

1301:7-9-06

**Design, construction, installation, operation and maintenance 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 design, construction, installation, operation and maintenance requirements for underground storage tanks (UST) containing petroleum or other regulated substances. This rule is adopted by the state fire marshal in accordance with Chapter 119. of the Revised Code and shall not be considered a part of the "Ohio Fire Code." The following UST systems are exempted 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) Performance standards for new UST systems.

- (1) New UST systems shall be provided with secondary containment for the UST and underground piping that routinely contains regulated substances to completely contain a release of a regulated substance and prevent a release of a regulated substance to the environment at any time during the operational life of the UST system pursuant to the following requirements:
  - (a) New USTs shall be double-wall and shall be equipped, operated and maintained pursuant to paragraphs (D)(1) and (D)(2) of this rule;
  - (b) Underground piping that routinely contains regulated substances that is part of a new UST system shall be double-wall and shall be equipped, operated and maintained pursuant to paragraphs (D)(3) and (D)(4) of this rule except that:
    - (i) Underground piping that conveys petroleum under suction is not required to be equipped to meet the secondary containment requirements of paragraph (B)(1)(b) of this rule; and
    - (ii) A manifold that conveys petroleum under suction between tanks is not required to be equipped to meet the secondary containment requirements of paragraph (B)(1)(b) of this rule.

- (c) New UST systems shall be equipped with containments and operated and maintained pursuant to paragraphs (D)(5) and (D)(6) of this rule, and containments shall be present at the following locations:
  - (i) In those areas where piping that routinely contains regulated substances exits the UST;
  - (ii) In those areas where piping that routinely contains regulated substances transitions from underground to above ground;
  - (iii) In those areas where a transition sump is required to maintain the proper slope of piping that routinely contains regulated substances; and
  - (iv) In those areas under each motor fuel dispenser.
- (d) Other methods of secondary containment, such as vaults, external liners and jackets, may be used if owners and/or operators:
  - (i) Demonstrate to the state fire marshal that the alternative method of secondary containment is as least as protective of human health and the environment as those methods described in paragraphs (B)(1) through (B)(1)(c)(iv) of this rule; and
  - (ii) Obtain written approval from the state fire marshal to use the alternative method of secondary containment before installation and operation of the new UST system. The state fire marshal may approve, deny or rescind the method at the state fire marshal's discretion. If the alternative method of secondary containment is approved by the state fire marshal, the owner and operator shall comply with any conditions imposed by the state fire marshal on its use. The alternative method request shall be evaluated on a site by site basis.
- (e) New UST systems shall be equipped with spill prevention equipment and overflow prevention equipment pursuant to paragraphs (D)(7) and (D)(8) of this rule.
- (f) 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.

(C) Performance standards for existing UST systems.

- (1) Existing USTs shall be equipped, operated and maintained pursuant to paragraphs (D)(1) and (D)(2) of this rule except that:
  - (a) Existing USTs installed prior to the effective date of this rule are not required to be equipped to meet the new UST secondary containment requirements of paragraph (B)(1) of this rule unless the USTs undergo work pursuant to paragraph (C)(7)(a) of this rule; and
  - (b) The addition of internal lining in the field to an existing metal UST system to meet cathodic protection requirements is prohibited unless owners and/or operators obtain written approval from the state fire marshal prior to the application of the

internal lining. The state fire marshal shall no longer grant approval pursuant to this paragraph as of twelve months after the effective date of this rule. The addition of internal lining in the field to UST systems for purposes other than for cathodic protection is allowed provided that owners and/or operators comply with the Ohio Fire Code and give written notice to the state fire marshal prior to the application of the internal lining. Owners and operators shall comply with any conditions imposed by the state fire marshal on the use of internal lining.

