

The Texas Commission on Environmental Quality (agency, commission, or TCEQ) adopts the amendments to §§334.42, 334.45, 334.49, and 334.50; and new §§334.601 - 334.606.

Sections 334.42, 334.45, 334.49, 334.50, 334.601 and 334.604 are adopted *without changes* as published in the October 1, 2010 issue of the *Texas Register* (35 TexReg 8880) and will not be republished. Sections 334.602, 334.603, 334.605 and 334.606 are adopted *with changes* to the proposed text and will be republished.

### **Background and Summary of the Factual Basis for the Adopted Rules**

These rules create an underground storage tank (UST) operator training program in order to meet federal requirements contained in the Federal Energy Policy Act of 2005 (Pub.L. 109-58, August 8, 2005, 119 Stat. 294, codified at 42 United States Code, §15801), (Energy Act). The Energy Act required states to implement training programs for persons responsible for the on-site operation and maintenance of UST systems by August 8, 2012. The operator training program in new Subchapter N meets the requirements of the Energy Act and is consistent with the United States Environmental Protection Agency's (EPA) "Grant Guidelines To States For Implementing The Operator Training Provision Of The Energy Policy Act Of 2005."

In addition, changes to Subchapter C, Technical Standards, are adopted to simplify and

clarify the existing rules in the areas of secondary containment, sumps, and corrosion protection.

### **Section by Section Discussion**

Throughout this rulemaking package, administrative changes have been made as necessary in accordance with Texas Register requirements.

#### *Subchapter C: Technical Standards*

TCEQ adopts the amendment to §334.42(i) by: (1) specifying which UST sumps must be inspected and kept liquid and debris free; (2) specifying that liquid and debris found during any agency or agency-authorized inspections must also be removed and properly disposed; and (3) allowing more time for removal and proper disposal of liquid and debris.

Section 334.45(d)(1)(E)(ii) is amended to increase the amount of existing piping that can be replaced without triggering secondary containment requirements from 20% to 35% and by stating that if the replaced portion of existing piping exceeds 35% or connects to a new dispenser, only the replaced portion of piping would need to be secondarily contained to better facilitate and encourage owners to make tank system upgrades when necessary. Section 334.45(d)(1)(E)(iv) and (vi) is amended to add

language that clarifies which sumps and manways require testing, inspection, and sensor probes. Section 334.45(d)(1)(E)(vii) is amended to allow more time to properly dispose of liquids in sumps and to require debris (in addition to liquids) in sumps to be properly disposed of upon discovery.

Section 334.49(a)(4) is amended to add language that clarifies the section's applicability to both existing and new UST systems to assure that the applicability of the section is understood to be universal. Language is also added to clearly specify that the section's requirements also apply not only to underground but also to totally or partially submerged metal components, in keeping with the intent of existing rule language which requires underground metal components to be protected from corrosion if they are in contact with groundwater or any other water. Section 334.49(b)(6) is amended by deleting language which allows submersible pump risers and housings to be protected from corrosion by coating and wrapping with a dielectric.

Section 334.50(b)(2)(A)(i) is amended to add language exempting airport hydrant systems from automatic line leak detection requirements because no practical methodologies are available.

#### *Subchapter N: Operator Training*

New Subchapter N, Operator Training, is adopted to create a UST facility operator

training program to implement requirements of the Energy Act.

New §334.601 describes the purpose and applicability of the subchapter and remains unchanged from proposal.

New §334.602 requires UST owners and operators to identify and designate for each facility at least one individual for each class of operator (A, B, and C), and it describes the required functions and training of those individuals. This section is amended as follows for adoption:

TCEQ adopts revisions to proposed §334.602(a)(3) by changing the maximum number of facilities an individual may be designated as a Class B Operator from 30 to 50 in response to comments.

TCEQ adopts non-substantive revisions to proposed §334.602(b)(2)(A) to make grammatical corrections.

TCEQ adopts revisions to proposed §334.602(b)(2)(B) to state that a UST facility owner or operator may designate as its Class B Operator a third party (i.e. an individual who is an independent contractor or consultant and is unaffiliated with the facility owner or operator) only if that individual takes a direct and active role in ensuring compliance of the facility and only if that individual is (in accordance with Chapter 334, Subchapter I

and with 30 TAC Chapter 30, Subchapter I) also a licensed UST On-Site Supervisor who holds a current "A" or "A/B" license and who either is, or is employed by, a registered UST Contractor. However, designation of an independent or not affiliated Class B operator in this manner does not also entitle that individual to certification as a Class A Operator for a facility.

TCEQ adopts revisions to proposed §334.602(b)(3)(A), to provide consistency in rule terminology, by changing the term "a person" to the term "an individual." This change was made because a Class C Operator must be an individual, whereas the term "person" could be interpreted to include business entities.

New §334.603 describes the types of acceptable training and certification processes that meet the requirements of this subchapter and is amended as follows:

TCEQ adopts revisions to proposed §334.603(a)(1) to make a grammatical correction and to further clarify the intent of the rule language by adding the phrase "non-contracted provider" in order to clarify the intent of the paragraph with regard to approved training, such that non-contracted training providers must be sponsored by an association or industry organization recognized nationwide or statewide with regard to its affiliation with regulated petroleum UST systems. Training providers who enter into contracts with TCEQ to provide training do not have to be sponsored by an organization

or association as described above.

In response to comments, TCEQ adopts revisions to proposed §334.603(a)(2)(B) to allow Class A and B operators to ensure that site-specific emergency procedures are maintained in an easily accessible location and are immediately available to a Class C operator at a UST facility, rather than requiring the posting of the emergency procedures.

New §334.604 establishes deadlines relating to this subchapter's operator training requirements. Per the deadlines established in the Energy Act, August 8, 2012, is the deadline for the initial training of all classes of operators. This section remains unchanged from proposal.

New §334.605 requires all classes of operators to be re-trained every three years and upon a finding of significant noncompliance. This section is amended as follows for adoption:

TCEQ adopts revisions to proposed §334.605(c), in response to comments, by changing the term "substantial noncompliance" to "significant noncompliance" and defining the new term. In addition, language is added to limit re-training on the basis of significant noncompliance to a maximum of once every 12 months.

New §334.606 describes how the documentation of operator training must be maintained by owners and operators of UST facilities and must be made available to investigators upon request and is amended as follows for adoption:

TCEQ adopts revisions to proposed §334.606, in response to comments, to allow owners and operators of UST facilities (except unmanned facilities) who maintain off-site electronic records, to provide a clear printed copy of operator training certification documentation to a TCEQ investigator or a TCEQ-authorized investigator within 72 hours of a facility investigation.

### **Final Regulatory Impact Analysis Determination**

The commission reviewed the rulemaking in light of the regulatory impact analysis requirements of Texas Government Code, §2001.0225, and determined that the rulemaking is not subject to §2001.0225 because it does not meet the definition of a "major environmental rule" as defined in that statute. A major environmental rule means a rule the specific intent of which is to protect the environment or reduce risks to human health from environmental exposure and that may adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, or the public health and safety of the state or a sector of the state. Regarding the first part of this definition, the specific intent of this rulemaking is to "protect the environment" by ensuring that UST operators are trained, which is

anticipated to reduce the number of releases to the environment from USTs, and by making minor changes to UST technical requirements to areas such as corrosion protection and secondary containment which are intended to prevent or minimize releases to the environment. However, the second part of the definition of a "major environmental rule" is not met: the adopted rules would not adversely affect, in a material way, the economy, a sector of the economy, productivity, competition, jobs, the environment, or the public health and safety of the state or a sector of the state. The term "material" means "having real importance or great consequence" in contrast to incidental or insignificant impact. Although there are some cost impacts associated with operator training and some cost-saving impacts associated with the UST technical requirement revisions, neither are determined to have the above-described adverse effect on the state so as to constitute a "major environmental rule."

Further, even if it were considered a "major environmental rule," the rulemaking does not meet any of the four requirements listed in Texas Government Code, §2001.0225(a). Texas Government Code, §2001.0225(a) states: "(a) This section applies only to a major environmental rule adopted by a state agency, the result of which is to: (1) exceed a standard set by federal law, unless the rule is specifically required by state law; (2) exceed an express requirement of state law, unless the rule is specifically required by federal law; (3) exceed a requirement of a delegation agreement or contract between the state and an agency or representative of the federal government to implement a state

and federal program; or (4) adopt a rule solely under the general powers of the agency instead of under a specific state law." These adopted rules do not meet any of the four applicability requirements and thus are not subject to the regulatory analysis provisions of the Texas Government Code. Specifically, the adopted rules "do not exceed a standard set by federal law"; they do not "exceed an express requirement of state law"; they do not "exceed a requirement of a federal delegation agreement or contract"; and they are not "adopted solely under the general powers of the agency" but rather under specific authorizing statutes as referenced in the STATUTORY AUTHORITY sections of this rulemaking.

The commission invited public comment regarding the draft regulatory impact analysis determination during the public comment period. No comments were received on the draft regulatory impact analysis determination.

### **Takings Impact Assessment**

The commission evaluated the adopted rules and performed an assessment of whether the adopted rules constitute a taking under Texas Government Code, Chapter 2007. The specific purpose of the adopted rules is to prevent releases and spills from USTs by requiring that UST operators be trained and by making certain minor changes to UST rules relating to such things as corrosion protection and secondary containment. The adopted rules would substantially advance this stated purpose by creating UST operator

training requirements which will allow UST operators to be trained effectively and efficiently and by making minor changes to UST technical rules.

The commission's assessment indicates that Texas Government Code, Chapter 2007 does not apply to these adopted rules because certain portions of this action (operator training and secondary containment) fall under the exception listed in Texas Government Code, §2007.003(b)(4): "an action . . . reasonably taken to fulfill an obligation mandated by federal law." In addition, the adopted rules in total are an action in response to a real and substantial threat to public health and safety; that is designed to significantly advance the health and safety purpose; and that does not impose a greater burden than is necessary to achieve the health and safety purpose. Thus, this action is exempt under Texas Government Code, §2007.003(b)(13).

The adopted rules are an "action taken in response to a real and substantial threat to public health and safety" in that contamination from releases from USTs pose a threat to both soils and groundwater with which the public may come into contact. The adopted rules are "designed to significantly advance the health and safety purpose" by requiring operator training of those who are responsible for and in control of USTs which contain regulated substances and by requiring changes to technical rules which relate to prevention of releases from USTs. The intent of this training and of the technical changes is to reduce the likelihood of releases of contaminants to the environment. The

adopted rules "do not impose a greater burden than is necessary to achieve the health and safety purpose" because the training requirements are narrowly tailored to the class of tank operators and narrowly tailored to specific training requirements which have a direct bearing on basic knowledge to prevent UST releases and spills. Additionally, the changes to the technical requirements are also narrowly tailored to achieve a health and safety purpose.

Nevertheless, the commission further performed an assessment of whether these adopted rules constitute a taking under Texas Government Code, Chapter 2007. The adopted rules implement the UST operator training portions of the Energy Act and make certain changes to the UST technical requirements. Promulgation and enforcement of the adopted rules would be neither a statutory nor a constitutional taking of private real property by the commission. Specifically, the adopted rules do not affect a landowner's rights in private real property because this rulemaking does not burden (constitutionally) nor restrict or limit the owner's rights to property and reduce its value by 25% or more beyond that which would otherwise exist in the absence of the adopted rules. There are no burdens imposed on private real property from these adopted rules and the benefits to society are the adopted rules' effect of training UST operators (and clarifications of technical requirements relating to release prevention) such that occurrences of releases of regulated substances into the environment are reduced. As a whole, this rulemaking will not constitute a taking under Texas

Government Code, Chapter 2007.

### **Consistency With The Coastal Management Program**

The commission reviewed the rulemaking and found that the rulemaking is subject to the Texas Coastal Management Program (CMP) in accordance with the Coastal Coordination Act, Texas Natural Resources Code, §§33.201 *et seq.*, and therefore, must be consistent with all applicable CMP goals and policies. The commission conducted a consistency determination for the rulemaking in accordance with Coastal Coordination Act Implementation Rules, 31 TAC §505.22, and found the rulemaking is consistent with the applicable CMP goals and policies.

