

1301:7-9-07

**Release detection methods and requirements for UST systems.**

(A) Purpose and scope

For the purpose of prescribing rules pursuant to section 3737.88 of the Revised Code, the state fire marshal hereby adopts this rule to establish release detection requirements and methods for underground storage tanks (UST) containing petroleum or other regulated substances. This rule is adopted by the state fire marshal in compliance with Chapter 119. of the Revised Code and shall not be considered a part of the "Ohio Fire Code." The following UST systems are exempt from this rule:

- (1) Wastewater treatment tank systems;
- (2) Any UST systems containing radioactive material that are regulated under the Atomic Energy Act of 1954 (42 U.S.C.A. 2014 and following);
- (3) Any UST system that is part of an emergency generator system at nuclear power generation facilities regulated by the United States nuclear regulatory commission;
- (4) Airport hydrant fuel distribution systems; and
- (5) UST systems with field-constructed tanks.

(B) Release detection requirements for new UST systems.

- (1) New USTs shall be equipped and monitored for releases at least every thirty days using interstitial monitoring pursuant to paragraph (D)(1)(d) of this rule.
- (2) Underground piping that routinely contains regulated substances that is part of a new UST system shall be equipped and monitored for releases pursuant to paragraph (D)(2)(b) through (D)(2)(c)(iii)(c) of this rule except that:
  - (a) Underground piping that conveys petroleum under suction shall be equipped and monitored for releases pursuant to paragraph (D)(2)(d) of this rule; and
  - (b) A manifold that conveys petroleum under suction between tanks does not have to meet the interstitial monitoring requirements as described in paragraph (D)(2)(b) of this rule.
- (3) Containments that are part of a new UST system shall be equipped and monitored for releases pursuant to paragraph (D)(3) of this rule.
- (4) New UST systems containing motor or aviation petroleum fuels are not required to be monitored using product inventory control as described in paragraph (D)(1)(a) of this rule.

- (5) New UST systems that store fuel for use by emergency power generators shall comply with release detection requirements pursuant to paragraphs (B)(1) through (B)(3) of this rule.
- (6) If a method of UST release detection authorized in paragraph (B)(1) of this rule is found to be defective, owners and operators shall immediately cause the method of release detection to undergo routine maintenance, modification or major repair.
- (a) While the method of release detection undergoes routine maintenance, modification or major repair, owners and operators may use product inventory control or automatic tank gauging in accordance with paragraph (D)(1)(a) or (D)(1)(c) of this rule in order to meet the requirements of paragraphs (B)(1) of this rule.
- (b) Owners and operators may use product inventory control or automatic tank gauging in accordance with paragraph (D)(1)(a) or (D)(1)(c) of this rule for a period of up to sixty days after the last passing result obtained in accordance with paragraphs (B)(1) of this rule. Afterwards, owners and operators shall take the UST system out of service in accordance with rule 1301:7-9-12 of the Administrative Code until such time as the routine maintenance, modification or major repair of the release detection method is complete.
- (7) If an owner and/or operator elects to equip an UST system in a manner that exceeds the requirements of this rule, the owner and/or operator is only required to maintain the UST system to the extent required by this rule.
- (8) Other methods of release detection may be used for tanks, piping and containments pursuant to paragraph (D)(4) of this rule.

(C) Release detection requirements for existing UST systems.

- (1) Existing UST systems shall be equipped and monitored for release in accordance with the following:
- (a) Existing USTs shall be equipped and monitored for releases at least every thirty days pursuant to paragraphs (D)(1)(c) or (D)(1)(d) of this rule except that:
- (i) Existing tanks with a capacity of five hundred fifty gallons or less may use manual tank gauging in compliance with paragraphs (D)(1)(b) of this rule as the sole method of release detection; and
- (ii) Existing tanks with a capacity of five hundred fifty-one to two thousand gallons that contain new or used oil may use manual

tank gauging in compliance with paragraphs (D)(1)(b) of this rule as a method of release detection provided that a tank tightness test is performed in accordance with paragraph (F)(1)(a) of this rule once every five years.

