

UST SYSTEM COMPLIANCE MANUAL



**Energy and Environment Cabinet
Division of Waste Management
Underground Storage Tank Branch
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Table of Contents

1.0	INTRODUCTION.....	4
1.1	Release Reporting	4
2.0	NOTIFICATION, REGISTRATION, AND ANNUAL FEE REQUIREMENTS	6
2.1	Notification to Install.....	6
2.2	Ownership and Registration	6
2.3	Annual Fees	6
2.4	Financial Responsibility	7
2.5	Lender Liability.....	7
3.0	TEMPORARY CLOSURE REQUIREMENTS.....	8
4.0	PERFORMANCE STANDARDS	9
4.1	Design and Maintenance Requirements	9
4.2	UST System Installations.....	9
4.3	UST System Repairs	10
4.4	Operation and Maintenance	10
4.5	Upgrading Existing UST Systems.....	10
4.6	Double Walled Tanks and Piping.....	10
4.6.1	Exception to Double Walled Requirements for Suction Piping.....	12
4.7	Emergency Shutoff Valves (Shear Valves)	12
4.8	Testing Requirements at Installation	12
5.0	SPILL CONTAINMENT DEVICES (SPILL BUCKETS AND CATCH BASINS)	13
5.1	Design and Installation Requirements	13
5.2	Periodic Testing	13
6.0	OVERFILL PREVENTION	15
6.1	Design and Installation Requirements	15
6.2	Flow Restrictors (Ball Floats).....	15
6.3	Periodic Testing	15
7.0	UNDER-DISPENSER CONTAINMENT AND SUMPS (SPILL PREVENTION DEVICES).....	16
7.1	Design, Installation, and Maintenance Requirements for Under-Dispenser Containment.....	16
7.2	Design, Installation, and Maintenance Requirements for Liquid-Tight Sumps.....	17
7.3	Periodic Testing	17
8.0	CORROSION PROTECTION	19
8.1	Cathodic Protection Evaluation.....	19
8.2	Cathodic Protection Testers	19
8.3	Periodic Testing	20
9.0	RELEASE DETECTION REQUIREMENTS.....	21
9.1	UST Systems Installed After April 1, 2012	21
9.2	UST Systems Installed Prior to April 1, 2012	22
9.3	Additional Release Detection Requirements for Pressurized Piping.....	23

9.4	Periodic Testing Requirements.....	23
9.4.1	Electronic Release Detection Equipment.....	23
9.4.2	Automatic Line Leak Detectors	23
9.5	Equipment Testers.....	24
10.0	OPERATOR TRAINING.....	25
10.1	Combined Class A and Class B Operator Training Requirements.....	25
10.2	Class C Operator Training Requirements	26
11.0	WALKTHROUGH INSPECTIONS	27
11.1	Monthly Walkthrough Inspections.....	27
11.2	Annual Walkthrough Inspections	27
12.0	DELIVERY PROHIBITION.....	28
13.0	RECORD KEEPING.....	29

Figures

Figure 1 – Double Walled UST System	11
Figure 2 – Double Walled Spill Bucket.....	13
Figure 3 – Under-Dispenser Containment (UDC).....	16
Figure 4 – Sump.....	17
Figure 5 – Sump Sensor Positioning	21

1.0 INTRODUCTION

This document establishes the requirements for the notification, design, installation, operation, and maintenance of underground storage tank (UST) systems in accordance with 401 KAR 42:020. This manual shall be used in conjunction with 401 KAR 42:020, and may not encompass all requirements in their entirety.

Double walled tanks and piping, and secondarily contained ancillary equipment, are designed to be more protective of the environment than traditional single walled UST systems. However, the design of these UST systems alone is not sufficient to prevent releases. Proper installation, operation, monitoring, and maintenance are necessary to prevent releases to the environment.

All generator UST systems used solely for the generation of power shall meet all of the requirements in 401 KAR Chapter 42.

Dual use UST systems used in the operation of heating equipment, boilers, and furnaces, with a secondary usage as part of an emergency generator system, are excluded, if:

1. Contents consumed on the premises where stored; and
2. UST system stores fuel oil number 1, 2, 4, 5, 6, or residual fuel oil.

The UST Branch may request documentation of product delivery and purchase for dual use UST systems to verify an exemption.

An owner or operator of a UST system shall ensure all components of the UST system are compatible with the substance being stored in the UST. Owners and operators shall ensure that a UST System Compatibility Verification, DWM 4234, be submitted to the cabinet within thirty (30) days of bringing a UST system into use, following a replacement of a component, or change in regulated substance.

1.1 Release Reporting

In accordance with 401 KAR 42:060, Section 1, owners and operators shall report immediately:

- A. Any unusual operating conditions or an unconfirmed UST system release, unless:
 1. The system equipment or component is found not to be releasing regulated substances to the environment;
 2. Any defective system equipment or component is immediately repaired or replaced; and
 3. For secondarily contained systems, any liquid in the interstitial space not used as part of the interstitial monitoring method is removed immediately.
- B. Any results, including investigation of an alarm, from a release detection method that indicate a release may have occurred, unless:
 1. The monitoring device is found to be defective, and is immediately repaired, recalibrated, or replaced, and additional monitoring does not confirm the initial result;
 2. The leak is contained in the liquid-tight secondary containment; and
 - a. Any liquid in the interstitial space not used as part of the interstitial monitoring method is immediately removed; and
 - b. Any defective system equipment or component is immediately repaired or replaced; or
 3. The alarm was investigated and determined to be a non-release event.

Repair documentation, performed in response to an unusual operating condition, shall be retained by the owner or operator, in accordance with Section 13.0 of this manual, and made available to the cabinet upon request.

Confirmed releases, spills, and overfills shall be reported immediately, in accordance with KRS 224.1-400(11), to the cabinet's 24-hour Environmental Response Line at (800) 928-2380, or (502) 564-2380, and appropriate authorities at the local, state, or federal level, for any one (1) of the following:

- A. A confirmed UST system release into the subsurface of any amount;
- B. An aboveground release of petroleum products (excluding diesel) in excess of twenty-five (25) gallons;
- C. An aboveground release of diesel in excess of seventy-five (75) gallons;
- D. An aboveground release of hazardous substance in excess of the reportable quantity under CERCLA (40 C.F.R. Part 302);
- E. Free product in soils, basements, sewer and utility lines, and nearby surface water; or
- F. Vapors in surrounding structures or utility lines resulting from any of the above.

If one (1) inch or more of water is present in any UST system as the result of equipment failure, or if the cause cannot be explained, the owner or operator shall follow the requirements in accordance with 401 KAR 42:060, Section 1, and shall remove the water accumulation as soon as practicable.

2.0 NOTIFICATION, REGISTRATION, AND ANNUAL FEE REQUIREMENTS

Owners of UST systems are required to notify the cabinet of all UST and piping installations, address or ownership changes, as well as registering UST systems with the cabinet, in accordance with 401 KAR 42:020, Sections 1 and 2.

2.1 Notification to Install

Owners shall submit a UST Notice of Intent to Install Underground Storage Tank or Piping, DWM 4231, to the appropriate regional office, at a minimum, fourteen (14) days prior to installation of a UST or an entire piping run, to afford a division representative the opportunity to be present during installation.

2.2 Ownership and Registration

A UST Facility Registration, DWM 4225, shall be submitted within thirty (30) days of bringing a UST system into use, or within thirty (30) days of any change to information on the most recently submitted registration.