CMP goals applicable to the rulemaking include two of the goals listed in 31 TAC §505.12: (1) to protect, preserve, restore, and enhance the diversity, quality, quantity, functions, and values of coastal natural resource areas (CNRAs); and (2) to minimize loss of human life and property due to the impairment and loss of protective features of CNRAs. Because this rulemaking requires UST operators to be trained in maintaining and operating UST systems and therefore indirectly will aid in preventing releases to the environment from those systems, this rulemaking is consistent with the goals of protecting and preserving coastal environments.

None of the CMP policies stated in 31 TAC §501.13 are relevant to, nor are they adversely

affected by, the rulemaking for the reason that there are no substantive changes relating to provision of information, monitoring of compliance, or variances. Additionally, none of the specific policies described in 31 TAC §§501.16 - 501.34 apply to this rulemaking.

Promulgation and enforcement of these rules will not violate or exceed any standards identified in the applicable CMP goals and policies because the rulemaking is consistent with these CMP goals and policies, and because these rules do not create or have a direct or significant adverse effect on any CNRAs.

The commission invited public comment regarding the consistency with the coastal management program during the public comment period. No comments were received on the coastal management program.

### **Public Comment**

The commission held a public hearing on October 26, 2010. The comment period closed on November 1, 2010. The commission received comments from the Texas Petroleum Marketers and Convenience Store Association (TPCA), Wal-Mart Stores, Inc. (Walmart), and Sam's Club (Walmart), which is a subsidiary of Wal-Mart Stores, Inc. and is therefore also referred to below as "Walmart." The commenters were in general support of the rule amendments, and each commenter suggested changes.

### **Response To Comments**

Regarding proposed §334.602(a)(3), Walmart requested that the maximum number of facilities for which an individual may be designated as a Class B Operator be increased from 30 to "75 to 100" facilities to allow reduction in compliance costs. Walmart also suggested that "up to 100" facilities be the maximum number.

**The commission adopts a revision to proposed §334.602(a)(3) by changing the maximum number from 30 to 50 facilities. A Class B operator implements the daily aspects of operating, maintaining, and recordkeeping and is responsible for implementing applicable UST regulatory requirements and standards in the field. Therefore, the commission is amenable to increasing the number of facilities to a maximum of 50. Increasing the number of facilities beyond a maximum of 50 may adversely impact an individual's ability to fulfill his or her duties as a Class B Operator.**

With regard to proposed §334.602(b)(2)(B), TPCA requested that the commission adopt amendments to add additional requirements for "third party" or "unaffiliated or independent" Class B Operators who are designated to provide services to companies or facilities other than their own.

**The commission agrees with the comment and has revised proposed §334.602(b)(2)(B) to state that a UST facility owner or operator may designate as its Class B Operator a third party (i.e. an individual who is an independent contractor or consultant and is not affiliated with the facility owner or operator) only if that individual takes a direct and active role in ensuring compliance of the facility and only if that individual is (in accordance with Chapter 334, Subchapter I and with Chapter 30, Subchapter I) also a licensed UST On-Site Supervisor who holds a current "A" or "A/B" license and who either is, or is employed by, a registered UST Contractor. However, designation of an independent or not affiliated Class B operator in this manner does not also entitle that individual to be certified as a Class A Operator for a facility.**

TPCA requested that the commission adopt amendments to proposed §334.603(a)(2)(B) to allow site-specific emergency procedures to be maintained in an easily accessible location immediately available to a Class C operator at a UST facility instead of requiring the posting of site-specific emergency procedures.

**The commission agrees with the comments and adopts the amendment to the proposed §334.603(a)(2)(B) to incorporate the suggested changes.**

TPCA stated support of mandated re-training of Class B Operators in proposed §334.605(c) in the event that a facility for which the Class B Operator is designated receives a notice of violation citing, "substantial noncompliance." TPCA also stated that the proposed definition of "substantial noncompliance" was somewhat ambiguous.

**The commission agrees and adopts revisions to proposed §334.605(c), which changes the term from "substantial noncompliance" to "significant noncompliance" and defines the new term. Language is also added to limit the additional re-training of Class B Operators to a maximum of once every 12 months when the re-training requirement is triggered as a result of significant noncompliance with applicable TCEQ rule requirements at one or more facilities under the Class B Operator's purview.**

Regarding proposed §334.606, TPCA requested that the commission adopt amendments to allow UST owners and operators up to 72 hours to provide training certification documentation upon request of TCEQ.

**The commission agrees and adopts an amendment to §334.606 to allow owners and operators of UST facilities who maintain off-site electronic records to provide a clear printed copy of operator training certification documentation to a TCEQ investigator or a TCEQ-authorized investigator**

**within 72 hours of a facility investigation.**

## **SUBCHAPTER C: TECHNICAL STANDARDS**

### **§§334.42, 334.45, 334.49, and 334.50**

#### **STATUTORY AUTHORITY**

The amendments are adopted under Texas Water Code (TWC), §5.012, which provides that the commission is the agency responsible for implementing the constitution and laws of the state relating to the conservation of natural resources and protection of the environment; TWC, §5.103, which authorizes the commission to adopt any rules necessary to carry out its powers and duties under this code and other laws of this state and to adopt rules repealing any statement of general applicability that interprets law or policy; TWC, §5.105, which requires the commission to establish and approve, by rule, all general policy of the commission; TWC, §26.011, which requires the commission to control the quality of water by rule; TWC, §26.039, which states that activities which are inherently or potentially capable of causing or resulting in the spillage or accidental discharge of waste or other substances and which pose serious or significant threats of pollution are subject to reasonable rules establishing safety and preventive measures which the commission may adopt or issue; TWC, §26.121, which prohibits persons from committing any other act or engaging in any other activity which in itself or in conjunction with any other discharge or activity causes, continues to cause, or will cause, pollution of any of the water in the state. The amendments are also adopted under TWC, §26.341, which states that it is the policy of this state to maintain and protect the

quality of groundwater and surface water resources in the state from certain substances in underground and aboveground storage tanks that may pollute groundwater and surface water resources, and requires the use of all reasonable methods, including risk-based corrective action to implement this policy; TWC, §26.345, which authorizes the commission to develop a regulatory program and to adopt rules regarding underground storage tanks; TWC, §26.3475, which requires underground storage tank systems to comply with commission requirements for tank release detection equipment and spill and overfill equipment; TWC, §26.348, which directs the commission to adopt standards of performance maintaining a leak detection system; and the federal Energy Policy Act of 2005, (Pub.L. 109-58, August 8, 2005, 119 Stat. 294, codified at 42 United States Code, §15801), (Energy Act), which requires states with authorized underground storage tank programs to implement secondary containment requirements.

The adopted amendments implement TWC, §§26.345, 26.3475, and 26.348. The adopted amendments also implement the portions of the Energy Act dealing with secondary containment of underground storage tank systems and underground storage tank operator training.

**§334.42. General Standards.**

(a) All components of any new or existing underground storage tank (UST) system subject to the provisions of this subchapter shall be designed, installed, and operated in a manner that will prevent releases of regulated substances due to structural failure or corrosion.

(b) For all components of any new or existing UST system subject to the provisions of this subchapter which contain, have contained, or will contain a regulated substance, the surfaces of such components which are in direct contact with the regulated substance shall be constructed of or lined with materials that are compatible with the substance stored in such components. Any compatibility determination or analysis shall be in accordance with a code or standard of practice developed by a nationally recognized association or independent testing laboratory.

(c) The owners and operators of UST systems subject to the provisions of this subchapter and those persons and/or business entities who engage in, perform, or supervise the installation, repair, or removal of UST systems shall be responsible for ensuring that those UST systems are designed, installed, repaired, removed, and operated in accordance with the provisions of this subchapter, as provided under §334.12(b) of this title (relating to Other General Provisions) and under the provisions of Chapter 70 of this title (relating to Enforcement).

(d) When provisions of this subchapter require compliance with a specific code or standard of practice developed by a nationally recognized association or independent testing laboratory, the most recent version of the referenced code in effect at the time of the regulated UST activity shall be applicable.

(e) Compliance with the provisions of this subchapter shall not relieve an owner or operator of an UST system from compliance with other applicable regulations legally developed by other governmental entities. This requirement is more fully discussed in §334.12(a) of this title.

(f) Unless otherwise stated in a variance approved by the agency in accordance with §334.43 of this title (relating to Variances and Alternative Procedures), the requirements of this subchapter shall take precedence if and when such requirements are determined to be in conflict with any provisions contained in the following:

(1) any code or standard of practice developed by a nationally recognized association or independent testing laboratory; and

(2) the manufacturers' specifications and instructions for installation and operation of UST equipment.

(g) Any underground component of an UST system installed on or after September 29, 1989, shall be properly protected from corrosion by one or more of the allowable methods in §334.49(b) of this title (relating to Corrosion Protection).

(h) Any new tank or line or dispenser installed as part of a UST system on or after January 1, 2009, shall incorporate secondary containment meeting the applicable requirements of §334.45(d) of this title (relating to Technical Standards for New Underground Storage Tank Systems).

(i) Any sumps (including dispenser sumps) or manways installed prior to January 1, 2009, which are utilized as a integral part of a UST release detection system to monitor the interstitial space of a secondarily contained piping system, and any overspill containers or catchment basins installed at any time, which are associated with a UST system must be inspected at least once every 60 days to assure that their sides, bottoms, and any penetration points are maintained liquid tight. Any liquid or debris found in them during that inspection or an agency or agency-authorized [an] inspection must be removed and properly disposed of within 96 [72] hours of discovery.

**§334.45. Technical Standards for New Underground Storage Tank Systems.**

(a) General requirements.

(1) Any new underground storage tank (UST) system installed on or after the effective date of this subchapter shall be in compliance with the provisions of this section during the entire operational life of the UST system.

(2) Any new UST system shall be designed, installed, and operated in a manner that will prevent releases due to structural failure or corrosion for the operational life of the UST system.

(3) The surfaces of all components of the new UST system which are in direct contact with a regulated substance shall be constructed of or lined with materials that are compatible with such regulated substances.

(4) All components of the new UST system which convey, contain, or store regulated substances shall be properly protected from corrosion in accordance with the applicable provisions in §334.49 of this title (relating to Corrosion Protection).

(5) All tanks, piping, and other ancillary equipment in a new UST system shall be installed in accordance with the requirements of §334.46 of this title (relating to Installation Standards for New Underground Storage Tank Systems).

(b) Technical standards for new tanks.

(1) Tank design and construction. Each new tank shall be properly designed, constructed, and protected from corrosion in accordance with one or more of the methods listed in subparagraphs (A) - (G) of this paragraph, and in accordance with specific codes and standards of practice developed by nationally recognized associations and independent testing laboratories, as referenced in the following subparagraphs:

(A) The tank may be constructed of fiberglass-reinforced plastic. Tanks constructed under this method shall meet UL Standard 1316, "Standard for Safety for Glass-Fiber-Reinforced Plastic Underground Storage Tanks for Petroleum Products, Alcohols, and Alcohol-Gasoline Mixtures";

(B) The tank may be constructed of coated steel and equipped with a factory-installed cathodic corrosion protection system. Any tank constructed under this method shall be thoroughly coated with a suitable dielectric material, shall be equipped with a factory-installed cathodic corrosion protection system meeting the appropriate design and operational requirements in §334.49(c)(1) of this title, and shall meet the following standards:

(i) UL Standard 58, "Standard for Safety for Steel Underground Tanks for Flammable and Combustible Liquids"; and

(ii) Part I of UL Standard 1746, "Standard for Safety for External Corrosion Protection Systems for Steel Underground Storage Tanks", or STI Standard, "Specification for sti-P<sub>3</sub> System of External Corrosion Protection of Underground Steel Storage Tanks."