- (2) Existing underground piping that routinely contains regulated substances shall be equipped, operated and maintained pursuant to the new piping requirements defined in paragraph (B)(1)(b) through (B)(1)(b)(ii) and paragraphs (D)(3) and (D)(4) of this rule except that:
  - (a) Existing underground piping associated with UST systems installed prior to March 1, 2005, is not required to be equipped to meet secondary containment requirements of paragraph (B)(1)(b) of this rule except those piping components undergoing work pursuant to paragraph (C)(7)(b) of this rule;
  - (b) Existing underground piping that conveys petroleum under suction is not required to be equipped to meet secondary containment requirements of paragraph (B)(1)(b) this rule;
  - (c) Existing suction manifolds between tanks are not required to be equipped to meet the secondary containment requirements of paragraph (B)(1)(b) of this rule; and
  - (d) Existing UST systems installed prior to March 1, 2005, are not required to be equipped with isolation valves between the piping and the tank as described in paragraph (D)(3)(b) of this rule.
- (3) Existing UST systems shall be equipped, operated and maintained with containments as specified in paragraphs (D)(5) and (D)(6) of this rule except that existing UST systems installed prior to March 1, 2005, are not required to be equipped with containments except for those UST systems undergoing work pursuant to paragraphs (C)(7)(c) and (C)(7)(d) of this rule.
- (4) Existing UST systems shall be equipped with spill prevention equipment and overflow prevention equipment meeting the requirements of paragraphs (D)(7) and (D)(8) of this rule except that:
  - (a) Existing UST systems installed prior to March 1, 2005, that were filled with transfers of no more than twenty-five gallons at one time are not required to be equipped to meet the spill and overflow requirements of this rule except USTs undergoing work pursuant to paragraph (C)(7)(a) of this rule; and
  - (b) Existing UST systems installed prior to March 1, 2005, are not required to be equipped with extractor float vent valves as part of overflow prevention as described in paragraph (D)(7)(b) of this rule except USTs undergoing work pursuant to paragraph (C)(7)(a) of this rule.

- (5) Existing UST systems containing hazardous substances as defined in rule 1301:7-9-03 of the Administrative Code shall be equipped, operated and maintained pursuant to the new UST system requirements defined in paragraph (B) of this rule except that:
- (a) Existing UST systems installed prior to March 1, 2005, are not required to be equipped with containments in all of the locations described in paragraph (B)(1)(c) of this rule. UST systems shall have sufficient containments to demonstrate that the UST system is fully secondarily contained;
  - (b) Existing UST systems installed prior to March 1, 2005, are not required to be equipped with isolation valves between the piping and the tank pursuant to paragraph (D)(3)(b) of this rule;
  - (c) Existing UST systems installed prior to March 1, 2005, are not required to be equipped with extractor valves as part of overfill prevention pursuant to paragraph (D)(7)(b) of this rule;
  - (d) Existing UST systems installed prior to March 1, 2005, that are filled with transfers of no more than twenty-five gallons at one time are not required to be equipped to meet the spill and overfill requirements of paragraph (D)(7) of this rule; and
  - (e) Existing underground piping and manifolds that convey hazardous substance under suction shall be equipped with full secondary containment pursuant to paragraph (B)(1)(b) of this rule.
- (6) Existing UST systems located in sensitive areas as defined in rule 1301:7-9-09 of the Administrative Code shall be equipped, operated and maintained pursuant to the new UST system requirements defined in paragraph (B) of this rule except that:
- (a) Existing UST systems installed prior to March 1, 2005, are not required to be equipped with containments in all of the locations described in paragraph (B)(1)(c) of this rule. UST systems shall have sufficient containments to demonstrate that the UST system is fully secondarily contained;
  - (b) Existing UST systems that were internally lined but were not equipped with supplemental cathodic protection systems shall be taken out of service no later than three years after the effective date of this rule, unless the UST system is modified to meet the cathodic protection requirements of paragraphs (D)(1) through (D)(2)(d)(iv)(b) of this rule,
  - (c) Existing UST systems installed prior to March 1, 2005, are not required to be equipped with isolation valves between the piping and the tank pursuant to paragraph (D)(3)(b) of this rule;
  - (d) Existing UST systems installed prior to March 1, 2005, are not required to be equipped with extractor float vent valves as part of overfill prevention pursuant to paragraph (D)(7)(b) of this rule;
  - (e) Existing UST systems installed prior to March 1, 2005, that were filled with transfers of no more than twenty-five gallons at one time are not required to be

equipped to meet the spill and overfill requirements of paragraph (D)(7) of this rule.