Owners and operators shall ensure that a UST System Compatibility Verification, DWM 4234, be submitted to the cabinet within thirty (30) days of bringing a UST system or component into use (if the component is no longer covered by a previously submitted UST System Compatibility form), or within thirty (30) days of a change in regulated substance.

An owner shall notify the cabinet within thirty (30) days of an address change by either submitting an amended UST Facility Registration, DWM 4225, or a UST Facility Owner Address Correction, DWM 4224.

For ownership changes, the new owner is responsible for completing and submitting an amended UST Facility Registration, DWM 4225, to the cabinet within thirty (30) days after the transaction. The previously assigned Agency Interest (AI) number shall be used for all registration documents. The cabinet may request a copy of the properly executed deed or other properly executed legal document proving the transfer of the UST system.

If a previous registration document is required for review, a copy may be requested by completing an open records request through the Department of Environmental Protection at (502) 564-3999 or EEC.KORA@ky.gov.

An unregistered UST system discovered (newly discovered) during permanent closure activities, shall be listed on the UST Closure Assessment Report Checklist, incorporated by reference in 401 KAR 42:060 in lieu of an amended UST Facility Registration.

2.3 Annual Fees

The owner or operator of a UST shall pay a thirty (30) dollar annual fee for each tank in the ground on July 1 of that year (July 1 through June 30). The UST Branch will invoice owners annually.

Annual fees shall not be due for years prior to July 1, 1990, or for an unregistered tank newly discovered during permanent closure activities.

2.4 Financial Responsibility

Owners and operators of petroleum storage tanks must demonstrate financial responsibility for taking corrective action, and for compensating third parties for bodily injury and property damage caused by accidental releases arising from the operation of petroleum USTs. For the amount and scope of financial responsibility requirements for petroleum storage tanks, refer to 40 C.F.R. 280 Subpart H.

An owner and operator shall certify on the UST Facility Registration, DWM 4225, that financial responsibility has been established and will be maintained. The Petroleum Storage Tank Environmental Assurance Fund (PSTEAF) may be utilized as a mechanism to demonstrate financial responsibility. Refer to 401 KAR 42:250 for the requirements for PSTEAF.

2.5 Lender Liability

Refer to 40 C.F.R. 280 Subpart I for requirements for lender liability. Lender liability protects lender agencies that acquire UST facilities via foreclosures and bankruptcies.

3.0 TEMPORARY CLOSURE REQUIREMENTS

An amended UST Facility Registration, DWM 4225, reflecting the change in UST system status, shall be submitted to the UST Branch within thirty (30) days of placing a UST system into temporary closure.

If a UST system is in temporary closure, the owner and operator shall continue operation and maintenance of corrosion protection, and release detection in accordance with 401 KAR 42:020, Sections 11 and 15.

In accordance with Section 3 of 401 KAR 42:020, spill and overfill operation and maintenance testing, and inspections are not required for a UST system in temporary closure. If a UST system is empty as defined by 401 KAR 42:005, UST system release detection and walkthrough inspections are not required.

"Empty" means all regulated substances have been removed from the UST system using commonly employed practices so that not more than two and five-tenths (2.5) centimeters (one (1) inch) of residue, or zero and three-tenths (0.3) percent by weight of the total capacity of the UST system, remain in the system.

If a UST system is in temporary closure for more than three (3) months, the following is required:

1. Vent lines shall be open and functioning; and
2. All other lines, pumps, manways, and ancillary equipment shall be capped and secure.

For UST system in temporary closure for more than twelve (12) months that do not meet the performance standards for corrosion protection, spill containment and overfill prevention, and release detection in accordance with 401 KAR 42:020, the owner and operator shall either complete permanent closure or request an extension with the UST Branch.

If a UST system is in temporary closure for more than twelve (12) months, and meets the performance standards for corrosion protection, spill containment and overfill prevention, and release detection, the owner and operator shall perform a tank and line tightness test prior to returning the UST system into use. In addition, all outstanding or past due periodic tests are required prior to returning the UST system into use.

4.0 PERFORMANCE STANDARDS

4.1 Design and Maintenance Requirements

UST systems shall be designed and manufactured in accordance with the performance standards for new UST systems as established in 40 C.F.R. 280.20 and 401 KAR 42:020. In addition, UST systems shall:

1. Be equipped with double walled tanks and double walled piping (double walled piping is not required for “european” or “safe” suction systems);
2. Contain regulated substances within the outer wall of the double walled tank or double walled piping until the substances are detected and removed, if an inner wall failure occurs;
3. Be compatible with the substances stored in the UST system;
4. Prevent releases of regulated substances to the environment at any time during the operational life of the UST system; and
5. Be designed to allow for continuous interstitial monitoring.

UST systems shall be designed and manufactured in accordance with a code of practice or industry standard developed by a nationally recognized association or independent testing laboratory. Examples of recognized associations and testing laboratories include Underwriters Laboratories, Inc. (UL), Underwriters Laboratories of Canada (ULC), Steel Tank Institute (STI), American Society of Mechanical Engineers (ASME), National Association of Corrosion Engineers (NACE), American Petroleum Institute (API), National Fire Protection Association (NFPA), and American Society of Testing and Materials (ASTM).

4.2 UST System Installations

UST systems shall be installed in accordance with the manufacturer’s instructions, in a manner that will prevent releases of regulated substances for the entire operating life of the UST system. UST system installations shall be performed by an installation contractor who holds a current certification issued by the Kentucky State Fire Marshal’s Office (SFMO), in accordance with 815 KAR 30:060. Installations shall be performed in accordance with a code of practice or industry standard developed by a nationally recognized association or independent testing laboratory, such as American Petroleum Institute Publication 1615, “Installation of Underground Petroleum Storage Systems”, Petroleum Equipment Institute Publication RP100-11, “Recommended Practices for Installation of Underground Liquid Storage Systems”, or their equivalents. UST system installations shall comply with the applicable sections of National Fire Protection Association (NFPA) Code 30, “Flammable and Combustible Liquids Code”, and NFPA Code 30A, “Code for Motor Fuel Dispensing Facilities and Repair Garages”.

When an existing tank is replaced with a new tank, the new tank shall not be connected to existing piping unless that piping also meets the standards in 401 KAR 42:020 and this manual.

An existing tank may not be removed and reinstalled unless it meets the requirements in 401 KAR 42:020 and this manual. Before reinstalling any existing tank, the following requirements shall be met:

1. The tank shall be inspected and tested by the equipment’s manufacturer; and
2. The owner or operator shall submit the following documentation to the cabinet:
 - a) Written certification from the manufacturer indicating the tank is suitable for reinstallation; and
 - b) A permit from the Kentucky SFMO in accordance with 815 KAR 30:060.

4.3 UST System Repairs

UST system repairs shall be performed by a contractor who holds a current certification issued by the Kentucky SFMO, in accordance with 815 KAR 30:060. Owners and operators shall ensure that repairs shall prevent releases due to structural failure or corrosion. Any repair to a tank, piping, or UST component shall be tested within thirty (30) days of the repair. The test shall be adequate to detect a release from the repaired component of the UST system.

The owner and operator shall submit a UST System Compatibility Verification, DWM 4234, if the component is no longer covered by a previously submitted UST System Compatibility form, to the UST Branch in accordance with 401 KAR 42:020, Section 12.

4.4 Operation and Maintenance

UST systems shall be operated, tested, and maintained in accordance with the equipment manufacturer's instructions, and operated and maintained in a manner that will prevent releases of regulated substances for the entire operating life of the UST system. UST system equipment shall not be stored, transported, handled, or installed in a manner that might damage the equipment or void the equipment manufacturer's warranty. Any UST system equipment found to be damaged, degraded, deteriorated, corroded, non-functioning, improperly designed, improperly installed, leaking, incompatible, or otherwise not performing in accordance with the equipment manufacturer's original design specifications, 401 KAR 42:020, or this manual, shall be immediately repaired, replaced, or permanently closed.