(C) The tank may be constructed of coated steel and equipped with a field-installed cathodic corrosion protection system. Any tank constructed under this method shall be thoroughly coated with a suitable dielectric material, shall be equipped with a field-installed cathodic protection system meeting the appropriate design and operational requirements in §334.49(c)(2) of this title, and shall meet the following standards:

(i) UL Standard 58, "Standard for Safety for Steel Underground Tanks for Flammable and Combustible Liquids"; and

(ii) NACE International Standard RP0285-95, "Corrosion Control of Underground Storage Tank Systems by Cathodic Protection."

(D) The tank may be factory-constructed either as a steel/fiberglass-reinforced plastic composite tank, or as a steel tank with a bonded fiberglass-reinforced plastic external cladding or as a steel tank with a bonded fiberglass reinforced polyurethane coating. Any tank constructed under this method is not required to be

equipped with a cathodic protection system, provided that the tank meets the following requirements:

(i) The tank shall be equipped with a factory-applied external fiberglass-reinforced plastic or fiberglass reinforced polyurethane cladding or laminate which has a total dry film thickness of 100 mils minimum and 125 mils nominal;

(ii) The tank shall be operated and maintained in accordance with the requirements of §334.49 of this title;

(iii) The tank shall be designed and fabricated in accordance with one or more of the following standards:

(I) Part II of UL Standard 1746, "Standard for Safety for External Corrosion Protection Systems for Steel Underground Storage Tanks";

(II) Steel Tank Institute (STI) ACT-100, "Specification for External Corrosion Protection of FRP Composite Steel Underground Storage Tanks";

or

(III) any other UL, or STI, or Underwriters'

Laboratories of Canada (ULC) standard which incorporates the requirements contained in the standards listed in either subclause (I) or (II) of this clause; and

(iv) The tank shall be electrically isolated from all other metallic structures by use of dielectric bushings or other appropriate methods utilized in accordance with applicable industry standards.

(E) The tank may be factory-constructed as a steel tank with a bonded polyurethane external coating. Any tank constructed under this method is not required to be equipped with a cathodic protection system, provided that the tank meets the following requirements:

(i) The tank shall be equipped with a factory-applied external polyurethane coating which has a minimum dry film thickness of 70 mils;

(ii) The tank shall be operated and maintained in accordance with the applicable requirements of §334.49 of this title;

(iii) The tank shall be designed and fabricated in accordance with one or more of the following standards:

(I) Part IV of UL Standard 1746, "Standard for Safety for External Corrosion Protection Systems for Steel Underground Storage Tanks";

(II) Steel Tank Institute (STI) ACT-100-U, "Specification for External Corrosion Protection of Composite Steel Underground Storage Tanks"; or

(III) any other UL, or STL, or Underwriters' Laboratories of Canada (ULC) standard which incorporates the requirements contained in the standards listed in either subclause (I) or (II) of this clause; and

(iv) The tank shall be electrically isolated from all other metallic structures by use of dielectric bushings or other appropriate methods utilized in accordance with applicable industry standards.

(F) The tank may be factory-constructed as a steel tank completely contained within a nonmetallic external tank jacket. Any tank constructed under this method is not required to be equipped with a cathodic protection system, provided that the tank meets the following requirements:

(i) The tank shall be equipped with a factory-constructed nonmetallic external jacket which provides both secondary containment and corrosion protection;

(ii) The tank shall be operated and maintained in accordance with the applicable requirements of §334.49 of this title;

(iii) The tank shall be designed and fabricated in accordance with the following:

(I) Part III of UL Standard 1746, "Standard for Safety for External Corrosion Protection Systems for Steel Underground Storage Tanks"; or

(II) any other UL, or STI, or Underwriters' Laboratories of Canada (ULC) standard which incorporates the requirements contained in the standard listed in subclause (I) of this clause; and

(iv) The tank shall be electrically isolated from all other metallic structures by use of dielectric bushings or other appropriate methods utilized in accordance with applicable industry standards.

(G) The tank may be designed, constructed, and protected from corrosion by an alternate method which has been reviewed and determined by the agency to control corrosion and prevent the release or threatened release of any stored regulated substance in a manner that is no less protective of human health and safety and the environment than the methods described in subparagraphs (A) - (D) of this paragraph, in accordance with the procedures in §334.43 of this title (relating to Variances and Alternative Procedures).

(2) Spill and overflow prevention equipment. All new tanks shall be equipped with spill and overflow prevention equipment, in accordance with §334.51(b) of this title (relating to Spill and Overflow Prevention and Control).

(3) Release detection for new tanks. All new tanks shall be monitored for releases of regulated substances in accordance with §334.50 of this title (relating to Release Detection).

(4) Other new tank components.

(A) Fittings. All metallic tank fittings (e.g., bung hole plugs) shall be protected from corrosion and shall be either:

(i) isolated from the backfill material and groundwater or any other water;

(ii) thoroughly coated with a suitable dielectric material, in accordance with the tank manufacturer's specifications; or

(iii) cathodically protected in accordance with the applicable provisions in §334.49(c) of this title.

(B) Striker plates. Factory-installed striker plates shall be located on the interior bottom surface of each tank under all fill and gauge openings.

(C) Dielectric bushings or fittings. In order to provide electrical isolation of the tank from other connected metal components, all coated steel tanks equipped with either a factory-installed cathodic protection system or a factory-applied fiberglass-reinforced plastic laminate or cladding shall also be fitted with dielectric bushings or fittings at each tank opening where other metal UST system components are connected, except for unused openings closed with metal plugs and for openings where the connected component is non-metallic.

(c) Technical standards for new piping.

(1) Piping design and construction. All new underground piping (including associated valves, fittings, and connectors) in an UST system shall be properly designed, constructed, and protected from corrosion in accordance with one of the methods listed in subparagraphs (A) - (D) of this paragraph and in accordance with specific codes and standards of practice developed by nationally recognized associations and independent testing laboratories, as referenced in the following subparagraphs.

(A) The piping may be constructed of fiberglass-reinforced plastic.

Piping constructed under this method shall meet the following standards:

(i) UL Standard 971, "Standard for Safety for Nonmetallic Underground Piping for Flammable Liquids"; and

(ii) UL Standard 567, "Standard for Safety for Pipe Connectors for Petroleum Products and LP Gas."

(B) The piping may be constructed of coated steel. Piping constructed under this method shall be thoroughly coated with a suitable dielectric material, shall be cathodically protected with a field-installed cathodic protection system meeting the appropriate design and operational requirements in §334.49(c) of this title, and shall meet the applicable provisions of the following standards.

(i) NFPA Standard 30, "Flammable and Combustible Liquids Code";

(ii) API Publication 1615, "Installation of Underground Petroleum Storage Systems";

(iii) API Publication 1632, "Cathodic Protection of Underground Storage Tanks and Piping Systems"; and

(iv) NACE International Standard RP0169-96, "Control of External Corrosion on Underground or Submerged Metallic Piping Systems."

(C) The piping may be constructed of flexible nonmetallic material. Piping constructed under this method shall meet the following standards:

(i) UL Standard 971, "Standard for Safety for Nonmetallic Underground Piping for Flammable Liquids"; and

(ii) UL Standard 567, "Standard for Safety for Pipe Connectors for Petroleum Products and LP Gas."

(D) The piping may be designed, constructed, and protected from corrosion by an alternate method which has been reviewed and determined by the agency to prevent the release of any stored regulated substance in a manner that is no less protective of human health and the environment than the methods described in subparagraphs (A) and (B) of this paragraph. Any alternative methods must be submitted and approved in accordance with the procedures in §334.43 of this title.

(2) Release detection for new piping. All new piping shall be monitored for releases of regulated substances in accordance with §334.50(b)(2) of this title.

(3) Other new piping components.

(A) For piping systems in which regulated substances are conveyed under pressure to an aboveground dispensing unit, a UL-listed (or agency accepted equivalent listing by Underwriters' Laboratories of Canada (ULC)) emergency shutoff valve (also called a shear or impact valve) shall be installed in each pressurized delivery or product line and shall be securely anchored at the base of the dispenser. This shut-off valve shall include a fusible link, and shall be designed to provide a positive shut-off of product flow in the event that a fire, collision, or other emergency occurs at the dispenser end of the pressurized line.

(B) UL-listed (or agency accepted equivalent listing by Underwriter's Laboratories of Canada (ULC), or Factory Mutual Research Corporation (FMRC)) flexible connectors shall be installed at both ends of each pressurized product or delivery line to provide flexibility and to allow for vertical and horizontal movement in the piping, unless inherently flexible piping is installed in accordance with manufacturer's requirements and in accordance with an applicable code or standard of practice developed by a nationally recognized association or independent testing laboratory. The use of metal swing joints in a pressurized UST piping system is specifically prohibited.

(C) If buried and in contact with soil or backfill materials, all metallic pipe, valves, and fittings (including flexible connectors) shall be equipped with corrosion protection meeting the applicable requirements in §334.49 of this title.

(D) Only UL-listed (or agency accepted equivalent listing by Underwriters' Laboratories of Canada (ULC), or Factory Mutual Research Corporation (FMRC)) flexible connectors or nonmetallic piping listed for aboveground use or listed for use in sumps can be used without backfill cover in sumps, manways, or dispenser pans.

(d) Secondary containment for UST systems.

(1) Applicability.

(A) A secondary containment system meeting the requirements of this subsection shall be installed as part of any hazardous substance UST system, in accordance with the applicable schedules in §334.44(a)(2) and (b)(2) of this title (relating to Implementation Schedules).

(B) A double-wall tank and piping system (or approved alternative) meeting the applicable requirements of this subchapter shall be installed for any UST system situated in the Edwards Aquifer recharge or transition zones, in accordance with Chapter 213 of this title (relating to Edwards Aquifer).

(C) An UST system, at a minimum, shall incorporate secondary containment as specified in Texas Water Code, §26.3476, if the UST system is located in an area described in that provision.

(D) The agency may specifically require the installation of a secondary containment system meeting the requirements of this subsection at other times when necessary for the protection of human health or safety or the environment.

(E) Requirements applicable to new tanks, lines and/or dispensers (including related sumps or manways) installed on or after January 1, 2009:

(i) Any new tank or line installed as part of a UST system must incorporate secondary containment in accordance with the applicable requirements of this subchapter, except that external liners will not be allowed as a secondary containment method.

(ii) Up to 35% [20%] of the total original length of an existing single wall line can be replaced with new single wall line in accordance with the applicable requirements of this subchapter without triggering the secondary containment requirement for that line, unless the new line segment connects the existing line to a new dispenser. If more than 35% [20%] of the total original length of an existing single wall line is to be replaced, or the new line segment connects the existing line to a new dispenser, that line segment must be replaced [in its entirety] with a line [one] which incorporates secondary containment.

(iii) The interstice of the secondarily contained tank and/or line must be monitored in accordance with the requirements of §334.50(d)(7) of this title.

(iv) Any sumps or manways included in a new secondarily contained UST system which are utilized as an integral part of a UST release detection system to monitor the interstitial space of a new secondarily contained piping system

must be compatible with the stored substance(s), must be installed and maintained in a manner that assures that their sides, bottoms, and any penetration points are liquid tight, and must be inspected for tightness annually and tested for tightness immediately after installation and at least once every three years thereafter.

(v) Under-dispenser containment in the form of a dispenser sump is required for any new dispenser. A new dispenser is defined as:

(I) any dispenser which is installed where none previously existed; or

(II) any existing dispenser which is removed and replaced with another dispenser and transitional piping components beneath the replacement dispenser (e.g., flexible connectors or piping risers) which serve to connect the dispenser to the underground piping are replaced. Each new dispenser must employ a dispenser sump which is compatible with the stored substance, is installed and maintained in a manner that assures that its sides, bottoms, and any penetration points are liquid tight, and must be inspected for tightness annually and tested for tightness, immediately after installation and at least once every three years thereafter.

(vi) Any sumps or manways included in a new secondarily contained UST system which are utilized as an integral part of a UST release detection

system to monitor the interstitial space of a new secondarily contained piping system, and any new dispenser sumps [All sumps (including dispenser sumps) and/or manways] must be equipped with a liquid sensing probe(s) [probe/s] which will alert the UST system owner or operator if more than two inches of liquid collects in any sump or manway.