(b) Existing underground piping that routinely contains regulated substances shall be equipped and monitored for releases pursuant to paragraph (D)(2)(a) through (D)(2)(d)(ii)(b) of this rule except that:

(i) Existing piping associated with UST systems installed prior to March 1, 2005, does not have to meet the interstitial monitoring requirements as described in paragraph (D)(2)(b) of this rule.

(ii) Existing underground piping that conveys regulated substances under suction shall be equipped and monitored for releases pursuant to paragraph (D)(2)(d) of this rule; and

(iii) An existing suction manifold between tanks does not have to meet the interstitial monitoring requirements as described in paragraph (D)(2)(b) of this rule.

(c) Existing containment systems shall be equipped and monitored for releases pursuant to paragraph (D)(3) of this rule except existing containments associated with UST systems installed prior to March 1, 2005, are not required to meet the release detection requirements of paragraph (D)(3) of this rule and shall instead be equipped and monitored pursuant to paragraph (D)(6) of rule 1301:7-9-06 of the Administrative Code.

(2) Existing UST systems containing hazardous substances as defined in rule 1301:7-9-03 of the Administrative Code shall be equipped and monitored for a releases of a hazardous substance as defined in 1301:7-9-03(B)(1) and (B)(2) pursuant to the new UST system requirements defined in paragraph (B) of this rule except that:

(a) Existing containments originally configured with one release detection sensor located at the lowest point of the secondary containment system are not required to have sensors in every containment; and

(b) Existing underground piping and manifolds that convey hazardous substance under suction shall be equipped and monitored for releases pursuant to paragraph (B)(2) of this rule.

(3) Existing UST systems located in sensitive areas as defined in rule 1301:7-9-09 of the Administrative Code shall be equipped and monitored for releases pursuant to the new UST system requirements defined in paragraph (B) of this rule except that:

- (a) Automatic line leak detectors are no longer required to be designed with a limited restart capability that automatically prevents the operator from restarting the flow of regulated substances more than once.
- (b) Existing containments originally configured with one release detection sensor located at the lowest point of the secondary containment system are not required to have sensors in every containment.
- (c) Existing UST systems that were installed in sensitive areas before the effective dates listed in paragraphs (C) to (E) of rule 1301:7-9-09 of the Administrative Code shall be equipped to be monitored for releases pursuant to the existing UST requirements of paragraph (C)(1) of this rule.
- (4) Owners and operators using soil gas monitoring or ground water monitoring as the sole method of release detection for USTs and piping were required to comply with one of the release detection methods as provided in paragraphs (D)(1)(c) or (D)(1)(d) of this rule by December 31, 2005. Owners and operators may request to continue using said methods of release detection or request to use an alternative method provided that the owner and operator receives written approval from the state fire marshal pursuant to paragraph (D)(4) of this rule.
- (5) Existing UST systems containing motor or aviation petroleum fuels are no longer required to be monitored daily using product inventory control as described in paragraph (D)(1)(a) of this rule.
- (6) Existing UST systems that store fuel for use by emergency power generators are not required to be equipped with release detection pursuant to paragraphs (B)(1) through (B)(3) of this rule unless the UST systems undergoes work pursuant to paragraph (C)(7) of rule 1301:7-9-06 of the Administrative Code.
- (7) If a method of UST release detection authorized in paragraph (C)(1)(a) of this rule is found to be defective, owners and operator shall comply with paragraph (B)(6)(a) through (B)(6)(b) of this rule and may use product inventory control as a method of UST release detection.
- (8) If work is performed on an existing UST system in order to meet the requirements of paragraph (C)(7) of rule 1301:7-9-06 of the Administrative Code, then the UST, piping or containments equipment affected by the work shall meet the release detection requirements for new UST systems as described in paragraphs (B)(1) through (B)(3) of this rule.
- (9) If an owner and/or operator elects to equip an UST system in a manner that exceeds the requirements of this rule, the owner and/or operator is only required to maintain the UST system to the extent required by this rule.

(10) Other methods of release detection may be used for tanks, piping and containments pursuant to paragraph (D)(4) of this rule.

(D) Methods, operation and maintenance of release detection systems on UST systems.

(1) UST release detection.