- (f) 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, operated and maintained pursuant to the existing UST requirements of paragraph (C)(1) through (C)(4)(b) of this rule.
- (7) Any work performed on an existing UST system that requires a permit pursuant to rule 1301:7-9-10 of the Administrative Code or as otherwise provided in this paragraph, shall meet the following requirements:
  - (a) If work causes an existing UST to be replaced, the new UST shall be equipped, operated and maintained pursuant to the new UST requirements defined in paragraph (B)(1)(a) of this rule. The following requirements may also apply:
    - (i) Tank top containments shall be installed pursuant to paragraph (B)(1)(c)(i) of this rule,
    - (ii) Existing piping and dispenser containments shall be installed, replaced, or modified pursuant to paragraphs (C)(7)(b) through (C)(7)(d) of this rule;
  - (b) If piping is installed, replaced, modified, or undergoes major repair that affects more than fifty percent (50%) of an existing piping run measured as the length of the pipe between the connection at the UST and the furthest dispenser or use location associated with the UST connection that routinely contains regulated substances, then the piping and associated containments shall be equipped, operated and maintained pursuant to the new piping and containment requirements defined in paragraphs (B)(1)(b) and (B)(1)(c) of this rule;
  - (c) If a new motor fuel dispenser is installed where there previously was no motor fuel dispenser at an existing UST site then a new containment shall be installed pursuant to paragraphs (D)(5) and (D)(6) of this rule; and
  - (d) If an existing motor fuel dispenser is replaced with another motor fuel dispenser and the piping prior to the flex connector and shear valve is also modified or replaced or if an island is to be replaced, then a new containment shall be installed pursuant to paragraph (D)(5) and (D)(6) of this rule.
- (8) 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.

(D) Design, construction, operation and maintenance of UST systems.

- (1) USTs shall be designed and constructed pursuant to one of the following:
  - (a) The tank is constructed of fiberglass-reinforced plastic in compliance with "Underwriters Laboratories Standard 1316-94; Standard for Glass-Fiber-Reinforced Plastic Underground Storage Tanks for Petroleum Products";

- (b) The tank is constructed of metal in compliance with "Underwriters Laboratories Standard 58-96; Standard for Steel Underground Tanks for Flammable and Combustible Liquids," coated with a suitable dielectric material and cathodically protected using:
    - (i) Field-installed cathodic protection systems that are designed by a corrosion expert; or
    - (ii) The tank and cathodic protection system comply with the requirements of one of the following:
      - (a) "Underwriters Laboratories Standard 1746-2007; External Corrosion Protection Systems for Steel Underground Storage Tanks";
      - (b) "National Association of Corrosion Engineers Standard RP-0285-02; Corrosion Control of Underground Storage Tank Systems by Cathodic Protection"; or
      - (c) "Steel Tank Institute Specification for STI-P3 System of External Corrosion Protection of Underground Steel Storage Tanks" and related Steel Tank Institute specifications.
  - (c) The tank is constructed of a steel-fiberglass-reinforced-plastic composite in compliance with "Underwriters Laboratories Standard 1746-2007; Corrosion Protection Systems for Underground Storage Tanks" or "Steel Tank Institute STI-F894; Specification for External Corrosion Protection of FRP Composite Steel Underground Storage Tanks" and related Steel Tank Institute specifications.
- (2) USTs shall be operated and maintained pursuant to all of the following:
- (a) Owners and/or operators shall use UST system components that are compatible with the regulated substance stored in the UST system.
  - (b) If the UST system is used to store alcohol blends, the owner and/or operator shall ensure compatibility by complying with the following applicable standards:
    - (i) "American Petroleum Institute Publication 1626-2000; Storing and Handling Ethanol and Gasoline-ethanol Blends at Distribution Terminals and Service Stations"; and
    - (ii) "Petroleum Institute Publication 1627-2000; Storage and Handling of Gasoline-methanol/cosolvent Blends at Distribution Terminals and Service Stations."
  - (c) Owners and operators shall inspect all accessible UST and piping components at least once a year for evidence of degradation and shall correct any deficiencies that could cause a release or prevent release detection equipment from working properly. At a minimum, USTs and piping shall be monitored for any visible corrosion, peeling, cracking or excessive distortion of the UST and piping components.
  - (d) Operation and maintenance of corrosion protection;

