Pressure Testing of Facilities

SCOPE AND PURPOSE

This procedure is to ensure adequate pressure testing of pipeline systems and to ensure discovery of all potentially hazardous leaks in the segment being tested as required under §§192.507, 192.509, 192.513. Other related code sections include §§192.511, 192.517, & 192.725.

RESPONSIBILITY

The Main Line Supervisor, Service Line Supervisor, Maintenance Supervisor, or other designee, is responsible to ensure that pressure testing is performed as described in this procedure.

PERSONNEL SAFETY (Where Applicable)

Every reasonable precaution shall be taken to protect employees and the general public.

EQUIPMENT AND MATERIALS

Test Device/Gauges/Recording Instruments
Test Medium (Nitrogen, Air, etc)
Leak Detection Equipment (Soap, CGI etc)
Fittings
Other Equipment as Needed

OPERATOR QUALIFICATION

This activity is a covered task under the Operator Qualification Plan and may only be performed by or directed and observed by an individual who is currently qualified to perform pressure testing for pipelines. Refer to the OQ Plan for specific qualification requirements.

INSTRUCTIONS

Pressure Testing Steps

1. Verify the following information prior to beginning the pressure test:
    a. Maximum Allowable Operating Pressure (MAOP) of the segment to be pressure tested.
    b. Maximum Operating Pressure (MOP) of the segment to be pressure tested.
    c. The minimum and maximum test pressure for the segment to be pressure tested (see #6).
    d. The test duration of the segment to be pressure tested (see #9).
    e. The test medium to be used for the pressure test.
2. Ensure that pressure gauges/recording instruments have been calibrated in accordance with company procedures and manufacturers' specifications.
3. Ensure that segment to be pressure tested is:
    a. Isolated from any customer piping to prevent the pressure test from being introduced into customer piping.
    b. Isolated from the source of gas (to prevent the pressure test from being introduced into the gas stream).
4. Ensure that the pipe end receiving the test gauge is cleaned prior to the installation of the test gauge.
5. Install test gauge on the isolated segment to be pressure tested.
6. Using the test medium (Air, Nitrogen), pressurize the isolated segment according to the following:

    a. *For steel mains and services operating at a pressure greater than or equal to 100 psig:*

- 1.5 times the MAOP
- The maximum test pressure may not be more than 1.5 times 20% of the SMYS (Specified Minimum Yield Strength). SMYS is the stress pressure at which the pipe may begin to deform.

b. For steel mains and services operating at a pressure less than 100 psig:

- 1.5 times the MAOP or 90 psig, whichever is greater.

c. For plastic mains and services:

- 1.5 times the MAOP or 90 psig, whichever is greater; however,
- The maximum test pressure may not be more than three times the design pressure (60 psig for SCUD's distribution system) at a temperature not less than the pipe temperature during the test.
- During the test, the temperature of the plastic pipe may not be more than 100˚F.

7. Record the initial time of the pressure test.
8. Soap-test the test-gauge and related fittings.
9. Maintain and observe the test pressure according to the following:
   a. The test must be observed for a minimum of 15 minutes for service lines.
   b. The test must be observed for a minimum of 2 hours for mains.
      - In cases where it would not create an undue delay in the completion of the job, the test should be left for longer periods of time.
      - The time shall begin after allowing time for pressure and temperature stabilization of the test material used.
      - The test duration will ensure the discovery of any leaks.
      - Investigate and repair all leaks discovered during the pressure test.
      - Apply a new pressure test once leaks have been repaired.
10. If the pressure test reveals that the isolated segment being pressure tested is free of leakage, slowly relieve the pressure from the isolated segment.
11. Remove testing device, gauges, and other related fittings.
12. Connect the isolated section to the source of gas.
13. Test the final connection(s) for leaks using a soap-test or other leak detection equipment.
14. Purge the test medium from the previously isolated segment.
15. Document the work performed as outlined in Reporting/Notification below.

REPORTING/NOTIFICATION

The following minimum information shall be recorded and kept of each test:

1. The operator's name, the name of the employee responsible for making the test, and/or the name of any test company used.
2. The test medium used (i.e. Air, Nitrogen).
3. The test pressure.
4. The test duration.
5. The test date.
6. Pressure recording charts or other record of pressure readings.
7. Elevation variations, whenever significant for the particular test.
8. Leaks and failures noted and their disposition.

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PRE-TESTED PIPE

A. General

When impractical to pressure test pipe after installation, it must be pre-tested. Pre-tested pipe may be used for emergency work or small replacement jobs and shall be tested in accordance with pressure testing standards in this procedure. If this option is chosen, the following procedure will be followed.

1. Yard Test
   a. Pressure tests will be at a pressure, and time duration appropriate for its intended use as stated in the Pressure Testing Steps of this procedure.
   b. All tests will be documented and will include the pipe manufacturer, manufacturer's lot number, date and start/stop time of test. The chart will be filed for future reference in a specific file for pre-tested documentation.
   c. The tested pipe must be marked or tagged with the test date and the reference number, which is attached to the pressure chart.
   d. When field personnel use the pre-tested pipe, the test date and reference number must be recorded on the appropriate field installation form(s) or as-built drawing.

ABNORMAL OPERATING CONDITIONS

AOC Main Category (Examples of Specific AOCs)	**Reactions to AOC, as appropriate**
Unplanned escape of product from a pipeline • Blowing/Escaping gas/Grade I leak	➢ Protect life & Property ➢ Prevent accidental ignition ➢ Notify appropriate personnel ➢ Notify Fire/Emergency Responders ➢ Initiate Emergency Plan ➢ Locate source/cause of AOC ➢ Use appropriate PPE ➢ Stop gas flow ➢ Make repairs/eliminate AOC
Fire or Explosion • Fire on a pipeline • Explosion	➢ Protect life & Property ➢ Prevent accidental ignition ➢ Notify appropriate personnel ➢ Notify Fire/Emergency Responders ➢ Initiate Emergency Plan ➢ Locate source/cause of AOC ➢ Use appropriate PPE ➢ Stop gas flow ➢ Make repairs/eliminate AOC
Unplanned Status Change • Inoperable/Failure of a Pipeline Component • Stray Current on a Pipeline – Electric Shock	➢ Protect life & property ➢ Notify appropriate personnel ➢ Initiate Emergency Plan as Needed ➢ Locate source/cause of AOC ➢ Make repairs/eliminate AOC
Inadequate Odorization or Reports of Gas Odor • Low odorization • Over odorization	➢ Protect life & property ➢ Prevent accidental ignition ➢ Locate source/cause of AOC ➢ Make repairs/eliminate AOC

• Odor complaint	➢ Notify appropriate personnel

RELATED PROCEDURES

CONST006 – Leak Test at Operating Pressure (Final Tie-in)