Owners and/or operators should carefully review the release detection requirements described in paragraphs (B) and (C) of this rule in order to determine which of the following methods apply to their UST system.

(a) Daily product inventory control shall be conducted as described in "American Petroleum Institute 1621-01; Recommended Practice for Bulk Liquid Stock Control of Retail Outlets."

(i) Inventory from UST systems shall be reconciled monthly. If the reconciliation for any month indicates an overage or shortage equal to or greater than one per cent of flow-through plus one hundred thirty gallons, owners and operators shall investigate the inventory discrepancy as described in "American Petroleum Institute 1621-01 Recommended Practice for Bulk Liquid Stock Control of Retail Outlets."

(ii) If inventory discrepancies occur for two consecutive months, owners and operators shall perform an investigation in accordance with all of the following:

(a) Conduct a tightness test of the UST system in accordance with paragraph (F) of this rule within seven days of discovery of the discrepancy; and

(b) Report any failure of a tightness test to BUSTR as a suspected release. A release is suspected and subject to the reporting requirements of sections 3737.88 and 3737.882 of the Revised Code and this chapter of the Administrative Code if a tightness test leak rate exceeds the amount designated for the testing method. Passing tightness test results do not have to be reported to the state fire marshal.

(iii) Gauging sticks and charts used in the performance of daily product inventory control as described in paragraphs (D)(1)(a) of this rule shall be designed for the UST being measured and shall be maintained in working order.

(b) Manual tank gauging shall be conducted weekly and comply with the following requirements:

- (i) Tank liquid level measurements shall be taken at the beginning and end of a time period of at least thirty-six hours during which no liquid is added to or removed from the tank;
- (ii) Level measurements are based on an average of two consecutive stick readings at both the beginning and ending of the period;
- (iii) The equipment used is capable of measuring the level of product over the full range of the tank's height to the nearest one-eighth of an inch; and
- (iv) A release is suspected and subject to the reporting requirements of sections 3737.88 and 3737.882 of the Revised Code and this chapter of the Administrative Code if the variation between the beginning and ending measurements exceeds the weekly or monthly standards in the following table:

<u>Tank Capacity</u>	<u>Weekly Standard (One test)</u>	<u>Monthly Standard (Average of four tests)</u>
<u>550 gallons or less</u>	<u>10 gallons</u>	<u>5 gallons</u>
<u>551-1,000 gallons</u>	<u>13 gallons</u>	<u>7 gallons</u>
<u>1,001-2,000 gallons</u>	<u>26 gallons</u>	<u>13 gallons</u>

- (v) Gauging sticks and charts used in the performance of manual tank gauging as described in paragraphs (D)(1)(b) of this rule shall be designed for the UST being measured and shall be maintained in working order.
- (c) Equipment for automatic tank gauging that tests for the loss of regulated substance and conducts inventory control shall comply with the following requirements:
- (i) Equipment for automatic tank gauging shall perform one of the following:
    - (a) An in-tank leak test capable of detecting a two tenth of a gallon per hour leak rate from any portion of the tank at least once every thirty days: or
    - (b) Continuous statistical leak detection capable of detecting a two-tenth of a gallon per hour leak rate from any portion of the tank once every thirty days.

(ii) A release is suspected and subject to the reporting requirements of sections 3737.88 and 3737.882 of the Revised Code and this chapter of the Administrative Code if a two-tenth of a gallon per hour leak rate is detected from any portion of the tank.

(iii) Equipment for automatic tank gauging, including probes, sensors and monitoring units, shall be evaluated annually by a qualified person as described in paragraph (D)(5) of this rule to confirm proper calibration and operation in accordance with the manufacturer's requirements.

(d) Monitoring of the interstice of secondarily contained UST systems shall comply with the following requirements:

(i) Monitoring of the interstitial space shall be performed at least once every thirty days;

(ii) Secondarily contained UST systems shall have an interstitial monitoring method that can detect a release through the inner wall or a failure of the outer wall in any portion of the tank that routinely contains a regulated substance;

(iii) A release is suspected and subject to the reporting requirements of sections 3737.88 and 3737.882 of the Revised Code and this chapter of the Administrative Code if any regulated substance is detected between the inner and outer wall, or if the outer wall fails; and

(iv) Equipment for interstitial monitoring, including probes, sensors and monitoring units, shall be evaluated annually by a qualified person as described in paragraph (D)(5) of this rule to confirm proper calibration and operation in accordance with the manufacturer's requirements.