(vii) Liquids and/or debris found in any sumps or manways which are included in a new secondarily contained UST system and utilized as an integral part of a UST release detection system to monitor the interstitial space of a new secondarily contained piping system, and/or in any new dispenser sumps must be removed and properly disposed of within 96 [72] hours of alert or discovery.

(viii) Inspections and testing:

(I) Inspections must be performed by a qualified person who is competent to conduct the inspection in accordance with recognized industry practices and in accordance with industry standards, if applicable.

(II) Testing of tanks and/or lines shall be performed in accordance with the applicable requirements of this chapter. Testing of sumps or manways (including dispenser sumps) must be performed by a qualified person who is

competent to conduct the inspection in accordance with recognized industry practices and in accordance with industry standards, if applicable.

(2) General performance standards. All secondary containment systems installed as part of a UST system shall be:

(A) designed, installed, and operated in a manner that will prevent the release of regulated substances from such secondary containment system into the surrounding soil, backfill, groundwater, or surface water during the operational life of the UST system;

(B) capable of collecting and containing releases of regulated substances from any portion of the primary containment vessels (e.g., tanks and piping) until such released substances are removed;

(C) constructed of or lined with materials which are compatible with the stored regulated substance;

(D) constructed of materials having sufficient strength and thickness to prevent failure due to pressure gradients (including static head and external hydrological forces), physical contact with the stored regulated substance (and any other substance to which they may normally be exposed), climatic conditions, the stresses of

installation, and the stresses of daily operation (including stresses from nearby vehicular traffic); and

(E) installed on a properly designed and properly placed bedding or backfill material which is capable of providing adequate support for the secondary containment system, capable of providing adequate resistance to any pressure gradients above and below the system, and capable of preventing failure due to settlement, compression, or uplift.

(3) Secondary containment for tanks. One or more of the following methods may be used to provide secondary containment for tanks.

(A) Double-wall tanks. Double-wall tanks may be used to comply with the secondary containment requirements of this subchapter, provided that such tanks shall meet the following additional provisions.

(i) The secondary wall of such double-wall tanks shall be structurally designed to contain and support the full-load capacity of the primary tank without failure.

(ii) The double-wall tank (including both the primary and secondary tank walls) shall be protected from corrosion in accordance with one or more of the allowable methods included in §334.49 of this title.

(iii) The double-wall tank shall be designed, installed, operated, and maintained in accordance with one of the applicable codes or standards of practice listed as follows:

(I) for fiberglass-reinforced plastic tanks: UL Standard 1316, "Standard for Safety for Glass-Fiber-Reinforced Plastic Underground Storage Tanks for Petroleum Products, Alcohols, and Alcohol-Gasoline Mixtures."

(II) for steel tanks: STI Standard, "Standard for Dual Wall Underground Steel Storage Tanks," UL Standard 58, "Standard for Safety for Steel Underground Tanks for Flammable and Combustible Liquids," and other applicable UL standards for double-wall steel tanks; and

(III) any other code or standard of practice developed by a nationally recognized association or independent testing laboratory that has been reviewed and determined by the agency to be no less protective of human health and

safety, and the environment than the standards described in subclauses (I) and (II) of this clause, in accordance with procedures in §334.43 of this title.

(iv) The double-wall tank system shall be installed in accordance with the requirements in §334.46(f)(2) of this title.

(B) External liners. Tank excavation liners may be used to comply with the secondary containment requirements of this paragraph, provided that such liners shall meet the following additional provisions.

(i) The tank excavation liner shall consist of an artificially constructed material that is of sufficient strength, thickness, puncture-resistance, and impermeability (i.e., allow permeation at a rate of no more than 0.25 ounces per square foot per 24 hours for the stored regulated substance) in order to permit the collection and containment of any releases from the UST system. The criteria for evaluation of the liner for compliance with this clause shall be in accordance with accepted industry practices for materials testing. Types of liners which may be used include certain reinforced and unreinforced flexible-membrane liners, rigid fiberglass-reinforced plastic liners, and reinforced concrete vaults.

(ii) The liner shall be protected from corrosion in accordance with one or more of the allowable methods included in §334.49 of this title.

(iii) The liner shall be sufficiently compatible with the stored regulated substance, so that any regulated substance collected in the liner system shall not cause any substantial deterioration of the liner that would allow the regulated substances to be released into the environment.

(iv) The liner shall be designed to provide a containment volume of no less than 100% of the full capacity of the largest tank within its containment area.

(v) The liner shall be installed in accordance with the requirements in §334.46(f)(4) of this title.

(4) Secondary containment for piping. One or more of the following methods shall be used to provide secondary containment for piping.

(A) Double-wall piping. Double-wall piping systems may be used to comply with the secondary containment requirements of this subchapter, provided that such piping systems meet the following additional provisions.

(i) The double-wall piping system shall be designed to contain a release from any portion of the primary piping within the secondary piping walls.

(ii) The double-wall piping system (including both the primary and secondary piping) shall be protected from corrosion in accordance with one or more of the allowable methods included in §334.49 of this title.

(iii) The double-wall piping system shall be designed, installed, and operated in accordance with a code or standard of practice developed by a nationally recognized association or independent testing laboratory.

(iv) The double-wall piping system shall be installed in accordance with the requirements in §334.46(f)(3) of this title.

(B) External liners. External piping trench liners may be used to comply with the secondary containment requirements of this paragraph, provided that such liners meet the additional provisions in paragraph (3)(B) of this subsection.

(e) Technical standards for other new UST system equipment.

(1) Vent lines. All underground portions of the vent lines (including all associated underground valves, fittings, and connectors) shall be designed and constructed in accordance with the piping requirements in subsection (c)(1) of this section, shall be properly protected from corrosion in accordance with one of the allowable methods in §334.49 of this title, and shall be installed in accordance with a code or standard of practice developed by a nationally recognized association or independent testing laboratory.

(2) Fill pipes. All fill pipes (including any connected fittings) shall be:

(A) designed and constructed in accordance with the piping requirements in subsection (c)(1) of this section;

(B) properly protected from corrosion in accordance with one of the allowable methods in §334.49 of this title;

(C) properly enclosed in or equipped with spill and overflow prevention equipment as required in §334.51(b) of this title; and

(D) equipped with a removable or permanent factory-constructed drop tube which shall extend to within 12 inches of the tank bottom.

(3) Release detection equipment. All release detection equipment shall be designed and constructed in accordance with the requirements for the particular type of equipment, as described in the applicable provisions in §334.50 of this title.

(4) Monitoring wells and observation wells.

(A) All monitoring wells and observation wells installed on or after the effective date of this subchapter shall be designed, constructed, and installed in accordance with the requirements in §334.46(g) of this title.

(B) Each separate tank hole in a new UST system installed on or after the effective date of this subchapter shall include a minimum number of four-inch diameter (nominal) observation wells, as specified in the following clauses:

(i) for a tank hole containing only one tank, a minimum of one observation well shall be required; and

(ii) for a tank hole containing two or more tanks, a minimum of two observation wells shall be required.

(f) Records for technical standards for new UST systems. Owners and operators of new UST systems shall maintain adequate records to demonstrate compliance with

the applicable provisions in this section, which at a minimum, shall include all records required in §334.46(i) of this title. All records shall be maintained in accordance with §334.10(b) of this title (relating to Reporting and Recordkeeping).

**§334.49. Corrosion Protection.**

(a) General requirements.

(1) Owners and operators of underground storage tank (UST) systems (or underground metal UST system components) which are required to be protected from corrosion shall comply with the requirements in this section to ensure that releases due to corrosion are prevented.

(2) All corrosion protection systems shall be designed, installed, operated, and maintained in a manner that will ensure that corrosion protection will be continuously provided to all underground metal components of the UST system.

(3) Any alternative methods for corrosion protection or variances from the requirements of this section are prohibited, except when reviewed and approved by the agency pursuant to procedures for variances found in §334.43 of this title (relating to Variances and Alternative Procedures).

(4) Corrosion protection in accordance with the provisions of this section shall be provided to all underground and/or totally or partially submerged metal components of any existing or new [an] UST system which are designed or used to convey, contain, or store regulated substances, including, but not limited to, the tanks, piping (including valves, fittings, flexible connectors, swing joints, and impact/shear valves), and also to other underground metal components associated with an UST system, including but not limited to, secondary containment devices, manways, manholes, fill pipes, vent lines, submersible pump housings, spill containers, and riser pipes.

(5) For internal corrosion protection, the interior bottom surface of new metal tanks installed on or after September 29, 1989, shall be fitted with a striker plate under all fill, gauge, and monitoring openings.

(6) When provisions of this subsection require compliance with a specific code or standard of practice developed by a nationally recognized association or independent testing laboratory, the most recent version of the referenced code in effect at the time of the regulated UST activity shall be applicable.

(7) For an UST system to be placed temporarily out of service, the owner or operator must comply with the requirements of §334.54(c) of this title (relating to Temporary Removal from Service).

(b) Allowable corrosion protection methods. All components of an UST system which are designed to convey, contain, or store regulated substances shall be protected from corrosion by one or more of the following methods.

(1) The component may be constructed of a noncorrodible material which is compatible with the stored regulated substance(s).

(2) The component may be electrically isolated from the corrosive elements of the surrounding soil, backfill, groundwater or any other water, and from other metallic components by installing the component in an open area (e.g., manway, sump, vault, pit, etc.) where periodic visual inspection of all parts of the component for the presence of corrosion or released substances is practicable.

(3) The component may be electrically isolated from the corrosive elements of the surrounding soil, backfill, groundwater or any other water, and from other metallic components by completely enclosing the component in a secondary containment device (e.g., wall, jacket, or liner), provided that:

(A) the secondary containment device is designed and installed in accordance with the applicable technical and installation standards in §334.45(d) of this title (relating to Technical Standards for New Underground Storage Tank Systems) and §334.46(f) of this title (relating to Installation Standards for New Underground Storage Tank Systems), and in accordance with an applicable code or standard of practice developed by a nationally recognized association or independent testing laboratory, and is either:

(i) constructed of a noncorrodible material which is compatible with the stored regulated substance;

(ii) electrically isolated from the protected component and other metallic components; or

(iii) cathodically protected by either a factory-installed or field-installed cathodic protection system meeting the applicable requirements of subsection (c) of this section; and

(B) the interstitial space between the protected component and the secondary containment device shall be free of any soil, backfill material, groundwater or any other water, or other substances, and the protected component shall be regularly

inspected and tested for electrical isolation in accordance with the provisions in subsection (d)(1) of this section.

(4) Tanks (only) may be factory-constructed either as a steel/fiberglass-reinforced plastic composite tank, or as a steel tank with a bonded fiberglass-reinforced plastic external cladding or laminate, or as a steel tank with a bonded fiberglass reinforced polyurethane coating, as a steel tank with a bonded polyurethane external coating, or as a steel tank completely contained within a nonmetallic external tank jacket in accordance with the requirements in §334.45(b)(1)(D), (E), or (F) of this title, as applicable.

(5) The component may be coated with a suitable dielectric material, equipped with appropriate dielectric fittings for electrical isolation, and equipped with either:

(A) a factory-installed cathodic protection system meeting the requirements of subsection (c)(1) of this section; or

(B) a field-installed cathodic protection system meeting the requirements of subsection (c)(2) of this section.

(6) Except for the tanks and the piping system components, other underground components of a UST system (including vent lines, fill risers, [submersible pump risers and housings,] spill containment vessels, and tank fittings (e.g., bunghole plugs)) which do not routinely contain regulated substances may be protected from corrosion by thorough coating or wrapping with a suitable dielectric material which is compatible with the stored regulated substance without the need for the use of other corrosion protection methods.

