>		
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**Confirm these controls / safeguards are in place and verified prior to starting work. Stop and seek help if anything changes.**

	Printed Name & Role	Signature	Date
Start Work Verifier			

## Pressure Pumping Diagram