(2) Piping release detection.

Owners and/or operators should carefully review the release detection requirements described in paragraphs (B) and (C) of this rule in order to determine which of the following methods apply to their UST system.

(a) Single wall piping that routinely contains regulated substances shall be monitored pursuant to paragraph (D)(2)(c) through (D)(2)(d)(ii)(b) of this rule.

(b) Secondarily contained piping that routinely contains regulated substances shall be monitored pursuant to paragraphs (D)(2)(c) through

(D)(2)(d)(ii)(b) of this rule, and the interstice of the secondarily contained piping shall be continuously monitored for releases using one of the following methods:

- (i) The sampling or testing method can detect a two-tenth of a gallon per hour leak rate from any portion of the inner or outer wall of the piping that routinely contains a regulated substance. A release is suspected and subject to the reporting requirements of sections 3737.88 and 3737.882 of the Revised Code and this chapter of the Administrative Code if a two-tenth of a gallon per hour leak rate is detected from any portion of the piping, or
- (ii) The piping is contiguous with the containment system and the sampling or testing method can detect a release from any portion of the inner wall of the piping that routinely contains a regulated substance pursuant to paragraph (D)(3) of this rule.

(c) Requirements for pressure piping:

- (i) Underground piping that conveys regulated substances under pressure shall be equipped with an automatic line leak detector attached to the piping that will alert the operator to the presence of a leak by restricting or shutting off the flow of regulated substances through the piping or triggering an audible or visual alarm if the automatic line leak detector detect a leak of three gallons per hour at ten pounds per square inch line pressure within one hour. The owner and operator is permitted to restart the flow of regulated substances only once to verify the presence of a piping leak or an equipment malfunction. If the flow of regulated substance is restricted or shut off or in the event of an audible or visual alarm within two hours of a restart by an operator, a release is suspected and subject to the reporting requirements of sections 3737.88 and 3737.882 of the Revised Code and this chapter of the Administrative Code.
- (ii) Automatic line leak detectors shall be tested annually by a qualified person pursuant to paragraph (D)(5) of this rule to confirm proper calibration and operation in accordance with the following:
  - (a) Automatic line leak detectors shall be tested in a manner that introduces a simulated leak into the product line between the tank and the dispenser, and the automatic line leak detector functions within design specifications and the flow of product is restricted, stopped or an alarm is activated; and



- (b) Automatic line leak detectors that fail a test method shall undergo routine maintenance, modification or major repair, as appropriate, to restore the automatic line leak detectors to working order.
- (iii) Underground piping that conveys regulated substances under pressure shall meet one of the following:
- (a) Have an annual tightness test conducted in compliance with paragraph (F)(2)(a) of this rule;
- (b) Have a monthly tightness test conducted by the on-site electronic line testing unit as described in paragraph (D)(2)(c) of this rule provided that the unit can detect a two-tenth of a gallon per hour leak rate at operating pressure; or
- (c) Be a part of secondarily contained piping system where by the interstice of the piping is continuously monitored pursuant to (D)(2)(b)(i) or (D)(2)(b)(ii) of this rule.
- (d) Requirements for suction pumping:
- (i) Underground piping that conveys regulated substances under suction shall be monitored for loss of vacuum indicated by an inability to dispense regulated substances or erratic operation of the pump. Within twenty-four (24) hours of an UST owner and operator suspecting a loss of vacuum, the owner and operator shall initiate an investigation of the cause of the loss of vacuum. If an owner and operator is unable to make a determination of the loss of vacuum, then the loss of vacuum shall be considered a suspected release as defined in O.A.C. 1301:7-9-13(C)(34) and the owner and operator shall comply with O.A.C. 1301:7-9-13(F)(2). If the loss of vacuum is determined to be due to a leaking component, it shall constitute a release as defined in O.A.C. 1301:7-9-13(C)(25) and the owner and operator shall comply with O.A.C. 1301:7-9-13(F).
- (ii) Underground piping that conveys regulated substances under suction shall meet one of the following:
- (a) Have a tightness test conducted every thirty-six month period in compliance with paragraph (F)(2)(a) of this rule; or
- (b) Demonstrate compliance with the following safe suction requirements:

- (i) The underground piping operates at less than atmospheric pressure;
  - (ii) The underground piping is sloped so that the contents of the pipe will drain back into the tank if the suction is released;
  - (iii) Only one check valve is included in each suction line;
  - (iv) The check valve is located directly below and as close as practical to the suction pump; and
  - (v) A method is provided that allows compliance with paragraphs (b)(i) through (iv) of this paragraph to be readily determined.
- (e) Above ground piping that routinely contains regulated substances that is fully visible to inspection is not required to be equipped with release detection. If a portion of the above ground piping is located below ground and the piping can not be easily accessed for visual inspection, then the piping must be equipped and monitored for releases release pursuant to paragraph (D)(2) of this rule.

(3) Release detection methods for containment systems:

Owners and/or operators should carefully review the release detection requirements described in paragraphs (B) and (C) of this rule in order to determine which of the following methods apply to their UST system.

- (a) Containment systems shall be continuously monitored with sensors capable of detecting a release of a regulated substance before the release reaches the lowest penetration in the containment system. Sensors shall be located in every containment
- (b) Any alarm from a sensor in any containment system shall be evaluated within twenty four hours to confirm proper operation or to confirm the presence of a release. A release is suspected and subject to the reporting requirements of sections 3737.88 and 3737.882 of the Revised Code and this chapter of the Administrative Code if any regulated substance is detected in the containment sump.
- (c) The following containment systems shall be tested for tightness every three years in accordance with paragraph (F)(3)(a) of this rule.
  - (i) All containment systems installed on new UST systems after March 1, 2005;



is:

- (a) Recognized by the manufacturer of the release detection method to be proficient in the evaluation of the release detection method;
- (b) Recognized by a third party approved by the state fire marshal to be proficient in the evaluation of the release detection method; or
- (c) Recognized by the state fire marshal as proficient in the evaluation of the release detection method.

(6) All methods of release detection shall be properly installed in accordance with the manufacturer's instructions and either "Petroleum Equipment Institute Publication RP100-2005; Recommended Practices for Installation of Underground Liquid Storage Systems" or "American Petroleum Institute Publication 1615-01; Installation of Underground Petroleum Storage Systems." Where there is a conflict between requirements the more protective requirement shall prevail.

(E) Release detection recordkeeping.

UST system owners and operators shall maintain records demonstrating compliance with this chapter, and these records shall be maintained pursuant to the following:

- (1) All written performance claims pertaining to any release detection system used, and the manner in which these claims have been justified or tested by the equipment manufacturer or installer, shall be maintained for the life of the UST system and for two years after the closure of the UST system in compliance with this chapter;
- (2) The results of any sampling, testing, or monitoring shall be maintained for at least two years;
- (3) Written documentation of all calibration, maintenance, and repair of release detection equipment permanently located at the facility, and any schedules of required calibration and maintenance provided by the release detection equipment manufacturer shall be retained for the life the equipment and for two years there after;
- (4) Owners and operators shall provide the state fire marshal access to all records with twenty-four hours of a request; and
- (5) Within thirty days of transfer of ownership of an UST system, the transferor shall provide the transferee with all records identified in section (E) of this rule or with equivalent copies of said records.

(F) Testing methods for UST systems.

(1) Tightness testing for USTs.

- (a) Tank tightness testing of the primary shell of both single wall and secondarily contained USTs shall be capable of detecting a one tenth of a gallon per hour leak rate from any portion of the primary shell while accounting for the effects of thermal expansion or contraction of the regulated substance, vapor pockets, tank deformation, evaporation or condensation, and the location of the water table.
- (b) Tightness testing of the interstice of secondarily contained USTs shall follow the manufacturers testing requirements or other requirements approved by the manufacturer, the state fire marshal, or a third party who has demonstrated proficiency in tightness testing to the state fire marshal.

(2) Tightness testing for piping.