Owners and operators shall follow the inspection, maintenance, testing, and reporting requirements in 401 KAR 42:020, 42:060, and this manual. Owners and operators may also refer to applicable guidance documents, recommended practices, or industry standards for recommendations on properly operating and maintaining a UST system such as:

1. "Operating and Maintaining Underground Storage Tank Systems: Practical Help and Checklists", EPA 510-K-16-001;
2. "UST Systems: Inspecting and Maintaining Sumps and Spill Buckets: Practical Help and Checklist", EPA 510-R-05-001; or
3. "Recommended Practices for the Inspection and Maintenance of UST Systems", Petroleum Equipment Institute Publication RP900-17.

4.5 Upgrading Existing UST Systems

Upgrade requirements for existing UST systems are established in 40 C.F.R. 280.21, except that interior lining shall not be an acceptable method of corrosion protection and all interior lined steel tanks that had not, as of December 22, 2013, been upgraded with impressed current corrosion protection shall be permanently closed immediately in accordance with 401 KAR 42:060, Section 6.0.

Metal UST system components that routinely contain regulated substances and are in contact with the ground must be cathodically protected. All UST systems must comply with UST system spill and overfill prevention requirements.

4.6 Double Walled Tanks and Piping

All newly installed tanks and piping (excluding "european" or "safe" suction piping) shall be designed and manufactured with double walled construction consisting of an inner and outer wall with an interstitial space between the tank walls, as shown in Figure 1. The interstitial space shall be continuously monitored for releases using a method of interstitial monitoring certified, as of the time of testing, by an independent third-party evaluator.

Newly installed piping that is associated with a newly installed UST system dispenser, located in an area where a UST system dispenser did not previously exist, shall be designed and manufactured with double walled construction. An existing tank that is removed shall meet the double wall requirements, if reinstated.

Both the inner and outer tank walls shall be designed to allow testing for structural integrity and tightness. Tanks shall be designed and manufactured to contain regulated substances within the outer tank wall until the substances can be detected and removed, if an inner tank wall failure occurs. All tank openings shall be equipped with liquid-tight caps or covers. Tanks shall be operated and maintained to prevent releases of regulated substances, and the ingress of water, for the operational life of the tank.

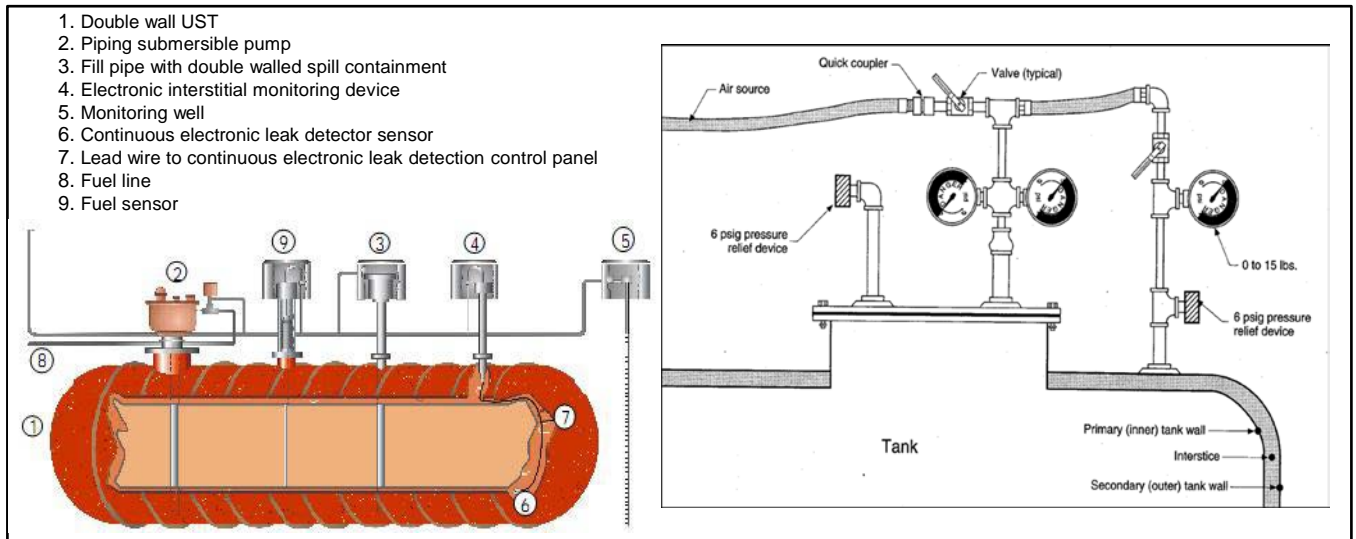
All existing single walled piping shall be permanently closed in accordance with 401 KAR 42:060, if an associated tank is permanently closed.

When fifty (50) percent or more of a piping run is replaced, the entire piping run shall meet the performance standard requirements in 401 KAR 42:020 and this manual. A piping run shall be measured from the tank to the farthest dispenser or other end-use equipment, excluding connectors.

All noncorrodible piping shall meet or exceed the Standard for Safety established by Underwriters Laboratories Inc. in "Standard for Nonmetallic Underground Piping for Flammable Liquids" – UL 971, as referenced in the note to 40 C.F.R 280.20(b)(1). Piping shall be operated and maintained to prevent releases of regulated substances for the operational life of the piping.

The owner and operator shall ensure repairs to noncorrodible piping are performed in accordance with Section 4.3 of this manual, or permanently close noncorrodible piping in accordance with 401 KAR 42:060, if the piping exhibits any of the conditions identified in UST Systems: Inspecting and Maintaining Sumps and Spill Buckets, EPA 510-R-05-001.

Figure 1 – Double Walled UST System¹



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4.6.1 Exception to Double Walled Requirements for Suction Piping

A UST system shall be considered a “european” or “safe” suction system if the following criteria are met:

1. The below grade piping operates at less than atmospheric pressure;
2. The below grade piping is sloped so the contents of the piping will drain back into the tank if the suction is released;
3. Only one check valve is installed for each piping run; and
4. The check valve is located directly below, and as close as practical to, the suction pump.

If suction piping is installed and determined to be a “european” or “safe” suction system, piping release detection, double walled piping requirements, and secondary containment for piping are not required.

If suction piping is installed that is not a “european” or “safe” suction system, piping release detection, double walled requirements, and secondary containment for piping are required. For suction systems that require containment sumps (secondary containment), the point at which the suction piping connects to the tank (stub-out/riser) shall be installed within a liquid-tight containment sump in accordance with 401 KAR 42:020 and this manual. Suction piping shall be installed with a ball valve or a product line isolation valve contained within the containment sump that will allow the suction piping to be isolated for precision line tightness testing without breaking the pipe connections. The containment sump is not required to be continuously monitored if the suction piping is a “european” or “safe” suction system.

4.7 Emergency Shutoff Valves (Shear Valves)

All pressurized piping systems that connect tanks to dispensers shall be installed with shear valves for each supply line at the base of each dispenser. The shear valves shall be rigidly anchored to the dispenser island or another appropriate anchoring point in a manner that allows the shear valve to close automatically in the event of significant impact to a dispenser. A shear valve found to be defective, inoperable, leaking, not functioning as designed by the manufacturer, or not rigidly anchored shall be immediately replaced or repaired in accordance with Sections 4 and 13 of 401 KAR 42:020.

