Leak detection for underground storage tank suction piping

Many leaks from underground storage tank (UST) systems are a result of piping failure. In fact, piping failures occur more than twice as frequently as tank failures. Since piping is assembled in the field, the piping integrity is sensitive to field conditions. Also, with numerous possible connections in a piping run, leaks are more likely to occur at connection points.

This fact sheet will discuss requirements for suction piping leak detection.

What is a suction piping system?

A suction system uses a pump at the dispenser to draw product from the tank. Suction lines usually operate at a vacuum of only three to five pounds per square inch. Theoretically, a suction system carries a lower environmental risk than a pressurized system. If a hole develops, the product will not be forced rapidly out of the piping by pump pressure.

If the system is designed as a "safe suction" system, the vacuum created by a dispenser check valve will not allow product to escape when the pump is off. If the check valve fails, or if the pipe is leaking, the product in the piping will drain back into the tank rather than be released to the environment.

What are the leak detection requirements for a "safe suction" system?

Most suction systems in use are "safe suction" type systems. No leak detection is required for "safe suction" systems. A "safe suction" system must be designed with the following:

- Only one check valve, which is located directly beneath the pump in the dispensing unit and can be inspected
- Enough slope so that the product in the pipe can drain back into the tank if the check valve fails, or the pipe is leaking

Is yours a "safe suction" system? Installers are required to provide design documentation to the tank owner, who must keep it on file for the life of the system. If such records have been lost over time, contact your tank service provider who can help you determine whether your system is a "safe suction" system. Retain a copy of their determination for future reference and Minnesota Pollution Control Agency (MPCA) inspections.

What are the leak detection requirements for other suction piping systems?

If your piping system is not a "safe suction" system, **one** of the following leak detection methods must be used:

- Line tightness testing every three years
- Monthly statistical inventory reconciliation (SIR)
- Interstitial monitoring of secondarily contained piping using a continuous automatic leak-sensing device (sump sensor)
- Interstitial monitoring of secondarily contained piping using monthly visual sump checks

For more information about these leak detection methods, see the "Leak Detection for Underground Storage Tank Pressure Piping" fact sheet.

Line tightness testing conducted by an agency-approved tester is the most commonly used method to fulfill the piping leak detection requirement. However, many times the test cannot be performed because the older check valve may not hold pressure for the test. In this situation, moving the check valve from the tank to the dispenser may be advisable to make the system a "safe suction" system.

If any portion of the piping is lower than the top of the tank, an anti-siphon device is required to be installed.

How must the piping leak detection system be maintained?

Sumps used for interstitial monitoring must be maintained liquid-tight and free of water and product. The sump itself must be visually inspected once a year, and integrity tested every three years, by an agency-approved tester to ensure that it remains liquid-tight.

Automatic leak-sensing devices (sump sensors) must be tested annually for proper function if equipped. Testing must be done by an agency-approved tester, should follow any manufacturer's instructions, and should verify that the alarm sounds or the pump shuts off or restricts flow when the sensor is in contact with water or product.

Do I have to report a possible leaking pipe based on test results?

Any time that:

- Piping fails a line tightness test
- Piping fails an sir evaluation
- Piping sir evaluations result in an "inconclusive" for two consecutive months
- A leak is discovered through interstitial monitoring

The tank owner must immediately call the Minnesota Duty Officer at 651-649-5451 or 800-422-0798. You must immediately investigate and resolve all suspected leaks.

What records must be kept on file?

Without written records, there is no way to verify that leak detection is being performed. Owners and operators are required to maintain certain written records. These records must be kept at the facility where the tanks are located, or if kept elsewhere must be immediately submitted to the MPCA upon request.

If you have a "safe suction" system, documentation of the design must be kept for as long as the piping is used.

If you have a system that is not "safe suction", the following records must be kept for at least **five years**:

- **For line tightness testing:** test results (required every three years)
- **For SIR:** monthly inventory control sheets and monthly sir provider reports
- **For interstitial monitoring:** monthly visual sump check record (if no sump sensor), or annual sump sensor test record
- **For interstitial monitoring:** annual visual inspection reports of secondary containment areas
- **For interstitial monitoring:** integrity testing reports of secondary containment sumps (required every three years)

Need more information?

Visit the UST Program at https://www.pca.state.mn.us/waste/underground-storage-tank-systems. The site has forms, fact sheets, and other information about USTs and UST requirements.

You can also call the MPCA at 651-296-6300 or 1-800-657-3864 and ask for the UST Program.