



**Berry Bros. General Contractors, Inc.
Corporate Policy Procedure**

**(HSE) Health, Safety & Environmental
Policies and Procedures Manual**

Issue Date: 8-17-17

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Approver: Joe Berry

Section # 81

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System Testing

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SUBPART A - PURPOSE

This document provides the basic guidelines for the safety of all BBGCI personnel and associated personnel during pressure (e.g., hydrostatic, pneumatic) testing operations.

This document is not meant to supersede or replace regulatory requirements, nor is it intended to be all inclusive of the applicable regulatory requirements. It is intended to be supportive and complimentary to such requirements.

SUBPART B - SCOPE

This document applies to all Berry Bros. General Contractors, Inc. personnel and its Contractors who are involved with pressure (Hydrostatic, pneumatic) testing operations. BBGCI understands that not all pressure tests are the same, but this document gives you an understanding on the Safework practices required by BBGCI Personnel and its Contractors. Job specific instructions will be provided in addition to these Safework Practices.

Any Subcontractors doing work directly under BBGCI must comply with this document unless an alternative system is approved through the risk management and safety department of BBGCI.



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SUBPART C – DEFINITIONS

System Testing- typically conducted during the pre-commissioning phase of fabrication activities to verify the integrity or functionality of process and control systems prior to commissioning or transportation. Tests may be conducted on individual subsystems prior to integration and/or on the overall integrated system

Pressure Testing- a test in which pressure vessels such as pipelines, plumbing, gas cylinders, boilers and fuel tanks can be tested for strength and leaks.

Hydrostatic Test- Using water, pressure vessels such as pipelines, plumbing, gas cylinders, boilers and fuel tanks can be tested for strength and leaks.

Pneumatic Testing- Strength air testing used in the oil and gas industry to prove the mechanical strength and integrity of pressure containing components in a system.

PIC (Person in Charge) - Highest Ranking Person Responsible for a particular job site

Safe Work Permit- document that identifies the work to be done, the hazard(s) involved, and the precautions to be taken. When filled out properly it ensures that all hazards and precautions have been considered before work begins.

Permit Control Point- a central location on a particular jobsite that is designated for the distribution, completion, display and administrative control of all work permits.

Tailgate Meeting- an informal safety meeting with all crews that are currently working on that site, which is generally conducted at the job site prior to the commencement of a job or work shift.

No-Go Zone- A hard physical barrier shall be erected around areas where high risk hazards exist that personnel need to keep away from during the job. Some examples include; Lifting Zones for critical/complex lifts, pressure testing areas, drop zones, etc.



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SUBPART D – RESPONSIBILITIES

A. Involved Personnel

1. Review and Sign off on the Work Permit and JSEA
2. Attend the tailgate meeting
3. Know and understand the required steps to take if a problem arises during the course of the job
4. Know and understand how and why to stop work and request assistance if job conditions change or an emergency occurs
5. Know and understand the hazards pertaining to the job at hand as well as the hazard controls put in place
6. Do not enter or otherwise be present at a pressure-testing event unless you are part of the testing team.
7. Personnel performing the test should approach the pressured line only in the performance of their duties. Where possible, personnel should use safety barriers for protection from the pressurized line and position the testing equipment in such a manner so as to minimize potential hazards.
8. Do not work over or near where pressure testing is being conducted
9. Wear the PPE as appropriate for the task being performed
10. Attend required training before working on the task

B. Management

1. Empower all personnel with the authority to “Stop Work” whenever hazardous conditions or potentially hazardous conditions are identified
2. Ensure that the PIC is competent in his/her job duties.
3. Be familiar with the work activity to ensure it is completed in accordance with BBGCI or its client’s requirements.
4. Provide for and require that signs, barricades or other protective barriers are placed in a manner and at a distance sufficient to demarcate a safe zone to protect personnel and the public from unanticipated pressure release or equipment failure.

C. Person in Charge on Jobsite (PIC)

The PIC is responsible for overseeing the effectiveness of System Testing Operations as well as:

1. Identifying possible conflicts(multiple permits or adjacent working crews, SIMOPS)
2. Ensure accurate completion of the permit form



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3. Establishing the infrastructure for the Permit to Work System and following all requirements located in Section #78 Permit to Work Policy.
4. All personnel involved in system testing are trained and competent for their role including understanding the hazards involved, the control steps and the Personal Protective Equipment required
5. Minimize the number of people in the area either by restricting access or by performing testing activities during times when the general workforce is not present, such as at night.
6. Ensuring controls are in place to mitigate hazards
7. Ensuring the personnel are adequately trained
8. Inform all affected site and community personnel of the planned test
9. Keep unauthorized personnel out of the test area
10. Ensure all barricades, signs, or other protective barriers are in place around the work zone.