4.8 Testing Requirements at Installation

Both the inner and outer walls of double walled tank and piping shall test tight after installation, prior to dispensing from the UST. Tests shall be completed on, and submitted to the cabinet, on the:

1. UST Tank Tightness Test, DWM 4235, for tank tightness tests; and
2. UST Line Tightness Test, DWM 4229, for line tightness tests.

The tightness test shall be conducted by an equipment tester who meets the requirements established in Section 9(4) of this manual. Testers shall use a method of tightness testing certified, as of the time of testing, by an independent third-party evaluator. Testers shall not use a test method or device that may cause damage to the UST system.

Double wall piping interstice test boots must be opened or loosened at conclusion of the installation testing and prior to use of the regulated piping system. Failure to loosen or open the test boots circumvents interstitial monitoring.

All spill containment devices, spill prevention devices, overfill prevention devices, and release detection equipment (i.e., automatic tank gauge, automatic line leak detectors, etc.) installed in accordance with 401 KAR 42:020 and this manual shall be tested. Tests shall ensure the device is functioning as designed prior to dispensing from the UST system. Testers shall use a test method approved by the device’s manufacturer, or a code of practice or industry standard developed by a nationally recognized association or independent testing laboratory, to ensure the device is functioning as designed.

Owners and operators shall maintain all testing records for a period of thirty-six (36) months.

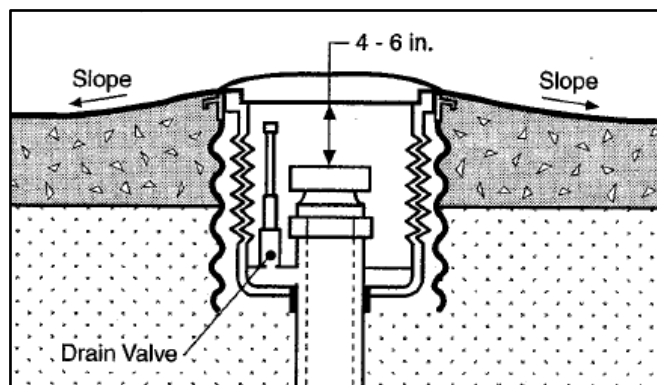
5.0 SPILL CONTAINMENT DEVICES (SPILL BUCKETS AND CATCH BASINS)

5.1 Design and Installation Requirements

All spill containment devices installed after April 1, 2012 shall be double walled, liquid-tight, and compatible with the substance being stored in the tank. Spill containment devices shall be installed in accordance with the manufacturer's instructions.

Spill containment devices shall be liquid-tight on all sides and at all penetrations, and shall be designed to prevent water ingress and product loss. Spill containment devices shall be designed to be structurally suitable for underground burial applications and with sufficient structural integrity to resist the forces associated with backfill, high ground water, and ground movement. Spill containment devices shall be designed to allow for visual inspection and access to the components in the spill containment device, and to accommodate the installation of electronic monitoring devices. Regulated substances, water, or debris shall not be allowed to accumulate in any spill containment devices. All liquid accumulations and debris in any spill containment device shall be immediately removed and disposed of properly.

Figure 2 – Double Walled Spill Bucket²



5.2 Periodic Testing

Spill containment devices installed after April 1, 2012 shall be of double wall construction and tested at installation, and, at a minimum, every thirty-six (36) months. The periodic test shall be documented on the UST Containment Device Test, DWM 4222. The test shall be able to assess the integrity of both the inner and outer wall. If a spill containment device is repaired, it shall be tested within thirty (30) days. Testers shall conduct a manufacturer approved integrity test to verify liquid-tightness.

Spill containment devices installed prior to April 1, 2012 shall be immediately tested and, at minimum, every thirty-six (36) months thereafter. If a single wall spill containment device is found to be defective or not operating as designed, it must be replaced with a spill containment device that meets the performance standards for new installations (i.e., double walled spill containment device).

Periodic testing of spill containment devices shall not be required if the device is:

1. Double walled;
2. The interstitial area is monitored at a minimum every thirty (30) days; and
3. Monitoring records are retained for the previous thirty-six (36) months.

If monitoring records cannot be maintained, then a thirty-six (36) month periodic test will be required within thirty (30) days.

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The spill containment device interstice shall be monitored and documented as follows:

1. For electronic devices capable of printing sensor readings, owners and operators shall obtain a record, at a minimum, every thirty (30) days; or
2. For devices not capable of printing sensor readings, a monthly log shall be maintained and documented on the UST Visual Interstitial Log, DWM 4236.

Owners and operators shall provide copies of spill containment device tests to the cabinet as follows:

1. Within seven (7) days for failing test results; and
2. Within thirty (30) days for passing test results.

Owners and operators shall retain documentation of test results for a minimum of thirty-six (36) months as referenced in Section 13.0 of this manual.

6.0 OVERFILL PREVENTION

6.1 Design and Installation Requirements

Overfill prevention equipment shall be installed on each UST system and be designed to stop product flow, reduce product flow, or alert the delivery person during delivery that the UST system is nearing full capacity in accordance with 401 KAR 42:020, Section 9. This allows the person filling the UST system to stop product delivery before the UST system becomes full and begins releasing product into the environment.

For all newly installed or replaced UST systems, overfill prevention equipment shall be installed with an extractable fitting, to allow for inspection, maintenance, and testing, and shall be capable of:

1. Automatically shutting off flow into the UST system when the UST system is no more than ninety (95) percent full; or
2. Alerting the transfer operator when the UST system is no more than ninety (90) percent full by triggering a high-level alarm.

Owners and operators are not required to use spill and overfill prevention equipment if transfers of no more than twenty-five (25) gallons are deposited in the UST system at one time.

Flow restrictors, also known as ball floats, shall not be used when overfill prevention is installed or replaced in accordance with 401 KAR 42:020, Section 9, and this manual. Approved overfill devices are automatic shutoff devices (ASD) and high level alarms.

6.2 Flow Restrictors (Ball Floats)

Flow restrictors (ball floats) shall not be installed as a form of overfill prevention for newly installed UST systems. All existing flow restrictors shall be removed and physically inspected to verify the ball and cage are intact and functioning properly. Any flow restrictor found to be defective, or not functioning as designed, shall not be repaired or replaced with another flow restrictor. ASD or high level alarm shall be installed in its place.

If the flow restrictor is inaccessible, the owner and operator may choose to have an alternative approved overfill prevention device installed, as long as the alternative has been designed to activate when the UST system is at no more than ninety (90) percent capacity. If the newly installed overfill prevention device is set to activate at more than ninety (90) percent capacity, the flow restrictor and housing shall be accessed and removed.

6.3 Periodic Testing

Overfill prevention devices shall be tested at installation and every thirty-six (36) months thereafter. Existing overfill prevention devices, that were not tested at installation, shall be immediately tested and every thirty-six (36) months thereafter. The overfill prevention device test shall be documented on the UST Overfill Prevention Device Test, DWM 4232. Testers shall conduct a manufacturer approved test, or test using a code of practice developed by a nationally recognized association or independent testing laboratory, to verify the equipment will prevent an overfill of fuel from the delivery truck to the UST system. If an overfill device is found to be defective, it shall be repaired or replaced, and tested within thirty (30) days.

Owners and operators shall provide copies of overfill prevention device tests to the cabinet as follows:

1. Within seven (7) days for failing test results; and
2. Within thirty (30) days for passing test results.

Owners and operators shall maintain written records documenting the test results for thirty-six (36) months, in accordance with Section 13.0 of this manual.