- (i) All corrosion protection systems shall be operated and maintained to continuously provide corrosion protection.
- (ii) All UST systems equipped with cathodic protection systems shall be inspected for proper operation by a qualified cathodic protection tester in compliance with the following requirements:
  - (a) All cathodic protection systems shall be tested within six months of installation and at least every three years thereafter; and
  - (b) The criteria to determine that cathodic protection is adequate shall be pursuant to "National Association of Corrosion Engineers Standard RP-0285-02; Corrosion Control of Underground Storage Tank Systems by Cathodic Protection".
- (iii) UST systems with impressed current cathodic protection systems shall be inspected every sixty days by the owner and/or operator to ensure that the equipment is operating properly.
- (iv) For UST systems using cathodic protection, records of the inspections of the cathodic protection system shall be maintained in compliance with this chapter to demonstrate compliance with the standards in paragraphs (D)(1) and (D)(2) of this rule. These records shall provide the following:
  - (a) The results of testing from the last two inspections required in paragraph (D)(2)(d)(ii)(a) of this rule; and
  - (b) The results of the last six inspections required by paragraph (D)(2)(d)(iii) of this rule.
- (e) UST systems internally lined to meet cathodic protection requirements shall comply with the following:
  - (i) Within ten years after lining, and every five years thereafter, the lined tank shall be internally inspected to determine if it is structurally sound with the lining still performing in accordance with "American Petroleum Institute Publication 1631-01; Interior Lining and Period Inspection of Underground Storage Tanks"; and
    - (a) Internal inspections shall be performed by a person listed by the state fire marshal to provide UST lining services;
    - (b) A modification permit shall be obtained prior to performing work in accordance with paragraph (D)(2)(e)(i) of this rule; and
    - (c) Video camera inspections shall not be used to meet the requirements of paragraph (D)(2)(e)(i) of this rule.
  - (ii) Any UST system internally lined that fails to meet the criteria described in paragraph (D)(2)(e) of this rule shall be removed in accordance with rule

1301:7-9-12 of the Administrative Code unless owner and/or operators obtain written approval from the state fire marshal to modify or repair the internally lined UST system. Owners and/or operators shall comply with any conditions imposed by the state fire marshal on the use of internal lining.

(iii) UST systems internally lined that also have cathodic protection that meets the requirements of paragraphs (D)(1) through (D)(2)(d)(iv)(b) of this rule do not have to comply with paragraph (D)(2)(e) of this rule.

(f) All corrosion protection systems on UST systems shall be installed, operated and maintained in a manner that minimizes any adverse effects on adjacent underground metallic structures, including but not limited to, natural gas pipe lines, telecommunication cables and water and sewage pipelines. If at any time a corrosion protection system on an UST system is believed to have adversely affected an adjacent underground metallic structure, owners and operators shall immediately participate in the testing and remediation of any such adverse effects.

(3) Piping that routinely contains regulated substances shall be designed and constructed pursuant to the following:

(a) Piping covered by earthen material shall be protected from corrosion in one of the following manners:

(i) The piping is constructed of fiberglass-reinforced plastic or flexible plastic technology piping in compliance with "Underwriters Laboratories Standard 971-2005; Nonmetallic Underground Piping for Flammable Liquids" and "Underwriters Laboratories Standard 567-03; Pipe Connectors for Petroleum Products and LP Gas"; or

(ii) The piping is constructed of metal in compliance with "National Fire Protection Association Standard 30-2008; Flammable and Combustible Liquids Code" and "American National Standards Institute B31.3-02; American National Standard Code for Pressure Piping", coated with a suitable dielectric material and cathodically protected using:

(a) Field-installed cathodic protection systems that are designed by a corrosion expert; or

(b) The piping and cathodic protection systems meet the requirements of "American Petroleum Institute Publication 1632-02; Cathodic Protection of Underground Petroleum Storage Tanks and Piping Systems", "National Association of Corrosion Engineers Standard RP-0169-02; Control of External Corrosion on Underground or Submerged Metallic Piping Systems", or "Steel Tank Institute R892; Recommended Practice for Corrosion Protection of Underground Piping Networks Associated with Liquid Storage and Dispensing Systems" and related Steel Tank Institute specifications; and

(b) Piping that routinely contains regulated substances shall be installed with an isolation valve to allow for the separation of the piping from the UST. The isolation valve shall be easily accessible.