- (a) Piping tightness testing of single wall pipe and the primary or inner pipe of secondarily contained pressure piping may be conducted only if it can detect a one-tenth of a gallon per hour leak rate at one and one-half times the operating pressure.
- (b) Tightness testing of suction and other non-pressurized piping shall be conducted as follows:
  - (i) Piping that can be isolated from the UST shall be tested using a method capable of detecting a one-tenth of a gallon per hour leak rate at a minimum of fifteen pounds per square inch pressure.
  - (ii) Piping that can not be isolated from the UST shall be tested using a method capable of detecting a one-tenth of a gallon per hour leak rate.
- (c) Tightness testing of the interstice of secondarily contained piping shall follow the manufacturers testing requirements or other requirements approved by the manufacturer, the state fire marshal, or a third party who has demonstrated proficiency in tightness testing to the state fire marshal.

(3) Testing of containment systems

Testing of containment systems shall be performed as follows:

- (a) For new containments, all penetrations must be completed prior to testing, including electrical;

- (b) The containment system shall be filled with water or other approved liquid to a height that covers the highest penetration; and
- (c) The test duration shall be sixty minutes with no drop in liquid levels or the method shall be capable of detecting a one tenth of a gallon per hour leak rate from the containment.
- (4) All testing methods listed in paragraphs (F)(1)(a) and (F)(2)(a) of this rule shall be third party approved to perform in a manner where the method can detect a release at the designated release rate with a probability of detection of 0.95 and a probability of falsely indicating a release of 0.05. A release is suspected and subject to the reporting requirements of sections 3737.88 and 3737.882 of the Revised Code and this chapter of the Administrative Code if a leak rate exceeds the amount designated for the testing method.
- (5) Testing shall be performed in accordance with the manufacturer's instructions, Petroleum Equipment Institute Publication RP100-2005; "Recommended Practices for Installation of Underground Liquid Storage Systems", American Petroleum Institute Publication 1615-01; "Installation of Underground Petroleum Storage Systems", National Fire Protection Association Publication NFPA 30-2008 "Flammable and Combustible Liquids Code", and National Fire Protection Association Publication NFPA 30A-2008 "Motor Fuel Dispensing Facilities and Repair Garages". Where there is a conflict between requirements the more protective requirement shall prevail.
- (6) No pressure testing with air shall be performed on a component of an UST system that has contained a flammable regulated substance or flammable vapors. The manufacturer's instructions for the testing method shall be followed when using gases for the test method.
- (7) All testing methods defined in paragraphs (F) to (F)(3)(a)(iii) of this rule shall be performed by a person who is:

  - (a) Recognized by the manufacturer of the tightness testing method to be proficient in performing the testing method;
  - (b) Recognized by a third party approved by the state fire marshal to be proficient in performing the tightness testing method; or
  - (c) Recognized by the state fire marshal to be proficient in performing the tightness testing method.
- (G) General performance standards, permits, certified UST installers and inspectors.

  - (1) Any person performing work in accordance with this rule shall obtain a permit as required in paragraph (C) of rule 1301:7-9-10 of the Administrative Code

prior to performing the work. All work performed pursuant to this rule shall be overseen by a Certified UST Installer and a Certified UST Inspector as required in paragraph (D) of rule 1301:7-9-10 of the Administrative Code.

- (2) Prior to going into operation, a functionality test shall be performed on any new or existing UST system component that undergoes work requiring a permit under paragraph (G)(1) of this rule. The UST system shall not be placed into operation until a passing functionality result is obtained for the UST system component undergoing work.
- (3) Performing work pursuant to this rule does not relieve a person engaged in UST activity from the obligation to comply with any other applicable federal, state, or local laws and regulations, including but not limited to, the Ohio Fire Code and the Ohio Building Code.
- (4) Other release detection requirements and methods may be used in place of any requirements or methods described in this rule if an owner and operator demonstrates that the alternative method is no less protective of human health and the environment than the method or requirement specified in this rule, and the state fire marshal approves the alternative method in writing prior to the use of the method. If the alternative method is approved, the owner and operator shall comply with any terms and conditions imposed on its use by the state fire marshal.

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Certification

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