7.0 UNDER-DISPENSER CONTAINMENT AND SUMPS (SPILL PREVENTION DEVICES)

If an under-dispenser containment (UDC), or sump sensor, monitoring device detects the presence of a liquid, the owner and operator shall ensure the UDC or sump is immediately inspected, and repaired if necessary. If 1/8th of an inch or greater of free product is discovered in a UDC or sump, requirements of 401 KAR 42:060, Section 1, shall be met.

Regulated substances, water, or debris shall not be allowed to accumulate in any UDC or sump that is required to be liquid-tight. All liquid accumulations and debris in any UDC or sump shall be immediately removed. If liquids are discovered within a UDC or sump, the device shall be further inspected to determine the source of liquid infiltration, the liquid shall be removed, and the UDC or sump shall be repaired as necessary.

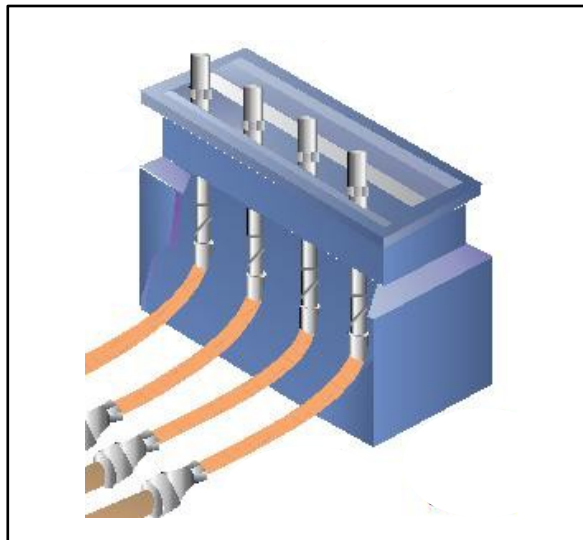
7.1 Design, Installation, and Maintenance Requirements for Under-Dispenser Containment

In accordance with 401 KAR 42:020, Section 10, the installation of liquid-tight UDC shall be required for all new or replaced dispensers, installed after April 1, 2012, when the following conditions exist:

1. A new dispenser is installed in an area where a UST system dispenser did not previously exist;
2. The equipment below the shear valve or union (e.g. flexible connectors, risers, and other transitional components) used to connect the dispenser to the piping is replaced, in conjunction with the replacement of an existing dispenser; or
3. When connected piping is double walled and interstitial monitoring is being used as the method of piping release detection.

UDC shall be liquid-tight on all sides and at all penetrations, and designed to prevent water ingress and product loss. UDC shall be designed to be structurally suitable for underground burial applications and with sufficient structural integrity to resist the forces associated with backfill, high ground water and ground movement. Design requirements for UDC shall allow for visual inspection, access to the components, and to accommodate the installation of electronic monitoring devices.

Figure 3 – Under-Dispenser Containment (UDC)

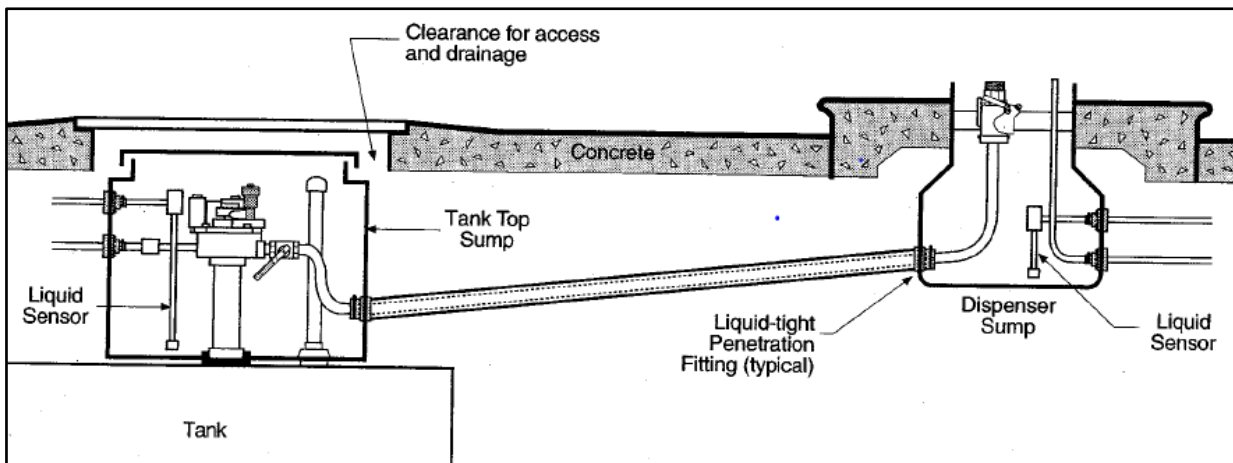


7.2 Design, Installation, and Maintenance Requirements for Liquid-Tight Sumps

In accordance with 401 KAR 42:020, Section 10, all new or replaced sumps containing product piping, installed in conjunction with a UST system installed after April 1, 2012, shall be liquid-tight. Sumps shall be compatible with the substance stored, and continuously monitored for the presence of liquids.

A sump shall be liquid-tight on all sides and at all penetrations, and shall be designed to prevent water ingress and product loss. Sumps shall be designed to be structurally suitable for underground burial applications and with sufficient structural integrity to resist the forces associated with backfill, high ground water, ground movement, and vehicular traffic. Design requirements for sumps shall allow for visual inspection and access to the components, and to accommodate the installation of electronic monitoring devices.

Figure 4 – Sump³



7.3 Periodic Testing

UDC and sumps, installed in accordance with Section 10 of 401 KAR 42:020, shall be inspected every twelve (12) months and tested for liquid-tightness every thirty-six (36) months. The liquid-tightness test shall be documented on the UST Containment Device Test, DWM 4222. Testers shall conduct a manufacturer approved test or test using a code of practice developed by a nationally recognized association or independent testing laboratory to verify liquid-tightness. If a repair or installation of new equipment connects to the UDC or sump, the equipment shall be tested within thirty (30) days.

Periodic testing of UDC or sumps shall not be required if:

1. The UDC or sump is double walled;
2. The interstitial area of the UDC or sump is monitored, at a minimum, every thirty (30) days; and
3. Monitoring records of the UDC or sump are maintained.

If monthly monitoring indicates the presence of liquid in the interstice of a UDC or sump, the device shall be further inspected to determine the source of liquid infiltration, the liquid shall be removed, and the UDC or sump shall be repaired as necessary. If repairs are necessary, periodic testing is required within thirty (30) days of the repair.

If monitoring records cannot be maintained, a thirty-six (36) month periodic test will be required within thirty (30) days.

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The thirty-six (36) month testing requirement shall not be required if the UDC or sump interstice is monitored, at a minimum, every thirty (30) days and is documented as follows:

1. For electronic devices capable of printing sensor readings, owners and operators shall obtain a record, at a minimum, every thirty (30) days; or
2. For devices not capable of printing sensor readings, a monthly log shall be maintained and documented on the UST Visual Interstitial Log, DWM 4236.

Owners and operators shall provide copies of overfill prevention device tests to the cabinet as follows:

1. Within seven (7) days for failing test results; and
2. Within thirty (30) days for passing test results.

Owners and operators shall maintain records documenting the test results for thirty-six (36) months, in accordance with Section 13.0 of this manual.