(7) Corrosion protection in accordance with the requirements of this subchapter is not required if it is determined by a corrosion specialist that corrosion protection of an underground metal UST system or UST system component is unnecessary because the site is not corrosive enough to cause a release due to corrosion for the operational life of the UST system. The upgrade or repair of an existing corrosion protection system for an underground metal UST system or UST system component is not required if it is determined by a corrosion specialist that said upgrading or repair is unnecessary and that the protection provided by the existing corrosion protection system is sufficient to prevent a release due to corrosion for the operational life of the UST system. In either case, the determination of the corrosion specialist must be made in writing, must be signed by the corrosion specialist (corrosion specialist must also seal the written determination if he or she is a qualified duly licensed professional engineer in Texas), and must be maintained by the owner and operator as part of the records for

the facility in keeping with the requirements of subsection (e) of this section and §334.10(b) of this title (relating to Reporting and Recordkeeping).

(c) Cathodic protection systems.

(1) Factory-installed cathodic protection systems.

(A) A factory-installed cathodic protection system on any UST component shall be designed, fabricated, installed, operated, and maintained in accordance with applicable codes or standards of practice developed for such cathodic protection method by a nationally recognized association or independent testing laboratory.

(B) At a minimum, the factory-installed cathodic protection system shall include the following components:

(i) a suitable dielectric external coating or laminate, which shall thoroughly cover all exterior surfaces exposed to the soil, backfill, or groundwater or any other water, and which shall consist of materials which are compatible with the stored regulated substances;

(ii) dielectric isolation bushings, connections, or fittings, which shall be installed at all locations where the protected component connects to other metallic system components, and which shall be constructed of materials which are compatible with the stored regulated substances; and

(iii) sacrificial anodes which are firmly attached and electrically connected to the protected components and which are positioned and sized to provide complete cathodic protection for all parts of the protected component.

(2) Field-installed cathodic protection systems.

(A) A field-installed cathodic protection system on any UST system component shall be designed by a qualified corrosion specialist, and shall be designed, installed, operated, and maintained in accordance with applicable codes or standards of practice developed for such cathodic protection systems by a nationally recognized association or independent testing laboratory.

(B) Impressed current cathodic protection systems shall be designed and equipped with appropriate equipment or devices capable of indicating the operational status of the system at all times.

(C) In addition to the standard inspection and testing requirements for all cathodic protection systems required in paragraph (4) of this subsection, all impressed current cathodic protection systems shall be regularly inspected by the owner or operator (or the owner's designated representative) to ensure that the rectifier and other system components are operating properly. Such inspections shall be performed at least once every 60 days.

(3) Test stations and connections. To allow for the periodic testing required in paragraph (4) of this subsection, any factory-installed or field-installed cathodic protection system shall include appropriate connections, insulated lead wires, and accessible test stations. All lead wires connected to the tanks, anodes, reference electrodes, and other components associated with the cathodic protection system shall terminate at one or more test stations. The termination of each lead wire at a test station shall be clearly labeled or coded to properly identify the specific component to which it is connected.

(4) Inspection and testing requirements for all cathodic protection systems.

(A) Except as provided in subsection (d)(2) of this section, all cathodic protection systems which are used to provide corrosion protection for any

component of a UST system shall be inspected and tested to determine the adequacy of the cathodic protection by a qualified corrosion specialist or corrosion technician in accordance with the requirements in this paragraph.

(B) The inspection and testing criteria used to determine the adequacy of the cathodic protection shall be in accordance with a code or standard of practice developed by a nationally recognized corrosion association or independent testing laboratory.

(C) All cathodic protection systems shall be inspected and tested for operability and adequacy of protection within three to six months after installation and at a subsequent frequency of at least once every three years.

(d) Requirements for other corrosion protection methods.

(1) Electrically isolated components.

(A) Except for jacketed tanks meeting the requirements of §334.45(b)(1)(F) of this title, any metal component of an UST system which is protected from corrosion by one of the electrical isolation methods described in subsection (b)(2) and (3) of this section, and which is not equipped with a cathodic protection system,

shall be periodically inspected and tested to ensure that the metal component remains electrically isolated from the surrounding soil, backfill, groundwater or any other water, and from other metal components in accordance with one or more of the following procedures.

(i) When visual inspection is possible, the entire exterior surface of such component may be thoroughly inspected visually by qualified personnel for the presence of corrosion or released regulated substances.

(ii) If visual inspection is not possible, the component may be inspected and tested by a qualified corrosion technician or by a qualified corrosion specialist by taking structure to soil voltage readings in accordance with procedures established by a code or standard of practice developed by a nationally recognized association or independent testing laboratory.

(iii) The component may be inspected and/or tested by an alternative method which has been reviewed and determined by the agency to ascertain electrical isolation and to prevent the release or threatened release of any stored regulated substance in a manner that is no less protective of human health and safety and the environment than the methods described in clauses (i) and (ii) of this subparagraph, in accordance with the procedures in §334.43 of this title.

(B) The inspections and tests required in subparagraph (A) of this paragraph shall be conducted within three to six months after installation of the metal component, and then once every three years thereafter for the remaining operational life of the UST system.

(C) If the tests required in subparagraph (A) of this paragraph indicate that the metal component is no longer electrically isolated from the surrounding soil, backfill, groundwater or any other water, or from other metal components, a qualified corrosion specialist shall review the test results and thoroughly inspect the area of the metal component to ascertain the extent of electrical isolation and corrosion protection for the component.

(D) If the qualified corrosion specialist determines that the metal component is no longer adequately protected from corrosion, the owner or operator shall assure that one or more of the following procedures are completed within 60 days of the date of such determination:

(i) appropriate repairs or modifications shall be made to restore the electrical isolation of the protected component; or

(ii) a field-installed cathodic protection system meeting the requirements of subsection (c)(2) of this section shall be installed.

(2) Dual-protected tanks. If a steel/fiberglass-reinforced plastic composite tank, a steel tank with a bonded fiberglass-reinforced plastic external cladding or laminate, a steel tank with a bonded fiberglass reinforced polyurethane coating, or a steel tank with a bonded polyurethane coating is also equipped with a factory-installed cathodic protection system, then the normal inspection and testing requirements for cathodic protection systems in subsection (c)(4) of this section may be waived. This paragraph shall be applicable only to tanks meeting the design and construction requirements in §334.45(b)(1)(D) or (E) [§334.45(b)(1)(E)] of this title, as applicable, and when such tanks are fitted with factory-installed cathodic protection systems meeting the requirements of subsection (c)(1) of this section.

(e) Corrosion protection records.

(1) Owners and operators shall maintain all corrosion protection records required in this subsection in accordance with the requirements in §334.10(b) of this title [(relating to Reporting and Recordkeeping)].

(2) Owners and operators shall maintain records adequate to demonstrate compliance with the corrosion protection requirements in this section, and in accordance with the following minimum requirements.

(A) All appropriate installation records related to the corrosion protection system, as listed in §334.46(i) of this title, shall be maintained for as long as the corrosion protection system is used, including:

(i) the name, address, telephone number, and corrosion protection credentials of either the company which designed the factory-installed cathodic protection system or the corrosion specialist who designed the field-installed cathodic protection system, as applicable;

(ii) drawings or plans depicting the locations of all cathodic protection system components, including the locations of all test stations; and

(iii) operating instructions and warranty information, maintenance schedules, and testing procedures for all operational components of the cathodic protection systems.

(B) The following corrosion protection records shall be maintained for at least five years after the applicable test or inspection is conducted:

(i) results of all tests and inspections of any impressed current cathodic protection system conducted in accordance with subsection (c)(2)(C) of this section;

(ii) results of all tests and inspections of the adequacy of any cathodic protection system conducted in accordance with subsection (c)(4) of this section;

(iii) results of all tests and inspections to assure corrosion protection for electrically isolated components in accordance with subsection (d)(1) of this section.

**§334.50. Release Detection.**

(a) General requirements.

(1) Owners and operators of new and existing underground storage tank (UST) systems shall provide a method, or combination of methods, of release detection which shall be:

(A) capable of detecting a release from any portion of the UST system which contains regulated substances including the tanks, piping, and other underground ancillary equipment;

(B) installed, calibrated, operated, maintained, utilized, and interpreted (as applicable) in accordance with the manufacturer's and/or methodology provider's specifications and instructions consistent with the other requirements of this section, and by personnel possessing the necessary experience, training, and competence to accomplish such requirements; and

(C) capable of meeting the particular performance requirements of such method (or methods) as specifically prescribed in this section, based on the performance claims by the equipment manufacturer or methodology provider/vendor, as verified by third-party evaluation conducted by a qualified independent testing organization, using applicable United States Environmental Protection Agency protocol, provided that the following additional requirements shall also be met.

(i) Any performance claims, together with their bases or methods of determination including the summary portion of the independent third-party evaluation, shall be obtained by the owner and/or operator from the equipment manufacturer, methodology provider, or installer and shall be in writing.

(ii) When any of the following release detection methods are used on or after December 22, 1990 (except for methods permanently installed and in operation prior to that date), such method shall be capable of detecting the particular release rate or quantity specified for that method such that the probability of detection shall be at least 95% and the probability of false alarm shall be no greater than 5.0%:

(I) tank tightness testing, as prescribed in subsection (d)(1)(A) of this section;

(II) automatic tank gauging, as prescribed in subsection (d)(4) of this section;

(III) automatic line leak detectors for piping, as prescribed in subsection (b)(2)(A)(i) of this section;

(IV) piping tightness testing, as prescribed in subsection (b)(2)(A)(ii)(I) of this section;

(V) electronic leak monitoring systems for piping, as prescribed in subsection (b)(2)(A)(ii)(III) of this section; and

(VI) statistical inventory reconciliation (SIR), as prescribed in subsection (d)(9) of this section.

(2) When a release detection method operated in accordance with the particular performance standards for that method indicates that a release either has or may have occurred, the owners and operators shall comply with the applicable release reporting, investigation, and corrective action requirements in Subchapter D of this chapter (relating to Release Reporting and Corrective Action).

(3) Owners and operators of all UST systems shall comply with the release detection requirements of this section in accordance with the applicable schedules in §334.44 of this title (relating to Implementation Schedules).

(4) As prescribed in §334.47(a)(2) of this title (relating to Technical Standards for Existing Underground Storage Tank Systems), any existing UST system that cannot be equipped or monitored with a method of release detection that meets the requirements of this section shall be permanently removed from service in accordance with the applicable procedures in §334.55 of this title (relating to Permanent Removal from Service) no later than 60 days after the implementation date for release detection as prescribed by the applicable schedules in §334.44 of this title.

(5) Any owner or operator who plans to install a release detection method for a UST system shall comply with the applicable construction notification requirements in §334.6 of this title (relating to Construction Notification for Underground Storage Tanks (USTs) and UST Systems), and upon completion of the installation of such method shall also comply with the applicable registration and certification requirements of §334.7 of this title (relating to Registration for Underground Storage Tanks (USTs) and UST Systems) and §334.8 of this title (relating to Certification for Underground Storage Tanks (USTs) and UST Systems).

(6) Any equipment installed or used for conducting release detection for a UST system shall be listed, approved, designed, and operated in accordance with standards developed by a nationally recognized association or independent testing laboratory (e.g., UL) for such installation or use, as specified in §334.42(d) of this title (relating to General Standards).

(7) For a UST system to be placed temporarily out-of-service, the owner or operator must comply with the requirements of §334.54(c) of this title (relating to Temporary Removal from Service).

(b) Release detection requirements for all UST systems. Owners and operators of all UST systems shall ensure that release detection equipment or procedures are provided in accordance with the following requirements.

(1) Release detection requirements for tanks.

(A) Except as provided in subparagraphs (B) and (C) of this paragraph and in subsection (d)(9) of this section, all tanks shall be monitored in a manner which will detect a release at a frequency of at least once every month (not to exceed 35 days between each monitoring) by using one or more of the release detection methods described in subsection (d)(4) - (10) of this section).

(B) A combination of tank tightness testing and inventory control in accordance with subsection (d)(1) of this section may be used as an acceptable release detection method for tanks only until December 22, 1998, and the required frequency of the tank tightness test shall be based on the following criteria.

