PRESSURIZED PIPING REQUIREMENTS

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What are the regulatory requirements for pressurized piping?

Leak detection requirements for piping differ somewhat from those of tanks. Each pressurized piping run must have one leak detection method from each set **(A and B)** below:

A. An Automatic Line Leak Detector (ALLD):
Automatic flow restrictor; or
Automatic flow shutoff; or
Continuous alarm system.

AND

B. One other method:
Monthly interstitial monitoring; or
Monthly vapor monitoring; or
Monthly groundwater monitoring; or
Monthly statistical inventory reconciliation; or
Line tightness testing (Annual or Monthly).

A. The ALLD must be designed to detect a leak at least as small as 3 gallons per hour at a line pressure of 10 pounds per square inch within 1 hour by shutting off the product flow, restricting the product flow, or triggering an audible or visual alarm.

B. Interstitial monitoring, vapor monitoring, groundwater monitoring, and statistical inventory reconciliation have the same regulatory requirements for piping as they do for tanks.

Annual line tightness test must be able to detect a leak at least as small as 0.1 gallons per hour when the line pressure is 1.5 times its normal operating pressure. Monthly line tightness test must be able to detect a leak at least as small as 0.2 gallons per hour. The test must be conducted each year or monthly. If the test is performed at pressures lower than 1.5 times operating pressure, the threshold leak rate to be detected must be correspondingly lower.

How do the leak detection methods for pressurized piping work?

A. Automatic line leak detectors (ALLDs)

Flow restrictors and flow shutoffs can monitor the pressure within the line in a variety of ways: whether the pressure decreases over time; how long it takes for a line to reach operating pressure; and combinations of increases and decreases in pressure.

If a suspected leak is detected, a flow restrictor keeps the product flow through the line well below the usual flow rate. If a suspected leak is detected, a flow shutoff completely cuts off product flow in the line or shuts down the pump.

Both automatic flow restrictors and shutoffs are permanently installed directly into the pipe or the pump housing.

ALLDs must also be able to meet the federal regulatory requirements regarding probabilities of detection and false alarm.

A continuous alarm system continuously monitors line conditions and immediately triggers an audible or visual alarm if a leak is suspected. Automated internal, vapor, or interstitial line monitoring systems can also be setup to operate continuously and sound an alarm, flash a signal on the console, or even ring a telephone in a manager's office when a leak is suspected.

Vapor and interstitial monitoring systems can be combined with automatic shutoff systems so that whenever the monitor detects a suspected release, the piping system is shut down. This would qualify as a continuous alarm system. Such a setup would meet the monthly monitoring requirement as well as the ALLD requirement.

Special note on alarm systems: Audible or visual alarms need to be placed such that the alarm can be heard or seen when the piping system is in operation. If the system is unattended (cardtrol), an audible or visual alarm alone does not meet the requirements (no one to hear or see the alarm). This type of piping system would require an automated shutoff of the pumps and/or offsite notification of an alarm.

B. Other Methods

Monthly Monitoring (interstitial, vapor, groundwater, and statistical inventory reconciliation)

Interstitial Monitoring

A barrier is placed between the piping and the environment. Double-walled piping or a leakproof liner in the piping trench can be used. A monitor is placed between the piping and the barrier to sense a leak if it occurs. Monitors range from a simple stick that can be put in a sump to see if a liquid is present, to continuous automated systems, such as those that monitor for the presence of liquid product or vapors.

Proper installation of secondary containment is the most important and the most difficult aspect of this leak detection method. Trained and experienced installers are necessary.

Vapor or Groundwater Monitoring

Vapor monitoring detects product that leaks into the soil and evaporates. Groundwater monitoring checks for leaked product floating on the groundwater near the piping. A site assessment may be necessary to determine monitoring well placement and spacing. UST systems using vapor or groundwater monitoring for the tanks are well suited to use the same monitoring method for the piping. Use of these methods with piping is similar to that for tanks.

Statistical Inventory Reconciliation

Statistical inventory reconciliation (SIR) uses computer software to conduct a statistical analysis of inventory, delivery, and dispensing data, which you must both collect and supply to the vendor on a regular basis, over a period of time, to determine whether or not a tank system is leaking.

Line tightness testing

Line tightness tests must be able to meet the federal regulatory requirements regarding probabilities of detection and false alarm.

The line is taken out of service and pressurized, usually above the normal operating pressure. A drop in pressure over time, usually an hour or more, suggests a possible leak.

Most line tightness tests are performed by a testing company. You just observe the test. Some tank tightness methods can be performed to include a tightness test of the connected piping.

For most line tightness tests, no permanent equipment is installed.

In the event of trapped vapor pockets, it may not be possible to conduct a valid line tightness test. There is no way to tell definitely before the test begins if this will be a problem, but long complicated piping runs with many risers and dead ends are more likely to have vapor pockets.

Tracer methods do not measure pressure or flow rates of the product. Instead, they use a tracer chemical to determine if there is a hole in the line.

Some permanently installed electronic systems (such as some Automatic Tank Gauging Systems) can meet the requirements of a line tightness test.

Will you be in compliance?

When installed and operated according to the manufacturer's specifications, the leak detection methods discussed in this handout meet the federal regulatory requirements for the life of new and existing Pressurized Piping.

Note: Underground storage tank systems (tanks and piping) **installed after January 1, 2009, must be double-walled** and use interstitial monitoring as the method of release detection.

Need more information?

If you have any questions concerning the UST piping requirements or the UST Rules in general, contact the Division of Waste Management at 701.328.5166. A copy of the North Dakota Underground Storage Tank Rules can be purchased from:

North Dakota Department of Environmental Quality
Division of Waste Management
4201 Normandy Street, 2nd Floor
Bismarck, ND 58503-1324

Rules are also available on the Internet at **https://deq.nd.gov/EHSRulesRegs.aspx**

You can also find UST publications, links to state regulatory authorities, and other UST information at EPA's Office of Underground Storage Tanks Web site at **www.epa.gov/OUST/**