8.0 CORROSION PROTECTION

8.1 Cathodic Protection Evaluation

UST system components that routinely contain product and are regularly, or intermittently, in contact with soil, water, or backfill, shall be protected from corrosion in accordance with 401 KAR 42:020, Section 11. A cathodic protection evaluation shall be performed to determine whether the UST system components are being protected from corrosion.

If a cathodic protection system has been installed on a UST component, due to intermittent contact with soil, water, and backfill, and the corrosion protection system is tested when the UST component is isolated, the cathodic protection system must demonstrate corrosion protection potential by either passing a standard cathodic protection test or by having a 100mV drop test performed. Responses submitted stating "isolated at time of the test" are not acceptable for demonstrating corrosion protection.

If a cathodic protection system was originally installed due to intermittent contact with soil, water, and backfill, and modifications to the UST system have been made to ensure that contact with soil, water, and backfill will no longer occur, the owner and operator may submit, to the UST Branch, documentation of the modification with a request for the cathodic protection requirements to be excluded.

Impressed current cathodic protection system design, or modifications to an impressed current corrosion protection system, shall only be conducted by a person qualified as a corrosion expert. The owner and operator shall complete the UST Rectifier Operational Record for Impressed Current Cathodic Protection Systems, DWM 4233, and at a minimum, every sixty (60) days for impressed current cathodic protection systems.

A tank or piping that has been left unprotected from corrosion, or that has been inadequately protected from corrosion for over 365 days, shall be permanently closed in accordance with 401 KAR 42:060, or shall undergo an integrity assessment on the unprotected tank or piping, conducted by a contractor certified by the SFMO, in accordance with 815 KAR 30:060, utilizing a method certified by an independent third-party evaluator. The integrity assessment and results, including the average tank metal thickness, shall be submitted to the cabinet on the UST Integrity Assessment, DWM 4228, within thirty (30) days of the assessment date. If results of the integrity assessment determine the average thickness of the steel tank is less than seventy-five (75) percent of the tank's original metal thickness, the steel tank shall be permanently closed in accordance with 401 KAR 42:060.

Steel tanks or piping that have never had corrosion protection installed, shall be immediately emptied of all regulated substances and shall be permanently closed in accordance with 401 KAR 42:060.

All interior lined steel tanks that had not, as of December 22, 2013, been upgraded with external corrosion protection shall be immediately permanently closed in accordance with 401 KAR 42:060.

8.2 Cathodic Protection Testers

Cathodic protection testers shall have completed a third-party corrosion protection tester training, which shall include:

1. Basics of corrosion, underground corrosion, and corrosion prevention;
2. Assessing physical conditions for corrosion potential;
3. Hands on field experience in the testing of both impressed current and sacrificial anode systems, which shall include using reference cells, taking remote readings for appropriate systems, how to read and understand a rectifier, taking measurements using -850 criterion, and typical and non-typical problems;
4. Review of EPA's regulatory requirements for corrosion protection; and
5. Review of standards and recommended practices from corrosion protection publications.

Owners or operators shall ensure that individuals, qualified to perform cathodic protection system evaluations in accordance with this section, submit to the cabinet upon request, documentation verifying that the training requirements have been met.

8.3 Periodic Testing

A cathodic protection evaluation shall be performed within 180 days of an installation, repair, or modification, and, at a minimum, every thirty-six (36) months thereafter. Testing must be performed by a certified third-party corrosion protection tester that meets the requirements of Section 8.2 of this manual. The owner and operator shall ensure that a cathodic protection tester submits to the cabinet the cathodic protection system evaluation within thirty (30) days of the system evaluation. Results of the cathodic protection evaluation shall be documented on either a UST Galvanic Cathodic Protection Evaluation, DWM 4226, or a UST Impressed Current Cathodic Protection Evaluation, DWM 4227.

If a cathodic protection system fails an evaluation, but the cathodic protection system evaluator determines that the failure could be attributable to adverse physical conditions related to the evaluation, and further determines that the system is otherwise in good working condition, then a re-evaluation shall be performed. If a re-evaluation is performed, it shall be within thirty (30) days of the failing evaluation. A re-evaluation shall only be performed once for a failed system evaluation. If the cathodic protection system fails the re-evaluation, then repairs or modifications shall be completed as soon as practicable, but not more than ninety (90) days after the performance of the evaluation.

If a cathodic protection system fails the evaluation, and it does not qualify for the thirty (30) day re-evaluation as described above, then repairs or modifications shall be completed as soon as practicable, but not more than ninety (90) days after the performance of the evaluation. If a cathodic protection system evaluation result is inconclusive, as a result of inconsistent remote and local potential readings, a corrosion expert shall evaluate the cathodic protection system and make a determination regarding cathodic protection system adequacy for the UST facility as soon as practicable, but not more than ninety (90) days after the performance of the evaluation.

Owners and operators shall provide copies of the evaluation and supporting documentation to the cabinet within thirty (30) days of an evaluation as referenced in Record Keeping, Section 13.0 of this manual. Owners and operators shall maintain records for the last two (2) cathodic protection evaluations.

9.0 RELEASE DETECTION REQUIREMENTS

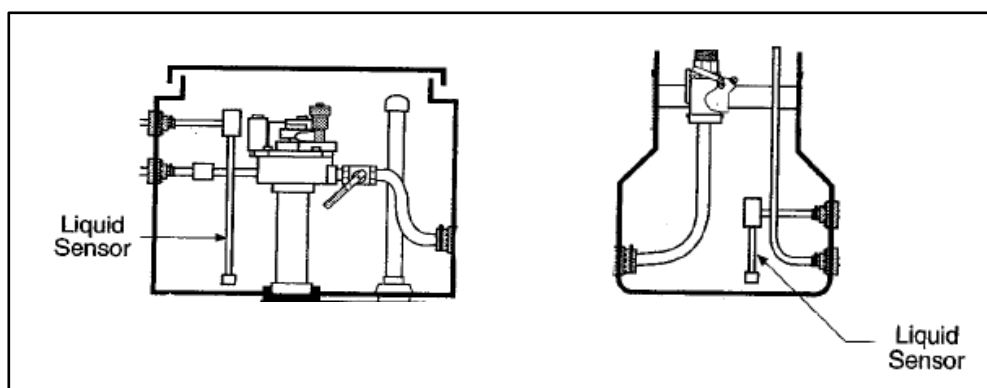
Owners and operators of UST systems must provide a method, or combination of methods of release detection, that can detect a release from any portion of the tank and piping that routinely contains product. Release detection equipment shall be operated and maintained in accordance with the equipment manufacturer's recommendations, Section 15 of 401 KAR 42:020, and this manual.

9.1 UST Systems Installed After April 1, 2012

Owners and operators shall continuously monitor tanks and piping for the presence of a release. An electronic method of continuous interstitial monitoring, certified by an independent third-party evaluator, shall be the primary release detection method for tanks and piping installed on or after April 1, 2012.

UDC and sumps shall be continuously monitored for liquids by a monitoring device, certified by an independent third-party evaluator, such as a liquid float sensor, optical sensor, magnetostrictive sensor, or another sensor approved by the cabinet ("european" or "safe" suction piping are exempt from this requirement). All sensors shall be installed in accordance with the sensor manufacturers' instructions. Sensors shall be properly anchored and positioned below the lowest penetration point within the UDC or sump so that the device can detect the presence of liquids in the UDC or sump.

Figure 5 – Sump Sensor Positioning⁴



Owners and operators shall obtain a record, at a minimum, every thirty (30) days, to verify that release detection is being performed and no releases have occurred. All release detection records for the most recent monthly verification, and for the preceding twelve (12) months, shall be maintained. Release detection equipment shall be operated and maintained in accordance with the equipment manufacturer's recommendations, 401 KAR 42:020, Section 15, and this manual.