- (4) Piping that routinely contains regulated substances shall be operated and maintained pursuant to all of the following:
  - (a) Owners and/or operators shall use piping system components that are compatible with the regulated substance stored in the UST system pursuant to paragraphs (D)(2)(a) through (D)(2)(b)(ii) of this rule.
  - (b) Owners and/or operators shall inspect all accessible piping components at least once a year for evidence of degradation and shall correct any deficiencies that could cause a release or prevent release detection equipment from working properly pursuant to paragraph (D)(2)(c) of this rule.
  - (c) All corrosion protection systems for piping shall be operated and maintained pursuant to paragraphs (D)(2)(d) through (D)(2)(d)(iv)(b) of this rule.
- (5) Containment systems shall be properly designed and constructed pursuant to all of the following:
  - (a) Each containment system shall be large enough to allow for the visible inspection and access of all components within the containment system;
  - (b) Each penetration through a containment system shall be water tight while allowing for any forces that may act on the penetration;
  - (c) Each containment system shall be designed to minimize the infiltration of surface water into the containment area; and
  - (d) Covers for containments system shall be designed or managed to allow access to the containment system within four hours of a request by the state fire marshal or local fire official.
- (6) Containment equipment shall be properly operated and maintained pursuant to the following:
  - (a) All containments shall be inspected at least once a year for proper operation and for the presence of water, regulated substances and debris in accordance with the following:
    - (i) Containments shall be inspected for evidence of excessive distortion, cracking or gross failure of the containments and any penetration fittings;
    - (ii) All water and debris shall be removed and properly disposed; and
    - (iii) All regulated substances shall be removed and properly disposed.
  - (b) Containment systems shall be tightness tested pursuant to paragraphs (D)(3)(c) and (F)(3)(a) of rule 1301:7-9-07 of the Administrative Code.
- (7) Spill prevention equipment and overfill prevention equipment shall be designed and constructed pursuant to all of the following:

- (a) To prevent spilling and overfilling associated with regulated substance transfer to the UST system, owners and/or operators shall install the following spill prevention equipment and overfill prevention equipment:
    - (i) Spill prevention equipment with a capacity of at least five gallons that will prevent the release of product into the environment when the transfer hose is detached from the fill pipe; and
    - (ii) Overfill prevention equipment that will achieve one of the following:
      - (a) Automatically shut off flow into the tank when the tank is no more than ninety-five per cent full; or
      - (b) Alert the transfer operator when the tank is no more than ninety per cent full by restricting the flow into the tank or triggering a high-level alarm; or
      - (c) Restrict flow thirty minutes prior to overfilling, alert the operator with a high level alarm one minute before overfilling, or automatically shut off flow into the tank so that none of the fittings located on top of the tank are exposed to product due to overfilling.
  - (b) Float vent valves for overfill prevention, when used, shall be installed with an extractor fitting to allow for the testing and maintenance of the UST system; and
  - (c) Float vent valves for overfill prevention shall not be allowed on any type of suction system.
- (8) Spill prevention equipment and overfill prevention equipment shall be properly operated and maintained pursuant to all of the following:
- (a) Owners and/or operators of all UST systems shall ensure that releases due to spilling or overfilling do not occur. The owner and/or operator shall ensure that the volume available in the tank is greater than the volume of product to be transferred to the tank before the transfer is made and that the transfer operation is monitored constantly to prevent overfilling and spilling;
  - (b) The owner and/or operator of all UST systems shall report, investigate and clean up any spills and overfills in compliance with rule 1301:7-9-13 of the Administrative Code;
  - (c) Owners and/or operators shall visually inspect all spill prevention equipment after each delivery and shall promptly remove and properly dispose of any water, regulated substances and/or debris from the spill prevention equipment; and
  - (d) Owners and operators shall inspect all spill prevention equipment and overfill prevention equipment annually for proper operation and evidence of deterioration.
- (E) General performance standards, permits, certified UST installers and inspectors.

- (1) All UST systems shall be properly installed, modified and repaired in accordance with the manufacturer's instructions, Petroleum Equipment Institute Publication RP100-2011; "Recommended Practices for Installation of Underground Liquid Storage Systems", Petroleum Equipment Institute Publication RP/1000-2009; "Recommended Practices for the Installation of Marine Fueling Systems", American Petroleum Institute Publication 1615-01; "Installation of Underground Petroleum Storage Systems", National Fire Protection Association Publication NFPA 407-01 "Standard for Aircraft Fuel Servicing", and applicable Steel Tank Institute installation instructions. Where there is a conflict between requirements the more protective requirement shall prevail.
- (2) Owners and/or operators shall maintain records of each installation, modification or major repair to the UST system that demonstrate compliance with the requirements of this chapter for the remaining operating life of the UST system and for two years after the closure of the UST system.
- (3) Performing work pursuant to this rule does not relieve a person engaged in underground storage tank activity from the obligation of complying with any other applicable federal, state, or local laws and regulations, including but not limited to, the Ohio Fire Code or the Ohio Building Code, etc.
- (4) 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 in accordance with 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.
- (5) A tightness test shall be performed on any new or existing UST system component that undergoes work requiring an installation, modification or major repair permit under paragraph (E)(4) of this rule prior to placing the UST system into operation. No UST system shall be placed into operation until a passing tightness test result is obtained for the UST system component undergoing work.
- (6) Other design, construction, installation, operation and maintenance 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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