(i) A tank tightness test shall be conducted at least once each year for any tank in an existing UST system which is not being operated in violation of the upgrading or replacement schedule in §334.44(b) of this title, but has not yet been either:

(I) replaced with a UST system meeting the applicable technical and installation standards in §334.45 of this title (relating to Technical Standards for New Underground Storage Tank Systems) and §334.46 of this title (relating to Installation Standards for New Underground Storage Tank Systems); or

(II) retrofitted or equipped in accordance with the minimum upgrading requirements applicable to existing UST systems in §334.47 of this title.

(ii) A tank tightness test shall be conducted at least once every five years for any tank in a UST system which has been either:

(I) installed in accordance with the applicable technical standards for new UST systems in §334.45 and §334.46 of this title; or

(II) retrofitted or equipped in accordance with the minimum upgrading requirements applicable to existing UST systems in §334.47 of this title.

(C) The manual tank gauging method of release detection, as prescribed in subsection (d)(2) of this section, may be used as the sole release detection system only for a petroleum substance tank with a nominal capacity of 1,000 gallons or

less. The monthly tank gauging method of release detection, as prescribed in subsection (d)(3) of this section, may be used as the sole release detection system only for emergency generator tanks.

(D) In addition to the requirements in subparagraphs (A) - (C) of this paragraph, any tank in a hazardous substance UST system shall also be equipped with a secondary containment system and related release detection equipment, as prescribed in subsection (c) of this section.

(2) Release detection for piping. Piping in a UST system shall be monitored in a manner which will detect a release from any portion of the piping system, in accordance with the following requirements.

(A) Requirements for pressurized piping. UST system piping that conveys regulated substances under pressure shall be in compliance with the following requirements.

(i) Each separate pressurized line (except for lines utilized in airport hydrant systems) shall be equipped with an automatic line leak detector meeting the following requirements.

(I) The line leak detector shall be capable of detecting any release from the piping system of three gallons per hour when the piping pressure is at ten pounds per square inch.

(II) The line leak detector shall be capable of alerting the UST system operator of any release within one hour of occurrence either by shutting off the flow of regulated substances, or by substantially restricting the flow of regulated substances.

(III) The line leak detector shall be tested at least once per year for performance and operational reliability and shall be properly calibrated and maintained, in accordance with the manufacturer's specifications and recommended procedures.

(ii) In addition to the required line leak detector prescribed in clause (i) of this subparagraph, each pressurized line shall also be tested or monitored for releases in accordance with at least one of the following methods.

(I) The piping may be tested at least once per year by means of a piping tightness test conducted in accordance with a code or standard of practice developed by a nationally recognized association or independent testing laboratory. Any such piping tightness test shall be capable of detecting any release from

the piping system of 0.1 gallons per hour when the piping pressure is at 150% of normal operating pressure.

(II) Except as provided in subsection (d)(9) of this section, the piping may be monitored for releases at least once every month (not to exceed 35 days between each monitoring) by using one or more of the release detection methods prescribed in subsection (d)(5) - (10) of this section.

(III) The piping may be monitored for releases at least once every month (not to exceed 35 days between each monitoring) by means of an electronic leak monitoring system capable of detecting any release from the piping system of 0.2 gallons per hour at normal operating pressure.

(B) Requirements for suction piping and gravity flow piping.

(i) Except as provided in clause (ii) of this subparagraph, each separate line in a UST piping system that conveys regulated substances either under suction or by gravity flow shall meet at least one of the following requirements.

(I) Each separate line may be tested at least once every three years by means of a positive or negative pressure tightness test applicable to underground product piping and conducted in accordance with a code or standard of

practice developed by a nationally recognized association or independent testing laboratory. Any such piping test shall be capable of detecting any release from the piping system of 0.1 gallons per hour.

(II) Each line may be monitored for releases at least once every month (not to exceed 35 days between each monitoring) by using one or more of the release detection methods prescribed in subsection (d)(5) - (10) of this section.

(ii) No release detection methods are required to be installed or applied for any piping system that conveys regulated substances under suction when such suction piping system is designed and constructed in accordance with the following standards:

(I) the below-grade piping operates at less than atmospheric pressure;

(II) the below-grade piping is sloped so that all the contents of the pipe will drain back into the storage tank if the suction is released;

(III) only one check valve is included in each suction line;

(IV) the check valve is located aboveground, directly below and as close as practical to the suction pump; and

(V) verification that the requirements under subclauses (I) - (IV) of this clause have been met can be provided in the form of:

(-a-) signed as-built drawings or plans provided by the installer or by a professional engineer who is duly licensed to practice in Texas; or

(-b-) signed written documentation provided by a UST contractor who is properly registered with the agency, by a UST installer who is properly licensed with the agency, or by a professional engineer who is duly licensed to practice in Texas.

(C) Monitoring secondary containment. In addition to the requirements in subparagraphs (A) and (B) of this paragraph, all piping in a hazardous substance UST system shall also be equipped with a secondary containment system and related release detection equipment, as prescribed in subsection (c) of this section.

(c) Additional release detection requirements for hazardous substance UST systems. In addition to the release detection requirements for all UST systems

prescribed in subsections (a) and (b) of this section, owners and operators of all hazardous substance UST systems shall also assure compliance with the following additional requirements.

(1) All new hazardous substance UST systems shall be in compliance with the requirements of paragraph (3) of this subsection for the entire operational life of the system.

(2) All existing hazardous substance UST systems shall be brought into compliance with the requirements of paragraph (3) of this subsection no later than December 22, 1998.

(3) Secondary containment and monitoring.

(A) All hazardous substance UST systems (including tanks and piping) shall be equipped with a secondary containment system which shall be designed, constructed, installed, and maintained in accordance with §334.45(d) and §334.46(f) of this title.

(B) All hazardous substance UST systems (including tanks and piping) shall include one or more of the release detection methods or equipment prescribed in subsection (d)(7) - (10) of this section, which shall be capable of

monitoring the space between the primary tank and piping walls and the secondary containment wall or barrier.

(d) Allowable methods of release detection. Tanks in a UST system may be monitored for releases using one or more of the methods included in paragraphs (2) - (10) of this subsection. Piping in a UST system may be monitored for releases using one or more of the methods included in paragraphs (5) - (10) of this subsection. Any method of release detection for tanks and/or piping in this section shall be allowable only when installed (or applied), operated, calibrated, and maintained in accordance with the particular requirements specified for such method in this subsection.

(1) Tank tightness testing and inventory control. A combination of tank tightness testing and inventory control may be used as a tank release detection method only until December 22, 1998, subject to the following conditions and requirements.

(A) Tank tightness test. Any tank tightness test shall be conducted in conformance with the following standards.

(i) The tank tightness test shall be conducted in accordance with a code or standard of practice developed by a nationally recognized association or independent testing laboratory.

(ii) The tank tightness test shall be performed by qualified personnel who possess the requisite experience, training, and competence to conduct the test properly, who are present at the facility and who maintain responsible oversight throughout the entire testing procedure, and who have been certified by the manufacturer or developer of the testing equipment as being qualified to perform the test. The tank tightness test shall be conducted in strict accordance with the testing procedures developed by the system manufacturer or developer.

(iii) The tank tightness test shall be capable of detecting a release of 0.1 gallons per hour from any portion of the tank which contains regulated substances.

(iv) The tank tightness test shall be performed in a manner that will account for the effects of vapor pockets, thermal expansion or contraction of the stored substance, temperature of the stored substance, temperature stratification, evaporation or condensation, groundwater elevation, pressure variations within the system, tank end deflection, tank deformation, and any other factors that could affect the accuracy of the test procedures.

(B) Inventory control. All inventory control procedures shall be in conformance with the following requirements.

(i) All inventory control procedures shall be in accordance with a code or standard of practice developed by a nationally recognized association or independent testing laboratory.

(ii) Reconciliation of detailed inventory control records shall be conducted at least once each month, and shall be sufficiently accurate to detect a release as small as the sum of 1.0% of the total substance flow-through for the month plus 130 gallons.

(iii) The operator shall assure that the following additional procedures and requirements are followed.

(I) Inventory volume measurement for regulated substance inputs, withdrawals, and the amount still remaining in the tank shall be recorded each operating day.

(II) The equipment used shall be capable of measuring the level of stored substance over the full range of the tank's height to the nearest 1/8 inch.

(III) Substance dispensing shall be metered and recorded within an accuracy of six or less cubic inches for every five gallons of product withdrawn.

(IV) The measurement of any water level in the bottom of the tank shall be made to the nearest 1/8 inch at least once a month, and appropriate adjustments to the inventory records shall be made.

(2) Manual tank gauging. Manual tank gauging may be used as a tank release detection method, subject to the following limitations and requirements.

(A) Manual tank gauging in accordance with this subparagraph may be used as the sole method of tank release detection only for petroleum substance tanks having a nominal capacity of 1,000 gallons or less.

(B) The use of manual tank gauging shall not be considered an acceptable method for meeting the release detection requirements of this section for any tanks with a nominal capacity greater than 1,000 gallons.

(C) When used for compliance with the release detection requirements of this section, the procedures and requirements in the following clauses shall be applicable.

(i) For purposes of this subparagraph only, the following definitions are applicable.

(I) Level measurement--The average of two consecutive liquid level readings from a tank gauge, measuring stick, or other measuring equipment.

(II) Gauging period--A weekly period during which no substance is added to or removed from the tank. The duration of the gauging period is dependant upon tank volume and diameter, as specified in clause (v) of this subparagraph.

(III) Weekly deviation--The variation between the level measurements taken at the beginning and the end of one gauging period, converted to and expressed as gallons.

(IV) Monthly deviation--The arithmetic average of four consecutive weekly deviations, expressed as gallons.

(ii) Any measuring equipment shall be capable of measuring the level of stored substance over the full range of the tank's height to the nearest 1/8 inch.

(iii) Separate liquid level measurements in the tank shall be taken weekly at the beginning and the ending of the gauging period, and the weekly deviation shall be determined from such level measurements.

(iv) Once each month, after four consecutive weekly deviations are determined, a monthly deviation shall be calculated.

(v) For the purposes of the manual tank gauging method of release detection, a release shall be indicated when either the weekly deviation or the monthly deviation exceeds the maximum allowable standards indicated in the following subclauses:

(I) for a tank with a capacity of 550 gallons or less (any tank diameter): minimum duration of gauging period = 36 hours; weekly standard = ten gallons; monthly standard = five gallons;

(II) for a tank with a capacity of 551 gallons to 1,000 gallons (when tank diameter is 64 inches): minimum duration of gauging period = 44 hours; weekly standard = nine gallons; monthly standard = four gallons;

(III) for a tank with a capacity of 551 gallons to 1,000 gallons (when tank diameter is 48 inches): minimum duration of gauging period = 58 hours; weekly standard = 12 gallons; monthly standard = six gallons.

(vi) When either the weekly standard or the monthly standard is exceeded and a suspected release is thereby indicated, the owner or operator shall comply with the applicable release reporting, investigation, and corrective action requirements of Subchapter D of this chapter.

(3) Monthly tank gauging. Monthly tank gauging may be used as a tank release detection method, subject to the following limitations and requirements.

(A) Monthly tank gauging in accordance with this paragraph may be used as the sole method of tank release detection only for emergency generator tanks.

(B) The use of monthly tank gauging shall not be considered an acceptable method for meeting the release detection requirements of this section for any tanks other than emergency generator tanks.

(C) When used for compliance with the release detection requirements of this section, the procedures and requirements in the following clauses shall be applicable.

(i) For purposes of this paragraph only, the following definitions are applicable.

(I) Level measurement--The average of two consecutive liquid level readings from a tank gauge, measuring stick, or other manual or automatic measuring equipment.

(II) Gauging period--A period of at least 36 hours during which no substance is added to or removed from the tank.

(III) Monthly deviation--The variation between the level measurements taken at the beginning and the end of one gauging period, converted to and expressed as gallons.

(ii) Any measuring equipment (whether operated manually or automatically) shall be capable of measuring the level of a stored substance over the full range of the tank's height to the nearest 1/8 inch.