For additional release detection requirements refer to Sections 9.3 and 9.4 of this manual.

When a sensor alarm is triggered, the owner or operator shall ensure the device is immediately inspected for the presence of free product. If free product is discovered in secondary containment or in an interstitial space of a double walled tank, the requirements of 401 KAR 42:060, Section 1, and Section 1.1 of this manual, shall be met. Owners and operators shall investigate, and conduct repairs if necessary, in response to any suspected release. Owners and operators shall immediately follow the equipment manufacturers' instructions for removing regulated substances from an interstitial space, UDC, sump, or other containment device.

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9.2 UST Systems Installed Prior to April 1, 2012

Owners and operators shall ensure the method of release detection is certified by an independent third-party evaluator prior to the method being utilized. Release detection methods for tanks and piping installed prior to April 1, 2012, shall be in accordance with 401 KAR 42:020, Section 15, and may include:

1. Manual tank gauging (for a UST system no larger than 2,000 gallons);
2. Statistical inventory control (SIR);
3. Automatic tank gauging (ATG); or
4. Interstitial monitoring.

Owners and operators shall obtain a record, at a minimum, every thirty (30) days, to verify that release detection is being performed and no releases have occurred. All release detection records for the most recent monthly verification and for the preceding twelve (12) months shall be maintained. Release detection equipment shall be operated and maintained in accordance with the equipment manufacturer's recommendations, 401 KAR 42:020, Section 15, and this manual.

Release detection for pressurized piping shall be performed in accordance with 401 KAR 42:020, Section 15, and shall include one (1) of the following:

1. A line tightness test performed every twelve (12) months, documented on UST Line Tightness Test, DWM 4229; or
2. Monitored monthly by either:
 - a) Electronic leak detection equipment;
 - b) Interstitial monitoring; or
 - c) SIR.

Release detection for "non-european" suction piping shall be performed in accordance with 401 KAR 42:020, Section 15, and shall include one (1) of the following:

1. A line tightness test performed every thirty-six (36) months, documented on UST Line Tightness Test, DWM 4229; or
2. Monthly monitored by either:
 - a) Interstitial monitoring; or
 - b) SIR.

Piping release detection is not required on "european" suction piping.

If owners and operators utilize interstitial monitoring as the primary method of release detection for tanks and piping installed prior to April 1, 2012, the following requirements shall be met:

1. Use electronic devices capable of printing sensor readings and obtain a record, at a minimum, every thirty (30) days; or
2. Maintain a monthly interstitial monitoring log on the UST Visual Interstitial Log, DWM 4236, for devices not capable of printing sensor readings; and
3. Meet the requirements for UDCs and sumps in 401 KAR 42:020, Section 10.

For additional release detection requirements refer to Sections 9.3 and 9.4 of this manual.

When a method of release detection indicates a fail or an unusual operating condition is observed, the owner or operator shall ensure the requirements of 401 KAR 42:060, Section 1, and Section 1.1 of this manual are met.

9.3 Additional Release Detection Requirements for Pressurized Piping

All pressurized piping shall be equipped with an automatic line leak detector (ALLD), certified by an independent third-party evaluator, capable of detecting a leak from the piping of three (3) gallons-per-hour at ten (10) pounds per square inch of line pressure, in accordance with 401 KAR 42:020, Section 15. Line leak detectors are required in addition to the continuous interstitial monitoring of pressurized double walled piping. Line leak detectors shall be designed and operated to alert the operator of the presence of a leak by restricting or shutting off the flow of regulated substances through the piping, or by triggering an audible or visual alarm. The ALLD may be either an electronic line leak detector or a mechanical line leak detector.

9.4 Periodic Testing Requirements

Release detection equipment shall be tested as described in Section 9.4.1 and 9.4.2 of this manual. Tests shall be performed by a tester who meets the requirements established in 401 KAR 42:020, Section 15(6). Testers shall conduct a test using a manufacturer approved method, a code of practice developed by a nationally recognized association or independent laboratory, or an equally protective method approved by the cabinet based on site-specific conditions.

Owners and operators shall provide copies of release detection operational tests, tank tightness tests and line tightness tests to the cabinet as follows:

1. Within seven (7) days for failing test results; and
2. Within thirty (30) days for passing test results.

Owners and operators shall retain the most recent twelve (12) months of release detection records at all times. Annual operational tests shall be retained for thirty-six (36) months, and tank tightness tests and line tightness tests shall be retained until the next test is performed. Refer to Section 13.0 of this manual for record keeping of release detection records and testing.

9.4.1 Electronic Release Detection Equipment

Electronic Release Detection Equipment shall be tested at installation, and at a minimum, every twelve (12) months thereafter and the test results shall be documented on UST Electronic Release Detection Equipment Test, DWM 4223.

Electronic release detection equipment includes ATG consoles and probes, interstitial monitoring consoles, probes, and sensors, and other electronic devices designed to detect releases of regulated substances, except for electronic line leak detectors, which shall be tested in accordance with 9.4.2 of this manual.

9.4.2 Automatic Line Leak Detectors

ALLD shall be tested at installation and, at a minimum, every twelve (12) months thereafter, and the test results documented on UST Automatic Line Leak Detector Operational Test, DWM 4221.

All ALLD installed on pressurized piping systems shall be performance tested, at a minimum, every twelve (12) months. Performance testing is required for both manual and electronic line leak detectors, even if the equipment manufacturer designates the line leak detector as "self-testing". The performance test shall verify that the ALLD is capable of detecting a leak rate equivalent to three (3) gallons-per-hour at ten (10) pounds per square inch of line pressure, in accordance with 401 KAR 42:020, Section 15(9).

9.5 Equipment Testers

Tests shall be performed by a UST system equipment tester who meets the requirements established in 401 KAR 42:020, Section 15(6). Testers shall conduct a test using a manufacturer approved method, or a code of practice developed by a nationally recognized association or independent laboratory.

A UST system equipment tester shall meet these requirements.

1. Use testing equipment and methods that are certified, as of the time of testing, by an independent third-party evaluator.
2. Complete a training course conducted or endorsed by the manufacturer of the testing equipment.
3. Maintain training credentials as prescribed by the manufacturer of the testing equipment.

An equipment tester shall provide a copy of his or her training credentials to the cabinet upon request. Failure to provide credentials shall render the test results invalid.

10.0 OPERATOR TRAINING

Operator training requirements for UST systems shall be as established in 40 C.F.R. 280 Subpart J and 401 KAR 42:020, Section 16. An owner of a:

1. UST system registered, but not permanently closed, shall immediately designate at least one (1) individual to be trained within thirty (30) days of designation, as a combined Class A and Class B operator, if a combined Class A and Class B operator has not previously been designated and trained, and the UST system is not newly installed or newly acquired.
2. Newly installed, or newly acquired but not permanently closed, UST system shall, within thirty (30) days of registration, designate at least one (1) individual to be trained, within thirty (30) days of designation, as a combined Class A and Class B operator.

If an owner of a UST system no longer has a trained combined Class A and Class B operator, the owner shall immediately designate another individual as a combined Class A and Class B operator who shall complete operator training within thirty (30) days.

It is the responsibility of the UST system owner to ensure the following requirements are met.

1. A trained combined Class A and Class B operator shall successfully retrain annually, within twelve (12) months of the most recent training date, unless otherwise directed or approved by the cabinet.
2. An operator training certificate, completed in accordance with this section, shall be submitted to the cabinet within thirty (30) days of completion.
3. An operator trained in accordance with this section, shall submit to the cabinet upon request, documentation verifying that the training requirements have been met.
4. A list of all employees trained as combined Class A and Class B operator, and Class C operators, shall be maintained.