SUBPART E – HAZARD ASSESSMENTS & CONTROLS

A. General Safety

1. Immediately stop a test when the testing personnel or equipment is not working in a safe manner
2. Consider the forces that would be present if any portion of the system failed while filling, under test, depressurizing or dewatering
3. When performing pneumatic tests, the piping shall be inspected to determine if the inside surfaces are contaminated with a combustible or flammable material
4. Never tamper with or tighten any fittings (i.e., connections, bolts, hoses) while component is under any pressure
5. Never tighten connections that are under pressure. If a leak develops, you must depressurize to a safe level and then re-tighten
6. Wear hearing protection when working in areas where noise exceeds 80 decibels

B. Worksite Safety

1. Verify that test equipment and materials are rated to withstand the test pressures
2. Verify that all supply lines and hose connections are secure with retaining devices before and during the test
3. Visually inspect and ensure soundness and proper installation and valve positioning of all equipment used



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4. Ensure adequate lighting is made available
5. Minimize authorized employees risk from the line of fire of potential leaks by utilizing proper engineering controls
6. Emergency spill kits, fire extinguishers, ladders, mobile light plants (if necessary), whip checks, warning signs and labels must be available.
7. Verify the pressure ratings of hoses, fittings, gaskets, and other manifold materials

C. No-Go Zones

1. Prior to any pressure test, a no-go zone will be created around the pressurized system
2. During pressure testing events, distinct warning signs, such as DANGER – HIGH PRESSURE TESTING IN PROGRESS must be posted at the test site and additional locations identified in the job specific safety plan
3. In circumstances where a pipeline or lateral is being pressure tested, barricades with warning labels will be at the access and egress of the jobsite.
4. Precautions should be taken to see that persons not directly engaged in the testing operations remain out of the test area during the test period.
5. Restrict access to the immediate area involving the pressure test (i.e., test shelter, manifolds, pressure pumps, instruments, etc.) to only those persons actively engaged in the testing operation

Below you will find the Recommended No-Go Zone Distances. Please take these recommendations into consideration when barricading the pressurized system.

PSI	No Go Zone Distance
0-100	10 Feet
100-1000	25 Feet
1001-3000	50 Feet
3001-8000	100 Feet
8000 +	PIC Approval

**Reference Shell UA Permian Basin Authorized Buffer Zones

D. Pressure System Pre-Job Prep

Pre-test Verification checkpoints will include:

1. Ensure that a tailgate meeting is performed to review the scope of test, risks involved, equipment and tools required and mitigation actions are taken.



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2. Ensure the Work Permit, JSEA, and Pressure Testing Checklist (attached below) is completed and signed off by all involved personnel
3. All testing equipment certifications need to be valid and readily available on all sites conducting pressure testing
4. Verify that the Permit to Work is approved by the PIC and a copy is located at the permit control point prior to pressure testing operations
5. Ensure that all testing equipment is rated for expected service
6. Inspect all piping, valves, and/or electrical controls prior to the test to verify condition and proper orientation (open/close, energized/de-energized, isolated/not isolated).
7. Check that all temporary hoses, couplings, and gauges are of the correct type, securely fastened, free from damage, suitable for the maximum pressure and temperature of the test, and functioning.
8. Ensure escape route(s) are established and not obstructed by test equipment or other material in the area.

E. Pressure Testing Operations

NOTE: Due to the potential for catastrophic release of energy associated with pneumatic testing, the procedures, size of the test system and the barrier management for this type of test are pre-approved by the client.

More additional steps will be required per Site Specific Safety Work Plan.

1. Ensure all barricades and signage is in the right locations
2. Ensure the No-go zone is clear of all unauthorized personnel
3. All permits, JSEA's, and other documentation is filled out properly
4. Toolbox Talk is conducted and all hazard controls are discussed prior to beginning operations
5. Use all applicable SOPs for the jobsite
6. Follow the testing instruction per Job Site instructions

F. Post Test Operations

1. Ensure the system is isolated, depressurized and/or de-energized prior to removing any testing equipment
2. Ensure there were no system failures
3. If there was a system failure, develop a plan for retesting
4. Establish means of safely capturing, disposing, and/or discharging and test fluids or gases in compliance with good industry practice and applicable laws, regulations and permits



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5. Once the test have been completed and all of the above have occurred the barriers and signage can then be removed

SUBPART F – TRAINING

All employees who work for Berry Bros. General Contractors, Inc. will at the minimum receive awareness level training to ensure familiarity with this document. All personnel who have pressure testing in their responsibilities must be adequately trained and competent to undertake their responsibilities.

Training must include the following:

- Understanding the documents required for this operation
- Know the hazards involved with pressure testing
- How to mitigate these hazards
- Safety Precautions
- Employee specific responsibilities

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