(iii) Separate liquid level measurements in the tank shall be taken at least once monthly at the beginning and the ending of the gauging period, and the monthly deviation shall be determined from such level measurements.

(iv) For the purposes of the monthly tank gauging method of release detection, a release shall be indicated when the monthly deviation exceeds the maximum allowable standards indicated in the following subclauses:

(I) for a tank with a capacity of 550 gallons or less:  
monthly standard = five gallons;

(II) for a tank with a capacity of 551 gallons to 1,000 gallons: monthly standard = seven gallons;

(III) for a tank with a capacity of 1,001 gallons to 2,000 gallons: monthly standard = 13 gallons;

(IV) for a tank with a capacity greater than 2,000 gallons: monthly standard = 1.0% of the total tank capacity.

(v) When the monthly standard is exceeded and a suspected release is thereby indicated, the owner or operator shall comply with the applicable release reporting, investigation, and corrective action requirements of Subchapter D of this chapter.

(4) Automatic tank gauging and inventory control.

(A) A combination of automatic tank gauging and inventory control may be used as a tank release detection method, subject to the following requirements.

(i) Inventory control procedures shall be in compliance with paragraph (1)(B) of this subsection.

(ii) The automatic tank gauging equipment shall be capable of:

(I) automatically monitoring the in-tank liquid levels, conducting automatic tests for substance loss, and collecting data for inventory control purposes; and

(II) performing an automatic test for substance loss that can detect a release of 0.2 gallon per hour from any portion of the tank which contains regulated substances.

(B) For emergency generator tanks only, automatic tank gauging may be used as a tank release detection method, provided that the automatic tank gauging equipment shall be capable of:

(i) automatically monitoring the in-tank liquid levels;

(ii) conducting continuous automatic tests for substance loss during the periods when the emergency generator engine is not in operation; and

(iii) performing an automatic test for substance loss that can detect a release of 0.2 gallon per hour from any portion of the tank which contains regulated substances.

(5) Vapor monitoring. Equipment and procedures designed to test or monitor for the presence of vapors from the regulated substance (or from a related tracer substance) in the soil gas of the backfilled excavation zone may be used, subject to the following limitations and requirements.

(A) The bedding and backfill materials in the excavation zone shall be sufficiently porous to allow vapors from any released regulated substance (or related tracer substance) to rapidly diffuse through the excavation zone (e.g., gravel, sand, crushed rock).

(B) The stored regulated substance, or any tracer substance placed in the tank system, shall be sufficiently volatile so that, in the event of a substance release from the UST system, vapors will develop to a level that can be readily detected by the monitoring devices located in the excavation zone.

(C) The capability of the monitoring device to detect vapors from the stored regulated substance shall not be adversely affected by the presence of any groundwater, rainfall, and/or soil moisture in a manner that would allow a release to remain undetected for more than one month (not to exceed 35 days).

(D) Any preexisting background contamination in the excavation zone shall not interfere with the capability of the vapor monitoring equipment to detect releases from the UST system.

(E) The vapor monitoring equipment shall be designed to detect vapors from either the stored regulated substance, a component or components of the

stored substance, or a tracer substance placed in the UST system, and shall be capable of detecting any significant increase in vapor concentration above preexisting background levels.

(F) Prior to installation of any vapor monitoring equipment, the site of the UST system (within the excavation zone) shall be assessed by qualified personnel to:

(i) ensure that the requirements in subparagraphs (A) - (D) of this paragraph have been met; and

(ii) determine the appropriate number and positioning of any monitor wells and/or observation wells, so that releases into the excavation zone from any part of the UST system can be detected within one month of the release (not to exceed 35 days).

(G) All monitoring wells and observation wells shall be designed and installed in accordance with the requirements of §334.46(g) of this title.

(6) Groundwater monitoring. Equipment or procedures designed to test or monitor for the presence of regulated substances floating on, or dissolved in, the

groundwater in the excavation zone may be used, subject to the following limitations and requirements.

(A) The stored regulated substance shall be immiscible in water and shall have a specific gravity of less than one.

(B) The natural groundwater level shall never be more than 20 feet (vertically) from the ground surface, and the hydraulic conductivity of the soils or backfill between all parts of the UST system and the monitoring points shall not be less than 0.01 centimeters per second (i.e., the soils or backfill shall consist of gravels, coarse to medium sands, or other similarly permeable material).

(C) Any automatic monitoring devices that are employed shall be capable of detecting the presence of at least 1/8 inch of free product on top of the groundwater in the monitoring well or observation well. Any manual monitoring method shall be capable of detecting a visible sheen or other accumulation of regulated substances in, or on, the groundwater in the monitoring well or observation well.

(D) Any preexisting background contamination in the monitored zone shall not interfere with the capability of the groundwater monitoring equipment or methodology to detect releases from the UST system, and the groundwater monitoring equipment or methodology shall be capable of detecting any significant increase above

preexisting background levels in the amount of regulated substance floating on, or dissolved in, the groundwater.

(E) Prior to installation of any groundwater monitoring equipment, the site of the UST system (within and immediately below the excavation zone) shall be assessed by qualified personnel to:

(i) ensure compliance with the requirements of subparagraphs (A) and (B) of this paragraph; and

(ii) determine the appropriate number and positioning of any monitoring wells and/or observation wells, so that releases from any part of the UST system can be detected within one month (not to exceed 35 days) of the release.

(F) All monitoring wells and observation wells shall be designed, installed, and maintained in accordance with the requirements in §334.46(g) of this title.

(7) Interstitial monitoring for double-wall or jacketed UST systems. Equipment designed to test or monitor for the presence of regulated substance vapors or liquids in the interstitial space between the inner (primary) and outer (secondary) walls

of a double-wall or jacketed UST system may be used, subject to the following conditions and requirements.

(A) Any double-wall UST system using this method of release detection shall be designed, constructed, and installed in accordance with the applicable technical and installation requirements in §334.45(d) and §334.46(f) of this title.

(B) The sampling, testing, or monitoring method shall be capable of detecting any release of stored regulated substances from any portion of the primary tank or piping within one month (not to exceed 35 days) of the release.

(C) The sampling, testing, or monitoring method shall be capable of detecting a breach or failure in the primary wall and the entrance of groundwater or any other water into the interstitial space due to a breach in the secondary wall of the double-wall or jacketed tank or piping system within one month (not to exceed 35 days) of such breach or failure (whether or not a stored regulated substance has been released into the environment).

(8) Monitoring of UST systems with secondary containment barriers. Equipment designed to test or monitor for the presence of regulated substances (liquids or vapors) in the excavation zone between the UST system and an impermeable

secondary containment barrier immediately around the UST system may be used, subject to the following conditions and requirements.

(A) Any secondary containment barrier or liner system at a UST system using this method of release detection shall be designed, constructed, and installed in accordance with the applicable technical and installation requirements in §334.45(d) and §334.46(f) of this title.

(B) The sampling, testing, or monitoring method shall be capable of detecting any release of stored regulated substance from any portion of the UST system into the excavation zone between the UST system and the secondary containment barrier within one month (not to exceed 35 days) of the release.

(C) The sampling, testing, or monitoring method shall be designed and installed in a manner that will ensure that groundwater, soil moisture, and rainfall will not render the method inoperative where a release could remain undetected for more than one month (not to exceed 35 days).

(D) Prior to installation of any secondary containment release monitoring equipment, the site of the UST system shall be assessed by qualified personnel to:

(i) ensure that the secondary containment barrier will be positioned above the groundwater level and outside the designated 25-year flood plain, unless the barrier and the monitoring equipment are designed for use under such conditions; and

(ii) determine the appropriate number and positioning of any observation wells.

(E) All observation wells shall be designed and installed in accordance with the requirements in §334.46(g) of this title.

(9) Statistical inventory reconciliation (SIR) and inventory control.

(A) A combination of SIR and inventory control may be used as a release detection method for UST system tanks and lines, subject to the following requirements.

(i) Inventory control procedures must be in compliance with paragraph (1)(B) of this subsection.

(ii) The SIR methodology as utilized by its provider or vendor, or by its vendor-authorized franchisee or licensee or representative must

analyze inventory control records in a manner which can detect a release of 0.2 gallons per hour from any part of the UST system.

(iii) The UST system owner and/or operator must take appropriate steps to assure that they receive a monthly analysis report from the entity which actually performs the SIR analysis (either the SIR provider/vendor or the provider/vendor-authorized franchisee or licensee or representative) in no more than 15 calendar days following the last day of the calendar month for which the analysis is performed. This analysis report must, at minimum:

(I) state the name of the SIR provider/vendor and the name and version of the SIR methodology which was utilized for the analysis as they are listed in the independent third-party evaluation of that methodology;

(II) state the name of the company and the individual (or the name of the individual if no company affiliation) who performed the analysis, if it was performed by a provider/vendor-authorized franchisee or licensee or representative;

(III) state the name and address of the facility at which analysis is performed and provide a description of each UST system for which analysis has been performed;

(IV) quantitatively state in gallons per hour for each UST system being monitored: the leak threshold for the month analyzed, and the minimum detectable leak rate for the month analyzed, and the indicated leak rate for the month analyzed;

(V) qualitatively state one of the following for each UST system being monitored: "pass," or "fail," or "inconclusive."

(iv) Any UST system analysis report result other than "pass" must be reported to the agency by the UST system owner or operator as a suspected release in accordance with §334.72 of this title (relating to Reporting of Suspected Releases).

(v) Any UST system analysis report result of "inconclusive" which has not been investigated and quantified as a "pass" (in the form of a replacement UST system analysis report meeting the requirements of clause (iii) of this subparagraph) must be reported to the agency as a suspected release within 72 hours of the time of receipt of the inconclusive analysis report result by the UST system owner or operator.

(B) At least once per calendar quarter, the SIR provider/vendor must select at random, at least one of the individual UST system analyses performed by each of its authorized franchisees or licensees or representatives during that period and audit that analysis to assure that provider/vendor standards are being maintained with regard to the acceptability of inventory control record data, the acceptability of analysis procedures, and the accuracy of analysis results. The written result of that audit must be provided to the authorized franchisee or licensee or representative and to the owner and/or operator of the audited UST system(s) by the SIR provider/vendor during that calendar quarter. In addition, within 30 days following each calendar quarter, the SIR provider/vendor must provide to the agency a list containing the name and address of each of its authorized franchisees or licensees or representatives which specifies for each one, the name and address of each facility at which one or more UST system audits were performed during the previous calendar quarter.

(10) Alternative release detection method. Any other release detection method, or combination of methods, may be used if such method has been reviewed and determined by the agency to be capable of detecting a release from any portion of the UST system in a manner that is no less protective of human health and safety and the environment than the methods described in paragraphs (1) - (8) of this subsection, in accordance with the provisions of §334.43 of this title (relating to Variances and Alternative Procedures).

(e) Release detection records.

(1) Owners and operators shall maintain the release detection records required in this subsection in accordance with the requirements in §334.10(b) of this title (relating to Reporting and Recordkeeping).

(2) Owners and operators shall maintain records adequate to demonstrate compliance with the release detection requirements in this section, and in accordance with the following minimum requirements.

(A) All appropriate installation records related to the release detection system, as listed in §334.46(i) of this title, shall be maintained for as long as the release detection system is used.

(B) All written performance claims pertaining to any release detection system used, and documentation of the manner in which such claims have been justified, verified, or tested by the equipment manufacturer, methodology provider/vendor, or independent third-party evaluator shall be maintained for as long as the release detection system is used.

(C) Records of the results of all manual and/or automatic methods of sampling, testing, or monitoring for releases (including tank tightness tests) shall be maintained for at least five years after the sampling, testing, or monitoring is conducted.

(D) Records and calculations related to inventory control reconciliation shall be maintained for at least five years from the date of reconciliation.

(E) Written documentation of all service, calibration, maintenance, and repair of release detection equipment permanently located on-site shall be maintained for at least five years after the work is completed. Any schedules of required calibration and maintenance provided by the release detection equipment manufacturer shall be retained for as long as the release detection system is used.