Operator training may be completed by utilizing the cabinet provided training or other operator training that meets the requirements of Sections 10.1 and 10.2 of this manual.

10.1 Combined Class A and Class B Operator Training Requirements

Combined Class A and Class B operator training must include general knowledge requirements that encompass all regulatory requirements, typical equipment used at a UST facility, and at a minimum, must teach the purpose, methods, and functions of the equipment and activities listed below.

1. Spill and overfill prevention
2. Release detection and related reporting
3. Corrosion protection
4. Emergency response
5. Product and equipment compatibility and demonstration
6. Financial responsibility
7. Notification and registration
8. Temporary and permanent closure
9. Related reporting, record keeping, testing, and inspection
10. Environmental and regulatory consequences of releases
11. Operation and maintenance
12. Training requirements for Class C operators

10.2 Class C Operator Training Requirements

A Class C operator training must include, at a minimum, the items as listed below.

1. Response to equipment alarms
2. Spill and overfill response
3. Threat to the public or to the environment caused by spills or releases
4. Emergency shut-off procedures
5. Contact telephone numbers to be used in response to emergencies caused by a release or a threatened release from a UST system

Refer to Section 13.0 of this manual for record keeping of operator training records.

11.0 WALKTHROUGH INSPECTIONS

An owner or operator shall ensure that monthly and annual walkthrough inspections are completed in accordance with 401 KAR 42:020, Section 17. Walkthrough inspections may be conducted by an owner, operator, or combined Class A and Class B operator. Walkthrough inspections shall be maintained for twelve (12) months after the last annual walkthrough inspection completion date, as referenced in Record Keeping, Section 13.0 of this manual. Documentation of walkthrough inspections shall be made available to the cabinet upon request.

11.1 Monthly Walkthrough Inspections

The initial monthly walkthrough inspection, for existing UST facilities with a UST system that is not newly installed or newly acquired, shall be completed immediately, and every thirty (30) days thereafter. At newly installed UST facilities, the initial monthly walkthrough inspection shall be completed within thirty (30) days of registration, and every thirty (30) days thereafter. For UST facilities that have a change in ownership, a monthly walkthrough inspection shall be completed within thirty (30) days of registration, and every thirty (30) days thereafter.

Monthly walkthrough inspections shall be documented on the UST Monthly Walkthrough Inspection, DWM 4230, or another form containing, at a minimum, the same information. Each monthly walkthrough inspection shall include:

1. A visual check of spill prevention equipment for damage, remove liquids and debris, remove obstructions in the fill tube, and check the fill cap to ensure it is securely attached to the fill tube;
2. A check of double walled spill prevention equipment with interstitial monitoring for a leak in the interstitial area; and
3. A check of release detection equipment to ensure the equipment is in operation with no alarms or other unusual operation conditions present, and that records of release detection testing are reviewed and current.

If a UST system has product deliveries less frequent than every thirty (30) days, the monthly walkthrough inspection is not required every thirty (30) days and will instead be required at the time of product delivery.

11.2 Annual Walkthrough Inspections

The initial annual walkthrough inspection, for existing UST facilities with a UST system that is not newly installed or newly acquired, shall be completed immediately, and every twelve (12) months thereafter. At newly installed UST facilities, the initial annual walkthrough inspection shall be completed within thirty (30) days of registration, and every twelve (12) months thereafter. For UST facilities that have a change in ownership, an annual walkthrough inspection shall be completed within thirty (30) days of registration, or within twelve (12) months of the last annual walkthrough inspection, and every twelve (12) months thereafter.

Annual walkthrough inspections shall be performed for each UST system and shall be documented on the UST Annual Walkthrough Inspection, DWM 4220, or another form containing, at a minimum, the same information. Each annual walkthrough inspection shall include:

1. A visual check of UDC and containment sumps for damage, leaks to the containment area, or releases to the environment, with removal of liquids (in contained sumps) and debris;
2. A check of double walled sumps with interstitial monitoring for a leak in the interstitial area; and
3. A check of hand held release detection equipment (i.e., tank gauge sticks) and replacement equipment is damaged or unable to function as originally designed.

When the annual walkthrough inspection is conducted, the monthly walkthrough inspection for that month may be conducted simultaneously, in accordance with Section 11.1 of this manual.

12.0 DELIVERY PROHIBITION

The cabinet shall issue a Notice of Violation to the UST system's owner or operator upon confirmation any of the following conditions:

1. Spill prevention equipment is not installed, operational, or maintained;
2. Overfill prevention equipment is not installed, operational, or maintained;
3. Corrosion protection equipment is not installed, operational, or maintained;
4. Release detection is not performed;
5. Release detection equipment is not installed, operational, or maintained;
6. Registration is not submitted or is not amended as necessary;
7. Annual fee is past due by more than one (1) year; or
8. A defective UST system component, confirmed by UST system testing or visual observation by the cabinet, and for which the owner and operator have not documented a repair or replacement, has:
 - a) Caused a release of a regulated substance into the environment; or
 - b) Allowed a regulated substance to infiltrate into the interstitial space or secondary containment of the UST system.

The initial Notice of Violation shall serve as notice to the owner or operator of the cabinet's intent to invoke delivery prohibition for the UST system if the violation is not corrected within the time frame established in writing by the cabinet.

Upon failure by the owner or operator to correct the violation of a condition as listed above, as cited in the initial Notice of Violation, or to request an extension, a second Notice of Violation shall be issued, and delivery prohibition shall be invoked. A cabinet representative shall attach a delivery prohibition tag to the non-compliant UST system.

An owner and operator shall:

1. Ensure that a delivery prohibition tag shall not be removed, defaced, altered, or destroyed.
2. Shall not allow the delivery, deposit, or acceptance of regulated substances into a UST system for which the cabinet has invoked delivery prohibition, unless otherwise directed in writing by the cabinet for the purpose of UST system testing.
3. Shall notify the appropriate product deliverer if delivery prohibition has been invoked.

Delivery prohibition shall remain in effect until the non-compliant UST system is returned to compliance for the violation that caused delivery prohibition to be invoked.

Delivery prohibition shall not apply to a regulated UST used to fuel an emergency backup generator.

The delivery prohibition process as established in 401 KAR 42:020, Section 18, is different than the delivery prohibition process as established in 401 KAR 42:060, Section 2. During the course of an environmental emergency, the ERT is not required to issue a NOV before invoking delivery prohibition if necessary to protect human health and the environment.

13.0 RECORD KEEPING

All records and documentation shall be retained in accordance with 401 KAR 42:020, Section 19.

Documentation	Retention
Installation records Upgrade and repair records Compatibility records	Lifetime of UST system or components
Release detection records – Monthly	12 months
Overfill prevention devices Spill containment devices (<i>i.e., spill buckets</i>) Spill prevention devices (<i>i.e., UDC and sumps</i>) Release detection – Annual (<i>i.e., electronic release detection equipment, line leak detectors, rectifier logs, etc.</i>)	36 months
Tank tightness tests Line tightness tests	Until next test is performed
Walkthrough inspections – Monthly Walkthrough inspections – Annual	12 months after the last Annual Walkthrough Inspection
Combined Class A and Class B Operator Certification	Until another operator is certified
Class C Operator Training	Current training records
Corrosion protection (<i>i.e., cathodic protection evaluations</i>)	2 previous evaluations (6 years)