## **SUBCHAPTER N: OPERATOR TRAINING**

### **§§334.601 - 334.606**

#### **STATUTORY AUTHORITY**

The new rules are adopted under Texas Water Code (TWC), §5.012, which provides that the commission is the agency responsible for implementing the constitution and laws of the state relating to the conservation of natural resources and protection of the environment; TWC, §5.103, which authorizes the commission to adopt any rules necessary to carry out its powers and duties under this code and other laws of this state and to adopt rules repealing any statement of general applicability that interprets law or policy; TWC, §5.105, which requires the commission to establish and approve, by rule, all general policy of the commission; TWC, §26.011, which requires the commission to control the quality of water by rule; TWC, §26.039, which states that activities which are inherently or potentially capable of causing or resulting in the spillage or accidental discharge of waste or other substances and which pose serious or significant threats of pollution are subject to reasonable rules establishing safety and preventive measures which the commission may adopt or issue; TWC, §26.121, which prohibits persons from committing any other act or engaging in any other activity which in itself or in conjunction with any other discharge or activity causes, continues to cause, or will cause, pollution of any of the water in the state. The new rules are also adopted under TWC, §26.341, which states that it is the policy of this state to maintain and protect the quality

of groundwater and surface water resources in the state from certain substances in underground and aboveground storage tanks that may pollute groundwater and surface water resources, and requires the use of all reasonable methods, including risk-based corrective action to implement this policy; TWC, §26.345, which authorizes the commission to develop a regulatory program and to adopt rules regarding underground storage tanks; TWC, §26.3475, which requires underground storage tank systems to comply with commission requirements for tank release detection equipment and spill and overfill equipment; TWC, §26.348, which directs the commission to adopt standards of performance for maintaining leak detection systems; and the federal Energy Policy Act of 2005, (Pub.L. 109-58, August 8, 2005, 119 Stat. 294, codified at 42 United States Code 15801), (Energy Act), which requires states with authorized underground storage tank programs to implement operator training requirements.

The adopted new sections implement TWC, §§26.345, 26.3475, and 26.348. The adopted new sections also implement the portions of the Energy Act dealing with secondary containment of underground storage tank systems and underground storage tank operator training.

**§334.601. Purpose and Applicability.**

(a) This subchapter establishes training requirements for different classes of underground storage tank (UST) facility operators to enhance the protection of the state's groundwater and surface water resources from environmental contamination that could result from any releases of harmful substances stored in such systems, and to minimize threats to human health and safety which could result from the improper operation of a UST facility.

(b) Owners and operators of regulated UST systems must comply with the operator training requirements listed in this subchapter.

**§334.602. Designation and Training of Classes of Operators.**

(a) Owners or operators shall identify and designate for each underground storage tank (UST) facility including unmanned facilities, at least one named individual for each class of operator - Class A, Class B, and Class C. All individuals designated as a Class A, B or C operator shall, at a minimum, be trained and certified in accordance with this subchapter. For the purposes of this subchapter, the terms "Class A Operator", "Class B Operator", "Class C Operator", "Certified Operator" or "Designated Operator" are terms specific to the training requirements of this subchapter. The term "operator" used without these descriptors is the same as the term "operator" used in Chapter 334 generally and as specifically defined in §334.2(70) of this title (relating to Definitions).

(1) Owners and operators may designate different individuals for each class of operator, or one individual for more than one of the operator classes.

(2) Any individual designated for more than one operator class shall be trained and certified for each operator class, except that training and certification as a Class B operator also entitles that individual to certification as a Class A operator.

(3) An individual may be designated as a Class A Operator for one or more facilities. An individual may be designated as a Class B Operator for one or more, but not to exceed 50 30 facilities. An individual Class C operator must be specifically trained for each facility.

(4) During hours of operation, UST facilities must have at least one certified operator (either a Class A, Class B, or Class C operator) present at the UST facility, except when a UST facility is unmanned. A UST facility is considered unmanned when during the normal course of business there is routinely no attendant present at the facility who could respond to alarms or emergencies related to the UST system.

(Examples of unmanned UST facilities include, but are not limited to, card lock or card access fueling stations, telecommunication towers or utility transfer stations serviced by emergency generator USTs, and unattended UST systems located at industrial facilities.)  
Unmanned facilities must have weather resistant signage clearly visible from any

dispenser which instructs users with regard to basic safety procedures, provides the customer with a 24-hour telephone contact number monitored by a Class A, B, or C operator for the facility and provides instruction on when to call 911.

(b) The three classes of operators are identified as follows.

(1) Class A Operator.

(A) Functions. A Class A operator of a UST facility is an individual who typically has primary responsibility for ensuring the proper operation and maintenance of the UST systems, particularly in the capacity of managing resources and personnel necessary to achieve and maintain compliance with all UST regulations.

(B) Qualifications and Training. Class A operators must be trained in and have a general knowledge of the requirements of applicable UST regulations, including, but not limited to-registration, system components, product compatibility, spill and overfill prevention, corrosion protection, release detection, recordkeeping, notification, release reporting and response, temporary and permanent closure, operator training, and financial responsibility.

(2) Class B Operator.

(A) Functions. A Class B operator of a UST facility is an individual who ensures the implementation of all applicable requirements of these regulations in the field and implements to implement the day-to-day aspects of the operation and maintenance of, and recordkeeping for, UST systems.

(B) Qualifications and Training. Class B operators must be trained in and have detailed knowledge of the requirements of applicable UST regulations, including, but not limited to registration, system components, product compatibility, spill and overfill prevention, corrosion protection, release detection, recordkeeping, notification, release reporting and response, temporary and permanent closure, operator training and financial responsibility. A UST facility owner or operator may designate as its Class B operator a third party (i.e. an individual who is an independent contractor or consultant and is not affiliated with the facility owner or operator) only if that individual takes a direct and active role in ensuring compliance of the facility and only if that individual is (in accordance with Chapter 334, Subchapter I and with Chapter 30, Subchapter I of this title relating to Underground Storage Tank On-Site Supervisor Licensing and Contractor Registration; and Underground Storage Tank On-Site Supervisor Licensing and Contractor Registration, respectively) also a licensed UST On-Site Supervisor who holds a current "A" or "A/B" license and who either is, or is employed by, a registered UST Contractor. However, designation of an independent or not affiliated Class B operator in this manner does not also entitle that individual to

certification as a Class A operator for a facility.

(3) Class C Operator.

(A) Function. A Class C operator of a UST facility is an individual a person designated by the UST system owner who typically controls the dispensing of fuel at the facility and is responsible for initial response to alarms, releases, spills, overfills or threats to the public or to the environment.

(B) Training. Class C operators must be trained in both general and facility-specific emergency response procedures, such as: the operation of emergency shut-off equipment; the initial response procedures following system alarm warnings; the appropriate first response actions to releases, spills, or overfills; and the notification procedures to emergency responders and to the designated Class A and Class B operators of a UST facility.

**§334.603. Acceptable Operator Training and Certification Processes.**

(a) Training. Operator training must fulfill the training requirements described for each class of operator in §334.602 of this title (relating to Designation and Training of Classes of Operators). The following is a list of acceptable approaches to meet the operator training requirements.

(1) Acceptable Training for Class A and Class B operators. Class A and Class B operators must complete a Texas Commission on Environmental Quality (TCEQ) approved operator training course or process that includes the information listed in §334.602(b)(1) or (2) of this title, respectively. Courses or processes may include in-person or on-line training performed by, contracted for, or approved by the TCEQ, and must include an evaluation of operator knowledge through testing, practical demonstration, or other tools deemed acceptable by the TCEQ. In order for a non-contracted provider to be approved by the agency, the provider of a training course or process must be sponsored by an association or industry organization recognized nationwide or statewide with regard to its affiliation with regulated petroleum underground storage tank (UST) systems. All providers Providers will also be required to provide training documentation, including on-going maintenance of records of certified operators. Those records will be required to be accessible to the agency on an on-going basis.

(2) Acceptable Training for Class C Operators.

(A) Class B operators must provide training or ensure that the UST facility's Class C operators otherwise complete training in emergency procedures that includes the information listed in §334.602(b)(3) of this title. Class C operator training

programs may include in-class, hands-on, on-line, or any other training format deemed acceptable by the Class B operator.

(B) Class A and Class B operators must ensure that site-specific emergency procedures are maintained in an easily accessible location at the UST facility which is immediately available to the Class C operator, and that site-specific notices that include site-specific emergency procedures, the location of emergency shut-off devices, and appropriate emergency contact telephone numbers are posted in a prominent area at the UST facility that is easily visible to the Class C operator.

(b) Certification. Operators are considered certified operators after successfully completing one of the training processes listed in subsection (a) of this section.

(1) Class A and Class B Operators. Approved training providers must provide verification to all Class A and Class B operators who have successfully completed training, in the form of a written or printable electronic training certificate stating the classification and the date it was obtained. Owners and operators must ensure that training certificates are maintained at each facility, with copies of initial or new certificates provided to the TCEQ at the time that annual self certification is required for that facility.

(2) Class C Operators. A designated Class B operator for a given facility

must provide the facility owner or operator with signed and dated written verification in the form of a list of all Class C operators who have been trained for that facility, which includes the date of that training. Owners and operators must ensure that a current and correct list of trained Class C operators is maintained at each facility.

**§334.604. Operator Training Deadlines.**

(a) No later than August 8, 2012, owners or operators of underground storage tank (UST) facilities must designate at least one Class A, Class B, and Class C operator for each facility who has completed an acceptable operator training course as specified in §334.603 of this title (relating to Acceptable Operator Training and Certification Processes).

(b) Class A or Class B operators designated by a UST facility owner or operator after August 8, 2012, must complete an acceptable operator training course as specified in §334.603 of this title, prior to assuming operation and maintenance responsibilities at the UST facility.

(c) Class C operators designated by a UST facility owner or operator after August 8, 2012, must complete an acceptable operator training course as specified in §334.603 of this title, prior to assuming unsupervised responsibility for responding to

emergencies at UST system facilities.

**§334.605. Operator Training Frequency.**

(a) Certified Class A and Class B Operators must be re-trained in accordance with §334.602 and §334.603 of this title (relating to Designation and Training of Classes of Operators; and Acceptable Operator Training and Certification Processes, respectively) within three years of their last training date.

(b) Certified Class C operators must be re-trained in accordance with §334.602 and §334.603 of this title within three years of their last training date. In addition, Class C operator training is only applicable at the specific facility for which the training was provided.

(c) If an underground storage tank (UST) facility receives a notice of violation and the agency determines that the UST facility is in **significant** ~~substantial~~ noncompliance, the designated Class B operators for that UST facility, must attend either a Texas Commission on Environmental Quality (TCEQ) approved compliance class that addresses the noted noncompliant areas or an acceptable operator training course as specified in §334.603 of this title, within the time frame specified by the TCEQ for that violation. **Class B operators are not, however, required to attend such training more than once every 12 months, regardless of the number of their designated facilities found in**

**violation.** (For the purposes of this subchapter, "**significant** ~~substantial~~ noncompliance" is defined as the ~~complete~~ failure to provide one or more of the following in accordance with applicable TCEQ rule **or Environmental Protection Agency Significant Operational Compliance guidelines**: release detection, spill/overflow prevention, corrosion protection or financial assurance.)

**§334.606. Documentation of Operator Training.**

Owners and operators of underground storage tank facilities (except unmanned facilities) must maintain required training certification documentation as described in §334.603(b) of this title (relating to Acceptable Operator Training and Certification Processes) on-site and must provide it upon request to a Texas Commission on Environmental Quality (TCEQ) or TCEQ-authorized investigator. Documentation may be maintained electronically off-site if that facility has the capability of producing a clear printed copy on-site which can be provided to a TCEQ or TCEQ-authorized investigator within 72 hours of at the time of the investigation. Owners and operators of unmanned facilities must provide documentation as requested by a TCEQ investigator or TCEQ-authorized investigator.